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Godina LXVIII

NAUTIČKI GODIŠNJAK

ZA

2010

GODINU

HIDROMETEOROLOŠKI ZAVOD CRNE GORE
SEKTOR ZA HIDROGRAFIJU I OKEANOGRAFIJU
PODGORICA – CRNA GORA

UKUPNA POPRAVKA VISINE

PRVA POPRAVKA VISINE
ZA SUNCE, ZVJEZDE I PLANETE

Opažena visina	⊙ refrakcija paralaksa radijus = 16′	★ i planeta refrakcija
° ′	′	′
6 30	+ 8.2	- 7.9
6 40	8.4	7.7
6 50	8.6	7.6
7 00	8.7	7.4
7 10	8.9	7.2
7 20	+ 9.0	- 7.1
7 30	9.2	7.0
7 40	9.3	6.8
7 50	9.5	6.7
8 00	9.6	6.6
8 10	+ 9.7	- 6.4
8 20	9.8	6.3
8 30	10.0	6.2
8 40	10.1	6.1
8 50	10.2	6.0
9 00	+ 10.3	- 5.9
9 20	10.5	5.7
9 40	10.6	5.5
10 00	10.8	5.3
10 20	11.0	5.2
10 40	+ 11.2	- 5.0
11 00	11.3	4.9
11 30	11.5	4.7
12 00	11.7	4.5
12 30	11.9	4.3
13 00	+ 12.0	- 4.1
13 30	12.2	4.0
14 00	12.3	3.8
15 00	12.6	3.6
16 00	12.8	3.4
17 00	+ 13.0	- 3.2
18 00	13.2	3.0
19 00	13.3	2.8
20 00	13.5	2.6
22 00	13.7	2.4
24 00	+ 14.0	- 2.2
26 00	14.1	2.0
28 00	14.3	1.8
30 00	14.4	1.7
32 00	14.6	1.6
34 00	+ 14.7	- 1.4
36 00	14.8	1.3
38 00	14.9	1.3
40 00	15.0	1.2
50 00	15.3	0.8
60 00	+ 15.5	- 0.6
70 00	15.7	0.4
80 00	15.8	0.2
90 00	16.0	0.0

DRUGA POPRAVKA VISINE
ZA VISINU OKA

Visina oka	depresija	Visina oka	depresija
metara	′	metara	′
0.5	- 1.3	18	- 7.5
1.0	1.8	19	7.7
1.5	2.2	20	7.9
2.0	2.5	21	8.1
8.5	2.8	22	8.3
3.0	- 3.1	23	- 8.5
3.5	3.3	24	8.7
4.0	3.5	25	8.9
4.5	3.8	26	9.0
5.0	3.9	27	9.2
5.5	- 4.1	28	- 9.4
6.0	4.3	29	9.6
6.5	4.5	30	9.7
7.0	4.7	50	12.6
7.5	4.9	75	15.4
8.0	- 5.0	100	- 17.7
8.5	5.2	125	19.9
9.0	5.3	150	21.8
9.5	5.4	175	23.5
10.0	5.6	200	25.1
11.0	- 5.9	250	- 28.1
12.0	6.1	300	30.8
13.0	6.4	350	33.2
14.0	6.5	400	35.5
15.0	6.9	450	37.7
16.0	- 7.1	500	- 39.7
17.0	7.3	600	43.5

TREĆA POPRAVKA VISINE
ZA VISINU PLANETE S OBZIROM NA PARALAKSU

Opažena visina planete	Horizontska paralaksa					
	′ 0.1	′ 0.2	′ 0.3	′ 0.4	′ 0.5	′ 0.6
°	′	′	′	′	′	′
10	0.1	0.2	0.3	0.4	0.5	0.6
30	0.1	0.2	0.3	0.3	0.4	0.5
50	0.1	0.1	0.2	0.3	0.3	0.4
70	0.0	0.1	0.1	0.2	0.2	0.2

TREĆA POPRAVKA VISINE
ZBOG PARALAKSE I PROMJENE RADIJUSA SUNCA

	Jan.	Feb.	Mart	Apr.	Maj	Jun	Jul	Avg.	Sep.	Okt.	Nov.	Dec.
	′	′	′	′	′	′	′	′	′	′	′	′
od 1. do 15.	+0.3	+0.2	+0.1	0.0	−0.1	−0.2	−0.2	−0.2	−0.1	+0.1	+0.2	+0.3
od 16. do kraja	+0.3	+0.2	+0.1	−0.1	−0.2	−0.2	−0.2	−0.2	0.0	+0.1	+0.2	+0.3

$\overline{\odot}$ Za *gornji rub Sunca* korekcija = tablična vrijednost *manje* dvostruki radijus (2r)

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IZDAVAČ:

SEKTOR ZA HIDROGRAFIJU I OKEANOGRAFIJU HMZ CRNE GORE PODGORICA

GLAVNI I ODGOVORNI UREDNIK:

Mr LUKA MITROVIĆ

RECENZENT:

Mr DUŠAN SLAVNIĆ

LEKTURA I KOREKTURA:

Prof. Dr STEVO ŠEGAN

UREĐIVAČKI ODBOR:

Mr LUKA MITROVIĆ

Mr DUŠAN SLAVNIĆ

Prof. Dr STEVO ŠEGAN

SLOG:

Prof. Dr STEVO ŠEGAN

ŠTAMPA: STUDIO PLUS, Beograd

POVEZ: STUDIO PLUS, Beograd

TIRAŽ:

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ADRESA IZDAVAČA:

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SADRŽAJ

Strana

Ukupna popravka visine **0**
Predgovor . . . . . **VI**
Astronomski znaci, skraćenice i konstante . . . . **VII**
Naši i engleski nazivi za znakove VII
Opšti astronomski znaci VII
Skraćenice VII
Zodijački znaci i sazvježđa VII
Osnovne astronomske konstante IAU (1976), XXIV (2000) VII

var
EFEMERIDE
1–184

Efemeride Sunca, Mjeseca, Venere, Marsa, Jupitera i Saturna 2

var
EFEMERIDE NAUTIČKIH ZVJEZDA
185–188

Surektascenzije nautičkih zvjezda za 1. u mjesecu . 186
Deklinacije nautičkih zvjezda za 1. u mjesecu 187
Vremena gornjih prolaza nautičkih zvjezda kroz meridijan u Griniču za 1. u mjesecu 188
Popravka za datum 188

var
TABLICE ZA ODREĐIVANJE GEOGRAFSKE ŠIRINE POMOĆU VISINE I AZIMUTA SJEVERNJAČE
189–192

Tablica I 190
Tablica II 191
Tablica III 191
Azimuti Sjevernjače 192

const
INTERPOLACIONE I POMOĆNE TABLICE
193–197

Interpolaciona tablica za izračunavanje trenutaka izlaza i zalaza Sunca i Mjeseca, za $\varphi = 0°$ do $\pm 30°$ 194
Interpolaciona tablica za izračunavanje trenutaka izlaza i zalaza Sunca i Mjeseca, za $\varphi = \pm(30°$ do $60°)$ 195
Interpolaciona tablica za izračunavanje trenutaka izlaza, zalaza i prolaza Mjeseca kroz meridijan . . . 196

Strana

Naše i engleske skraćenice i ključne rječi . . . . **VIII**
Podaci o Mjesecu i planetama . . . . . **IX**
Mjesečeve mjene IX
Perigej i apogej Mjeseca IX
Vidljivost planeta IX
Počeci godišnjih doba IX
Pomračenja Sunca i Mjeseca u 2010. godini . . **X**
Kalendar za prostu 2010. godinu . . . . . **XI**

const
INTERPOLACIONA TABLICA ZA POPRAVKU ČASOVNOG UGLA I DEKLINACIJE
199–259

const
TABLICA ZA PRETVARANJE
260

Ugaonih u vremenske vrednosti 260
Vremenskih u ugaone vrednosti 260

var
UPUTSTVO ZA KORIŠĆENJE NAUTIČKOG GODIŠNJAKA
261–271

Određivanje časovnog ugla i deklinacije nebeskih tjela 263
Određivanje izlaza i zalaza nebeskih tjela 265
Određivanje gornjeg prolaza nebeskih tjela kroz meridijan 267
Sjevernjača 269
Pretvaranje raznih vrsta vremena 269
Identifikacija zvjezda pomoću zvjezdanih karata . . . 270

const
ZVANIČNA I ZONSKA VREMENA
273–276

Pregled zvaničnih vremena 275
Karta zonskih i zvaničnih vremena 276

const
KARTE ZVJEZDANOG NEBA
277–280

Karta sazvježđa severnog neba 278
Karta sazvježđa južnog neba 279
Zvjezdano nebo u pola noći 280

var = promjenljivi deo Nautičkog godišnjaka
const = stalni deo Nautičkog godišnjaka

PREDGOVOR

Hidrometeorološki zavod Crne Gore izdaje svoj prvi broj NAUTIČKOG GODIŠNJAKA, koji je sedamnaesti u prethodnom nizu i šezdesetisedmi u ukupnom nizu izdanja ove publikacije na našim prostorima.

Za šezdeset i sedam brojeva Nautičkog godišnjaka, do sada, možemo zahvaliti jednoj maloj armiji ljudi, entuzijasta i naučnika, koji su dali svoj nesebični doprinos da ova publikacija bude prisutna među pomorcima Kraljevine Jugoslavije, Socijalističke Jugoslavije, Saveza Republika Srbije i Crne Gore, a sada i samo Crne Gore.

Put je išao preko preuzimanja ruskih Nautičkih godišnjaka, koji su prevođeni na naš jezik i ručno ukucavane brojevne vrednosti efemerida, tablica popravki i svih ostalih tablica, do današnje skoro sasvim automatizovane računarske obrade podataka.

Od 1983. godine, zahvaljujući prof. dr Stevi Šeganu, počelo se sa računarskom obradom Nautičkog godišnjaka.

Algoritme i softver za potrebna izračunavanja, kao i računarsku pripremu za štampu i za ovaj broj, kao i za prethodnih dvadeset četri, izvršio je prof. dr Stevo Šegan sa Katedre za astronomiju Univerziteta u Beogradu.

Svi podaci potrebni za navigaciju izračunati su polazeći od heliocentričnih pravouglih koordinata nebeskih tjela za standardnu epohu J2000.0, a izračunavanja su usklađena sa preporukama i rješenjima Međunarodne astronomske unije (IAU 1976–1983 i XXIV GA 2000). Takvim postupkom osigurana je maksimalna tačnost u današnje vrijeme.

Podaci u Nautičkom godišnjaku izračunati su i prirađeni isključivo za potrebe astronomske navigacije.

Godišnjak se sastoji iz dva djela—*efemeridskog* (var) i *stalnog* (const). Efemeridski dio sadrži za tekuću godinu efemeride Sunca, Mjeseca, četiri velike planete (Venere, Marsa, Jupitera i Saturna) i pedeset četiri najsjajnije (nautičke) zvjezde kao i tablice za određivanje geografske širine pomoću visine i azimuta Sjevernjače. Stalni dio Godišnjaka sadrži interpolacione i pomoćne tablice.

Svi vremenski podaci u Nautičkom godišnjaku odnose se na Grinički meridijan. Prema tome, argument u svim efemeridama je univerzalno, odnosno svjetsko vrijeme, koje se računa od ponoći ($00^h.00$) na meridijanu Griniča.

Tačnost astronomskih podataka data je u ugaonoj mjeri od jedne desetine minuta, u vremenskoj skali od jedne sekunde, odnosno, gdje je to bilo potrebno, do jedne desetine sekunde. Podaci izračunati u interpolacionim tablicama imaju približno istu tačnost.

Izbor i sastav efemerida ostao je neizmjenjen i u ovom izdanju. Raspored efemerida je, kao i ranije, po datumima, po dva na svakoj stranici. Efemeride zvjezda i tablice za izračunavanje geografske širine pomoću visine i azimuta Sjevernjače izdvojene su posebno. Interpolacione tablice, zajedničke za ispravke časovnog ugla i deklinacije, takođe su date posebno.

Ukoliko postoje opravdane primjedbe i potreba za izmjenama i ispravkama molimo da nam ih proslijedite, a mi ćemo ih, sa punim uvažavanjem, razmotriti.

Podgorica, Decembar 2009.

ZA HIDROMETEOROLOŠKI ZAVOD CRNE GORE

DIREKTOR
mr LUKA MITROVIĆ

ASTRONOMSKI ZNACI, SKRAĆENICE I KONSTANTE

NAŠI I ENGLESKI NAZIVI ZA ZNAKOVE
Domestic and English Names for Symbols

☉	Sunce	The Sun
☾	Mjesec	The Moon
★	Zvjezda	A Star
♀	Venera	Venus
♂	Mars	Mars
♃	Jupiter	Jupiter
♄	Saturn	Saturn
♈	Proljećna tačka	First Point of Aries
●	Mlad Mjesec	New Moon
◐	Prva četvrt	First Quarter
○	Pun Mjesec	Full Moon
◑	Poslednja četvrt	Last Quarter
°	Stepen	Degree
′	Minut (luka)	Minute of Arc
″	Sekunda (luka)	Second of Arc

ZODIJAČKI ZNACI I SAZVEŽĐA

♈	Ovan	Aries
♉	Bik	Taurus
♊	Blizanci	Gemini
♋	Rak	Cancer
♌	Lav	Leo
♍	Djevojka	Virgo
♎	Vaga	Libra
♏	Škorpija	Scorpius
♐	Strelac	Sagittarius
♑	Jarac	Capricornus
♒	Vodolija	Aquarius
♓	Ribe	Pisces

♈ ... Proljećna tačka
♎ ... Jesenja tačka

OPŠTI ASTRONOMSKI ZNACI

☉	Sunce	♅	Uran
☾	Mjesec	♆	Neptun
☿	Merkur	♇	Pluton
♀	Venera	☄	Kometa
♁	Zemlja	●	Mlad Mjesec
♂	Mars	◐	Prva četvrt
♃	Jupiter	○	Pun Mjesec
♄	Saturn	◑	Poslednja četvrt

SKRAĆENICE

d	dan	vremena
h	čas	
min	minut	
s	sekunda	
°	stepen	ugla
′	minut	
″	sekunda	
+	sjeverne geografske širine i deklinacije; istočne geografske dužine	
−	južne geografske širine i deklinacije; zapadne geografske dužine	

OSNOVNE ASTRONOMSKE KONSTANTE
IAU(1976) XXIV(2000)

DEFINICIONE KONSTANTE

Gausova gravitaciona konstanta	$k = 0.017\,202\,098\,95$
Brzina svjetlosti	$c = 299\,792\,458\,m/s$

OSNOVNE KONSTANTE

Svjetlosno vrijeme	$\tau_A = 499.004\,786\,s$
Ekvatorski poluprečnik Zemlje	$a_e = 6\,378\,137\,m$
Dinamički faktor oblika Zemlje	$J_2 = 0.001\,082\,64$
Geocentrična gravitaciona konstanta	GE=$3.986\,004 \times 10^{14}\,m^3/s^2$
Konstanta gravitacije	G=$6.673 \times 10^{-11}\,m^3/kg\,s^2$
Masa Mjeseca u jedinic. mase Zemlje	$\mu = 0.012\,300\,04$
Opšta precesija u longitudi, za Julijansko stoljeće	$p = 5029''.7970$
Nagib ekliptike	$\varepsilon = 23°26'21''.448$

IZVEDENE KONSTANTE

Konstanta nutacije	$N = 9''.2052$
Jedinica rastojanja (astronomska jed.)	$c\tau_A$ =A=$1.495\,978\,71 \times 10^{11}\,m$
Paralaksa Sunca	$\arcsin(a_e/A) = \pi_\odot = 8''.794\,143$
Konstanta aberacije	$\varkappa = 20''.495\,51$
Faktor Zemljine spljoštenosti	$f = 0.003\,352\,82 = 1/298.256$
Heliocentrična gravitaciona konstanta	$GS = 1.327\,124\,42 \times 10^{20}\,m^3/s^2$
Masa Sunca u jedinicama mase Zemlje	$GS/GE = S/E = 332\,946.0$
Masa Sunca	$GS/G = S = 1.9884 \times 10^{30}\,kg$
Relativne mase planeta:	
Merkur	6 023 600
Venera	408 523.7
Zemlja+Mjesec	328 900.6
Mars	3 098 708
Jupiter	1 047.349
Saturn	3 497.9
Uran	22 903
Neptun	19 412
Pluton	135 200 000

NAŠE I ENGLESKE SKRAĆENICE I KLJUČNE RIJEČI

Domestic and English Abbreviations and Key Words

UT	Univerzalno (svjetsko) vrijeme	**UT**	Universal Time
$\mathbf{T_p}$	Griničko pravo vrijeme	**GAT**	Greenwich Apparent Time
$\mathbf{T_z}$	Griničko zvjezdano vrijeme	**GST**	Greenwich Sidereal Time
$\mathbf{T_{\overline{m}}}$	Srednje vrijeme gornjeg prolaza kroz meridijan u Griniču	$\mathbf{T_{\bar{r}}}$	Greenwich Mean Time of the Upper Transit on the Meridian of Greenwich
$\mathbf{T_{\underline{m}}}$	Srednje vrijeme donjeg prolaza kroz meridijan u Griniču	$\mathbf{T_{\underline{r}}}$	Greenwich Mean Time of the Lower Transit on the Meridian of Greenwich
$\mathbf{t_s}$	Mjesno srednje vrijeme	**LMT**	Local Mean Time
$\mathbf{t_p}$	Mjesno pravo vrijeme	**LAT**	Local Apparent Time
$\mathbf{t_z}$	Mjesno zvjezdano vrijeme	**LST**	Local Sidereal Time
$\mathbf{t_x}$	Zonsko vrijeme	**ZT**	Zone Time
$\mathbf{t_{zv}}$	Zvanično vrijeme	**LCT**	Local Civil Time
e	Vremensko izjednačenje	**Eq.T.**	Equation of Time (App.-Mean)
S	Grinički časovni ugao	**GHA**	Greenwich Hour Angle
s	Mjesni časovni ugao	**LHA**	Local Hour Angle, Meridian Angle
δ	Deklinacija	**Dec.**	Declination
α	Rektascenzija	**RA**	Right Ascension
$(\mathbf{360}^\circ - \alpha)$	Surektascenzija	**SHA**	Sidereal Hour Angle
Υ	Proljećna tačka	Υ	First Point of Aries
π	Horizontska paralaksa	**H.P.**	Horizontal Parallax
φ	Geografska širina	**Lat.**	Latitude
λ	Geografska dužina	**Long.**	Longitude
r	Poluprečnik	**SD**	Semidiameter
Pl.	Planete	**Pl.**	Planets
Br.	Broj	**No.**	Number
Vel.	Veličina	**Mag.**	Magnitude
d	Dan	**d**	Day
h	Čas	**h**	Hour
min	Minut	**min**	Minute of Time
s	Sekunda	**s**	Second of Time

Pregled zvjezda	Review of Selected Stars
Prividni položaji zvjezda	Apparent Places of Selected Stars
Popravka časovnog ugla	Increment to GHA
Druga popravka za časovni ugao i deklinaciju	Correction to GHA and Declination
Vrijeme prolaza zvjezda	Upper Transit of Stars at Greenwich
Popravka	Correction
Tablice za određivanje geografske širine i azimuta pomoću Sjevernjače	Latitude and Azimuth by Polaris
Interpolacione tablice	Interpolation Tables
Izlaz, zalaz	Rise, Set
Trajanje sumraka	Twilight Duration
Građanski	Civil
Astronomski	Astronomic
Mjesečeve mene	Moon Phases
Starost Mjeseca	Moon Age
Perigej	Perigee
Apogej	Apogee

PODACI O MJESECU I POČETKU GODIŠNJIH DOBA

MJESEČEVE MJENE

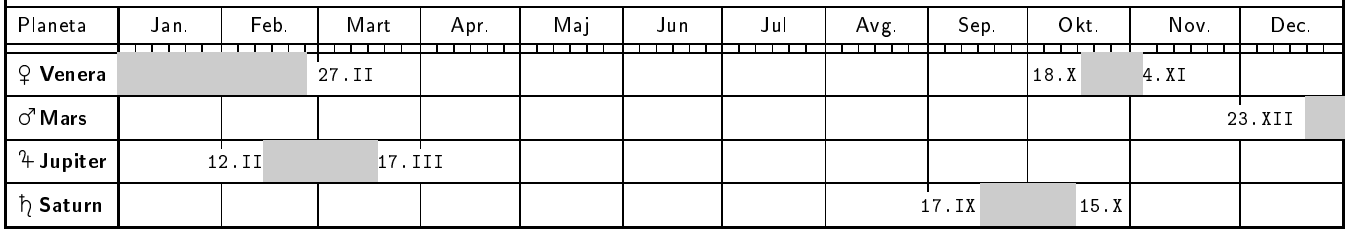
mjesec	PRVA ČETVRT				PUN MJESEC				POSLEDNJA ČETVRT				MLAD MJESEC				mjesec
	◐			◐	○			○	◑			◑	●			●	
	dan	h	min	dan	h	min	dan	h	min	dan	h	min	dan	h	min	dan	h	min	
Januar	15	7	11		23	10	53		30	6	18		7	10	39				Januar
Februar	14	2	51		22	0	42		28	16	38		5	23	48				Februar
Mart	15	21	1		23	11	0		30	2	25		7	15	42				Mart
April	14	12	29		21	18	20		28	12	18		6	9	37				April
Maj	14	1	4		20	23	43		27	23	7		6	4	15				Maj
Jun	12	11	15		19	4	29		26	11	30		4	22	13				Jun
Jul	11	19	40		18	10	10		26	1	36		4	14	35				Jul
Avgust	10	3	8		16	18	14		24	17	5		3	4	59				Avgust
Septembar	8	10	30		15	5	50		23	9	17		1	17	22				Septembar
Oktobar	7	18	44		14	21	27		23	1	36		1	3	52	30	12	46	Oktobar
Novembar	6	4	52		13	16	39		21	17	27					28	20	36	Novembar
Decembar	5	17	36		13	13	59		21	8	13					28	4	18	Decembar

PERIGEJ I APOGEJ MJESECA

mjesec	PERIGEJ							APOGEJ						mjesec
	dan	h	min	dan	h	min		dan	h	min	dan	h	min	
Januar	1	20	37.0	30	9	0.4		17	1	41.0				Januar
Februar				27	21	41.0		13	2	7.0				Februar
Mart				28	4	57.0		12	10	8.0				Mart
April				24	21	0.0		9	2	46.0				April
Maj				20	8	40.0		6	21	54.0				Maj
Jun				15	14	55.0		3	16	52.0				Jun
Jul				13	11	22.0		1	10	13.0	28	23	51.0	Jul
Avgust				10	17	57.0					25	5	52.0	Avgust
Septembar				8	4	2.0					21	8	4.0	Septembar
Oktobar				6	13	42.0					18	18	19.0	Oktobar
Novembar	30	19	10.0	3	17	23.0					12	11	48.0	Novembar
Decembar	25	12	25.0								13	8	36.0	Decembar

VIDLJIVOST PLANETA

Osjenčeni dio dijagrama pokazuje kada je planeta nevidljiva



POČECI GODIŠNJIH DOBA

PROLJEĆE	LJETO	JESEN	ZIMA
20. mart u $17^h 32.^m0$	21. jun u $11^h 28.^m0$	23. septembar u $3^h 9.^m0$	21. decembar u $23^h 38.^m0$

PODACI O MJESECU I POČETKU GODIŠNJIH DOBA

MJESEČEVE MJENE

mjesec	MLAD MJESEC				PRVA ČETVRT				PUN MJESEC				POSLEDNJA ČETVRT				mjesec
	●			●			◐		○			○	◑		◑		
	dan	h	min	dan	h	min	dan	h	min	dan	h	min	dan	h	min	dan	h	min	
Januar	15	7	11		23	10	53		30	6	18		7	10	39				Januar
Februar	14	2	51		22	0	42		28	16	38		5	23	48				Februar
Mart	15	21	1		23	11	0		30	2	25		7	15	42				Mart
April	14	12	29		21	18	20		28	12	18		6	9	37				April
Maj	14	1	4		20	23	43		27	23	7		6	4	15				Maj
Jun	12	11	15		19	4	29		26	11	30		4	22	13				Jun
Jul	11	19	40		18	10	10		26	1	36		4	14	35				Jul
Avgust	10	3	8		16	18	14		24	17	5		3	4	59				Avgust
Septembar	8	10	30		15	5	50		23	9	17		1	17	22				Septembar
Oktobar	7	18	44		14	21	27		23	1	36		1	3	52	30	12	46	Oktobar
Novembar	6	4	52		13	16	39		21	17	27					28	20	36	Novembar
Decembar	5	17	36		13	13	59		21	8	13					28	4	18	Decembar

PERIGEJ I APOGEJ MJESECA

mjesec	PERIGEJ							APOGEJ						mjesec
	dan	h	min	dan	h	min		dan	h	min	dan	h	min	
Januar	1	20	37.0	30	9	0.4		17	1	41.0				Januar
Februar				27	21	41.0		13	2	7.0				Februar
Mart				28	4	57.0		12	10	8.0				Mart
April				24	21	0.0		9	2	46.0				April
Maj				20	8	40.0		6	21	54.0				Maj
Jun				15	14	55.0		3	16	52.0				Jun
Jul				13	11	22.0		1	10	13.0	28	23	51.0	Jul
Avgust				10	17	57.0					25	5	52.0	Avgust
Septembar				8	4	2.0					21	8	4.0	Septembar
Oktobar				6	13	42.0					18	18	19.0	Oktobar
Novembar	30	19	10.0	3	17	23.0					12	11	48.0	Novembar
Decembar	25	12	25.0								13	8	36.0	Decembar

VIDLJIVOST PLANETA

Osjenčeni dio dijagrama pokazuje kada je planeta nevidljiva

Planeta	Jan.	Feb.	Mart	Apr.	Maj	Jun	Jul	Avg.	Sep.	Okt.	Nov.	Dec.
♀ Venera			27.II							18.X	4.XI	
♂ Mars												23.XII
♃ Jupiter		12.II		17.III								
♄ Saturn									17.IX	15.X		

POČECI GODIŠNJIH DOBA

PROLJEĆE	LJETO	JESEN	ZIMA
20. mart u $17^h 32^m.0$	21. jun u $11^h 28^m.0$	23. septembar u $3^h 9^m.0$	21. decembar u $23^h 38^m.0$

POMRAČENJA SUNCA I MJESECA

u 2010. godini

DESIĆE SE UKUPNO ČETRI POMRAČENJA:
JEDNO PRSTENASTO I JEDNO POTPUNO POMRAČENJE SUNCA
JEDNO DELIMIČNO I JEDNO POTPUNO POMRAČENJE MJESECA

1.	15. JANUAR	PRSTENASTO POMRAČENJE SUNCA	univerzalno (svjetsko) vrijeme dan h min
•	→	POČETAK POMRAČENJA	15 4 5.4
••••	⇉	SREDINA POMRAČENJA	15 7 20.3
•	←	KRAJ POMRAČENJA	15 10 7.6
		VIDLJIVOST: EKVATORSKA AFRIKA, JUG INDIJE I ŠRI LANKA, JUGO–ISTOČNA AZIJA	

4.	26. JUN	DELIMIČNO POMRAČENJE MJESECA	univerzalno (svjetsko) vrijeme dan h min
•	→	ULAZAK MJESECA U POLUSENKU	26 8 55.5
••••	⇉	SREDINA POMRAČENJA	26 11 38.5
•	←	IZLAZAK MJESECA IZ POLUSENKE	26 14 21.4

3.	11. JUL	POTPUNO POMRAČENJE SUNCA	univerzalno (svjetsko) vrijeme dan h min
•	→	POČETAK POMRAČENJA	11 17 9.6
•••	← →	POČETAK POTPUNOG POMRAČENJA	11 18 16.8
••••	⇉	SREDINA POMRAČENJA	11 19 50.9
•••	← →	KRAJ POTPUNOG POMRAČENJA	11 20 50.0
•	←	KRAJ POMRAČENJA	11 21 57.2
		VIDLJIVOST: KUKOVO OSTRVO, POLINEZIJA, JUG JUŽNE AMERIKE	

2.	21. DECEMBAR	POTPUNO POMRAČENJE MJESECA	univerzalno (svjetsko) vrijeme dan h min
•	→	ULAZAK MJESECA U POLUSENKU	21 5 27.7
•••	← →	PRVI KONTAKT SA SENKOM	21 6 32.3
••••	⇉	SREDINA POMRAČENJA	21 8 17.0
•••	← →	POSLEDNJI KONTAKT SA SENKOM	21 10 1.7
•	←	IZLAZAK MJESECA IZ POLUSENKE	21 11 6.1

KALENDAR

za prostu 2010. godinu

JANUAR

Dan u sed.	Dan u mjes.	Dan u god.	Julijanski datum
			245
PE	1	1	5197.5
SU	2	2	5198.5
NE1	3	3	5199.5
PO	4	4	5200.5
UT	5	5	5201.5
SR	6	6	5202.5
ČE	7	7	5203.5
PE	8	8	5204.5
SU	9	9	5205.5
NE2	10	10	5206.5
PO	11	11	5207.5
UT	12	12	5208.5
SR	13	13	5209.5
ČE	14	14	5210.5
PE	15	15	5211.5
SU	16	16	5212.5
NE3	17	17	5213.5
PO	18	18	5214.5
UT	19	19	5215.5
SR	20	20	5216.5
ČE	21	21	5217.5
PE	22	22	5218.5
SU	23	23	5219.5
NE4	24	24	5220.5
PO	25	25	5221.5
UT	26	26	5222.5
SR	27	27	5223.5
ČE	28	28	5224.5
PE	29	29	5225.5
SU	30	30	5226.5
NE5	31	31	5227.5

FEBRUAR

Dan u sed.	Dan u mjes.	Dan u god.	Julijanski datum
			245
PO	1	32	5228.5
UT	2	33	5229.5
SR	3	34	5230.5
ČE	4	35	5231.5
PE	5	36	5232.5
SU	6	37	5233.5
NE6	7	38	5234.5
PO	8	39	5235.5
UT	9	40	5236.5
SR	10	41	5237.5
ČE	11	42	5238.5
PE	12	43	5239.5
SU	13	44	5240.5
NE7	14	45	5241.5
PO	15	46	5242.5
UT	16	47	5243.5
SR	17	48	5244.5
ČE	18	49	5245.5
PE	19	50	5246.5
SU	20	51	5247.5
NE8	21	52	5248.5
PO	22	53	5249.5
UT	23	54	5250.5
SR	24	55	5251.5
ČE	25	56	5252.5
PE	26	57	5253.5
SU	27	58	5254.5
NE9	28	59	5255.5

MART

Dan u sed.	Dan u mjes.	Dan u god.	Julijanski datum
			245
PO	1	60	5256.5
UT	2	61	5257.5
SR	3	62	5258.5
ČE	4	63	5259.5
PE	5	64	5260.5
SU	6	65	5261.5
NE10	7	66	5262.5
PO	8	67	5263.5
UT	9	68	5264.5
SR	10	69	5265.5
ČE	11	70	5266.5
PE	12	71	5267.5
SU	13	72	5268.5
NE11	14	73	5269.5
PO	15	74	5270.5
UT	16	75	5271.5
SR	17	76	5272.5
ČE	18	77	5273.5
PE	19	78	5274.5
SU	20	79	5275.5
NE12	21	80	5276.5
PO	22	81	5277.5
UT	23	82	5278.5
SR	24	83	5279.5
ČE	25	84	5280.5
PE	26	85	5281.5
SU	27	86	5282.5
NE13	28	87	5283.5
PO	29	88	5284.5
UT	30	89	5285.5
SR	31	90	5286.5

APRIL

Dan u sed.	Dan u mjes.	Dan u god.	Julijanski datum
			245
ČE	1	91	5287.5
PE	2	92	5288.5
SU	3	93	5289.5
NE14	4	94	5290.5
PO	5	95	5291.5
UT	6	96	5292.5
SR	7	97	5293.5
ČE	8	98	5294.5
PE	9	99	5295.5
SU	10	100	5296.5
NE15	11	101	5297.5
PO	12	102	5298.5
UT	13	103	5299.5
SR	14	104	5300.5
ČE	15	105	5301.5
PE	16	106	5302.5
SU	17	107	5303.5
NE16	18	108	5304.5
PO	19	109	5305.5
UT	20	110	5306.5
SR	21	111	5307.5
ČE	22	112	5308.5
PE	23	113	5309.5
SU	24	114	5310.5
NE17	25	115	5311.5
PO	26	116	5312.5
UT	27	117	5313.5
SR	28	118	5314.5
ČE	29	119	5315.5
PE	30	120	5316.5

MAJ

Dan u sed.	Dan u mjes.	Dan u god.	Julijanski datum
			245
SU	1	121	5317.5
NE18	2	122	5318.5
PO	3	123	5319.5
UT	4	124	5320.5
SR	5	125	5321.5
ČE	6	126	5322.5
PE	7	127	5323.5
SU	8	128	5324.5
NE19	9	129	5325.5
PO	10	130	5326.5
UT	11	131	5327.5
SR	12	132	5328.5
ČE	13	133	5329.5
PE	14	134	5330.5
SU	15	135	5331.5
NE20	16	136	5332.5
PO	17	137	5333.5
UT	18	138	5334.5
SR	19	139	5335.5
ČE	20	140	5336.5
PE	21	141	5337.5
SU	22	142	5338.5
NE21	23	143	5339.5
PO	24	144	5340.5
UT	25	145	5341.5
SR	26	146	5342.5
ČE	27	147	5343.5
PE	28	148	5344.5
SU	29	149	5345.5
NE22	30	150	5346.5
PO	31	151	5347.5

JUN

Dan u sed.	Dan u mjes.	Dan u god.	Julijanski datum
			245
UT	1	152	5348.5
SR	2	153	5349.5
ČE	3	154	5350.5
PE	4	155	5351.5
SU	5	156	5352.5
NE23	6	157	5353.5
PO	7	158	5354.5
UT	8	159	5355.5
SR	9	160	5356.5
ČE	10	161	5357.5
PE	11	162	5358.5
SU	12	163	5359.5
NE24	13	164	5360.5
PO	14	165	5361.5
UT	15	166	5362.5
SR	16	167	5363.5
ČE	17	168	5364.5
PE	18	169	5365.5
SU	19	170	5366.5
NE25	20	171	5367.5
PO	21	172	5368.5
UT	22	173	5369.5
SR	23	174	5370.5
ČE	24	175	5371.5
PE	25	176	5372.5
SU	26	177	5373.5
NE26	27	178	5374.5
PO	28	179	5375.5
UT	29	180	5376.5
SR	30	181	5377.5

JUL

Dan u sed.	Dan u mjes.	Dan u god.	Julijanski datum
			245
ČE	1	182	5378.5
PE	2	183	5379.5
SU	3	184	5380.5
NE27	4	185	5381.5
PO	5	186	5382.5
UT	6	187	5383.5
SR	7	188	5384.5
ČE	8	189	5385.5
PE	9	190	5386.5
SU	10	191	5387.5
NE28	11	192	5388.5
PO	12	193	5389.5
UT	13	194	5390.5
SR	14	195	5391.5
ČE	15	196	5392.5
PE	16	197	5393.5
SU	17	198	5394.5
NE29	18	199	5395.5
PO	19	200	5396.5
UT	20	201	5397.5
SR	21	202	5398.5
ČE	22	203	5399.5
PE	23	204	5400.5
SU	24	205	5401.5
NE30	25	206	5402.5
PO	26	207	5403.5
UT	27	208	5404.5
SR	28	209	5405.5
ČE	29	210	5406.5
PE	30	211	5407.5
SU	31	212	5408.5

AVGUST

Dan u sed.	Dan u mjes.	Dan u god.	Julijanski datum
			245
NE31	1	213	5409.5
PO	2	214	5410.5
UT	3	215	5411.5
SR	4	216	5412.5
ČE	5	217	5413.5
PE	6	218	5414.5
SU	7	219	5415.5
NE32	8	220	5416.5
PO	9	221	5417.5
UT	10	222	5418.5
SR	11	223	5419.5
ČE	12	224	5420.5
PE	13	225	5421.5
SU	14	226	5422.5
NE33	15	227	5423.5
PO	16	228	5424.5
UT	17	229	5425.5
SR	18	230	5426.5
ČE	19	231	5427.5
PE	20	232	5428.5
SU	21	233	5429.5
NE34	22	234	5430.5
PO	23	235	5431.5
UT	24	236	5432.5
SR	25	237	5433.5
ČE	26	238	5434.5
PE	27	239	5435.5
SU	28	240	5436.5
NE35	29	241	5437.5
PO	30	242	5438.5
UT	31	243	5439.5

SEPTEMBAR

Dan u sed.	Dan u mjes.	Dan u god.	Julijanski datum
			245
SR	1	244	5440.5
ČE	2	245	5441.5
PE	3	246	5442.5
SU	4	247	5443.5
NE36	5	248	5444.5
PO	6	249	5445.5
UT	7	250	5446.5
SR	8	251	5447.5
ČE	9	252	5448.5
PE	10	253	5449.5
SU	11	254	5450.5
NE37	12	255	5451.5
PO	13	256	5452.5
UT	14	257	5453.5
SR	15	258	5454.5
ČE	16	259	5455.5
PE	17	260	5456.5
SU	18	261	5457.5
NE38	19	262	5458.5
PO	20	263	5459.5
UT	21	264	5460.5
SR	22	265	5461.5
ČE	23	266	5462.5
PE	24	267	5463.5
SU	25	268	5464.5
NE39	26	269	5465.5
PO	27	270	5466.5
UT	28	271	5467.5
SR	29	272	5468.5
ČE	30	273	5469.5

OKTOBAR

Dan u sed.	Dan u mjes.	Dan u god.	Julijanski datum
			245
PE	1	274	5470.5
SU	2	275	5471.5
NE40	3	276	5472.5
PO	4	277	5473.5
UT	5	278	5474.5
SR	6	279	5475.5
ČE	7	280	5476.5
PE	8	281	5477.5
SU	9	282	5478.5
NE41	10	283	5479.5
PO	11	284	5480.5
UT	12	285	5481.5
SR	13	286	5482.5
ČE	14	287	5483.5
PE	15	288	5484.5
SU	16	289	5485.5
NE42	17	290	5486.5
PO	18	291	5487.5
UT	19	292	5488.5
SR	20	293	5489.5
ČE	21	294	5490.5
PE	22	295	5491.5
SU	23	296	5492.5
NE43	24	297	5493.5
PO	25	298	5494.5
UT	26	299	5495.5
SR	27	300	5496.5
ČE	28	301	5497.5
PE	29	302	5498.5
SU	30	303	5499.5
NE44	31	304	5500.5

NOVEMBAR

Dan u sed.	Dan u mjes.	Dan u god.	Julijanski datum
			245
PO	1	305	5501.5
UT	2	306	5502.5
SR	3	307	5503.5
ČE	4	308	5504.5
PE	5	309	5505.5
SU	6	310	5506.5
NE45	7	311	5507.5
PO	8	312	5508.5
UT	9	313	5509.5
SR	10	314	5510.5
ČE	11	315	5511.5
PE	12	316	5512.5
SU	13	317	5513.5
NE46	14	318	5514.5
PO	15	319	5515.5
UT	16	320	5516.5
SR	17	321	5517.5
ČE	18	322	5518.5
PE	19	323	5519.5
SU	20	324	5520.5
NE47	21	325	5521.5
PO	22	326	5522.5
UT	23	327	5523.5
SR	24	328	5524.5
ČE	25	329	5525.5
PE	26	330	5526.5
SU	27	331	5527.5
NE48	28	332	5528.5
PO	29	333	5529.5
UT	30	334	5530.5

DECEMBAR

Dan u sed.	Dan u mjes.	Dan u god.	Julijanski datum
			245
SR	1	335	5531.5
ČE	2	336	5532.5
PE	3	337	5533.5
SU	4	338	5534.5
NE49	5	339	5535.5
PO	6	340	5536.5
UT	7	341	5537.5
SR	8	342	5538.5
ČE	9	343	5539.5
PE	10	344	5540.5
SU	11	345	5541.5
NE50	12	346	5542.5
PO	13	347	5543.5
UT	14	348	5544.5
SR	15	349	5545.5
ČE	16	350	5546.5
PE	17	351	5547.5
SU	18	352	5548.5
NE51	19	353	5549.5
PO	20	354	5550.5
UT	21	355	5551.5
SR	22	356	5552.5
ČE	23	357	5553.5
PE	24	358	5554.5
SU	25	359	5555.5
NE52	26	360	5556.5
PO	27	361	5557.5
UT	28	362	5558.5
SR	29	363	5559.5
ČE	30	364	5560.5
PE	31	365	5561.5

⋆ ★ ★ ★ ⋆

Efemeride

SUNCA, MJESECA, VENERE,
MARSA, JUPITERA I SATURNA

1. JANUAR 2010. PETAK

UT	SUNCE $S_\odot$	SUNCE $\delta_\odot$	PROLJ. TAČKA S_Υ	VENERA S_φ	VENERA δ_φ	MARS S_σ	MARS δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	179 10.0	-23 1.6	100 32.0	181 58.1	-23 38.5	318 3.9	18 45.1
2	209 9.4	-23 1.2	130 36.9	211 56.1	-23 38.3	348 9.6	18 45.6
4	239 8.8	-23 .8	160 41.9	241 54.2	-23 38.1	18 15.2	18 46.0
6	269 8.2	-23 .4	190 46.8	271 52.3	-23 37.9	48 20.9	18 46.5
8	299 7.6	-23 .0	220 51.7	301 50.3	-23 37.7	78 26.5	18 46.9
10	329 7.0	-22 59.6	250 56.6	331 48.4	-23 37.5	108 32.2	18 47.3
12	359 6.4	-22 59.2	281 1.6	1 46.4	-23 37.3	138 37.8	18 47.8
14	29 5.8	-22 58.8	311 6.5	31 44.5	-23 37.1	168 43.5	18 48.2
16	59 5.2	-22 58.3	341 11.4	61 42.6	-23 36.9	198 49.2	18 48.7
18	89 4.7	-22 57.9	11 16.4	91 40.6	-23 36.7	228 54.9	18 49.1
20	119 4.1	-22 57.5	41 21.3	121 38.7	-23 36.4	259 .6	18 49.6
22	149 3.5	-22 57.1	71 26.2	151 36.8	-23 36.2	289 6.2	18 50.0
Δ	-3	2		-10	1	28	2

UT	MJESEC $S_\leftmoon$	MJESEC Δ	MJESEC $\delta_\leftmoon$	MJESEC Δ	JUPITER S_4	JUPITER δ_4	SATURN S_η	SATURN δ_η
h	° ′		° ′		° ′	° ′	° ′	° ′
0	356 4.0	31	23 30.0	-73	131 37.2	-13 36.5	275 29.9	0 18.5
2	24 48.3	32	23 15.3	-77	161 41.2	-13 36.2	305 34.7	0 18.5
4	53 32.8	34	22 59.9	-80	191 45.1	-13 35.8	335 39.5	0 18.5
6	82 17.5	35	22 43.8	-84	221 49.1	-13 35.5	5 44.3	0 18.5
8	111 2.5	37	22 27.1	-87	251 53.0	-13 35.1	35 49.2	0 18.5
10	139 47.9	38	22 9.7	-90	281 57.0	-13 34.8	65 54.0	0 18.4
12	168 33.5	40	21 51.7	-93	312 .9	-13 34.4	95 58.8	0 18.4
14	197 19.5	41	21 33.0	-96	342 4.9	-13 34.1	126 3.6	0 18.4
16	226 5.7	43	21 13.7	-99	12 8.8	-13 33.7	156 8.4	0 18.4
18	254 52.4	45	20 53.8	-102	42 12.8	-13 33.4	186 13.2	0 18.3
20	283 39.3	47	20 33.3	-105	72 16.7	-13 33.0	216 18.1	0 18.3
22	312 26.7	48	20 12.2	-108	102 20.7	-13 32.7	246 22.9	0 18.3
Δ					20	2	24	0

φ	SUNCE IZLAZ	SUNCE ZALAZ	TRAJANJE SUMRAKA GRAĐ.	TRAJANJE SUMRAKA ASTR.	MJESEC IZLAZ	MJESEC Δ/24	MJESEC ZALAZ	MJESEC Δ/24
N	h min	h min	h min	h min	h min	min	h min	min
60	9 2	15 5	0 57	2 44	16 9	4.5	9 38	.6
55	8 25	15 42	0 45	2 17	16 45	4.0	9 0	1.1
50	7 59	16 9	0 38	1 59	17 11	3.7	8 33	1.4
45	7 38	16 29	0 34	1 46	17 30	3.5	8 13	1.6
40	7 22	16 45	0 30	1 37	17 46	3.3	7 56	1.8
35	7 8	16 59	0 28	1 30	17 59	3.1	7 42	1.9
30	6 56	17 11	0 26	1 25	18 11	3.0	7 29	2.0
20	6 35	17 32	0 24	1 18	18 31	2.8	7 8	2.2
10	6 17	17 50	0 23	1 15	18 48	2.6	6 49	2.4
0	5 60	18 7	0 22	1 15	19 4	2.5	6 31	2.5
10	5 43	18 25	0 23	1 17	19 20	2.3	6 14	2.7
20	5 24	18 43	0 24	1 24	19 37	2.1	5 55	2.8
30	5 2	19 5	0 27	1 36	19 56	1.9	5 33	3.0
35	4 50	19 17	0 30	1 46	20 7	1.8	5 20	3.2
40	4 35	19 32	0 33	2 2	20 20	1.6	5 5	3.3
45	4 17	19 50	0 37	2 30	20 35	1.4	4 47	3.5
50	3 55	20 12	0 44	: ::	20 54	1.2	4 24	3.7
55	3 26	20 41	0 57	: ::	21 18	.9	3 55	4.0
60	2 43	21 23	1 36	: ::	21 50	.5	3 11	4.5
S								

SUNCE UT	SUNCE e = Tp − UT	SUNCE Δ/24	SUNCE r	MJESEC Prolaz	MJESEC Δ/24	MJESEC $\pi_\leftmoon$	MJESEC r
h	min s	s	′	h min	min	′	′
00	- 3 20.0	-1.2	16.3	$T_{\overline{m}}$ 0 16	2.6	61.0	16.6
12	- 3 34.1	$T_{\overline{m}_\odot}$ 12 h 3.6 min		Starost 15.5 d	Faza ○		

PLANETE

Pl.	$T_{\overline{m}}$	π	360−α	Vel.	Pl.	$T_{\overline{m}}$	π	360−α	Vel.
	h min	′	°			h min	′	°	
♀	11 53	.1	81	-3.8	♃	15 12	.0	31	-2.0
♂	2 47	.2	218	-.8	♄	5 37	.0	175	.8

2. JANUAR SUBOTA

UT	SUNCE $S_\odot$	SUNCE $\delta_\odot$	PROLJ. TAČKA S_Υ	VENERA S_φ	VENERA δ_φ	MARS S_σ	MARS δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	179 2.9	-22 56.6	101 31.1	181 34.8	-23 36.0	319 11.9	18 50.5
2	209 2.3	-22 56.2	131 36.1	211 32.9	-23 35.7	349 17.6	18 51.0
4	239 1.7	-22 55.7	161 41.0	241 31.0	-23 35.5	19 23.4	18 51.4
6	269 1.2	-22 55.3	191 45.9	271 29.0	-23 35.2	49 29.1	18 51.9
8	299 .6	-22 54.8	221 50.9	301 27.1	-23 34.9	79 34.8	18 52.3
10	329 .0	-22 54.4	251 55.8	331 25.2	-23 34.7	109 40.5	18 52.8
12	358 59.4	-22 53.9	282 .7	1 23.2	-23 34.4	139 46.3	18 53.3
14	28 58.8	-22 53.5	312 5.6	31 21.3	-23 34.1	169 52.0	18 53.7
16	58 58.3	-22 53.0	342 10.6	61 19.4	-23 33.8	199 57.7	18 54.2
18	88 57.7	-22 52.6	12 15.5	91 17.4	-23 33.6	230 3.5	18 54.7
20	118 57.1	-22 52.1	42 20.4	121 15.5	-23 33.3	260 9.2	18 55.1
22	148 56.5	-22 51.6	72 25.4	151 13.6	-23 33.0	290 15.0	18 55.6
Δ	-3	2		-10	1	29	2

UT	MJESEC $S_\leftmoon$	MJESEC Δ	MJESEC $\delta_\leftmoon$	MJESEC Δ	JUPITER S_4	JUPITER δ_4	SATURN S_η	SATURN δ_η
h	° ′		° ′		° ′	° ′	° ′	° ′
0	341 14.3	50	19 50.6	-111	132 24.6	-13 32.3	276 27.7	0 18.3
2	10 2.4	52	19 28.4	-114	162 28.6	-13 32.0	306 32.5	0 18.3
4	38 50.8	54	19 5.7	-116	192 32.5	-13 31.6	336 37.3	0 18.2
6	67 39.7	56	18 42.5	-119	222 36.4	-13 31.3	6 42.2	0 18.2
8	96 28.9	58	18 18.7	-121	252 40.4	-13 30.9	36 47.0	0 18.2
10	125 18.4	60	17 54.5	-123	282 44.3	-13 30.6	66 51.8	0 18.2
12	154 8.4	62	17 29.8	-126	312 48.3	-13 30.2	96 56.6	0 18.2
14	182 58.8	64	17 4.7	-128	342 52.2	-13 29.9	127 1.5	0 18.2
16	211 49.5	66	16 39.2	-130	12 56.2	-13 29.5	157 6.3	0 18.1
18	240 40.7	68	16 13.2	-132	43 .1	-13 29.2	187 11.1	0 18.1
20	269 32.2	70	15 46.8	-134	73 4.0	-13 28.8	217 16.0	0 18.1
22	298 24.2	72	15 20.0	-136	103 8.0	-13 28.5	247 20.8	0 18.1
Δ					20	2	24	0

φ	SUNCE IZLAZ	SUNCE ZALAZ	TRAJANJE SUMRAKA GRAĐ.	TRAJANJE SUMRAKA ASTR.	MJESEC IZLAZ	MJESEC Δ/24	MJESEC ZALAZ	MJESEC Δ/24
N	h min	h min	h min	h min	h min	min	h min	min
60	9 2	15 7	0 57	2 44	17 57	4.4	9 53	.4
55	8 25	15 44	0 45	2 16	18 22	4.0	9 27	.8
50	7 58	16 10	0 38	1 59	18 39	3.6	9 7	1.1
45	7 38	16 30	0 34	1 46	18 54	3.4	8 52	1.3
40	7 22	16 46	0 30	1 37	19 5	3.2	8 39	1.5
35	7 8	16 60	0 28	1 30	19 15	3.1	8 28	1.6
30	6 56	17 12	0 26	1 25	19 23	2.9	8 18	1.8
20	6 35	17 33	0 24	1 18	19 38	2.7	8 1	2.0
10	6 17	17 51	0 23	1 15	19 51	2.5	7 46	2.2
0	6 0	18 8	0 22	1 15	20 3	2.3	7 32	2.4
10	5 43	18 25	0 23	1 17	20 15	2.1	7 18	2.6
20	5 25	18 43	0 24	1 24	20 27	1.9	7 3	2.7
30	5 3	19 5	0 27	1 36	20 41	1.7	6 46	3.0
35	4 50	19 18	0 29	1 46	20 50	1.5	6 35	3.1
40	4 36	19 32	0 33	2 1	20 59	1.4	6 24	3.3
45	4 18	19 50	0 37	2 29	21 10	1.2	6 10	3.5
50	3 56	20 11	0 44	: ::	21 23	1.0	5 53	3.7
55	3 27	20 40	0 56	: ::	21 39	.7	5 31	4.0
60	2 44	21 23	1 34	: ::	22 1	.3	5 0	4.5
S								

SUNCE UT	SUNCE e = Tp − UT	SUNCE Δ/24	SUNCE r	MJESEC Prolaz	MJESEC Δ/24	MJESEC $\pi_\leftmoon$	MJESEC r
h	min s	s	′	h min	min	′	′
00	- 3 48.2	-1.2	16.3	$T_{\overline{m}}$ 1 18	2.4	61.1	16.7
12	- 4 2.1	$T_{\overline{m}_\odot}$ 12 h 4.0 min		Starost 16.5 d	Faza ○		

PLANETE

Pl.	$T_{\overline{m}}$	π	360−α	Vel.	Pl.	$T_{\overline{m}}$	π	360−α	Vel.
	h min	′	°			h min	′	°	
♀	11 54	.1	80	-3.8	♃	15 8	.0	31	-2.0
♂	2 43	.2	218	-.8	♄	5 33	.0	175	.8

UT	SUNCE $S_\odot$		SUNCE $\delta_\odot$		PROLJ. TAČKA S_Υ		VENERA S_φ		VENERA δ_φ		MARS S_σ		MARS δ_σ	
h	°	′	°	′	°	′	°	′	°	′	°	′	°	′
0	178	56.0	-22	51.1	102	30.3	181	11.6	-23	32.7	320	20.8	18	56.1
2	208	55.4	-22	50.7	132	35.2	211	9.7	-23	32.4	350	26.5	18	56.6
4	238	54.8	-22	50.2	162	40.1	241	7.8	-23	32.0	20	32.3	18	57.0
6	268	54.2	-22	49.7	192	45.1	271	5.9	-23	31.7	50	38.1	18	57.5
8	298	53.7	-22	49.2	222	50.0	301	3.9	-23	31.4	80	43.9	18	58.0
10	328	53.1	-22	48.7	252	54.9	331	2.0	-23	31.1	110	49.7	18	58.5
12	358	52.5	-22	48.2	282	59.9	1	.1	-23	30.7	140	55.5	18	59.0
14	28	51.9	-22	47.7	313	4.8	30	58.2	-23	30.4	171	1.3	18	59.5
16	58	51.4	-22	47.2	343	9.7	60	56.2	-23	30.1	201	7.1	18	59.9
18	88	50.8	-22	46.7	13	14.6	90	54.3	-23	29.7	231	12.9	19	.4
20	118	50.2	-22	46.2	43	19.6	120	52.4	-23	29.4	261	18.8	19	.9
22	148	49.7	-22	45.7	73	24.5	150	50.5	-23	29.0	291	24.6	19	1.4
Δ		-3		2				-10		2		29		2

UT	MJESEC $S_\leftmoon$		MJESEC Δ	MJESEC $\delta_\leftmoon$		MJESEC Δ	JUPITER S_4		JUPITER δ_4		SATURN S_η		SATURN δ_η	
h	°	′		°	′		°	′	°	′	°	′	°	′
0	327	16.5	73	14	52.9	-137	133	11.9	-13	28.1	277	25.6	0	18.1
2	356	9.2	75	14	25.4	-139	163	15.9	-13	27.8	307	30.4	0	18.0
4	25	2.2	77	13	57.6	-141	193	19.8	-13	27.4	337	35.3	0	18.0
6	53	55.7	79	13	29.5	-142	223	23.7	-13	27.0	7	40.1	0	18.0
8	82	49.5	81	13	1.0	-144	253	27.7	-13	26.7	37	44.9	0	18.0
10	111	43.7	83	12	32.3	-145	283	31.6	-13	26.3	67	49.8	0	18.0
12	140	38.2	85	12	3.3	-146	313	35.5	-13	26.0	97	54.6	0	18.0
14	169	33.1	86	11	34.1	-147	343	39.5	-13	25.6	127	59.4	0	18.0
16	198	28.4	88	11	4.6	-148	13	43.4	-13	25.3	158	4.3	0	17.9
18	227	24.0	90	10	35.0	-149	43	47.4	-13	24.9	188	9.1	0	17.9
20	256	19.9	91	10	5.1	-150	73	51.3	-13	24.6	218	13.9	0	17.9
22	285	16.2	93	9	35.0	-151	103	55.2	-13	24.2	248	18.8	0	17.9
Δ								20		2		24		0

φ	SUNCE IZLAZ	SUNCE ZALAZ	TRAJANJE SUMRAKA GRAĐ.	TRAJANJE SUMRAKA ASTR.	MJESEC IZLAZ	MJESEC Δ/24	MJESEC ZALAZ	MJESEC Δ/24
N	h min	h min	h min	h min	h min	min	h min	min
60	9 1	15 8	0 56	2 43	19 43	4.2	10 2	.3
55	8 24	15 45	0 45	2 16	19 57	3.8	9 46	.6
50	7 58	16 11	0 38	1 59	20 7	3.5	9 33	.9
45	7 38	16 31	0 34	1 46	20 15	3.3	9 23	1.1
40	7 22	16 47	0 30	1 37	20 22	3.1	9 14	1.3
35	7 8	17 1	0 28	1 30	20 28	2.9	9 7	1.4
30	6 56	17 13	0 26	1 25	20 33	2.8	9 0	1.6
20	6 36	17 33	0 24	1 18	20 42	2.5	8 49	1.8
10	6 18	17 51	0 23	1 15	20 50	2.3	8 39	2.0
0	6 1	18 8	0 22	1 15	20 57	2.1	8 29	2.2
10	5 44	18 25	0 23	1 17	21 5	1.9	8 19	2.4
20	5 25	18 44	0 24	1 23	21 12	1.7	8 9	2.6
30	5 4	19 5	0 27	1 36	21 21	1.5	7 57	2.9
35	4 51	19 18	0 29	1 46	21 26	1.4	7 50	3.0
40	4 37	19 32	0 32	2 1	21 32	1.2	7 42	3.2
45	4 19	19 50	0 37	2 28	21 38	1.0	7 33	3.4
50	3 57	20 11	0 44	: ::	21 46	.8	7 21	3.6
55	3 28	20 40	0 56	: ::	21 56	.6	7 7	3.9
60	2 46	21 22	1 32	: ::	22 8	.2	6 48	4.3
S								

SUNCE UT	SUNCE $e = T_p - UT$	SUNCE Δ/24	SUNCE r	MJESEC Prolaz	MJESEC Δ/24	MJESEC $\pi_\leftmoon$	MJESEC r
h	min s	s	′	h min	min	′	′
00	- 4 16.0	-1.1	16.3	$T_{\overline{m}}$ 2 16	2.3	60.9	16.6
12	- 4 29.7	$T_{\overline{m}_\odot}$ 12 h	4.5 min	Starost 17.5 d	Faza ❍		

PLANETE

Pl.	$T_{\overline{m}}$	π	360−α	Vel.	Pl.	$T_{\overline{m}}$	π	360−α	Vel.
	h min	′	°			h min	′	°	
♀	11 56	.1	79	-3.8	♃	15 5	.0	31	-2.0
♂	2 38	.2	218	-.8	♄	5 29	.0	175	.8

UT	SUNCE $S_\odot$		SUNCE $\delta_\odot$		PROLJ. TAČKA S_Υ		VENERA S_φ		VENERA δ_φ		MARS S_σ		MARS δ_σ	
h	°	′	°	′	°	′	°	′	°	′	°	′	°	′
0	178	49.1	-22	45.2	103	29.4	180	48.5	-23	28.6	321	30.4	19	1.9
2	208	48.5	-22	44.7	133	34.4	210	46.6	-23	28.3	351	36.3	19	2.4
4	238	48.0	-22	44.2	163	39.3	240	44.7	-23	27.9	21	42.1	19	2.9
6	268	47.4	-22	43.7	193	44.2	270	42.8	-23	27.5	51	48.0	19	3.4
8	298	46.8	-22	43.1	223	49.1	300	40.9	-23	27.1	81	53.8	19	3.9
10	328	46.3	-22	42.6	253	54.1	330	38.9	-23	26.7	111	59.7	19	4.4
12	358	45.7	-22	42.1	283	59.0	0	37.0	-23	26.3	142	5.6	19	4.9
14	28	45.1	-22	41.5	314	3.9	30	35.1	-23	25.9	172	11.5	19	5.4
16	58	44.6	-22	41.0	344	8.9	60	33.2	-23	25.5	202	17.3	19	5.9
18	88	44.0	-22	40.5	14	13.8	90	31.3	-23	25.1	232	23.2	19	6.4
20	118	43.4	-22	39.9	44	18.7	120	29.4	-23	24.7	262	29.1	19	6.9
22	148	42.9	-22	39.4	74	23.6	150	27.5	-23	24.3	292	35.0	19	7.4
Δ		-3		3				-10		2		29		3

UT	MJESEC $S_\leftmoon$		MJESEC Δ	MJESEC $\delta_\leftmoon$		MJESEC Δ	JUPITER S_4		JUPITER δ_4		SATURN S_η		SATURN δ_η	
h	°	′		°	′		°	′	°	′	°	′	°	′
0	314	12.7	94	9	4.7	-152	133	59.2	-13	23.8	278	23.6	0	17.9
2	343	9.6	96	8	34.3	-153	164	3.1	-13	23.5	308	28.5	0	17.9
4	12	6.8	97	8	3.8	-153	194	7.0	-13	23.1	338	33.3	0	17.9
6	41	4.3	99	7	33.1	-154	224	11.0	-13	22.8	8	38.1	0	17.9
8	70	2.0	100	7	2.3	-154	254	14.9	-13	22.4	38	43.0	0	17.8
10	99	.1	102	6	31.4	-155	284	18.8	-13	22.1	68	47.8	0	17.8
12	127	58.4	103	6	.4	-155	314	22.7	-13	21.7	98	52.7	0	17.8
14	156	57.0	104	5	29.3	-156	344	26.7	-13	21.3	128	57.5	0	17.8
16	185	55.8	105	4	58.2	-156	14	30.6	-13	21.0	159	2.4	0	17.8
18	214	54.9	106	4	27.1	-156	44	34.5	-13	20.6	189	7.2	0	17.8
20	243	54.2	108	3	55.9	-156	74	38.5	-13	20.3	219	12.0	0	17.8
22	272	53.7	109	3	24.7	-156	104	42.4	-13	19.9	249	16.9	0	17.8
Δ								20		2		24		0

φ	SUNCE IZLAZ	SUNCE ZALAZ	TRAJANJE SUMRAKA GRAĐ.	TRAJANJE SUMRAKA ASTR.	MJESEC IZLAZ	MJESEC Δ/24	MJESEC ZALAZ	MJESEC Δ/24
N	h min	h min	h min	h min	h min	min	h min	min
60	9 1	15 10	0 56	2 43	21 23	4.0	10 8	.2
55	8 24	15 46	0 45	2 16	21 28	3.7	10 0	.5
50	7 58	16 12	0 38	1 58	21 31	3.4	9 54	.8
45	7 38	16 32	0 34	1 46	21 34	3.2	9 49	1.0
40	7 22	16 48	0 30	1 37	21 37	3.0	9 45	1.2
35	7 8	17 2	0 28	1 30	21 39	2.8	9 41	1.3
30	6 57	17 13	0 26	1 25	21 40	2.7	9 38	1.4
20	6 36	17 34	0 24	1 18	21 43	2.4	9 32	1.7
10	6 18	17 52	0 23	1 15	21 46	2.2	9 27	1.9
0	6 1	18 9	0 22	1 15	21 49	2.0	9 22	2.1
10	5 44	18 26	0 23	1 17	21 51	1.8	9 17	2.3
20	5 26	18 44	0 24	1 23	21 54	1.6	9 12	2.5
30	5 5	19 5	0 27	1 35	21 57	1.4	9 6	2.7
35	4 52	19 18	0 29	1 45	21 59	1.3	9 2	2.9
40	4 37	19 32	0 32	2 1	22 1	1.1	8 58	3.0
45	4 20	19 49	0 37	2 28	22 3	1.0	8 53	3.2
50	3 58	20 11	0 44	: ::	22 6	.8	8 48	3.5
55	3 30	20 39	0 56	: ::	22 9	.5	8 41	3.7
60	2 48	21 21	1 31	: ::	22 13	.2	8 31	4.1
S								

SUNCE UT	SUNCE $e = T_p - UT$	SUNCE Δ/24	SUNCE r	MJESEC Prolaz	MJESEC Δ/24	MJESEC $\pi_\leftmoon$	MJESEC r
h	min s	s	′	h min	min	′	′
00	- 4 43.5	-1.1	16.3	$T_{\overline{m}}$ 3 10	2.1	60.5	16.5
12	- 4 57.0	$T_{\overline{m}_\odot}$ 12 h	5.0 min	Starost 18.5 d	Faza ❍		

PLANETE

Pl.	$T_{\overline{m}}$	π	360−α	Vel.	Pl.	$T_{\overline{m}}$	π	360−α	Vel.
	h min	′	°			h min	′	°	
♀	11 58	.1	77	-3.8	♃	15 2	.0	30	-1.9
♂	2 33	.2	218	-.8	♄	5 26	.0	175	.8

UT	SUNCE				PROLJ. TAČKA		VENERA				MARS			
	$S_\odot$		$\delta_\odot$		S_Υ		S_φ		δ_φ		S_σ		δ_σ	
h	°	′	°	′	°	′	°	′	°	′	°	′	°	′
0	178	42.3	-22	38.8	104	28.6	180	25.5	-23	23.9	322	40.9	19	7.9
2	208	41.8	-22	38.3	134	33.5	210	23.6	-23	23.4	352	46.8	19	8.4
4	238	41.2	-22	37.7	164	38.4	240	21.7	-23	23.0	22	52.8	19	8.9
6	268	40.6	-22	37.2	194	43.3	270	19.8	-23	22.6	52	58.7	19	9.5
8	298	40.1	-22	36.6	224	48.3	300	17.9	-23	22.1	83	4.6	19	10.0
10	328	39.5	-22	36.0	254	53.2	330	16.0	-23	21.7	113	10.5	19	10.5
12	358	39.0	-22	35.5	284	58.1	0	14.1	-23	21.2	143	16.5	19	11.0
14	28	38.4	-22	34.9	315	3.1	30	12.2	-23	20.8	173	22.4	19	11.5
16	58	37.9	-22	34.3	345	8.0	60	10.3	-23	20.3	203	28.4	19	12.0
18	88	37.3	-22	33.7	15	12.9	90	8.4	-23	19.8	233	34.3	19	12.6
20	118	36.8	-22	33.2	45	17.8	120	6.4	-23	19.4	263	40.3	19	13.1
22	148	36.2	-22	32.6	75	22.8	150	4.5	-23	18.9	293	46.3	19	13.6
Δ		-3		3				-10		2		30		3

UT	MJESEC						JUPITER				SATURN			
	$S_\leftmoon$		Δ	$\delta_\leftmoon$		Δ	S_{4}		δ_{4}		S_{h}		δ_{h}	
h	°	′		°	′		°	′	°	′	°	′	°	′
0	301	53.4	110	2	53.5	-156	134	46.3	-13	19.5	279	21.7	0	17.8
2	330	53.3	111	2	22.3	-156	164	50.3	-13	19.2	309	26.6	0	17.7
4	359	53.4	112	1	51.1	-156	194	54.2	-13	18.8	339	31.4	0	17.7
6	28	53.8	112	1	19.9	-156	224	58.1	-13	18.5	9	36.3	0	17.7
8	57	54.2	113	0	48.8	-155	255	2.0	-13	18.1	39	41.1	0	17.7
10	86	54.9	114	0	17.7	-155	285	6.0	-13	17.7	69	46.0	0	17.7
12	115	55.7	115	- 0	13.3	-155	315	9.9	-13	17.4	99	50.8	0	17.7
14	144	56.6	115	- 0	44.2	-154	345	13.8	-13	17.0	129	55.7	0	17.7
16	173	57.7	116	- 1	15.0	-154	15	17.7	-13	16.7	160	.5	0	17.7
18	202	58.9	117	- 1	45.8	-153	45	21.7	-13	16.3	190	5.4	0	17.7
20	232	.2	117	- 2	16.4	-153	75	25.6	-13	15.9	220	10.2	0	17.7
22	261	1.6	118	- 2	46.9	-152	105	29.5	-13	15.6	250	15.1	0	17.7
Δ								20		2		24		0

φ	SUNCE		TRAJANJE SUMRAKA		MJESEC			
	IZLAZ	ZALAZ	GRAĐ.	ASTR.	IZLAZ	Δ/24	ZALAZ	Δ/24
N	h min	h min	h min	h min	h min	min	h min	min
60	8 60	15 11	0 56	2 43	22 60	3.9	10 13	.2
55	8 24	15 48	0 45	2 16	22 56	3.6	10 13	.5
50	7 58	16 13	0 38	1 58	22 53	3.3	10 13	.7
45	7 38	16 33	0 33	1 46	22 50	3.1	10 13	1.0
40	7 22	16 49	0 30	1 37	22 48	2.9	10 13	1.1
35	7 9	17 2	0 28	1 30	22 46	2.8	10 13	1.3
30	6 57	17 14	0 26	1 25	22 45	2.6	10 13	1.4
20	6 36	17 35	0 24	1 18	22 42	2.4	10 12	1.6
10	6 18	17 52	0 23	1 15	22 40	2.2	10 12	1.8
0	6 2	18 9	0 22	1 15	22 38	2.0	10 12	2.0
10	5 45	18 26	0 23	1 17	22 36	1.8	10 12	2.2
20	5 26	18 44	0 24	1 23	22 33	1.6	10 12	2.4
30	5 5	19 5	0 27	1 35	22 31	1.4	10 11	2.7
35	4 53	19 18	0 29	1 45	22 29	1.3	10 11	2.8
40	4 38	19 32	0 32	2 0	22 28	1.1	10 11	2.9
45	4 21	19 49	0 37	2 27	22 26	1.0	10 11	3.1
50	3 60	20 11	0 43	: ::	22 24	.8	10 11	3.3
55	3 31	20 39	0 55	: ::	22 21	.5	10 10	3.6
60	2 50	21 20	1 29	: ::	22 17	.2	10 10	4.0
S								

SUNCE				MJESEC			
UT	e = Tp − UT	Δ/24	r	Prolaz	Δ/24	$\pi_\leftmoon$	r
h	min s	s	′	h min	min	′	′
00	- 5 10.5	-1.1	16.3	$T_{\overline{m}}$ 4 0	2.0	59.8	16.3
12	- 5 23.9	$T_{\overline{m}_\odot}$ 12 h 5.4 min		Starost 19.5 d	Faza ◑		

PLANETE									
Pl.	$T_{\overline{m}}$	π	360−α	Vel.	Pl.	$T_{\overline{m}}$	π	360−α	Vel.
	h min	′	°			h min	′	°	
♀	11 59	.1	76	-3.8	♃	14 59	.0	30	-1.9
♂	2 29	.2	218	-.9	♄	5 22	.0	175	.8

UT	SUNCE				PROLJ. TAČKA		VENERA				MARS			
	$S_\odot$		$\delta_\odot$		S_Υ		S_φ		δ_φ		S_σ		δ_σ	
h	°	′	°	′	°	′	°	′	°	′	°	′	°	′
0	178	35.7	-22	32.0	105	27.7	180	2.6	-23	18.4	323	52.2	19	14.1
2	208	35.1	-22	31.4	135	32.6	210	.7	-23	17.9	353	58.2	19	14.7
4	238	34.5	-22	30.8	165	37.6	239	58.8	-23	17.4	24	4.2	19	15.2
6	268	34.0	-22	30.2	195	42.5	269	56.9	-23	16.9	54	10.2	19	15.7
8	298	33.5	-22	29.6	225	47.4	299	55.0	-23	16.4	84	16.2	19	16.3
10	328	32.9	-22	29.0	255	52.3	329	53.1	-23	15.9	114	22.2	19	16.8
12	358	32.4	-22	28.4	285	57.3	359	51.2	-23	15.4	144	28.2	19	17.3
14	28	31.8	-22	27.8	316	2.2	29	49.3	-23	14.9	174	34.2	19	17.9
16	58	31.3	-22	27.2	346	7.1	59	47.4	-23	14.3	204	40.2	19	18.4
18	88	30.7	-22	26.6	16	12.1	89	45.5	-23	13.8	234	46.3	19	18.9
20	118	30.2	-22	26.0	46	17.0	119	43.6	-23	13.3	264	52.3	19	19.5
22	148	29.6	-22	25.3	76	21.9	149	41.8	-23	12.7	294	58.3	19	20.0
Δ		-3		3				-9		3		30		3

UT	MJESEC						JUPITER				SATURN			
	$S_\leftmoon$		Δ	$\delta_\leftmoon$		Δ	S_{4}		δ_{4}		S_{h}		δ_{h}	
h	°	′		°	′		°	′	°	′	°	′	°	′
0	290	3.1	118	- 3	17.3	-151	135	33.4	-13	15.2	280	19.9	0	17.7
2	319	4.7	118	- 3	47.6	-150	165	37.3	-13	14.8	310	24.8	0	17.7
4	348	6.4	119	- 4	17.7	-150	195	41.3	-13	14.5	340	29.6	0	17.7
6	17	8.1	119	- 4	47.6	-149	225	45.2	-13	14.1	10	34.5	0	17.7
8	46	9.9	119	- 5	17.4	-148	255	49.1	-13	13.7	40	39.4	0	17.6
10	75	11.8	119	- 5	46.9	-147	285	53.0	-13	13.4	70	44.2	0	17.6
12	104	13.7	120	- 6	16.4	-146	315	56.9	-13	13.0	100	49.1	0	17.6
14	133	15.6	120	- 6	45.6	-145	346	.9	-13	12.7	130	53.9	0	17.6
16	162	17.6	120	- 7	14.6	-144	16	4.8	-13	12.3	160	58.8	0	17.6
18	191	19.5	120	- 7	43.4	-143	46	8.7	-13	11.9	191	3.7	0	17.6
20	220	21.5	120	- 8	11.9	-142	76	12.6	-13	11.6	221	8.5	0	17.6
22	249	23.5	120	- 8	40.3	-141	106	16.5	-13	11.2	251	13.4	0	17.6
Δ								20		2		24		0

φ	SUNCE		TRAJANJE SUMRAKA		MJESEC			
	IZLAZ	ZALAZ	GRAĐ.	ASTR.	IZLAZ	Δ/24	ZALAZ	Δ/24
N	h min	h min	h min	h min	h min	min	h min	min
60	8 59	15 13	0 56	2 42	. . .	.0	10 18	.2
55	8 23	15 49	0 44	2 15	. . .	.0	10 25	.5
50	7 58	16 14	0 38	1 58	. . .	.0	10 31	.8
45	7 38	16 34	0 33	1 46	. . .	.0	10 36	1.0
40	7 22	16 50	0 30	1 37	23 58	2.9	10 40	1.1
35	7 9	17 3	0 28	1 30	23 52	2.7	10 43	1.3
30	6 57	17 15	0 26	1 25	23 48	2.6	10 46	1.4
20	6 37	17 35	0 24	1 18	23 40	2.4	10 51	1.6
10	6 19	17 53	0 23	1 15	23 32	2.2	10 56	1.8
0	6 2	18 10	0 22	1 15	23 26	2.0	11 1	2.0
10	5 45	18 26	0 23	1 17	23 19	1.8	11 5	2.2
20	5 27	18 44	0 24	1 23	23 12	1.7	11 10	2.4
30	5 6	19 5	0 27	1 35	23 4	1.4	11 15	2.6
35	4 54	19 18	0 29	1 45	22 60	1.3	11 18	2.7
40	4 39	19 32	0 32	1 60	22 55	1.2	11 22	2.9
45	4 22	19 49	0 37	2 26	22 49	1.0	11 26	3.1
50	4 1	20 10	0 43	: ::	22 42	.8	11 31	3.3
55	3 33	20 38	0 55	: ::	22 33	.6	11 37	3.5
60	2 51	21 19	1 28	: ::	22 22	.2	11 45	3.9
S								

SUNCE				MJESEC			
UT	e = Tp − UT	Δ/24	r	Prolaz	Δ/24	$\pi_\leftmoon$	r
h	min s	s	′	h min	min	′	′
00	- 5 37.2	-1.1	16.3	$T_{\overline{m}}$ 4 49	2.0	59.0	16.1
12	- 5 50.4	$T_{\overline{m}_\odot}$ 12 h 5.8 min		Starost 20.5 d	Faza ◑		

PLANETE									
Pl.	$T_{\overline{m}}$	π	360−α	Vel.	Pl.	$T_{\overline{m}}$	π	360−α	Vel.
	h min	′	°			h min	′	°	
♀	12 1	.1	75	-3.8	♃	14 56	.0	30	-1.9
♂	2 24	.2	218	-.9	♄	5 18	.0	175	.8

UT	SUNCE				PROLJ. TAČKA		VENERA				MARS			
	$S_\odot$		$\delta_\odot$		S_Υ		S_φ		δ_φ		S_σ		δ_σ	
h	°	′	°	′	°	′	°	′	°	′	°	′	°	′
0	178	29.1	-22	24.7	106	26.8	179	39.9	-23	12.2	325	4.4	19	20.6
2	208	28.5	-22	24.1	136	31.8	209	38.0	-23	11.6	355	10.4	19	21.1
4	238	28.0	-22	23.5	166	36.7	239	36.1	-23	11.1	25	16.5	19	21.6
6	268	27.5	-22	22.8	196	41.6	269	34.2	-23	10.5	55	22.5	19	22.2
8	298	26.9	-22	22.2	226	46.6	299	32.3	-23	10.0	85	28.6	19	22.7
10	328	26.4	-22	21.6	256	51.5	329	30.4	-23	9.4	115	34.7	19	23.3
12	358	25.9	-22	20.9	286	56.4	359	28.5	-23	8.8	145	40.7	19	23.8
14	28	25.3	-22	20.3	317	1.3	29	26.6	-23	8.2	175	46.8	19	24.4
16	58	24.8	-22	19.6	347	6.3	59	24.8	-23	7.7	205	52.9	19	24.9
18	88	24.2	-22	19.0	17	11.2	89	22.9	-23	7.1	235	59.0	19	25.5
20	118	23.7	-22	18.3	47	16.1	119	21.0	-23	6.5	266	5.1	19	26.1
22	148	23.2	-22	17.7	77	21.1	149	19.1	-23	5.9	296	11.2	19	26.6
Δ		-3		3				-9		3		30		3

UT	MJESEC						JUPITER				SATURN			
	$S_\leftmoon$		Δ	$\delta_\leftmoon$		Δ	S_{4}		δ_{4}		S_{5}		δ_{5}	
h	°	′		°	′		°	′	°	′	°	′	°	′
0	278	25.5	120	- 9	8.4	-139	136	20.4	-13	10.8	281	18.2	0	17.6
2	307	27.4	120	- 9	36.2	-138	166	24.4	-13	10.5	311	23.1	0	17.6
4	336	29.4	120	-10	3.8	-137	196	28.3	-13	10.1	341	28.0	0	17.6
6	5	31.3	119	-10	31.1	-135	226	32.2	-13	9.7	11	32.8	0	17.6
8	34	33.1	119	-10	58.2	-134	256	36.1	-13	9.4	41	37.7	0	17.6
10	63	34.9	119	-11	25.0	-133	286	40.0	-13	9.0	71	42.6	0	17.6
12	92	36.7	119	-11	51.5	-131	316	43.9	-13	8.6	101	47.4	0	17.6
14	121	38.4	118	-12	17.7	-130	346	47.9	-13	8.3	131	52.3	0	17.6
16	150	40.1	118	-12	43.6	-128	16	51.8	-13	7.9	161	57.2	0	17.6
18	179	41.6	117	-13	9.2	-126	46	55.7	-13	7.5	192	2.0	0	17.6
20	208	43.1	117	-13	34.5	-125	76	59.6	-13	7.2	222	6.9	0	17.6
22	237	44.5	117	-13	59.4	-123	107	3.5	-13	6.8	252	11.8	0	17.6
Δ								20		2		24		0

φ	SUNCE		TRAJANJE SUMRAKA		MJESEC			
	IZLAZ	ZALAZ	GRAĐ.	ASTR.	IZLAZ	Δ/24	ZALAZ	Δ/24
N	h min	h min	h min	h min	h min	min	h min	min
60	8 58	15 15	0 55	2 42	0 35	3.9	10 23	.3
55	8 23	15 50	0 44	2 15	0 22	3.5	10 38	.6
50	7 57	16 16	0 38	1 58	0 12	3.2	10 50	.9
45	7 38	16 35	0 33	1 46	0 5	3.0	10 59	1.1
40	7 22	16 51	0 30	1 37	. . .	.0	11 7	1.2
35	7 9	17 4	0 28	1 30	. . .	.0	11 14	1.4
30	6 57	17 16	0 26	1 25	. . .	.0	11 20	1.5
20	6 37	17 36	0 24	1 18	. . .	.0	11 31	1.7
10	6 19	17 53	0 23	1 15	. . .	.0	11 40	1.9
0	6 3	18 10	0 22	1 14	. . .	.0	11 49	2.0
10	5 46	18 27	0 23	1 17	. . .	.0	11 57	2.2
20	5 28	18 45	0 24	1 23	23 52	1.7	12 7	2.4
30	5 7	19 6	0 27	1 35	23 39	1.5	12 17	2.6
35	4 54	19 18	0 29	1 45	23 32	1.4	12 24	2.7
40	4 40	19 32	0 32	1 60	23 23	1.3	12 31	2.8
45	4 23	19 49	0 36	2 25	23 13	1.1	12 39	3.0
50	4 2	20 10	0 43	: ::	23 2	1.0	12 49	3.2
55	3 34	20 38	0 55	: ::	22 47	.7	13 2	3.5
60	2 53	21 18	1 26	: ::	22 28	.3	13 18	3.9
S								

SUNCE				MJESEC				
UT	e = Tp − UT	Δ/24	r	Prolaz	Δ/24	$\pi_\leftmoon$	r	
h	min s	s	′	h min	min	′	′	
00	- 6 3.5	-1.1	16.3	$T_{\overline{m}}$ 5 37	2.0	58.2	15.9	
12	- 6 16.4	$T_{\overline{m}_\odot}$ 12 h 6.3 min		Starost 21.5 d	Faza ◑			

PLANETE									
Pl.	$T_{\overline{m}}$	π	360 − α	Vel.	Pl.	$T_{\overline{m}}$	π	360 − α	Vel.
	h min	′	°			h min	′	°	
♀	12 2	.1	73	-3.8	♃	14 53	.0	30	-1.9
♂	2 19	.2	219	-.9	♄	5 14	.0	175	.8

UT	SUNCE				PROLJ. TAČKA		VENERA				MARS			
	$S_\odot$		$\delta_\odot$		S_Υ		S_φ		δ_φ		S_σ		δ_σ	
h	°	′	°	′	°	′	°	′	°	′	°	′	°	′
0	178	22.6	-22	17.0	107	26.0	179	17.2	-23	5.3	326	17.3	19	27.2
2	208	22.1	-22	16.3	137	30.9	209	15.3	-23	4.7	356	23.4	19	27.7
4	238	21.6	-22	15.7	167	35.8	239	13.5	-23	4.1	26	29.5	19	28.3
6	268	21.1	-22	15.0	197	40.8	269	11.6	-23	3.4	56	35.7	19	28.8
8	298	20.5	-22	14.3	227	45.7	299	9.7	-23	2.8	86	41.8	19	29.4
10	328	20.0	-22	13.7	257	50.6	329	7.8	-23	2.2	116	47.9	19	30.0
12	358	19.5	-22	13.0	287	55.5	359	6.0	-23	1.6	146	54.1	19	30.5
14	28	18.9	-22	12.3	318	.5	29	4.1	-23	.9	177	.2	19	31.1
16	58	18.4	-22	11.6	348	5.4	59	2.2	-23	.3	207	6.4	19	31.7
18	88	17.9	-22	10.9	18	10.3	89	.3	-22	59.6	237	12.5	19	32.2
20	118	17.4	-22	10.2	48	15.3	118	58.5	-22	59.0	267	18.7	19	32.8
22	148	16.8	-22	9.5	78	20.2	148	56.6	-22	58.3	297	24.9	19	33.4
Δ		-3		3				-9		3		31		3

UT	MJESEC						JUPITER				SATURN			
	$S_\leftmoon$		Δ	$\delta_\leftmoon$		Δ	S_{4}		δ_{4}		S_{5}		δ_{5}	
h	°	′		°	′		°	′	°	′	°	′	°	′
0	266	45.9	116	-14	24.0	-121	137	7.4	-13	6.4	282	16.6	0	17.6
2	295	47.1	116	-14	48.3	-120	167	11.3	-13	6.1	312	21.5	0	17.6
4	324	48.2	115	-15	12.3	-118	197	15.2	-13	5.7	342	26.4	0	17.6
6	353	49.3	115	-15	35.9	-116	227	19.1	-13	5.3	12	31.3	0	17.6
8	22	50.2	114	-15	59.1	-114	257	23.0	-13	4.9	42	36.1	0	17.6
10	51	51.0	113	-16	22.0	-112	287	27.0	-13	4.6	72	41.0	0	17.6
12	80	51.7	113	-16	44.5	-111	317	30.9	-13	4.2	102	45.9	0	17.6
14	109	52.3	112	-17	6.6	-109	347	34.8	-13	3.8	132	50.8	0	17.6
16	138	52.7	112	-17	28.3	-107	17	38.7	-13	3.5	162	55.6	0	17.6
18	167	53.1	111	-17	49.7	-105	47	42.6	-13	3.1	193	.5	0	17.6
20	196	53.3	110	-18	10.6	-103	77	46.5	-13	2.7	223	5.4	0	17.6
22	225	53.4	110	-18	31.1	-101	107	50.4	-13	2.4	253	10.3	0	17.7
Δ								20		2		24		0

φ	SUNCE		TRAJANJE SUMRAKA		MJESEC			
	IZLAZ	ZALAZ	GRAĐ.	ASTR.	IZLAZ	Δ/24	ZALAZ	Δ/24
N	h min	h min	h min	h min	h min	min	h min	min
60	8 57	15 17	0 55	2 41	2 8	3.8	10 29	.4
55	8 22	15 52	0 44	2 15	1 46	3.4	10 53	.8
50	7 57	16 17	0 38	1 58	1 30	3.2	11 11	1.1
45	7 38	16 36	0 33	1 46	1 17	3.0	11 25	1.2
40	7 22	16 52	0 30	1 37	1 7	2.8	11 37	1.4
35	7 9	17 5	0 28	1 30	0 58	2.7	11 47	1.5
30	6 57	17 17	0 26	1 25	0 50	2.6	11 56	1.6
20	6 37	17 37	0 24	1 18	0 36	2.4	12 11	1.8
10	6 19	17 54	0 23	1 15	0 25	2.2	12 25	1.9
0	6 3	18 10	0 22	1 14	0 14	2.0	12 37	2.1
10	5 46	18 27	0 23	1 17	0 3	1.9	12 50	2.2
20	5 28	18 45	0 24	1 23	. . .	.0	13 4	2.4
30	5 8	19 6	0 27	1 35	. . .	.0	13 19	2.5
35	4 55	19 18	0 29	1 44	. . .	.0	13 28	2.6
40	4 41	19 32	0 32	1 59	23 54	1.5	13 39	2.8
45	4 24	19 49	0 36	2 24	23 41	1.4	13 51	2.9
50	4 3	20 10	0 43	: ::	23 25	1.2	14 6	3.1
55	3 36	20 37	0 54	: ::	23 4	.9	14 25	3.4
60	2 55	21 17	1 24	: ::	22 36	.5	14 51	3.8
S								

SUNCE				MJESEC				
UT	e = Tp − UT	Δ/24	r	Prolaz	Δ/24	$\pi_\leftmoon$	r	
h	min s	s	′	h min	min	′	′	
00	- 6 29.2	-1.1	16.3	$T_{\overline{m}}$ 6 26	2.0	57.4	15.6	
12	- 6 41.9	$T_{\overline{m}_\odot}$ 12 h 6.7 min		Starost 22.5 d	Faza ◑			

PLANETE									
Pl.	$T_{\overline{m}}$	π	360 − α	Vel.	Pl.	$T_{\overline{m}}$	π	360 − α	Vel.
	h min	′	°			h min	′	°	
♀	12 4	.1	72	-3.8	♃	14 50	.0	30	-1.9
♂	2 14	.2	219	-.9	♄	5 10	.0	175	.8

9. JANUAR 2010. SUBOTA

UT	SUNCE $S_\odot$	SUNCE $\delta_\odot$	PROLJ. TAČKA S_Υ	VENERA S_φ	VENERA δ_φ	MARS S_σ	MARS δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	178 16.3	-22 8.8	108 25.1	178 54.7	-22 57.6	327 31.0	19 33.9
2	208 15.8	-22 8.1	138 30.0	208 52.9	-22 57.0	357 37.2	19 34.5
4	238 15.3	-22 7.4	168 35.0	238 51.0	-22 56.3	27 43.4	19 35.1
6	268 14.8	-22 6.7	198 39.9	268 49.1	-22 55.6	57 49.6	19 35.7
8	298 14.2	-22 6.0	228 44.8	298 47.3	-22 54.9	87 55.8	19 36.2
10	328 13.7	-22 5.3	258 49.8	328 45.4	-22 54.3	118 2.0	19 36.8
12	358 13.2	-22 4.6	288 54.7	358 43.6	-22 53.6	148 8.2	19 37.4
14	28 12.7	-22 3.9	318 59.6	28 41.7	-22 52.9	178 14.4	19 38.0
16	58 12.2	-22 3.2	349 4.5	58 39.8	-22 52.2	208 20.6	19 38.6
18	88 11.7	-22 2.4	19 9.5	88 38.0	-22 51.5	238 26.9	19 39.1
20	118 11.1	-22 1.7	49 14.4	118 36.1	-22 50.7	268 33.1	19 39.7
22	148 10.6	-22 1.0	79 19.3	148 34.3	-22 50.0	298 39.3	19 40.3
Δ	-3	4		-9	3	31	3

UT	MJESEC $S_\leftmoon$	MJESEC Δ	MJESEC $\delta_\leftmoon$	MJESEC Δ	JUPITER S_4	JUPITER δ_4	SATURN S_η	SATURN δ_η
h	° ′		° ′		° ′	° ′	° ′	° ′
0	254 53.3	109	-18 51.3	-99	137 54.3	-13 2.0	283 15.2	0 17.7
2	283 53.1	108	-19 11.0	-97	167 58.2	-13 1.6	313 20.0	0 17.7
4	312 52.8	108	-19 30.3	-94	198 2.1	-13 1.2	343 24.9	0 17.7
6	341 52.4	107	-19 49.2	-92	228 6.0	-13 .9	13 29.8	0 17.7
8	10 51.8	106	-20 7.6	-90	258 9.9	-13 .5	43 34.7	0 17.7
10	39 51.1	106	-20 25.6	-88	288 13.8	-13 .1	73 39.6	0 17.7
12	68 50.2	105	-20 43.2	-86	318 17.7	-12 59.8	103 44.4	0 17.7
14	97 49.2	104	-21 .3	-83	348 21.6	-12 59.4	133 49.3	0 17.7
16	126 48.1	104	-21 16.9	-81	18 25.5	-12 59.0	163 54.2	0 17.7
18	155 46.9	103	-21 33.1	-79	48 29.4	-12 58.6	193 59.1	0 17.7
20	184 45.5	102	-21 48.9	-76	78 33.3	-12 58.3	224 4.0	0 17.7
22	213 44.0	102	-22 4.2	-74	108 37.2	-12 57.9	254 8.9	0 17.7
Δ					20	2	24	0

φ	SUNCE IZLAZ	SUNCE ZALAZ	TRAJANJE SUMRAKA GRAĐ.	TRAJANJE SUMRAKA ASTR.	MJESEC IZLAZ	MJESEC Δ/24	MJESEC ZALAZ	MJESEC Δ/24
N	h min	h min	h min	h min	h min	min	h min	min
60	8 56	15 19	0 55	2 41	3 40	3.7	10 39	.7
55	8 21	15 53	0 44	2 15	3 9	3.3	11 12	1.1
50	7 56	16 18	0 38	1 57	2 46	3.0	11 36	1.3
45	7 37	16 37	0 33	1 45	2 28	2.9	11 55	1.5
40	7 22	16 53	0 30	1 36	2 14	2.7	12 10	1.6
35	7 9	17 6	0 28	1 30	2 2	2.6	12 23	1.7
30	6 57	17 17	0 26	1 25	1 51	2.5	12 35	1.8
20	6 37	17 37	0 24	1 18	1 33	2.4	12 54	1.9
10	6 20	17 55	0 23	1 15	1 18	2.2	13 11	2.0
0	6 3	18 11	0 22	1 14	1 3	2.1	13 27	2.1
10	5 47	18 27	0 23	1 17	0 49	2.0	13 43	2.2
20	5 29	18 45	0 24	1 23	0 33	1.8	14 0	2.4
30	5 8	19 6	0 27	1 35	0 16	1.7	14 20	2.5
35	4 56	19 18	0 29	1 44	0 6	1.6	14 32	2.6
40	4 42	19 32	0 32	1 59	.. ..	.0	14 45	2.7
45	4 25	19 48	0 36	2 23	.. ..	.0	15 1	2.8
50	4 5	20 9	0 43	: ::	23 53	1.5	15 21	2.9
55	3 37	20 36	0 54	: ::	23 26	1.3	15 46	3.2
60	2 57	21 15	1 23	: ::	22 48	.9	16 22	3.6
S								

SUNCE UT	SUNCE $e = T_p - UT$	SUNCE Δ/24	SUNCE r	MJESEC Prolaz	MJESEC Δ/24	MJESEC $\pi_\leftmoon$	MJESEC r
h	min s	s	′	h min	min	′	′
00	- 6 54.5	-1.0	16.3	$T_{\overline{m}}$ 7 15	2.1	56.7	15.4
12	- 7 6.9	$T_{\overline{m}_\odot}$ 12 h 7.1 min		Starost 23.5 d	Faza ◑		

PLANETE

Pl.	$T_{\overline{m}}$	π	360−α	Vel.	Pl.	$T_{\overline{m}}$	π	360−α	Vel.
	h min	′	°			h min	′	°	
♀	12 5	.1	70	-3.8	♃	14 46	.0	29	-1.9
♂	2 9	.2	219	-1.0	♄	5 6	.0	175	.8

10. JANUAR NEDJELJA

UT	SUNCE $S_\odot$	SUNCE $\delta_\odot$	PROLJ. TAČKA S_Υ	VENERA S_φ	VENERA δ_φ	MARS S_σ	MARS δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	178 10.1	-22 .2	109 24.3	178 32.4	-22 49.3	328 45.6	19 40.9
2	208 9.6	-21 59.5	139 29.2	208 30.6	-22 48.6	358 51.8	19 41.5
4	238 9.1	-21 58.8	169 34.1	238 28.7	-22 47.9	28 58.1	19 42.1
6	268 8.6	-21 58.0	199 39.0	268 26.9	-22 47.1	59 4.3	19 42.6
8	298 8.1	-21 57.3	229 44.0	298 25.0	-22 46.4	89 10.6	19 43.2
10	328 7.6	-21 56.5	259 48.9	328 23.2	-22 45.6	119 16.8	19 43.8
12	358 7.1	-21 55.8	289 53.8	358 21.3	-22 44.9	149 23.1	19 44.4
14	28 6.6	-21 55.0	319 58.8	28 19.5	-22 44.1	179 29.4	19 45.0
16	58 6.1	-21 54.3	350 3.7	58 17.6	-22 43.4	209 35.7	19 45.6
18	88 5.6	-21 53.5	20 8.6	88 15.8	-22 42.6	239 42.0	19 46.2
20	118 5.1	-21 52.7	50 13.5	118 13.9	-22 41.8	269 48.3	19 46.8
22	148 4.6	-21 52.0	80 18.5	148 12.1	-22 41.1	299 54.5	19 47.4
Δ	-3	4		-9	4	31	3

UT	MJESEC $S_\leftmoon$	MJESEC Δ	MJESEC $\delta_\leftmoon$	MJESEC Δ	JUPITER S_4	JUPITER δ_4	SATURN S_η	SATURN δ_η
h	° ′		° ′		° ′	° ′	° ′	° ′
0	242 42.4	101	-22 18.9	-72	138 41.1	-12 57.5	284 13.8	0 17.7
2	271 40.6	101	-22 33.3	-69	168 45.0	-12 57.1	314 18.7	0 17.7
4	300 38.7	100	-22 47.1	-67	198 48.9	-12 56.8	344 23.5	0 17.8
6	329 36.7	99	-23 .5	-64	228 52.8	-12 56.4	14 28.4	0 17.8
8	358 34.6	99	-23 13.3	-62	258 56.7	-12 56.0	44 33.3	0 17.8
10	27 32.4	98	-23 25.7	-59	289 .6	-12 55.6	74 38.2	0 17.8
12	56 30.1	98	-23 37.6	-57	319 4.5	-12 55.3	104 43.1	0 17.8
14	85 27.7	97	-23 48.9	-54	349 8.4	-12 54.9	134 48.0	0 17.8
16	114 25.2	97	-23 59.8	-52	19 12.3	-12 54.5	164 52.9	0 17.8
18	143 22.6	97	-24 10.1	-49	49 16.2	-12 54.1	194 57.8	0 17.8
20	172 19.9	96	-24 20.0	-47	79 20.1	-12 53.8	225 2.7	0 17.8
22	201 17.2	96	-24 29.3	-44	109 24.0	-12 53.4	255 7.6	0 17.9
Δ					19	2	24	0

φ	SUNCE IZLAZ	SUNCE ZALAZ	TRAJANJE SUMRAKA GRAĐ.	TRAJANJE SUMRAKA ASTR.	MJESEC IZLAZ	MJESEC Δ/24	MJESEC ZALAZ	MJESEC Δ/24
N	h min	h min	h min	h min	h min	min	h min	min
60	8 55	15 21	0 54	2 40	5 10	3.4	10 55	1.1
55	8 20	15 55	0 44	2 14	4 27	3.0	11 38	1.5
50	7 56	16 19	0 37	1 57	3 58	2.8	12 8	1.7
45	7 37	16 38	0 33	1 45	3 37	2.7	12 30	1.8
40	7 22	16 54	0 30	1 36	3 19	2.6	12 49	1.8
35	7 8	17 7	0 28	1 30	3 4	2.5	13 4	1.9
30	6 57	17 18	0 26	1 25	2 51	2.4	13 17	2.0
20	6 37	17 38	0 24	1 18	2 30	2.3	13 40	2.0
10	6 20	17 55	0 23	1 15	2 11	2.2	13 60	2.1
0	6 4	18 11	0 22	1 14	1 54	2.2	14 18	2.2
10	5 47	18 28	0 23	1 17	1 36	2.1	14 37	2.2
20	5 30	18 45	0 24	1 23	1 18	2.0	14 57	2.3
30	5 9	19 6	0 27	1 34	0 57	1.9	15 20	2.4
35	4 57	19 18	0 29	1 44	0 44	1.8	15 33	2.4
40	4 43	19 31	0 32	1 58	0 30	1.7	15 49	2.5
45	4 27	19 48	0 36	2 23	0 13	1.6	16 8	2.5
50	4 6	20 8	0 43	3 39	.. ..	.0	16 31	2.6
55	3 39	20 35	0 54	: ::	23 56	1.7	17 2	2.8
60	2 60	21 14	1 21	: ::	23 9	1.5	17 48	3.1
S								

SUNCE UT	SUNCE $e = T_p - UT$	SUNCE Δ/24	SUNCE r	MJESEC Prolaz	MJESEC Δ/24	MJESEC $\pi_\leftmoon$	MJESEC r
h	min s	s	′	h min	min	′	′
00	- 7 19.3	-1.0	16.3	$T_{\overline{m}}$ 8 6	2.2	56.0	15.3
12	- 7 31.5	$T_{\overline{m}_\odot}$ 12 h 7.5 min		Starost 24.5 d	Faza ◑		

PLANETE

Pl.	$T_{\overline{m}}$	π	360−α	Vel.	Pl.	$T_{\overline{m}}$	π	360−α	Vel.
	h min	′	°			h min	′	°	
♀	12 7	.1	69	-3.8	♃	14 43	.0	29	-1.9
♂	2 5	.2	219	-1.0	♄	5 2	.0	175	.8

UT	SUNCE $S_\odot$	SUNCE $\delta_\odot$	PROLJ. TAČKA S_Υ	VENERA S_φ	VENERA δ_φ	MARS S_σ	MARS δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	178 4.1	-21 51.2	110 23.4	178 10.3	-22 40.3	330 .9	19 48.0
2	208 3.6	-21 50.4	140 28.3	208 8.4	-22 39.5	0 7.2	19 48.6
4	238 3.1	-21 49.7	170 33.3	238 6.6	-22 38.7	30 13.5	19 49.2
6	268 2.6	-21 48.9	200 38.2	268 4.8	-22 37.9	60 19.8	19 49.8
8	298 2.1	-21 48.1	230 43.1	298 2.9	-22 37.1	90 26.1	19 50.4
10	328 1.6	-21 47.3	260 48.0	328 1.1	-22 36.3	120 32.4	19 51.0
12	358 1.1	-21 46.5	290 53.0	357 59.3	-22 35.5	150 38.8	19 51.6
14	28 .6	-21 45.8	320 57.9	27 57.4	-22 34.7	180 45.1	19 52.2
16	58 .1	-21 45.0	351 2.8	57 55.6	-22 33.9	210 51.5	19 52.8
18	87 59.6	-21 44.2	21 7.8	87 53.8	-22 33.0	240 57.8	19 53.4
20	117 59.1	-21 43.4	51 12.7	117 52.0	-22 32.2	271 4.2	19 54.0
22	147 58.6	-21 42.6	81 17.6	147 50.1	-22 31.4	301 10.5	19 54.6
Δ	-2	4		-9	4	32	3

UT	MJESEC $S_\leftmoon$	MJESEC Δ	MJESEC $\delta_\leftmoon$	MJESEC Δ	JUPITER $S_\jupiter$	JUPITER $\delta_\jupiter$	SATURN $S_\saturn$	SATURN $\delta_\saturn$
h	° ′		° ′		° ′	° ′	° ′	° ′
0	230 14.3	96	-24 38.1	-42	139 27.9	-12 53.0	285 12.5	0 17.9
2	259 11.4	95	-24 46.4	-39	169 31.8	-12 52.6	315 17.4	0 17.9
4	288 8.5	95	-24 54.2	-36	199 35.7	-12 52.3	345 22.3	0 17.9
6	317 5.5	95	-25 1.5	-34	229 39.6	-12 51.9	15 27.2	0 17.9
8	346 2.5	95	-25 8.2	-31	259 43.5	-12 51.5	45 32.1	0 17.9
10	14 59.4	94	-25 14.4	-28	289 47.4	-12 51.1	75 37.0	0 17.9
12	43 56.3	94	-25 20.1	-26	319 51.3	-12 50.7	105 41.9	0 17.9
14	72 53.2	94	-25 25.3	-23	349 55.2	-12 50.4	135 46.8	0 18.0
16	101 50.0	94	-25 29.9	-21	19 59.1	-12 50.0	165 51.7	0 18.0
18	130 46.9	94	-25 34.0	-18	50 2.9	-12 49.6	195 56.6	0 18.0
20	159 43.8	94	-25 37.6	-15	80 6.8	-12 49.2	226 1.5	0 18.0
22	188 40.6	95	-25 40.6	-13	110 10.7	-12 48.9	256 6.4	0 18.0
Δ					19	2	25	0

φ	SUNCE IZLAZ	SUNCE ZALAZ	TRAJANJE SUMRAKA GRAĐ.	TRAJANJE SUMRAKA ASTR.	MJESEC IZLAZ	MJESEC Δ/24	MJESEC ZALAZ	MJESEC Δ/24
N	h min	h min	h min	h min	h min	min	h min	min
60	8 53	15 23	0 54	2 39	6 31	2.7	11 21	1.9
55	8 20	15 57	0 44	2 14	5 39	2.5	12 13	2.0
50	7 55	16 21	0 37	1 57	5 5	2.4	12 47	2.1
45	7 37	16 39	0 33	1 45	4 40	2.4	13 13	2.1
40	7 21	16 55	0 30	1 36	4 21	2.3	13 33	2.1
35	7 8	17 8	0 28	1 30	4 4	2.3	13 50	2.1
30	6 57	17 19	0 26	1 24	3 50	2.3	14 4	2.1
20	6 37	17 38	0 24	1 18	3 26	2.2	14 29	2.2
10	6 20	17 56	0 23	1 15	3 5	2.2	14 50	2.2
0	6 4	18 12	0 22	1 14	2 45	2.2	15 10	2.2
10	5 48	18 28	0 23	1 17	2 26	2.1	15 30	2.2
20	5 30	18 45	0 24	1 23	2 5	2.1	15 52	2.2
30	5 10	19 6	0 27	1 34	1 41	2.1	16 17	2.2
35	4 58	19 17	0 29	1 44	1 27	2.0	16 31	2.2
40	4 44	19 31	0 32	1 58	1 11	2.0	16 48	2.2
45	4 28	19 48	0 36	2 22	0 52	1.9	17 8	2.2
50	4 7	20 8	0 42	3 31	0 28	1.9	17 34	2.2
55	3 40	20 34	0 53	: ::	.. ..	.0	18 8	2.2
60	3 2	21 13	1 20	: ::	23 45	2.3	19 2	2.2
S								

SUNCE UT	SUNCE $e = T_p - UT$	SUNCE Δ/24	SUNCE r	MJESEC Prolaz	MJESEC Δ/24	MJESEC $\pi_\leftmoon$	MJESEC r
h	min s	s	′	h min	min	′	′
00	- 7 43.6	-1.0	16.3	$T_{\overline{m}}$ 8 58	2.2	55.5	15.1
12	- 7 55.4	$T_{\overline{m}_\odot}$ 12 h 7.9 min		Starost 25.5 d	Faza ◑		

PLANETE

Pl.	$T_{\overline{m}}$	π	360−α	Vel.	Pl.	$T_{\overline{m}}$	π	360−α	Vel.
	h min	′	°			h min	′	°	
♀	12 8	.1	68	-3.8	♃	14 40	.0	29	-1.9
♂	1 60	.2	220	-1.0	♄	4 58	.0	175	.8

UT	SUNCE $S_\odot$	SUNCE $\delta_\odot$	PROLJ. TAČKA S_Υ	VENERA S_φ	VENERA δ_φ	MARS S_σ	MARS δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	177 58.1	-21 41.8	111 22.5	177 48.3	-22 30.5	331 16.9	19 55.2
2	207 57.7	-21 41.0	141 27.5	207 46.5	-22 29.7	1 23.3	19 55.8
4	237 57.2	-21 40.1	171 32.4	237 44.7	-22 28.9	31 29.6	19 56.4
6	267 56.7	-21 39.3	201 37.3	267 42.9	-22 28.0	61 36.0	19 57.0
8	297 56.2	-21 38.5	231 42.2	297 41.0	-22 27.1	91 42.4	19 57.6
10	327 55.7	-21 37.7	261 47.2	327 39.2	-22 26.3	121 48.8	19 58.3
12	357 55.2	-21 36.9	291 52.1	357 37.4	-22 25.4	151 55.2	19 58.9
14	27 54.8	-21 36.1	321 57.0	27 35.6	-22 24.5	182 1.6	19 59.5
16	57 54.3	-21 35.2	352 2.0	57 33.8	-22 23.7	212 8.0	20 .1
18	87 53.8	-21 34.4	22 6.9	87 32.0	-22 22.8	242 14.4	20 .7
20	117 53.3	-21 33.6	52 11.8	117 30.2	-22 21.9	272 20.8	20 1.3
22	147 52.8	-21 32.7	82 16.7	147 28.4	-22 21.0	302 27.2	20 1.9
Δ	-2	4		-9	4	32	3

UT	MJESEC $S_\leftmoon$	MJESEC Δ	MJESEC $\delta_\leftmoon$	MJESEC Δ	JUPITER $S_\jupiter$	JUPITER $\delta_\jupiter$	SATURN $S_\saturn$	SATURN $\delta_\saturn$
h	° ′		° ′		° ′	° ′	° ′	° ′
0	217 37.5	95	-25 43.1	-10	140 14.6	-12 48.5	286 11.3	0 18.0
2	246 34.5	95	-25 45.1	-7	170 18.5	-12 48.1	316 16.2	0 18.1
4	275 31.5	95	-25 46.6	-5	200 22.4	-12 47.7	346 21.1	0 18.1
6	304 28.5	95	-25 47.5	-2	230 26.3	-12 47.3	16 26.0	0 18.1
8	333 25.6	96	-25 47.9	1	260 30.2	-12 47.0	46 30.9	0 18.1
10	2 22.7	96	-25 47.8	3	290 34.1	-12 46.6	76 35.8	0 18.1
12	31 19.9	97	-25 47.1	6	320 38.0	-12 46.2	106 40.7	0 18.1
14	60 17.2	97	-25 46.0	8	350 41.8	-12 45.8	136 45.6	0 18.2
16	89 14.6	97	-25 44.3	11	20 45.7	-12 45.4	166 50.5	0 18.2
18	118 12.1	98	-25 42.1	14	50 49.6	-12 45.1	196 55.5	0 18.2
20	147 9.7	99	-25 39.4	16	80 53.5	-12 44.7	227 .4	0 18.2
22	176 7.5	99	-25 36.1	19	110 57.4	-12 44.3	257 5.3	0 18.2
Δ					19	2	25	0

φ	SUNCE IZLAZ	SUNCE ZALAZ	TRAJANJE SUMRAKA GRAĐ.	TRAJANJE SUMRAKA ASTR.	MJESEC IZLAZ	MJESEC Δ/24	MJESEC ZALAZ	MJESEC Δ/24
N	h min	h min	h min	h min	h min	min	h min	min
60	8 52	15 25	0 54	2 39	7 34	1.8	12 6	2.7
55	8 19	15 58	0 44	2 14	6 39	1.9	13 1	2.5
50	7 55	16 22	0 37	1 57	6 4	2.0	13 37	2.4
45	7 36	16 41	0 33	1 45	5 38	2.0	14 3	2.4
40	7 21	16 56	0 30	1 36	5 17	2.1	14 23	2.3
35	7 8	17 9	0 28	1 29	4 60	2.1	14 41	2.3
30	6 57	17 20	0 26	1 24	4 45	2.1	14 56	2.3
20	6 38	17 39	0 24	1 18	4 20	2.1	15 21	2.2
10	6 21	17 56	0 23	1 14	3 58	2.1	15 42	2.2
0	6 5	18 12	0 22	1 14	3 38	2.2	16 3	2.1
10	5 49	18 28	0 23	1 16	3 17	2.2	16 23	2.1
20	5 31	18 45	0 24	1 22	2 56	2.2	16 44	2.0
30	5 11	19 5	0 27	1 34	2 31	2.2	17 9	2.0
35	4 59	19 17	0 29	1 43	2 16	2.2	17 24	2.0
40	4 45	19 31	0 32	1 57	1 59	2.2	17 41	1.9
45	4 29	19 47	0 36	2 21	1 38	2.2	18 2	1.9
50	4 9	20 7	0 42	3 24	1 13	2.2	18 27	1.8
55	3 42	20 33	0 53	: ::	0 38	2.3	19 2	1.6
60	3 4	21 11	1 19	: ::	.. ..	.0	19 55	1.4
S								

SUNCE UT	SUNCE $e = T_p - UT$	SUNCE Δ/24	SUNCE r	MJESEC Prolaz	MJESEC Δ/24	MJESEC $\pi_\leftmoon$	MJESEC r
h	min s	s	′	h min	min	′	′
00	- 8 7.3	-1.0	16.3	$T_{\overline{m}}$ 9 50	2.2	55.0	15.0
12	- 8 18.8	$T_{\overline{m}_\odot}$ 12 h 8.3 min		Starost 26.5 d	Faza ◑		

PLANETE

Pl.	$T_{\overline{m}}$	π	360−α	Vel.	Pl.	$T_{\overline{m}}$	π	360−α	Vel.
	h min	′	°			h min	′	°	
♀	12 10	.1	66	-3.8	♃	14 37	.0	29	-1.9
♂	1 54	.2	220	-1.0	♄	4 54	.0	175	.8

UT	SUNCE				PROLJ. TAČKA		VENERA				MARS			
	$S_\odot$		$\delta_\odot$		S_Υ		S_φ		δ_φ		S_σ		δ_σ	
h	°	′	°	′	°	′	°	′	°	′	°	′	°	′
0	177	52.4	-21	31.9	112	21.7	177	26.6	-22	20.1	332	33.7	20	2.6
2	207	51.9	-21	31.0	142	26.6	207	24.8	-22	19.2	2	40.1	20	3.2
4	237	51.4	-21	30.2	172	31.5	237	23.0	-22	18.3	32	46.5	20	3.8
6	267	50.9	-21	29.4	202	36.5	267	21.2	-22	17.4	62	53.0	20	4.4
8	297	50.5	-21	28.5	232	41.4	297	19.4	-22	16.5	92	59.4	20	5.0
10	327	50.0	-21	27.6	262	46.3	327	17.6	-22	15.6	123	5.9	20	5.6
12	357	49.5	-21	26.8	292	51.2	357	15.8	-22	14.7	153	12.3	20	6.3
14	27	49.1	-21	25.9	322	56.2	27	14.0	-22	13.7	183	18.8	20	6.9
16	57	48.6	-21	25.1	353	1.1	57	12.2	-22	12.8	213	25.2	20	7.5
18	87	48.1	-21	24.2	23	6.0	87	10.4	-22	11.9	243	31.7	20	8.1
20	117	47.7	-21	23.3	53	11.0	117	8.6	-22	10.9	273	38.2	20	8.8
22	147	47.2	-21	22.5	83	15.9	147	6.8	-22	10.0	303	44.7	20	9.4
Δ		-2		4				-9		5		32		3

UT	MJESEC						JUPITER				SATURN			
	$S_\leftmoon$		Δ	$\delta_\leftmoon$		Δ	S_4		δ_4		S_η		δ_η	
h	°	′		°	′		°	′	°	′	°	′	°	′
0	205	5.3	100	-25	32.4	21	141	1.3	-12	43.9	287	10.2	0	18.2
2	234	3.3	101	-25	28.2	24	171	5.2	-12	43.5	317	15.1	0	18.3
4	263	1.4	101	-25	23.4	26	201	9.0	-12	43.1	347	20.0	0	18.3
6	291	59.7	102	-25	18.2	29	231	12.9	-12	42.8	17	24.9	0	18.3
8	320	58.1	103	-25	12.5	31	261	16.8	-12	42.4	47	29.8	0	18.3
10	349	56.7	104	-25	6.2	33	291	20.7	-12	42.0	77	34.8	0	18.3
12	18	55.4	105	-24	59.5	36	321	24.6	-12	41.6	107	39.7	0	18.4
14	47	54.3	106	-24	52.4	38	351	28.5	-12	41.2	137	44.6	0	18.4
16	76	53.5	106	-24	44.7	41	21	32.3	-12	40.9	167	49.5	0	18.4
18	105	52.8	107	-24	36.6	43	51	36.2	-12	40.5	197	54.4	0	18.4
20	134	52.2	108	-24	28.0	45	81	40.1	-12	40.1	227	59.4	0	18.5
22	163	51.9	109	-24	18.9	48	111	44.0	-12	39.7	258	4.3	0	18.5
Δ								19		2		25		0

φ	SUNCE		TRAJANJE SUMRAKA		MJESEC			
	IZLAZ	ZALAZ	GRAĐ.	ASTR.	IZLAZ	Δ/24	ZALAZ	Δ/24
N	h min	h min	h min	h min	h min	min	h min	min
60	8 51	15 27	0 53	2 38	8 16	1.0	13 11	3.3
55	8 18	15 60	0 43	2 13	7 25	1.4	14 2	2.9
50	7 54	16 24	0 37	1 57	6 51	1.6	14 35	2.7
45	7 36	16 42	0 33	1 45	6 26	1.7	14 60	2.6
40	7 21	16 57	0 30	1 36	6 6	1.8	15 19	2.5
35	7 8	17 10	0 28	1 29	5 50	1.8	15 36	2.4
30	6 57	17 21	0 26	1 24	5 35	1.9	15 50	2.3
20	6 38	17 40	0 24	1 18	5 10	2.0	16 14	2.2
10	6 21	17 57	0 23	1 14	4 49	2.0	16 35	2.1
0	6 5	18 12	0 22	1 14	4 29	2.1	16 54	2.0
10	5 49	18 28	0 23	1 16	4 9	2.2	17 13	2.0
20	5 32	18 45	0 24	1 22	3 48	2.2	17 34	1.9
30	5 12	19 5	0 27	1 34	3 23	2.3	17 57	1.8
35	4 60	19 17	0 29	1 43	3 9	2.3	18 11	1.7
40	4 46	19 31	0 32	1 57	2 52	2.4	18 27	1.6
45	4 30	19 47	0 36	2 20	2 32	2.5	18 46	1.5
50	4 10	20 6	0 42	3 19	2 7	2.6	19 10	1.4
55	3 44	20 32	0 52	: ::	1 32	2.7	19 41	1.2
60	3 6	21 10	1 17	: ::	0 39	3.0	20 28	.8
S								

SUNCE				MJESEC				
UT	e = Tp − UT	Δ/24	r	Prolaz		Δ/24	$\pi_\leftmoon$	r
h	min s	s	′		h min	min	′	′
00	- 8 30.3	-.9	16.3	$T_{\overline{m}}$	10 42	2.0	54.6	14.9
12	- 8 41.6	$T_{\overline{m}_\odot}$	12 h 8.7 min	Starost 27.5 d		Faza ●		

PLANETE									
Pl.	$T_{\overline{m}}$	π	360−α	Vel.	Pl.	$T_{\overline{m}}$	π	360−α	Vel.
	h min	′	°			h min	′	°	
♀	12 11	.1	65	-3.8	♃	14 34	.0	29	-1.9
♂	1 49	.2	220	-1.0	♄	4 51	.0	175	.8

UT	SUNCE				PROLJ. TAČKA		VENERA				MARS			
	$S_\odot$		$\delta_\odot$		S_Υ		S_φ		δ_φ		S_σ		δ_σ	
h	°	′	°	′	°	′	°	′	°	′	°	′	°	′
0	177	46.7	-21	21.6	113	20.8	177	5.0	-22	9.0	333	51.1	20	10.0
2	207	46.3	-21	20.7	143	25.7	207	3.2	-22	8.1	3	57.6	20	10.6
4	237	45.8	-21	19.8	173	30.7	237	1.5	-22	7.1	34	4.1	20	11.3
6	267	45.4	-21	19.0	203	35.6	266	59.7	-22	6.1	64	10.6	20	11.9
8	297	44.9	-21	18.1	233	40.5	296	57.9	-22	5.2	94	17.1	20	12.5
10	327	44.5	-21	17.2	263	45.5	326	56.1	-22	4.2	124	23.6	20	13.1
12	357	44.0	-21	16.3	293	50.4	356	54.3	-22	3.2	154	30.1	20	13.8
14	27	43.5	-21	15.4	323	55.3	26	52.6	-22	2.2	184	36.7	20	14.4
16	57	43.1	-21	14.5	354	.2	56	50.8	-22	1.2	214	43.2	20	15.0
18	87	42.6	-21	13.6	24	5.2	86	49.0	-22	.3	244	49.7	20	15.7
20	117	42.2	-21	12.7	54	10.1	116	47.3	-21	59.3	274	56.2	20	16.3
22	147	41.7	-21	11.8	84	15.0	146	45.5	-21	58.3	305	2.8	20	16.9
Δ		-2		4				-9		5		33		3

UT	MJESEC						JUPITER				SATURN			
	$S_\leftmoon$		Δ	$\delta_\leftmoon$		Δ	S_4		δ_4		S_η		δ_η	
h	°	′		°	′		°	′	°	′	°	′	°	′
0	192	51.8	111	-24	9.4	50	141	47.9	-12	39.3	288	9.2	0	18.5
2	221	51.9	112	-23	59.4	52	171	51.8	-12	38.9	318	14.1	0	18.5
4	250	52.3	113	-23	49.0	54	201	55.6	-12	38.5	348	19.0	0	18.6
6	279	52.8	114	-23	38.1	56	231	59.5	-12	38.2	18	24.0	0	18.6
8	308	53.6	115	-23	26.9	59	262	3.4	-12	37.8	48	28.9	0	18.6
10	337	54.5	116	-23	15.1	61	292	7.3	-12	37.4	78	33.8	0	18.6
12	6	55.8	117	-23	3.0	63	322	11.1	-12	37.0	108	38.7	0	18.6
14	35	57.2	118	-22	50.4	65	352	15.0	-12	36.6	138	43.7	0	18.7
16	64	58.9	120	-22	37.5	67	22	18.9	-12	36.2	168	48.6	0	18.7
18	94	.8	121	-22	24.1	69	52	22.8	-12	35.8	198	53.5	0	18.7
20	123	3.0	122	-22	10.3	71	82	26.7	-12	35.5	228	58.5	0	18.8
22	152	5.4	123	-21	56.2	73	112	30.5	-12	35.1	259	3.4	0	18.8
Δ								19		2		25		0

φ	SUNCE		TRAJANJE SUMRAKA		MJESEC			
	IZLAZ	ZALAZ	GRAĐ.	ASTR.	IZLAZ	Δ/24	ZALAZ	Δ/24
N	h min	h min	h min	h min	h min	min	h min	min
60	8 49	15 29	0 53	2 38	8 41	.6	14 29	3.5
55	8 17	16 2	0 43	2 13	7 58	1.0	15 11	3.1
50	7 54	16 25	0 37	1 56	7 29	1.2	15 39	2.8
45	7 35	16 43	0 33	1 45	7 7	1.4	16 1	2.6
40	7 20	16 58	0 30	1 36	6 49	1.5	16 18	2.5
35	7 8	17 11	0 28	1 29	6 33	1.6	16 33	2.4
30	6 57	17 22	0 26	1 24	6 20	1.7	16 46	2.3
20	6 38	17 40	0 24	1 18	5 58	1.8	17 7	2.2
10	6 21	17 57	0 22	1 14	5 38	1.9	17 26	2.1
0	6 5	18 13	0 22	1 14	5 20	2.0	17 43	1.9
10	5 50	18 29	0 23	1 16	5 1	2.1	18 0	1.8
20	5 32	18 46	0 24	1 22	4 41	2.2	18 19	1.7
30	5 13	19 5	0 27	1 33	4 19	2.3	18 40	1.6
35	5 1	19 17	0 29	1 43	4 5	2.4	18 52	1.5
40	4 48	19 30	0 32	1 56	3 50	2.5	19 6	1.4
45	4 32	19 46	0 36	2 19	3 31	2.6	19 23	1.2
50	4 12	20 6	0 42	3 15	3 8	2.8	19 43	1.1
55	3 46	20 31	0 52	: ::	2 37	3.0	20 9	.8
60	3 9	21 8	1 16	: ::	1 52	3.4	20 46	.5
S								

SUNCE				MJESEC				
UT	e = Tp − UT	Δ/24	r	Prolaz		Δ/24	$\pi_\leftmoon$	r
h	min s	s	′		h min	min	′	′
00	- 8 52.8	-.9	16.3	$T_{\overline{m}}$	11 31	2.0	54.3	14.8
12	- 9 3.8	$T_{\overline{m}_\odot}$	12 h 9.1 min	Starost 28.5 d		Faza ●		

PLANETE									
Pl.	$T_{\overline{m}}$	π	360−α	Vel.	Pl.	$T_{\overline{m}}$	π	360−α	Vel.
	h min	′	°			h min	′	°	
♀	12 12	.1	64	-3.8	♃	14 31	.0	28	-1.9
♂	1 44	.2	220	-1.1	♄	4 47	.0	175	.8

UT	SUNCE $S_\odot$	SUNCE $\delta_\odot$	PROLJ. TAČKA S_Υ	VENERA S_φ	VENERA δ_φ	MARS S_σ	MARS δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	177 41.3	-21 10.9	114 20.0	176 43.7	-21 57.3	335 9.3	20 17.6
2	207 40.8	-21 10.0	144 24.9	206 42.0	-21 56.2	5 15.8	20 18.2
4	237 40.4	-21 9.1	174 29.8	236 40.2	-21 55.2	35 22.4	20 18.8
6	267 40.0	-21 8.2	204 34.7	266 38.4	-21 54.2	65 28.9	20 19.5
8	297 39.5	-21 7.2	234 39.7	296 36.7	-21 53.2	95 35.5	20 20.1
10	327 39.1	-21 6.3	264 44.6	326 34.9	-21 52.2	125 42.1	20 20.7
12	357 38.6	-21 5.4	294 49.5	356 33.2	-21 51.1	155 48.6	20 21.4
14	27 38.2	-21 4.5	324 54.4	26 31.4	-21 50.1	185 55.2	20 22.0
16	57 37.7	-21 3.5	354 59.4	56 29.6	-21 49.0	216 1.8	20 22.6
18	87 37.3	-21 2.6	25 4.3	86 27.9	-21 48.0	246 8.4	20 23.3
20	117 36.9	-21 1.7	55 9.2	116 26.1	-21 46.9	276 14.9	20 23.9
22	147 36.4	-21 .7	85 14.2	146 24.4	-21 45.9	306 21.5	20 24.5
Δ	-2	5		-9	5	33	3

UT	MJESEC $S_\leftmoon$	MJESEC Δ	MJESEC $\delta_\leftmoon$	MJESEC Δ	JUPITER S_4	JUPITER δ_4	SATURN S_η	SATURN δ_η
h	° ′		° ′		° ′	° ′	° ′	° ′
0	181 8.0	124	-21 41.6	75	142 34.4	-12 34.7	289 8.3	0 18.8
2	210 10.9	126	-21 26.7	76	172 38.3	-12 34.3	319 13.2	0 18.8
4	239 14.0	127	-21 11.4	78	202 42.2	-12 33.9	349 18.2	0 18.9
6	268 17.4	128	-20 55.7	80	232 46.0	-12 33.5	19 23.1	0 18.9
8	297 21.0	129	-20 39.7	82	262 49.9	-12 33.1	49 28.0	0 18.9
10	326 24.9	131	-20 23.4	84	292 53.8	-12 32.8	79 33.0	0 18.9
12	355 29.0	132	-20 6.6	85	322 57.7	-12 32.4	109 37.9	0 19.0
14	24 33.4	133	-19 49.6	87	353 1.5	-12 32.0	139 42.8	0 19.0
16	53 38.0	134	-19 32.2	89	23 5.4	-12 31.6	169 47.8	0 19.0
18	82 42.9	135	-19 14.5	90	53 9.3	-12 31.2	199 52.7	0 19.1
20	111 47.9	137	-18 56.5	92	83 13.2	-12 30.8	229 57.6	0 19.1
22	140 53.3	138	-18 38.1	93	113 17.0	-12 30.4	260 2.6	0 19.1
Δ					19	2	25	0

φ	SUNCE IZLAZ	SUNCE ZALAZ	TRAJANJE SUMRAKA GRAĐ.	TRAJANJE SUMRAKA ASTR.	MJESEC IZLAZ	MJESEC Δ/24	MJESEC ZALAZ	MJESEC Δ/24
N	h min	h min	h min	h min	h min	min	h min	min
60	8 48	15 32	0 53	2 37	8 55	.4	15 52	3.5
55	8 16	16 3	0 43	2 12	8 22	.7	16 24	3.1
50	7 53	16 26	0 37	1 56	7 58	1.0	16 47	2.8
45	7 35	16 44	0 33	1 44	7 39	1.1	17 4	2.7
40	7 20	16 59	0 30	1 36	7 24	1.3	17 19	2.5
35	7 8	17 11	0 28	1 29	7 11	1.4	17 31	2.4
30	6 57	17 22	0 26	1 24	6 60	1.5	17 41	2.3
20	6 38	17 41	0 24	1 17	6 40	1.6	17 60	2.1
10	6 21	17 58	0 22	1 14	6 23	1.8	18 15	2.0
0	6 6	18 13	0 22	1 14	6 7	1.9	18 30	1.8
10	5 50	18 29	0 23	1 16	5 51	2.0	18 44	1.7
20	5 33	18 46	0 24	1 22	5 34	2.2	18 59	1.6
30	5 13	19 5	0 27	1 33	5 15	2.3	19 17	1.4
35	5 2	19 17	0 29	1 42	5 3	2.4	19 27	1.3
40	4 49	19 30	0 32	1 56	4 50	2.5	19 39	1.2
45	4 33	19 45	0 36	2 18	4 34	2.7	19 52	1.0
50	4 13	20 5	0 41	3 11	4 14	2.8	20 9	.9
55	3 48	20 30	0 52	: ::	3 49	3.1	20 30	.6
60	3 11	21 6	1 14	: ::	3 13	3.5	20 58	.3
S								

SUNCE UT	SUNCE $e = T_p - UT$	SUNCE Δ/24	SUNCE r	MJESEC Prolaz	MJESEC Δ/24	MJESEC $\pi_\leftmoon$	MJESEC r
h	min s	s	′	h min	min	′	′
00	- 9 14.7	-.9	16.3	$T_{\overline{m}}$ 12 19	1.8	54.1	14.8
12	- 9 25.3	$T_{\overline{m}_\odot}$ 12 h 9.4 min		Starost 29.5 d	Faza ●		

PLANETE Pl.	$T_{\overline{m}}$	π	360−α	Vel.	Pl.	$T_{\overline{m}}$	π	360−α	Vel.
	h min	′	°			h min	′	°	
♀	12 14	.1	62	-3.8	♃	14 28	.0	28	-1.9
♂	1 39	.2	221	-1.1	♄	4 43	.0	175	.8

UT	SUNCE $S_\odot$	SUNCE $\delta_\odot$	PROLJ. TAČKA S_Υ	VENERA S_φ	VENERA δ_φ	MARS S_σ	MARS δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	177 36.0	-20 59.8	115 19.1	176 22.7	-21 44.8	336 28.1	20 25.2
2	207 35.6	-20 58.8	145 24.0	206 20.9	-21 43.8	6 34.7	20 25.8
4	237 35.1	-20 57.9	175 28.9	236 19.2	-21 42.7	36 41.3	20 26.5
6	267 34.7	-20 56.9	205 33.9	266 17.4	-21 41.6	66 47.9	20 27.1
8	297 34.3	-20 56.0	235 38.8	296 15.7	-21 40.5	96 54.5	20 27.7
10	327 33.8	-20 55.0	265 43.7	326 13.9	-21 39.4	127 1.1	20 28.4
12	357 33.4	-20 54.1	295 48.7	356 12.2	-21 38.4	157 7.8	20 29.0
14	27 33.0	-20 53.1	325 53.6	26 10.5	-21 37.3	187 14.4	20 29.7
16	57 32.6	-20 52.2	355 58.5	56 8.7	-21 36.2	217 21.0	20 30.3
18	87 32.1	-20 51.2	26 3.4	86 7.0	-21 35.1	247 27.6	20 30.9
20	117 31.7	-20 50.2	56 8.4	116 5.3	-21 34.0	277 34.3	20 31.6
22	147 31.3	-20 49.2	86 13.3	146 3.6	-21 32.8	307 40.9	20 32.2
Δ	-2	5		-9	5	33	3

UT	MJESEC $S_\leftmoon$	MJESEC Δ	MJESEC $\delta_\leftmoon$	MJESEC Δ	JUPITER S_4	JUPITER δ_4	SATURN S_η	SATURN δ_η
h	° ′		° ′		° ′	° ′	° ′	° ′
0	169 58.8	139	-18 19.5	95	143 20.9	-12 30.0	290 7.5	0 19.1
2	199 4.6	140	-18 .5	96	173 24.8	-12 29.6	320 12.5	0 19.2
4	228 10.7	141	-17 41.3	98	203 28.6	-12 29.3	350 17.4	0 19.2
6	257 16.9	142	-17 21.8	99	233 32.5	-12 28.9	20 22.3	0 19.2
8	286 23.4	144	-17 2.0	100	263 36.4	-12 28.5	50 27.3	0 19.3
10	315 30.1	145	-16 41.9	102	293 40.3	-12 28.1	80 32.2	0 19.3
12	344 37.0	146	-16 21.6	103	323 44.1	-12 27.7	110 37.2	0 19.3
14	13 44.2	147	-16 1.0	104	353 48.0	-12 27.3	140 42.1	0 19.4
16	42 51.6	148	-15 40.1	105	23 51.9	-12 26.9	170 47.1	0 19.4
18	71 59.1	149	-15 19.1	107	53 55.7	-12 26.5	200 52.0	0 19.4
20	101 6.9	150	-14 57.7	108	83 59.6	-12 26.1	230 56.9	0 19.5
22	130 14.9	151	-14 36.2	109	114 3.5	-12 25.7	261 1.9	0 19.5
Δ					19	2	25	0

φ	SUNCE IZLAZ	SUNCE ZALAZ	TRAJANJE SUMRAKA GRAĐ.	TRAJANJE SUMRAKA ASTR.	MJESEC IZLAZ	MJESEC Δ/24	MJESEC ZALAZ	MJESEC Δ/24
N	h min	h min	h min	h min	h min	min	h min	min
60	8 46	15 34	0 53	2 36	9 4	.2	17 15	3.4
55	8 15	16 5	0 43	2 12	8 39	.6	17 38	3.1
50	7 52	16 28	0 37	1 56	8 21	.8	17 55	2.8
45	7 34	16 46	0 33	1 44	8 6	1.0	18 8	2.6
40	7 20	17 0	0 30	1 35	7 54	1.1	18 19	2.5
35	7 7	17 12	0 27	1 29	7 44	1.2	18 28	2.4
30	6 57	17 23	0 26	1 24	7 35	1.3	18 37	2.2
20	6 38	17 42	0 24	1 17	7 19	1.5	18 50	2.1
10	6 22	17 58	0 22	1 14	7 6	1.6	19 3	1.9
0	6 6	18 13	0 22	1 14	6 53	1.8	19 14	1.8
10	5 51	18 29	0 23	1 16	6 40	1.9	19 25	1.6
20	5 34	18 46	0 24	1 22	6 26	2.1	19 37	1.4
30	5 14	19 5	0 27	1 33	6 10	2.3	19 50	1.3
35	5 3	19 16	0 29	1 42	6 1	2.4	19 58	1.2
40	4 50	19 29	0 31	1 55	5 50	2.5	20 7	1.0
45	4 34	19 45	0 35	2 17	5 38	2.6	20 17	.9
50	4 15	20 4	0 41	3 7	5 22	2.8	20 29	.7
55	3 49	20 29	0 51	: ::	5 3	3.1	20 45	.5
60	3 14	21 4	1 13	: ::	4 36	3.4	21 5	.2
S								

SUNCE UT	SUNCE $e = T_p - UT$	SUNCE Δ/24	SUNCE r	MJESEC Prolaz	MJESEC Δ/24	MJESEC $\pi_\leftmoon$	MJESEC r
h	min s	s	′	h min	min	′	′
00	- 9 35.8	-.9	16.3	$T_{\overline{m}}$ 13 3	1.8	54.0	14.7
12	- 9 46.1	$T_{\overline{m}_\odot}$ 12 h 9.8 min		Starost .7 d	Faza ●		

PLANETE Pl.	$T_{\overline{m}}$	π	360−α	Vel.	Pl.	$T_{\overline{m}}$	π	360−α	Vel.
	h min	′	°			h min	′	°	
♀	12 15	.1	61	-3.8	♃	14 25	.0	28	-1.9
♂	1 34	.2	221	-1.1	♄	4 39	.0	175	.8

UT	SUNCE		PROLJ. TAČKA	VENERA		MARS	
	$S_\odot$	$\delta_\odot$	S_Υ	S_φ	δ_φ	S_σ	δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	177 30.9	-20 48.3	116 18.2	176 1.8	-21 31.7	337 47.6	20 32.9
2	207 30.5	-20 47.3	146 23.2	206 .1	-21 30.6	7 54.2	20 33.5
4	237 30.0	-20 46.3	176 28.1	235 58.4	-21 29.5	38 .9	20 34.2
6	267 29.6	-20 45.3	206 33.0	265 56.7	-21 28.4	68 7.5	20 34.8
8	297 29.2	-20 44.3	236 37.9	295 54.9	-21 27.2	98 14.2	20 35.4
10	327 28.8	-20 43.4	266 42.9	325 53.2	-21 26.1	128 20.8	20 36.1
12	357 28.4	-20 42.4	296 47.8	355 51.5	-21 24.9	158 27.5	20 36.7
14	27 28.0	-20 41.4	326 52.7	25 49.8	-21 23.8	188 34.2	20 37.4
16	57 27.6	-20 40.4	356 57.7	55 48.1	-21 22.6	218 40.8	20 38.0
18	87 27.2	-20 39.4	27 2.6	85 46.4	-21 21.5	248 47.5	20 38.7
20	117 26.7	-20 38.4	57 7.5	115 44.7	-21 20.3	278 54.2	20 39.3
22	147 26.3	-20 37.4	87 12.4	145 43.0	-21 19.2	309 .9	20 40.0
Δ	-2	5		-9	6	33	3

UT	MJESEC				JUPITER		SATURN	
	$S_\leftmoon$	Δ	$\delta_\leftmoon$	Δ	S_4	δ_4	S_η	δ_η
h	° ′		° ′		° ′	° ′	° ′	° ′
0	159 23.0	152	-14 14.4	110	144 7.3	-12 25.4	291 6.8	0 19.5
2	188 31.4	153	-13 52.4	111	174 11.2	-12 25.0	321 11.8	0 19.6
4	217 39.9	154	-13 30.2	112	204 15.1	-12 24.6	351 16.7	0 19.6
6	246 48.7	155	-13 7.7	113	234 18.9	-12 24.2	21 21.7	0 19.6
8	275 57.6	155	-12 45.1	114	264 22.8	-12 23.8	51 26.6	0 19.7
10	305 6.6	156	-12 22.3	115	294 26.7	-12 23.4	81 31.6	0 19.7
12	334 15.9	157	-11 59.3	116	324 30.5	-12 23.0	111 36.5	0 19.7
14	3 25.3	158	-11 36.1	117	354 34.4	-12 22.6	141 41.5	0 19.8
16	32 34.8	158	-11 12.7	118	24 38.3	-12 22.2	171 46.4	0 19.8
18	61 44.5	159	-10 49.2	119	54 42.1	-12 21.8	201 51.4	0 19.8
20	90 54.3	160	-10 25.5	119	84 46.0	-12 21.4	231 56.3	0 19.9
22	120 4.3	161	-10 1.6	120	114 49.9	-12 21.0	262 1.3	0 19.9
Δ					19	2	25	0

φ	SUNCE		TRAJANJE SUMRAKA		MJESEC			
	IZLAZ	ZALAZ	GRAĐ.	ASTR.	IZLAZ	Δ/24	ZALAZ	Δ/24
N	h min	h min	h min	h min	h min	min	h min	min
60	8 45	15 36	0 52	2 36	9 10	.2	18 37	3.3
55	8 14	16 7	0 43	2 12	8 53	.5	18 51	3.0
50	7 51	16 29	0 37	1 56	8 40	.7	19 2	2.8
45	7 34	16 47	0 33	1 44	8 29	.8	19 11	2.6
40	7 19	17 1	0 30	1 35	8 21	1.0	19 19	2.5
35	7 7	17 13	0 27	1 29	8 13	1.1	19 25	2.3
30	6 56	17 24	0 26	1 24	8 7	1.2	19 30	2.2
20	6 38	17 42	0 24	1 17	7 55	1.4	19 40	2.0
10	6 22	17 59	0 22	1 14	7 45	1.6	19 48	1.9
0	6 6	18 14	0 22	1 14	7 36	1.7	19 56	1.7
10	5 51	18 29	0 23	1 16	7 26	1.9	20 4	1.5
20	5 34	18 46	0 24	1 22	7 16	2.0	20 12	1.4
30	5 15	19 5	0 27	1 33	7 5	2.2	20 21	1.2
35	5 4	19 16	0 29	1 42	6 58	2.3	20 26	1.1
40	4 51	19 29	0 31	1 55	6 50	2.5	20 32	1.0
45	4 35	19 44	0 35	2 16	6 41	2.6	20 39	.8
50	4 16	20 3	0 41	3 4	6 30	2.8	20 47	.6
55	3 51	20 28	0 51	: ::	6 17	3.0	20 57	.4
60	3 16	21 3	1 12	: ::	5 58	3.3	21 10	.2
S								

SUNCE				MJESEC			
UT	e = Tp − UT	Δ/24	r	Prolaz	Δ/24	$\pi_\leftmoon$	r
h	min s	s	′	h min	min	′	′
00	- 9 56.3	-.8	16.3	$T_{\overline{m}}$ 13 46	1.7	53.9	14.7
12	-10 6.2	$T_{\overline{m}_\odot}$ 12 h 10.1 min		Starost 1.7 d	Faza ●		

PLANETE								
Pl.	$T_{\overline{m}}$	π	360−α	Vel.	Pl.	$T_{\overline{m}}$	π	360−α	Vel.
	h min	′	°			h min	′	°	
♀	12 17	.1	60	-3.8	♃	14 22	.0	28	-1.9
♂	1 29	.2	221	-1.1	♄	4 35	.0	175	.8

UT	SUNCE		PROLJ. TAČKA	VENERA		MARS	
	$S_\odot$	$\delta_\odot$	S_Υ	S_φ	δ_φ	S_σ	δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	177 25.9	-20 36.4	117 17.4	175 41.3	-21 18.0	339 7.6	20 40.6
2	207 25.5	-20 35.4	147 22.3	205 39.6	-21 16.8	9 14.3	20 41.2
4	237 25.1	-20 34.3	177 27.2	235 37.9	-21 15.6	39 21.0	20 41.9
6	267 24.7	-20 33.3	207 32.2	265 36.2	-21 14.5	69 27.7	20 42.5
8	297 24.3	-20 32.3	237 37.1	295 34.5	-21 13.3	99 34.4	20 43.2
10	327 23.9	-20 31.3	267 42.0	325 32.8	-21 12.1	129 41.1	20 43.8
12	357 23.5	-20 30.3	297 46.9	355 31.1	-21 10.9	159 47.8	20 44.5
14	27 23.1	-20 29.2	327 51.9	25 29.4	-21 9.7	189 54.5	20 45.1
16	57 22.7	-20 28.2	357 56.8	55 27.7	-21 8.5	220 1.2	20 45.8
18	87 22.3	-20 27.2	28 1.7	85 26.0	-21 7.3	250 8.0	20 46.4
20	117 22.0	-20 26.1	58 6.7	115 24.3	-21 6.1	280 14.7	20 47.1
22	147 21.6	-20 25.1	88 11.6	145 22.7	-21 4.8	310 21.4	20 47.7
Δ	-2	5		-8	6	34	3

UT	MJESEC				JUPITER		SATURN	
	$S_\leftmoon$	Δ	$\delta_\leftmoon$	Δ	S_4	δ_4	S_η	δ_η
h	° ′		° ′		° ′	° ′	° ′	° ′
0	149 14.4	161	- 9 37.6	121	144 53.7	-12 20.6	292 6.2	0 20.0
2	178 24.6	162	- 9 13.4	122	174 57.6	-12 20.2	322 11.2	0 20.0
4	207 35.0	162	- 8 49.1	122	205 1.4	-12 19.9	352 16.2	0 20.0
6	236 45.4	163	- 8 24.7	123	235 5.3	-12 19.5	22 21.1	0 20.1
8	265 56.0	163	- 8 .1	123	265 9.2	-12 19.1	52 26.1	0 20.1
10	295 6.6	164	- 7 35.4	124	295 13.0	-12 18.7	82 31.0	0 20.1
12	324 17.4	164	- 7 10.6	125	325 16.9	-12 18.3	112 36.0	0 20.2
14	353 28.2	165	- 6 45.7	125	355 20.8	-12 17.9	142 41.0	0 20.2
16	22 39.1	165	- 6 20.7	126	25 24.6	-12 17.5	172 45.9	0 20.3
18	51 50.1	165	- 5 55.5	126	55 28.5	-12 17.1	202 50.9	0 20.3
20	81 1.1	165	- 5 30.3	127	85 32.3	-12 16.7	232 55.8	0 20.3
22	110 12.2	166	- 5 5.0	127	115 36.2	-12 16.3	263 .8	0 20.4
Δ					19	2	25	0

φ	SUNCE		TRAJANJE SUMRAKA		MJESEC			
	IZLAZ	ZALAZ	GRAĐ.	ASTR.	IZLAZ	Δ/24	ZALAZ	Δ/24
N	h min	h min	h min	h min	h min	min	h min	min
60	8 43	15 38	0 52	2 35	9 14	.1	19 56	3.3
55	8 12	16 9	0 42	2 11	9 4	.4	20 4	3.0
50	7 50	16 31	0 37	1 55	8 56	.6	20 9	2.8
45	7 33	16 48	0 33	1 44	8 50	.8	20 14	2.6
40	7 19	17 2	0 30	1 35	8 45	.9	20 18	2.4
35	7 7	17 14	0 27	1 29	8 40	1.1	20 21	2.3
30	6 56	17 25	0 26	1 24	8 36	1.2	20 24	2.2
20	6 38	17 43	0 23	1 17	8 29	1.4	20 28	2.0
10	6 22	17 59	0 22	1 14	8 23	1.5	20 33	1.8
0	6 7	18 14	0 22	1 13	8 17	1.7	20 37	1.7
10	5 52	18 29	0 23	1 16	8 11	1.8	20 40	1.5
20	5 35	18 46	0 24	1 21	8 5	2.0	20 45	1.3
30	5 16	19 4	0 27	1 32	7 58	2.2	20 49	1.2
35	5 5	19 16	0 29	1 41	7 54	2.3	20 52	1.0
40	4 52	19 28	0 31	1 54	7 49	2.4	20 55	.9
45	4 37	19 44	0 35	2 15	7 44	2.6	20 58	.8
50	4 18	20 2	0 41	3 0	7 37	2.8	21 2	.6
55	3 53	20 27	0 50	: ::	7 29	3.0	21 7	.4
60	3 19	21 1	1 11	: ::	7 19	3.3	21 13	.1
S								

SUNCE				MJESEC			
UT	e = Tp − UT	Δ/24	r	Prolaz	Δ/24	$\pi_\leftmoon$	r
h	min s	s	′	h min	min	′	′
00	-10 16.1	-.8	16.3	$T_{\overline{m}}$ 14 27	1.7	54.0	14.7
12	-10 25.6	$T_{\overline{m}_\odot}$ 12 h 10.4 min		Starost 2.7 d	Faza ●		

PLANETE								
Pl.	$T_{\overline{m}}$	π	360−α	Vel.	Pl.	$T_{\overline{m}}$	π	360−α	Vel.
	h min	′	°			h min	′	°	
♀	12 18	.1	58	-3.8	♃	14 19	.0	28	-1.9
♂	1 23	.2	222	-1.1	♄	4 31	.0	175	.8

UT	SUNCE $S_\odot$	SUNCE $\delta_\odot$	PROLJ. TAČKA S_Υ	VENERA S_φ	VENERA δ_φ	MARS S_σ	MARS δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	177 21.2	-20 24.1	118 16.5	175 21.0	-21 3.6	340 28.2	20 48.3
2	207 20.8	-20 23.0	148 21.4	205 19.3	-21 2.4	10 34.9	20 49.0
4	237 20.4	-20 22.0	178 26.4	235 17.6	-21 1.2	40 41.6	20 49.6
6	267 20.0	-20 20.9	208 31.3	265 15.9	-20 59.9	70 48.4	20 50.3
8	297 19.6	-20 19.9	238 36.2	295 14.3	-20 58.7	100 55.1	20 50.9
10	327 19.2	-20 18.8	268 41.1	325 12.6	-20 57.5	131 1.9	20 51.6
12	357 18.9	-20 17.8	298 46.1	355 10.9	-20 56.2	161 8.6	20 52.2
14	27 18.5	-20 16.7	328 51.0	25 9.3	-20 55.0	191 15.4	20 52.9
16	57 18.1	-20 15.7	358 55.9	55 7.6	-20 53.7	221 22.2	20 53.5
18	87 17.7	-20 14.6	29 .9	85 5.9	-20 52.4	251 28.9	20 54.2
20	117 17.3	-20 13.5	59 5.8	115 4.3	-20 51.2	281 35.7	20 54.8
22	147 17.0	-20 12.5	89 10.7	145 2.6	-20 49.9	311 42.5	20 55.5
Δ	-2	5		-8	6	34	3

UT	MJESEC $S_\leftmoon$	MJESEC Δ	MJESEC $\delta_\leftmoon$	MJESEC Δ	JUPITER S_4	JUPITER δ_4	SATURN S_η	SATURN δ_η
h	° ′		° ′		° ′	° ′	° ′	° ′
0	139 23.3	166	-4 39.6	127	145 40.1	-12 15.9	293 5.8	0 20.4
2	168 34.5	166	-4 14.1	128	175 43.9	-12 15.5	323 10.7	0 20.5
4	197 45.7	166	-3 48.6	128	205 47.8	-12 15.1	353 15.7	0 20.5
6	226 57.0	166	-3 22.9	128	235 51.6	-12 14.7	23 20.7	0 20.6
8	256 8.2	166	-2 57.3	129	265 55.5	-12 14.3	53 25.6	0 20.6
10	285 19.5	166	-2 31.5	129	295 59.4	-12 13.9	83 30.6	0 20.6
12	314 30.7	166	-2 5.7	129	326 3.2	-12 13.5	113 35.6	0 20.7
14	343 42.0	166	-1 39.9	129	356 7.1	-12 13.1	143 40.5	0 20.7
16	12 53.2	166	-1 14.0	130	26 10.9	-12 12.7	173 45.5	0 20.8
18	42 4.5	166	-0 48.1	130	56 14.8	-12 12.3	203 50.5	0 20.8
20	71 15.7	166	-0 22.1	130	86 18.6	-12 11.9	233 55.4	0 20.9
22	100 26.8	166	0 3.9	130	116 22.5	-12 11.5	264 .4	0 20.9
Δ					19	2	25	0

φ	SUNCE IZLAZ	SUNCE ZALAZ	TRAJANJE SUMRAKA GRAĐ.	TRAJANJE SUMRAKA ASTR.	MJESEC IZLAZ	MJESEC Δ/24	MJESEC ZALAZ	MJESEC Δ/24
N	h min	h min	h min	h min	h min	min	h min	min
60	8 41	15 41	0 52	2 35	9 17	.1	21 15	3.3
55	8 11	16 11	0 42	2 11	9 14	.4	21 16	3.0
50	7 49	16 33	0 36	1 55	9 11	.6	21 16	2.8
45	7 32	16 50	0 32	1 44	9 9	.8	21 16	2.6
40	7 18	17 4	0 30	1 35	9 7	.9	21 16	2.5
35	7 6	17 15	0 27	1 29	9 5	1.0	21 16	2.3
30	6 56	17 26	0 26	1 24	9 4	1.2	21 16	2.2
20	6 38	17 44	0 23	1 17	9 1	1.3	21 16	2.0
10	6 22	17 60	0 22	1 14	8 59	1.5	21 17	1.9
0	6 7	18 14	0 22	1 13	8 57	1.7	21 17	1.7
10	5 52	18 29	0 23	1 16	8 55	1.8	21 17	1.5
20	5 36	18 45	0 24	1 21	8 53	2.0	21 17	1.4
30	5 17	19 4	0 26	1 32	8 51	2.2	21 17	1.2
35	5 6	19 15	0 28	1 41	8 49	2.3	21 17	1.1
40	4 53	19 28	0 31	1 54	8 48	2.5	21 17	.9
45	4 38	19 43	0 35	2 14	8 46	2.6	21 17	.8
50	4 19	20 1	0 41	2 57	8 44	2.8	21 17	.6
55	3 55	20 25	0 50	: ::	8 41	3.0	21 17	.4
60	3 21	20 59	1 9	: ::	8 38	3.3	21 17	.1
S								

SUNCE UT	SUNCE $e = T_p - UT$	SUNCE Δ/24	SUNCE r	MJESEC Prolaz	MJESEC Δ/24	MJESEC $\pi_\leftmoon$	MJESEC r
h	min s	s	′	h min	min	′	′
00	-10 35.1	-.8	16.3	$T_{\overline{m}}$ 15 7	1.7	54.1	14.8
12	-10 44.3	$T_{\overline{m}_\odot}$ 12 h 10.7 min		Starost 3.7 d	Faza ◑		

PLANETE

Pl.	$T_{\overline{m}}$	π	360−α	Vel.	Pl.	$T_{\overline{m}}$	π	360−α	Vel.
	h min	′	°			h min	′	°	
♀	12 19	.1	57	-3.8	♃	14 15	.0	27	-1.9
♂	1 18	.2	222	-1.2	♄	4 27	.0	175	.8

UT	SUNCE $S_\odot$	SUNCE $\delta_\odot$	PROLJ. TAČKA S_Υ	VENERA S_φ	VENERA δ_φ	MARS S_σ	MARS δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	177 16.6	-20 11.4	119 15.6	175 1.0	-20 48.6	341 49.3	20 56.1
2	207 16.2	-20 10.3	149 20.6	204 59.3	-20 47.3	11 56.0	20 56.8
4	237 15.9	-20 9.2	179 25.5	234 57.6	-20 46.1	42 2.8	20 57.4
6	267 15.5	-20 8.2	209 30.4	264 56.0	-20 44.8	72 9.6	20 58.0
8	297 15.1	-20 7.1	239 35.4	294 54.3	-20 43.5	102 16.4	20 58.7
10	327 14.7	-20 6.0	269 40.3	324 52.7	-20 42.2	132 23.2	20 59.3
12	357 14.4	-20 4.9	299 45.2	354 51.1	-20 40.9	162 30.0	20 60.0
14	27 14.0	-20 3.8	329 50.1	24 49.4	-20 39.6	192 36.8	21 .6
16	57 13.7	-20 2.7	359 55.1	54 47.8	-20 38.3	222 43.6	21 1.3
18	87 13.3	-20 1.6	30 .0	84 46.1	-20 37.0	252 50.4	21 1.9
20	117 12.9	-20 .5	60 4.9	114 44.5	-20 35.7	282 57.2	21 2.6
22	147 12.6	-19 59.4	90 9.9	144 42.9	-20 34.3	313 4.0	21 3.2
Δ	-2	5		-8	7	34	3

UT	MJESEC $S_\leftmoon$	MJESEC Δ	MJESEC $\delta_\leftmoon$	MJESEC Δ	JUPITER S_4	JUPITER δ_4	SATURN S_η	SATURN δ_η
h	° ′		° ′		° ′	° ′	° ′	° ′
0	129 37.9	165	0 29.9	130	146 26.4	-12 11.1	294 5.4	0 20.9
2	158 49.0	165	0 55.9	130	176 30.2	-12 10.7	324 10.3	0 21.0
4	188 .0	165	1 21.9	130	206 34.1	-12 10.3	354 15.3	0 21.0
6	217 10.9	164	1 47.9	130	236 37.9	-12 9.9	24 20.3	0 21.1
8	246 21.8	164	2 14.0	130	266 41.8	-12 9.5	54 25.3	0 21.1
10	275 32.6	163	2 40.0	130	296 45.6	-12 9.1	84 30.2	0 21.2
12	304 43.2	163	3 6.0	130	326 49.5	-12 8.7	114 35.2	0 21.2
14	333 53.8	162	3 32.0	130	356 53.3	-12 8.3	144 40.2	0 21.3
16	3 4.3	162	3 57.9	130	26 57.2	-12 7.9	174 45.2	0 21.3
18	32 14.6	161	4 23.9	129	57 1.0	-12 7.5	204 50.2	0 21.3
20	61 24.8	160	4 49.8	129	87 4.9	-12 7.1	234 55.1	0 21.4
22	90 34.9	160	5 15.6	129	117 8.7	-12 6.7	265 .1	0 21.4
Δ					19	2	25	0

φ	SUNCE IZLAZ	SUNCE ZALAZ	TRAJANJE SUMRAKA GRAĐ.	TRAJANJE SUMRAKA ASTR.	MJESEC IZLAZ	MJESEC Δ/24	MJESEC ZALAZ	MJESEC Δ/24
N	h min	h min	h min	h min	h min	min	h min	min
60	8 39	15 43	0 51	2 34	9 20	.1	22 35	3.4
55	8 10	16 13	0 42	2 11	9 23	.4	22 28	3.1
50	7 48	16 34	0 36	1 55	9 25	.6	22 23	2.9
45	7 32	16 51	0 32	1 43	9 27	.8	22 19	2.7
40	7 18	17 5	0 29	1 35	9 29	1.0	22 15	2.5
35	7 6	17 16	0 27	1 28	9 30	1.1	22 12	2.4
30	6 56	17 27	0 26	1 23	9 32	1.2	22 10	2.3
20	6 38	17 44	0 23	1 17	9 34	1.4	22 5	2.1
10	6 22	17 60	0 22	1 14	9 36	1.6	22 1	1.9
0	6 7	18 15	0 22	1 13	9 38	1.7	21 57	1.8
10	5 53	18 29	0 22	1 16	9 39	1.9	21 53	1.6
20	5 36	18 45	0 24	1 21	9 42	2.1	21 49	1.4
30	5 18	19 4	0 26	1 32	9 44	2.3	21 45	1.2
35	5 7	19 15	0 28	1 40	9 45	2.4	21 42	1.1
40	4 54	19 27	0 31	1 53	9 47	2.5	21 39	1.0
45	4 39	19 42	0 35	2 13	9 49	2.7	21 36	.8
50	4 21	20 0	0 40	2 55	9 51	2.8	21 31	.7
55	3 57	20 24	0 50	: ::	9 53	3.1	21 26	.4
60	3 24	20 57	1 8	: ::	9 57	3.4	21 20	.2
S								

SUNCE UT	SUNCE $e = T_p - UT$	SUNCE Δ/24	SUNCE r	MJESEC Prolaz	MJESEC Δ/24	MJESEC $\pi_\leftmoon$	MJESEC r
h	min s	s	′	h min	min	′	′
00	-10 53.4	-.7	16.3	$T_{\overline{m}}$ 15 47	1.7	54.4	14.8
12	-11 2.2	$T_{\overline{m}_\odot}$ 12 h 11.0 min		Starost 4.7 d	Faza ◑		

PLANETE

Pl.	$T_{\overline{m}}$	π	360−α	Vel.	Pl.	$T_{\overline{m}}$	π	360−α	Vel.
	h min	′	°			h min	′	°	
♀	12 21	.1	56	-3.8	♃	14 12	.0	27	-1.9
♂	1 12	.2	223	-1.2	♄	4 23	.0	175	.8

UT	SUNCE				PROLJ. TAČKA		VENERA				MARS			
	$S_\odot$		$\delta_\odot$		S_Υ		S_φ		δ_φ		S_σ		δ_σ	
h	°	′	°	′	°	′	°	′	°	′	°	′	°	′
0	177	12.2	-19	58.3	120	14.8	174	41.2	-20	33.0	343	10.8	21	3.9
2	207	11.9	-19	57.2	150	19.7	204	39.6	-20	31.7	13	17.6	21	4.5
4	237	11.5	-19	56.1	180	24.6	234	38.0	-20	30.4	43	24.5	21	5.1
6	267	11.1	-19	55.0	210	29.6	264	36.3	-20	29.0	73	31.3	21	5.8
8	297	10.8	-19	53.9	240	34.5	294	34.7	-20	27.7	103	38.1	21	6.4
10	327	10.4	-19	52.8	270	39.4	324	33.1	-20	26.3	133	44.9	21	7.1
12	357	10.1	-19	51.7	300	44.4	354	31.5	-20	25.0	163	51.8	21	7.7
14	27	9.7	-19	50.5	330	49.3	24	29.8	-20	23.6	193	58.6	21	8.4
16	57	9.4	-19	49.4	0	54.2	54	28.2	-20	22.3	224	5.5	21	9.0
18	87	9.1	-19	48.3	30	59.1	84	26.6	-20	20.9	254	12.3	21	9.6
20	117	8.7	-19	47.2	61	4.1	114	25.0	-20	19.5	284	19.1	21	10.3
22	147	8.4	-19	46.0	91	9.0	144	23.4	-20	18.2	314	26.0	21	10.9
Δ		-2		6				-8		7		34		3

UT	MJESEC						JUPITER				SATURN			
	$S_\leftmoon$		Δ	$\delta_\leftmoon$		Δ	S_4		δ_4		S_η		δ_η	
h	°	′		°	′		°	′	°	′	°	′	°	′
0	119	44.8	159	5	41.4	129	147	12.6	-12	6.3	295	5.1	0	21.5
2	148	54.6	158	6	7.2	128	177	16.4	-12	5.9	325	10.1	0	21.5
4	178	4.2	157	6	32.9	128	207	20.3	-12	5.5	355	15.1	0	21.6
6	207	13.6	156	6	58.5	128	237	24.2	-12	5.1	25	20.0	0	21.6
8	236	22.9	155	7	24.0	127	267	28.0	-12	4.7	55	25.0	0	21.7
10	265	32.0	154	7	49.5	127	297	31.9	-12	4.3	85	30.0	0	21.7
12	294	40.8	153	8	14.9	127	327	35.7	-12	3.9	115	35.0	0	21.8
14	323	49.5	152	8	40.2	126	357	39.6	-12	3.5	145	40.0	0	21.8
16	352	58.0	151	9	5.4	125	27	43.4	-12	3.1	175	45.0	0	21.9
18	22	6.2	150	9	30.5	125	57	47.3	-12	2.7	205	49.9	0	21.9
20	51	14.2	149	9	55.5	124	87	51.1	-12	2.3	235	54.9	0	22.0
22	80	21.9	148	10	20.4	124	117	55.0	-12	1.9	265	59.9	0	22.0
Δ								19		2		25		0

φ	SUNCE		TRAJANJE SUMRAKA		MJESEC			
	IZLAZ	ZALAZ	GRAĐ.	ASTR.	IZLAZ	Δ/24	ZALAZ	Δ/24
N	h min	h min	h min	h min	h min	min	h min	min
60	8 38	15 46	0 51	2 33	9 24	.2	23 57	3.6
55	8 9	16 15	0 42	2 10	9 33	.5	23 43	3.2
50	7 47	16 36	0 36	1 54	9 41	.7	23 32	3.0
45	7 31	16 52	0 32	1 43	9 47	.9	23 24	2.8
40	7 17	17 6	0 29	1 35	9 52	1.0	23 16	2.6
35	7 6	17 17	0 27	1 28	9 56	1.2	23 10	2.5
30	6 55	17 28	0 26	1 23	10 0	1.3	23 5	2.4
20	6 38	17 45	0 23	1 17	10 7	1.5	22 55	2.2
10	6 22	18 0	0 22	1 14	10 13	1.6	22 47	2.0
0	6 8	18 15	0 22	1 13	10 19	1.8	22 39	1.9
10	5 53	18 30	0 22	1 15	10 25	2.0	22 32	1.7
20	5 37	18 45	0 24	1 21	10 31	2.1	22 23	1.5
30	5 19	19 4	0 26	1 32	10 38	2.3	22 14	1.3
35	5 8	19 14	0 28	1 40	10 42	2.5	22 9	1.2
40	4 56	19 27	0 31	1 53	10 47	2.6	22 3	1.1
45	4 41	19 41	0 35	2 12	10 52	2.7	21 56	1.0
50	4 23	19 59	0 40	2 52	10 59	2.9	21 47	.8
55	3 59	20 22	0 49	: ::	11 7	3.2	21 37	.5
60	3 26	20 55	1 7	: ::	11 18	3.5	21 24	.2
S								

SUNCE				MJESEC				
UT	e = Tp − UT	Δ/24	r	Prolaz		Δ/24	$\pi_\leftmoon$	r
h	min s	s	′		h min	min	′	′
00	-11 11.0	-.7	16.3	$T_{\overline{m}}$	16 29	1.8	54.8	14.9
12	-11 19.4	$T_{\overline{m}_\odot}$	12 h 11.3 min	Starost	5.7 d	Faza	◐	

PLANETE									
Pl.	$T_{\overline{m}}$	π	360−α	Vel.	Pl.	$T_{\overline{m}}$	π	360−α	Vel.
	h min	′	°			h min	′	°	
♀	12 22	.1	54	-3.8	♃	14 9	.0	27	-1.9
♂	1 7	.2	223	-1.2	♄	4 19	.0	175	.8

UT	SUNCE				PROLJ. TAČKA		VENERA				MARS			
	$S_\odot$		$\delta_\odot$		S_Υ		S_φ		δ_φ		S_σ		δ_σ	
h	°	′	°	′	°	′	°	′	°	′	°	′	°	′
0	177	8.0	-19	44.9	121	13.9	174	21.8	-20	16.8	344	32.8	21	11.6
2	207	7.7	-19	43.8	151	18.9	204	20.2	-20	15.4	14	39.7	21	12.2
4	237	7.3	-19	42.6	181	23.8	234	18.6	-20	14.0	44	46.5	21	12.9
6	267	7.0	-19	41.5	211	28.7	264	17.0	-20	12.6	74	53.4	21	13.5
8	297	6.7	-19	40.3	241	33.6	294	15.4	-20	11.3	105	.3	21	14.1
10	327	6.3	-19	39.2	271	38.6	324	13.8	-20	9.9	135	7.1	21	14.8
12	357	6.0	-19	38.0	301	43.5	354	12.2	-20	8.5	165	14.0	21	15.4
14	27	5.7	-19	36.9	331	48.4	24	10.6	-20	7.1	195	20.9	21	16.0
16	57	5.3	-19	35.7	1	53.3	54	9.0	-20	5.6	225	27.7	21	16.7
18	87	5.0	-19	34.6	31	58.3	84	7.4	-20	4.2	255	34.6	21	17.3
20	117	4.7	-19	33.4	62	3.2	114	5.8	-20	2.8	285	41.5	21	18.0
22	147	4.3	-19	32.3	92	8.1	144	4.2	-20	1.4	315	48.4	21	18.6
Δ		-2		6				-8		7		34		3

UT	MJESEC						JUPITER				SATURN			
	$S_\leftmoon$		Δ	$\delta_\leftmoon$		Δ	S_4		δ_4		S_η		δ_η	
h	°	′		°	′		°	′	°	′	°	′	°	′
0	109	29.4	146	10	45.1	123	147	58.8	-12	1.5	296	4.9	0	22.1
2	138	36.7	145	11	9.7	122	178	2.6	-12	1.1	326	9.9	0	22.1
4	167	43.6	143	11	34.2	122	208	6.5	-12	.7	356	14.9	0	22.2
6	196	50.3	142	11	58.5	121	238	10.3	-12	.3	26	19.9	0	22.2
8	225	56.8	141	12	22.7	120	268	14.2	-11	59.9	56	24.9	0	22.3
10	255	2.9	139	12	46.7	119	298	18.0	-11	59.5	86	29.9	0	22.3
12	284	8.7	138	13	10.5	118	328	21.9	-11	59.1	116	34.8	0	22.4
14	313	14.2	136	13	34.2	117	358	25.7	-11	58.7	146	39.8	0	22.5
16	342	19.4	134	13	57.6	116	28	29.6	-11	58.3	176	44.8	0	22.5
18	11	24.2	133	14	20.9	115	58	33.4	-11	57.9	206	49.8	0	22.6
20	40	28.8	131	14	44.0	114	88	37.3	-11	57.5	236	54.8	0	22.6
22	69	32.9	129	15	6.8	113	118	41.1	-11	57.1	266	59.8	0	22.7
Δ								19		2		25		0

φ	SUNCE		TRAJANJE SUMRAKA		MJESEC			
	IZLAZ	ZALAZ	GRAĐ.	ASTR.	IZLAZ	Δ/24	ZALAZ	Δ/24
N	h min	h min	h min	h min	h min	min	h min	min
60	8 36	15 48	0 51	2 33	9 28	.3	. . .	.0
55	8 7	16 17	0 42	2 10	9 45	.6	. . .	.0
50	7 46	16 37	0 36	1 54	9 58	.9	. . .	.0
45	7 30	16 54	0 32	1 43	10 8	1.0	. . .	.0
40	7 17	17 7	0 29	1 35	10 17	1.2	. . .	.0
35	7 5	17 18	0 27	1 28	10 24	1.3	. . .	.0
30	6 55	17 28	0 26	1 23	10 31	1.4	. . .	.0
20	6 38	17 46	0 23	1 17	10 42	1.6	23 48	2.3
10	6 22	18 1	0 22	1 14	10 53	1.8	23 35	2.2
0	6 8	18 15	0 22	1 13	11 2	1.9	23 24	2.0
10	5 53	18 30	0 22	1 15	11 12	2.1	23 13	1.9
20	5 38	18 45	0 24	1 21	11 22	2.3	23 0	1.7
30	5 20	19 3	0 26	1 31	11 34	2.5	22 46	1.5
35	5 9	19 14	0 28	1 40	11 41	2.6	22 38	1.4
40	4 57	19 26	0 31	1 52	11 49	2.7	22 29	1.3
45	4 42	19 40	0 35	2 11	11 58	2.9	22 19	1.2
50	4 24	19 58	0 40	2 49	12 9	3.1	22 6	1.0
55	4 1	20 21	0 49	: ::	12 24	3.3	21 50	.7
60	3 29	20 53	1 6	: ::	12 42	3.7	21 29	.3
S								

SUNCE				MJESEC				
UT	e = Tp − UT	Δ/24	r	Prolaz		Δ/24	$\pi_\leftmoon$	r
h	min s	s	′		h min	min	′	′
00	-11 27.7	-.7	16.3	$T_{\overline{m}}$	17 13	2.0	55.4	15.1
12	-11 35.7	$T_{\overline{m}_\odot}$	12 h 11.6 min	Starost	6.7 d	Faza	◐	

PLANETE									
Pl.	$T_{\overline{m}}$	π	360−α	Vel.	Pl.	$T_{\overline{m}}$	π	360−α	Vel.
	h min	′	°			h min	′	°	
♀	12 23	.1	53	-3.8	♃	14 6	.0	27	-1.9
♂	1 2	.2	223	-1.2	♄	4 15	.0	175	.8

UT	SUNCE $S_\odot$	SUNCE $\delta_\odot$	PROLJ. TAČKA S_Υ	VENERA S_φ	VENERA δ_φ	MARS S_σ	MARS δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	177 4.0	-19 31.1	122 13.1	174 2.6	-19 60.0	345 55.2	21 19.2
2	207 3.7	-19 29.9	152 18.0	204 1.0	-19 58.5	16 2.1	21 19.9
4	237 3.4	-19 28.8	182 22.9	233 59.5	-19 57.1	46 9.0	21 20.5
6	267 3.1	-19 27.6	212 27.8	263 57.9	-19 55.7	76 15.9	21 21.1
8	297 2.7	-19 26.4	242 32.8	293 56.3	-19 54.2	106 22.8	21 21.8
10	327 2.4	-19 25.2	272 37.7	323 54.7	-19 52.8	136 29.7	21 22.4
12	357 2.1	-19 24.1	302 42.6	353 53.1	-19 51.4	166 36.6	21 23.1
14	27 1.8	-19 22.9	332 47.6	23 51.6	-19 49.9	196 43.5	21 23.7
16	57 1.5	-19 21.7	2 52.5	53 50.0	-19 48.4	226 50.4	21 24.3
18	87 1.2	-19 20.5	32 57.4	83 48.4	-19 47.0	256 57.3	21 24.9
20	117 .8	-19 19.3	63 2.3	113 46.9	-19 45.5	287 4.2	21 25.6
22	147 .5	-19 18.1	93 7.3	143 45.3	-19 44.0	317 11.1	21 26.2
Δ	-2	6		-8	7	34	3

UT	MJESEC $S_\leftmoon$	MJESEC Δ	MJESEC $\delta_\leftmoon$	MJESEC Δ	JUPITER S_4	JUPITER δ_4	SATURN S_η	SATURN δ_η
h	° ′		° ′		° ′	° ′	° ′	° ′
0	98 36.8	127	15 29.4	112	148 45.0	-11 56.7	297 4.8	0 22.7
2	127 40.2	125	15 51.8	111	178 48.8	-11 56.3	327 9.8	0 22.8
4	156 43.3	124	16 14.0	110	208 52.7	-11 55.9	357 14.8	0 22.8
6	185 46.0	122	16 35.9	108	238 56.5	-11 55.5	27 19.8	0 22.9
8	214 48.4	120	16 57.6	107	269 .3	-11 55.1	57 24.8	0 22.9
10	243 50.3	118	17 18.9	106	299 4.2	-11 54.6	87 29.8	0 23.0
12	272 51.9	116	17 40.1	104	329 8.0	-11 54.2	117 34.8	0 23.1
14	301 53.0	114	18 .9	103	359 11.9	-11 53.8	147 39.8	0 23.1
16	330 53.8	112	18 21.4	101	29 15.7	-11 53.4	177 44.8	0 23.2
18	359 54.1	110	18 41.6	99	59 19.6	-11 53.0	207 49.8	0 23.2
20	28 54.0	107	19 1.5	98	89 23.4	-11 52.6	237 54.8	0 23.3
22	57 53.5	105	19 21.0	96	119 27.2	-11 52.2	267 59.8	0 23.3
Δ					19	2	25	0

φ	SUNCE IZLAZ	SUNCE ZALAZ	TRAJANJE SUMRAKA GRAĐ.	TRAJANJE SUMRAKA ASTR.	MJESEC IZLAZ	MJESEC Δ/24	MJESEC ZALAZ	MJESEC Δ/24
N	h min	h min	h min	h min	h min	min	h min	min
60	8 34	15 51	0 50	2 32	9 35	.5	1 25	3.8
55	8 6	16 18	0 42	2 9	9 60	.9	1 1	3.4
50	7 45	16 39	0 36	1 54	10 19	1.1	0 44	3.1
45	7 29	16 55	0 32	1 43	10 33	1.3	0 31	2.9
40	7 16	17 8	0 29	1 34	10 46	1.4	0 20	2.7
35	7 5	17 19	0 27	1 28	10 56	1.6	0 10	2.6
30	6 55	17 29	0 25	1 23	11 5	1.7	0 2	2.5
20	6 38	17 46	0 23	1 17	11 21	1.8	. . .	.0
10	6 22	18 1	0 22	1 13	11 35	2.0	. . .	.0
0	6 8	18 15	0 22	1 13	11 49	2.1	. . .	.0
10	5 54	18 30	0 22	1 15	12 2	2.3	23 57	2.1
20	5 38	18 45	0 24	1 21	12 16	2.4	23 42	2.0
30	5 21	19 3	0 26	1 31	12 33	2.6	23 23	1.8
35	5 10	19 13	0 28	1 39	12 42	2.7	23 13	1.7
40	4 58	19 25	0 31	1 51	12 54	2.8	23 1	1.6
45	4 44	19 39	0 34	2 10	13 7	2.9	22 46	1.5
50	4 26	19 57	0 40	2 47	13 23	3.1	22 29	1.3
55	4 3	20 19	0 48	: ::	13 43	3.4	22 7	1.0
60	3 32	20 50	1 5	: ::	14 11	3.9	21 37	.6
S								

SUNCE UT	SUNCE $e = T_p - UT$	SUNCE Δ/24	SUNCE r	MJESEC Prolaz	MJESEC Δ/24	MJESEC $\pi_\leftmoon$	MJESEC r
h	min s	s	′	h min	min	′	′
00	-11 43.7	-.6	16.3	$T_{\overline{m}}$ 18 0	2.2	56.1	15.3
12	-11 51.3	$T_{\overline{m}_\odot}$ 12 h 11.9 min		Starost 7.7 d	Faza ◐		

PLANETE

Pl.	$T_{\overline{m}}$	π	360−α	Vel.	Pl.	$T_{\overline{m}}$	π	360−α	Vel.
	h min	′	°			h min	′	°	
♀	12 24	.1	52	-3.8	♃	14 3	.0	27	-1.9
♂	0 56	.2	224	-1.2	♄	4 11	.0	175	.8

UT	SUNCE $S_\odot$	SUNCE $\delta_\odot$	PROLJ. TAČKA S_Υ	VENERA S_φ	VENERA δ_φ	MARS S_σ	MARS δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	177 .2	-19 16.9	123 12.2	173 43.8	-19 42.6	347 18.0	21 26.8
2	206 59.9	-19 15.8	153 17.1	203 42.2	-19 41.1	17 24.9	21 27.5
4	236 59.6	-19 14.6	183 22.1	233 40.6	-19 39.6	47 31.8	21 28.1
6	266 59.3	-19 13.4	213 27.0	263 39.1	-19 38.1	77 38.7	21 28.7
8	296 59.0	-19 12.1	243 31.9	293 37.5	-19 36.6	107 45.7	21 29.4
10	326 58.7	-19 10.9	273 36.8	323 36.0	-19 35.2	137 52.6	21 30.0
12	356 58.4	-19 9.7	303 41.8	353 34.4	-19 33.7	167 59.5	21 30.6
14	26 58.1	-19 8.5	333 46.7	23 32.9	-19 32.2	198 6.4	21 31.2
16	56 57.8	-19 7.3	3 51.6	53 31.4	-19 30.7	228 13.3	21 31.9
18	86 57.5	-19 6.1	33 56.6	83 29.8	-19 29.2	258 20.3	21 32.5
20	116 57.2	-19 4.9	64 1.5	113 28.3	-19 27.6	288 27.2	21 33.1
22	146 56.9	-19 3.7	94 6.4	143 26.7	-19 26.1	318 34.1	21 33.7
Δ	-1	6		-8	7	35	3

UT	MJESEC $S_\leftmoon$	MJESEC Δ	MJESEC $\delta_\leftmoon$	MJESEC Δ	JUPITER S_4	JUPITER δ_4	SATURN S_η	SATURN δ_η
h	° ′		° ′		° ′	° ′	° ′	° ′
0	86 52.6	103	19 40.3	94	149 31.1	-11 51.8	298 4.8	0 23.4
2	115 51.2	101	19 59.1	93	179 34.9	-11 51.4	328 9.8	0 23.5
4	144 49.4	99	20 17.6	91	209 38.8	-11 51.0	358 14.8	0 23.5
6	173 47.1	96	20 35.7	89	239 42.6	-11 50.6	28 19.8	0 23.6
8	202 44.4	94	20 53.5	87	269 46.4	-11 50.2	58 24.8	0 23.6
10	231 41.2	92	21 10.8	85	299 50.3	-11 49.8	88 29.9	0 23.7
12	260 37.6	90	21 27.7	83	329 54.1	-11 49.4	118 34.9	0 23.8
14	289 33.5	87	21 44.2	80	359 58.0	-11 48.9	148 39.9	0 23.8
16	318 29.0	85	22 .3	78	30 1.8	-11 48.5	178 44.9	0 23.9
18	347 24.1	83	22 15.9	76	60 5.6	-11 48.1	208 49.9	0 23.9
20	16 18.6	81	22 31.1	74	90 9.5	-11 47.7	238 54.9	0 24.0
22	45 12.7	78	22 45.8	71	120 13.3	-11 47.3	268 59.9	0 24.1
Δ					19	2	25	0

φ	SUNCE IZLAZ	SUNCE ZALAZ	TRAJANJE SUMRAKA GRAĐ.	TRAJANJE SUMRAKA ASTR.	MJESEC IZLAZ	MJESEC Δ/24	MJESEC ZALAZ	MJESEC Δ/24
N	h min	h min	h min	h min	h min	min	h min	min
60	8 32	15 53	0 50	2 31	9 46	.8	2 55	3.8
55	8 4	16 20	0 41	2 9	10 20	1.2	2 22	3.4
50	7 44	16 41	0 36	1 54	10 45	1.5	1 58	3.1
45	7 28	16 56	0 32	1 43	11 4	1.7	1 40	3.0
40	7 15	17 9	0 29	1 34	11 20	1.8	1 25	2.8
35	7 4	17 20	0 27	1 28	11 34	1.9	1 13	2.7
30	6 54	17 30	0 25	1 23	11 45	2.0	1 2	2.6
20	6 37	17 47	0 23	1 17	12 5	2.1	0 44	2.5
10	6 23	18 2	0 22	1 13	12 23	2.2	0 27	2.3
0	6 9	18 16	0 22	1 13	12 39	2.3	0 12	2.2
10	5 54	18 30	0 22	1 15	12 56	2.4	. . .	.0
20	5 39	18 45	0 24	1 20	13 14	2.5	. . .	.0
30	5 21	19 2	0 26	1 31	13 35	2.7	. . .	.0
35	5 11	19 13	0 28	1 39	13 47	2.7	23 53	2.1
40	4 59	19 25	0 31	1 51	14 1	2.8	23 39	2.0
45	4 45	19 38	0 34	2 9	14 17	3.0	23 21	1.9
50	4 28	19 56	0 40	2 44	14 38	3.1	22 59	1.7
55	4 5	20 18	0 48	: ::	15 5	3.4	22 31	1.5
60	3 34	20 48	1 4	: ::	15 44	3.8	21 51	1.1
S								

SUNCE UT	SUNCE $e = T_p - UT$	SUNCE Δ/24	SUNCE r	MJESEC Prolaz	MJESEC Δ/24	MJESEC $\pi_\leftmoon$	MJESEC r
h	min s	s	′	h min	min	′	′
00	-11 58.9	-.6	16.3	$T_{\overline{m}}$ 18 52	2.4	56.9	15.5
12	-12 6.1	$T_{\overline{m}_\odot}$ 12 h 12.1 min		Starost 8.7 d	Faza ◐		

PLANETE

Pl.	$T_{\overline{m}}$	π	360−α	Vel.	Pl.	$T_{\overline{m}}$	π	360−α	Vel.
	h min	′	°			h min	′	°	
♀	12 26	.1	51	-3.8	♃	14 0	.0	26	-1.9
♂	0 51	.2	224	-1.2	♄	4 7	.0	175	.8

UT	SUNCE $S_\odot$	SUNCE $\delta_\odot$	PROLJ. TAČKA S_Υ	VENERA S_φ	VENERA δ_φ	MARS S_σ	MARS δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	176 56.6	-19 2.4	124 11.3	173 25.2	-19 24.6	348 41.1	21 34.4
2	206 56.3	-19 1.2	154 16.3	203 23.7	-19 23.1	18 48.0	21 35.0
4	236 56.0	-19 .0	184 21.2	233 22.1	-19 21.6	48 54.9	21 35.6
6	266 55.8	-18 58.8	214 26.1	263 20.6	-19 20.0	79 1.9	21 36.2
8	296 55.5	-18 57.5	244 31.1	293 19.1	-19 18.5	109 8.8	21 36.9
10	326 55.2	-18 56.3	274 36.0	323 17.6	-19 16.9	139 15.7	21 37.5
12	356 54.9	-18 55.1	304 40.9	353 16.0	-19 15.4	169 22.7	21 38.1
14	26 54.6	-18 53.8	334 45.8	23 14.5	-19 13.9	199 29.6	21 38.7
16	56 54.3	-18 52.6	4 50.8	53 13.0	-19 12.3	229 36.6	21 39.3
18	86 54.1	-18 51.3	34 55.7	83 11.5	-19 10.8	259 43.5	21 40.0
20	116 53.8	-18 50.1	65 .6	113 10.0	-19 9.2	289 50.5	21 40.6
22	146 53.5	-18 48.8	95 5.6	143 8.5	-19 7.6	319 57.4	21 41.2
Δ	-1	6		-8	8	35	3

UT	MJESEC $S_\leftmoon$	MJESEC Δ	MJESEC $\delta_\leftmoon$	MJESEC Δ	JUPITER S_4	JUPITER δ_4	SATURN S_η	SATURN δ_η
h	° ′		° ′		° ′	° ′	° ′	° ′
0	74 6.4	76	23 .0	69	150 17.2	-11 46.9	299 4.9	0 24.1
2	102 59.6	74	23 13.8	66	180 21.0	-11 46.5	329 9.9	0 24.2
4	131 52.4	72	23 27.0	64	210 24.8	-11 46.1	359 15.0	0 24.2
6	160 44.7	69	23 39.7	61	240 28.7	-11 45.7	29 20.0	0 24.3
8	189 36.6	67	23 51.8	58	270 32.5	-11 45.3	59 25.0	0 24.4
10	218 28.0	65	24 3.4	55	300 36.4	-11 44.9	89 30.0	0 24.4
12	247 19.0	63	24 14.5	53	330 40.2	-11 44.4	119 35.0	0 24.5
14	276 9.6	61	24 25.0	50	0 44.0	-11 44.0	149 40.0	0 24.6
16	304 59.7	59	24 34.9	47	30 47.9	-11 43.6	179 45.0	0 24.6
18	333 49.5	57	24 44.3	44	60 51.7	-11 43.2	209 50.1	0 24.7
20	2 38.8	55	24 53.0	41	90 55.5	-11 42.8	239 55.1	0 24.7
22	31 27.8	53	25 1.1	37	120 59.4	-11 42.4	270 .1	0 24.8
Δ					19	2	25	0

φ	SUNCE IZLAZ	SUNCE ZALAZ	TRAJANJE SUMRAKA GRAĐ.	TRAJANJE SUMRAKA ASTR.	MJESEC IZLAZ	MJESEC Δ/24	MJESEC ZALAZ	MJESEC Δ/24
N	h min	h min	h min	h min	h min	min	h min	min
60	8 30	15 56	0 50	2 31	10 6	1.5	4 27	3.6
55	8 3	16 22	0 41	2 9	10 50	1.9	3 44	3.2
50	7 43	16 42	0 36	1 53	11 21	2.0	3 14	3.0
45	7 27	16 58	0 32	1 42	11 44	2.1	2 51	2.9
40	7 15	17 11	0 29	1 34	12 3	2.2	2 33	2.8
35	7 4	17 21	0 27	1 28	12 19	2.3	2 18	2.7
30	6 54	17 31	0 25	1 23	12 32	2.3	2 5	2.7
20	6 37	17 48	0 23	1 16	12 56	2.4	1 43	2.6
10	6 23	18 2	0 22	1 13	13 16	2.4	1 23	2.5
0	6 9	18 16	0 22	1 13	13 35	2.5	1 5	2.4
10	5 55	18 30	0 22	1 15	13 54	2.6	0 47	2.3
20	5 40	18 45	0 24	1 20	14 15	2.6	0 28	2.2
30	5 22	19 2	0 26	1 30	14 38	2.7	0 6	2.1
35	5 12	19 12	0 28	1 39	14 53	2.7	. . .	.0
40	5 0	19 24	0 31	1 50	15 9	2.8	. . .	.0
45	4 46	19 38	0 34	2 8	15 28	2.8	. . .	.0
50	4 29	19 54	0 39	2 42	15 53	2.9	23 41	2.4
55	4 7	20 16	0 47	: ::	16 26	3.0	23 7	2.3
60	3 37	20 46	1 3	: ::	17 16	3.2	22 17	2.1
S								

SUNCE UT	SUNCE $e = T_p - UT$	SUNCE Δ/24	SUNCE r	MJESEC Prolaz	MJESEC Δ/24	MJESEC $\pi_\leftmoon$	MJESEC r
h	min s	s	′	h min	min	′	′
00	-12 13.3	-.6	16.3	$T_{\overline{m}}$ 19 49	2.5	57.8	15.8
12	-12 20.1	$T_{\overline{m}_\odot}$ 12 h 12.3 min		Starost 9.7 d	Faza ◐		

PLANETE

Pl.	$T_{\overline{m}}$	π	360−α	Vel.	Pl.	$T_{\overline{m}}$	π	360−α	Vel.
	h min	′	°			h min	′	°	
♀	12 27	.1	49	-3.8	♃	13 57	.0	26	-1.9
♂	0 45	.2	224	-1.2	♄	4 3	.0	175	.8

UT	SUNCE $S_\odot$	SUNCE $\delta_\odot$	PROLJ. TAČKA S_Υ	VENERA S_φ	VENERA δ_φ	MARS S_σ	MARS δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	176 53.2	-18 47.6	125 10.5	173 7.0	-19 6.1	350 4.4	21 41.8
2	206 53.0	-18 46.3	155 15.4	203 5.5	-19 4.5	20 11.3	21 42.4
4	236 52.7	-18 45.1	185 20.3	233 4.0	-19 2.9	50 18.3	21 43.0
6	266 52.4	-18 43.8	215 25.3	263 2.5	-19 1.3	80 25.2	21 43.6
8	296 52.1	-18 42.6	245 30.2	293 1.0	-18 59.8	110 32.2	21 44.2
10	326 51.9	-18 41.3	275 35.1	322 59.5	-18 58.2	140 39.2	21 44.9
12	356 51.6	-18 40.0	305 40.0	352 58.0	-18 56.6	170 46.1	21 45.5
14	26 51.3	-18 38.8	335 45.0	22 56.5	-18 55.0	200 53.1	21 46.1
16	56 51.1	-18 37.5	5 49.9	52 55.0	-18 53.4	231 .0	21 46.7
18	86 50.8	-18 36.2	35 54.8	82 53.5	-18 51.8	261 7.0	21 47.3
20	116 50.5	-18 34.9	65 59.8	112 52.0	-18 50.2	291 14.0	21 47.9
22	146 50.3	-18 33.7	96 4.7	142 50.5	-18 48.6	321 20.9	21 48.5
Δ	-1	6		-7	8	35	3

UT	MJESEC $S_\leftmoon$	MJESEC Δ	MJESEC $\delta_\leftmoon$	MJESEC Δ	JUPITER S_4	JUPITER δ_4	SATURN S_η	SATURN δ_η
h	° ′		° ′		° ′	° ′	° ′	° ′
0	60 16.4	51	25 8.6	34	151 3.2	-11 42.0	300 5.1	0 24.9
2	89 4.6	49	25 15.5	31	181 7.0	-11 41.6	330 10.1	0 24.9
4	117 52.4	47	25 21.7	28	211 10.9	-11 41.2	0 15.2	0 25.0
6	146 39.9	46	25 27.2	25	241 14.7	-11 40.8	30 20.2	0 25.1
8	175 27.1	44	25 32.1	21	271 18.5	-11 40.3	60 25.2	0 25.1
10	204 13.9	43	25 36.3	18	301 22.4	-11 39.9	90 30.2	0 25.2
12	233 .4	41	25 39.9	14	331 26.2	-11 39.5	120 35.3	0 25.3
14	261 46.7	40	25 42.7	11	1 30.0	-11 39.1	150 40.3	0 25.3
16	290 32.6	39	25 44.9	7	31 33.9	-11 38.7	180 45.3	0 25.4
18	319 18.3	37	25 46.3	4	61 37.7	-11 38.3	210 50.3	0 25.5
20	348 3.8	36	25 47.0	0	91 41.5	-11 37.9	240 55.4	0 25.5
22	16 49.0	35	25 47.0	-4	121 45.4	-11 37.5	271 .4	0 25.6
Δ					19	2	25	0

φ	SUNCE IZLAZ	SUNCE ZALAZ	TRAJANJE SUMRAKA GRAĐ.	TRAJANJE SUMRAKA ASTR.	MJESEC IZLAZ	MJESEC Δ/24	MJESEC ZALAZ	MJESEC Δ/24
N	h min	h min	h min	h min	h min	min	h min	min
60	8 28	15 58	0 49	2 30	10 42	2.7	5 53	2.7
55	8 1	16 24	0 41	2 8	11 35	2.7	5 0	2.7
50	7 42	16 44	0 36	1 53	12 10	2.7	4 26	2.7
45	7 26	16 59	0 32	1 42	12 36	2.7	4 1	2.7
40	7 14	17 12	0 29	1 34	12 56	2.7	3 40	2.6
35	7 3	17 22	0 27	1 28	13 13	2.7	3 24	2.6
30	6 54	17 32	0 25	1 23	13 28	2.7	3 9	2.6
20	6 37	17 48	0 23	1 16	13 53	2.6	2 44	2.6
10	6 23	18 3	0 22	1 13	14 15	2.6	2 23	2.6
0	6 9	18 16	0 22	1 13	14 35	2.6	2 3	2.6
10	5 55	18 30	0 22	1 15	14 55	2.6	1 43	2.5
20	5 40	18 45	0 24	1 20	15 17	2.6	1 22	2.5
30	5 23	19 2	0 26	1 30	15 43	2.6	0 57	2.5
35	5 13	19 12	0 28	1 38	15 58	2.5	0 43	2.5
40	5 2	19 23	0 31	1 50	16 15	2.5	0 26	2.4
45	4 48	19 37	0 34	2 7	16 36	2.5	0 6	2.4
50	4 31	19 53	0 39	2 40	17 2	2.4	. . .	.0
55	4 9	20 14	0 47	: ::	17 38	2.3	. . .	.0
60	3 40	20 44	1 2	: ::	18 34	2.1	23 6	3.4
S								

SUNCE UT	SUNCE $e = T_p - UT$	SUNCE Δ/24	SUNCE r	MJESEC Prolaz	MJESEC Δ/24	MJESEC $\pi_\leftmoon$	MJESEC r
h	min s	s	′	h min	min	′	′
00	-12 26.9	-.5	16.3	$T_{\overline{m}}$ 20 50	2.6	58.8	16.0
12	-12 33.3	$T_{\overline{m}_\odot}$ 12 h 12.6 min		Starost 10.7 d	Faza ◐		

PLANETE

Pl.	$T_{\overline{m}}$	π	360−α	Vel.	Pl.	$T_{\overline{m}}$	π	360−α	Vel.
	h min	′	°			h min	′	°	
♀	12 28	.1	48	-3.8	♃	13 54	.0	26	-1.9
♂	0 40	.2	225	-1.3	♄	3 59	.0	175	.8

UT	SUNCE $S_\odot$	SUNCE $\delta_\odot$	PROLJ. TAČKA S_Υ	VENERA S_φ	VENERA δ_φ	MARS S_σ	MARS δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	176 50.0	-18 32.4	126 9.6	172 49.0	-18 47.0	351 27.9	21 49.1
2	206 49.8	-18 31.1	156 14.5	202 47.6	-18 45.4	21 34.9	21 49.7
4	236 49.5	-18 29.8	186 19.5	232 46.1	-18 43.7	51 41.9	21 50.3
6	266 49.3	-18 28.5	216 24.4	262 44.6	-18 42.1	81 48.8	21 50.9
8	296 49.0	-18 27.2	246 29.3	292 43.1	-18 40.5	111 55.8	21 51.5
10	326 48.8	-18 25.9	276 34.3	322 41.7	-18 38.9	142 2.8	21 52.1
12	356 48.5	-18 24.7	306 39.2	352 40.2	-18 37.2	172 9.7	21 52.7
14	26 48.3	-18 23.4	336 44.1	22 38.7	-18 35.6	202 16.7	21 53.3
16	56 48.0	-18 22.1	6 49.0	52 37.3	-18 34.0	232 23.7	21 53.9
18	86 47.8	-18 20.8	36 54.0	82 35.8	-18 32.3	262 30.7	21 54.5
20	116 47.5	-18 19.5	66 58.9	112 34.3	-18 30.7	292 37.7	21 55.1
22	146 47.3	-18 18.2	97 3.8	142 32.9	-18 29.0	322 44.6	21 55.7
Δ	-1	6		-7	8	35	3

UT	MJESEC $S_\leftmoon$	MJESEC Δ	MJESEC $\delta_\leftmoon$	MJESEC Δ	JUPITER S_4	JUPITER δ_4	SATURN S_η	SATURN δ_η
h	° ′		° ′		° ′	° ′	° ′	° ′
0	45 34.1	34	25 46.3	-7	151 49.2	-11 37.0	301 5.4	0 25.7
2	74 18.9	33	25 44.9	-11	181 53.0	-11 36.6	331 10.5	0 25.7
4	103 3.6	33	25 42.7	-15	211 56.9	-11 36.2	1 15.5	0 25.8
6	131 48.1	32	25 39.8	-18	242 .7	-11 35.8	31 20.5	0 25.9
8	160 32.5	31	25 36.1	-22	272 4.5	-11 35.4	61 25.5	0 25.9
10	189 16.7	31	25 31.7	-26	302 8.4	-11 35.0	91 30.6	0 26.0
12	218 .9	31	25 26.5	-30	332 12.2	-11 34.6	121 35.6	0 26.1
14	246 45.0	30	25 20.6	-33	2 16.0	-11 34.1	151 40.6	0 26.1
16	275 29.1	30	25 13.9	-37	32 19.9	-11 33.7	181 45.7	0 26.2
18	304 13.1	30	25 6.5	-41	62 23.7	-11 33.3	211 50.7	0 26.3
20	332 57.1	30	24 58.4	-45	92 27.5	-11 32.9	241 55.7	0 26.4
22	1 41.1	30	24 49.4	-48	122 31.4	-11 32.5	272 .8	0 26.4
Δ					19	2	25	0

φ	SUNCE IZLAZ	SUNCE ZALAZ	TRAJANJE SUMRAKA GRAĐ.	TRAJANJE SUMRAKA ASTR.	MJESEC IZLAZ	MJESEC Δ/24	MJESEC ZALAZ	MJESEC Δ/24
N	h min	h min	h min	h min	h min	min	h min	min
60	8 25	16 1	0 49	2 30	11 48	3.9	6 58	1.6
55	7 60	16 27	0 41	2 8	12 40	3.5	6 5	2.0
50	7 41	16 46	0 36	1 53	13 15	3.3	5 30	2.2
45	7 25	17 1	0 32	1 42	13 40	3.2	5 4	2.3
40	7 13	17 13	0 29	1 34	14 0	3.1	4 44	2.3
35	7 2	17 23	0 27	1 27	14 17	3.0	4 27	2.4
30	6 53	17 33	0 25	1 23	14 32	2.9	4 12	2.4
20	6 37	17 49	0 23	1 16	14 57	2.8	3 47	2.5
10	6 23	18 3	0 22	1 13	15 18	2.7	3 25	2.6
0	6 9	18 16	0 22	1 12	15 38	2.6	3 5	2.6
10	5 56	18 30	0 22	1 15	15 58	2.5	2 44	2.7
20	5 41	18 44	0 24	1 20	16 19	2.4	2 22	2.7
30	5 24	19 1	0 26	1 30	16 44	2.3	1 57	2.8
35	5 14	19 11	0 28	1 38	16 58	2.3	1 42	2.8
40	5 3	19 22	0 30	1 49	17 15	2.2	1 25	2.9
45	4 49	19 36	0 34	2 7	17 35	2.0	1 4	2.9
50	4 33	19 52	0 39	2 38	18 0	1.9	0 37	3.0
55	4 12	20 13	0 47	: ::	18 34	1.6	0 2	3.1
60	3 42	20 41	1 1	: ::	19 25	1.2	. . .	.0
S								

SUNCE UT	SUNCE $e = T_p - UT$	SUNCE Δ/24	SUNCE r	MJESEC Prolaz	MJESEC Δ/24	MJESEC $\pi_\leftmoon$	MJESEC r
h	min s	s	′	h min	min	′	′
00	-12 39.7	-.5	16.3	$T_{\overline{m}}$ 21 53	2.6	59.7	16.3
12	-12 45.7	$T_{\overline{m}_\odot}$ 12 h 12.8 min		Starost 11.7 d	Faza ◐		

PLANETE

Pl.	$T_{\overline{m}}$	π	360−α	Vel.	Pl.	$T_{\overline{m}}$	π	360−α	Vel.
	h min	′	°			h min	′	°	
♀	12 29	.1	47	-3.8	♃	13 51	.0	26	-1.9
♂	0 34	.2	225	-1.3	♄	3 55	.0	175	.8

UT	SUNCE $S_\odot$	SUNCE $\delta_\odot$	PROLJ. TAČKA S_Υ	VENERA S_φ	VENERA δ_φ	MARS S_σ	MARS δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	176 47.0	-18 16.8	127 8.8	172 31.4	-18 27.4	352 51.6	21 56.3
2	206 46.8	-18 15.5	157 13.7	202 30.0	-18 25.7	22 58.6	21 56.9
4	236 46.6	-18 14.2	187 18.6	232 28.5	-18 24.0	53 5.6	21 57.5
6	266 46.3	-18 12.9	217 23.5	262 27.1	-18 22.4	83 12.6	21 58.1
8	296 46.1	-18 11.6	247 28.5	292 25.6	-18 20.7	113 19.5	21 58.7
10	326 45.9	-18 10.3	277 33.4	322 24.2	-18 19.0	143 26.5	21 59.3
12	356 45.6	-18 9.0	307 38.3	352 22.7	-18 17.3	173 33.5	21 59.8
14	26 45.4	-18 7.6	337 43.3	22 21.3	-18 15.7	203 40.5	22 .4
16	56 45.2	-18 6.3	7 48.2	52 19.8	-18 14.0	233 47.5	22 1.0
18	86 44.9	-18 5.0	37 53.1	82 18.4	-18 12.3	263 54.5	22 1.6
20	116 44.7	-18 3.7	67 58.0	112 17.0	-18 10.6	294 1.5	22 2.2
22	146 44.5	-18 2.3	98 3.0	142 15.5	-18 8.9	324 8.4	22 2.8
Δ	-1	7		-7	8	35	3

UT	MJESEC $S_\leftmoon$	MJESEC Δ	MJESEC $\delta_\leftmoon$	MJESEC Δ	JUPITER S_4	JUPITER δ_4	SATURN S_η	SATURN δ_η
h	° ′		° ′		° ′	° ′	° ′	° ′
0	30 25.2	30	24 39.8	-52	152 35.2	-11 32.1	302 5.8	0 26.5
2	59 9.3	31	24 29.4	-56	182 39.0	-11 31.7	332 10.9	0 26.6
4	87 53.4	31	24 18.3	-59	212 42.8	-11 31.2	2 15.9	0 26.6
6	116 37.6	32	24 6.4	-63	242 46.7	-11 30.8	32 20.9	0 26.7
8	145 21.9	32	23 53.8	-67	272 50.5	-11 30.4	62 26.0	0 26.8
10	174 6.4	33	23 40.5	-70	302 54.3	-11 30.0	92 31.0	0 26.9
12	202 51.0	34	23 26.4	-74	332 58.2	-11 29.6	122 36.1	0 26.9
14	231 35.7	34	23 11.7	-77	3 2.0	-11 29.2	152 41.1	0 27.0
16	260 20.6	35	22 56.2	-81	33 5.8	-11 28.8	182 46.1	0 27.1
18	289 5.6	36	22 40.1	-84	63 9.6	-11 28.3	212 51.2	0 27.2
20	317 50.9	37	22 23.2	-87	93 13.5	-11 27.9	242 56.2	0 27.2
22	346 36.3	38	22 5.7	-91	123 17.3	-11 27.5	273 1.3	0 27.3
Δ					19	2	25	0

φ	SUNCE IZLAZ	SUNCE ZALAZ	TRAJANJE SUMRAKA GRAĐ.	TRAJANJE SUMRAKA ASTR.	MJESEC IZLAZ	MJESEC Δ/24	MJESEC ZALAZ	MJESEC Δ/24
N	h min	h min	h min	h min	h min	min	h min	min
60	8 23	16 3	0 49	2 29	13 21	4.5	7 36	.9
55	7 58	16 29	0 41	2 8	14 5	4.0	6 52	1.4
50	7 39	16 47	0 35	1 53	14 34	3.7	6 22	1.6
45	7 24	17 2	0 32	1 42	14 56	3.5	5 59	1.8
40	7 12	17 14	0 29	1 34	15 14	3.3	5 40	2.0
35	7 2	17 24	0 27	1 27	15 29	3.2	5 24	2.1
30	6 53	17 34	0 25	1 22	15 42	3.0	5 11	2.2
20	6 37	17 49	0 23	1 16	16 4	2.9	4 47	2.3
10	6 23	18 3	0 22	1 13	16 23	2.7	4 27	2.5
0	6 9	18 17	0 22	1 12	16 41	2.6	4 8	2.6
10	5 56	18 30	0 22	1 14	16 59	2.4	3 49	2.7
20	5 42	18 44	0 23	1 20	17 18	2.2	3 28	2.9
30	5 25	19 1	0 26	1 30	17 40	2.1	3 5	3.0
35	5 15	19 10	0 28	1 38	17 52	1.9	2 50	3.1
40	5 4	19 21	0 30	1 49	18 7	1.8	2 34	3.2
45	4 51	19 34	0 34	2 6	18 24	1.6	2 15	3.3
50	4 34	19 50	0 39	2 36	18 45	1.4	1 50	3.5
55	4 14	20 11	0 46	: ::	19 13	1.1	1 17	3.8
60	3 45	20 39	1 0	: ::	19 52	.6	0 27	4.3
S								

SUNCE UT	SUNCE $e = T_p - UT$	SUNCE Δ/24	SUNCE r	MJESEC Prolaz	MJESEC Δ/24	MJESEC $\pi_\leftmoon$	MJESEC r
h	min s	s	′	h min	min	′	′
00	-12 51.6	-.5	16.3	$T_{\overline{m}}$ 22 56	2.5	60.6	16.5
12	-12 57.2	$T_{\overline{m}_\odot}$ 12 h 13.0 min		Starost 12.7 d	Faza ○		

PLANETE

Pl.	$T_{\overline{m}}$	π	360−α	Vel.	Pl.	$T_{\overline{m}}$	π	360−α	Vel.
	h min	′	°			h min	′	°	
♀	12 31	.1	45	-3.8	♃	13 48	.0	25	-1.9
♂	0 28	.2	226	-1.3	♄	3 51	.0	175	.8

UT	SUNCE $S_\odot$	SUNCE $\delta_\odot$	PROLJ. TAČKA S_Υ	VENERA S_φ	VENERA δ_φ	MARS S_σ	MARS δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	176 44.3	-18 1.0	128 7.9	172 14.1	-18 7.2	354 15.4	22 3.4
2	206 44.0	-17 59.6	158 12.8	202 12.7	-18 5.5	24 22.4	22 3.9
4	236 43.8	-17 58.3	188 17.8	232 11.3	-18 3.8	54 29.4	22 4.5
6	266 43.6	-17 57.0	218 22.7	262 9.8	-18 2.1	84 36.4	22 5.1
8	296 43.4	-17 55.6	248 27.6	292 8.4	-18 .4	114 43.4	22 5.7
10	326 43.2	-17 54.3	278 32.5	322 7.0	-17 58.7	144 50.4	22 6.2
12	356 42.9	-17 52.9	308 37.5	352 5.6	-17 56.9	174 57.4	22 6.8
14	26 42.7	-17 51.6	338 42.4	22 4.2	-17 55.2	205 4.4	22 7.4
16	56 42.5	-17 50.2	8 47.3	52 2.8	-17 53.5	235 11.4	22 8.0
18	86 42.3	-17 48.9	38 52.2	82 1.3	-17 51.8	265 18.3	22 8.5
20	116 42.1	-17 47.5	68 57.2	111 59.9	-17 50.0	295 25.3	22 9.1
22	146 41.9	-17 46.2	99 2.1	141 58.5	-17 48.3	325 32.3	22 9.7
Δ	-1	7		-7	9	35	3

UT	MJESEC $S_\leftmoon$	MJESEC Δ	MJESEC $\delta_\leftmoon$	MJESEC Δ	JUPITER S_4	JUPITER δ_4	SATURN S_η	SATURN δ_η
h	° ′		° ′		° ′	° ′	° ′	° ′
0	15 22.0	40	21 47.6	-94	153 21.1	-11 27.1	303 6.3	0 27.4
2	44 8.0	41	21 28.8	-97	183 25.0	-11 26.7	333 11.4	0 27.4
4	72 54.1	42	21 9.3	-100	213 28.8	-11 26.3	3 16.4	0 27.5
6	101 40.6	43	20 49.2	-103	243 32.6	-11 25.8	33 21.4	0 27.6
8	130 27.2	45	20 28.5	-106	273 36.4	-11 25.4	63 26.5	0 27.7
10	159 14.2	46	20 7.2	-109	303 40.3	-11 25.0	93 31.5	0 27.7
12	188 1.5	48	19 45.3	-112	333 44.1	-11 24.6	123 36.6	0 27.8
14	216 49.0	49	19 22.9	-115	3 47.9	-11 24.2	153 41.6	0 27.9
16	245 36.8	51	18 59.8	-118	33 51.7	-11 23.7	183 46.7	0 28.0
18	274 25.0	52	18 36.3	-121	63 55.6	-11 23.3	213 51.7	0 28.1
20	303 13.4	54	18 12.2	-123	93 59.4	-11 22.9	243 56.8	0 28.1
22	332 2.2	55	17 47.5	-126	124 3.2	-11 22.5	274 1.8	0 28.2
Δ					19	2	25	0

φ	SUNCE IZLAZ	SUNCE ZALAZ	TRAJANJE SUMRAKA GRAĐ.	TRAJANJE SUMRAKA ASTR.	MJESEC IZLAZ	MJESEC Δ/24	MJESEC ZALAZ	MJESEC Δ/24
N	h min	h min	h min	h min	h min	min	h min	min
60	8 21	16 6	0 48	2 28	15 9	4.6	7 58	.5
55	7 56	16 31	0 40	2 7	15 40	4.1	7 25	1.0
50	7 38	16 49	0 35	1 52	16 2	3.8	7 1	1.3
45	7 23	17 3	0 32	1 42	16 19	3.5	6 43	1.5
40	7 11	17 15	0 29	1 33	16 33	3.3	6 28	1.7
35	7 1	17 26	0 27	1 27	16 45	3.2	6 15	1.8
30	6 52	17 35	0 25	1 22	16 55	3.0	6 3	1.9
20	6 36	17 50	0 23	1 16	17 13	2.8	5 44	2.1
10	6 23	18 4	0 22	1 13	17 28	2.6	5 27	2.3
0	6 10	18 17	0 22	1 12	17 42	2.4	5 11	2.5
10	5 56	18 30	0 22	1 14	17 57	2.2	4 54	2.7
20	5 42	18 44	0 23	1 20	18 12	2.0	4 37	2.8
30	5 26	19 0	0 26	1 29	18 29	1.8	4 17	3.1
35	5 16	19 10	0 28	1 37	18 39	1.7	4 5	3.2
40	5 5	19 20	0 30	1 48	18 50	1.5	3 51	3.3
45	4 52	19 33	0 34	2 5	19 4	1.3	3 35	3.5
50	4 36	19 49	0 38	2 34	19 20	1.1	3 15	3.8
55	4 16	20 9	0 46	: ::	19 40	.8	2 48	4.1
60	3 48	20 37	0 60	: ::	20 7	.4	2 11	4.6
S								

SUNCE UT	SUNCE $e = T_p - UT$	SUNCE Δ/24	SUNCE r	MJESEC Prolaz	MJESEC Δ/24	MJESEC $\pi_\leftmoon$	MJESEC r
h	min s	s	′	h min	min	′	′
00	-13 2.8	-.4	16.3	$T_{\overline{m}}$ 23 56	2.4	61.2	16.7
12	-13 7.9	$T_{\overline{m}_\odot}$ 12 h 13.1 min		Starost 13.7 d	Faza ○		

PLANETE

Pl.	$T_{\overline{m}}$	π	360−α	Vel.	Pl.	$T_{\overline{m}}$	π	360−α	Vel.
	h min	′	°			h min	′	°	
♀	12 32	.1	44	-3.8	♃	13 45	.0	25	-1.9
♂	0 23	.2	226	-1.3	♄	3 47	.0	175	.7

UT	SUNCE $S_\odot$	SUNCE $\delta_\odot$	PROLJ. TAČKA S_Υ	VENERA S_φ	VENERA δ_φ	MARS S_σ	MARS δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	176 41.7	-17 44.8	129 7.0	171 57.1	-17 46.5	355 39.3	22 10.2
2	206 41.5	-17 43.4	159 12.0	201 55.7	-17 44.8	25 46.3	22 10.8
4	236 41.3	-17 42.1	189 16.9	231 54.3	-17 43.0	55 53.3	22 11.4
6	266 41.1	-17 40.7	219 21.8	261 52.9	-17 41.3	86 .3	22 11.9
8	296 40.9	-17 39.3	249 26.7	291 51.5	-17 39.5	116 7.3	22 12.5
10	326 40.7	-17 38.0	279 31.7	321 50.1	-17 37.8	146 14.3	22 13.1
12	356 40.5	-17 36.6	309 36.6	351 48.7	-17 36.0	176 21.3	22 13.6
14	26 40.3	-17 35.2	339 41.5	21 47.4	-17 34.2	206 28.3	22 14.2
16	56 40.1	-17 33.8	9 46.5	51 46.0	-17 32.5	236 35.3	22 14.7
18	86 39.9	-17 32.5	39 51.4	81 44.6	-17 30.7	266 42.3	22 15.3
20	116 39.7	-17 31.1	69 56.3	111 43.2	-17 28.9	296 49.2	22 15.9
22	146 39.5	-17 29.7	100 1.2	141 41.8	-17 27.2	326 56.2	22 16.4
Δ	-1	7		-7	9	35	3

UT	MJESEC $S_\leftmoon$	MJESEC Δ	MJESEC $\delta_\leftmoon$	MJESEC Δ	JUPITER S_4	JUPITER δ_4	SATURN S_η	SATURN δ_η
h	° ′		° ′		° ′	° ′	° ′	° ′
0	0 51.3	57	17 22.4	-128	154 7.0	-11 22.1	304 6.9	0 28.3
2	29 40.7	59	16 56.8	-130	184 10.9	-11 21.7	334 11.9	0 28.4
4	58 30.4	60	16 30.7	-133	214 14.7	-11 21.2	4 17.0	0 28.4
6	87 20.4	62	16 4.2	-135	244 18.5	-11 20.8	34 22.0	0 28.5
8	116 10.8	63	15 37.3	-137	274 22.3	-11 20.4	64 27.1	0 28.6
10	145 1.5	65	15 9.9	-139	304 26.2	-11 20.0	94 32.2	0 28.7
12	173 52.5	67	14 42.1	-141	334 30.0	-11 19.6	124 37.2	0 28.8
14	202 43.9	68	14 14.0	-143	4 33.8	-11 19.1	154 42.3	0 28.8
16	231 35.6	70	13 45.4	-144	34 37.6	-11 18.7	184 47.3	0 28.9
18	260 27.5	72	13 16.5	-146	64 41.5	-11 18.3	214 52.4	0 29.0
20	289 19.9	73	12 47.3	-148	94 45.3	-11 17.9	244 57.4	0 29.1
22	318 12.5	75	12 17.8	-149	124 49.1	-11 17.5	275 2.5	0 29.2
Δ					19	2	25	0

φ	SUNCE IZLAZ	SUNCE ZALAZ	TRAJANJE SUMRAKA GRAĐ.	TRAJANJE SUMRAKA ASTR.	MJESEC IZLAZ	MJESEC Δ/24	MJESEC ZALAZ	MJESEC Δ/24
N	h min	h min	h min	h min	h min	min	h min	min
60	8 19	16 9	0 48	2 28	16 59	4.4	8 10	.3
55	7 55	16 33	0 40	2 7	17 18	4.0	7 48	.7
50	7 37	16 51	0 35	1 52	17 32	3.7	7 32	1.0
45	7 22	17 5	0 31	1 41	17 44	3.5	7 18	1.2
40	7 11	17 16	0 29	1 33	17 53	3.3	7 7	1.4
35	7 0	17 27	0 27	1 27	18 1	3.1	6 58	1.6
30	6 52	17 35	0 25	1 22	18 8	2.9	6 50	1.7
20	6 36	17 51	0 23	1 16	18 20	2.7	6 35	1.9
10	6 23	18 4	0 22	1 13	18 31	2.5	6 22	2.2
0	6 10	18 17	0 22	1 12	18 40	2.3	6 10	2.3
10	5 57	18 30	0 22	1 14	18 50	2.1	5 58	2.5
20	5 43	18 44	0 23	1 19	19 1	1.9	5 45	2.8
30	5 27	18 59	0 26	1 29	19 12	1.6	5 30	3.0
35	5 17	19 9	0 28	1 37	19 19	1.5	5 21	3.1
40	5 6	19 20	0 30	1 48	19 27	1.3	5 11	3.3
45	4 54	19 32	0 33	2 4	19 36	1.1	4 59	3.5
50	4 38	19 48	0 38	2 32	19 46	.9	4 45	3.8
55	4 18	20 7	0 46	: ::	19 59	.6	4 26	4.1
60	3 51	20 34	0 59	: ::	20 16	.3	4 1	4.5
S								

SUNCE UT	SUNCE $e = T_p - UT$	SUNCE Δ/24	SUNCE r	MJESEC Prolaz	MJESEC Δ/24	MJESEC $\pi_\leftmoon$	MJESEC r
h	min s	s	′	h min	min	′	′
00	-13 13.1	-.4	16.3	$T_{\overline{m}}$	1.0	61.5	16.7
12	-13 17.8	$T_{\overline{m}_\odot}$ 12 h 13.3 min		Starost 14.7 d	Faza ○		

PLANETE

Pl.	$T_{\overline{m}}$	π	360−α	Vel.	Pl.	$T_{\overline{m}}$	π	360−α	Vel.
	h min	′	°			h min	′	°	
♀	12 33	.1	43	-3.8	♃	13 42	.0	25	-1.9
♂	0 17	.2	227	-1.3	♄	3 43	.0	175	.7

UT	SUNCE		PROLJ. TAČKA	VENERA		MARS	
	$S_\odot$	$\delta_\odot$	S_Υ	S_φ	δ_φ	S_σ	δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	176 39.3	-17 28.3	130 6.2	171 40.5	-17 25.4	357 3.2	22 17.0
2	206 39.1	-17 26.9	160 11.1	201 39.1	-17 23.6	27 10.2	22 17.5
4	236 38.9	-17 25.5	190 16.0	231 37.7	-17 21.8	57 17.2	22 18.1
6	266 38.7	-17 24.1	220 21.0	261 36.3	-17 20.0	87 24.2	22 18.6
8	296 38.6	-17 22.7	250 25.9	291 35.0	-17 18.2	117 31.2	22 19.2
10	326 38.4	-17 21.3	280 30.8	321 33.6	-17 16.4	147 38.2	22 19.7
12	356 38.2	-17 19.9	310 35.7	351 32.2	-17 14.6	177 45.2	22 20.3
14	26 38.0	-17 18.5	340 40.7	21 30.9	-17 12.8	207 52.2	22 20.8
16	56 37.8	-17 17.1	10 45.6	51 29.5	-17 11.0	237 59.2	22 21.4
18	86 37.7	-17 15.7	40 50.5	81 28.2	-17 9.2	268 6.2	22 21.9
20	116 37.5	-17 14.3	70 55.5	111 26.8	-17 7.3	298 13.2	22 22.4
22	146 37.3	-17 12.9	101 .4	141 25.4	-17 5.5	328 20.1	22 23.0
Δ	-1	7		-7	9	35	3

UT	MJESEC				JUPITER		SATURN	
	$S_\leftmoon$	Δ	$\delta_\leftmoon$	Δ	S_4	δ_4	S_η	δ_η
h	° ′		° ′		° ′	° ′	° ′	° ′
0	347 5.4	76	11 48.0	-151	154 52.9	-11 17.0	305 7.6	0 29.2
2	15 58.7	78	11 17.9	-152	184 56.7	-11 16.6	335 12.6	0 29.3
4	44 52.2	79	10 47.5	-153	215 .6	-11 16.2	5 17.7	0 29.4
6	73 46.1	81	10 16.9	-154	245 4.4	-11 15.8	35 22.7	0 29.5
8	102 40.2	82	9 46.1	-155	275 8.2	-11 15.4	65 27.8	0 29.6
10	131 34.6	84	9 15.0	-156	305 12.0	-11 14.9	95 32.9	0 29.6
12	160 29.3	85	8 43.8	-157	335 15.8	-11 14.5	125 37.9	0 29.7
14	189 24.3	86	8 12.3	-158	5 19.7	-11 14.1	155 43.0	0 29.8
16	218 19.6	88	7 40.7	-159	35 23.5	-11 13.7	185 48.1	0 29.9
18	247 15.1	89	7 9.0	-159	65 27.3	-11 13.3	215 53.1	0 30.0
20	276 10.8	90	6 37.1	-160	95 31.1	-11 12.8	245 58.2	0 30.1
22	305 6.8	91	6 5.2	-160	125 35.0	-11 12.4	276 3.3	0 30.1
Δ					19	2	25	0

φ	SUNCE		TRAJANJE SUMRAKA		MJESEC			
	IZLAZ	ZALAZ	GRAĐ.	ASTR.	IZLAZ	Δ/24	ZALAZ	Δ/24
N	h min	h min	h min	h min	h min	min	h min	min
60	8 16	16 11	0 48	2 27	18 45	4.3	8 18	.2
55	7 53	16 35	0 40	2 6	18 54	3.9	8 5	.6
50	7 35	16 52	0 35	1 52	19 1	3.6	7 56	.9
45	7 21	17 6	0 31	1 41	19 7	3.4	7 48	1.1
40	7 10	17 18	0 29	1 33	19 11	3.2	7 41	1.3
35	6 60	17 28	0 27	1 27	19 15	3.0	7 36	1.4
30	6 51	17 36	0 25	1 22	19 19	2.8	7 31	1.6
20	6 36	17 51	0 23	1 16	19 25	2.6	7 22	1.8
10	6 23	18 4	0 22	1 13	19 30	2.4	7 14	2.0
0	6 10	18 17	0 22	1 12	19 35	2.2	7 7	2.2
10	5 57	18 30	0 22	1 14	19 40	2.0	6 59	2.4
20	5 43	18 43	0 23	1 19	19 45	1.7	6 51	2.6
30	5 28	18 59	0 26	1 29	19 51	1.5	6 42	2.9
35	5 18	19 8	0 28	1 36	19 55	1.4	6 37	3.0
40	5 8	19 19	0 30	1 47	19 58	1.2	6 31	3.2
45	4 55	19 31	0 33	2 3	20 3	1.0	6 23	3.4
50	4 40	19 46	0 38	2 30	20 8	.8	6 15	3.6
55	4 20	20 6	0 45	: ::	20 14	.5	6 4	3.9
60	3 53	20 32	0 58	: ::	20 23	.2	5 50	4.3
S								

SUNCE				MJESEC			
UT	$e = T_p - UT$	Δ/24	r	Prolaz	Δ/24	$\pi_\leftmoon$	r
h	min s	s	′	h min	min	′	′
00	-13 22.6	-.4	16.3	$T_{\overline{m}}$ 0 54	2.3	61.4	16.7
12	-13 26.9	$T_{\overline{m}_\odot}$ 12 h 13.5 min		Starost 15.7 d	Faza ○		

PLANETE								
Pl.	$T_{\overline{m}}$	π	360−α	Vel.	Pl.	$T_{\overline{m}}$	π	360−α	Vel.
	h min	′	°			h min	′	°	
♀	12 34	.1	42	-3.8	♃	13 39	.0	25	-1.9
♂	0 12	.2	227	-1.3	♄	3 39	.0	175	.7

UT	SUNCE		PROLJ. TAČKA	VENERA		MARS	
	$S_\odot$	$\delta_\odot$	S_Υ	S_φ	δ_φ	S_σ	δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	176 37.1	-17 11.5	131 5.3	171 24.1	-17 3.7	358 27.1	22 23.5
2	206 37.0	-17 10.1	161 10.2	201 22.7	-17 1.9	28 34.1	22 24.1
4	236 36.8	-17 8.7	191 15.2	231 21.4	-17 .0	58 41.1	22 24.6
6	266 36.6	-17 7.2	221 20.1	261 20.0	-16 58.2	88 48.1	22 25.1
8	296 36.5	-17 5.8	251 25.0	291 18.7	-16 56.4	118 55.1	22 25.7
10	326 36.3	-17 4.4	281 30.0	321 17.4	-16 54.5	149 2.1	22 26.2
12	356 36.1	-17 3.0	311 34.9	351 16.0	-16 52.7	179 9.1	22 26.7
14	26 36.0	-17 1.5	341 39.8	21 14.7	-16 50.8	209 16.0	22 27.3
16	56 35.8	-17 .1	11 44.7	51 13.4	-16 49.0	239 23.0	22 27.8
18	86 35.6	-16 58.7	41 49.7	81 12.0	-16 47.1	269 30.0	22 28.3
20	116 35.5	-16 57.3	71 54.6	111 10.7	-16 45.3	299 37.0	22 28.8
22	146 35.3	-16 55.8	101 59.5	141 9.4	-16 43.4	329 44.0	22 29.4
Δ	-1	7		-7	9	35	3

UT	MJESEC				JUPITER		SATURN	
	$S_\leftmoon$	Δ	$\delta_\leftmoon$	Δ	S_4	δ_4	S_η	δ_η
h	° ′		° ′		° ′	° ′	° ′	° ′
0	334 3.1	92	5 33.1	-161	155 38.8	-11 12.0	306 8.3	0 30.2
2	2 59.6	94	5 .9	-161	185 42.6	-11 11.6	336 13.4	0 30.3
4	31 56.3	95	4 28.7	-161	215 46.4	-11 11.1	6 18.5	0 30.4
6	60 53.2	96	3 56.4	-162	245 50.2	-11 10.7	36 23.5	0 30.5
8	89 50.3	97	3 24.1	-162	275 54.0	-11 10.3	66 28.6	0 30.6
10	118 47.6	98	2 51.8	-162	305 57.9	-11 9.9	96 33.7	0 30.6
12	147 45.1	98	2 19.5	-162	336 1.7	-11 9.5	126 38.8	0 30.7
14	176 42.8	99	1 47.2	-161	6 5.5	-11 9.0	156 43.8	0 30.8
16	205 40.7	100	1 14.9	-161	36 9.3	-11 8.6	186 48.9	0 30.9
18	234 38.7	101	0 42.6	-161	66 13.1	-11 8.2	216 54.0	0 31.0
20	263 36.9	102	0 10.4	-161	96 17.0	-11 7.8	246 59.0	0 31.1
22	292 35.3	102	- 0 21.7	-160	126 20.8	-11 7.3	277 4.1	0 31.2
Δ					19	2	25	0

φ	SUNCE		TRAJANJE SUMRAKA		MJESEC			
	IZLAZ	ZALAZ	GRAĐ.	ASTR.	IZLAZ	Δ/24	ZALAZ	Δ/24
N	h min	h min	h min	h min	h min	min	h min	min
60	8 14	16 14	0 47	2 27	20 27	4.1	8 23	.2
55	7 51	16 37	0 40	2 6	20 27	3.8	8 19	.5
50	7 34	16 54	0 35	1 52	20 27	3.5	8 16	.8
45	7 20	17 8	0 31	1 41	20 27	3.3	8 14	1.0
40	7 9	17 19	0 29	1 33	20 27	3.1	8 11	1.2
35	6 59	17 29	0 27	1 27	20 27	2.9	8 10	1.3
30	6 50	17 37	0 25	1 22	20 27	2.8	8 8	1.5
20	6 36	17 52	0 23	1 16	20 27	2.5	8 5	1.7
10	6 22	18 5	0 22	1 12	20 27	2.3	8 2	1.9
0	6 10	18 17	0 22	1 12	20 27	2.1	7 60	2.1
10	5 58	18 30	0 22	1 14	20 27	1.9	7 57	2.3
20	5 44	18 43	0 23	1 19	20 27	1.7	7 55	2.6
30	5 28	18 58	0 26	1 29	20 27	1.5	7 52	2.8
35	5 19	19 7	0 28	1 36	20 27	1.3	7 50	2.9
40	5 9	19 18	0 30	1 46	20 27	1.2	7 48	3.1
45	4 57	19 30	0 33	2 2	20 27	1.0	7 45	3.3
50	4 41	19 45	0 38	2 29	20 28	.8	7 42	3.5
55	4 22	20 4	0 45	: ::	20 28	.5	7 39	3.8
60	3 56	20 29	0 57	: ::	20 28	.2	7 34	4.2
S								

SUNCE				MJESEC			
UT	$e = T_p - UT$	Δ/24	r	Prolaz	Δ/24	$\pi_\leftmoon$	r
h	min s	s	′	h min	min	′	′
00	-13 31.3	-.3	16.3	$T_{\overline{m}}$ 1 48	2.1	61.0	16.6
12	-13 35.2	$T_{\overline{m}_\odot}$ 12 h 13.6 min		Starost 16.7 d	Faza ○		

PLANETE								
Pl.	$T_{\overline{m}}$	π	360−α	Vel.	Pl.	$T_{\overline{m}}$	π	360−α	Vel.
	h min	′	°			h min	′	°	
♀	12 35	.1	40	-3.8	♃	13 36	.0	25	-1.9
♂	0 6	.2	227	-1.3	♄	3 35	.0	175	.7

UT	SUNCE $S_\odot$	SUNCE $\delta_\odot$	PROLJ. TAČKA S_Υ	VENERA S_φ	VENERA δ_φ	MARS S_σ	MARS δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	176 35.2	-16 54.4	132 4.5	171 8.0	-16 41.6	359 51.0	22 29.9
2	206 35.0	-16 52.9	162 9.4	201 6.7	-16 39.7	29 57.9	22 30.4
4	236 34.9	-16 51.5	192 14.3	231 5.4	-16 37.8	60 4.9	22 30.9
6	266 34.7	-16 50.1	222 19.2	261 4.1	-16 36.0	90 11.9	22 31.4
8	296 34.6	-16 48.6	252 24.2	291 2.8	-16 34.1	120 18.9	22 32.0
10	326 34.4	-16 47.2	282 29.1	321 1.4	-16 32.2	150 25.9	22 32.5
12	356 34.3	-16 45.7	312 34.0	351 .1	-16 30.3	180 32.8	22 33.0
14	26 34.1	-16 44.3	342 38.9	20 58.8	-16 28.4	210 39.8	22 33.5
16	56 34.0	-16 42.8	12 43.9	50 57.5	-16 26.5	240 46.8	22 34.0
18	86 33.8	-16 41.3	42 48.8	80 56.2	-16 24.7	270 53.8	22 34.5
20	116 33.7	-16 39.9	72 53.7	110 54.9	-16 22.8	301 .7	22 35.0
22	146 33.5	-16 38.4	102 58.7	140 53.6	-16 20.9	331 7.7	22 35.5
Δ	-1	7		-7	9	35	3

UT	MJESEC $S_\leftmoon$	MJESEC Δ	MJESEC $\delta_\leftmoon$	MJESEC Δ	JUPITER $S_\jupiter$	JUPITER $\delta_\jupiter$	SATURN $S_\saturn$	SATURN $\delta_\saturn$
h	° ′		° ′		° ′	° ′	° ′	° ′
0	321 33.8	103	- 0 53.8	-160	156 24.6	-11 6.9	307 9.2	0 31.2
2	350 32.4	104	- 1 25.7	-159	186 28.4	-11 6.5	337 14.3	0 31.3
4	19 31.1	104	- 1 57.6	-159	216 32.2	-11 6.1	7 19.3	0 31.4
6	48 30.0	105	- 2 29.3	-158	246 36.0	-11 5.6	37 24.4	0 31.5
8	77 28.9	105	- 3 .9	-157	276 39.9	-11 5.2	67 29.5	0 31.6
10	106 28.0	106	- 3 32.4	-157	306 43.7	-11 4.8	97 34.6	0 31.7
12	135 27.1	106	- 4 3.7	-156	336 47.5	-11 4.4	127 39.7	0 31.8
14	164 26.3	106	- 4 34.9	-155	6 51.3	-11 3.9	157 44.7	0 31.9
16	193 25.6	107	- 5 5.8	-154	36 55.1	-11 3.5	187 49.8	0 32.0
18	222 25.0	107	- 5 36.6	-153	66 58.9	-11 3.1	217 54.9	0 32.0
20	251 24.4	107	- 6 7.1	-152	97 2.8	-11 2.7	247 60.0	0 32.1
22	280 23.9	108	- 6 37.5	-151	127 6.6	-11 2.2	278 5.1	0 32.2
Δ					19	2	25	0

φ	SUNCE IZLAZ	SUNCE ZALAZ	TRAJANJE SUMRAKA GRAĐ.	TRAJANJE SUMRAKA ASTR.	MJESEC IZLAZ	MJESEC Δ/24	MJESEC ZALAZ	MJESEC Δ/24
N	h min	h min	h min	h min	h min	min	h min	min
60	8 12	16 16	0 47	2 26	22 6	4.0	8 28	.2
55	7 49	16 39	0 40	2 6	21 57	3.7	8 32	.5
50	7 32	16 56	0 35	1 51	21 51	3.4	8 35	.8
45	7 19	17 9	0 31	1 41	21 45	3.2	8 38	1.0
40	7 8	17 20	0 29	1 33	21 41	3.0	8 40	1.2
35	6 58	17 30	0 27	1 27	21 37	2.8	8 42	1.3
30	6 50	17 38	0 25	1 22	21 33	2.7	8 43	1.5
20	6 35	17 52	0 23	1 16	21 27	2.5	8 46	1.7
10	6 22	18 5	0 22	1 12	21 22	2.3	8 49	1.9
0	6 10	18 17	0 22	1 12	21 18	2.1	8 51	2.1
10	5 58	18 29	0 22	1 14	21 13	1.9	8 54	2.3
20	5 45	18 43	0 23	1 19	21 8	1.7	8 56	2.5
30	5 29	18 58	0 26	1 28	21 2	1.5	8 59	2.7
35	5 20	19 7	0 27	1 36	20 59	1.3	9 1	2.9
40	5 10	19 17	0 30	1 46	20 56	1.2	9 2	3.0
45	4 58	19 29	0 33	2 1	20 51	1.0	9 5	3.2
50	4 43	19 43	0 38	2 27	20 46	.8	9 7	3.4
55	4 24	20 2	0 45	3 37	20 40	.6	9 10	3.7
60	3 59	20 27	0 56	: ::	20 33	.2	9 15	4.1
S								

SUNCE UT	SUNCE $e = T_p - UT$	SUNCE Δ/24	SUNCE r	MJESEC Prolaz	MJESEC Δ/24	MJESEC $\pi_\leftmoon$	MJESEC r
h	min s	s	′	h min	min	′	′
00	-13 39.1	-.3	16.3	$T_{\overline{m}}$ 2 39	2.1	60.4	16.5
12	-13 42.7	$T_{\overline{m}_\odot}$ 12 h 13.7 min		Starost 17.7 d	Faza ◑		

PLANETE

Pl.	$T_{\overline{m}}$	π	360−α	Vel.	Pl.	$T_{\overline{m}}$	π	360−α	Vel.
	h min	′	°			h min	′	°	
♀	12 36	.1	39	-3.8	♃	13 33	.0	24	-1.9
♂	0 1	.2	228	-1.3	♄	3 31	.0	175	.7

UT	SUNCE $S_\odot$	SUNCE $\delta_\odot$	PROLJ. TAČKA S_Υ	VENERA S_φ	VENERA δ_φ	MARS S_σ	MARS δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	176 33.4	-16 37.0	133 3.6	170 52.3	-16 19.0	1 14.7	22 36.0
2	206 33.3	-16 35.5	163 8.5	200 51.0	-16 17.1	31 21.6	22 36.5
4	236 33.1	-16 34.0	193 13.4	230 49.7	-16 15.1	61 28.6	22 37.0
6	266 33.0	-16 32.6	223 18.4	260 48.4	-16 13.2	91 35.6	22 37.5
8	296 32.9	-16 31.1	253 23.3	290 47.1	-16 11.3	121 42.5	22 38.0
10	326 32.7	-16 29.6	283 28.2	320 45.8	-16 9.4	151 49.5	22 38.5
12	356 32.6	-16 28.2	313 33.2	350 44.6	-16 7.5	181 56.5	22 39.0
14	26 32.5	-16 26.7	343 38.1	20 43.3	-16 5.6	212 3.4	22 39.5
16	56 32.3	-16 25.2	13 43.0	50 42.0	-16 3.6	242 10.4	22 40.0
18	86 32.2	-16 23.7	43 47.9	80 40.7	-16 1.7	272 17.3	22 40.5
20	116 32.1	-16 22.2	73 52.9	110 39.4	-15 59.8	302 24.3	22 41.0
22	146 32.0	-16 20.8	103 57.8	140 38.2	-15 57.8	332 31.3	22 41.5
Δ	-1	7		-6	10	35	2

UT	MJESEC $S_\leftmoon$	MJESEC Δ	MJESEC $\delta_\leftmoon$	MJESEC Δ	JUPITER $S_\jupiter$	JUPITER $\delta_\jupiter$	SATURN $S_\saturn$	SATURN $\delta_\saturn$
h	° ′		° ′		° ′	° ′	° ′	° ′
0	309 23.4	108	- 7 7.6	-149	157 10.4	-11 1.8	308 10.1	0 32.3
2	338 22.9	108	- 7 37.5	-148	187 14.2	-11 1.4	338 15.2	0 32.4
4	7 22.5	108	- 8 7.2	-147	217 18.0	-11 1.0	8 20.3	0 32.5
6	36 22.0	108	- 8 36.6	-146	247 21.8	-11 .5	38 25.4	0 32.6
8	65 21.6	108	- 9 5.7	-144	277 25.6	-11 .1	68 30.5	0 32.7
10	94 21.2	108	- 9 34.5	-143	307 29.5	-10 59.7	98 35.6	0 32.8
12	123 20.8	108	-10 3.1	-141	337 33.3	-10 59.3	128 40.7	0 32.9
14	152 20.4	108	-10 31.4	-140	7 37.1	-10 58.8	158 45.7	0 32.9
16	181 20.0	108	-10 59.4	-138	37 40.9	-10 58.4	188 50.8	0 33.0
18	210 19.6	108	-11 27.0	-137	67 44.7	-10 58.0	218 55.9	0 33.1
20	239 19.1	107	-11 54.4	-135	97 48.5	-10 57.6	249 1.0	0 33.2
22	268 18.6	107	-12 21.4	-133	127 52.3	-10 57.1	279 6.1	0 33.3
Δ					19	2	25	0

φ	SUNCE IZLAZ	SUNCE ZALAZ	TRAJANJE SUMRAKA GRAĐ.	TRAJANJE SUMRAKA ASTR.	MJESEC IZLAZ	MJESEC Δ/24	MJESEC ZALAZ	MJESEC Δ/24
N	h min	h min	h min	h min	h min	min	h min	min
60	8 9	16 19	0 47	2 26	23 43	4.0	8 33	.3
55	7 47	16 41	0 40	2 5	23 25	3.6	8 45	.6
50	7 31	16 57	0 35	1 51	23 12	3.3	8 54	.9
45	7 18	17 10	0 31	1 41	23 1	3.1	9 2	1.1
40	7 7	17 21	0 29	1 33	22 52	2.9	9 8	1.2
35	6 57	17 31	0 27	1 26	22 45	2.8	9 14	1.4
30	6 49	17 39	0 25	1 22	22 38	2.7	9 19	1.5
20	6 35	17 53	0 23	1 15	22 27	2.4	9 27	1.7
10	6 22	18 5	0 22	1 12	22 17	2.3	9 34	1.9
0	6 10	18 17	0 22	1 12	22 8	2.1	9 41	2.1
10	5 58	18 29	0 22	1 14	21 58	1.9	9 48	2.3
20	5 45	18 42	0 23	1 19	21 49	1.8	9 56	2.5
30	5 30	18 57	0 26	1 28	21 38	1.6	10 4	2.7
35	5 21	19 6	0 27	1 35	21 32	1.4	10 9	2.8
40	5 11	19 16	0 30	1 45	21 24	1.3	10 15	3.0
45	4 59	19 27	0 33	2 0	21 16	1.1	10 22	3.1
50	4 45	19 42	0 37	2 25	21 6	.9	10 30	3.3
55	4 27	19 60	0 44	3 28	20 54	.7	10 40	3.6
60	4 2	20 24	0 56	: ::	20 38	.3	10 53	4.0
S								

SUNCE UT	SUNCE $e = T_p - UT$	SUNCE Δ/24	SUNCE r	MJESEC Prolaz	MJESEC Δ/24	MJESEC $\pi_\leftmoon$	MJESEC r
h	min s	s	′	h min	min	′	′
00	-13 46.2	-.3	16.3	$T_{\overline{m}}$ 3 29	2.1	59.5	16.2
12	-13 49.3	$T_{\overline{m}_\odot}$ 12 h 13.8 min		Starost 18.7 d	Faza ◑		

PLANETE

Pl.	$T_{\overline{m}}$	π	360−α	Vel.	Pl.	$T_{\overline{m}}$	π	360−α	Vel.
	h min	′	°			h min	′	°	
♀	12 37	.1	38	-3.8	♃	13 30	.0	24	-1.9
♂	23 49	.2	228	-1.2	♄	3 27	.0	175	.7

UT	SUNCE $S_\odot$	SUNCE $\delta_\odot$	PROLJ. TAČKA S_Υ	VENERA S_φ	VENERA δ_φ	MARS S_σ	MARS δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	176 31.8	-16 19.3	134 2.7	170 36.9	-15 55.9	2 38.2	22 42.0
2	206 31.7	-16 17.8	164 7.7	200 35.6	-15 54.0	32 45.2	22 42.5
4	236 31.6	-16 16.3	194 12.6	230 34.3	-15 52.0	62 52.1	22 42.9
6	266 31.5	-16 14.8	224 17.5	260 33.1	-15 50.1	92 59.1	22 43.4
8	296 31.4	-16 13.3	254 22.4	290 31.8	-15 48.1	123 6.0	22 43.9
10	326 31.2	-16 11.8	284 27.4	320 30.5	-15 46.2	153 13.0	22 44.4
12	356 31.1	-16 10.3	314 32.3	350 29.3	-15 44.2	183 19.9	22 44.9
14	26 31.0	-16 8.8	344 37.2	20 28.0	-15 42.2	213 26.9	22 45.3
16	56 30.9	-16 7.3	14 42.2	50 26.8	-15 40.3	243 33.8	22 45.8
18	86 30.8	-16 5.8	44 47.1	80 25.5	-15 38.3	273 40.7	22 46.3
20	116 30.7	-16 4.3	74 52.0	110 24.3	-15 36.3	303 47.7	22 46.8
22	146 30.6	-16 2.8	104 56.9	140 23.0	-15 34.4	333 54.6	22 47.2
Δ	-1	7		-6	10	35	2

UT	MJESEC $S_\leftmoon$	MJESEC Δ	MJESEC $\delta_\leftmoon$	MJESEC Δ	JUPITER S_4	JUPITER δ_4	SATURN S_η	SATURN δ_η
h	° ′		° ′		° ′	° ′	° ′	° ′
0	297 18.1	107	-12 48.0	-132	157 56.2	-10 56.7	309 11.2	0 33.4
2	326 17.5	107	-13 14.4	-130	187 60.0	-10 56.3	339 16.3	0 33.5
4	355 16.8	107	-13 40.3	-128	218 3.8	-10 55.9	9 21.4	0 33.6
6	24 16.2	106	-14 6.0	-126	248 7.6	-10 55.4	39 26.5	0 33.7
8	53 15.4	106	-14 31.2	-124	278 11.4	-10 55.0	69 31.6	0 33.8
10	82 14.6	106	-14 56.1	-122	308 15.2	-10 54.6	99 36.6	0 33.9
12	111 13.8	105	-15 20.6	-120	338 19.0	-10 54.1	129 41.7	0 34.0
14	140 12.8	105	-15 44.6	-119	8 22.8	-10 53.7	159 46.8	0 34.1
16	169 11.8	105	-16 8.3	-116	38 26.7	-10 53.3	189 51.9	0 34.2
18	198 10.7	104	-16 31.6	-114	68 30.5	-10 52.9	219 57.0	0 34.3
20	227 9.6	104	-16 54.5	-112	98 34.3	-10 52.4	250 2.1	0 34.4
22	256 8.3	103	-17 17.0	-110	128 38.1	-10 52.0	280 7.2	0 34.4
Δ					19	2	25	0

φ	SUNCE IZLAZ	SUNCE ZALAZ	TRAJANJE SUMRAKA GRAĐ.	TRAJANJE SUMRAKA ASTR.	MJESEC IZLAZ	MJESEC Δ/24	MJESEC ZALAZ	MJESEC Δ/24
N	h min	h min	h min	h min	h min	min	h min	min
60	8 7	16 22	0 47	2 25	. . .	.0	8 39	.4
55	7 46	16 43	0 39	2 5	. . .	.0	8 60	.8
50	7 29	16 59	0 35	1 51	. . .	.0	9 15	1.0
45	7 16	17 12	0 31	1 40	. . .	.0	9 28	1.2
40	7 6	17 23	0 28	1 32	. . .	.0	9 38	1.4
35	6 57	17 32	0 26	1 26	23 51	2.7	9 47	1.5
30	6 49	17 40	0 25	1 22	23 42	2.6	9 55	1.6
20	6 35	17 54	0 23	1 15	23 25	2.4	10 8	1.8
10	6 22	18 6	0 22	1 12	23 11	2.3	10 20	2.0
0	6 10	18 17	0 22	1 12	22 58	2.1	10 31	2.1
10	5 59	18 29	0 22	1 13	22 45	2.0	10 43	2.3
20	5 46	18 42	0 23	1 18	22 31	1.8	10 55	2.4
30	5 31	18 56	0 26	1 28	22 15	1.7	11 9	2.6
35	5 22	19 5	0 27	1 35	22 6	1.6	11 17	2.7
40	5 13	19 15	0 30	1 45	21 56	1.5	11 26	2.9
45	5 1	19 26	0 33	1 60	21 43	1.3	11 37	3.0
50	4 47	19 40	0 37	2 24	21 29	1.1	11 50	3.2
55	4 29	19 58	0 44	3 21	21 10	.9	12 7	3.5
60	4 4	20 22	0 55	: ::	20 46	.5	12 29	3.9
S								

SUNCE UT	SUNCE $e = T_p - UT$	SUNCE Δ/24	SUNCE r	MJESEC Prolaz	MJESEC Δ/24	MJESEC $\pi_\leftmoon$	MJESEC r
h	min s	s	′	h min	min	′	′
00	-13 52.5	-.2	16.3	$T_{\overline{m}}$ 4 20	2.1	58.6	16.0
12	-13 55.2	$T_{\overline{m}_\odot}$ 12 h 13.9 min		Starost 19.7 d	Faza ◑		

PLANETE

Pl.	$T_{\overline{m}}$	π	360−α	Vel.	Pl.	$T_{\overline{m}}$	π	360−α	Vel.
	h min	′	°			h min	′	°	
♀	12 38	.1	37	-3.8	♄	13 27	.0	24	-1.9
♂	23 44	.2	229	-1.2	♃	3 23	.0	175	.7

UT	SUNCE $S_\odot$	SUNCE $\delta_\odot$	PROLJ. TAČKA S_Υ	VENERA S_φ	VENERA δ_φ	MARS S_σ	MARS δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	176 30.5	-16 1.3	135 1.9	170 21.8	-15 32.4	4 1.5	22 47.7
2	206 30.4	-15 59.8	165 6.8	200 20.5	-15 30.4	34 8.5	22 48.2
4	236 30.3	-15 58.3	195 11.7	230 19.3	-15 28.4	64 15.4	22 48.6
6	266 30.2	-15 56.7	225 16.7	260 18.0	-15 26.4	94 22.3	22 49.1
8	296 30.1	-15 55.2	255 21.6	290 16.8	-15 24.5	124 29.3	22 49.6
10	326 30.0	-15 53.7	285 26.5	320 15.5	-15 22.5	154 36.2	22 50.0
12	356 29.9	-15 52.2	315 31.4	350 14.3	-15 20.5	184 43.1	22 50.5
14	26 29.8	-15 50.7	345 36.4	20 13.1	-15 18.5	214 50.0	22 50.9
16	56 29.7	-15 49.1	15 41.3	50 11.8	-15 16.5	244 57.0	22 51.4
18	86 29.6	-15 47.6	45 46.2	80 10.6	-15 14.5	275 3.9	22 51.8
20	116 29.5	-15 46.1	75 51.1	110 9.4	-15 12.5	305 10.8	22 52.3
22	146 29.4	-15 44.5	105 56.1	140 8.2	-15 10.5	335 17.7	22 52.7
Δ	0	8		-6	10	35	2

UT	MJESEC $S_\leftmoon$	MJESEC Δ	MJESEC $\delta_\leftmoon$	MJESEC Δ	JUPITER S_4	JUPITER δ_4	SATURN S_η	SATURN δ_η
h	° ′		° ′		° ′	° ′	° ′	° ′
0	285 7.0	103	-17 39.0	-108	158 41.9	-10 51.6	310 12.3	0 34.5
2	314 5.6	103	-18 .6	-106	188 45.7	-10 51.1	340 17.4	0 34.6
4	343 4.1	102	-18 21.8	-104	218 49.5	-10 50.7	10 22.5	0 34.7
6	12 2.5	102	-18 42.5	-101	248 53.3	-10 50.3	40 27.6	0 34.8
8	41 .8	101	-19 2.8	-99	278 57.1	-10 49.9	70 32.7	0 34.9
10	69 59.1	101	-19 22.7	-97	309 1.0	-10 49.4	100 37.8	0 35.0
12	98 57.2	100	-19 42.1	-95	339 4.8	-10 49.0	130 42.9	0 35.1
14	127 55.2	100	-20 1.0	-92	9 8.6	-10 48.6	160 48.0	0 35.2
16	156 53.2	99	-20 19.4	-90	39 12.4	-10 48.1	190 53.1	0 35.3
18	185 51.1	99	-20 37.4	-88	69 16.2	-10 47.7	220 58.2	0 35.4
20	214 48.9	98	-20 54.9	-85	99 20.0	-10 47.3	251 3.3	0 35.5
22	243 46.6	98	-21 11.9	-83	129 23.8	-10 46.9	281 8.4	0 35.6
Δ					19	2	26	0

φ	SUNCE IZLAZ	SUNCE ZALAZ	TRAJANJE SUMRAKA GRAĐ.	TRAJANJE SUMRAKA ASTR.	MJESEC IZLAZ	MJESEC Δ/24	MJESEC ZALAZ	MJESEC Δ/24
N	h min	h min	h min	h min	h min	min	h min	min
60	8 5	16 24	0 46	2 25	1 20	3.9	8 48	.6
55	7 44	16 45	0 39	2 5	0 52	3.4	9 18	1.0
50	7 28	17 1	0 34	1 51	0 31	3.2	9 40	1.2
45	7 15	17 13	0 31	1 40	0 15	3.0	9 57	1.4
40	7 5	17 24	0 28	1 32	0 2	2.8	10 11	1.6
35	6 56	17 33	0 26	1 26	. . .	.0	10 23	1.7
30	6 48	17 40	0 25	1 21	. . .	.0	10 33	1.8
20	6 34	17 54	0 23	1 15	. . .	.0	10 52	1.9
10	6 22	18 6	0 22	1 12	. . .	.0	11 7	2.0
0	6 11	18 17	0 21	1 11	23 49	2.2	11 22	2.2
10	5 59	18 29	0 22	1 13	23 33	2.1	11 37	2.3
20	5 46	18 41	0 23	1 18	23 15	2.0	11 53	2.4
30	5 32	18 56	0 25	1 27	22 55	1.8	12 12	2.6
35	5 23	19 4	0 27	1 35	22 44	1.8	12 23	2.6
40	5 14	19 14	0 30	1 44	22 30	1.7	12 35	2.8
45	5 2	19 25	0 33	1 59	22 15	1.5	12 50	2.9
50	4 49	19 38	0 37	2 22	21 56	1.4	13 8	3.1
55	4 31	19 56	0 44	3 15	21 31	1.2	13 31	3.3
60	4 7	20 19	0 54	: ::	20 57	.7	14 3	3.7
S								

SUNCE UT	SUNCE $e = T_p - UT$	SUNCE Δ/24	SUNCE r	MJESEC Prolaz	MJESEC Δ/24	MJESEC $\pi_\leftmoon$	MJESEC r
h	min s	s	′	h min	min	′	′
00	-13 57.9	-.2	16.2	$T_{\overline{m}}$ 5 10	2.2	57.6	15.7
12	-14 .3	$T_{\overline{m}_\odot}$ 12 h 14.0 min		Starost 20.7 d	Faza ◑		

PLANETE

Pl.	$T_{\overline{m}}$	π	360−α	Vel.	Pl.	$T_{\overline{m}}$	π	360−α	Vel.
	h min	′	°			h min	′	°	
♀	12 39	.1	35	-3.8	♄	13 24	.0	24	-1.9
♂	23 38	.2	229	-1.2	♃	3 19	.0	175	.7

UT	SUNCE $S_\odot$	SUNCE $\delta_\odot$	PROLJ. TAČKA S_Υ	VENERA S_φ	VENERA δ_φ	MARS S_σ	MARS δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	176 29.3	-15 43.0	136 1.0	170 6.9	-15 8.5	5 24.6	22 53.2
2	206 29.2	-15 41.5	166 5.9	200 5.7	-15 6.4	35 31.5	22 53.6
4	236 29.1	-15 39.9	196 10.9	230 4.5	-15 4.4	65 38.4	22 54.1
6	266 29.0	-15 38.4	226 15.8	260 3.3	-15 2.4	95 45.4	22 54.5
8	296 29.0	-15 36.9	256 20.7	290 2.1	-15 .4	125 52.3	22 55.0
10	326 28.9	-15 35.3	286 25.6	320 .8	-14 58.4	155 59.2	22 55.4
12	356 28.8	-15 33.8	316 30.6	349 59.6	-14 56.3	186 6.1	22 55.9
14	26 28.7	-15 32.2	346 35.5	19 58.4	-14 54.3	216 13.0	22 56.3
16	56 28.6	-15 30.7	16 40.4	49 57.2	-14 52.3	246 19.8	22 56.7
18	86 28.6	-15 29.1	46 45.4	79 56.0	-14 50.2	276 26.7	22 57.2
20	116 28.5	-15 27.6	76 50.3	109 54.8	-14 48.2	306 33.6	22 57.6
22	146 28.4	-15 26.0	106 55.2	139 53.6	-14 46.1	336 40.5	22 58.0
Δ	0	8		-6	10	34	2

UT	MJESEC $S_\leftmoon$	MJESEC Δ	MJESEC $\delta_\leftmoon$	MJESEC Δ	JUPITER $S_\jupiter$	JUPITER $\delta_\jupiter$	SATURN $S_\saturn$	SATURN $\delta_\saturn$
h	° ′		° ′		° ′	° ′	° ′	° ′
0	272 44.2	98	-21 28.4	-80	159 27.6	-10 46.4	311 13.5	0 35.7
2	301 41.7	97	-21 44.5	-78	189 31.4	-10 46.0	341 18.6	0 35.8
4	330 39.1	97	-22 .0	-75	219 35.2	-10 45.6	11 23.7	0 35.9
6	359 36.5	96	-22 15.1	-73	249 39.0	-10 45.1	41 28.9	0 36.0
8	28 33.8	96	-22 29.6	-70	279 42.9	-10 44.7	71 34.0	0 36.1
10	57 31.0	96	-22 43.7	-68	309 46.7	-10 44.3	101 39.1	0 36.2
12	86 28.1	95	-22 57.2	-65	339 50.5	-10 43.8	131 44.2	0 36.3
14	115 25.2	95	-23 10.2	-63	9 54.3	-10 43.4	161 49.3	0 36.4
16	144 22.2	95	-23 22.7	-60	39 58.1	-10 43.0	191 54.4	0 36.5
18	173 19.2	95	-23 34.7	-57	70 1.9	-10 42.5	221 59.5	0 36.6
20	202 16.1	94	-23 46.2	-55	100 5.7	-10 42.1	252 4.6	0 36.7
22	231 12.9	94	-23 57.1	-52	130 9.5	-10 41.7	282 9.7	0 36.8
Δ		19		2			26	1

φ	SUNCE IZLAZ	SUNCE ZALAZ	TRAJANJE SUMRAKA GRAĐ.	TRAJANJE SUMRAKA ASTR.	MJESEC IZLAZ	MJESEC Δ/24	MJESEC ZALAZ	MJESEC Δ/24
N	h min	h min	h min	h min	h min	min	h min	min
60	8 2	16 27	0 46	2 24	2 53	3.6	9 2	1.0
55	7 42	16 47	0 39	2 4	2 14	3.1	9 42	1.3
50	7 26	17 3	0 34	1 50	1 47	2.9	10 9	1.6
45	7 14	17 15	0 31	1 40	1 27	2.8	10 31	1.7
40	7 4	17 25	0 28	1 32	1 10	2.7	10 48	1.8
35	6 55	17 34	0 26	1 26	0 56	2.6	11 3	1.9
30	6 47	17 41	0 25	1 21	0 44	2.5	11 16	1.9
20	6 34	17 55	0 23	1 15	0 23	2.4	11 37	2.0
10	6 22	18 6	0 22	1 12	0 6	2.3	11 56	2.1
0	6 11	18 18	0 21	1 11	.. ..	.0	12 14	2.2
10	5 59	18 29	0 22	1 13	.. ..	.0	12 32	2.3
20	5 47	18 41	0 23	1 18	.. ..	.0	12 51	2.3
30	5 33	18 55	0 25	1 27	23 39	2.0	13 13	2.4
35	5 25	19 3	0 27	1 34	23 26	2.0	13 26	2.5
40	5 15	19 12	0 29	1 44	23 10	1.9	13 41	2.6
45	5 4	19 23	0 32	1 58	22 52	1.8	13 59	2.6
50	4 50	19 37	0 37	2 21	22 29	1.7	14 21	2.8
55	4 33	19 54	0 43	3 10	21 59	1.6	14 50	2.9
60	4 10	20 17	0 54	: ::	21 15	1.3	15 33	3.3
S								

SUNCE UT	SUNCE $e = T_p - UT$	SUNCE Δ/24	SUNCE r	MJESEC Prolaz	MJESEC Δ/24	MJESEC $\pi_\leftmoon$	MJESEC r
h	min s	s	′	h min	min	′	′
00	-14 2.6	-.2	16.2	$T_{\overline{m}}$ 6 2	2.2	56.7	15.5
12	-14 4.6	$T_{\overline{m}_\odot}$ 12 h 14.1 min		Starost 21.7 d	Faza ◑		

PLANETE Pl.	$T_{\overline{m}}$	π	360−α	Vel.	Pl.	$T_{\overline{m}}$	π	360−α	Vel.
	h min	′	°			h min	′	°	
♀	12 40	.1	34	-3.8	♃	13 20	.0	23	-1.9
♂	23 33	.2	229	-1.2	♄	3 15	.0	175	.7

UT	SUNCE $S_\odot$	SUNCE $\delta_\odot$	PROLJ. TAČKA S_Υ	VENERA S_φ	VENERA δ_φ	MARS S_σ	MARS δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	176 28.3	-15 24.5	137 .1	169 52.4	-14 44.1	6 47.4	22 58.5
2	206 28.3	-15 22.9	167 5.1	199 51.2	-14 42.1	36 54.3	22 58.9
4	236 28.2	-15 21.4	197 10.0	229 50.0	-14 40.0	67 1.2	22 59.3
6	266 28.1	-15 19.8	227 14.9	259 48.8	-14 38.0	97 8.0	22 59.7
8	296 28.0	-15 18.2	257 19.9	289 47.6	-14 35.9	127 14.9	23 .2
10	326 28.0	-15 16.7	287 24.8	319 46.4	-14 33.8	157 21.8	23 .6
12	356 27.9	-15 15.1	317 29.7	349 45.3	-14 31.8	187 28.7	23 1.0
14	26 27.8	-15 13.5	347 34.6	19 44.1	-14 29.7	217 35.5	23 1.4
16	56 27.8	-15 12.0	17 39.6	49 42.9	-14 27.6	247 42.4	23 1.8
18	86 27.7	-15 10.4	47 44.5	79 41.7	-14 25.6	277 49.3	23 2.2
20	116 27.7	-15 8.8	77 49.4	109 40.5	-14 23.5	307 56.1	23 2.6
22	146 27.6	-15 7.2	107 54.4	139 39.4	-14 21.4	338 3.0	23 3.1
Δ	0	8		-6	10	34	2

UT	MJESEC $S_\leftmoon$	MJESEC Δ	MJESEC $\delta_\leftmoon$	MJESEC Δ	JUPITER $S_\jupiter$	JUPITER $\delta_\jupiter$	SATURN $S_\saturn$	SATURN $\delta_\saturn$
h	° ′		° ′		° ′	° ′	° ′	° ′
0	260 9.7	94	-24 7.6	-50	160 13.3	-10 41.3	312 14.8	0 36.9
2	289 6.5	94	-24 17.5	-47	190 17.1	-10 40.8	342 20.0	0 37.0
4	318 3.2	94	-24 26.9	-44	220 20.9	-10 40.4	12 25.1	0 37.1
6	347 .0	93	-24 35.7	-42	250 24.7	-10 40.0	42 30.2	0 37.2
8	15 56.6	93	-24 44.0	-39	280 28.5	-10 39.5	72 35.3	0 37.3
10	44 53.3	93	-24 51.8	-36	310 32.3	-10 39.1	102 40.4	0 37.4
12	73 50.0	93	-24 59.1	-34	340 36.2	-10 38.7	132 45.5	0 37.5
14	102 46.6	93	-25 5.8	-31	10 40.0	-10 38.2	162 50.6	0 37.6
16	131 43.3	93	-25 12.0	-28	40 43.8	-10 37.8	192 55.8	0 37.7
18	160 40.0	93	-25 17.7	-26	70 47.6	-10 37.4	223 .9	0 37.8
20	189 36.7	94	-25 22.8	-23	100 51.4	-10 36.9	253 6.0	0 37.9
22	218 33.4	94	-25 27.4	-20	130 55.2	-10 36.5	283 11.1	0 38.1
Δ		19		2			26	1

φ	SUNCE IZLAZ	SUNCE ZALAZ	TRAJANJE SUMRAKA GRAĐ.	TRAJANJE SUMRAKA ASTR.	MJESEC IZLAZ	MJESEC Δ/24	MJESEC ZALAZ	MJESEC Δ/24
N	h min	h min	h min	h min	h min	min	h min	min
60	7 60	16 30	0 46	2 24	4 18	2.9	9 25	1.6
55	7 40	16 49	0 39	2 4	3 29	2.7	10 14	1.8
50	7 25	17 4	0 34	1 50	2 57	2.6	10 47	1.9
45	7 13	17 16	0 31	1 40	2 33	2.5	11 11	2.0
40	7 3	17 26	0 28	1 32	2 14	2.4	11 31	2.0
35	6 54	17 35	0 26	1 26	1 58	2.4	11 47	2.1
30	6 46	17 42	0 25	1 21	1 44	2.4	12 2	2.1
20	6 33	17 55	0 23	1 15	1 20	2.3	12 26	2.1
10	6 22	18 7	0 22	1 12	1 0	2.2	12 47	2.2
0	6 11	18 18	0 21	1 11	0 41	2.2	13 7	2.2
10	5 60	18 29	0 22	1 13	0 22	2.1	13 26	2.2
20	5 48	18 40	0 23	1 18	0 2	2.1	13 47	2.2
30	5 34	18 54	0 25	1 27	.. ..	.0	14 11	2.3
35	5 26	19 2	0 27	1 34	.. ..	.0	14 26	2.3
40	5 16	19 11	0 29	1 43	23 56	2.1	14 42	2.3
45	5 5	19 22	0 32	1 57	23 36	2.1	15 2	2.3
50	4 52	19 35	0 37	2 19	23 11	2.1	15 27	2.4
55	4 35	19 52	0 43	3 5	22 37	2.1	16 1	2.4
60	4 13	20 14	0 53	: ::	21 45	2.0	16 52	2.5
S								

SUNCE UT	SUNCE $e = T_p - UT$	SUNCE Δ/24	SUNCE r	MJESEC Prolaz	MJESEC Δ/24	MJESEC $\pi_\leftmoon$	MJESEC r
h	min s	s	′	h min	min	′	′
00	-14 6.5	-.1	16.2	$T_{\overline{m}}$ 6 54	2.2	56.0	15.2
12	-14 8.1	$T_{\overline{m}_\odot}$ 12 h 14.1 min		Starost 22.7 d	Faza ◑		

PLANETE Pl.	$T_{\overline{m}}$	π	360−α	Vel.	Pl.	$T_{\overline{m}}$	π	360−α	Vel.
	h min	′	°			h min	′	°	
♀	12 41	.1	33	-3.8	♃	13 17	.0	23	-1.9
♂	23 27	.2	230	-1.2	♄	3 10	.0	175	.7

UT	SUNCE $S_\odot$	SUNCE $\delta_\odot$	PROLJ. TAČKA S_Υ	VENERA S_φ	VENERA δ_φ	MARS S_σ	MARS δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	176 27.5	-15 5.7	137 59.3	169 38.2	-14 19.4	8 9.8	23 3.5
2	206 27.5	-15 4.1	168 4.2	199 37.0	-14 17.3	38 16.7	23 3.9
4	236 27.4	-15 2.5	198 9.1	229 35.8	-14 15.2	68 23.5	23 4.3
6	266 27.4	-15 .9	228 14.1	259 34.7	-14 13.1	98 30.4	23 4.7
8	296 27.3	-14 59.3	258 19.0	289 33.5	-14 11.0	128 37.2	23 5.1
10	326 27.3	-14 57.8	288 23.9	319 32.3	-14 8.9	158 44.1	23 5.5
12	356 27.2	-14 56.2	318 28.9	349 31.2	-14 6.8	188 50.9	23 5.9
14	26 27.2	-14 54.6	348 33.8	19 30.0	-14 4.7	218 57.7	23 6.3
16	56 27.1	-14 53.0	18 38.7	49 28.9	-14 2.6	249 4.6	23 6.7
18	86 27.1	-14 51.4	48 43.6	79 27.7	-14 .5	279 11.4	23 7.1
20	116 27.0	-14 49.8	78 48.6	109 26.5	-13 58.4	309 18.2	23 7.5
22	146 27.0	-14 48.2	108 53.5	139 25.4	-13 56.3	339 25.0	23 7.8
Δ	0	8		-6	10	34	2

UT	MJESEC $S_\leftmoon$	MJESEC Δ	MJESEC $\delta_\leftmoon$	MJESEC Δ	JUPITER $S_\jupiter$	JUPITER $\delta_\jupiter$	SATURN $S_\saturn$	SATURN $\delta_\saturn$
h	° ′		° ′		° ′	° ′	° ′	° ′
0	247 30.2	94	-25 31.5	-18	160 59.0	-10 36.1	313 16.2	0 38.2
2	276 27.0	94	-25 35.0	-15	191 2.8	-10 35.6	343 21.4	0 38.3
4	305 23.8	94	-25 38.0	-12	221 6.6	-10 35.2	13 26.5	0 38.4
6	334 20.7	95	-25 40.5	-10	251 10.4	-10 34.8	43 31.6	0 38.5
8	3 17.7	95	-25 42.5	-7	281 14.2	-10 34.3	73 36.7	0 38.6
10	32 14.7	96	-25 43.9	-5	311 18.0	-10 33.9	103 41.8	0 38.7
12	61 11.8	96	-25 44.8	-2	341 21.8	-10 33.5	133 47.0	0 38.8
14	90 9.0	96	-25 45.2	1	11 25.6	-10 33.0	163 52.1	0 38.9
16	119 6.3	97	-25 45.0	3	41 29.4	-10 32.6	193 57.2	0 39.0
18	148 3.7	97	-25 44.3	6	71 33.2	-10 32.2	224 2.3	0 39.1
20	177 1.2	98	-25 43.2	8	101 37.0	-10 31.7	254 7.5	0 39.2
22	205 58.8	99	-25 41.5	11	131 40.8	-10 31.3	284 12.6	0 39.3
Δ					19	2	26	1

φ	SUNCE IZLAZ	SUNCE ZALAZ	TRAJANJE SUMRAKA GRAĐ.	TRAJANJE SUMRAKA ASTR.	MJESEC IZLAZ	MJESEC Δ/24	MJESEC ZALAZ	MJESEC Δ/24
N	h min	h min	h min	h min	h min	min	h min	min
60	7 57	16 32	0 46	2 23	5 29	2.0	10 3	2.4
55	7 38	16 51	0 39	2 4	4 34	2.1	10 58	2.3
50	7 23	17 6	0 34	1 50	3 59	2.1	11 33	2.3
45	7 11	17 18	0 31	1 40	3 33	2.1	11 59	2.3
40	7 2	17 27	0 28	1 32	3 12	2.1	12 20	2.3
35	6 53	17 36	0 26	1 26	2 55	2.2	12 37	2.2
30	6 46	17 43	0 25	1 21	2 40	2.2	12 52	2.2
20	6 33	17 56	0 23	1 15	2 15	2.2	13 17	2.2
10	6 22	18 7	0 22	1 12	1 54	2.2	13 39	2.2
0	6 11	18 18	0 21	1 11	1 34	2.2	13 59	2.1
10	5 60	18 28	0 22	1 13	1 14	2.2	14 19	2.1
20	5 48	18 40	0 23	1 18	0 52	2.2	14 41	2.1
30	5 34	18 53	0 25	1 27	0 27	2.2	15 6	2.1
35	5 27	19 1	0 27	1 33	0 13	2.2	15 21	2.0
40	5 17	19 10	0 29	1 43	.. ..	.0	15 38	2.0
45	5 7	19 21	0 32	1 57	.. ..	.0	15 58	2.0
50	4 54	19 33	0 36	2 18	.. ..	.0	16 24	1.9
55	4 37	19 50	0 43	3 1	23 27	2.6	16 59	1.8
60	4 15	20 11	0 53	: ::	22 33	2.8	17 52	1.6
S								

SUNCE UT	SUNCE $e = T_p - UT$	SUNCE Δ/24	SUNCE r	MJESEC Prolaz	MJESEC Δ/24	MJESEC $\pi_\leftmoon$	MJESEC r
h	min s	s	′	h min	min	′	′
00	-14 9.6	-.1	16.2	$T_{\overline{m}}$ 7 46	2.2	55.3	15.1
12	-14 10.8	$T_{\overline{m}_\odot}$ 12 h 14.2 min		Starost 23.7 d	Faza ◑		

PLANETE

Pl.	$T_{\overline{m}}$	π	360−α	Vel.	Pl.	$T_{\overline{m}}$	π	360−α	Vel.
	h min	′	°			h min	′	°	
♀	12 42	.1	32	-3.8	♃	13 14	.0	23	-1.9
♂	23 22	.2	230	-1.1	♄	3 6	.0	175	.7

UT	SUNCE $S_\odot$	SUNCE $\delta_\odot$	PROLJ. TAČKA S_Υ	VENERA S_φ	VENERA δ_φ	MARS S_σ	MARS δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	176 27.0	-14 46.6	138 58.4	169 24.2	-13 54.2	9 31.9	23 8.2
2	206 26.9	-14 45.0	169 3.4	199 23.1	-13 52.1	39 38.7	23 8.6
4	236 26.9	-14 43.4	199 8.3	229 21.9	-13 50.0	69 45.5	23 9.0
6	266 26.8	-14 41.8	229 13.2	259 20.8	-13 47.9	99 52.3	23 9.4
8	296 26.8	-14 40.2	259 18.1	289 19.7	-13 45.7	129 59.1	23 9.8
10	326 26.8	-14 38.6	289 23.1	319 18.5	-13 43.6	160 5.9	23 10.1
12	356 26.7	-14 37.0	319 28.0	349 17.4	-13 41.5	190 12.7	23 10.5
14	26 26.7	-14 35.4	349 32.9	19 16.2	-13 39.4	220 19.5	23 10.9
16	56 26.7	-14 33.8	19 37.8	49 15.1	-13 37.2	250 26.3	23 11.3
18	86 26.6	-14 32.2	49 42.8	79 14.0	-13 35.1	280 33.1	23 11.6
20	116 26.6	-14 30.5	79 47.7	109 12.8	-13 33.0	310 39.9	23 12.0
22	146 26.6	-14 28.9	109 52.6	139 11.7	-13 30.8	340 46.7	23 12.4
Δ	0	8		-6	11	34	2

UT	MJESEC $S_\leftmoon$	MJESEC Δ	MJESEC $\delta_\leftmoon$	MJESEC Δ	JUPITER $S_\jupiter$	JUPITER $\delta_\jupiter$	SATURN $S_\saturn$	SATURN $\delta_\saturn$
h	° ′		° ′		° ′	° ′	° ′	° ′
0	234 56.5	99	-25 39.3	14	161 44.6	-10 30.9	314 17.7	0 39.4
2	263 54.3	100	-25 36.5	16	191 48.5	-10 30.4	344 22.8	0 39.5
4	292 52.3	101	-25 33.3	19	221 52.3	-10 30.0	14 28.0	0 39.6
6	321 50.4	101	-25 29.6	21	251 56.1	-10 29.6	44 33.1	0 39.8
8	350 48.7	102	-25 25.4	24	281 59.9	-10 29.1	74 38.2	0 39.9
10	19 47.1	103	-25 20.7	26	312 3.7	-10 28.7	104 43.4	0 40.0
12	48 45.7	104	-25 15.5	28	342 7.5	-10 28.2	134 48.5	0 40.1
14	77 44.5	105	-25 9.8	31	12 11.3	-10 27.8	164 53.6	0 40.2
16	106 43.4	105	-25 3.6	33	42 15.1	-10 27.4	194 58.7	0 40.3
18	135 42.5	106	-24 56.9	36	72 18.9	-10 26.9	225 3.9	0 40.4
20	164 41.7	107	-24 49.8	38	102 22.7	-10 26.5	255 9.0	0 40.5
22	193 41.2	108	-24 42.2	40	132 26.5	-10 26.1	285 14.1	0 40.6
Δ					19	2	26	1

φ	SUNCE IZLAZ	SUNCE ZALAZ	TRAJANJE SUMRAKA GRAĐ.	TRAJANJE SUMRAKA ASTR.	MJESEC IZLAZ	MJESEC Δ/24	MJESEC ZALAZ	MJESEC Δ/24
N	h min	h min	h min	h min	h min	min	h min	min
60	7 54	16 35	0 45	2 23	6 17	1.2	11 2	3.1
55	7 36	16 54	0 39	2 4	5 24	1.5	11 54	2.8
50	7 21	17 8	0 34	1 50	4 50	1.7	12 28	2.6
45	7 10	17 19	0 31	1 40	4 24	1.8	12 54	2.5
40	7 0	17 29	0 28	1 32	4 4	1.8	13 14	2.4
35	6 52	17 37	0 26	1 26	3 47	1.9	13 31	2.3
30	6 45	17 44	0 25	1 21	3 32	1.9	13 45	2.3
20	6 32	17 56	0 23	1 15	3 7	2.0	14 10	2.2
10	6 21	18 7	0 22	1 12	2 46	2.1	14 31	2.1
0	6 11	18 18	0 21	1 11	2 26	2.1	14 50	2.1
10	6 0	18 28	0 22	1 13	2 6	2.2	15 10	2.0
20	5 49	18 40	0 23	1 18	1 44	2.2	15 31	1.9
30	5 35	18 53	0 25	1 26	1 19	2.3	15 55	1.8
35	5 28	19 0	0 27	1 33	1 5	2.3	16 9	1.8
40	5 19	19 9	0 29	1 42	0 48	2.3	16 26	1.7
45	5 8	19 19	0 32	1 56	0 27	2.4	16 45	1.6
50	4 56	19 32	0 36	2 17	0 1	2.5	17 10	1.5
55	4 40	19 48	0 42	2 57	.. ..	.0	17 42	1.3
60	4 18	20 9	0 52	: ::	23 40	3.3	18 31	.9
S								

SUNCE UT	SUNCE $e = T_p - UT$	SUNCE Δ/24	SUNCE r	MJESEC Prolaz	MJESEC Δ/24	MJESEC $\pi_\leftmoon$	MJESEC r
h	min s	s	′	h min	min	′	′
00	-14 12.0	-.1	16.2	$T_{\overline{m}}$ 8 38	2.1	54.8	14.9
12	-14 12.8	$T_{\overline{m}_\odot}$ 12 h 14.2 min		Starost 24.7 d	Faza ◑		

PLANETE

Pl.	$T_{\overline{m}}$	π	360−α	Vel.	Pl.	$T_{\overline{m}}$	π	360−α	Vel.
	h min	′	°			h min	′	°	
♀	12 43	.1	30	-3.8	♃	13 11	.0	23	-1.9
♂	23 17	.2	231	-1.1	♄	3 2	.0	175	.7

UT	SUNCE $S_\odot$	$\delta_\odot$	PROLJ. TAČKA S_Υ	VENERA S_φ	δ_φ	MARS S_σ	δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	176 26.6	-14 27.3	139 57.6	169 10.6	-13 28.7	10 53.5	23 12.7
2	206 26.5	-14 25.7	170 2.5	199 9.5	-13 26.5	41 .2	23 13.1
4	236 26.5	-14 24.1	200 7.4	229 8.3	-13 24.4	71 7.0	23 13.5
6	266 26.5	-14 22.4	230 12.3	259 7.2	-13 22.2	101 13.8	23 13.8
8	296 26.5	-14 20.8	260 17.3	289 6.1	-13 20.1	131 20.5	23 14.2
10	326 26.5	-14 19.2	290 22.2	319 5.0	-13 17.9	161 27.3	23 14.6
12	356 26.4	-14 17.6	320 27.1	349 3.9	-13 15.8	191 34.1	23 14.9
14	26 26.4	-14 15.9	350 32.1	19 2.8	-13 13.6	221 40.8	23 15.3
16	56 26.4	-14 14.3	20 37.0	49 1.6	-13 11.5	251 47.6	23 15.6
18	86 26.4	-14 12.7	50 41.9	79 .5	-13 9.3	281 54.3	23 16.0
20	116 26.4	-14 11.0	80 46.8	108 59.4	-13 7.1	312 1.1	23 16.3
22	146 26.4	-14 9.4	110 51.8	138 58.3	-13 5.0	342 7.8	23 16.7
Δ	0	8		-6	11	34	2

UT	MJESEC $S_\leftmoon$	Δ	$\delta_\leftmoon$	Δ	JUPITER S_4	δ_4	SATURN S_η	δ_η
h	° ′		° ′		° ′	° ′	° ′	° ′
0	222 40.9	109	-24 34.1	43	162 30.3	-10 25.6	315 19.3	0 40.7
2	251 40.7	110	-24 25.6	45	192 34.1	-10 25.2	345 24.4	0 40.8
4	280 40.8	111	-24 16.6	47	222 37.9	-10 24.8	15 29.5	0 41.0
6	309 41.0	112	-24 7.2	49	252 41.7	-10 24.3	45 34.7	0 41.1
8	338 41.5	113	-23 57.3	52	282 45.5	-10 23.9	75 39.8	0 41.2
10	7 42.2	114	-23 47.0	54	312 49.3	-10 23.5	105 45.0	0 41.3
12	36 43.1	116	-23 36.3	56	342 53.1	-10 23.0	135 50.1	0 41.4
14	65 44.2	117	-23 25.1	58	12 56.9	-10 22.6	165 55.2	0 41.5
16	94 45.5	118	-23 13.5	60	43 .7	-10 22.1	196 .4	0 41.6
18	123 47.1	119	-23 1.5	62	73 4.5	-10 21.7	226 5.5	0 41.7
20	152 48.8	120	-22 49.1	64	103 8.3	-10 21.3	256 10.6	0 41.8
22	181 50.9	121	-22 36.3	66	133 12.1	-10 20.8	286 15.8	0 42.0
Δ					19	2	26	1

φ	SUNCE IZLAZ	ZALAZ	TRAJANJE SUMRAKA GRAĐ.	ASTR.	MJESEC IZLAZ	Δ/24	ZALAZ	Δ/24
N	h min	h min	h min	h min	h min	min	h min	min
60	7 52	16 38	0 45	2 23	6 47	.7	12 16	3.4
55	7 34	16 56	0 38	2 3	6 1	1.1	13 1	3.0
50	7 20	17 9	0 34	1 50	5 30	1.3	13 31	2.8
45	7 9	17 21	0 31	1 39	5 7	1.5	13 53	2.6
40	6 59	17 30	0 28	1 32	4 48	1.6	14 12	2.5
35	6 51	17 38	0 26	1 26	4 32	1.6	14 27	2.4
30	6 44	17 45	0 25	1 21	4 19	1.7	14 40	2.3
20	6 32	17 57	0 23	1 15	3 55	1.8	15 3	2.2
10	6 21	18 7	0 22	1 12	3 35	1.9	15 22	2.1
0	6 11	18 18	0 21	1 11	3 16	2.0	15 40	2.0
10	6 0	18 28	0 22	1 13	2 57	2.1	15 58	1.9
20	5 49	18 39	0 23	1 17	2 37	2.2	16 17	1.8
30	5 36	18 52	0 25	1 26	2 13	2.3	16 39	1.6
35	5 29	18 59	0 27	1 33	1 60	2.4	16 52	1.5
40	5 20	19 8	0 29	1 42	1 44	2.5	17 6	1.4
45	5 10	19 18	0 32	1 55	1 24	2.6	17 24	1.3
50	4 57	19 30	0 36	2 15	1 1	2.7	17 46	1.2
55	4 42	19 45	0 42	2 54	0 29	2.9	18 14	.9
60	4 21	20 6	0 52	: ::	. . .	.0	18 54	.6
S								

SUNCE UT	$e = T_p - UT$	Δ/24	r	MJESEC Prolaz	Δ/24	$\pi_\leftmoon$	r
h	min s	s	′	h min	min	′	′
00	-14 13.6	.0	16.2	$T_{\overline{m}}$ 9 28	2.0	54.4	14.8
12	-14 14.0	$T_{\overline{m}_\odot}$ 12 h 14.2 min		Starost 25.7 d	Faza ●		

PLANETE

Pl.	$T_{\overline{m}}$	π	360−α	Vel.	Pl.	$T_{\overline{m}}$	π	360−α	Vel.
	h min	′	°			h min	′	°	
♀	12 44	.1	29	-3.8	♃	13 8	.0	23	-1.9
♂	23 11	.2	231	-1.1	♄	2 58	.0	175	.7

UT	SUNCE $S_\odot$	$\delta_\odot$	PROLJ. TAČKA S_Υ	VENERA S_φ	δ_φ	MARS S_σ	δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	176 26.4	-14 7.8	140 56.7	168 57.2	-13 2.8	12 14.6	23 17.0
2	206 26.3	-14 6.1	171 1.6	198 56.1	-13 .6	42 21.3	23 17.3
4	236 26.3	-14 4.5	201 6.6	228 55.0	-12 58.4	72 28.0	23 17.7
6	266 26.3	-14 2.8	231 11.5	258 53.9	-12 56.3	102 34.8	23 18.0
8	296 26.3	-14 1.2	261 16.4	288 52.8	-12 54.1	132 41.5	23 18.4
10	326 26.3	-13 59.5	291 21.3	318 51.7	-12 51.9	162 48.2	23 18.7
12	356 26.3	-13 57.9	321 26.3	348 50.6	-12 49.7	192 54.9	23 19.0
14	26 26.3	-13 56.2	351 31.2	18 49.5	-12 47.5	223 1.6	23 19.4
16	56 26.3	-13 54.6	21 36.1	48 48.5	-12 45.3	253 8.4	23 19.7
18	86 26.3	-13 52.9	51 41.1	78 47.4	-12 43.2	283 15.1	23 20.0
20	116 26.3	-13 51.3	81 46.0	108 46.3	-12 41.0	313 21.8	23 20.4
22	146 26.3	-13 49.6	111 50.9	138 45.2	-12 38.8	343 28.5	23 20.7
Δ	0	8		-5	11	34	2

UT	MJESEC $S_\leftmoon$	Δ	$\delta_\leftmoon$	Δ	JUPITER S_4	δ_4	SATURN S_η	δ_η
h	° ′		° ′		° ′	° ′	° ′	° ′
0	210 53.1	122	-22 23.0	68	163 15.9	-10 20.4	316 20.9	0 42.1
2	239 55.6	123	-22 9.4	70	193 19.7	-10 20.0	346 26.1	0 42.2
4	268 58.2	125	-21 55.4	72	223 23.5	-10 19.5	16 31.2	0 42.3
6	298 1.2	126	-21 41.0	74	253 27.3	-10 19.1	46 36.4	0 42.4
8	327 4.3	127	-21 26.2	76	283 31.1	-10 18.6	76 41.5	0 42.5
10	356 7.7	128	-21 11.1	78	313 34.9	-10 18.2	106 46.6	0 42.6
12	25 11.4	129	-20 55.6	79	343 38.7	-10 17.8	136 51.8	0 42.8
14	54 15.2	130	-20 39.7	81	13 42.5	-10 17.3	166 56.9	0 42.9
16	83 19.3	132	-20 23.5	83	43 46.3	-10 16.9	197 2.1	0 43.0
18	112 23.6	133	-20 6.9	84	73 50.1	-10 16.5	227 7.2	0 43.1
20	141 28.2	134	-19 50.0	86	103 53.9	-10 16.0	257 12.4	0 43.2
22	170 33.0	135	-19 32.8	88	133 57.7	-10 15.6	287 17.5	0 43.3
Δ					19	2	26	1

φ	SUNCE IZLAZ	ZALAZ	TRAJANJE SUMRAKA GRAĐ.	ASTR.	MJESEC IZLAZ	Δ/24	ZALAZ	Δ/24
N	h min	h min	h min	h min	h min	min	h min	min
60	7 49	16 40	0 45	2 22	7 4	.4	13 38	3.5
55	7 31	16 58	0 38	2 3	6 28	.8	14 12	3.1
50	7 18	17 11	0 34	1 49	6 2	1.0	14 37	2.8
45	7 7	17 22	0 30	1 39	5 42	1.2	14 56	2.6
40	6 58	17 31	0 28	1 31	5 26	1.3	15 12	2.5
35	6 50	17 39	0 26	1 25	5 12	1.4	15 25	2.4
30	6 43	17 45	0 25	1 21	4 60	1.5	15 36	2.3
20	6 31	17 57	0 23	1 15	4 39	1.7	15 55	2.1
10	6 21	18 8	0 22	1 11	4 21	1.8	16 12	2.0
0	6 11	18 18	0 21	1 11	4 5	1.9	16 27	1.9
10	6 1	18 28	0 22	1 13	3 48	2.0	16 43	1.7
20	5 50	18 39	0 23	1 17	3 30	2.2	16 59	1.6
30	5 37	18 51	0 25	1 26	3 9	2.3	17 18	1.4
35	5 30	18 58	0 27	1 32	2 57	2.4	17 29	1.3
40	5 21	19 7	0 29	1 42	2 43	2.5	17 41	1.2
45	5 11	19 16	0 32	1 54	2 26	2.6	17 56	1.1
50	4 59	19 28	0 36	2 14	2 5	2.8	18 13	.9
55	4 44	19 43	0 42	2 51	1 38	3.0	18 36	.7
60	4 24	20 3	0 51	: ::	0 59	3.4	19 7	.3
S								

SUNCE UT	$e = T_p - UT$	Δ/24	r	MJESEC Prolaz	Δ/24	$\pi_\leftmoon$	r
h	min s	s	′	h min	min	′	′
00	-14 14.4	.0	16.2	$T_{\overline{m}}$ 10 16	1.9	54.1	14.8
12	-14 14.4	$T_{\overline{m}_\odot}$ 12 h 14.2 min		Starost 26.7 d	Faza ●		

PLANETE

Pl.	$T_{\overline{m}}$	π	360−α	Vel.	Pl.	$T_{\overline{m}}$	π	360−α	Vel.
	h min	′	°			h min	′	°	
♀	12 45	.1	28	-3.8	♃	13 5	.0	22	-1.9
♂	23 6	.2	231	-1.1	♄	2 54	.0	175	.7

UT	SUNCE $S_\odot$	SUNCE $\delta_\odot$	PROLJ. TAČKA S_Υ	VENERA S_φ	VENERA δ_φ	MARS S_σ	MARS δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	176 26.3	-13 48.0	141 55.8	168 44.1	-12 36.6	13 35.2	23 21.0
2	206 26.4	-13 46.3	172 .8	198 43.0	-12 34.4	43 41.9	23 21.3
4	236 26.4	-13 44.7	202 5.7	228 42.0	-12 32.2	73 48.5	23 21.6
6	266 26.4	-13 43.0	232 10.6	258 40.9	-12 29.9	103 55.2	23 22.0
8	296 26.4	-13 41.3	262 15.6	288 39.8	-12 27.7	134 1.9	23 22.3
10	326 26.4	-13 39.7	292 20.5	318 38.7	-12 25.5	164 8.6	23 22.6
12	356 26.4	-13 38.0	322 25.4	348 37.7	-12 23.3	194 15.3	23 22.9
14	26 26.4	-13 36.3	352 30.3	18 36.6	-12 21.1	224 21.9	23 23.2
16	56 26.4	-13 34.7	22 35.3	48 35.5	-12 18.9	254 28.6	23 23.5
18	86 26.5	-13 33.0	52 40.2	78 34.5	-12 16.7	284 35.2	23 23.8
20	116 26.5	-13 31.3	82 45.1	108 33.4	-12 14.4	314 41.9	23 24.1
22	146 26.5	-13 29.6	112 50.0	138 32.4	-12 12.2	344 48.6	23 24.4
Δ	0	8		-5	11	33	2

UT	MJESEC $S_\leftmoon$	MJESEC Δ	MJESEC $\delta_\leftmoon$	MJESEC Δ	JUPITER S_4	JUPITER δ_4	SATURN S_η	SATURN δ_η
h	° ′		° ′		° ′	° ′	° ′	° ′
0	199 38.0	136	-19 15.3	89	164 1.5	-10 15.1	317 22.7	0 43.4
2	228 43.2	137	-18 57.4	91	194 5.3	-10 14.7	347 27.8	0 43.6
4	257 48.7	138	-18 39.2	92	224 9.1	-10 14.3	17 33.0	0 43.7
6	286 54.3	139	-18 20.7	94	254 12.9	-10 13.8	47 38.1	0 43.8
8	316 .2	141	-18 1.9	95	284 16.7	-10 13.4	77 43.2	0 43.9
10	345 6.4	142	-17 42.8	97	314 20.5	-10 12.9	107 48.4	0 44.0
12	14 12.7	143	-17 23.4	98	344 24.3	-10 12.5	137 53.5	0 44.1
14	43 19.2	144	-17 3.8	100	14 28.1	-10 12.1	167 58.7	0 44.3
16	72 26.0	145	-16 43.8	101	44 31.9	-10 11.6	198 3.9	0 44.4
18	101 32.9	146	-16 23.6	102	74 35.7	-10 11.2	228 9.0	0 44.5
20	130 40.1	147	-16 3.2	104	104 39.5	-10 10.7	258 14.2	0 44.6
22	159 47.4	148	-15 42.4	105	134 43.3	-10 10.3	288 19.3	0 44.7
Δ					19	2	26	1

φ	SUNCE IZLAZ	SUNCE ZALAZ	TRAJANJE SUMRAKA GRAĐ.	TRAJANJE SUMRAKA ASTR.	MJESEC IZLAZ	MJESEC Δ/24	MJESEC ZALAZ	MJESEC Δ/24
N	h min	h min	h min	h min	h min	min	h min	min
60	7 47	16 43	0 45	2 22	7 14	.3	15 1	3.4
55	7 29	16 60	0 38	2 3	6 47	.6	15 26	3.1
50	7 16	17 13	0 34	1 49	6 27	.8	15 45	2.8
45	7 6	17 23	0 30	1 39	6 11	1.0	15 60	2.6
40	6 57	17 32	0 28	1 31	5 57	1.1	16 12	2.5
35	6 49	17 40	0 26	1 25	5 46	1.3	16 22	2.4
30	6 43	17 46	0 25	1 21	5 36	1.4	16 31	2.3
20	6 31	17 58	0 23	1 15	5 19	1.5	16 46	2.1
10	6 21	18 8	0 22	1 11	5 5	1.7	16 60	1.9
0	6 11	18 18	0 21	1 11	4 51	1.8	17 12	1.8
10	6 1	18 27	0 22	1 12	4 37	2.0	17 24	1.6
20	5 50	18 38	0 23	1 17	4 22	2.1	17 37	1.5
30	5 38	18 50	0 25	1 26	4 4	2.3	17 52	1.3
35	5 31	18 57	0 27	1 32	3 54	2.4	18 1	1.2
40	5 22	19 5	0 29	1 41	3 43	2.5	18 11	1.1
45	5 13	19 15	0 32	1 54	3 29	2.6	18 22	.9
50	5 1	19 26	0 36	2 13	3 12	2.8	18 36	.8
55	4 46	19 41	0 41	2 48	2 51	3.1	18 53	.5
60	4 26	20 0	0 50	: ::	2 22	3.4	19 16	.2
S								

SUNCE UT	SUNCE $e = T_p - UT$	SUNCE Δ/24	SUNCE r	MJESEC Prolaz	MJESEC Δ/24	MJESEC $\pi_\leftmoon$	MJESEC r
h	min s	s	′	h min	min	′	′
00	-14 14.4	.0	16.2	$T_{\overline{m}}$ 11 1	1.8	54.0	14.7
12	-14 14.1	$T_{\overline{m}_\odot}$ 12 h 14.2 min		Starost 27.7 d	Faza ●		

PLANETE

Pl.	$T_{\overline{m}}$	π	360−α	Vel.	Pl.	$T_{\overline{m}}$	π	360−α	Vel.
	h min	′	°			h min	′	°	
♀	12 46	.1	27	-3.8	♃	13 2	.0	22	-1.9
♂	23 1	.2	232	-1.1	♄	2 50	.0	175	.7

UT	SUNCE $S_\odot$	SUNCE $\delta_\odot$	PROLJ. TAČKA S_Υ	VENERA S_φ	VENERA δ_φ	MARS S_σ	MARS δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	176 26.5	-13 28.0	142 55.0	168 31.3	-12 10.0	14 55.2	23 24.7
2	206 26.5	-13 26.3	172 59.9	198 30.2	-12 7.8	45 1.9	23 25.0
4	236 26.6	-13 24.6	203 4.8	228 29.2	-12 5.5	75 8.5	23 25.3
6	266 26.6	-13 22.9	233 9.8	258 28.1	-12 3.3	105 15.1	23 25.6
8	296 26.6	-13 21.2	263 14.7	288 27.1	-12 1.1	135 21.8	23 25.9
10	326 26.6	-13 19.6	293 19.6	318 26.0	-11 58.8	165 28.4	23 26.2
12	356 26.7	-13 17.9	323 24.5	348 25.0	-11 56.6	195 35.0	23 26.5
14	26 26.7	-13 16.2	353 29.5	18 23.9	-11 54.3	225 41.6	23 26.8
16	56 26.7	-13 14.5	23 34.4	48 22.9	-11 52.1	255 48.2	23 27.1
18	86 26.8	-13 12.8	53 39.3	78 21.9	-11 49.8	285 54.9	23 27.4
20	116 26.8	-13 11.1	83 44.3	108 20.8	-11 47.6	316 1.5	23 27.6
22	146 26.8	-13 9.4	113 49.2	138 19.8	-11 45.3	346 8.1	23 27.9
Δ	0	8		-5	11	33	1

UT	MJESEC $S_\leftmoon$	MJESEC Δ	MJESEC $\delta_\leftmoon$	MJESEC Δ	JUPITER S_4	JUPITER δ_4	SATURN S_η	SATURN δ_η
h	° ′		° ′		° ′	° ′	° ′	° ′
0	188 55.0	149	-15 21.5	106	164 47.1	-10 9.9	318 24.5	0 44.8
2	218 2.7	150	-15 .2	107	194 50.9	-10 9.4	348 29.6	0 45.0
4	247 10.6	151	-14 38.8	108	224 54.7	-10 9.0	18 34.8	0 45.1
6	276 18.7	151	-14 17.1	110	254 58.5	-10 8.6	48 39.9	0 45.2
8	305 27.0	152	-13 55.2	111	285 2.3	-10 8.1	78 45.1	0 45.3
10	334 35.5	153	-13 33.1	112	315 6.1	-10 7.7	108 50.2	0 45.4
12	3 44.1	154	-13 10.7	113	345 9.9	-10 7.2	138 55.4	0 45.6
14	32 52.9	155	-12 48.2	114	15 13.7	-10 6.8	169 .6	0 45.7
16	62 1.8	155	-12 25.4	115	45 17.5	-10 6.3	199 5.7	0 45.8
18	91 10.9	156	-12 2.5	116	75 21.3	-10 5.9	229 10.9	0 45.9
20	120 20.2	157	-11 39.3	117	105 25.1	-10 5.5	259 16.0	0 46.0
22	149 29.5	158	-11 16.0	117	135 28.9	-10 5.0	289 21.2	0 46.2
Δ					19	2	26	1

φ	SUNCE IZLAZ	SUNCE ZALAZ	TRAJANJE SUMRAKA GRAĐ.	TRAJANJE SUMRAKA ASTR.	MJESEC IZLAZ	MJESEC Δ/24	MJESEC ZALAZ	MJESEC Δ/24
N	h min	h min	h min	h min	h min	min	h min	min
60	7 44	16 46	0 44	2 22	7 21	.2	16 22	3.3
55	7 27	17 2	0 38	2 3	7 1	.5	16 40	3.0
50	7 14	17 15	0 34	1 49	6 47	.7	16 53	2.8
45	7 4	17 25	0 30	1 39	6 35	.9	17 3	2.6
40	6 56	17 33	0 28	1 31	6 25	1.0	17 12	2.5
35	6 48	17 41	0 26	1 25	6 17	1.1	17 19	2.3
30	6 42	17 47	0 25	1 21	6 9	1.3	17 25	2.2
20	6 30	17 58	0 23	1 14	5 56	1.4	17 36	2.0
10	6 20	18 8	0 22	1 11	5 45	1.6	17 46	1.9
0	6 11	18 18	0 21	1 11	5 34	1.7	17 55	1.7
10	6 1	18 27	0 22	1 12	5 24	1.9	18 4	1.6
20	5 51	18 37	0 23	1 17	5 12	2.1	18 13	1.4
30	5 39	18 49	0 25	1 25	4 59	2.2	18 24	1.2
35	5 32	18 56	0 27	1 32	4 52	2.4	18 30	1.1
40	5 24	19 4	0 29	1 41	4 43	2.5	18 37	1.0
45	5 14	19 13	0 32	1 53	4 33	2.6	18 45	.8
50	5 3	19 25	0 36	2 12	4 20	2.8	18 54	.7
55	4 48	19 39	0 41	2 45	4 5	3.0	19 6	.5
60	4 29	19 58	0 50	: ::	3 44	3.4	19 21	.2
S								

SUNCE UT	SUNCE $e = T_p - UT$	SUNCE Δ/24	SUNCE r	MJESEC Prolaz	MJESEC Δ/24	MJESEC $\pi_\leftmoon$	MJESEC r
h	min s	s	′	h min	min	′	′
00	-14 13.7	.1	16.2	$T_{\overline{m}}$ 11 45	1.7	53.9	14.7
12	-14 13.0	$T_{\overline{m}_\odot}$ 12 h 14.2 min		Starost 28.7 d	Faza ●		

PLANETE

Pl.	$T_{\overline{m}}$	π	360−α	Vel.	Pl.	$T_{\overline{m}}$	π	360−α	Vel.
	h min	′	°			h min	′	°	
♀	12 46	.1	26	-3.8	♃	12 59	.0	22	-1.9
♂	22 55	.2	232	-1.0	♄	2 46	.0	175	.7

UT	SUNCE $S_\odot$	SUNCE $\delta_\odot$	PROLJ. TAČKA S_Υ	VENERA S_φ	VENERA δ_φ	MARS S_σ	MARS δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	176 26.9	-13 7.7	143 54.1	168 18.7	-11 43.1	16 14.7	23 28.2
2	206 26.9	-13 6.0	173 59.0	198 17.7	-11 40.8	46 21.2	23 28.5
4	236 27.0	-13 4.3	204 4.0	228 16.7	-11 38.6	76 27.8	23 28.8
6	266 27.0	-13 2.6	234 8.9	258 15.6	-11 36.3	106 34.4	23 29.0
8	296 27.0	-13 .9	264 13.8	288 14.6	-11 34.0	136 41.0	23 29.3
10	326 27.1	-12 59.2	294 18.8	318 13.6	-11 31.8	166 47.6	23 29.6
12	356 27.1	-12 57.5	324 23.7	348 12.6	-11 29.5	196 54.1	23 29.8
14	26 27.2	-12 55.8	354 28.6	18 11.5	-11 27.2	227 .7	23 30.1
16	56 27.2	-12 54.1	24 33.5	48 10.5	-11 25.0	257 7.3	23 30.4
18	86 27.3	-12 52.4	54 38.5	78 9.5	-11 22.7	287 13.8	23 30.6
20	116 27.3	-12 50.7	84 43.4	108 8.5	-11 20.4	317 20.4	23 30.9
22	146 27.4	-12 49.0	114 48.3	138 7.4	-11 18.2	347 26.9	23 31.1
Δ	0	9		-5	11	33	1

UT	MJESEC $S_\leftmoon$	MJESEC Δ	MJESEC $\delta_\leftmoon$	MJESEC Δ	JUPITER S_4	JUPITER δ_4	SATURN S_η	SATURN δ_η
h	° ′		° ′		° ′	° ′	° ′	° ′
0	178 39.1	158	-10 52.5	118	165 32.7	-10 4.6	319 26.4	0 46.3
2	207 48.7	159	-10 28.9	119	195 36.5	-10 4.1	349 31.5	0 46.4
4	236 58.5	159	-10 5.0	120	225 40.3	-10 3.7	19 36.7	0 46.5
6	266 8.4	160	- 9 41.1	121	255 44.1	-10 3.3	49 41.8	0 46.6
8	295 18.4	161	- 9 16.9	121	285 47.9	-10 2.8	79 47.0	0 46.8
10	324 28.5	161	- 8 52.6	122	315 51.7	-10 2.4	109 52.2	0 46.9
12	353 38.8	162	- 8 28.2	123	345 55.5	-10 1.9	139 57.3	0 47.0
14	22 49.1	162	- 8 3.7	123	15 59.3	-10 1.5	170 2.5	0 47.1
16	51 59.5	162	- 7 39.0	124	46 3.1	-10 1.1	200 7.7	0 47.2
18	81 10.0	163	- 7 14.2	125	76 6.9	-10 .6	230 12.8	0 47.4
20	110 20.6	163	- 6 49.3	125	106 10.7	-10 .2	260 18.0	0 47.5
22	139 31.2	164	- 6 24.2	126	136 14.4	- 9 59.7	290 23.2	0 47.6
Δ					19	2	26	1

φ	SUNCE IZLAZ	SUNCE ZALAZ	TRAJANJE SUMRAKA GRAĐ.	TRAJANJE SUMRAKA ASTR.	MJESEC IZLAZ	MJESEC Δ/24	MJESEC ZALAZ	MJESEC Δ/24
N	h min	h min	h min	h min	h min	min	h min	min
60	7 41	16 48	0 44	2 21	7 25	.2	17 43	3.3
55	7 25	17 4	0 38	2 2	7 13	.4	17 52	3.0
50	7 13	17 16	0 34	1 49	7 4	.6	17 60	2.8
45	7 3	17 26	0 30	1 39	6 56	.8	18 6	2.6
40	6 54	17 34	0 28	1 31	6 50	1.0	18 11	2.5
35	6 47	17 42	0 26	1 25	6 44	1.1	18 15	2.3
30	6 41	17 48	0 25	1 21	6 39	1.2	18 19	2.2
20	6 30	17 59	0 23	1 14	6 31	1.4	18 25	2.0
10	6 20	18 8	0 21	1 11	6 23	1.5	18 31	1.8
0	6 11	18 18	0 21	1 10	6 16	1.7	18 36	1.7
10	6 1	18 27	0 22	1 12	6 9	1.9	18 41	1.5
20	5 51	18 37	0 23	1 17	6 2	2.0	18 47	1.4
30	5 39	18 48	0 25	1 25	5 53	2.2	18 53	1.2
35	5 33	18 55	0 27	1 31	5 48	2.3	18 56	1.1
40	5 25	19 3	0 29	1 40	5 42	2.5	19 0	.9
45	5 16	19 12	0 32	1 52	5 36	2.6	19 5	.8
50	5 4	19 23	0 35	2 11	5 28	2.8	19 10	.6
55	4 50	19 37	0 41	2 43	5 18	3.0	19 17	.4
60	4 32	19 55	0 50	: ::	5 5	3.3	19 25	.1
S								

SUNCE UT	SUNCE $e = T_p - UT$	SUNCE Δ/24	SUNCE r	MJESEC Prolaz	MJESEC Δ/24	MJESEC $\pi_\leftmoon$	MJESEC r
h	min s	s	′	h min	min	′	′
00	-14 12.3	.1	16.2	$T_{\overline{m}}$ 12 26	1.7	54.0	14.7
12	-14 11.2	$T_{\overline{m}_\odot}$ 12 h 14.2 min		Starost 29.7 d	Faza ●		

PLANETE

Pl.	$T_{\overline{m}}$	π	360−α	Vel.	Pl.	$T_{\overline{m}}$	π	360−α	Vel.
	h min	′	°			h min	′	°	
♀	12 47	.1	24	-3.8	♃	12 56	.0	22	-1.9
♂	22 50	.2	232	-1.0	♄	2 42	.0	176	.7

UT	SUNCE $S_\odot$	SUNCE $\delta_\odot$	PROLJ. TAČKA S_Υ	VENERA S_φ	VENERA δ_φ	MARS S_σ	MARS δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	176 27.4	-12 47.3	144 53.3	168 6.4	-11 15.9	17 33.5	23 31.4
2	206 27.5	-12 45.6	174 58.2	198 5.4	-11 13.6	47 40.0	23 31.7
4	236 27.5	-12 43.9	205 3.1	228 4.4	-11 11.3	77 46.6	23 31.9
6	266 27.6	-12 42.1	235 8.0	258 3.4	-11 9.0	107 53.1	23 32.2
8	296 27.7	-12 40.4	265 13.0	288 2.4	-11 6.7	137 59.6	23 32.4
10	326 27.7	-12 38.7	295 17.9	318 1.4	-11 4.4	168 6.1	23 32.7
12	356 27.8	-12 37.0	325 22.8	348 .4	-11 2.2	198 12.7	23 32.9
14	26 27.8	-12 35.3	355 27.8	17 59.4	-10 59.9	228 19.2	23 33.1
16	56 27.9	-12 33.5	25 32.7	47 58.4	-10 57.6	258 25.7	23 33.4
18	86 28.0	-12 31.8	55 37.6	77 57.4	-10 55.3	288 32.2	23 33.6
20	116 28.0	-12 30.1	85 42.5	107 56.4	-10 53.0	318 38.7	23 33.9
22	146 28.1	-12 28.4	115 47.5	137 55.4	-10 50.7	348 45.2	23 34.1
Δ	0	9		-5	11	33	1

UT	MJESEC $S_\leftmoon$	MJESEC Δ	MJESEC $\delta_\leftmoon$	MJESEC Δ	JUPITER S_4	JUPITER δ_4	SATURN S_η	SATURN δ_η
h	° ′		° ′		° ′	° ′	° ′	° ′
0	168 41.9	164	- 5 59.1	126	166 18.2	- 9 59.3	320 28.3	0 47.7
2	197 52.7	164	- 5 33.9	127	196 22.0	- 9 58.8	350 33.5	0 47.9
4	227 3.5	164	- 5 8.5	127	226 25.8	- 9 58.4	20 38.7	0 48.0
6	256 14.4	165	- 4 43.1	127	256 29.6	- 9 58.0	50 43.8	0 48.1
8	285 25.3	165	- 4 17.6	128	286 33.4	- 9 57.5	80 49.0	0 48.2
10	314 36.3	165	- 3 52.1	128	316 37.2	- 9 57.1	110 54.2	0 48.4
12	343 47.2	165	- 3 26.4	129	346 41.0	- 9 56.6	140 59.3	0 48.5
14	12 58.2	165	- 3 .7	129	16 44.8	- 9 56.2	171 4.5	0 48.6
16	42 9.2	165	- 2 35.0	129	46 48.6	- 9 55.8	201 9.7	0 48.7
18	71 20.2	165	- 2 9.2	129	76 52.4	- 9 55.3	231 14.8	0 48.9
20	100 31.2	165	- 1 43.3	129	106 56.2	- 9 54.9	261 20.0	0 49.0
22	129 42.2	165	- 1 17.4	130	137 .0	- 9 54.4	291 25.2	0 49.1
Δ					19	2	26	1

φ	SUNCE IZLAZ	SUNCE ZALAZ	TRAJANJE SUMRAKA GRAĐ.	TRAJANJE SUMRAKA ASTR.	MJESEC IZLAZ	MJESEC Δ/24	MJESEC ZALAZ	MJESEC Δ/24
N	h min	h min	h min	h min	h min	min	h min	min
60	7 39	16 51	0 44	2 21	7 29	.1	19 2	3.3
55	7 23	17 6	0 38	2 2	7 23	.4	19 5	3.0
50	7 11	17 18	0 33	1 49	7 19	.6	19 7	2.8
45	7 1	17 28	0 30	1 39	7 16	.8	19 8	2.6
40	6 53	17 36	0 28	1 31	7 13	.9	19 10	2.5
35	6 46	17 43	0 26	1 25	7 10	1.0	19 11	2.3
30	6 40	17 49	0 24	1 20	7 8	1.2	19 12	2.2
20	6 29	17 59	0 23	1 14	7 4	1.4	19 14	2.0
10	6 20	18 9	0 21	1 11	7 0	1.5	19 15	1.8
0	6 11	18 18	0 21	1 10	6 57	1.7	19 16	1.7
10	6 2	18 27	0 22	1 12	6 54	1.8	19 18	1.5
20	5 52	18 36	0 23	1 17	6 50	2.0	19 19	1.4
30	5 40	18 48	0 25	1 25	6 46	2.2	19 21	1.2
35	5 34	18 54	0 26	1 31	6 44	2.3	19 22	1.1
40	5 26	19 2	0 29	1 40	6 41	2.5	19 23	.9
45	5 17	19 10	0 31	1 52	6 38	2.6	19 24	.8
50	5 6	19 21	0 35	2 10	6 35	2.8	19 25	.6
55	4 53	19 34	0 41	2 41	6 30	3.0	19 27	.4
60	4 35	19 52	0 49	: ::	6 24	3.3	19 29	.1
S								

SUNCE UT	SUNCE $e = T_p - UT$	SUNCE Δ/24	SUNCE r	MJESEC Prolaz	MJESEC Δ/24	MJESEC $\pi_\leftmoon$	MJESEC r
h	min s	s	′	h min	min	′	′
00	-14 10.1	.1	16.2	$T_{\overline{m}}$ 13 7	1.7	54.1	14.7
12	-14 8.6	$T_{\overline{m}_\odot}$ 12 h 14.1 min		Starost .9 d	Faza ●		

PLANETE

Pl.	$T_{\overline{m}}$	π	360−α	Vel.	Pl.	$T_{\overline{m}}$	π	360−α	Vel.
	h min	′	°			h min	′	°	
♀	12 48	.1	23	-3.8	♃	12 53	.0	21	-1.9
♂	22 45	.2	233	-1.0	♄	2 38	.0	176	.7

UT	SUNCE $S_\odot$	SUNCE $\delta_\odot$	PROLJ. TAČKA S_Υ	VENERA S_φ	VENERA δ_φ	MARS S_σ	MARS δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	176 28.2	-12 26.6	145 52.4	167 54.4	-10 48.4	18 51.7	23 34.3
2	206 28.2	-12 24.9	175 57.3	197 53.4	-10 46.1	48 58.1	23 34.6
4	236 28.3	-12 23.2	206 2.3	227 52.4	-10 43.7	79 4.6	23 34.8
6	266 28.4	-12 21.4	236 7.2	257 51.4	-10 41.4	109 11.1	23 35.0
8	296 28.4	-12 19.7	266 12.1	287 50.4	-10 39.1	139 17.6	23 35.3
10	326 28.5	-12 18.0	296 17.0	317 49.4	-10 36.8	169 24.0	23 35.5
12	356 28.6	-12 16.2	326 22.0	347 48.4	-10 34.5	199 30.5	23 35.7
14	26 28.7	-12 14.5	356 26.9	17 47.5	-10 32.2	229 36.9	23 35.9
16	56 28.7	-12 12.7	26 31.8	47 46.5	-10 29.9	259 43.4	23 36.2
18	86 28.8	-12 11.0	56 36.7	77 45.5	-10 27.5	289 49.8	23 36.4
20	116 28.9	-12 9.3	86 41.7	107 44.5	-10 25.2	319 56.3	23 36.6
22	146 29.0	-12 7.5	116 46.6	137 43.5	-10 22.9	350 2.7	23 36.8
Δ	0	9		-5	12	32	1

UT	MJESEC $S_\leftmoon$	MJESEC Δ	MJESEC $\delta_\leftmoon$	MJESEC Δ	JUPITER S_4	JUPITER δ_4	SATURN S_η	SATURN δ_η
h	° ′		° ′		° ′	° ′	° ′	° ′
0	158 53.2	165	- 0 51.5	130	167 3.8	- 9 54.0	321 30.4	0 49.2
2	188 4.2	165	- 0 25.5	130	197 7.6	- 9 53.5	351 35.5	0 49.4
4	217 15.1	164	0 .5	130	227 11.4	- 9 53.1	21 40.7	0 49.5
6	246 26.0	164	0 26.5	130	257 15.2	- 9 52.7	51 45.9	0 49.6
8	275 36.8	164	0 52.5	130	287 19.0	- 9 52.2	81 51.1	0 49.7
10	304 47.6	164	1 18.5	130	317 22.8	- 9 51.8	111 56.2	0 49.9
12	333 58.4	163	1 44.5	130	347 26.6	- 9 51.3	142 1.4	0 50.0
14	3 9.1	163	2 10.5	130	17 30.4	- 9 50.9	172 6.6	0 50.1
16	32 19.7	163	2 36.5	130	47 34.2	- 9 50.4	202 11.8	0 50.2
18	61 30.2	162	3 2.4	130	77 38.0	- 9 50.0	232 16.9	0 50.4
20	90 40.6	162	3 28.4	130	107 41.8	- 9 49.5	262 22.1	0 50.5
22	119 51.0	161	3 54.3	129	137 45.6	- 9 49.1	292 27.3	0 50.6
Δ					19	2	26	1

φ	SUNCE IZLAZ	SUNCE ZALAZ	TRAJANJE SUMRAKA GRAĐ.	TRAJANJE SUMRAKA ASTR.	MJESEC IZLAZ	MJESEC Δ/24	MJESEC ZALAZ	MJESEC Δ/24
N	h min	h min	h min	h min	h min	min	h min	min
60	7 36	16 53	0 44	2 21	7 32	.1	20 22	3.4
55	7 21	17 8	0 38	2 2	7 33	.4	20 17	3.1
50	7 9	17 20	0 33	1 49	7 34	.6	20 14	2.8
45	6 60	17 29	0 30	1 39	7 34	.8	20 11	2.7
40	6 52	17 37	0 28	1 31	7 35	.9	20 9	2.5
35	6 45	17 43	0 26	1 25	7 35	1.1	20 7	2.4
30	6 39	17 49	0 24	1 20	7 36	1.2	20 5	2.3
20	6 29	17 60	0 22	1 14	7 36	1.4	20 2	2.1
10	6 19	18 9	0 21	1 11	7 37	1.5	19 59	1.9
0	6 11	18 17	0 21	1 10	7 37	1.7	19 57	1.7
10	6 2	18 26	0 22	1 12	7 38	1.9	19 54	1.6
20	5 52	18 36	0 23	1 16	7 39	2.0	19 52	1.4
30	5 41	18 47	0 25	1 25	7 39	2.2	19 49	1.2
35	5 35	18 53	0 26	1 31	7 40	2.4	19 47	1.1
40	5 27	19 0	0 29	1 39	7 40	2.5	19 45	1.0
45	5 18	19 9	0 31	1 51	7 41	2.6	19 43	.8
50	5 8	19 19	0 35	2 9	7 42	2.8	19 40	.6
55	4 55	19 32	0 40	2 38	7 42	3.0	19 36	.4
60	4 37	19 49	0 49	: ::	7 44	3.3	19 32	.2
S								

SUNCE UT	SUNCE $e = T_p - UT$	SUNCE Δ/24	SUNCE r	MJESEC Prolaz	MJESEC Δ/24	MJESEC $\pi_\leftmoon$	MJESEC r
h	min s	s	′	h min	min	′	′
00	-14 7.2	.2	16.2	$T_{\overline{m}}$ 13 47	1.7	54.3	14.8
12	-14 5.3	$T_{\overline{m}_\odot}$ 12 h 14.1 min		Starost 1.9 d	Faza ●		

PLANETE

Pl.	$T_{\overline{m}}$	π	360−α	Vel.	Pl.	$T_{\overline{m}}$	π	360−α	Vel.
	h min	′	°			h min	′	°	
♀	12 49	.1	22	-3.8	♃	12 50	.0	21	-1.9
♂	22 40	.2	233	-1.0	♄	2 34	.0	176	.7

UT	SUNCE $S_\odot$	SUNCE $\delta_\odot$	PROLJ. TAČKA S_Υ	VENERA S_φ	VENERA δ_φ	MARS S_σ	MARS δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	176 29.1	-12 5.8	146 51.5	167 42.6	-10 20.6	20 9.1	23 37.0
2	206 29.2	-12 4.0	176 56.5	197 41.6	-10 18.2	50 15.6	23 37.2
4	236 29.2	-12 2.3	207 1.4	227 40.6	-10 15.9	80 22.0	23 37.4
6	266 29.3	-12 .5	237 6.3	257 39.7	-10 13.6	110 28.4	23 37.6
8	296 29.4	-11 58.8	267 11.2	287 38.7	-10 11.2	140 34.8	23 37.9
10	326 29.5	-11 57.0	297 16.2	317 37.7	-10 8.9	170 41.2	23 38.1
12	356 29.6	-11 55.3	327 21.1	347 36.8	-10 6.6	200 47.6	23 38.3
14	26 29.7	-11 53.5	357 26.0	17 35.8	-10 4.2	230 54.0	23 38.5
16	56 29.8	-11 51.8	27 31.0	47 34.8	-10 1.9	261 .4	23 38.7
18	86 29.9	-11 50.0	57 35.9	77 33.9	- 9 59.5	291 6.8	23 38.9
20	116 30.0	-11 48.3	87 40.8	107 32.9	- 9 57.2	321 13.2	23 39.0
22	146 30.1	-11 46.5	117 45.7	137 32.0	- 9 54.8	351 19.5	23 39.2
Δ	0	9		-5	12	32	1

UT	MJESEC $S_\leftmoon$	MJESEC Δ	MJESEC $\delta_\leftmoon$	MJESEC Δ	JUPITER S_4	JUPITER δ_4	SATURN S_η	SATURN δ_η
h	° ′		° ′		° ′	° ′	° ′	° ′
0	149 1.2	161	4 20.2	129	167 49.3	- 9 48.7	322 32.5	0 50.7
2	178 11.3	160	4 46.0	129	197 53.1	- 9 48.2	352 37.7	0 50.9
4	207 21.3	159	5 11.8	129	227 56.9	- 9 47.8	22 42.8	0 51.0
6	236 31.2	159	5 37.5	128	258 .7	- 9 47.3	52 48.0	0 51.1
8	265 41.0	158	6 3.2	128	288 4.5	- 9 46.9	82 53.2	0 51.3
10	294 50.6	157	6 28.7	128	318 8.3	- 9 46.4	112 58.4	0 51.4
12	324 .0	157	6 54.3	127	348 12.1	- 9 46.0	143 3.6	0 51.5
14	353 9.3	156	7 19.7	127	18 15.9	- 9 45.5	173 8.7	0 51.6
16	22 18.5	155	7 45.0	126	48 19.7	- 9 45.1	203 13.9	0 51.8
18	51 27.5	154	8 10.3	126	78 23.5	- 9 44.7	233 19.1	0 51.9
20	80 36.3	153	8 35.4	125	108 27.3	- 9 44.2	263 24.3	0 52.0
22	109 44.9	152	9 .4	125	138 31.1	- 9 43.8	293 29.5	0 52.2
Δ					19	2	26	1

φ	SUNCE IZLAZ	SUNCE ZALAZ	TRAJANJE SUMRAKA GRAĐ.	TRAJANJE SUMRAKA ASTR.	MJESEC IZLAZ	MJESEC Δ/24	MJESEC ZALAZ	MJESEC Δ/24
N	h min	h min	h min	h min	h min	min	h min	min
60	7 33	16 56	0 44	2 20	7 36	.2	21 43	3.5
55	7 18	17 10	0 38	2 2	7 43	.5	21 31	3.2
50	7 7	17 22	0 33	1 48	7 49	.7	21 22	2.9
45	6 58	17 31	0 30	1 38	7 53	.9	21 15	2.7
40	6 51	17 38	0 28	1 31	7 57	1.0	21 9	2.6
35	6 44	17 44	0 26	1 25	8 1	1.1	21 4	2.4
30	6 38	17 50	0 24	1 20	8 4	1.2	20 59	2.3
20	6 28	18 0	0 22	1 14	8 9	1.4	20 52	2.1
10	6 19	18 9	0 21	1 11	8 14	1.6	20 45	2.0
0	6 11	18 17	0 21	1 10	8 18	1.8	20 38	1.8
10	6 2	18 26	0 22	1 12	8 23	1.9	20 32	1.7
20	5 53	18 35	0 23	1 16	8 27	2.1	20 25	1.5
30	5 42	18 46	0 25	1 24	8 33	2.3	20 17	1.3
35	5 36	18 52	0 26	1 31	8 36	2.4	20 13	1.2
40	5 28	18 59	0 28	1 39	8 40	2.5	20 8	1.1
45	5 20	19 7	0 31	1 50	8 44	2.7	20 2	.9
50	5 10	19 17	0 35	2 8	8 49	2.9	19 55	.7
55	4 57	19 30	0 40	2 36	8 56	3.1	19 47	.5
60	4 40	19 46	0 48	3 58	9 4	3.4	19 36	.2
S								

SUNCE UT	SUNCE $e = T_p - UT$	SUNCE Δ/24	SUNCE r	MJESEC Prolaz	MJESEC Δ/24	MJESEC $\pi_\leftmoon$	MJESEC r
h	min s	s	′	h min	min	′	′
00	-14 3.5	.2	16.2	$T_{\overline{m}}$ 14 28	1.8	54.6	14.9
12	-14 1.3	$T_{\overline{m}_\odot}$ 12 h 14.0 min		Starost 2.9 d	Faza ●		

PLANETE

Pl.	$T_{\overline{m}}$	π	360−α	Vel.	Pl.	$T_{\overline{m}}$	π	360−α	Vel.
	h min	′	°			h min	′	°	
♀	12 50	.1	21	-3.8	♃	12 47	.0	21	-1.9
♂	22 35	.2	233	-.9	♄	2 29	.0	176	.7

UT	SUNCE $S_\odot$	SUNCE $\delta_\odot$	PROLJ. TAČKA S_Υ	VENERA S_φ	VENERA δ_φ	MARS S_σ	MARS δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	176 30.2	-11 44.7	147 50.7	167 31.0	- 9 52.5	21 25.9	23 39.4
2	206 30.3	-11 43.0	177 55.6	197 30.0	- 9 50.1	51 32.3	23 39.6
4	236 30.4	-11 41.2	208 .5	227 29.1	- 9 47.8	81 38.6	23 39.8
6	266 30.5	-11 39.4	238 5.5	257 28.1	- 9 45.4	111 45.0	23 40.0
8	296 30.6	-11 37.7	268 10.4	287 27.2	- 9 43.1	141 51.3	23 40.2
10	326 30.7	-11 35.9	298 15.3	317 26.2	- 9 40.7	171 57.7	23 40.4
12	356 30.8	-11 34.1	328 20.2	347 25.3	- 9 38.4	202 4.0	23 40.5
14	26 30.9	-11 32.4	358 25.2	17 24.4	- 9 36.0	232 10.4	23 40.7
16	56 31.0	-11 30.6	28 30.1	47 23.4	- 9 33.6	262 16.7	23 40.9
18	86 31.1	-11 28.8	58 35.0	77 22.5	- 9 31.3	292 23.0	23 41.1
20	116 31.2	-11 27.1	88 40.0	107 21.5	- 9 28.9	322 29.3	23 41.2
22	146 31.3	-11 25.3	118 44.9	137 20.6	- 9 26.5	352 35.6	23 41.4
Δ	1	9		-5	12	32	1

UT	MJESEC $S_\leftmoon$	MJESEC Δ	MJESEC $\delta_\leftmoon$	MJESEC Δ	JUPITER S_4	JUPITER δ_4	SATURN S_η	SATURN δ_η
h	° ′		° ′		° ′	° ′	° ′	° ′
0	138 53.3	151	9 25.4	124	168 34.9	- 9 43.3	323 34.7	0 52.3
2	168 1.5	150	9 50.2	123	198 38.7	- 9 42.9	353 39.8	0 52.4
4	197 9.5	149	10 14.8	123	228 42.5	- 9 42.4	23 45.0	0 52.6
6	226 17.3	148	10 39.3	122	258 46.3	- 9 42.0	53 50.2	0 52.7
8	255 24.9	147	11 3.7	121	288 50.1	- 9 41.5	83 55.4	0 52.8
10	284 32.2	145	11 28.0	120	318 53.9	- 9 41.1	114 .6	0 52.9
12	313 39.3	144	11 52.0	120	348 57.7	- 9 40.7	144 5.8	0 53.1
14	342 46.1	143	12 15.9	119	19 1.5	- 9 40.2	174 11.0	0 53.2
16	11 52.7	142	12 39.7	118	49 5.2	- 9 39.8	204 16.2	0 53.3
18	40 59.1	140	13 3.2	117	79 9.0	- 9 39.3	234 21.3	0 53.5
20	70 5.2	139	13 26.6	116	109 12.8	- 9 38.9	264 26.5	0 53.6
22	99 11.0	138	13 49.7	115	139 16.6	- 9 38.4	294 31.7	0 53.7
Δ					19	2	26	1

φ	SUNCE IZLAZ	SUNCE ZALAZ	TRAJANJE SUMRAKA GRAĐ.	TRAJANJE SUMRAKA ASTR.	MJESEC IZLAZ	MJESEC Δ/24	MJESEC ZALAZ	MJESEC Δ/24
N	h min	h min	h min	h min	h min	min	h min	min
60	7 30	16 59	0 43	2 20	7 40	.3	23 7	3.6
55	7 16	17 13	0 37	2 2	7 54	.6	22 47	3.3
50	7 5	17 23	0 33	1 48	8 5	.8	22 32	3.0
45	6 57	17 32	0 30	1 38	8 14	1.0	22 20	2.8
40	6 49	17 39	0 28	1 31	8 22	1.1	22 11	2.7
35	6 43	17 45	0 26	1 25	8 28	1.3	22 3	2.5
30	6 37	17 51	0 24	1 20	8 34	1.4	21 55	2.4
20	6 28	18 1	0 22	1 14	8 44	1.6	21 43	2.2
10	6 19	18 9	0 21	1 11	8 52	1.7	21 32	2.1
0	6 11	18 17	0 21	1 10	9 1	1.9	21 22	1.9
10	6 2	18 26	0 21	1 12	9 9	2.0	21 12	1.8
20	5 53	18 35	0 23	1 16	9 18	2.2	21 1	1.6
30	5 43	18 45	0 25	1 24	9 28	2.4	20 48	1.4
35	5 37	18 51	0 26	1 30	9 34	2.5	20 41	1.3
40	5 30	18 58	0 28	1 38	9 41	2.6	20 33	1.2
45	5 21	19 6	0 31	1 50	9 49	2.8	20 24	1.1
50	5 12	19 15	0 35	2 7	9 58	3.0	20 13	.9
55	4 59	19 27	0 40	2 34	10 11	3.2	19 59	.6
60	4 43	19 43	0 48	3 44	10 27	3.6	19 41	.3
S								

SUNCE UT	SUNCE $e = T_p - UT$	SUNCE Δ/24	SUNCE r	MJESEC Prolaz	MJESEC Δ/24	MJESEC $\pi_\leftmoon$	MJESEC r
h	min s	s	′	h min	min	′	′
00	-13 59.2	.2	16.2	$T_{\overline{m}}$ 15 11	1.9	55.0	15.0
12	-13 56.6	$T_{\overline{m}_\odot}$ 12 h 13.9 min		Starost 3.9 d	Faza ◑		

PLANETE

Pl.	$T_{\overline{m}}$	π	360−α	Vel.	Pl.	$T_{\overline{m}}$	π	360−α	Vel.
	h min	′	°			h min	′	°	
♀	12 50	.1	20	-3.8	♃	12 44	.0	21	-1.9
♂	22 30	.2	234	-.9	♄	2 25	.0	176	.7

UT	SUNCE $S_\odot$	SUNCE $\delta_\odot$	PROLJ. TAČKA S_Υ	VENERA S_φ	VENERA δ_φ	MARS S_σ	MARS δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	176 31.4	-11 23.5	148 49.8	167 19.7	- 9 24.2	22 42.0	23 41.6
2	206 31.5	-11 21.7	178 54.7	197 18.7	- 9 21.8	52 48.3	23 41.8
4	236 31.7	-11 19.9	208 59.7	227 17.8	- 9 19.4	82 54.6	23 41.9
6	266 31.8	-11 18.2	239 4.6	257 16.8	- 9 17.0	113 .8	23 42.1
8	296 31.9	-11 16.4	269 9.5	287 15.9	- 9 14.7	143 7.1	23 42.3
10	326 32.0	-11 14.6	299 14.5	317 15.0	- 9 12.3	173 13.4	23 42.4
12	356 32.1	-11 12.8	329 19.4	347 14.1	- 9 9.9	203 19.7	23 42.6
14	26 32.2	-11 11.0	359 24.3	17 13.1	- 9 7.5	233 26.0	23 42.7
16	56 32.4	-11 9.3	29 29.2	47 12.2	- 9 5.1	263 32.2	23 42.9
18	86 32.5	-11 7.5	59 34.2	77 11.3	- 9 2.8	293 38.5	23 43.0
20	116 32.6	-11 5.7	89 39.1	107 10.4	- 9 .4	323 44.7	23 43.2
22	146 32.7	-11 3.9	119 44.0	137 9.4	- 8 58.0	353 51.0	23 43.3
Δ	1	9		-5	12	31	1

UT	MJESEC $S_\leftmoon$	MJESEC Δ	MJESEC $\delta_\leftmoon$	MJESEC Δ	JUPITER S_4	JUPITER δ_4	SATURN S_η	SATURN δ_η
h	° ′		° ′		° ′	° ′	° ′	° ′
0	128 16.5	136	14 12.7	114	169 20.4	- 9 38.0	324 36.9	0 53.9
2	157 21.7	135	14 35.4	113	199 24.2	- 9 37.5	354 42.1	0 54.0
4	186 26.7	133	14 58.0	111	229 28.0	- 9 37.1	24 47.3	0 54.1
6	215 31.3	132	15 20.3	110	259 31.8	- 9 36.6	54 52.5	0 54.3
8	244 35.6	130	15 42.3	109	289 35.6	- 9 36.2	84 57.7	0 54.4
10	273 39.6	128	16 4.1	108	319 39.4	- 9 35.7	115 2.9	0 54.5
12	302 43.3	127	16 25.7	106	349 43.2	- 9 35.3	145 8.1	0 54.7
14	331 46.7	125	16 47.0	105	19 47.0	- 9 34.9	175 13.3	0 54.8
16	0 49.7	124	17 8.0	104	49 50.8	- 9 34.4	205 18.5	0 54.9
18	29 52.4	122	17 28.7	102	79 54.6	- 9 34.0	235 23.7	0 55.1
20	58 54.8	120	17 49.2	101	109 58.4	- 9 33.5	265 28.9	0 55.2
22	87 56.8	118	18 9.4	99	140 2.2	- 9 33.1	295 34.0	0 55.3
Δ					19	2	26	1

φ	SUNCE IZLAZ	SUNCE ZALAZ	TRAJANJE SUMRAKA GRAĐ.	TRAJANJE SUMRAKA ASTR.	MJESEC IZLAZ	MJESEC Δ/24	MJESEC ZALAZ	MJESEC Δ/24
N	h min	h min	h min	h min	h min	min	h min	min
60	7 28	17 1	0 43	2 20	7 46	.4	. . .	.0
55	7 14	17 15	0 37	2 2	8 8	.7	. . .	.0
50	7 3	17 25	0 33	1 48	8 24	1.0	23 44	3.1
45	6 55	17 33	0 30	1 38	8 38	1.2	23 28	2.9
40	6 48	17 40	0 28	1 31	8 49	1.3	23 15	2.7
35	6 42	17 46	0 26	1 25	8 58	1.4	23 3	2.6
30	6 36	17 52	0 24	1 20	9 6	1.5	22 53	2.5
20	6 27	18 1	0 22	1 14	9 21	1.7	22 36	2.4
10	6 19	18 9	0 21	1 11	9 33	1.9	22 22	2.2
0	6 10	18 17	0 21	1 10	9 45	2.0	22 8	2.1
10	6 2	18 25	0 21	1 12	9 57	2.1	21 54	2.0
20	5 54	18 34	0 23	1 16	10 10	2.3	21 40	1.8
30	5 43	18 44	0 25	1 24	10 25	2.5	21 23	1.7
35	5 37	18 50	0 26	1 30	10 34	2.6	21 13	1.6
40	5 31	18 56	0 28	1 38	10 44	2.7	21 2	1.4
45	5 23	19 4	0 31	1 49	10 55	2.9	20 50	1.3
50	5 13	19 13	0 35	2 6	11 10	3.0	20 34	1.1
55	5 1	19 25	0 40	2 32	11 28	3.3	20 14	.9
60	4 45	19 41	0 47	3 35	11 53	3.7	19 48	.5
S								

SUNCE UT	SUNCE $e = T_p - UT$	SUNCE Δ/24	SUNCE r	MJESEC Prolaz	MJESEC Δ/24	MJESEC $\pi_\leftmoon$	MJESEC r
h	min s	s	′	h min	min	′	′
00	-13 54.1	.2	16.2	$T_{\overline{m}}$ 15 57	2.0	55.5	15.1
12	-13 51.2	$T_{\overline{m}_\odot}$ 12 h 13.9 min		Starost 4.9 d	Faza ◑		

PLANETE

Pl.	$T_{\overline{m}}$	π	360−α	Vel.	Pl.	$T_{\overline{m}}$	π	360−α	Vel.
	h min	′	°			h min	′	°	
♀	12 51	.1	18	-3.8	♃	12 41	.0	21	-1.9
♂	22 25	.2	234	-.9	♄	2 21	.0	176	.7

UT	SUNCE $S_\odot$	SUNCE $\delta_\odot$	PROLJ. TAČKA S_Υ	VENERA S_φ	VENERA δ_φ	MARS S_σ	MARS δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	176 32.9	-11 2.1	149 48.9	167 8.5	- 8 55.6	23 57.2	23 43.5
2	206 33.0	-11 .3	179 53.9	197 7.6	- 8 53.2	54 3.5	23 43.6
4	236 33.1	-10 58.5	209 58.8	227 6.7	- 8 50.8	84 9.7	23 43.8
6	266 33.2	-10 56.7	240 3.7	257 5.8	- 8 48.4	114 15.9	23 43.9
8	296 33.4	-10 54.9	270 8.7	287 4.9	- 8 46.0	144 22.2	23 44.1
10	326 33.5	-10 53.1	300 13.6	317 4.0	- 8 43.6	174 28.4	23 44.2
12	356 33.6	-10 51.3	330 18.5	347 3.0	- 8 41.2	204 34.6	23 44.3
14	26 33.8	-10 49.5	0 23.4	17 2.1	- 8 38.8	234 40.8	23 44.5
16	56 33.9	-10 47.7	30 28.4	47 1.2	- 8 36.4	264 47.0	23 44.6
18	86 34.1	-10 45.9	60 33.3	77 .3	- 8 34.0	294 53.2	23 44.7
20	116 34.2	-10 44.1	90 38.2	106 59.4	- 8 31.6	324 59.4	23 44.9
22	146 34.3	-10 42.3	120 43.2	136 58.5	- 8 29.2	355 5.6	23 45.0
Δ	1	9		-5	12	31	1

UT	MJESEC $S_\leftmoon$	MJESEC Δ	MJESEC $\delta_\leftmoon$	MJESEC Δ	JUPITER S_4	JUPITER δ_4	SATURN S_η	SATURN δ_η
h	° ′		° ′		° ′	° ′	° ′	° ′
0	116 58.5	117	18 29.2	98	170 5.9	- 9 32.6	325 39.2	0 55.5
2	145 59.8	115	18 48.7	96	200 9.7	- 9 32.2	355 44.4	0 55.6
4	175 .7	113	19 7.9	94	230 13.5	- 9 31.7	25 49.6	0 55.7
6	204 1.3	111	19 26.8	93	260 17.3	- 9 31.3	55 54.8	0 55.9
8	233 1.5	109	19 45.3	91	290 21.1	- 9 30.8	86 .0	0 56.0
10	262 1.3	107	20 3.5	89	320 24.9	- 9 30.4	116 5.2	0 56.1
12	291 .8	105	20 21.3	87	350 28.7	- 9 29.9	146 10.4	0 56.3
14	319 59.9	103	20 38.7	85	20 32.5	- 9 29.5	176 15.6	0 56.4
16	348 58.6	102	20 55.7	83	50 36.3	- 9 29.0	206 20.8	0 56.5
18	17 56.9	100	21 12.4	81	80 40.1	- 9 28.6	236 26.0	0 56.7
20	46 54.8	98	21 28.6	79	110 43.9	- 9 28.2	266 31.2	0 56.8
22	75 52.3	96	21 44.5	77	140 47.7	- 9 27.7	296 36.4	0 56.9
Δ					19	2	26	1

φ	SUNCE IZLAZ	SUNCE ZALAZ	TRAJANJE SUMRAKA GRAĐ.	TRAJANJE SUMRAKA ASTR.	MJESEC IZLAZ	MJESEC Δ/24	MJESEC ZALAZ	MJESEC Δ/24
N	h min	h min	h min	h min	h min	min	h min	min
60	7 25	17 4	0 43	2 20	7 55	.6	0 35	3.7
55	7 12	17 17	0 37	2 1	8 26	1.1	0 6	3.3
50	7 2	17 27	0 33	1 48	8 48	1.3	. . .	.0
45	6 53	17 35	0 30	1 38	9 6	1.5	. . .	.0
40	6 47	17 41	0 28	1 30	9 20	1.6	. . .	.0
35	6 41	17 47	0 26	1 25	9 33	1.7	. . .	.0
30	6 35	17 52	0 24	1 20	9 43	1.8	23 54	2.6
20	6 26	18 1	0 22	1 14	10 2	1.9	23 33	2.5
10	6 18	18 9	0 21	1 11	10 18	2.1	23 15	2.3
0	6 10	18 17	0 21	1 10	10 34	2.2	22 58	2.3
10	6 3	18 25	0 21	1 12	10 49	2.3	22 41	2.2
20	5 54	18 33	0 23	1 16	11 5	2.4	22 23	2.1
30	5 44	18 43	0 25	1 24	11 25	2.6	22 3	1.9
35	5 38	18 48	0 26	1 30	11 36	2.6	21 51	1.9
40	5 32	18 55	0 28	1 38	11 49	2.7	21 37	1.8
45	5 24	19 2	0 31	1 49	12 4	2.9	21 21	1.6
50	5 15	19 11	0 34	2 5	12 23	3.0	21 1	1.5
55	5 3	19 23	0 39	2 31	12 47	3.3	20 35	1.3
60	4 48	19 38	0 47	3 28	13 22	3.7	19 59	.8
S								

SUNCE UT	SUNCE $e = T_p - UT$	SUNCE Δ/24	SUNCE r	MJESEC Prolaz	MJESEC Δ/24	MJESEC $\pi_\leftmoon$	MJESEC r
h	min s	s	′	h min	min	′	′
00	-13 48.4	.3	16.2	$T_{\overline{m}}$ 16 46	2.2	56.0	15.3
12	-13 45.1	$T_{\overline{m}_\odot}$ 12 h 13.8 min		Starost 5.9 d	Faza ◐		

PLANETE

Pl.	$T_{\overline{m}}$	π	360−α	Vel.	Pl.	$T_{\overline{m}}$	π	360−α	Vel.
	h min	′	°			h min	′	°	
♀	12 52	.1	17	-3.8	♃	12 38	.0	20	-1.9
♂	22 20	.2	234	-.9	♄	2 17	.0	176	.7

UT	SUNCE $S_\odot$	SUNCE $\delta_\odot$	PROLJ. TAČKA S_Υ	VENERA S_φ	VENERA δ_φ	MARS S_σ	MARS δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	176 34.5	-10 40.5	150 48.1	166 57.6	- 8 26.8	25 11.8	23 45.1
2	206 34.6	-10 38.7	180 53.0	196 56.7	- 8 24.4	55 17.9	23 45.3
4	236 34.8	-10 36.9	210 57.9	226 55.8	- 8 22.0	85 24.1	23 45.4
6	266 34.9	-10 35.1	241 2.9	256 54.9	- 8 19.6	115 30.3	23 45.5
8	296 35.0	-10 33.3	271 7.8	286 54.0	- 8 17.1	145 36.4	23 45.6
10	326 35.2	-10 31.5	301 12.7	316 53.1	- 8 14.7	175 42.6	23 45.7
12	356 35.3	-10 29.7	331 17.7	346 52.2	- 8 12.3	205 48.7	23 45.9
14	26 35.5	-10 27.9	1 22.6	16 51.3	- 8 9.9	235 54.9	23 46.0
16	56 35.6	-10 26.0	31 27.5	46 50.5	- 8 7.5	266 1.0	23 46.1
18	86 35.8	-10 24.2	61 32.4	76 49.6	- 8 5.0	296 7.1	23 46.2
20	116 35.9	-10 22.4	91 37.4	106 48.7	- 8 2.6	326 13.2	23 46.3
22	146 36.1	-10 20.6	121 42.3	136 47.8	- 8 .2	356 19.4	23 46.4
Δ	1	9		-4	12	31	1

UT	MJESEC $S_\leftmoon$	MJESEC Δ	MJESEC $\delta_\leftmoon$	MJESEC Δ	JUPITER S_4	JUPITER δ_4	SATURN S_η	SATURN δ_η
h	° ′		° ′		° ′	° ′	° ′	° ′
0	104 49.5	94	21 59.9	75	170 51.5	- 9 27.3	326 41.6	0 57.1
2	133 46.2	92	22 14.8	73	200 55.3	- 9 26.8	356 46.8	0 57.2
4	162 42.6	90	22 29.3	70	230 59.1	- 9 26.4	26 52.0	0 57.4
6	191 38.6	88	22 43.4	68	261 2.9	- 9 25.9	56 57.2	0 57.5
8	220 34.2	86	22 57.0	66	291 6.6	- 9 25.5	87 2.5	0 57.6
10	249 29.4	84	23 10.1	63	321 10.4	- 9 25.0	117 7.7	0 57.8
12	278 24.3	82	23 22.8	61	351 14.2	- 9 24.6	147 12.9	0 57.9
14	307 18.8	80	23 34.9	58	21 18.0	- 9 24.1	177 18.1	0 58.0
16	336 12.8	79	23 46.6	56	51 21.8	- 9 23.7	207 23.3	0 58.2
18	5 6.6	77	23 57.7	53	81 25.6	- 9 23.2	237 28.5	0 58.3
20	33 59.9	75	24 8.3	50	111 29.4	- 9 22.8	267 33.7	0 58.5
22	62 52.9	73	24 18.4	48	141 33.2	- 9 22.3	297 38.9	0 58.6
Δ					19	2	26	1

φ	SUNCE IZLAZ	SUNCE ZALAZ	TRAJANJE SUMRAKA GRAĐ.	TRAJANJE SUMRAKA ASTR.	MJESEC IZLAZ	MJESEC Δ/24	MJESEC ZALAZ	MJESEC Δ/24
N	h min	h min	h min	h min	h min	min	h min	min
60	7 22	17 6	0 43	2 20	8 11	1.2	2 4	3.6
55	7 9	17 19	0 37	2 1	8 51	1.5	1 25	3.2
50	6 60	17 28	0 33	1 48	9 19	1.7	0 58	3.0
45	6 52	17 36	0 30	1 38	9 41	1.9	0 37	2.8
40	6 45	17 43	0 27	1 30	9 59	2.0	0 20	2.7
35	6 40	17 48	0 26	1 25	10 13	2.0	0 6	2.6
30	6 34	17 53	0 24	1 20	10 26	2.1	. . .	.0
20	6 26	18 2	0 22	1 14	10 48	2.2	. . .	.0
10	6 18	18 10	0 21	1 11	11 8	2.3	. . .	.0
0	6 10	18 17	0 21	1 10	11 26	2.3	23 52	2.4
10	6 3	18 24	0 21	1 11	11 44	2.4	23 33	2.4
20	5 54	18 33	0 23	1 16	12 3	2.5	23 13	2.3
30	5 45	18 42	0 25	1 23	12 26	2.6	22 49	2.2
35	5 39	18 47	0 26	1 29	12 39	2.6	22 35	2.2
40	5 33	18 54	0 28	1 37	12 55	2.7	22 19	2.2
45	5 26	19 1	0 31	1 48	13 13	2.8	22 0	2.1
50	5 17	19 10	0 34	2 4	13 36	2.9	21 37	2.0
55	5 6	19 20	0 39	2 29	14 7	3.1	21 5	1.9
60	4 51	19 35	0 47	3 22	14 52	3.4	20 19	1.5
S								

SUNCE UT	SUNCE $e = T_p - UT$	SUNCE Δ/24	SUNCE r	MJESEC Prolaz	MJESEC Δ/24	MJESEC $\pi_\leftmoon$	MJESEC r
h	min s	s	′	h min	min	′	′
00	-13 41.9	.3	16.2	$T_{\overline{m}}$ 17 39	2.4	56.7	15.5
12	-13 38.4	$T_{\overline{m}_\odot}$ 12 h 13.6 min		Starost 6.9 d	Faza ◐		

PLANETE

Pl.	$T_{\overline{m}}$	π	360−α	Vel.	Pl.	$T_{\overline{m}}$	π	360−α	Vel.
	h min	′	°			h min	′	°	
♀	12 53	.1	16	-3.8	♃	12 35	.0	20	-1.9
♂	22 15	.2	234	-.8	♄	2 13	.0	176	.7

UT	SUNCE $S_\odot$	SUNCE $\delta_\odot$	PROLJ. TAČKA S_Υ	VENERA S_φ	VENERA δ_φ	MARS S_σ	MARS δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	176 36.2	-10 18.8	151 47.2	166 46.9	- 7 57.8	26 25.5	23 46.5
2	206 36.4	-10 17.0	181 52.2	196 46.0	- 7 55.3	56 31.6	23 46.6
4	236 36.5	-10 15.1	211 57.1	226 45.1	- 7 52.9	86 37.7	23 46.7
6	266 36.7	-10 13.3	242 2.0	256 44.3	- 7 50.5	116 43.8	23 46.8
8	296 36.9	-10 11.5	272 6.9	286 43.4	- 7 48.0	146 49.9	23 46.9
10	326 37.0	-10 9.7	302 11.9	316 42.5	- 7 45.6	176 56.0	23 47.0
12	356 37.2	-10 7.9	332 16.8	346 41.6	- 7 43.2	207 2.0	23 47.1
14	26 37.3	-10 6.0	2 21.7	16 40.7	- 7 40.7	237 8.1	23 47.2
16	56 37.5	-10 4.2	32 26.7	46 39.9	- 7 38.3	267 14.2	23 47.3
18	86 37.7	-10 2.4	62 31.6	76 39.0	- 7 35.8	297 20.2	23 47.4
20	116 37.8	-10 .5	92 36.5	106 38.1	- 7 33.4	327 26.3	23 47.5
22	146 38.0	- 9 58.7	122 41.4	136 37.3	- 7 31.0	357 32.4	23 47.6
Δ	1	9		-4	12	30	0

UT	MJESEC $S_\leftmoon$	MJESEC Δ	MJESEC $\delta_\leftmoon$	MJESEC Δ	JUPITER S_4	JUPITER δ_4	SATURN S_η	SATURN δ_η
h	° ′		° ′		° ′	° ′	° ′	° ′
0	91 45.5	71	24 27.9	45	171 37.0	- 9 21.9	327 44.1	0 58.7
2	120 37.8	70	24 36.9	42	201 40.8	- 9 21.4	357 49.3	0 58.9
4	149 29.7	68	24 45.3	39	231 44.6	- 9 21.0	27 54.5	0 59.0
6	178 21.3	66	24 53.1	36	261 48.4	- 9 20.5	57 59.7	0 59.1
8	207 12.6	65	25 .4	33	291 52.2	- 9 20.1	88 4.9	0 59.3
10	236 3.5	63	25 7.0	30	321 56.0	- 9 19.6	118 10.1	0 59.4
12	264 54.1	62	25 13.1	27	351 59.8	- 9 19.2	148 15.4	0 59.6
14	293 44.5	60	25 18.5	24	22 3.6	- 9 18.7	178 20.6	0 59.7
16	322 34.5	59	25 23.4	21	52 7.3	- 9 18.3	208 25.8	0 59.8
18	351 24.3	57	25 27.6	18	82 11.1	- 9 17.8	238 31.0	0 60.0
20	20 13.7	56	25 31.2	15	112 14.9	- 9 17.4	268 36.2	1 .1
22	49 3.0	55	25 34.1	12	142 18.7	- 9 16.9	298 41.4	1 .3
Δ					19	2	26	1

φ	SUNCE IZLAZ	SUNCE ZALAZ	TRAJANJE SUMRAKA GRAĐ.	TRAJANJE SUMRAKA ASTR.	MJESEC IZLAZ	MJESEC Δ/24	MJESEC ZALAZ	MJESEC Δ/24
N	h min	h min	h min	h min	h min	min	h min	min
60	7 19	17 9	0 43	2 19	8 39	2.1	3 31	3.0
55	7 7	17 21	0 37	2 1	9 28	2.2	2 42	2.8
50	6 58	17 30	0 33	1 48	10 1	2.3	2 9	2.7
45	6 50	17 38	0 30	1 38	10 26	2.3	1 45	2.7
40	6 44	17 44	0 27	1 30	10 46	2.4	1 26	2.6
35	6 38	17 49	0 26	1 24	11 2	2.4	1 9	2.6
30	6 34	17 54	0 24	1 20	11 16	2.4	0 55	2.6
20	6 25	18 2	0 22	1 14	11 41	2.4	0 32	2.5
10	6 17	18 10	0 21	1 11	12 2	2.5	0 11	2.5
0	6 10	18 17	0 21	1 10	12 22	2.5	.. ..	.0
10	6 3	18 24	0 21	1 11	12 42	2.5	.. ..	.0
20	5 55	18 32	0 22	1 15	13 3	2.5	.. ..	.0
30	5 46	18 41	0 25	1 23	13 28	2.5	23 43	2.6
35	5 40	18 46	0 26	1 29	13 42	2.5	23 28	2.6
40	5 34	18 52	0 28	1 37	13 59	2.5	23 11	2.6
45	5 27	18 59	0 31	1 48	14 20	2.5	22 50	2.6
50	5 18	19 8	0 34	2 3	14 45	2.5	22 25	2.6
55	5 8	19 18	0 39	2 27	15 20	2.5	21 50	2.6
60	4 53	19 32	0 46	3 16	16 14	2.5	20 56	2.7
S								

SUNCE UT	SUNCE $e = T_p - UT$	SUNCE Δ/24	SUNCE r	MJESEC Prolaz	MJESEC Δ/24	MJESEC $\pi_\leftmoon$	MJESEC r
h	min s	s	′	h min	min	′	′
00	-13 34.9	.3	16.2	$T_{\overline{m}}$ 18 36	2.5	57.5	15.7
12	-13 31.0	$T_{\overline{m}_\odot}$ 12 h 13.5 min		Starost 7.9 d	Faza ◐		

PLANETE

Pl.	$T_{\overline{m}}$	π	360−α	Vel.	Pl.	$T_{\overline{m}}$	π	360−α	Vel.
	h min	′	°			h min	′	°	
♀	12 53	.1	15	-3.8	♃	12 32	.0	20	-1.9
♂	22 10	.2	235	-.8	♄	2 9	.0	176	.7

UT	SUNCE $S_\odot$	SUNCE $\delta_\odot$	PROLJ. TAČKA S_Υ	VENERA S_φ	VENERA δ_φ	MARS S_σ	MARS δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	176 38.2	- 9 56.9	152 46.4	166 36.4	- 7 28.5	27 38.4	23 47.7
2	206 38.3	- 9 55.1	182 51.3	196 35.5	- 7 26.1	57 44.4	23 47.8
4	236 38.5	- 9 53.2	212 56.2	226 34.7	- 7 23.6	87 50.5	23 47.9
6	266 38.7	- 9 51.4	243 1.2	256 33.8	- 7 21.2	117 56.5	23 47.9
8	296 38.8	- 9 49.6	273 6.1	286 32.9	- 7 18.7	148 2.5	23 48.0
10	326 39.0	- 9 47.7	303 11.0	316 32.1	- 7 16.3	178 8.6	23 48.1
12	356 39.2	- 9 45.9	333 15.9	346 31.2	- 7 13.8	208 14.6	23 48.2
14	26 39.4	- 9 44.0	3 20.9	16 30.3	- 7 11.4	238 20.6	23 48.3
16	56 39.5	- 9 42.2	33 25.8	46 29.5	- 7 8.9	268 26.6	23 48.3
18	86 39.7	- 9 40.4	63 30.7	76 28.6	- 7 6.5	298 32.6	23 48.4
20	116 39.9	- 9 38.5	93 35.6	106 27.8	- 7 4.0	328 38.6	23 48.5
22	146 40.1	- 9 36.7	123 40.6	136 26.9	- 7 1.5	358 44.5	23 48.5
Δ	1	9		-4	12	30	0

UT	MJESEC $S_\leftmoon$	MJESEC Δ	MJESEC $\delta_\leftmoon$	MJESEC Δ	JUPITER S_4	JUPITER δ_4	SATURN S_η	SATURN δ_η
h	° ′		° ′		° ′	° ′	° ′	° ′
0	77 51.9	54	25 36.4	8	172 22.5	- 9 16.5	328 46.6	1 .4
2	106 40.7	53	25 38.1	5	202 26.3	- 9 16.0	358 51.8	1 .5
4	135 29.2	52	25 39.1	2	232 30.1	- 9 15.6	28 57.0	1 .7
6	164 17.5	51	25 39.4	-2	262 33.9	- 9 15.1	59 2.3	1 .8
8	193 5.6	50	25 39.1	-5	292 37.7	- 9 14.7	89 7.5	1 1.0
10	221 53.5	49	25 38.1	-8	322 41.5	- 9 14.2	119 12.7	1 1.1
12	250 41.3	48	25 36.4	-12	352 45.3	- 9 13.8	149 17.9	1 1.2
14	279 28.9	47	25 34.1	-15	22 49.1	- 9 13.3	179 23.1	1 1.4
16	308 16.4	47	25 31.0	-19	52 52.9	- 9 12.9	209 28.3	1 1.5
18	337 3.7	46	25 27.3	-22	82 56.7	- 9 12.4	239 33.6	1 1.7
20	5 51.0	46	25 22.8	-26	113 .5	- 9 12.0	269 38.8	1 1.8
22	34 38.1	45	25 17.7	-29	143 4.2	- 9 11.6	299 44.0	1 1.9
Δ					19	2	26	1

φ	SUNCE IZLAZ	SUNCE ZALAZ	TRAJANJE SUMRAKA GRAĐ.	TRAJANJE SUMRAKA ASTR.	MJESEC IZLAZ	MJESEC Δ/24	MJESEC ZALAZ	MJESEC Δ/24
N	h min	h min	h min	h min	h min	min	h min	min
60	7 16	17 12	0 43	2 19	9 28	3.3	4 43	2.0
55	7 5	17 23	0 37	2 1	10 22	3.0	3 49	2.2
50	6 56	17 32	0 33	1 48	10 56	2.9	3 15	2.3
45	6 49	17 39	0 30	1 38	11 22	2.8	2 49	2.4
40	6 42	17 45	0 27	1 30	11 43	2.8	2 29	2.4
35	6 37	17 50	0 26	1 24	11 60	2.7	2 11	2.4
30	6 33	17 55	0 24	1 20	12 14	2.7	1 57	2.4
20	6 24	18 3	0 22	1 14	12 39	2.6	1 32	2.5
10	6 17	18 10	0 21	1 10	13 1	2.6	1 10	2.5
0	6 10	18 17	0 21	1 10	13 21	2.5	0 50	2.5
10	6 3	18 24	0 21	1 11	13 41	2.5	0 30	2.5
20	5 55	18 31	0 22	1 15	14 3	2.4	0 8	2.5
30	5 46	18 40	0 24	1 23	14 28	2.3	.. ..	.0
35	5 41	18 45	0 26	1 29	14 43	2.3	.. ..	.0
40	5 35	18 51	0 28	1 37	14 60	2.2	.. ..	.0
45	5 29	18 57	0 31	1 47	15 20	2.2	23 53	3.0
50	5 20	19 6	0 34	2 2	15 46	2.1	23 27	3.2
55	5 10	19 16	0 39	2 26	16 21	1.9	22 53	3.4
60	4 56	19 29	0 46	3 12	17 15	1.5	21 59	3.7
S								

SUNCE UT	SUNCE $e = T_p - UT$	SUNCE Δ/24	SUNCE r	MJESEC Prolaz	MJESEC Δ/24	MJESEC $\pi_\leftmoon$	MJESEC r
h	min s	s	′	h min	min	′	′
00	-13 27.1	.3	16.2	$T_{\overline{m}}$ 19 36	2.5	58.4	15.9
12	-13 23.0	$T_{\overline{m}_\odot}$ 12 h 13.4 min		Starost 8.9 d	Faza ◐		

PLANETE

Pl.	$T_{\overline{m}}$	π	360−α	Vel.	Pl.	$T_{\overline{m}}$	π	360−α	Vel.
	h min	′	°			h min	′	°	
♀	12 54	.1	14	-3.8	♃	12 29	.0	20	-1.9
♂	22 5	.2	235	-.8	♄	2 5	.0	176	.7

UT	SUNCE $S_\odot$	SUNCE $\delta_\odot$	PROLJ. TAČKA S_Υ	VENERA S_φ	VENERA δ_φ	MARS S_σ	MARS δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	176 40.3	- 9 34.8	153 45.5	166 26.1	- 6 59.1	28 50.5	23 48.6
2	206 40.4	- 9 33.0	183 50.4	196 25.2	- 6 56.6	58 56.5	23 48.7
4	236 40.6	- 9 31.2	213 55.4	226 24.4	- 6 54.2	89 2.5	23 48.7
6	266 40.8	- 9 29.3	244 .3	256 23.5	- 6 51.7	119 8.4	23 48.8
8	296 41.0	- 9 27.5	274 5.2	286 22.7	- 6 49.2	149 14.4	23 48.9
10	326 41.2	- 9 25.6	304 10.1	316 21.8	- 6 46.8	179 20.3	23 48.9
12	356 41.4	- 9 23.8	334 15.1	346 21.0	- 6 44.3	209 26.3	23 49.0
14	26 41.5	- 9 21.9	4 20.0	16 20.1	- 6 41.8	239 32.2	23 49.0
16	56 41.7	- 9 20.1	34 24.9	46 19.3	- 6 39.4	269 38.1	23 49.1
18	86 41.9	- 9 18.2	64 29.9	76 18.4	- 6 36.9	299 44.1	23 49.1
20	116 42.1	- 9 16.4	94 34.8	106 17.6	- 6 34.4	329 50.0	23 49.2
22	146 42.3	- 9 14.5	124 39.7	136 16.8	- 6 31.9	359 55.9	23 49.3
Δ	1	9		-4	12	30	0

UT	MJESEC $S_\leftmoon$	MJESEC Δ	MJESEC $\delta_\leftmoon$	MJESEC Δ	JUPITER S_4	JUPITER δ_4	SATURN S_η	SATURN δ_η
h	° ′		° ′		° ′	° ′	° ′	° ′
0	63 25.2	45	25 11.9	-32	173 8.0	- 9 11.1	329 49.2	1 2.1
2	92 12.2	45	25 5.4	-36	203 11.8	- 9 10.7	359 54.4	1 2.2
4	120 59.1	45	24 58.2	-39	233 15.6	- 9 10.2	29 59.6	1 2.4
6	149 46.0	45	24 50.3	-43	263 19.4	- 9 9.8	60 4.9	1 2.5
8	178 32.9	44	24 41.7	-46	293 23.2	- 9 9.3	90 10.1	1 2.6
10	207 19.8	45	24 32.4	-50	323 27.0	- 9 8.9	120 15.3	1 2.8
12	236 6.7	45	24 22.5	-53	353 30.8	- 9 8.4	150 20.5	1 2.9
14	264 53.7	45	24 11.8	-57	23 34.6	- 9 8.0	180 25.7	1 3.1
16	293 40.6	45	24 .4	-60	53 38.4	- 9 7.5	210 31.0	1 3.2
18	322 27.7	45	23 48.4	-64	83 42.2	- 9 7.1	240 36.2	1 3.4
20	351 14.8	46	23 35.7	-67	113 46.0	- 9 6.6	270 41.4	1 3.5
22	20 1.9	46	23 22.3	-70	143 49.8	- 9 6.1	300 46.6	1 3.6
Δ					19	2	26	1

φ	SUNCE IZLAZ	SUNCE ZALAZ	TRAJANJE SUMRAKA GRAĐ.	TRAJANJE SUMRAKA ASTR.	MJESEC IZLAZ	MJESEC Δ/24	MJESEC ZALAZ	MJESEC Δ/24
N	h min	h min	h min	h min	h min	min	h min	min
60	7 13	17 14	0 43	2 19	10 47	4.1	5 31	1.2
55	7 2	17 25	0 37	2 1	11 34	3.6	4 43	1.6
50	6 54	17 33	0 33	1 48	12 6	3.4	4 10	1.8
45	6 47	17 40	0 30	1 38	12 30	3.2	3 46	2.0
40	6 41	17 46	0 27	1 30	12 49	3.1	3 26	2.1
35	6 36	17 51	0 26	1 24	13 5	3.0	3 9	2.2
30	6 31	17 55	0 24	1 20	13 19	2.9	2 55	2.2
20	6 24	18 3	0 22	1 14	13 43	2.8	2 31	2.4
10	6 17	18 10	0 21	1 10	14 3	2.6	2 10	2.4
0	6 10	18 17	0 21	1 10	14 22	2.5	1 50	2.5
10	6 3	18 23	0 21	1 11	14 41	2.4	1 30	2.6
20	5 56	18 30	0 22	1 15	15 1	2.3	1 9	2.7
30	5 47	18 39	0 24	1 23	15 24	2.1	0 44	2.8
35	5 42	18 44	0 26	1 29	15 38	2.0	0 30	2.9
40	5 37	18 49	0 28	1 36	15 54	1.9	0 13	3.0
45	5 30	18 56	0 30	1 47	16 13	1.8	. . .	.0
50	5 22	19 4	0 34	2 1	16 36	1.6	. . .	.0
55	5 12	19 13	0 39	2 24	17 6	1.3	. . .	.0
60	4 59	19 26	0 46	3 8	17 51	.8	23 29	4.3
S								

SUNCE UT	SUNCE $e = T_p - UT$	SUNCE Δ/24	SUNCE r	MJESEC Prolaz	MJESEC Δ/24	MJESEC $\pi_\leftmoon$	MJESEC r
h	min s	s	′	h min	min	′	′
00	-13 18.8	.4	16.2	$T_{\overline{m}}$ 20 36	2.5	59.3	16.1
12	-13 14.3	$T_{\overline{m}_\odot}$ 12 h 13.2 min		Starost 9.9 d	Faza ◐		

PLANETE

Pl.	$T_{\overline{m}}$	π	360−α	Vel.	Pl.	$T_{\overline{m}}$	π	360−α	Vel.
	h min	′	°			h min	′	°	
♀	12 55	.1	13	-3.8	♃	12 26	.0	19	-1.9
♂	22 0	.2	235	-.8	♄	2 0	.0	176	.7

UT	SUNCE $S_\odot$	SUNCE $\delta_\odot$	PROLJ. TAČKA S_Υ	VENERA S_φ	VENERA δ_φ	MARS S_σ	MARS δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	176 42.5	- 9 12.7	154 44.6	166 15.9	- 6 29.5	30 1.8	23 49.3
2	206 42.7	- 9 10.8	184 49.6	196 15.1	- 6 27.0	60 7.7	23 49.3
4	236 42.9	- 9 8.9	214 54.5	226 14.2	- 6 24.5	90 13.6	23 49.4
6	266 43.1	- 9 7.1	244 59.4	256 13.4	- 6 22.0	120 19.5	23 49.4
8	296 43.3	- 9 5.2	275 4.4	286 12.6	- 6 19.6	150 25.4	23 49.5
10	326 43.5	- 9 3.4	305 9.3	316 11.7	- 6 17.1	180 31.3	23 49.5
12	356 43.7	- 9 1.5	335 14.2	346 10.9	- 6 14.6	210 37.1	23 49.6
14	26 43.9	- 8 59.6	5 19.1	16 10.1	- 6 12.1	240 43.0	23 49.6
16	56 44.1	- 8 57.8	35 24.1	46 9.2	- 6 9.6	270 48.9	23 49.6
18	86 44.3	- 8 55.9	65 29.0	76 8.4	- 6 7.2	300 54.7	23 49.7
20	116 44.5	- 8 54.1	95 33.9	106 7.6	- 6 4.7	331 .6	23 49.7
22	146 44.7	- 8 52.2	125 38.9	136 6.8	- 6 2.2	1 6.4	23 49.7
Δ	1	9		-4	12	29	0

UT	MJESEC $S_\leftmoon$	MJESEC Δ	MJESEC $\delta_\leftmoon$	MJESEC Δ	JUPITER S_4	JUPITER δ_4	SATURN S_η	SATURN δ_η
h	° ′		° ′		° ′	° ′	° ′	° ′
0	48 49.2	47	23 8.3	-74	173 53.6	- 9 5.7	330 51.8	1 3.8
2	77 36.6	47	22 53.5	-77	203 57.4	- 9 5.2	0 57.1	1 3.9
4	106 24.1	48	22 38.2	-80	234 1.2	- 9 4.8	31 2.3	1 4.1
6	135 11.7	49	22 22.1	-83	264 4.9	- 9 4.3	61 7.5	1 4.2
8	163 59.5	50	22 5.4	-87	294 8.7	- 9 3.9	91 12.7	1 4.4
10	192 47.4	50	21 48.1	-90	324 12.5	- 9 3.4	121 18.0	1 4.5
12	221 35.5	51	21 30.2	-93	354 16.3	- 9 3.0	151 23.2	1 4.7
14	250 23.7	52	21 11.6	-96	24 20.1	- 9 2.5	181 28.4	1 4.8
16	279 12.1	53	20 52.5	-99	54 23.9	- 9 2.1	211 33.6	1 4.9
18	308 .7	54	20 32.7	-102	84 27.7	- 9 1.6	241 38.9	1 5.1
20	336 49.5	55	20 12.3	-105	114 31.5	- 9 1.2	271 44.1	1 5.2
22	5 38.5	56	19 51.4	-108	144 35.3	- 9 .7	301 49.3	1 5.4
Δ					19	2	26	1

φ	SUNCE IZLAZ	SUNCE ZALAZ	TRAJANJE SUMRAKA GRAĐ.	TRAJANJE SUMRAKA ASTR.	MJESEC IZLAZ	MJESEC Δ/24	MJESEC ZALAZ	MJESEC Δ/24
N	h min	h min	h min	h min	h min	min	h min	min
60	7 11	17 17	0 42	2 19	12 25	4.4	5 59	.7
55	6 60	17 27	0 37	2 1	13 2	3.9	5 21	1.1
50	6 52	17 35	0 33	1 48	13 28	3.6	4 54	1.4
45	6 45	17 42	0 30	1 38	13 48	3.4	4 33	1.6
40	6 40	17 47	0 27	1 30	14 4	3.2	4 16	1.8
35	6 35	17 52	0 26	1 24	14 17	3.1	4 1	1.9
30	6 30	17 56	0 24	1 20	14 29	3.0	3 49	2.0
20	6 23	18 4	0 22	1 14	14 49	2.8	3 27	2.2
10	6 16	18 10	0 21	1 10	15 6	2.6	3 9	2.3
0	6 10	18 16	0 21	1 10	15 22	2.4	2 51	2.5
10	6 3	18 23	0 21	1 11	15 39	2.3	2 33	2.6
20	5 56	18 30	0 22	1 15	15 56	2.1	2 14	2.8
30	5 48	18 38	0 24	1 23	16 15	1.9	1 52	3.0
35	5 43	18 42	0 26	1 28	16 27	1.8	1 39	3.1
40	5 38	18 48	0 28	1 36	16 40	1.6	1 24	3.2
45	5 31	18 54	0 30	1 46	16 55	1.5	1 6	3.3
50	5 24	19 2	0 34	2 1	17 14	1.2	0 43	3.6
55	5 14	19 11	0 39	2 23	17 38	.9	0 14	3.8
60	5 1	19 23	0 45	3 4	18 11	.5	. . .	.0
S								

SUNCE UT	SUNCE $e = T_p - UT$	SUNCE Δ/24	SUNCE r	MJESEC Prolaz	MJESEC Δ/24	MJESEC $\pi_\leftmoon$	MJESEC r
h	min s	s	′	h min	min	′	′
00	-13 9.8	.4	16.2	$T_{\overline{m}}$ 21 37	2.4	60.1	16.4
12	-13 5.0	$T_{\overline{m}_\odot}$ 12 h 13.1 min		Starost 10.9 d	Faza ◐		

PLANETE

Pl.	$T_{\overline{m}}$	π	360−α	Vel.	Pl.	$T_{\overline{m}}$	π	360−α	Vel.
	h min	′	°			h min	′	°	
♀	12 55	.1	12	-3.8	♃	12 23	.0	19	-1.9
♂	21 56	.2	235	-.7	♄	1 56	.0	176	.7

26. FEBRUAR 2010. PETAK

UT	SUNCE $S_\odot$	SUNCE $\delta_\odot$	PROLJ. TAČKA S_Υ	VENERA S_φ	VENERA δ_φ	MARS S_σ	MARS δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	176 44.9	- 8 50.3	155 43.8	166 5.9	- 5 59.7	31 12.3	23 49.8
2	206 45.1	- 8 48.5	185 48.7	196 5.1	- 5 57.2	61 18.1	23 49.8
4	236 45.3	- 8 46.6	215 53.6	226 4.3	- 5 54.7	91 23.9	23 49.8
6	266 45.5	- 8 44.7	245 58.6	256 3.5	- 5 52.2	121 29.8	23 49.8
8	296 45.7	- 8 42.9	276 3.5	286 2.6	- 5 49.7	151 35.6	23 49.9
10	326 45.9	- 8 41.0	306 8.4	316 1.8	- 5 47.2	181 41.4	23 49.9
12	356 46.1	- 8 39.1	336 13.4	346 1.0	- 5 44.7	211 47.2	23 49.9
14	26 46.4	- 8 37.2	6 18.3	16 .2	- 5 42.2	241 53.0	23 49.9
16	56 46.6	- 8 35.4	36 23.2	45 59.4	- 5 39.7	271 58.8	23 49.9
18	86 46.8	- 8 33.5	66 28.1	75 58.5	- 5 37.2	302 4.6	23 50.0
20	116 47.0	- 8 31.6	96 33.1	105 57.7	- 5 34.8	332 10.4	23 50.0
22	146 47.2	- 8 29.7	126 38.0	135 56.9	- 5 32.3	2 16.1	23 50.0
Δ	1	9		-4	12	29	0

UT	MJESEC $S_\leftmoon$	MJESEC Δ	MJESEC $\delta_\leftmoon$	MJESEC Δ	JUPITER $S_\jupiter$	JUPITER $\delta_\jupiter$	SATURN $S_\saturn$	SATURN $\delta_\saturn$
h	° ′		° ′		° ′	° ′	° ′	° ′
0	34 27.7	57	19 29.9	-110	174 39.1	- 9 .3	331 54.5	1 5.5
2	63 17.2	58	19 7.8	-113	204 42.9	- 8 59.8	1 59.8	1 5.7
4	92 6.8	59	18 45.2	-116	234 46.7	- 8 59.4	32 5.0	1 5.8
6	120 56.7	60	18 22.0	-118	264 50.5	- 8 58.9	62 10.2	1 6.0
8	149 46.8	62	17 58.4	-121	294 54.3	- 8 58.5	92 15.5	1 6.1
10	178 37.1	63	17 34.2	-123	324 58.1	- 8 58.0	122 20.7	1 6.2
12	207 27.6	64	17 9.5	-126	355 1.9	- 8 57.6	152 25.9	1 6.4
14	236 18.4	65	16 44.3	-128	25 5.6	- 8 57.1	182 31.1	1 6.5
16	265 9.4	66	16 18.7	-130	55 9.4	- 8 56.7	212 36.4	1 6.7
18	294 .7	68	15 52.6	-133	85 13.2	- 8 56.2	242 41.6	1 6.8
20	322 52.2	69	15 26.1	-135	115 17.0	- 8 55.8	272 46.8	1 7.0
22	351 43.9	70	14 59.1	-137	145 20.8	- 8 55.3	302 52.1	1 7.1
Δ					19	2	26	1

φ	SUNCE IZLAZ	SUNCE ZALAZ	TRAJANJE SUMRAKA GRAĐ.	TRAJANJE SUMRAKA ASTR.	MJESEC IZLAZ	MJESEC Δ/24	MJESEC ZALAZ	MJESEC Δ/24
N	h min	h min	h min	h min	h min	min	h min	min
60	7 8	17 19	0 42	2 19	14 12	4.5	6 15	.4
55	6 58	17 29	0 37	2 1	14 37	4.0	5 48	.8
50	6 50	17 37	0 33	1 48	14 55	3.7	5 28	1.1
45	6 43	17 43	0 30	1 38	15 10	3.5	5 12	1.3
40	6 38	17 48	0 27	1 30	15 21	3.3	4 58	1.5
35	6 34	17 53	0 26	1 24	15 32	3.1	4 47	1.7
30	6 29	17 57	0 24	1 20	15 40	3.0	4 37	1.8
20	6 22	18 4	0 22	1 13	15 55	2.7	4 20	2.0
10	6 16	18 10	0 21	1 10	16 9	2.5	4 5	2.2
0	6 10	18 16	0 21	1 9	16 21	2.3	3 50	2.4
10	6 3	18 22	0 21	1 11	16 33	2.1	3 36	2.6
20	5 57	18 29	0 22	1 15	16 46	1.9	3 21	2.8
30	5 49	18 37	0 24	1 22	17 1	1.7	3 3	3.0
35	5 44	18 41	0 26	1 28	17 9	1.6	2 52	3.1
40	5 39	18 46	0 28	1 36	17 19	1.4	2 40	3.3
45	5 33	18 52	0 30	1 46	17 30	1.2	2 26	3.5
50	5 25	18 59	0 34	1 60	17 44	1.0	2 9	3.7
55	5 16	19 8	0 38	2 22	18 1	.7	1 46	4.0
60	5 4	19 20	0 45	3 1	18 23	.3	1 15	4.5
S								

SUNCE UT	SUNCE $e = T_p - UT$	SUNCE Δ/24	SUNCE r	MJESEC Prolaz	MJESEC Δ/24	MJESEC $\pi_\leftmoon$	MJESEC r
h	min s	s	′	h min	min	′	′
00	-13 .2	.4	16.2	$T_{\overline{m}}$ 22 34	2.3	60.7	16.5
12	-12 55.1	$T_{\overline{m}_\odot}$ 12 h 12.9 min		Starost 11.9 d	Faza ◐		

PLANETE

Pl.	$T_{\overline{m}}$	π	360−α	Vel.	Pl.	$T_{\overline{m}}$	π	360−α	Vel.
	h min	′	°			h min	′	°	
♀	12 56	.1	10	-3.8	♃	12 20	.0	19	-1.9
♂	21 51	.2	235	-.7	♄	1 52	.0	176	.7

27. FEBRUAR SUBOTA

UT	SUNCE $S_\odot$	SUNCE $\delta_\odot$	PROLJ. TAČKA S_Υ	VENERA S_φ	VENERA δ_φ	MARS S_σ	MARS δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	176 47.4	- 8 27.9	156 42.9	165 56.1	- 5 29.7	32 21.9	23 50.0
2	206 47.7	- 8 26.0	186 47.8	195 55.3	- 5 27.2	62 27.7	23 50.0
4	236 47.9	- 8 24.1	216 52.8	225 54.5	- 5 24.7	92 33.4	23 50.0
6	266 48.1	- 8 22.2	246 57.7	255 53.7	- 5 22.2	122 39.2	23 50.0
8	296 48.3	- 8 20.4	277 2.6	285 52.9	- 5 19.7	152 44.9	23 50.0
10	326 48.5	- 8 18.5	307 7.6	315 52.1	- 5 17.2	182 50.7	23 50.0
12	356 48.8	- 8 16.6	337 12.5	345 51.2	- 5 14.7	212 56.4	23 50.0
14	26 49.0	- 8 14.7	7 17.4	15 50.4	- 5 12.2	243 2.1	23 50.0
16	56 49.2	- 8 12.8	37 22.3	45 49.6	- 5 9.7	273 7.9	23 50.0
18	86 49.4	- 8 11.0	67 27.3	75 48.8	- 5 7.2	303 13.6	23 50.0
20	116 49.7	- 8 9.1	97 32.2	105 48.0	- 5 4.7	333 19.3	23 50.0
22	146 49.9	- 8 7.2	127 37.1	135 47.2	- 5 2.2	3 25.0	23 50.0
Δ	1	9		-4	13	29	0

UT	MJESEC $S_\leftmoon$	MJESEC Δ	MJESEC $\delta_\leftmoon$	MJESEC Δ	JUPITER $S_\jupiter$	JUPITER $\delta_\jupiter$	SATURN $S_\saturn$	SATURN $\delta_\saturn$
h	° ′		° ′		° ′	° ′	° ′	° ′
0	20 35.9	71	14 31.7	-139	175 24.6	- 8 54.9	332 57.3	1 7.3
2	49 28.1	72	14 4.0	-141	205 28.4	- 8 54.4	3 2.5	1 7.4
4	78 20.6	73	13 35.8	-143	235 32.2	- 8 54.0	33 7.8	1 7.6
6	107 13.3	75	13 7.3	-144	265 36.0	- 8 53.5	63 13.0	1 7.7
8	136 6.2	76	12 38.4	-146	295 39.8	- 8 53.1	93 18.2	1 7.9
10	164 59.4	77	12 9.2	-148	325 43.6	- 8 52.6	123 23.5	1 8.0
12	193 52.7	78	11 39.7	-149	355 47.4	- 8 52.2	153 28.7	1 8.1
14	222 46.3	79	11 9.8	-151	25 51.2	- 8 51.7	183 33.9	1 8.3
16	251 40.2	80	10 39.7	-152	55 55.0	- 8 51.3	213 39.2	1 8.4
18	280 34.2	81	10 9.3	-153	85 58.8	- 8 50.8	243 44.4	1 8.6
20	309 28.4	82	9 38.7	-154	116 2.6	- 8 50.4	273 49.6	1 8.7
22	338 22.9	83	9 7.8	-156	146 6.4	- 8 49.9	303 54.9	1 8.9
Δ					19	2	26	1

φ	SUNCE IZLAZ	SUNCE ZALAZ	TRAJANJE SUMRAKA GRAĐ.	TRAJANJE SUMRAKA ASTR.	MJESEC IZLAZ	MJESEC Δ/24	MJESEC ZALAZ	MJESEC Δ/24
N	h min	h min	h min	h min	h min	min	h min	min
60	7 5	17 22	0 42	2 19	15 58	4.4	6 25	.3
55	6 55	17 31	0 37	2 1	16 13	4.0	6 8	.7
50	6 48	17 39	0 33	1 48	16 24	3.7	5 55	.9
45	6 42	17 44	0 30	1 38	16 33	3.4	5 44	1.2
40	6 37	17 49	0 27	1 30	16 40	3.2	5 35	1.3
35	6 32	17 54	0 25	1 24	16 46	3.1	5 27	1.5
30	6 28	17 58	0 24	1 20	16 52	2.9	5 20	1.6
20	6 21	18 4	0 22	1 13	17 1	2.7	5 8	1.9
10	6 15	18 10	0 21	1 10	17 9	2.4	4 58	2.1
0	6 9	18 16	0 21	1 9	17 17	2.2	4 48	2.3
10	6 3	18 22	0 21	1 11	17 24	2.0	4 38	2.5
20	5 57	18 28	0 22	1 15	17 33	1.8	4 27	2.7
30	5 49	18 36	0 24	1 22	17 42	1.6	4 14	2.9
35	5 45	18 40	0 26	1 28	17 47	1.4	4 7	3.1
40	5 40	18 45	0 28	1 35	17 53	1.3	3 59	3.3
45	5 34	18 51	0 30	1 45	17 60	1.1	3 49	3.5
50	5 27	18 57	0 34	1 59	18 8	.9	3 37	3.7
55	5 18	19 6	0 38	2 20	18 18	.6	3 22	4.0
60	5 7	19 17	0 45	2 58	18 31	.2	3 3	4.4
S								

SUNCE UT	SUNCE $e = T_p - UT$	SUNCE Δ/24	SUNCE r	MJESEC Prolaz	MJESEC Δ/24	MJESEC $\pi_\leftmoon$	MJESEC r
h	min s	s	′	h min	min	′	′
00	-12 50.1	.4	16.2	$T_{\overline{m}}$ 23 30	2.2	61.1	16.7
12	-12 44.7	$T_{\overline{m}_\odot}$ 12 h 12.7 min		Starost 12.9 d	Faza ○		

PLANETE

Pl.	$T_{\overline{m}}$	π	360−α	Vel.	Pl.	$T_{\overline{m}}$	π	360−α	Vel.
	h min	′	°			h min	′	°	
♀	12 57	.1	9	-3.8	♃	12 17	.0	19	-1.9
♂	21 46	.2	236	-.7	♄	1 48	.0	176	.7

UT	SUNCE $S_\odot$	SUNCE $\delta_\odot$	PROLJ. TAČKA S_Υ	VENERA S_φ	VENERA δ_φ	MARS S_σ	MARS δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	176 50.1	- 8 5.3	157 42.1	165 46.4	- 4 59.7	33 30.7	23 50.0
2	206 50.3	- 8 3.4	187 47.0	195 45.6	- 4 57.2	63 36.4	23 50.0
4	236 50.6	- 8 1.5	217 51.9	225 44.8	- 4 54.6	93 42.1	23 50.0
6	266 50.8	- 7 59.6	247 56.8	255 44.0	- 4 52.1	123 47.8	23 50.0
8	296 51.0	- 7 57.7	278 1.8	285 43.2	- 4 49.6	153 53.5	23 50.0
10	326 51.3	- 7 55.9	308 6.7	315 42.4	- 4 47.1	183 59.1	23 50.0
12	356 51.5	- 7 54.0	338 11.6	345 41.6	- 4 44.6	214 4.8	23 49.9
14	26 51.7	- 7 52.1	8 16.6	15 40.8	- 4 42.1	244 10.5	23 49.9
16	56 52.0	- 7 50.2	38 21.5	45 40.0	- 4 39.5	274 16.1	23 49.9
18	86 52.2	- 7 48.3	68 26.4	75 39.3	- 4 37.0	304 21.8	23 49.9
20	116 52.5	- 7 46.4	98 31.3	105 38.5	- 4 34.5	334 27.4	23 49.9
22	146 52.7	- 7 44.5	128 36.3	135 37.7	- 4 32.0	4 33.0	23 49.9
Δ	1	9		-4	13	28	0

UT	MJESEC $S_\leftmoon$	MJESEC Δ	MJESEC $\delta_\leftmoon$	MJESEC Δ	JUPITER $S_\jupiter$	JUPITER $\delta_\jupiter$	SATURN $S_\saturn$	SATURN $\delta_\saturn$
h	° ′		° ′		° ′	° ′	° ′	° ′
0	7 17.5	84	8 36.6	-157	176 10.2	- 8 49.5	334 .1	1 9.0
2	36 12.4	85	8 5.3	-158	206 13.9	- 8 49.0	4 5.4	1 9.2
4	65 7.4	86	7 33.8	-159	236 17.7	- 8 48.6	34 10.6	1 9.3
6	94 2.6	87	7 2.1	-159	266 21.5	- 8 48.1	64 15.8	1 9.5
8	122 58.0	88	6 30.2	-160	296 25.3	- 8 47.7	94 21.1	1 9.6
10	151 53.6	89	5 58.2	-161	326 29.1	- 8 47.2	124 26.3	1 9.8
12	180 49.3	89	5 26.0	-161	356 32.9	- 8 46.8	154 31.5	1 9.9
14	209 45.2	90	4 53.8	-162	26 36.7	- 8 46.3	184 36.8	1 10.1
16	238 41.3	91	4 21.4	-162	56 40.5	- 8 45.8	214 42.0	1 10.2
18	267 37.5	92	3 49.0	-162	86 44.3	- 8 45.4	244 47.3	1 10.4
20	296 33.8	92	3 16.5	-163	116 48.1	- 8 44.9	274 52.5	1 10.5
22	325 30.3	93	2 44.0	-163	146 51.9	- 8 44.5	304 57.7	1 10.7
Δ					19	2	26	1

φ	SUNCE IZLAZ	SUNCE ZALAZ	TRAJANJE SUMRAKA GRAĐ.	TRAJANJE SUMRAKA ASTR.	MJESEC IZLAZ	MJESEC Δ/24	MJESEC ZALAZ	MJESEC Δ/24
N	h min	h min	h min	h min	h min	min	h min	min
60	7 2	17 24	0 42	2 19	17 43	4.3	6 32	.2
55	6 53	17 33	0 37	2 1	17 48	3.9	6 24	.6
50	6 46	17 40	0 33	1 48	17 52	3.6	6 17	.8
45	6 40	17 46	0 30	1 38	17 55	3.4	6 11	1.1
40	6 35	17 51	0 27	1 30	17 57	3.2	6 7	1.2
35	6 31	17 55	0 25	1 24	17 60	3.0	6 3	1.4
30	6 27	17 58	0 24	1 20	18 2	2.9	5 59	1.5
20	6 21	18 5	0 22	1 13	18 5	2.6	5 53	1.8
10	6 15	18 10	0 21	1 10	18 8	2.4	5 48	2.0
0	6 9	18 16	0 21	1 9	18 11	2.2	5 42	2.2
10	6 4	18 21	0 21	1 11	18 13	2.0	5 37	2.4
20	5 57	18 28	0 22	1 15	18 16	1.8	5 32	2.6
30	5 50	18 35	0 24	1 22	18 20	1.5	5 25	2.9
35	5 46	18 39	0 26	1 28	18 21	1.4	5 21	3.0
40	5 41	18 43	0 28	1 35	18 24	1.2	5 17	3.2
45	5 35	18 49	0 30	1 45	18 26	1.0	5 12	3.4
50	5 29	18 55	0 33	1 59	18 29	.8	5 6	3.6
55	5 20	19 4	0 38	2 19	18 33	.6	4 58	3.9
60	5 9	19 14	0 45	2 55	18 37	.2	4 49	4.3
S								

SUNCE UT	SUNCE $e = T_p - UT$	SUNCE Δ/24	SUNCE r	MJESEC Prolaz	MJESEC Δ/24	MJESEC $\pi_\leftmoon$	MJESEC r
h	min s	s	′	h min	min	′	′
00	-12 39.3	.5	16.2	$T_{\overline{m}}$	1.0	61.3	16.7
12	-12 33.7	$T_{\overline{m}_\odot}$ 12 h 12.6 min		Starost 13.9 d	Faza ○		

PLANETE

Pl.	$T_{\overline{m}}$	π	360−α	Vel.	Pl.	$T_{\overline{m}}$	π	360−α	Vel.
	h min	′	°			h min	′	°	
♀	12 57	.1	8	-3.8	♃	12 14	.0	18	-1.9
♂	21 42	.2	236	-.6	♄	1 44	.0	176	.7

UT	SUNCE $S_\odot$	SUNCE $\delta_\odot$	PROLJ. TAČKA S_Υ	VENERA S_φ	VENERA δ_φ	MARS S_σ	MARS δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	176 52.9	- 7 42.6	158 41.2	165 36.9	- 4 29.4	34 38.7	23 49.8
2	206 53.2	- 7 40.7	188 46.1	195 36.1	- 4 26.9	64 44.3	23 49.8
4	236 53.4	- 7 38.8	218 51.1	225 35.3	- 4 24.4	94 49.9	23 49.8
6	266 53.7	- 7 36.9	248 56.0	255 34.5	- 4 21.9	124 55.5	23 49.7
8	296 53.9	- 7 35.0	279 .9	285 33.7	- 4 19.3	155 1.1	23 49.7
10	326 54.1	- 7 33.1	309 5.8	315 32.9	- 4 16.8	185 6.8	23 49.7
12	356 54.4	- 7 31.2	339 10.8	345 32.2	- 4 14.3	215 12.3	23 49.7
14	26 54.6	- 7 29.3	9 15.7	15 31.4	- 4 11.8	245 17.9	23 49.6
16	56 54.9	- 7 27.4	39 20.6	45 30.6	- 4 9.2	275 23.5	23 49.6
18	86 55.1	- 7 25.5	69 25.6	75 29.8	- 4 6.7	305 29.1	23 49.6
20	116 55.4	- 7 23.6	99 30.5	105 29.0	- 4 4.2	335 34.7	23 49.5
22	146 55.6	- 7 21.7	129 35.4	135 28.2	- 4 1.6	5 40.3	23 49.5
Δ	1	10		-4	13	28	0

UT	MJESEC $S_\leftmoon$	MJESEC Δ	MJESEC $\delta_\leftmoon$	MJESEC Δ	JUPITER $S_\jupiter$	JUPITER $\delta_\jupiter$	SATURN $S_\saturn$	SATURN $\delta_\saturn$
h	° ′		° ′		° ′	° ′	° ′	° ′
0	354 26.8	94	2 11.4	-163	176 55.7	- 8 44.0	335 3.0	1 10.8
2	23 23.5	94	1 38.8	-163	206 59.5	- 8 43.6	5 8.2	1 11.0
4	52 20.3	95	1 6.2	-163	237 3.3	- 8 43.1	35 13.5	1 11.1
6	81 17.3	95	0 33.6	-163	267 7.1	- 8 42.7	65 18.7	1 11.3
8	110 14.3	95	0 1.1	-163	297 10.9	- 8 42.2	95 23.9	1 11.4
10	139 11.4	96	- 0 31.5	-162	327 14.7	- 8 41.8	125 29.2	1 11.6
12	168 8.5	96	- 1 3.9	-162	357 18.5	- 8 41.3	155 34.4	1 11.7
14	197 5.8	97	- 1 36.3	-161	27 22.3	- 8 40.9	185 39.7	1 11.9
16	226 3.1	97	- 2 8.6	-161	57 26.1	- 8 40.4	215 44.9	1 12.0
18	255 .5	97	- 2 40.8	-160	87 29.9	- 8 40.0	245 50.2	1 12.2
20	283 57.9	97	- 3 12.9	-160	117 33.7	- 8 39.5	275 55.4	1 12.3
22	312 55.4	98	- 3 44.8	-159	147 37.4	- 8 39.1	306 .6	1 12.5
Δ					19	2	26	1

φ	SUNCE IZLAZ	SUNCE ZALAZ	TRAJANJE SUMRAKA GRAĐ.	TRAJANJE SUMRAKA ASTR.	MJESEC IZLAZ	MJESEC Δ/24	MJESEC ZALAZ	MJESEC Δ/24
N	h min	h min	h min	h min	h min	min	h min	min
60	6 59	17 27	0 42	2 19	19 25	4.2	6 38	.2
55	6 50	17 35	0 36	2 1	19 21	3.8	6 37	.6
50	6 44	17 42	0 32	1 48	19 18	3.5	6 37	.8
45	6 38	17 47	0 29	1 38	19 16	3.3	6 37	1.0
40	6 34	17 52	0 27	1 30	19 13	3.1	6 37	1.2
35	6 30	17 55	0 25	1 24	19 12	3.0	6 36	1.4
30	6 26	17 59	0 24	1 20	19 10	2.8	6 36	1.5
20	6 20	18 5	0 22	1 13	19 7	2.6	6 36	1.7
10	6 14	18 10	0 21	1 10	19 5	2.4	6 36	2.0
0	6 9	18 16	0 21	1 9	19 3	2.2	6 35	2.2
10	6 4	18 21	0 21	1 11	19 1	2.0	6 35	2.4
20	5 58	18 27	0 22	1 15	18 58	1.7	6 35	2.6
30	5 51	18 33	0 24	1 22	18 56	1.5	6 34	2.8
35	5 47	18 37	0 26	1 27	18 54	1.4	6 34	3.0
40	5 42	18 42	0 28	1 35	18 53	1.2	6 34	3.1
45	5 37	18 47	0 30	1 44	18 51	1.0	6 34	3.3
50	5 30	18 53	0 33	1 58	18 49	.8	6 33	3.6
55	5 22	19 1	0 38	2 18	18 46	.6	6 33	3.9
60	5 12	19 11	0 44	2 53	18 43	.2	6 32	4.2
S								

SUNCE UT	SUNCE $e = T_p - UT$	SUNCE Δ/24	SUNCE r	MJESEC Prolaz	MJESEC Δ/24	MJESEC $\pi_\leftmoon$	MJESEC r
h	min s	s	′	h min	min	′	′
00	-12 28.1	.5	16.2	$T_{\overline{m}}$ 0 23	2.2	61.1	16.6
12	-12 22.2	$T_{\overline{m}_\odot}$ 12 h 12.4 min		Starost 14.9 d	Faza ○		

PLANETE

Pl.	$T_{\overline{m}}$	π	360−α	Vel.	Pl.	$T_{\overline{m}}$	π	360−α	Vel.
	h min	′	°			h min	′	°	
♀	12 58	.1	7	-3.8	♃	12 11	.0	18	-1.9
♂	21 37	.2	236	-.6	♄	1 40	.0	176	.7

UT	SUNCE $S_\odot$	SUNCE $\delta_\odot$	PROLJ. TAČKA S_Υ	VENERA S_φ	VENERA δ_φ	MARS S_σ	MARS δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	176 55.9	- 7 19.8	159 40.3	165 27.5	- 3 59.1	35 45.8	23 49.4
2	206 56.1	- 7 17.9	189 45.3	195 26.7	- 3 56.6	65 51.4	23 49.4
4	236 56.4	- 7 16.0	219 50.2	225 25.9	- 3 54.0	95 56.9	23 49.3
6	266 56.6	- 7 14.1	249 55.1	255 25.1	- 3 51.5	126 2.5	23 49.3
8	296 56.9	- 7 12.2	280 .1	285 24.3	- 3 49.0	156 8.0	23 49.3
10	326 57.1	- 7 10.3	310 5.0	315 23.6	- 3 46.4	186 13.5	23 49.2
12	356 57.4	- 7 8.3	340 9.9	345 22.8	- 3 43.9	216 19.1	23 49.2
14	26 57.6	- 7 6.4	10 14.8	15 22.0	- 3 41.4	246 24.6	23 49.1
16	56 57.9	- 7 4.5	40 19.8	45 21.2	- 3 38.8	276 30.1	23 49.1
18	86 58.2	- 7 2.6	70 24.7	75 20.5	- 3 36.3	306 35.6	23 49.0
20	116 58.4	- 7 .7	100 29.6	105 19.7	- 3 33.7	336 41.1	23 49.0
22	146 58.7	- 6 58.8	130 34.5	135 18.9	- 3 31.2	6 46.6	23 48.9
Δ	1	10		-4	13	28	0

UT	MJESEC $S_\leftmoon$	MJESEC Δ	MJESEC $\delta_\leftmoon$	MJESEC Δ	JUPITER S_4	JUPITER δ_4	SATURN S_η	SATURN δ_η
h	° ′		° ′		° ′	° ′	° ′	° ′
0	341 52.9	98	- 4 16.6	-158	177 41.2	- 8 38.6	336 5.9	1 12.6
2	10 50.4	98	- 4 48.3	-157	207 45.0	- 8 38.2	6 11.1	1 12.8
4	39 48.0	98	- 5 19.7	-156	237 48.8	- 8 37.7	36 16.4	1 12.9
6	68 45.6	98	- 5 51.0	-155	267 52.6	- 8 37.2	66 21.6	1 13.1
8	97 43.2	98	- 6 22.1	-154	297 56.4	- 8 36.8	96 26.9	1 13.2
10	126 40.8	98	- 6 53.0	-153	328 .2	- 8 36.3	126 32.1	1 13.4
12	155 38.4	98	- 7 23.6	-152	358 4.0	- 8 35.9	156 37.4	1 13.5
14	184 36.0	98	- 7 54.1	-151	28 7.8	- 8 35.4	186 42.6	1 13.7
16	213 33.5	98	- 8 24.2	-150	58 11.6	- 8 35.0	216 47.9	1 13.8
18	242 31.1	98	- 8 54.1	-148	88 15.4	- 8 34.5	246 53.1	1 14.0
20	271 28.6	97	- 9 23.8	-147	118 19.2	- 8 34.1	276 58.4	1 14.1
22	300 26.1	97	- 9 53.1	-145	148 23.0	- 8 33.6	307 3.6	1 14.3
Δ					19	2	26	1

φ	SUNCE IZLAZ	SUNCE ZALAZ	TRAJANJE SUMRAKA GRAĐ.	TRAJANJE SUMRAKA ASTR.	MJESEC IZLAZ	MJESEC Δ/24	MJESEC ZALAZ	MJESEC Δ/24
N	h min	h min	h min	h min	h min	min	h min	min
60	6 56	17 29	0 42	2 19	21 6	4.2	6 43	.3
55	6 48	17 37	0 36	2 1	20 53	3.8	6 51	.6
50	6 42	17 44	0 32	1 48	20 43	3.5	6 57	.9
45	6 37	17 48	0 29	1 38	20 35	3.2	7 2	1.1
40	6 32	17 53	0 27	1 30	20 28	3.1	7 6	1.3
35	6 28	17 56	0 25	1 24	20 23	2.9	7 9	1.4
30	6 25	17 60	0 24	1 20	20 18	2.8	7 12	1.5
20	6 19	18 5	0 22	1 13	20 9	2.5	7 18	1.8
10	6 14	18 11	0 21	1 10	20 2	2.3	7 23	2.0
0	6 9	18 15	0 21	1 9	19 55	2.2	7 27	2.2
10	6 4	18 21	0 21	1 11	19 48	2.0	7 32	2.4
20	5 58	18 26	0 22	1 14	19 40	1.8	7 37	2.6
30	5 52	18 32	0 24	1 22	19 32	1.6	7 42	2.8
35	5 48	18 36	0 26	1 27	19 28	1.4	7 46	2.9
40	5 43	18 40	0 28	1 34	19 22	1.3	7 49	3.1
45	5 38	18 45	0 30	1 44	19 16	1.1	7 54	3.3
50	5 32	18 51	0 33	1 57	19 9	.9	7 59	3.5
55	5 24	18 59	0 38	2 17	18 60	.7	8 5	3.8
60	5 14	19 8	0 44	2 50	18 48	.3	8 13	4.2
S								

SUNCE UT	SUNCE $e = T_p - UT$	SUNCE Δ/24	SUNCE r	MJESEC Prolaz	MJESEC Δ/24	MJESEC $\pi_\leftmoon$	MJESEC r
h	min s	s	′	h min	min	′	′
00	-12 16.3	.5	16.2	$T_{\overline{m}}$ 1 15	2.2	60.6	16.5
12	-12 10.2	$T_{\overline{m}_\odot}$ 12 h 12.2 min		Starost 15.9 d	Faza ○		

PLANETE

Pl.	$T_{\overline{m}}$	π	360−α	Vel.	Pl.	$T_{\overline{m}}$	π	360−α	Vel.
	h min	′	°			h min	′	°	
♀	12 59	.1	6	-3.8	♃	12 8	.0	18	-1.9
♂	21 33	.2	236	-.6	♄	1 35	.0	176	.7

UT	SUNCE $S_\odot$	SUNCE $\delta_\odot$	PROLJ. TAČKA S_Υ	VENERA S_φ	VENERA δ_φ	MARS S_σ	MARS δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	176 58.9	- 6 56.9	160 39.5	165 18.1	- 3 28.7	36 52.1	23 48.8
2	206 59.2	- 6 55.0	190 44.4	195 17.4	- 3 26.1	66 57.6	23 48.8
4	236 59.5	- 6 53.1	220 49.3	225 16.6	- 3 23.6	97 3.1	23 48.7
6	266 59.7	- 6 51.1	250 54.3	255 15.8	- 3 21.0	127 8.6	23 48.7
8	297 .0	- 6 49.2	280 59.2	285 15.1	- 3 18.5	157 14.0	23 48.6
10	327 .3	- 6 47.3	311 4.1	315 14.3	- 3 15.9	187 19.5	23 48.5
12	357 .5	- 6 45.4	341 9.0	345 13.5	- 3 13.4	217 25.0	23 48.5
14	27 .8	- 6 43.5	11 14.0	15 12.8	- 3 10.8	247 30.4	23 48.4
16	57 1.0	- 6 41.5	41 18.9	45 12.0	- 3 8.3	277 35.9	23 48.3
18	87 1.3	- 6 39.6	71 23.8	75 11.2	- 3 5.8	307 41.3	23 48.3
20	117 1.6	- 6 37.7	101 28.8	105 10.5	- 3 3.2	337 46.7	23 48.2
22	147 1.9	- 6 35.8	131 33.7	135 9.7	- 3 .7	7 52.2	23 48.1
Δ	1	10		-4	13	27	0

UT	MJESEC $S_\leftmoon$	MJESEC Δ	MJESEC $\delta_\leftmoon$	MJESEC Δ	JUPITER S_4	JUPITER δ_4	SATURN S_η	SATURN δ_η
h	° ′		° ′		° ′	° ′	° ′	° ′
0	329 23.6	97	-10 22.2	-144	178 26.8	- 8 33.2	337 8.9	1 14.4
2	358 21.0	97	-10 50.9	-142	208 30.6	- 8 32.7	7 14.1	1 14.6
4	27 18.4	97	-11 19.4	-141	238 34.4	- 8 32.3	37 19.3	1 14.7
6	56 15.7	96	-11 47.5	-139	268 38.2	- 8 31.8	67 24.6	1 14.9
8	85 13.0	96	-12 15.2	-137	298 42.0	- 8 31.4	97 29.8	1 15.0
10	114 10.2	96	-12 42.6	-135	328 45.8	- 8 30.9	127 35.1	1 15.2
12	143 7.4	95	-13 9.7	-133	358 49.6	- 8 30.4	157 40.3	1 15.4
14	172 4.5	95	-13 36.3	-132	28 53.4	- 8 30.0	187 45.6	1 15.5
16	201 1.5	95	-14 2.6	-130	58 57.2	- 8 29.5	217 50.9	1 15.7
18	229 58.4	94	-14 28.5	-128	89 1.0	- 8 29.1	247 56.1	1 15.8
20	258 55.3	94	-14 54.1	-126	119 4.8	- 8 28.6	278 1.4	1 16.0
22	287 52.1	94	-15 19.2	-123	149 8.6	- 8 28.2	308 6.6	1 16.1
Δ					19	2	26	1

φ	SUNCE IZLAZ	SUNCE ZALAZ	TRAJANJE SUMRAKA GRAĐ.	TRAJANJE SUMRAKA ASTR.	MJESEC IZLAZ	MJESEC Δ/24	MJESEC ZALAZ	MJESEC Δ/24
N	h min	h min	h min	h min	h min	min	h min	min
60	6 53	17 32	0 42	2 19	22 46	4.1	6 49	.3
55	6 46	17 39	0 36	2 1	22 23	3.6	7 5	.7
50	6 40	17 45	0 32	1 48	22 6	3.3	7 18	1.0
45	6 35	17 50	0 29	1 38	21 53	3.1	7 27	1.2
40	6 31	17 54	0 27	1 30	21 42	3.0	7 36	1.4
35	6 27	17 57	0 25	1 24	21 32	2.8	7 43	1.5
30	6 24	18 0	0 24	1 19	21 24	2.7	7 49	1.6
20	6 18	18 6	0 22	1 13	21 10	2.5	8 0	1.8
10	6 13	18 11	0 21	1 10	20 58	2.4	8 10	2.0
0	6 9	18 15	0 21	1 9	20 47	2.2	8 19	2.2
10	6 4	18 20	0 21	1 10	20 35	2.0	8 28	2.4
20	5 58	18 25	0 22	1 14	20 23	1.9	8 38	2.5
30	5 52	18 31	0 24	1 22	20 10	1.7	8 49	2.8
35	5 49	18 35	0 26	1 27	20 2	1.6	8 56	2.9
40	5 44	18 39	0 28	1 34	19 53	1.4	9 3	3.0
45	5 40	18 43	0 30	1 44	19 43	1.3	9 12	3.2
50	5 34	18 49	0 33	1 57	19 31	1.1	9 23	3.4
55	5 26	18 56	0 38	2 16	19 15	.8	9 36	3.7
60	5 17	19 5	0 44	2 48	18 55	.4	9 54	4.1
S								

SUNCE UT	SUNCE $e = T_p - UT$	SUNCE Δ/24	SUNCE r	MJESEC Prolaz	MJESEC Δ/24	MJESEC $\pi_\leftmoon$	MJESEC r
h	min s	s	′	h min	min	′	′
00	-12 4.1	.5	16.2	$T_{\overline{m}}$ 2 7	2.2	59.8	16.3
12	-11 57.7	$T_{\overline{m}_\odot}$ 12 h 12.0 min		Starost 16.9 d	Faza ○		

PLANETE

Pl.	$T_{\overline{m}}$	π	360−α	Vel.	Pl.	$T_{\overline{m}}$	π	360−α	Vel.
	h min	′	°			h min	′	°	
♀	12 59	.1	5	-3.8	♃	12 5	.0	18	-1.9
♂	21 29	.2	236	-.6	♄	1 31	.0	176	.7

UT	SUNCE $S_\odot$	SUNCE $\delta_\odot$	PROLJ. TAČKA S_Υ	VENERA S_φ	VENERA δ_φ	MARS S_σ	MARS δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	177 2.1	- 6 33.9	161 38.6	165 8.9	- 2 58.1	37 57.6	23 48.0
2	207 2.4	- 6 31.9	191 43.5	195 8.2	- 2 55.6	68 3.0	23 48.0
4	237 2.7	- 6 30.0	221 48.5	225 7.4	- 2 53.0	98 8.4	23 47.9
6	267 2.9	- 6 28.1	251 53.4	255 6.7	- 2 50.5	128 13.8	23 47.8
8	297 3.2	- 6 26.2	281 58.3	285 5.9	- 2 47.9	158 19.2	23 47.7
10	327 3.5	- 6 24.2	312 3.3	315 5.1	- 2 45.4	188 24.6	23 47.7
12	357 3.8	- 6 22.3	342 8.2	345 4.4	- 2 42.8	218 30.0	23 47.6
14	27 4.0	- 6 20.4	12 13.1	15 3.6	- 2 40.3	248 35.4	23 47.5
16	57 4.3	- 6 18.5	42 18.0	45 2.9	- 2 37.7	278 40.8	23 47.4
18	87 4.6	- 6 16.5	72 23.0	75 2.1	- 2 35.1	308 46.2	23 47.3
20	117 4.9	- 6 14.6	102 27.9	105 1.3	- 2 32.6	338 51.5	23 47.2
22	147 5.1	- 6 12.7	132 32.8	135 .6	- 2 30.0	8 56.9	23 47.2
Δ	1	10		-4	13	27	0

UT	MJESEC $S_\leftmoon$	MJESEC Δ	MJESEC $\delta_\leftmoon$	MJESEC Δ	JUPITER $S_\jupiter$	JUPITER $\delta_\jupiter$	SATURN $S_\saturn$	SATURN $\delta_\saturn$
h	° ′		° ′		° ′	° ′	° ′	° ′
0	316 48.8	93	-15 43.8	-121	179 12.4	- 8 27.7	338 11.9	1 16.3
2	345 45.5	93	-16 8.1	-119	209 16.2	- 8 27.3	8 17.1	1 16.4
4	14 42.0	92	-16 31.9	-117	239 19.9	- 8 26.8	38 22.4	1 16.6
6	43 38.5	92	-16 55.3	-115	269 23.7	- 8 26.4	68 27.6	1 16.7
8	72 34.9	92	-17 18.3	-112	299 27.5	- 8 25.9	98 32.9	1 16.9
10	101 31.2	91	-17 40.8	-110	329 31.3	- 8 25.5	128 38.1	1 17.0
12	130 27.5	91	-18 2.8	-108	359 35.1	- 8 25.0	158 43.4	1 17.2
14	159 23.6	90	-18 24.3	-105	29 38.9	- 8 24.5	188 48.6	1 17.3
16	188 19.7	90	-18 45.4	-103	59 42.7	- 8 24.1	218 53.9	1 17.5
18	217 15.7	90	-19 6.0	-101	89 46.5	- 8 23.6	248 59.1	1 17.7
20	246 11.6	89	-19 26.1	-98	119 50.3	- 8 23.2	279 4.4	1 17.8
22	275 7.4	89	-19 45.7	-96	149 54.1	- 8 22.7	309 9.7	1 18.0
Δ					19	2	26	1

φ	SUNCE IZLAZ	SUNCE ZALAZ	TRAJANJE SUMRAKA GRAĐ.	TRAJANJE SUMRAKA ASTR.	MJESEC IZLAZ	MJESEC Δ/24	MJESEC ZALAZ	MJESEC Δ/24
N	h min	h min	h min	h min	h min	min	h min	min
60	6 50	17 35	0 42	2 20	. . .	.0	6 57	.5
55	6 43	17 41	0 36	2 1	23 50	3.4	7 22	.9
50	6 38	17 47	0 32	1 48	23 26	3.1	7 41	1.2
45	6 33	17 51	0 29	1 38	23 8	3.0	7 56	1.4
40	6 29	17 55	0 27	1 30	22 53	2.8	8 8	1.5
35	6 26	17 58	0 25	1 24	22 40	2.7	8 19	1.7
30	6 23	18 1	0 24	1 19	22 29	2.6	8 28	1.8
20	6 18	18 6	0 22	1 13	22 11	2.5	8 44	1.9
10	6 13	18 11	0 21	1 10	21 54	2.4	8 58	2.1
0	6 8	18 15	0 21	1 9	21 39	2.2	9 12	2.2
10	6 4	18 20	0 21	1 10	21 24	2.1	9 25	2.4
20	5 59	18 24	0 22	1 14	21 9	2.0	9 39	2.5
30	5 53	18 30	0 24	1 21	20 50	1.8	9 55	2.7
35	5 49	18 33	0 26	1 27	20 40	1.7	10 5	2.8
40	5 46	18 37	0 27	1 34	20 28	1.6	10 16	2.9
45	5 41	18 42	0 30	1 43	20 14	1.5	10 29	3.1
50	5 35	18 47	0 33	1 56	19 57	1.3	10 45	3.3
55	5 29	18 54	0 37	2 15	19 35	1.1	11 5	3.5
60	5 20	19 2	0 44	2 46	19 5	.7	11 32	4.0
S								

SUNCE UT	SUNCE $e = T_p - UT$	SUNCE Δ/24	SUNCE r	MJESEC Prolaz	MJESEC Δ/24	MJESEC $\pi_\leftmoon$	MJESEC r
h	min s	s	′	h min	min	′	′
00	-11 51.3	.5	16.2	$T_{\overline{m}}$ 2 59	2.2	58.9	16.1
12	-11 44.7	$T_{\overline{m}_\odot}$ 12 h 11.7 min		Starost 17.9 d	Faza ◑		

PLANETE

Pl.	$T_{\overline{m}}$	π	360−α	Vel.	Pl.	$T_{\overline{m}}$	π	360−α	Vel.
	h min	′	°			h min	′	°	
♀	12 60	.1	3	-3.8	♃	12 2	.0	18	-1.9
♂	21 24	.2	236	-.5	♄	1 27	.0	177	.7

UT	SUNCE $S_\odot$	SUNCE $\delta_\odot$	PROLJ. TAČKA S_Υ	VENERA S_φ	VENERA δ_φ	MARS S_σ	MARS δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	177 5.4	- 6 10.8	162 37.8	164 59.8	- 2 27.5	39 2.3	23 47.1
2	207 5.7	- 6 8.8	192 42.7	194 59.1	- 2 24.9	69 7.6	23 47.0
4	237 6.0	- 6 6.9	222 47.6	224 58.3	- 2 22.4	99 13.0	23 46.9
6	267 6.3	- 6 5.0	252 52.5	254 57.6	- 2 19.8	129 18.3	23 46.8
8	297 6.5	- 6 3.0	282 57.5	284 56.8	- 2 17.3	159 23.6	23 46.7
10	327 6.8	- 6 1.1	313 2.4	314 56.1	- 2 14.7	189 29.0	23 46.6
12	357 7.1	- 5 59.2	343 7.3	344 55.3	- 2 12.1	219 34.3	23 46.5
14	27 7.4	- 5 57.2	13 12.3	14 54.6	- 2 9.6	249 39.6	23 46.4
16	57 7.7	- 5 55.3	43 17.2	44 53.8	- 2 7.0	279 44.9	23 46.3
18	87 8.0	- 5 53.4	73 22.1	74 53.1	- 2 4.5	309 50.2	23 46.2
20	117 8.2	- 5 51.4	103 27.0	104 52.3	- 2 1.9	339 55.5	23 46.1
22	147 8.5	- 5 49.5	133 32.0	134 51.6	- 1 59.3	10 .8	23 46.0
Δ	1	10		-4	13	27	0

UT	MJESEC $S_\leftmoon$	MJESEC Δ	MJESEC $\delta_\leftmoon$	MJESEC Δ	JUPITER $S_\jupiter$	JUPITER $\delta_\jupiter$	SATURN $S_\saturn$	SATURN $\delta_\saturn$
h	° ′		° ′		° ′	° ′	° ′	° ′
0	304 3.1	88	-20 4.8	-93	179 57.9	- 8 22.3	339 14.9	1 18.1
2	332 58.8	88	-20 23.4	-91	210 1.7	- 8 21.8	9 20.2	1 18.3
4	1 54.4	88	-20 41.5	-88	240 5.5	- 8 21.4	39 25.4	1 18.4
6	30 50.0	87	-20 59.1	-85	270 9.3	- 8 20.9	69 30.7	1 18.6
8	59 45.4	87	-21 16.2	-83	300 13.1	- 8 20.5	99 35.9	1 18.7
10	88 40.8	87	-21 32.7	-80	330 16.9	- 8 20.0	129 41.2	1 18.9
12	117 36.2	86	-21 48.7	-77	0 20.7	- 8 19.6	159 46.5	1 19.0
14	146 31.5	86	-22 4.2	-75	30 24.5	- 8 19.1	189 51.7	1 19.2
16	175 26.7	86	-22 19.1	-72	60 28.3	- 8 18.6	219 57.0	1 19.4
18	204 21.9	86	-22 33.5	-69	90 32.1	- 8 18.2	250 2.2	1 19.5
20	233 17.1	86	-22 47.4	-67	120 35.9	- 8 17.7	280 7.5	1 19.7
22	262 12.2	85	-23 .7	-64	150 39.7	- 8 17.3	310 12.7	1 19.8
Δ					19	2	26	1

φ	SUNCE IZLAZ	SUNCE ZALAZ	TRAJANJE SUMRAKA GRAĐ.	TRAJANJE SUMRAKA ASTR.	MJESEC IZLAZ	MJESEC Δ/24	MJESEC ZALAZ	MJESEC Δ/24
N	h min	h min	h min	h min	h min	min	h min	min
60	6 47	17 37	0 42	2 20	0 24	3.8	7 9	.8
55	6 41	17 43	0 36	2 1	. . .	.0	7 44	1.2
50	6 35	17 48	0 32	1 48	. . .	.0	8 10	1.5
45	6 31	17 53	0 29	1 38	. . .	.0	8 29	1.6
40	6 28	17 56	0 27	1 30	. . .	.0	8 45	1.7
35	6 25	17 59	0 25	1 24	23 46	2.5	8 59	1.8
30	6 22	18 2	0 24	1 19	23 32	2.5	9 10	1.9
20	6 17	18 6	0 22	1 13	23 10	2.4	9 31	2.0
10	6 12	18 11	0 21	1 10	22 51	2.3	9 48	2.1
0	6 8	18 15	0 21	1 9	22 33	2.2	10 5	2.2
10	6 4	18 19	0 21	1 10	22 15	2.2	10 21	2.3
20	5 59	18 24	0 22	1 14	21 56	2.1	10 39	2.4
30	5 54	18 29	0 24	1 21	21 34	2.0	10 60	2.6
35	5 50	18 32	0 26	1 27	21 22	1.9	11 12	2.6
40	5 47	18 36	0 27	1 34	21 7	1.9	11 26	2.7
45	5 42	18 40	0 30	1 43	20 50	1.8	11 42	2.8
50	5 37	18 45	0 33	1 56	20 28	1.6	12 3	3.0
55	5 31	18 51	0 37	2 14	20 1	1.5	12 29	3.2
60	5 22	18 59	0 43	2 44	19 21	1.1	13 8	3.6
S								

SUNCE UT	SUNCE $e = T_p - UT$	SUNCE Δ/24	SUNCE r	MJESEC Prolaz	MJESEC Δ/24	MJESEC $\pi_\leftmoon$	MJESEC r
h	min s	s	′	h min	min	′	′
00	-11 38.2	.6	16.2	$T_{\overline{m}}$ 3 52	2.3	57.9	15.8
12	-11 31.4	$T_{\overline{m}_\odot}$ 12 h 11.5 min		Starost 18.9 d	Faza ◑		

PLANETE

Pl.	$T_{\overline{m}}$	π	360−α	Vel.	Pl.	$T_{\overline{m}}$	π	360−α	Vel.
	h min	′	°			h min	′	°	
♀	13 0	.1	2	-3.8	♃	11 59	.0	17	-1.9
♂	21 20	.2	236	-.5	♄	1 23	.0	177	.7

UT	SUNCE $S_\odot$	SUNCE $\delta_\odot$	PROLJ. TAČKA S_Υ	VENERA S_φ	VENERA δ_φ	MARS S_σ	MARS δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	177 8.8	- 5 47.6	163 36.9	164 50.8	- 1 56.8	40 6.1	23 45.9
2	207 9.1	- 5 45.6	193 41.8	194 50.1	- 1 54.2	70 11.4	23 45.8
4	237 9.4	- 5 43.7	223 46.8	224 49.3	- 1 51.7	100 16.7	23 45.7
6	267 9.7	- 5 41.8	253 51.7	254 48.6	- 1 49.1	130 21.9	23 45.6
8	297 10.0	- 5 39.8	283 56.6	284 47.8	- 1 46.5	160 27.2	23 45.5
10	327 10.3	- 5 37.9	314 1.5	314 47.1	- 1 44.0	190 32.4	23 45.4
12	357 10.5	- 5 35.9	344 6.5	344 46.3	- 1 41.4	220 37.7	23 45.2
14	27 10.8	- 5 34.0	14 11.4	14 45.6	- 1 38.8	250 43.0	23 45.1
16	57 11.1	- 5 32.1	44 16.3	44 44.8	- 1 36.3	280 48.2	23 45.0
18	87 11.4	- 5 30.1	74 21.2	74 44.1	- 1 33.7	310 53.4	23 44.9
20	117 11.7	- 5 28.2	104 26.2	104 43.3	- 1 31.1	340 58.7	23 44.8
22	147 12.0	- 5 26.2	134 31.1	134 42.6	- 1 28.6	11 3.9	23 44.7
Δ	1	10		-4	13	26	-1

UT	MJESEC $S_\leftmoon$	MJESEC Δ	MJESEC $\delta_\leftmoon$	MJESEC Δ	JUPITER $S_\jupiter$	JUPITER $\delta_\jupiter$	SATURN $S_\saturn$	SATURN $\delta_\saturn$
h	° ′		° ′		° ′	° ′	° ′	° ′
0	291 7.3	85	-23 13.5	-61	180 43.5	- 8 16.8	340 18.0	1 20.0
2	320 2.3	85	-23 25.7	-58	210 47.3	- 8 16.4	10 23.3	1 20.1
4	348 57.4	85	-23 37.4	-56	240 51.1	- 8 15.9	40 28.5	1 20.3
6	17 52.4	85	-23 48.5	-53	270 54.9	- 8 15.5	70 33.8	1 20.4
8	46 47.4	85	-23 59.0	-50	300 58.7	- 8 15.0	100 39.0	1 20.6
10	75 42.5	85	-24 9.0	-47	331 2.5	- 8 14.6	130 44.3	1 20.8
12	104 37.5	85	-24 18.5	-44	1 6.3	- 8 14.1	160 49.6	1 20.9
14	133 32.6	85	-24 27.4	-42	31 10.1	- 8 13.7	190 54.8	1 21.1
16	162 27.6	86	-24 35.7	-39	61 13.9	- 8 13.2	221 .1	1 21.2
18	191 22.8	86	-24 43.5	-36	91 17.7	- 8 12.7	251 5.3	1 21.4
20	220 17.9	86	-24 50.7	-33	121 21.5	- 8 12.3	281 10.6	1 21.5
22	249 13.1	86	-24 57.3	-31	151 25.3	- 8 11.8	311 15.9	1 21.7
Δ					19	2	26	1

φ	SUNCE IZLAZ	SUNCE ZALAZ	TRAJANJE SUMRAKA GRAĐ.	TRAJANJE SUMRAKA ASTR.	MJESEC IZLAZ	MJESEC Δ/24	MJESEC ZALAZ	MJESEC Δ/24
N	h min	h min	h min	h min	h min	min	h min	min
60	6 44	17 40	0 42	2 20	1 56	3.3	7 29	1.4
55	6 38	17 45	0 36	2 1	1 12	2.9	8 14	1.7
50	6 33	17 50	0 32	1 48	0 42	2.8	8 45	1.8
45	6 29	17 54	0 29	1 38	0 19	2.7	9 8	1.9
40	6 26	17 57	0 27	1 30	0 1	2.6	9 27	2.0
35	6 23	17 60	0 25	1 24	.. ..	.0	9 43	2.0
30	6 21	18 2	0 24	1 19	.. ..	.0	9 56	2.1
20	6 16	18 7	0 22	1 13	.. ..	.0	10 20	2.1
10	6 12	18 11	0 21	1 10	23 46	2.2	10 40	2.2
0	6 8	18 15	0 21	1 9	23 27	2.2	10 59	2.2
10	6 4	18 19	0 21	1 10	23 7	2.2	11 18	2.3
20	5 59	18 23	0 22	1 14	22 46	2.2	11 38	2.3
30	5 54	18 28	0 24	1 21	22 22	2.1	12 1	2.4
35	5 51	18 31	0 26	1 26	22 8	2.1	12 15	2.4
40	5 48	18 34	0 27	1 33	21 52	2.1	12 31	2.5
45	5 44	18 38	0 30	1 42	21 32	2.1	12 50	2.5
50	5 39	18 43	0 33	1 55	21 8	2.0	13 14	2.6
55	5 33	18 49	0 37	2 13	20 35	1.9	13 46	2.7
60	5 25	18 56	0 43	2 42	19 47	1.8	14 34	2.9
S								

SUNCE UT	SUNCE $e = T_p - UT$	SUNCE Δ/24	SUNCE r	MJESEC Prolaz	MJESEC Δ/24	MJESEC $\pi_\leftmoon$	MJESEC r
h	min s	s	′	h min	min	′	′
00	-11 24.6	.6	16.1	$T_{\overline{m}}$ 4 46	2.2	57.0	15.5
12	-11 17.6	$T_{\overline{m}_\odot}$ 12 h 11.3 min		Starost 19.9 d	Faza ◑		

PLANETE

Pl.	$T_{\overline{m}}$	π	360−α	Vel.	Pl.	$T_{\overline{m}}$	π	360−α	Vel.
	h min	′	°			h min	′	°	
♀	13 1	.1	1	-3.8	♃	11 56	.0	17	-1.9
♂	21 16	.2	236	-.5	♄	1 19	.0	177	.7

UT	SUNCE $S_\odot$	SUNCE $\delta_\odot$	PROLJ. TAČKA S_Υ	VENERA S_φ	VENERA δ_φ	MARS S_σ	MARS δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	177 12.3	- 5 24.3	164 36.0	164 41.8	- 1 26.0	41 9.1	23 44.5
2	207 12.6	- 5 22.3	194 41.0	194 41.1	- 1 23.4	71 14.3	23 44.4
4	237 12.9	- 5 20.4	224 45.9	224 40.4	- 1 20.9	101 19.5	23 44.3
6	267 13.2	- 5 18.5	254 50.8	254 39.6	- 1 18.3	131 24.7	23 44.2
8	297 13.5	- 5 16.5	284 55.7	284 38.9	- 1 15.7	161 29.9	23 44.1
10	327 13.8	- 5 14.6	315 .7	314 38.1	- 1 13.2	191 35.1	23 43.9
12	357 14.1	- 5 12.6	345 5.6	344 37.4	- 1 10.6	221 40.3	23 43.8
14	27 14.4	- 5 10.7	15 10.5	14 36.6	- 1 8.0	251 45.5	23 43.7
16	57 14.7	- 5 8.7	45 15.5	44 35.9	- 1 5.5	281 50.7	23 43.5
18	87 15.0	- 5 6.8	75 20.4	74 35.2	- 1 2.9	311 55.8	23 43.4
20	117 15.3	- 5 4.8	105 25.3	104 34.4	- 1 .3	342 1.0	23 43.3
22	147 15.6	- 5 2.9	135 30.2	134 33.7	- 0 57.8	12 6.2	23 43.2
Δ	1	10		-4	13	26	-1

UT	MJESEC $S_\leftmoon$	MJESEC Δ	MJESEC $\delta_\leftmoon$	MJESEC Δ	JUPITER $S_\jupiter$	JUPITER $\delta_\jupiter$	SATURN $S_\saturn$	SATURN $\delta_\saturn$
h	° ′		° ′		° ′	° ′	° ′	° ′
0	278 8.3	86	-25 3.4	-28	181 29.1	- 8 11.4	341 21.1	1 21.8
2	307 3.6	87	-25 9.0	-25	211 32.9	- 8 10.9	11 26.4	1 22.0
4	335 59.0	87	-25 14.0	-22	241 36.7	- 8 10.5	41 31.7	1 22.2
6	4 54.4	88	-25 18.4	-19	271 40.5	- 8 10.0	71 36.9	1 22.3
8	33 49.9	88	-25 22.3	-17	301 44.3	- 8 9.6	101 42.2	1 22.5
10	62 45.6	89	-25 25.6	-14	331 48.1	- 8 9.1	131 47.5	1 22.6
12	91 41.3	89	-25 28.4	-11	1 51.9	- 8 8.7	161 52.7	1 22.8
14	120 37.1	90	-25 30.6	-9	31 55.7	- 8 8.2	191 58.0	1 22.9
16	149 33.0	90	-25 32.3	-6	61 59.5	- 8 7.7	222 3.2	1 23.1
18	178 29.0	91	-25 33.5	-3	92 3.3	- 8 7.3	252 8.5	1 23.3
20	207 25.2	92	-25 34.1	0	122 7.1	- 8 6.8	282 13.8	1 23.4
22	236 21.5	92	-25 34.2	2	152 10.9	- 8 6.4	312 19.0	1 23.6
Δ					19	2	26	1

φ	SUNCE IZLAZ	SUNCE ZALAZ	TRAJANJE SUMRAKA GRAĐ.	TRAJANJE SUMRAKA ASTR.	MJESEC IZLAZ	MJESEC Δ/24	MJESEC ZALAZ	MJESEC Δ/24
N	h min	h min	h min	h min	h min	min	h min	min
60	6 41	17 42	0 42	2 20	3 15	2.4	8 2	2.2
55	6 36	17 47	0 36	2 1	2 22	2.4	8 55	2.2
50	6 31	17 52	0 32	1 48	1 48	2.3	9 29	2.2
45	6 28	17 55	0 29	1 38	1 23	2.3	9 54	2.2
40	6 25	17 58	0 27	1 30	1 3	2.3	10 15	2.2
35	6 22	18 1	0 25	1 24	0 46	2.3	10 32	2.2
30	6 20	18 3	0 24	1 19	0 32	2.3	10 46	2.2
20	6 15	18 7	0 22	1 13	0 7	2.3	11 11	2.2
10	6 11	18 11	0 21	1 10	.. ..	.0	11 32	2.2
0	6 8	18 14	0 21	1 9	.. ..	.0	11 52	2.2
10	6 4	18 18	0 21	1 10	23 60	2.2	12 12	2.2
20	5 60	18 22	0 22	1 14	23 38	2.2	12 34	2.2
30	5 55	18 27	0 24	1 21	23 14	2.3	12 59	2.2
35	5 52	18 29	0 25	1 26	22 59	2.3	13 13	2.2
40	5 49	18 33	0 27	1 33	22 42	2.3	13 30	2.1
45	5 45	18 36	0 30	1 42	22 22	2.3	13 50	2.1
50	5 40	18 41	0 33	1 54	21 56	2.4	14 16	2.1
55	5 35	18 46	0 37	2 12	21 22	2.4	14 50	2.1
60	5 27	18 53	0 43	2 40	20 29	2.6	15 43	2.0
S								

SUNCE UT	SUNCE $e = T_p - UT$	SUNCE Δ/24	SUNCE r	MJESEC Prolaz	MJESEC Δ/24	MJESEC $\pi_\leftmoon$	MJESEC r
h	min s	s	′	h min	min	′	′
00	-11 10.6	.6	16.1	$T_{\overline{m}}$ 5 40	2.2	56.1	15.3
12	-11 3.4	$T_{\overline{m}_\odot}$ 12 h 11.1 min		Starost 20.9 d	Faza ◑		

PLANETE

Pl.	$T_{\overline{m}}$	π	360−α	Vel.	Pl.	$T_{\overline{m}}$	π	360−α	Vel.
	h min	′	°			h min	′	°	
♀	13 2	.1	0	-3.8	♃	11 53	.0	17	-1.9
♂	21 12	.2	237	-.5	♄	1 14	.0	177	.7

UT	SUNCE $S_\odot$	SUNCE $\delta_\odot$	PROLJ. TAČKA S_Υ	VENERA S_φ	VENERA δ_φ	MARS S_σ	MARS δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	177 15.9	- 5 .9	165 35.2	164 32.9	- 0 55.2	42 11.3	23 43.0
2	207 16.2	- 4 59.0	195 40.1	194 32.2	- 0 52.6	72 16.5	23 42.9
4	237 16.5	- 4 57.0	225 45.0	224 31.5	- 0 50.1	102 21.6	23 42.7
6	267 16.8	- 4 55.1	255 50.0	254 30.7	- 0 47.5	132 26.7	23 42.6
8	297 17.1	- 4 53.1	285 54.9	284 30.0	- 0 44.9	162 31.9	23 42.5
10	327 17.4	- 4 51.2	315 59.8	314 29.3	- 0 42.4	192 37.0	23 42.3
12	357 17.7	- 4 49.2	346 4.7	344 28.5	- 0 39.8	222 42.1	23 42.2
14	27 18.0	- 4 47.3	16 9.7	14 27.8	- 0 37.2	252 47.2	23 42.0
16	57 18.3	- 4 45.3	46 14.6	44 27.0	- 0 34.6	282 52.3	23 41.9
18	87 18.7	- 4 43.4	76 19.5	74 26.3	- 0 32.1	312 57.4	23 41.8
20	117 19.0	- 4 41.4	106 24.5	104 25.6	- 0 29.5	343 2.5	23 41.6
22	147 19.3	- 4 39.5	136 29.4	134 24.8	- 0 26.9	13 7.6	23 41.5
Δ	2	10		-4	13	26	-1

UT	MJESEC $S_\leftmoon$	MJESEC Δ	MJESEC $\delta_\leftmoon$	MJESEC Δ	JUPITER S_4	JUPITER δ_4	SATURN S_η	SATURN δ_η
h	° ′		° ′		° ′	° ′	° ′	° ′
0	265 18.0	93	-25 33.7	5	182 14.7	- 8 5.9	342 24.3	1 23.7
2	294 14.5	94	-25 32.8	7	212 18.5	- 8 5.5	12 29.6	1 23.9
4	323 11.3	95	-25 31.3	10	242 22.3	- 8 5.0	42 34.8	1 24.0
6	352 8.2	95	-25 29.2	13	272 26.1	- 8 4.6	72 40.1	1 24.2
8	21 5.3	96	-25 26.7	15	302 29.9	- 8 4.1	102 45.4	1 24.4
10	50 2.5	97	-25 23.6	18	332 33.7	- 8 3.7	132 50.6	1 24.5
12	79 .0	98	-25 20.1	20	2 37.5	- 8 3.2	162 55.9	1 24.7
14	107 57.6	99	-25 16.0	23	32 41.3	- 8 2.7	193 1.2	1 24.8
16	136 55.4	100	-25 11.4	25	62 45.1	- 8 2.3	223 6.4	1 25.0
18	165 53.4	101	-25 6.4	28	92 48.9	- 8 1.8	253 11.7	1 25.1
20	194 51.6	102	-25 .8	30	122 52.7	- 8 1.4	283 17.0	1 25.3
22	223 50.0	103	-24 54.8	33	152 56.5	- 8 .9	313 22.2	1 25.5
Δ					19	2	26	1

φ	SUNCE IZLAZ	SUNCE ZALAZ	TRAJANJE SUMRAKA GRAĐ.	TRAJANJE SUMRAKA ASTR.	MJESEC IZLAZ	MJESEC Δ/24	MJESEC ZALAZ	MJESEC Δ/24
N	h min	h min	h min	h min	h min	min	h min	min
60	6 38	17 45	0 42	2 20	4 12	1.5	8 54	2.9
55	6 33	17 49	0 36	2 1	3 19	1.8	9 48	2.6
50	6 29	17 53	0 32	1 48	2 44	1.9	10 22	2.5
45	6 26	17 57	0 29	1 38	2 19	1.9	10 48	2.4
40	6 23	17 59	0 27	1 30	1 58	2.0	11 8	2.4
35	6 21	18 2	0 25	1 24	1 41	2.0	11 25	2.3
30	6 18	18 4	0 24	1 19	1 27	2.0	11 39	2.3
20	6 14	18 7	0 22	1 13	1 2	2.1	12 4	2.2
10	6 11	18 11	0 21	1 10	0 40	2.1	12 25	2.2
0	6 8	18 14	0 21	1 9	0 20	2.2	12 45	2.1
10	6 4	18 17	0 21	1 10	.. ..	.0	13 5	2.1
20	6 0	18 21	0 22	1 14	.. ..	.0	13 26	2.0
30	5 56	18 26	0 24	1 21	.. ..	.0	13 51	1.9
35	5 53	18 28	0 25	1 26	23 54	2.4	14 5	1.9
40	5 50	18 31	0 27	1 33	23 37	2.4	14 22	1.8
45	5 46	18 34	0 30	1 42	23 18	2.5	14 41	1.7
50	5 42	18 39	0 33	1 54	22 53	2.6	15 6	1.6
55	5 37	18 44	0 37	2 11	22 20	2.8	15 39	1.5
60	5 30	18 50	0 43	2 39	21 31	3.1	16 30	1.2
S								

SUNCE UT	SUNCE $e = T_p - UT$	SUNCE Δ/24	SUNCE r	MJESEC Prolaz	MJESEC Δ/24	MJESEC $\pi_\leftmoon$	MJESEC r
h	min s	s	′	h min	min	′	′
00	-10 56.2	.6	16.1	$T_{\overline{m}}$ 6 33	2.1	55.4	15.1
12	-10 48.8	$T_{\overline{m}_\odot}$ 12 h 10.8 min		Starost 21.9 d	Faza ◑		

PLANETE

Pl.	$T_{\overline{m}}$	π	360−α	Vel.	Pl.	$T_{\overline{m}}$	π	360−α	Vel.
	h min	′	°			h min	′	°	
♀	13 2	.1	359	-3.8	♃	11 50	.0	17	-1.9
♂	21 8	.2	237	-.4	♄	1 10	.0	177	.7

UT	SUNCE $S_\odot$	SUNCE $\delta_\odot$	PROLJ. TAČKA S_Υ	VENERA S_φ	VENERA δ_φ	MARS S_σ	MARS δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	177 19.6	- 4 37.5	166 34.3	164 24.1	- 0 24.4	43 12.7	23 41.3
2	207 19.9	- 4 35.6	196 39.2	194 23.4	- 0 21.8	73 17.8	23 41.2
4	237 20.2	- 4 33.6	226 44.2	224 22.6	- 0 19.2	103 22.9	23 41.0
6	267 20.5	- 4 31.7	256 49.1	254 21.9	- 0 16.6	133 27.9	23 40.9
8	297 20.8	- 4 29.7	286 54.0	284 21.2	- 0 14.1	163 33.0	23 40.7
10	327 21.1	- 4 27.7	316 59.0	314 20.4	- 0 11.5	193 38.1	23 40.6
12	357 21.5	- 4 25.8	347 3.9	344 19.7	- 0 8.9	223 43.1	23 40.4
14	27 21.8	- 4 23.8	17 8.8	14 18.9	- 0 6.3	253 48.2	23 40.2
16	57 22.1	- 4 21.9	47 13.7	44 18.2	- 0 3.8	283 53.2	23 40.1
18	87 22.4	- 4 19.9	77 18.7	74 17.5	- 0 1.2	313 58.3	23 39.9
20	117 22.7	- 4 18.0	107 23.6	104 16.7	0 1.4	344 3.3	23 39.8
22	147 23.0	- 4 16.0	137 28.5	134 16.0	0 3.9	14 8.3	23 39.6
Δ	2	10		-4	13	25	-1

UT	MJESEC $S_\leftmoon$	MJESEC Δ	MJESEC $\delta_\leftmoon$	MJESEC Δ	JUPITER S_4	JUPITER δ_4	SATURN S_η	SATURN δ_η
h	° ′		° ′		° ′	° ′	° ′	° ′
0	252 48.6	104	-24 48.3	35	183 .3	- 8 .5	343 27.5	1 25.6
2	281 47.5	105	-24 41.3	37	213 4.1	- 8 .0	13 32.8	1 25.8
4	310 46.5	106	-24 33.8	40	243 7.9	- 7 59.6	43 38.1	1 25.9
6	339 45.8	108	-24 25.9	42	273 11.7	- 7 59.1	73 43.3	1 26.1
8	8 45.3	109	-24 17.5	44	303 15.5	- 7 58.7	103 48.6	1 26.2
10	37 45.0	110	-24 8.7	46	333 19.3	- 7 58.2	133 53.9	1 26.4
12	66 45.0	111	-23 59.4	49	3 23.1	- 7 57.7	163 59.1	1 26.6
14	95 45.2	112	-23 49.6	51	33 26.9	- 7 57.3	194 4.4	1 26.7
16	124 45.7	113	-23 39.5	53	63 30.7	- 7 56.8	224 9.7	1 26.9
18	153 46.3	115	-23 28.9	55	93 34.5	- 7 56.4	254 14.9	1 27.0
20	182 47.3	116	-23 17.8	57	123 38.3	- 7 55.9	284 20.2	1 27.2
22	211 48.4	117	-23 6.4	59	153 42.1	- 7 55.5	314 25.5	1 27.4
Δ					19	2	26	1

φ	SUNCE IZLAZ	SUNCE ZALAZ	TRAJANJE SUMRAKA GRAĐ.	TRAJANJE SUMRAKA ASTR.	MJESEC IZLAZ	MJESEC Δ/24	MJESEC ZALAZ	MJESEC Δ/24
N	h min	h min	h min	h min	h min	min	h min	min
60	6 35	17 47	0 42	2 21	4 49	.9	10 4	3.3
55	6 31	17 51	0 36	2 2	4 1	1.3	10 51	2.9
50	6 27	17 55	0 32	1 48	3 29	1.4	11 23	2.7
45	6 24	17 58	0 29	1 38	3 5	1.6	11 46	2.6
40	6 21	18 0	0 27	1 30	2 46	1.7	12 5	2.5
35	6 19	18 2	0 25	1 24	2 29	1.7	12 21	2.4
30	6 17	18 4	0 24	1 19	2 15	1.8	12 34	2.3
20	6 14	18 8	0 22	1 13	1 52	1.9	12 57	2.2
10	6 10	18 11	0 21	1 10	1 31	2.0	13 17	2.1
0	6 7	18 14	0 21	1 9	1 12	2.1	13 36	2.0
10	6 4	18 17	0 21	1 10	0 52	2.1	13 54	1.9
20	6 0	18 20	0 22	1 14	0 32	2.2	14 14	1.8
30	5 56	18 24	0 24	1 21	0 8	2.3	14 37	1.7
35	5 54	18 27	0 25	1 26	.. ..	.0	14 50	1.6
40	5 51	18 29	0 27	1 33	.. ..	.0	15 5	1.5
45	5 48	18 33	0 30	1 41	.. ..	.0	15 23	1.4
50	5 44	18 36	0 33	1 54	23 56	2.8	15 46	1.3
55	5 39	18 41	0 37	2 11	23 27	3.0	16 15	1.1
60	5 32	18 47	0 43	2 37	22 46	3.4	16 58	.7
S								

SUNCE UT	SUNCE $e = T_p - UT$	SUNCE Δ/24	SUNCE r	MJESEC Prolaz	MJESEC Δ/24	MJESEC $\pi_\leftmoon$	MJESEC r
h	min s	s	′	h min	min	′	′
00	-10 41.5	.6	16.1	$T_{\overline{m}}$ 7 24	2.0	54.8	14.9
12	-10 33.9	$T_{\overline{m}_\odot}$ 12 h 10.6 min		Starost 22.9 d	Faza ◑		

PLANETE

Pl.	$T_{\overline{m}}$	π	360−α	Vel.	Pl.	$T_{\overline{m}}$	π	360−α	Vel.
	h min	′	°			h min	′	°	
♀	13 3	.1	358	-3.8	♃	11 46	.0	16	-1.9
♂	21 4	.2	237	-.4	♄	1 6	.0	177	.7

UT	SUNCE $S_\odot$	SUNCE $\delta_\odot$	PROLJ. TAČKA S_Υ	VENERA S_φ	VENERA δ_φ	MARS S_σ	MARS δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	177 23.4	- 4 14.0	167 33.4	164 15.3	0 6.5	44 13.3	23 39.4
2	207 23.7	- 4 12.1	197 38.4	194 14.5	0 9.1	74 18.3	23 39.3
4	237 24.0	- 4 10.1	227 43.3	224 13.8	0 11.7	104 23.4	23 39.1
6	267 24.3	- 4 8.2	257 48.2	254 13.1	0 14.2	134 28.4	23 39.0
8	297 24.6	- 4 6.2	287 53.2	284 12.3	0 16.8	164 33.4	23 38.8
10	327 24.9	- 4 4.2	317 58.1	314 11.6	0 19.4	194 38.3	23 38.6
12	357 25.3	- 4 2.3	348 3.0	344 10.9	0 22.0	224 43.3	23 38.5
14	27 25.6	- 4 .3	18 7.9	14 10.2	0 24.5	254 48.3	23 38.3
16	57 25.9	- 3 58.4	48 12.9	44 9.4	0 27.1	284 53.3	23 38.1
18	87 26.2	- 3 56.4	78 17.8	74 8.7	0 29.7	314 58.3	23 37.9
20	117 26.6	- 3 54.4	108 22.7	104 8.0	0 32.2	345 3.2	23 37.8
22	147 26.9	- 3 52.5	138 27.7	134 7.2	0 34.8	15 8.2	23 37.6
Δ	2	10		-4	13	25	-1

UT	MJESEC $S_\leftmoon$	MJESEC Δ	MJESEC $\delta_\leftmoon$	MJESEC Δ	JUPITER S_4	JUPITER δ_4	SATURN S_η	SATURN δ_η
h	° ′		° ′		° ′	° ′	° ′	° ′
0	240 49.8	118	-22 54.5	61	183 45.9	- 7 55.0	344 30.8	1 27.5
2	269 51.5	120	-22 42.3	63	213 49.7	- 7 54.6	14 36.0	1 27.7
4	298 53.4	121	-22 29.6	65	243 53.5	- 7 54.1	44 41.3	1 27.8
6	327 55.6	122	-22 16.5	67	273 57.4	- 7 53.7	74 46.6	1 28.0
8	356 57.9	123	-22 3.1	69	304 1.2	- 7 53.2	104 51.8	1 28.1
10	26 .6	124	-21 49.2	71	334 5.0	- 7 52.7	134 57.1	1 28.3
12	55 3.5	126	-21 35.0	73	4 8.8	- 7 52.3	165 2.4	1 28.5
14	84 6.6	127	-21 20.4	75	34 12.6	- 7 51.8	195 7.7	1 28.6
16	113 10.0	128	-21 5.5	77	64 16.4	- 7 51.4	225 12.9	1 28.8
18	142 13.6	129	-20 50.2	78	94 20.2	- 7 50.9	255 18.2	1 28.9
20	171 17.5	131	-20 34.5	80	124 24.0	- 7 50.5	285 23.5	1 29.1
22	200 21.6	132	-20 18.5	82	154 27.8	- 7 50.0	315 28.8	1 29.3
Δ					19	2	26	1

φ	SUNCE IZLAZ	SUNCE ZALAZ	TRAJANJE SUMRAKA GRAĐ.	TRAJANJE SUMRAKA ASTR.	MJESEC IZLAZ	MJESEC Δ/24	MJESEC ZALAZ	MJESEC Δ/24
N	h min	h min	h min	h min	h min	min	h min	min
60	6 32	17 50	0 41	2 21	5 10	.5	11 24	3.4
55	6 28	17 54	0 36	2 2	4 31	.9	12 1	3.0
50	6 25	17 57	0 32	1 48	4 4	1.1	12 28	2.8
45	6 22	17 59	0 29	1 38	3 43	1.3	12 48	2.6
40	6 20	18 1	0 27	1 30	3 26	1.4	13 4	2.5
35	6 18	18 3	0 25	1 24	3 11	1.5	13 18	2.4
30	6 16	18 5	0 24	1 19	2 59	1.6	13 30	2.3
20	6 13	18 8	0 22	1 13	2 37	1.7	13 50	2.2
10	6 10	18 11	0 21	1 10	2 18	1.8	14 8	2.0
0	6 7	18 14	0 21	1 9	2 1	2.0	14 24	1.9
10	6 4	18 16	0 21	1 10	1 43	2.1	14 40	1.8
20	6 1	18 20	0 22	1 14	1 25	2.2	14 57	1.6
30	5 57	18 23	0 24	1 21	1 3	2.3	15 17	1.5
35	5 55	18 25	0 25	1 26	0 50	2.4	15 29	1.4
40	5 52	18 28	0 27	1 32	0 36	2.5	15 42	1.3
45	5 49	18 31	0 30	1 41	0 18	2.6	15 57	1.2
50	5 45	18 34	0 33	1 53	. . .	.0	16 16	1.0
55	5 41	18 39	0 37	2 10	. . .	.0	16 41	.8
60	5 35	18 44	0 43	2 36	. . .	.0	17 14	.4
S								

SUNCE UT	SUNCE $e = T_p - UT$	SUNCE Δ/24	SUNCE r	MJESEC Prolaz	MJESEC Δ/24	MJESEC $\pi_\leftmoon$	MJESEC r
h	min s	s	′	h min	min	′	′
00	-10 26.4	.6	16.1	$T_{\overline{m}}$ 8 13	1.9	54.4	14.8
12	-10 18.7	$T_{\overline{m}_\odot}$ 12 h 10.3 min		Starost 23.9 d	Faza ◑		

PLANETE

Pl.	$T_{\overline{m}}$	π	360−α	Vel.	Pl.	$T_{\overline{m}}$	π	360−α	Vel.
	h min	′	°			h min	′	°	
♀	13 3	.1	357	-3.8	♃	11 43	.0	16	-1.9
♂	20 60	.2	237	-.4	♄	1 2	.0	177	.7

UT	SUNCE $S_\odot$	SUNCE $\delta_\odot$	PROLJ. TAČKA S_Υ	VENERA S_φ	VENERA δ_φ	MARS S_σ	MARS δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	177 27.2	- 3 50.5	168 32.6	164 6.5	0 37.4	45 13.1	23 37.4
2	207 27.5	- 3 48.5	198 37.5	194 5.8	0 40.0	75 18.1	23 37.2
4	237 27.9	- 3 46.6	228 42.4	224 5.0	0 42.5	105 23.0	23 37.1
6	267 28.2	- 3 44.6	258 47.4	254 4.3	0 45.1	135 28.0	23 36.9
8	297 28.5	- 3 42.6	288 52.3	284 3.6	0 47.7	165 32.9	23 36.7
10	327 28.8	- 3 40.7	318 57.2	314 2.8	0 50.3	195 37.8	23 36.5
12	357 29.2	- 3 38.7	349 2.2	344 2.1	0 52.8	225 42.8	23 36.3
14	27 29.5	- 3 36.8	19 7.1	14 1.4	0 55.4	255 47.7	23 36.1
16	57 29.8	- 3 34.8	49 12.0	44 .6	0 58.0	285 52.6	23 36.0
18	87 30.1	- 3 32.8	79 16.9	73 59.9	1 .6	315 57.5	23 35.8
20	117 30.5	- 3 30.9	109 21.9	103 59.2	1 3.1	346 2.4	23 35.6
22	147 30.8	- 3 28.9	139 26.8	133 58.5	1 5.7	16 7.3	23 35.4
Δ	2	10		-4	13	25	-1

UT	MJESEC $S_\leftmoon$	MJESEC Δ	MJESEC $\delta_\leftmoon$	MJESEC Δ	JUPITER S_4	JUPITER δ_4	SATURN S_η	SATURN δ_η
h	° ′		° ′		° ′	° ′	° ′	° ′
0	229 25.9	133	-20 2.2	83	184 31.6	- 7 49.6	345 34.0	1 29.4
2	258 30.5	134	-19 45.5	85	214 35.4	- 7 49.1	15 39.3	1 29.6
4	287 35.3	135	-19 28.5	87	244 39.2	- 7 48.7	45 44.6	1 29.7
6	316 40.4	136	-19 11.1	88	274 43.0	- 7 48.2	75 49.8	1 29.9
8	345 45.6	137	-18 53.5	90	304 46.8	- 7 47.7	105 55.1	1 30.1
10	14 51.1	139	-18 35.5	91	334 50.6	- 7 47.3	136 .4	1 30.2
12	43 56.8	140	-18 17.3	93	4 54.4	- 7 46.8	166 5.7	1 30.4
14	73 2.8	141	-17 58.7	94	34 58.2	- 7 46.4	196 10.9	1 30.5
16	102 9.0	142	-17 39.8	96	65 2.0	- 7 45.9	226 16.2	1 30.7
18	131 15.3	143	-17 20.7	97	95 5.8	- 7 45.5	256 21.5	1 30.9
20	160 21.9	144	-17 1.3	98	125 9.6	- 7 45.0	286 26.8	1 31.0
22	189 28.7	145	-16 41.6	100	155 13.4	- 7 44.6	316 32.0	1 31.2
Δ					19	2	26	1

φ	SUNCE IZLAZ	SUNCE ZALAZ	TRAJANJE SUMRAKA GRAĐ.	TRAJANJE SUMRAKA ASTR.	MJESEC IZLAZ	MJESEC Δ/24	MJESEC ZALAZ	MJESEC Δ/24
N	h min	h min	h min	h min	h min	min	h min	min
60	6 29	17 52	0 41	2 21	5 22	.3	12 46	3.4
55	6 26	17 55	0 36	2 2	4 53	.7	13 14	3.1
50	6 23	17 58	0 32	1 48	4 31	.9	13 35	2.8
45	6 20	18 0	0 29	1 38	4 13	1.1	13 51	2.6
40	6 18	18 2	0 27	1 30	3 59	1.2	14 4	2.5
35	6 17	18 4	0 25	1 24	3 47	1.3	14 15	2.4
30	6 15	18 6	0 24	1 19	3 37	1.4	14 25	2.3
20	6 12	18 8	0 22	1 13	3 19	1.6	14 42	2.1
10	6 9	18 11	0 21	1 10	3 3	1.7	14 56	1.9
0	6 7	18 13	0 21	1 9	2 48	1.8	15 10	1.8
10	6 4	18 16	0 21	1 10	2 33	2.0	15 23	1.7
20	6 1	18 19	0 22	1 14	2 17	2.1	15 37	1.5
30	5 58	18 22	0 24	1 20	1 59	2.3	15 53	1.3
35	5 56	18 24	0 25	1 26	1 48	2.4	16 3	1.2
40	5 53	18 26	0 27	1 32	1 35	2.5	16 13	1.1
45	5 50	18 29	0 30	1 41	1 21	2.6	16 26	1.0
50	5 47	18 32	0 33	1 53	1 3	2.8	16 41	.8
55	5 43	18 36	0 37	2 9	0 40	3.1	16 59	.6
60	5 37	18 41	0 42	2 35	0 7	3.4	17 25	.3
S								

SUNCE UT	SUNCE $e = T_p - UT$	SUNCE Δ/24	SUNCE r	MJESEC Prolaz	MJESEC Δ/24	MJESEC $\pi_\leftmoon$	MJESEC r
h	min s	s	′	h min	min	′	′
00	-10 11.0	.7	16.1	$T_{\overline{m}}$ 8 59	1.8	54.1	14.8
12	-10 3.1	$T_{\overline{m}_\odot}$ 12 h 10.1 min		Starost 24.9 d	Faza ◑		

PLANETE

Pl.	$T_{\overline{m}}$	π	360−α	Vel.	Pl.	$T_{\overline{m}}$	π	360−α	Vel.
	h min	′	°			h min	′	°	
♀	13 4	.1	356	-3.8	♃	11 40	.0	16	-1.9
♂	20 56	.2	237	-.4	♄	0 58	.0	177	.7

UT	SUNCE $S_\odot$	SUNCE $\delta_\odot$	PROLJ. TAČKA S_Υ	VENERA S_φ	VENERA δ_φ	MARS S_σ	MARS δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	177 31.1	- 3 26.9	169 31.7	163 57.7	1 8.3	46 12.2	23 35.2
2	207 31.5	- 3 25.0	199 36.7	193 57.0	1 10.8	76 17.1	23 35.0
4	237 31.8	- 3 23.0	229 41.6	223 56.3	1 13.4	106 21.9	23 34.8
6	267 32.1	- 3 21.0	259 46.5	253 55.5	1 16.0	136 26.8	23 34.6
8	297 32.5	- 3 19.1	289 51.4	283 54.8	1 18.6	166 31.7	23 34.4
10	327 32.8	- 3 17.1	319 56.4	313 54.1	1 21.1	196 36.5	23 34.2
12	357 33.1	- 3 15.1	350 1.3	343 53.3	1 23.7	226 41.4	23 34.1
14	27 33.5	- 3 13.1	20 6.2	13 52.6	1 26.3	256 46.3	23 33.9
16	57 33.8	- 3 11.2	50 11.2	43 51.9	1 28.9	286 51.1	23 33.7
18	87 34.1	- 3 9.2	80 16.1	73 51.2	1 31.4	316 55.9	23 33.5
20	117 34.5	- 3 7.2	110 21.0	103 50.4	1 34.0	347 .8	23 33.3
22	147 34.8	- 3 5.3	140 25.9	133 49.7	1 36.6	17 5.6	23 33.1
Δ	2	10		-4	13	24	-1

UT	MJESEC $S_\leftmoon$	MJESEC Δ	MJESEC $\delta_\leftmoon$	MJESEC Δ	JUPITER $S_\jupiter$	JUPITER $\delta_\jupiter$	SATURN $S_\saturn$	SATURN $\delta_\saturn$
h	° ′		° ′		° ′	° ′	° ′	° ′
0	218 35.7	146	-16 21.6	101	185 17.3	- 7 44.1	346 37.3	1 31.3
2	247 42.9	147	-16 1.4	102	215 21.1	- 7 43.7	16 42.6	1 31.5
4	276 50.2	148	-15 40.9	104	245 24.9	- 7 43.2	46 47.9	1 31.7
6	305 57.8	149	-15 20.2	105	275 28.7	- 7 42.7	76 53.2	1 31.8
8	335 5.6	150	-14 59.2	106	305 32.5	- 7 42.3	106 58.4	1 32.0
10	4 13.5	151	-14 38.0	107	335 36.3	- 7 41.8	137 3.7	1 32.1
12	33 21.6	151	-14 16.5	108	5 40.1	- 7 41.4	167 9.0	1 32.3
14	62 29.8	152	-13 54.8	109	35 43.9	- 7 40.9	197 14.3	1 32.5
16	91 38.3	153	-13 32.9	111	65 47.7	- 7 40.5	227 19.5	1 32.6
18	120 46.9	154	-13 10.8	112	95 51.5	- 7 40.0	257 24.8	1 32.8
20	149 55.6	154	-12 48.5	113	125 55.3	- 7 39.6	287 30.1	1 32.9
22	179 4.5	155	-12 26.0	114	155 59.1	- 7 39.1	317 35.4	1 33.1
Δ					19	2	26	1

φ	SUNCE IZLAZ	SUNCE ZALAZ	TRAJANJE SUMRAKA GRAĐ.	TRAJANJE SUMRAKA ASTR.	MJESEC IZLAZ	MJESEC Δ/24	MJESEC ZALAZ	MJESEC Δ/24
N	h min	h min	h min	h min	h min	min	h min	min
60	6 26	17 54	0 41	2 22	5 31	.2	14 8	3.4
55	6 23	17 57	0 36	2 2	5 9	.5	14 28	3.0
50	6 21	17 60	0 32	1 48	4 52	.8	14 43	2.8
45	6 19	18 2	0 29	1 38	4 39	.9	14 54	2.6
40	6 17	18 3	0 27	1 30	4 28	1.1	15 4	2.5
35	6 15	18 5	0 25	1 24	4 19	1.2	15 12	2.3
30	6 14	18 6	0 24	1 19	4 11	1.3	15 20	2.2
20	6 11	18 9	0 22	1 13	3 56	1.5	15 32	2.0
10	6 9	18 11	0 21	1 10	3 44	1.6	15 43	1.9
0	6 7	18 13	0 21	1 9	3 32	1.8	15 53	1.7
10	6 4	18 15	0 21	1 10	3 20	1.9	16 3	1.6
20	6 1	18 18	0 22	1 14	3 8	2.1	16 14	1.4
30	5 58	18 21	0 24	1 20	2 53	2.3	16 26	1.2
35	5 56	18 23	0 25	1 25	2 45	2.4	16 32	1.1
40	5 54	18 25	0 27	1 32	2 35	2.5	16 40	1.0
45	5 52	18 27	0 29	1 41	2 24	2.6	16 49	.9
50	5 49	18 30	0 33	1 52	2 10	2.8	17 0	.7
55	5 45	18 34	0 37	2 9	1 53	3.0	17 14	.5
60	5 40	18 38	0 42	2 33	1 29	3.4	17 31	.2
S								

SUNCE UT	SUNCE e = Tp − UT	SUNCE Δ/24	SUNCE r	MJESEC Prolaz	MJESEC Δ/24	MJESEC $\pi_\leftmoon$	MJESEC r
h	min s	s	′	h min	min	′	′
00	- 9 55.3	.7	16.1	$T_{\overline{m}}$ 9 43	1.8	54.0	14.7
12	- 9 47.3	$T_{\overline{m}_\odot}$ 12 h 9.8 min		Starost 25.9 d	Faza ●		

PLANETE

Pl.	$T_{\overline{m}}$	π	360−α	Vel.	Pl.	$T_{\overline{m}}$	π	360−α	Vel.
	h min	′	°			h min	′	°	
♀	13 4	.1	354	-3.8	♃	11 37	.0	16	-1.9
♂	20 52	.2	237	-.3	♄	0 53	.0	177	.7

UT	SUNCE $S_\odot$	SUNCE $\delta_\odot$	PROLJ. TAČKA S_Υ	VENERA S_φ	VENERA δ_φ	MARS S_σ	MARS δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	177 35.1	- 3 3.3	170 30.9	163 49.0	1 39.1	47 10.4	23 32.9
2	207 35.5	- 3 1.3	200 35.8	193 48.2	1 41.7	77 15.3	23 32.7
4	237 35.8	- 2 59.4	230 40.7	223 47.5	1 44.3	107 20.1	23 32.4
6	267 36.2	- 2 57.4	260 45.7	253 46.8	1 46.9	137 24.9	23 32.2
8	297 36.5	- 2 55.4	290 50.6	283 46.0	1 49.4	167 29.7	23 32.0
10	327 36.8	- 2 53.4	320 55.5	313 45.3	1 52.0	197 34.5	23 31.8
12	357 37.2	- 2 51.5	351 .4	343 44.6	1 54.6	227 39.3	23 31.6
14	27 37.5	- 2 49.5	21 5.4	13 43.9	1 57.1	257 44.1	23 31.4
16	57 37.8	- 2 47.5	51 10.3	43 43.1	1 59.7	287 48.9	23 31.2
18	87 38.2	- 2 45.6	81 15.2	73 42.4	2 2.3	317 53.6	23 31.0
20	117 38.5	- 2 43.6	111 20.1	103 41.7	2 4.8	347 58.4	23 30.8
22	147 38.9	- 2 41.6	141 25.1	133 40.9	2 7.4	18 3.2	23 30.6
Δ	2	10		-4	13	24	-1

UT	MJESEC $S_\leftmoon$	MJESEC Δ	MJESEC $\delta_\leftmoon$	MJESEC Δ	JUPITER $S_\jupiter$	JUPITER $\delta_\jupiter$	SATURN $S_\saturn$	SATURN $\delta_\saturn$
h	° ′		° ′		° ′	° ′	° ′	° ′
0	208 13.6	156	-12 3.3	115	186 2.9	- 7 38.7	347 40.7	1 33.3
2	237 22.7	157	-11 40.3	116	216 6.7	- 7 38.2	17 45.9	1 33.4
4	266 32.0	157	-11 17.2	116	246 10.5	- 7 37.7	47 51.2	1 33.6
6	295 41.5	158	-10 54.0	117	276 14.4	- 7 37.3	77 56.5	1 33.7
8	324 51.0	158	-10 30.5	118	306 18.2	- 7 36.8	108 1.8	1 33.9
10	354 .7	159	-10 6.9	119	336 22.0	- 7 36.4	138 7.0	1 34.1
12	23 10.5	159	- 9 43.1	120	6 25.8	- 7 35.9	168 12.3	1 34.2
14	52 20.3	160	- 9 19.1	120	36 29.6	- 7 35.5	198 17.6	1 34.4
16	81 30.3	160	- 8 55.0	121	66 33.4	- 7 35.0	228 22.9	1 34.5
18	110 40.4	161	- 8 30.8	122	96 37.2	- 7 34.6	258 28.2	1 34.7
20	139 50.5	161	- 8 6.4	123	126 41.0	- 7 34.1	288 33.4	1 34.9
22	169 .7	161	- 7 41.9	123	156 44.8	- 7 33.7	318 38.7	1 35.0
Δ					19	2	26	1

φ	SUNCE IZLAZ	SUNCE ZALAZ	TRAJANJE SUMRAKA GRAĐ.	TRAJANJE SUMRAKA ASTR.	MJESEC IZLAZ	MJESEC Δ/24	MJESEC ZALAZ	MJESEC Δ/24
N	h min	h min	h min	h min	h min	min	h min	min
60	6 23	17 57	0 41	2 22	5 36	.2	15 28	3.3
55	6 21	17 59	0 36	2 2	5 22	.5	15 41	3.0
50	6 18	18 1	0 32	1 48	5 10	.7	15 50	2.8
45	6 17	18 3	0 29	1 38	5 1	.8	15 57	2.6
40	6 15	18 5	0 27	1 30	4 54	1.0	16 3	2.5
35	6 14	18 6	0 25	1 24	4 47	1.1	16 9	2.3
30	6 13	18 7	0 24	1 19	4 42	1.2	16 13	2.2
20	6 10	18 9	0 22	1 13	4 32	1.4	16 21	2.0
10	6 8	18 11	0 21	1 10	4 23	1.6	16 28	1.9
0	6 6	18 13	0 21	1 9	4 15	1.7	16 35	1.7
10	6 4	18 15	0 21	1 10	4 6	1.9	16 41	1.5
20	6 2	18 17	0 22	1 14	3 58	2.0	16 48	1.4
30	5 59	18 20	0 24	1 20	3 47	2.2	16 55	1.2
35	5 57	18 21	0 25	1 25	3 42	2.3	16 60	1.1
40	5 55	18 23	0 27	1 32	3 35	2.5	17 5	1.0
45	5 53	18 25	0 29	1 40	3 27	2.6	17 10	.8
50	5 50	18 28	0 32	1 52	3 18	2.8	17 17	.6
55	5 47	18 31	0 37	2 8	3 6	3.0	17 26	.4
60	5 42	18 35	0 42	2 32	2 50	3.3	17 36	.2
S								

SUNCE UT	SUNCE e = Tp − UT	SUNCE Δ/24	SUNCE r	MJESEC Prolaz	MJESEC Δ/24	MJESEC $\pi_\leftmoon$	MJESEC r
h	min s	s	′	h min	min	′	′
00	- 9 39.3	.7	16.1	$T_{\overline{m}}$ 10 25	1.7	54.0	14.7
12	- 9 31.1	$T_{\overline{m}_\odot}$ 12 h 9.5 min		Starost 26.9 d	Faza ●		

PLANETE

Pl.	$T_{\overline{m}}$	π	360−α	Vel.	Pl.	$T_{\overline{m}}$	π	360−α	Vel.
	h min	′	°			h min	′	°	
♀	13 5	.1	353	-3.8	♃	11 34	.0	16	-1.9
♂	20 48	.2	237	-.3	♄	0 49	.0	177	.7

UT	SUNCE $S_\odot$	SUNCE $\delta_\odot$	PROLJ. TAČKA S_Υ	VENERA S_φ	VENERA δ_φ	MARS S_σ	MARS δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	177 39.2	- 2 39.6	171 30.0	163 40.2	2 10.0	48 7.9	23 30.3
2	207 39.6	- 2 37.7	201 34.9	193 39.5	2 12.5	78 12.7	23 30.1
4	237 39.9	- 2 35.7	231 39.9	223 38.7	2 15.1	108 17.4	23 29.9
6	267 40.2	- 2 33.7	261 44.8	253 38.0	2 17.7	138 22.2	23 29.7
8	297 40.6	- 2 31.7	291 49.7	283 37.3	2 20.2	168 26.9	23 29.5
10	327 40.9	- 2 29.8	321 54.6	313 36.5	2 22.8	198 31.7	23 29.2
12	357 41.3	- 2 27.8	351 59.6	343 35.8	2 25.4	228 36.4	23 29.0
14	27 41.6	- 2 25.8	22 4.5	13 35.1	2 27.9	258 41.1	23 28.8
16	57 42.0	- 2 23.9	52 9.4	43 34.3	2 30.5	288 45.9	23 28.6
18	87 42.3	- 2 21.9	82 14.4	73 33.6	2 33.1	318 50.6	23 28.4
20	117 42.7	- 2 19.9	112 19.3	103 32.9	2 35.6	348 55.3	23 28.1
22	147 43.0	- 2 17.9	142 24.2	133 32.2	2 38.2	18 60.0	23 27.9
Δ	2	10		-4	13	24	-1

UT	MJESEC $S_\leftmoon$	MJESEC Δ	MJESEC $\delta_\leftmoon$	MJESEC Δ	JUPITER S_4	JUPITER δ_4	SATURN S_η	SATURN δ_η
h	° ′		° ′		° ′	° ′	° ′	° ′
0	198 11.0	162	- 7 17.2	124	186 48.6	- 7 33.2	348 44.0	1 35.2
2	227 21.4	162	- 6 52.5	124	216 52.4	- 7 32.7	18 49.3	1 35.3
4	256 31.8	162	- 6 27.6	125	246 56.3	- 7 32.3	48 54.6	1 35.5
6	285 42.3	163	- 6 2.6	126	277 .1	- 7 31.8	78 59.8	1 35.7
8	314 52.8	163	- 5 37.4	126	307 3.9	- 7 31.4	109 5.1	1 35.8
10	344 3.3	163	- 5 12.2	127	337 7.7	- 7 30.9	139 10.4	1 36.0
12	13 13.9	163	- 4 46.9	127	7 11.5	- 7 30.5	169 15.7	1 36.1
14	42 24.5	163	- 4 21.5	127	37 15.3	- 7 30.0	199 21.0	1 36.3
16	71 35.2	163	- 3 56.1	128	67 19.1	- 7 29.6	229 26.3	1 36.5
18	100 45.8	163	- 3 30.5	128	97 22.9	- 7 29.1	259 31.5	1 36.6
20	129 56.5	163	- 3 4.9	128	127 26.7	- 7 28.7	289 36.8	1 36.8
22	159 7.1	163	- 2 39.2	129	157 30.5	- 7 28.2	319 42.1	1 36.9
Δ					19	2	26	1

φ	SUNCE IZLAZ	SUNCE ZALAZ	TRAJANJE SUMRAKA GRAĐ.	TRAJANJE SUMRAKA ASTR.	MJESEC IZLAZ	MJESEC Δ/24	MJESEC ZALAZ	MJESEC Δ/24
N	h min	h min	h min	h min	h min	min	h min	min
60	6 20	17 59	0 41	2 23	5 40	.2	16 48	3.3
55	6 18	18 1	0 36	2 3	5 33	.4	16 53	3.0
50	6 16	18 3	0 32	1 49	5 27	.6	16 57	2.8
45	6 15	18 4	0 29	1 38	5 22	.8	16 60	2.6
40	6 14	18 6	0 27	1 30	5 17	.9	17 2	2.5
35	6 12	18 7	0 25	1 24	5 14	1.1	17 5	2.3
30	6 11	18 8	0 24	1 20	5 11	1.2	17 6	2.2
20	6 9	18 9	0 22	1 13	5 5	1.4	17 10	2.0
10	6 8	18 11	0 21	1 10	5 0	1.5	17 13	1.9
0	6 6	18 13	0 21	1 9	4 56	1.7	17 15	1.7
10	6 4	18 14	0 21	1 10	4 51	1.9	17 18	1.5
20	6 2	18 16	0 22	1 13	4 46	2.0	17 21	1.4
30	5 60	18 18	0 24	1 20	4 41	2.2	17 24	1.2
35	5 58	18 20	0 25	1 25	4 38	2.3	17 26	1.1
40	5 56	18 21	0 27	1 32	4 34	2.5	17 28	.9
45	5 54	18 23	0 29	1 40	4 30	2.6	17 30	.8
50	5 52	18 26	0 32	1 51	4 25	2.8	17 33	.6
55	5 49	18 28	0 36	2 7	4 18	3.0	17 36	.4
60	5 45	18 32	0 42	2 31	4 10	3.3	17 40	.2
S								

SUNCE UT	SUNCE $e = T_p - UT$	SUNCE Δ/24	SUNCE r	MJESEC Prolaz	MJESEC Δ/24	MJESEC $\pi_\leftmoon$	MJESEC r
h	min s	s	′	h min	min	′	′
00	- 9 23.0	.7	16.1	$T_{\overline{m}}$ 11 6	1.7	54.1	14.8
12	- 9 14.7	$T_{\overline{m}_\odot}$ 12 h 9.2 min		Starost 27.9 d	Faza ●		

PLANETE

Pl.	$T_{\overline{m}}$	π	360−α	Vel.	Pl.	$T_{\overline{m}}$	π	360−α	Vel.
	h min	′	°			h min	′	°	
♀	13 6	.1	352	-3.8	♃	11 31	.0	15	-1.9
♂	20 44	.2	237	-.3	♄	0 45	.0	177	.7

UT	SUNCE $S_\odot$	SUNCE $\delta_\odot$	PROLJ. TAČKA S_Υ	VENERA S_φ	VENERA δ_φ	MARS S_σ	MARS δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	177 43.3	- 2 16.0	172 29.1	163 31.4	2 40.8	49 4.7	23 27.7
2	207 43.7	- 2 14.0	202 34.1	193 30.7	2 43.3	79 9.4	23 27.4
4	237 44.0	- 2 12.0	232 39.0	223 30.0	2 45.9	109 14.1	23 27.2
6	267 44.4	- 2 10.0	262 43.9	253 29.2	2 48.5	139 18.8	23 27.0
8	297 44.7	- 2 8.1	292 48.9	283 28.5	2 51.0	169 23.4	23 26.7
10	327 45.1	- 2 6.1	322 53.8	313 27.8	2 53.6	199 28.1	23 26.5
12	357 45.4	- 2 4.1	352 58.7	343 27.0	2 56.2	229 32.8	23 26.3
14	27 45.8	- 2 2.1	23 3.6	13 26.3	2 58.7	259 37.4	23 26.0
16	57 46.1	- 2 .2	53 8.6	43 25.6	3 1.3	289 42.1	23 25.8
18	87 46.5	- 1 58.2	83 13.5	73 24.8	3 3.8	319 46.8	23 25.6
20	117 46.8	- 1 56.2	113 18.4	103 24.1	3 6.4	349 51.4	23 25.3
22	147 47.2	- 1 54.2	143 23.4	133 23.4	3 9.0	19 56.0	23 25.1
Δ	2	10		-4	13	23	-1

UT	MJESEC $S_\leftmoon$	MJESEC Δ	MJESEC $\delta_\leftmoon$	MJESEC Δ	JUPITER S_4	JUPITER δ_4	SATURN S_η	SATURN δ_η
h	° ′		° ′		° ′	° ′	° ′	° ′
0	188 17.8	163	- 2 13.4	129	187 34.4	- 7 27.8	349 47.4	1 37.1
2	217 28.4	163	- 1 47.6	129	217 38.2	- 7 27.3	19 52.7	1 37.3
4	246 39.0	163	- 1 21.8	129	247 42.0	- 7 26.8	49 57.9	1 37.4
6	275 49.6	163	- 0 55.9	130	277 45.8	- 7 26.4	80 3.2	1 37.6
8	305 .1	163	- 0 30.0	130	307 49.6	- 7 25.9	110 8.5	1 37.8
10	334 10.6	162	- 0 4.0	130	337 53.4	- 7 25.5	140 13.8	1 37.9
12	3 21.1	162	0 22.0	130	7 57.2	- 7 25.0	170 19.1	1 38.1
14	32 31.5	162	0 48.0	130	38 1.0	- 7 24.6	200 24.4	1 38.2
16	61 41.8	161	1 14.0	130	68 4.8	- 7 24.1	230 29.6	1 38.4
18	90 52.1	161	1 40.0	130	98 8.7	- 7 23.7	260 34.9	1 38.6
20	120 2.3	161	2 6.0	130	128 12.5	- 7 23.2	290 40.2	1 38.7
22	149 12.4	160	2 32.0	130	158 16.3	- 7 22.8	320 45.5	1 38.9
Δ					19	2	26	1

φ	SUNCE IZLAZ	SUNCE ZALAZ	TRAJANJE SUMRAKA GRAĐ.	TRAJANJE SUMRAKA ASTR.	MJESEC IZLAZ	MJESEC Δ/24	MJESEC ZALAZ	MJESEC Δ/24
N	h min	h min	h min	h min	h min	min	h min	min
60	6 17	18 2	0 41	2 23	5 44	.2	18 8	3.4
55	6 16	18 3	0 36	2 3	5 43	.4	18 6	3.1
50	6 14	18 5	0 32	1 49	5 42	.6	18 4	2.8
45	6 13	18 6	0 29	1 38	5 41	.8	18 3	2.7
40	6 12	18 7	0 27	1 30	5 40	.9	18 2	2.5
35	6 11	18 7	0 25	1 24	5 39	1.1	18 1	2.4
30	6 10	18 8	0 24	1 20	5 39	1.2	17 60	2.3
20	6 9	18 10	0 22	1 13	5 38	1.4	17 59	2.1
10	6 7	18 11	0 21	1 10	5 37	1.5	17 57	1.9
0	6 6	18 12	0 21	1 9	5 36	1.7	17 56	1.7
10	6 4	18 14	0 21	1 10	5 36	1.9	17 55	1.6
20	6 2	18 15	0 22	1 13	5 35	2.0	17 54	1.4
30	6 0	18 17	0 24	1 20	5 34	2.2	17 52	1.2
35	5 59	18 18	0 25	1 25	5 34	2.4	17 51	1.1
40	5 57	18 20	0 27	1 31	5 33	2.5	17 50	1.0
45	5 56	18 21	0 29	1 40	5 32	2.6	17 49	.8
50	5 54	18 23	0 32	1 51	5 32	2.8	17 48	.6
55	5 51	18 26	0 36	2 7	5 31	3.0	17 46	.4
60	5 47	18 29	0 42	2 30	5 30	3.3	17 44	.2
S								

SUNCE UT	SUNCE $e = T_p - UT$	SUNCE Δ/24	SUNCE r	MJESEC Prolaz	MJESEC Δ/24	MJESEC $\pi_\leftmoon$	MJESEC r
h	min s	s	′	h min	min	′	′
00	- 9 6.4	.7	16.1	$T_{\overline{m}}$ 11 46	1.7	54.4	14.8
12	- 8 58.0	$T_{\overline{m}_\odot}$ 12 h 9.0 min		Starost 28.9 d	Faza ●		

PLANETE

Pl.	$T_{\overline{m}}$	π	360−α	Vel.	Pl.	$T_{\overline{m}}$	π	360−α	Vel.
	h min	′	°			h min	′	°	
♀	13 6	.1	351	-3.8	♃	11 28	.0	15	-1.9
♂	20 40	.2	237	-.2	♄	0 41	.0	177	.7

UT	SUNCE $S_\odot$	SUNCE $\delta_\odot$	PROLJ. TAČKA S_Υ	VENERA S_φ	VENERA δ_φ	MARS S_σ	MARS δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	177 47.5	- 1 52.2	173 28.3	163 22.6	3 11.5	50 .7	23 24.9
2	207 47.9	- 1 50.3	203 33.2	193 21.9	3 14.1	80 5.3	23 24.6
4	237 48.2	- 1 48.3	233 38.1	223 21.1	3 16.6	110 9.9	23 24.4
6	267 48.6	- 1 46.3	263 43.1	253 20.4	3 19.2	140 14.6	23 24.1
8	297 49.0	- 1 44.3	293 48.0	283 19.7	3 21.8	170 19.2	23 23.9
10	327 49.3	- 1 42.4	323 52.9	313 18.9	3 24.3	200 23.8	23 23.6
12	357 49.7	- 1 40.4	353 57.9	343 18.2	3 26.9	230 28.4	23 23.4
14	27 50.0	- 1 38.4	24 2.8	13 17.5	3 29.4	260 33.0	23 23.1
16	57 50.4	- 1 36.4	54 7.7	43 16.7	3 32.0	290 37.6	23 22.9
18	87 50.7	- 1 34.5	84 12.6	73 16.0	3 34.5	320 42.2	23 22.6
20	117 51.1	- 1 32.5	114 17.6	103 15.3	3 37.1	350 46.8	23 22.4
22	147 51.4	- 1 30.5	144 22.5	133 14.5	3 39.6	20 51.4	23 22.1
Δ	2	10		-4	13	23	-1

UT	MJESEC $S_\leftmoon$	MJESEC Δ	MJESEC $\delta_\leftmoon$	MJESEC Δ	JUPITER $S_\jupiter$	JUPITER $\delta_\jupiter$	SATURN $S_\saturn$	SATURN $\delta_\saturn$
h	° ′		° ′		° ′	° ′	° ′	° ′
0	178 22.4	160	2 58.0	130	188 20.1	- 7 22.3	350 50.8	1 39.0
2	207 32.3	159	3 23.9	130	218 23.9	- 7 21.9	20 56.1	1 39.2
4	236 42.1	159	3 49.8	129	248 27.7	- 7 21.4	51 1.3	1 39.4
6	265 51.8	158	4 15.7	129	278 31.5	- 7 20.9	81 6.6	1 39.5
8	295 1.4	157	4 41.6	129	308 35.3	- 7 20.5	111 11.9	1 39.7
10	324 10.9	157	5 7.4	129	338 39.2	- 7 20.0	141 17.2	1 39.8
12	353 20.2	156	5 33.2	128	8 43.0	- 7 19.6	171 22.5	1 40.0
14	22 29.4	155	5 58.9	128	38 46.8	- 7 19.1	201 27.8	1 40.2
16	51 38.5	154	6 24.5	128	68 50.6	- 7 18.7	231 33.0	1 40.3
18	80 47.3	154	6 50.0	127	98 54.4	- 7 18.2	261 38.3	1 40.5
20	109 56.1	153	7 15.5	127	128 58.2	- 7 17.8	291 43.6	1 40.6
22	139 4.6	152	7 40.9	126	159 2.0	- 7 17.3	321 48.9	1 40.8
Δ					19	2	26	1

φ	SUNCE IZLAZ	SUNCE ZALAZ	TRAJANJE SUMRAKA GRAĐ.	TRAJANJE SUMRAKA ASTR.	MJESEC IZLAZ	MJESEC Δ/24	MJESEC ZALAZ	MJESEC Δ/24
N	h min	h min	h min	h min	h min	min	h min	min
60	6 14	18 4	0 42	2 24	5 48	.2	19 28	3.5
55	6 13	18 5	0 36	2 3	5 53	.5	19 19	3.2
50	6 12	18 6	0 32	1 49	5 57	.7	19 12	2.9
45	6 11	18 7	0 29	1 38	6 0	.9	19 7	2.7
40	6 10	18 8	0 27	1 30	6 3	1.0	19 2	2.6
35	6 10	18 8	0 25	1 24	6 5	1.1	18 58	2.4
30	6 9	18 9	0 24	1 20	6 7	1.2	18 54	2.3
20	6 8	18 10	0 22	1 13	6 11	1.4	18 48	2.1
10	6 7	18 11	0 21	1 10	6 14	1.6	18 43	2.0
0	6 5	18 12	0 21	1 9	6 17	1.8	18 38	1.8
10	6 4	18 13	0 21	1 10	6 21	1.9	18 32	1.6
20	6 3	18 14	0 22	1 13	6 24	2.1	18 27	1.5
30	6 1	18 16	0 24	1 20	6 28	2.3	18 21	1.3
35	5 60	18 17	0 25	1 25	6 30	2.4	18 17	1.2
40	5 58	18 18	0 27	1 31	6 33	2.5	18 13	1.0
45	5 57	18 20	0 29	1 40	6 36	2.7	18 9	.9
50	5 55	18 21	0 32	1 51	6 39	2.9	18 3	.7
55	5 53	18 23	0 36	2 6	6 44	3.1	17 57	.5
60	5 50	18 26	0 42	2 29	6 50	3.4	17 48	.2
S								

SUNCE UT	SUNCE $e = T_p - UT$	SUNCE Δ/24	SUNCE r	MJESEC Prolaz	MJESEC Δ/24	MJESEC $\pi_\leftmoon$	MJESEC r
h	min s	s	′	h min	min	′	′
00	- 8 49.7	.7	16.1	$T_{\overline{m}}$ 12 27	1.8	54.6	14.9
12	- 8 41.1	$T_{\overline{m}_\odot}$ 12 h 8.7 min		Starost .1 d	Faza ●		

PLANETE

Pl.	$T_{\overline{m}}$	π	360−α	Vel.	Pl.	$T_{\overline{m}}$	π	360−α	Vel.
	h min	′	°			h min	′	°	
♀	13 7	.1	350	-3.8	♃	11 25	.0	15	-1.9
♂	20 37	.2	237	-.2	♄	0 37	.0	177	.7

UT	SUNCE $S_\odot$	SUNCE $\delta_\odot$	PROLJ. TAČKA S_Υ	VENERA S_φ	VENERA δ_φ	MARS S_σ	MARS δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	177 51.8	- 1 28.5	174 27.4	163 13.8	3 42.2	50 56.0	23 21.9
2	207 52.1	- 1 26.5	204 32.3	193 13.0	3 44.8	81 .5	23 21.6
4	237 52.5	- 1 24.6	234 37.3	223 12.3	3 47.3	111 5.1	23 21.4
6	267 52.9	- 1 22.6	264 42.2	253 11.6	3 49.9	141 9.7	23 21.1
8	297 53.2	- 1 20.6	294 47.1	283 10.8	3 52.4	171 14.2	23 20.9
10	327 53.6	- 1 18.6	324 52.1	313 10.1	3 55.0	201 18.8	23 20.6
12	357 53.9	- 1 16.7	354 57.0	343 9.3	3 57.5	231 23.3	23 20.3
14	27 54.3	- 1 14.7	25 1.9	13 8.6	4 .1	261 27.9	23 20.1
16	57 54.7	- 1 12.7	55 6.8	43 7.9	4 2.6	291 32.4	23 19.8
18	87 55.0	- 1 10.7	85 11.8	73 7.1	4 5.2	321 36.9	23 19.6
20	117 55.4	- 1 8.7	115 16.7	103 6.4	4 7.7	351 41.5	23 19.3
22	147 55.7	- 1 6.8	145 21.6	133 5.6	4 10.3	21 46.0	23 19.0
Δ	2	10		-4	13	23	-1

UT	MJESEC $S_\leftmoon$	MJESEC Δ	MJESEC $\delta_\leftmoon$	MJESEC Δ	JUPITER $S_\jupiter$	JUPITER $\delta_\jupiter$	SATURN $S_\saturn$	SATURN $\delta_\saturn$
h	° ′		° ′		° ′	° ′	° ′	° ′
0	168 13.0	151	8 6.1	126	189 5.9	- 7 16.9	351 54.2	1 41.0
2	197 21.2	150	8 31.3	125	219 9.7	- 7 16.4	21 59.5	1 41.1
4	226 29.3	149	8 56.4	125	249 13.5	- 7 16.0	52 4.7	1 41.3
6	255 37.1	148	9 21.3	124	279 17.3	- 7 15.5	82 10.0	1 41.5
8	284 44.7	147	9 46.1	123	309 21.1	- 7 15.1	112 15.3	1 41.6
10	313 52.2	146	10 10.8	123	339 24.9	- 7 14.6	142 20.6	1 41.8
12	342 59.4	145	10 35.3	122	9 28.8	- 7 14.1	172 25.9	1 41.9
14	12 6.3	144	10 59.7	121	39 32.6	- 7 13.7	202 31.2	1 42.1
16	41 13.1	143	11 24.0	120	69 36.4	- 7 13.2	232 36.5	1 42.3
18	70 19.6	141	11 48.0	119	99 40.2	- 7 12.8	262 41.7	1 42.4
20	99 25.9	140	12 11.9	119	129 44.0	- 7 12.3	292 47.0	1 42.6
22	128 32.0	139	12 35.6	118	159 47.8	- 7 11.9	322 52.3	1 42.7
Δ					19	2	26	1

φ	SUNCE IZLAZ	SUNCE ZALAZ	TRAJANJE SUMRAKA GRAĐ.	TRAJANJE SUMRAKA ASTR.	MJESEC IZLAZ	MJESEC Δ/24	MJESEC ZALAZ	MJESEC Δ/24
N	h min	h min	h min	h min	h min	min	h min	min
60	6 11	18 7	0 42	2 24	5 52	.2	20 52	3.6
55	6 11	18 7	0 36	2 4	6 4	.5	20 35	3.2
50	6 10	18 8	0 32	1 49	6 13	.8	20 22	3.0
45	6 9	18 8	0 29	1 39	6 21	1.0	20 12	2.8
40	6 9	18 9	0 27	1 31	6 27	1.1	20 4	2.6
35	6 8	18 9	0 25	1 24	6 32	1.2	19 56	2.5
30	6 8	18 9	0 24	1 20	6 37	1.3	19 50	2.4
20	6 7	18 10	0 22	1 13	6 45	1.5	19 39	2.2
10	6 6	18 11	0 21	1 10	6 53	1.7	19 30	2.1
0	6 5	18 12	0 21	1 9	6 60	1.8	19 21	1.9
10	6 4	18 13	0 21	1 10	7 7	2.0	19 12	1.8
20	6 3	18 14	0 22	1 13	7 14	2.2	19 2	1.6
30	6 1	18 15	0 24	1 20	7 23	2.4	18 52	1.4
35	6 1	18 16	0 25	1 25	7 28	2.5	18 45	1.3
40	5 60	18 17	0 27	1 31	7 34	2.6	18 38	1.2
45	5 58	18 18	0 29	1 39	7 40	2.8	18 30	1.0
50	5 57	18 19	0 32	1 50	7 49	3.0	18 21	.8
55	5 55	18 21	0 36	2 6	7 59	3.2	18 8	.6
60	5 52	18 23	0 42	2 28	8 12	3.6	17 53	.3
S								

SUNCE UT	SUNCE $e = T_p - UT$	SUNCE Δ/24	SUNCE r	MJESEC Prolaz	MJESEC Δ/24	MJESEC $\pi_\leftmoon$	MJESEC r
h	min s	s	′	h min	min	′	′
00	- 8 32.7	.7	16.1	$T_{\overline{m}}$ 13 10	1.9	55.0	15.0
12	- 8 24.0	$T_{\overline{m}_\odot}$ 12 h 8.4 min		Starost 1.1 d	Faza ●		

PLANETE

Pl.	$T_{\overline{m}}$	π	360−α	Vel.	Pl.	$T_{\overline{m}}$	π	360−α	Vel.
	h min	′	°			h min	′	°	
♀	13 7	.1	349	-3.8	♃	11 22	.0	15	-1.9
♂	20 33	.2	236	-.2	♄	0 32	.0	177	.7

UT	SUNCE $S_\odot$	SUNCE $\delta_\odot$	PROLJ. TAČKA S_Υ	VENERA S_φ	VENERA δ_φ	MARS S_σ	MARS δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	177 56.1	- 1 4.8	175 26.6	163 4.9	4 12.8	51 50.5	23 18.8
2	207 56.4	- 1 2.8	205 31.5	193 4.2	4 15.4	81 55.0	23 18.5
4	237 56.8	- 1 .8	235 36.4	223 3.4	4 17.9	111 59.5	23 18.2
6	267 57.2	- 0 58.9	265 41.3	253 2.7	4 20.4	142 4.0	23 18.0
8	297 57.5	- 0 56.9	295 46.3	283 1.9	4 23.0	172 8.5	23 17.7
10	327 57.9	- 0 54.9	325 51.2	313 1.2	4 25.5	202 13.0	23 17.4
12	357 58.3	- 0 52.9	355 56.1	343 .4	4 28.1	232 17.5	23 17.2
14	27 58.6	- 0 50.9	26 1.1	12 59.7	4 30.6	262 22.0	23 16.9
16	57 59.0	- 0 49.0	56 6.0	42 58.9	4 33.2	292 26.5	23 16.6
18	87 59.3	- 0 47.0	86 10.9	72 58.2	4 35.7	322 31.0	23 16.3
20	117 59.7	- 0 45.0	116 15.8	102 57.4	4 38.2	352 35.4	23 16.1
22	148 .1	- 0 43.0	146 20.8	132 56.7	4 40.8	22 39.9	23 15.8
Δ	2	10		-4	13	22	-1

UT	MJESEC $S_\leftmoon$	MJESEC Δ	MJESEC $\delta_\leftmoon$	MJESEC Δ	JUPITER S_4	JUPITER δ_4	SATURN S_η	SATURN δ_η
h	° ′		° ′		° ′	° ′	° ′	° ′
0	157 37.8	138	12 59.1	117	189 51.7	- 7 11.4	352 57.6	1 42.9
2	186 43.3	136	13 22.5	116	219 55.5	- 7 11.0	23 2.9	1 43.1
4	215 48.6	135	13 45.6	115	249 59.3	- 7 10.5	53 8.2	1 43.2
6	244 53.6	134	14 8.5	113	280 3.1	- 7 10.1	83 13.5	1 43.4
8	273 58.3	132	14 31.2	112	310 6.9	- 7 9.6	113 18.7	1 43.5
10	303 2.8	131	14 53.6	111	340 10.7	- 7 9.2	143 24.0	1 43.7
12	332 6.9	129	15 15.8	110	10 14.6	- 7 8.7	173 29.3	1 43.9
14	1 10.8	128	15 37.8	109	40 18.4	- 7 8.3	203 34.6	1 44.0
16	30 14.4	126	15 59.5	107	70 22.2	- 7 7.8	233 39.9	1 44.2
18	59 17.7	125	16 21.0	106	100 26.0	- 7 7.4	263 45.2	1 44.3
20	88 20.7	123	16 42.1	104	130 29.8	- 7 6.9	293 50.5	1 44.5
22	117 23.3	122	17 3.0	103	160 33.6	- 7 6.5	323 55.7	1 44.7
Δ					19	2	26	1

φ	SUNCE IZLAZ	SUNCE ZALAZ	TRAJANJE SUMRAKA GRAĐ.	TRAJANJE SUMRAKA ASTR.	MJESEC IZLAZ	MJESEC Δ/24	MJESEC ZALAZ	MJESEC Δ/24
N	h min	h min	h min	h min	h min	min	h min	min
60	6 8	18 9	0 42	2 25	5 58	.4	22 18	3.7
55	6 8	18 9	0 36	2 4	6 17	.7	21 53	3.3
50	6 8	18 9	0 32	1 49	6 32	.9	21 34	3.0
45	6 7	18 10	0 29	1 39	6 43	1.1	21 19	2.9
40	6 7	18 10	0 27	1 31	6 53	1.3	21 7	2.7
35	6 7	18 10	0 25	1 24	7 2	1.4	20 57	2.6
30	6 7	18 10	0 24	1 20	7 9	1.5	20 48	2.5
20	6 6	18 10	0 22	1 13	7 22	1.7	20 32	2.3
10	6 5	18 11	0 21	1 10	7 33	1.8	20 19	2.2
0	6 5	18 11	0 21	1 9	7 44	2.0	20 6	2.0
10	6 4	18 12	0 21	1 10	7 55	2.1	19 54	1.9
20	6 3	18 13	0 22	1 13	8 6	2.3	19 41	1.8
30	6 2	18 14	0 24	1 20	8 20	2.5	19 25	1.6
35	6 1	18 14	0 25	1 25	8 28	2.6	19 17	1.5
40	6 1	18 15	0 27	1 31	8 36	2.7	19 7	1.4
45	5 60	18 16	0 29	1 39	8 47	2.8	18 55	1.2
50	5 58	18 17	0 32	1 50	8 60	3.0	18 41	1.0
55	5 57	18 18	0 36	2 5	9 16	3.3	18 23	.8
60	5 55	18 20	0 42	2 27	9 37	3.7	17 59	.4
S								

SUNCE UT	SUNCE $e = T_p - UT$	SUNCE Δ/24	SUNCE r	MJESEC Prolaz	MJESEC Δ/24	MJESEC $\pi_\leftmoon$	MJESEC r
h	min s	s	′	h min	min	′	′
00	- 8 15.5	.7	16.1	$T_{\overline{m}}$ 13 55	2.0	55.4	15.1
12	- 8 6.8	$T_{\overline{m}_\odot}$ 12 h 8.1 min		Starost 2.1 d	Faza ●		

PLANETE

Pl.	$T_{\overline{m}}$	π	360−α	Vel.	Pl.	$T_{\overline{m}}$	π	360−α	Vel.
	h min	′	°			h min	′	°	
♀	13 8	.1	348	-3.8	♃	11 19	.0	14	-1.9
♂	20 30	.2	236	-.2	♄	0 28	.0	178	.7

UT	SUNCE $S_\odot$	SUNCE $\delta_\odot$	PROLJ. TAČKA S_Υ	VENERA S_φ	VENERA δ_φ	MARS S_σ	MARS δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	178 .4	- 0 41.1	176 25.7	162 56.0	4 43.3	52 44.4	23 15.5
2	208 .8	- 0 39.1	206 30.6	192 55.2	4 45.9	82 48.8	23 15.2
4	238 1.2	- 0 37.1	236 35.6	222 54.5	4 48.4	112 53.3	23 15.0
6	268 1.5	- 0 35.1	266 40.5	252 53.7	4 50.9	142 57.7	23 14.7
8	298 1.9	- 0 33.1	296 45.4	282 53.0	4 53.5	173 2.2	23 14.4
10	328 2.3	- 0 31.2	326 50.3	312 52.2	4 56.0	203 6.6	23 14.1
12	358 2.6	- 0 29.2	356 55.3	342 51.5	4 58.6	233 11.0	23 13.8
14	28 3.0	- 0 27.2	27 .2	12 50.7	5 1.1	263 15.5	23 13.6
16	58 3.4	- 0 25.2	57 5.1	42 50.0	5 3.6	293 19.9	23 13.3
18	88 3.7	- 0 23.3	87 10.1	72 49.2	5 6.2	323 24.3	23 13.0
20	118 4.1	- 0 21.3	117 15.0	102 48.5	5 8.7	353 28.7	23 12.7
22	148 4.5	- 0 19.3	147 19.9	132 47.7	5 11.2	23 33.1	23 12.4
Δ	2	10		-4	13	22	-1

UT	MJESEC $S_\leftmoon$	MJESEC Δ	MJESEC $\delta_\leftmoon$	MJESEC Δ	JUPITER S_4	JUPITER δ_4	SATURN S_η	SATURN δ_η
h	° ′		° ′		° ′	° ′	° ′	° ′
0	146 25.7	120	17 23.6	101	190 37.5	- 7 6.0	354 1.0	1 44.8
2	175 27.7	119	17 43.9	100	220 41.3	- 7 5.5	24 6.3	1 45.0
4	204 29.5	117	18 3.9	98	250 45.1	- 7 5.1	54 11.6	1 45.2
6	233 30.9	115	18 23.5	97	280 48.9	- 7 4.6	84 16.9	1 45.3
8	262 32.0	114	18 42.9	95	310 52.7	- 7 4.2	114 22.2	1 45.5
10	291 32.7	112	19 1.9	93	340 56.6	- 7 3.7	144 27.5	1 45.6
12	320 33.1	110	19 20.5	91	11 .4	- 7 3.3	174 32.8	1 45.8
14	349 33.2	109	19 38.8	90	41 4.2	- 7 2.8	204 38.0	1 46.0
16	18 33.0	107	19 56.7	88	71 8.0	- 7 2.4	234 43.3	1 46.1
18	47 32.4	105	20 14.3	86	101 11.8	- 7 1.9	264 48.6	1 46.3
20	76 31.5	104	20 31.4	84	131 15.7	- 7 1.5	294 53.9	1 46.4
22	105 30.2	102	20 48.2	82	161 19.5	- 7 1.0	324 59.2	1 46.6
Δ					19	2	26	1

φ	SUNCE IZLAZ	SUNCE ZALAZ	TRAJANJE SUMRAKA GRAĐ.	TRAJANJE SUMRAKA ASTR.	MJESEC IZLAZ	MJESEC Δ/24	MJESEC ZALAZ	MJESEC Δ/24
N	h min	h min	h min	h min	h min	min	h min	min
60	6 5	18 12	0 42	2 26	6 7	.6	23 47	3.6
55	6 5	18 11	0 36	2 4	6 34	1.0	23 12	3.2
50	6 5	18 11	0 32	1 50	6 54	1.2	22 47	3.0
45	6 6	18 11	0 29	1 39	7 10	1.4	22 28	2.8
40	6 6	18 11	0 27	1 31	7 24	1.5	22 12	2.7
35	6 5	18 11	0 25	1 25	7 35	1.6	21 59	2.6
30	6 5	18 11	0 24	1 20	7 45	1.7	21 48	2.5
20	6 5	18 11	0 22	1 13	8 2	1.9	21 28	2.4
10	6 5	18 11	0 21	1 10	8 17	2.0	21 11	2.3
0	6 5	18 11	0 21	1 9	8 31	2.1	20 55	2.2
10	6 4	18 11	0 21	1 10	8 46	2.2	20 40	2.1
20	6 4	18 12	0 22	1 13	9 1	2.4	20 23	2.0
30	6 3	18 12	0 24	1 20	9 19	2.5	20 3	1.8
35	6 2	18 13	0 25	1 25	9 29	2.6	19 52	1.7
40	6 2	18 13	0 27	1 31	9 41	2.7	19 39	1.6
45	6 1	18 14	0 29	1 39	9 55	2.9	19 24	1.5
50	5 60	18 15	0 32	1 50	10 12	3.0	19 6	1.4
55	5 59	18 16	0 36	2 5	10 35	3.3	18 42	1.1
60	5 57	18 17	0 42	2 26	11 6	3.7	18 10	.7
S								

SUNCE UT	SUNCE $e = T_p - UT$	SUNCE Δ/24	SUNCE r	MJESEC Prolaz	MJESEC Δ/24	MJESEC $\pi_\leftmoon$	MJESEC r
h	min s	s	′	h min	min	′	′
00	- 7 58.1	.7	16.1	$T_{\overline{m}}$ 14 43	2.2	55.9	15.2
12	- 7 49.3	$T_{\overline{m}_\odot}$ 12 h 7.8 min		Starost 3.1 d	Faza ◐		

PLANETE

Pl.	$T_{\overline{m}}$	π	360−α	Vel.	Pl.	$T_{\overline{m}}$	π	360−α	Vel.
	h min	′	°			h min	′	°	
♀	13 9	.1	346	-3.8	♃	11 16	.0	14	-1.9
♂	20 26	.2	236	-.1	♄	0 24	.0	178	.7

UT	SUNCE $S_\odot$	SUNCE $\delta_\odot$	PROLJ. TAČKA S_Υ	VENERA S_φ	VENERA δ_φ	MARS S_σ	MARS δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	178 4.8	- 0 17.3	177 24.8	162 47.0	5 13.7	53 37.5	23 12.1
2	208 5.2	- 0 15.4	207 29.8	192 46.2	5 16.3	83 41.9	23 11.8
4	238 5.6	- 0 13.4	237 34.7	222 45.4	5 18.8	113 46.3	23 11.6
6	268 5.9	- 0 11.4	267 39.6	252 44.7	5 21.3	143 50.7	23 11.3
8	298 6.3	- 0 9.4	297 44.6	282 43.9	5 23.9	173 55.1	23 11.0
10	328 6.7	- 0 7.4	327 49.5	312 43.2	5 26.4	203 59.5	23 10.7
12	358 7.0	- 0 5.5	357 54.4	342 42.4	5 28.9	234 3.8	23 10.4
14	28 7.4	- 0 3.5	27 59.3	12 41.7	5 31.4	264 8.2	23 10.1
16	58 7.8	- 0 1.5	58 4.3	42 40.9	5 34.0	294 12.6	23 9.8
18	88 8.1	0 .5	88 9.2	72 40.2	5 36.5	324 16.9	23 9.5
20	118 8.5	0 2.4	118 14.1	102 39.4	5 39.0	354 21.3	23 9.2
22	148 8.9	0 4.4	148 19.0	132 38.6	5 41.5	24 25.6	23 8.9
Δ	2	10		-4	13	22	-1

UT	MJESEC $S_\leftmoon$	MJESEC Δ	MJESEC $\delta_\leftmoon$	MJESEC Δ	JUPITER S_4	JUPITER δ_4	SATURN S_η	SATURN δ_η
h	° ′		° ′		° ′	° ′	° ′	° ′
0	134 28.6	100	21 4.6	80	191 23.3	- 7 .6	355 4.5	1 46.8
2	163 26.7	99	21 20.5	78	221 27.1	- 7 .1	25 9.8	1 46.9
4	192 24.4	97	21 36.1	76	251 31.0	- 6 59.7	55 15.1	1 47.1
6	221 21.8	95	21 51.2	73	281 34.8	- 6 59.2	85 20.3	1 47.2
8	250 18.8	94	22 5.8	71	311 38.6	- 6 58.8	115 25.6	1 47.4
10	279 15.6	92	22 20.1	69	341 42.4	- 6 58.3	145 30.9	1 47.6
12	308 12.0	90	22 33.8	66	11 46.2	- 6 57.9	175 36.2	1 47.7
14	337 8.0	89	22 47.1	64	41 50.1	- 6 57.4	205 41.5	1 47.9
16	6 3.8	87	22 59.9	62	71 53.9	- 6 57.0	235 46.8	1 48.0
18	34 59.2	85	23 12.3	59	101 57.7	- 6 56.5	265 52.1	1 48.2
20	63 54.3	84	23 24.1	57	132 1.5	- 6 56.1	295 57.4	1 48.4
22	92 49.0	82	23 35.4	54	162 5.4	- 6 55.6	326 2.6	1 48.5
Δ					19	2	26	1

φ	SUNCE IZLAZ	SUNCE ZALAZ	TRAJANJE SUMRAKA GRAĐ.	TRAJANJE SUMRAKA ASTR.	MJESEC IZLAZ	MJESEC Δ/24	MJESEC ZALAZ	MJESEC Δ/24
N	h min	h min	h min	h min	h min	min	h min	min
60	6 2	18 14	0 42	2 26	6 20	1.0	. . .	.0
55	6 3	18 13	0 36	2 5	6 57	1.4	. . .	.0
50	6 3	18 13	0 32	1 50	7 23	1.6	23 59	2.8
45	6 4	18 12	0 29	1 39	7 43	1.7	23 36	2.7
40	6 4	18 12	0 27	1 31	7 60	1.8	23 17	2.6
35	6 4	18 12	0 25	1 25	8 14	1.9	23 2	2.6
30	6 4	18 11	0 24	1 20	8 26	2.0	22 48	2.5
20	6 4	18 11	0 22	1 13	8 47	2.1	22 26	2.4
10	6 4	18 11	0 21	1 10	9 5	2.2	22 6	2.4
0	6 4	18 11	0 21	1 9	9 22	2.3	21 48	2.3
10	6 4	18 11	0 21	1 10	9 39	2.3	21 29	2.3
20	6 4	18 11	0 22	1 13	9 58	2.4	21 10	2.2
30	6 3	18 11	0 24	1 20	10 19	2.5	20 47	2.1
35	6 3	18 11	0 25	1 24	10 32	2.6	20 34	2.1
40	6 3	18 12	0 27	1 31	10 46	2.7	20 19	2.0
45	6 2	18 12	0 29	1 39	11 4	2.8	20 1	1.9
50	6 2	18 13	0 32	1 50	11 25	2.9	19 39	1.8
55	6 1	18 13	0 36	2 4	11 54	3.1	19 9	1.6
60	5 60	18 14	0 41	2 26	12 35	3.5	18 27	1.3
S								

SUNCE UT	SUNCE $e = T_p - UT$	SUNCE Δ/24	SUNCE r	MJESEC Prolaz	MJESEC Δ/24	MJESEC $\pi_\leftmoon$	MJESEC r
h	min s	s	′	h min	min	′	′
00	- 7 40.5	.7	16.1	$T_{\overline{m}}$ 15 35	2.3	56.4	15.4
12	- 7 31.7	$T_{\overline{m}_\odot}$ 12 h 7.5 min		Starost 4.1 d	Faza ◑		

PLANETE

Pl.	$T_{\overline{m}}$	π	360−α	Vel.	Pl.	$T_{\overline{m}}$	π	360−α	Vel.
	h min	′	°			h min	′	°	
♀	13 9	.1	345	-3.8	♃	11 13	.0	14	-1.9
♂	20 23	.2	236	-.1	♄	0 20	.0	178	.7

UT	SUNCE $S_\odot$	SUNCE $\delta_\odot$	PROLJ. TAČKA S_Υ	VENERA S_φ	VENERA δ_φ	MARS S_σ	MARS δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	178 9.2	0 6.4	178 24.0	162 37.9	5 44.1	54 30.0	23 8.6
2	208 9.6	0 8.4	208 28.9	192 37.1	5 46.6	84 34.3	23 8.3
4	238 10.0	0 10.3	238 33.8	222 36.4	5 49.1	114 38.7	23 8.0
6	268 10.4	0 12.3	268 38.8	252 35.6	5 51.6	144 43.0	23 7.7
8	298 10.7	0 14.3	298 43.7	282 34.8	5 54.1	174 47.3	23 7.4
10	328 11.1	0 16.3	328 48.6	312 34.1	5 56.6	204 51.7	23 7.1
12	358 11.5	0 18.2	358 53.5	342 33.3	5 59.2	234 56.0	23 6.8
14	28 11.8	0 20.2	28 58.5	12 32.5	6 1.7	265 .3	23 6.5
16	58 12.2	0 22.2	59 3.4	42 31.8	6 4.2	295 4.6	23 6.2
18	88 12.6	0 24.2	89 8.3	72 31.0	6 6.7	325 8.9	23 5.9
20	118 13.0	0 26.1	119 13.3	102 30.2	6 9.2	355 13.2	23 5.6
22	148 13.3	0 28.1	149 18.2	132 29.5	6 11.7	25 17.5	23 5.2
Δ	2	10		-4	13	22	-2

UT	MJESEC $S_\leftmoon$	MJESEC Δ	MJESEC $\delta_\leftmoon$	MJESEC Δ	JUPITER S_4	JUPITER δ_4	SATURN S_η	SATURN δ_η
h	° ′		° ′		° ′	° ′	° ′	° ′
0	121 43.5	81	23 46.3	52	192 9.2	- 6 55.1	356 7.9	1 48.7
2	150 37.7	79	23 56.6	49	222 13.0	- 6 54.7	26 13.2	1 48.8
4	179 31.6	78	24 6.3	46	252 16.8	- 6 54.2	56 18.5	1 49.0
6	208 25.1	76	24 15.6	44	282 20.6	- 6 53.8	86 23.8	1 49.2
8	237 18.4	75	24 24.3	41	312 24.5	- 6 53.3	116 29.1	1 49.3
10	266 11.5	74	24 32.4	38	342 28.3	- 6 52.9	146 34.4	1 49.5
12	295 4.2	72	24 40.0	35	12 32.1	- 6 52.4	176 39.7	1 49.6
14	323 56.7	71	24 47.1	32	42 35.9	- 6 52.0	206 44.9	1 49.8
16	352 48.9	70	24 53.5	29	72 39.8	- 6 51.5	236 50.2	1 50.0
18	21 40.9	69	24 59.4	26	102 43.6	- 6 51.1	266 55.5	1 50.1
20	50 32.7	68	25 4.7	24	132 47.4	- 6 50.6	297 .8	1 50.3
22	79 24.2	67	25 9.4	21	162 51.2	- 6 50.2	327 6.1	1 50.4
Δ					19	2	26	1

φ	SUNCE IZLAZ	SUNCE ZALAZ	TRAJANJE SUMRAKA GRAĐ.	TRAJANJE SUMRAKA ASTR.	MJESEC IZLAZ	MJESEC Δ/24	MJESEC ZALAZ	MJESEC Δ/24
N	h min	h min	h min	h min	h min	min	h min	min
60	5 59	18 17	0 42	2 27	6 44	1.7	1 15	3.2
55	6 0	18 15	0 36	2 5	7 30	2.0	0 29	2.9
50	6 1	18 14	0 32	1 50	8 1	2.1	. . .	.0
45	6 2	18 13	0 29	1 39	8 24	2.1	. . .	.0
40	6 2	18 13	0 27	1 31	8 43	2.2	. . .	.0
35	6 3	18 12	0 25	1 25	8 59	2.2	. . .	.0
30	6 3	18 12	0 24	1 20	9 13	2.3	23 49	2.4
20	6 3	18 11	0 22	1 13	9 37	2.3	23 24	2.4
10	6 4	18 11	0 21	1 10	9 57	2.3	23 3	2.4
0	6 4	18 10	0 21	1 9	10 16	2.4	22 43	2.4
10	6 4	18 10	0 21	1 10	10 36	2.4	22 24	2.4
20	6 4	18 10	0 22	1 13	10 56	2.4	22 3	2.4
30	6 4	18 10	0 24	1 20	11 20	2.5	21 38	2.4
35	6 4	18 10	0 25	1 24	11 34	2.5	21 24	2.4
40	6 4	18 10	0 27	1 31	11 51	2.5	21 7	2.4
45	6 3	18 10	0 29	1 39	12 10	2.6	20 47	2.4
50	6 3	18 10	0 32	1 49	12 35	2.6	20 22	2.3
55	6 3	18 11	0 36	2 4	13 8	2.7	19 48	2.3
60	6 2	18 11	0 41	2 25	13 58	2.8	18 58	2.2
S								

SUNCE UT	SUNCE $e = T_p - UT$	SUNCE Δ/24	SUNCE r	MJESEC Prolaz	MJESEC Δ/24	MJESEC $\pi_\leftmoon$	MJESEC r
h	min s	s	′	h min	min	′	′
00	- 7 22.8	.7	16.1	$T_{\overline{m}}$ 16 30	2.4	56.9	15.5
12	- 7 13.9	$T_{\overline{m}_\odot}$ 12 h 7.2 min		Starost 5.1 d	Faza ◑		

PLANETE

Pl.	$T_{\overline{m}}$	π	360−α	Vel.	Pl.	$T_{\overline{m}}$	π	360−α	Vel.
	h min	′	°			h min	′	°	
♀	13 10	.1	344	-3.8	♃	11 10	.0	14	-1.9
♂	20 19	.2	236	-.1	♄	0 15	.0	178	.7

UT	SUNCE $S_\odot$	SUNCE $\delta_\odot$	PROLJ. TAČKA S_Υ	VENERA S_φ	VENERA δ_φ	MARS S_σ	MARS δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	178 13.7	0 30.1	179 23.1	162 28.7	6 14.2	55 21.8	23 4.9
2	208 14.1	0 32.1	209 28.0	192 27.9	6 16.7	85 26.1	23 4.6
4	238 14.4	0 34.0	239 33.0	222 27.2	6 19.2	115 30.4	23 4.3
6	268 14.8	0 36.0	269 37.9	252 26.4	6 21.8	145 34.7	23 4.0
8	298 15.2	0 38.0	299 42.8	282 25.6	6 24.3	175 38.9	23 3.7
10	328 15.6	0 40.0	329 47.8	312 24.9	6 26.8	205 43.2	23 3.4
12	358 15.9	0 41.9	359 52.7	342 24.1	6 29.3	235 47.5	23 3.1
14	28 16.3	0 43.9	29 57.6	12 23.3	6 31.8	265 51.7	23 2.7
16	58 16.7	0 45.9	60 2.5	42 22.6	6 34.3	295 56.0	23 2.4
18	88 17.1	0 47.9	90 7.5	72 21.8	6 36.8	326 .2	23 2.1
20	118 17.4	0 49.8	120 12.4	102 21.0	6 39.3	356 4.5	23 1.8
22	148 17.8	0 51.8	150 17.3	132 20.2	6 41.8	26 8.7	23 1.5
Δ	2	10		−4	13	21	−2

UT	MJESEC $S_\leftmoon$	MJESEC Δ	MJESEC $\delta_\leftmoon$	MJESEC Δ	JUPITER $S_\jupiter$	JUPITER $\delta_\jupiter$	SATURN $S_\saturn$	SATURN $\delta_\saturn$
h	° ′		° ′		° ′	° ′	° ′	° ′
0	108 15.5	66	25 13.5	18	192 55.1	− 6 49.7	357 11.4	1 50.6
2	137 6.6	65	25 17.0	14	222 58.9	− 6 49.3	27 16.7	1 50.8
4	165 57.5	64	25 19.9	11	253 2.7	− 6 48.8	57 22.0	1 50.9
6	194 48.2	63	25 22.1	8	283 6.6	− 6 48.4	87 27.2	1 51.1
8	223 38.8	62	25 23.8	5	313 10.4	− 6 47.9	117 32.5	1 51.2
10	252 29.2	61	25 24.8	2	343 14.2	− 6 47.5	147 37.8	1 51.4
12	281 19.4	61	25 25.2	−1	13 18.0	− 6 47.0	177 43.1	1 51.6
14	310 9.5	60	25 25.0	−4	43 21.9	− 6 46.6	207 48.4	1 51.7
16	338 59.5	59	25 24.1	−7	73 25.7	− 6 46.1	237 53.7	1 51.9
18	7 49.4	59	25 22.6	−11	103 29.5	− 6 45.7	267 59.0	1 52.0
20	36 39.1	58	25 20.5	−14	133 33.3	− 6 45.2	298 4.3	1 52.2
22	65 28.8	58	25 17.7	−17	163 37.2	− 6 44.8	328 9.6	1 52.4
Δ					19	2	26	1

φ	SUNCE IZLAZ	SUNCE ZALAZ	TRAJANJE SUMRAKA GRAĐ.	TRAJANJE SUMRAKA ASTR.	MJESEC IZLAZ	MJESEC Δ/24	MJESEC ZALAZ	MJESEC Δ/24
N	h min	h min	h min	h min	h min	min	h min	min
60	5 56	18 19	0 42	2 28	7 25	2.8	2 31	2.3
55	5 58	18 17	0 36	2 6	8 17	2.7	1 39	2.4
50	5 59	18 16	0 32	1 50	8 51	2.6	1 5	2.4
45	5 60	18 15	0 29	1 39	9 16	2.6	0 40	2.4
40	6 1	18 14	0 27	1 31	9 36	2.6	0 20	2.4
35	6 1	18 13	0 25	1 25	9 53	2.5	0 3	2.4
30	6 2	18 13	0 24	1 20	10 7	2.5	. . .	.0
20	6 3	18 12	0 22	1 13	10 32	2.5	. . .	.0
10	6 3	18 11	0 21	1 10	10 53	2.5	. . .	.0
0	6 4	18 10	0 21	1 9	11 13	2.4	23 41	2.4
10	6 4	18 10	0 21	1 10	11 33	2.4	23 22	2.5
20	6 4	18 9	0 22	1 13	11 55	2.4	23 0	2.6
30	6 5	18 9	0 24	1 20	12 20	2.3	22 35	2.6
35	6 5	18 9	0 25	1 24	12 35	2.3	22 21	2.7
40	6 5	18 9	0 27	1 30	12 52	2.3	22 4	2.7
45	6 5	18 8	0 29	1 38	13 12	2.2	21 44	2.8
50	6 5	18 8	0 32	1 49	13 38	2.2	21 18	2.9
55	6 5	18 8	0 36	2 4	14 12	2.1	20 44	3.0
60	6 5	18 8	0 41	2 24	15 5	1.8	19 50	3.3
S								

SUNCE UT	SUNCE $e = T_p - UT$	SUNCE Δ/24	SUNCE r	MJESEC Prolaz	MJESEC Δ/24	MJESEC $\pi_\leftmoon$	MJESEC r
h	min s	s	′	h min	min	′	′
00	− 7 5.0	.7	16.1	$T_{\overline{m}}$ 17 27	2.5	57.6	15.7
12	− 6 56.0	$T_{\overline{m}_\odot}$ 12 h 6.9 min		Starost 6.1 d	Faza ◐		

PLANETE

Pl.	$T_{\overline{m}}$	π	360−α	Vel.	Pl.	$T_{\overline{m}}$	π	360−α	Vel.
	h min	′	°			h min	′	°	
♀	13 10	.1	343	−3.8	♃	11 7	.0	14	−1.9
♂	20 16	.2	236	−.1	♄	0 11	.0	178	.7

UT	SUNCE $S_\odot$	SUNCE $\delta_\odot$	PROLJ. TAČKA S_Υ	VENERA S_φ	VENERA δ_φ	MARS S_σ	MARS δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	178 18.2	0 53.8	180 22.3	162 19.5	6 44.3	56 13.0	23 1.1
2	208 18.6	0 55.7	210 27.2	192 18.7	6 46.8	86 17.2	23 .8
4	238 18.9	0 57.7	240 32.1	222 17.9	6 49.3	116 21.4	23 .5
6	268 19.3	0 59.7	270 37.0	252 17.1	6 51.8	146 25.6	23 .2
8	298 19.7	1 1.7	300 42.0	282 16.4	6 54.2	176 29.9	22 59.8
10	328 20.1	1 3.6	330 46.9	312 15.6	6 56.7	206 34.1	22 59.5
12	358 20.4	1 5.6	0 51.8	342 14.8	6 59.2	236 38.3	22 59.2
14	28 20.8	1 7.6	30 56.8	12 14.0	7 1.7	266 42.5	22 58.9
16	58 21.2	1 9.5	61 1.7	42 13.2	7 4.2	296 46.7	22 58.5
18	88 21.6	1 11.5	91 6.6	72 12.5	7 6.7	326 50.9	22 58.2
20	118 21.9	1 13.5	121 11.5	102 11.7	7 9.2	356 55.1	22 57.9
22	148 22.3	1 15.5	151 16.5	132 10.9	7 11.7	26 59.3	22 57.6
Δ	2	10		−4	12	21	−2

UT	MJESEC $S_\leftmoon$	MJESEC Δ	MJESEC $\delta_\leftmoon$	MJESEC Δ	JUPITER $S_\jupiter$	JUPITER $\delta_\jupiter$	SATURN $S_\saturn$	SATURN $\delta_\saturn$
h	° ′		° ′		° ′	° ′	° ′	° ′
0	94 18.4	58	25 14.3	−20	193 41.0	− 6 44.3	358 14.8	1 52.5
2	123 8.0	57	25 10.3	−24	223 44.8	− 6 43.9	28 20.1	1 52.7
4	151 57.5	57	25 5.5	−27	253 48.7	− 6 43.4	58 25.4	1 52.8
6	180 46.9	57	25 .2	−30	283 52.5	− 6 43.0	88 30.7	1 53.0
8	209 36.4	57	24 54.2	−33	313 56.3	− 6 42.5	118 36.0	1 53.2
10	238 25.8	57	24 47.5	−36	344 .1	− 6 42.1	148 41.3	1 53.3
12	267 15.2	57	24 40.3	−40	14 4.0	− 6 41.6	178 46.6	1 53.5
14	296 4.7	57	24 32.3	−43	44 7.8	− 6 41.2	208 51.9	1 53.6
16	324 54.1	57	24 23.8	−46	74 11.6	− 6 40.7	238 57.1	1 53.8
18	353 43.6	58	24 14.5	−49	104 15.5	− 6 40.3	269 2.4	1 53.9
20	22 33.1	58	24 4.7	−52	134 19.3	− 6 39.8	299 7.7	1 54.1
22	51 22.7	58	23 54.2	−56	164 23.1	− 6 39.4	329 13.0	1 54.3
Δ					19	2	26	1

φ	SUNCE IZLAZ	SUNCE ZALAZ	TRAJANJE SUMRAKA GRAĐ.	TRAJANJE SUMRAKA ASTR.	MJESEC IZLAZ	MJESEC Δ/24	MJESEC ZALAZ	MJESEC Δ/24
N	h min	h min	h min	h min	h min	min	h min	min
60	5 53	18 22	0 42	2 29	8 31	3.7	3 26	1.4
55	5 55	18 19	0 36	2 6	9 21	3.3	2 36	1.8
50	5 57	18 17	0 32	1 51	9 54	3.1	2 3	1.9
45	5 58	18 16	0 29	1 40	10 18	3.0	1 38	2.0
40	5 59	18 15	0 27	1 31	10 38	2.9	1 18	2.1
35	5 60	18 14	0 25	1 25	10 54	2.8	1 1	2.2
30	6 1	18 13	0 24	1 20	11 8	2.7	0 47	2.2
20	6 2	18 12	0 22	1 13	11 32	2.6	0 22	2.3
10	6 3	18 11	0 21	1 10	11 53	2.5	0 1	2.4
0	6 3	18 10	0 21	1 9	12 12	2.4	. . .	.0
10	6 4	18 9	0 21	1 10	12 31	2.3	. . .	.0
20	6 5	18 8	0 22	1 13	12 52	2.2	. . .	.0
30	6 5	18 8	0 24	1 20	13 16	2.1	23 39	2.8
35	6 5	18 7	0 25	1 24	13 30	2.1	23 25	2.9
40	6 6	18 7	0 27	1 30	13 46	2.0	23 9	3.0
45	6 6	18 7	0 29	1 38	14 5	1.9	22 51	3.1
50	6 6	18 6	0 32	1 49	14 30	1.7	22 27	3.3
55	6 7	18 6	0 36	2 3	15 2	1.5	21 56	3.5
60	6 7	18 5	0 41	2 24	15 49	1.1	21 9	4.0
S								

SUNCE UT	SUNCE $e = T_p - UT$	SUNCE Δ/24	SUNCE r	MJESEC Prolaz	MJESEC Δ/24	MJESEC $\pi_\leftmoon$	MJESEC r
h	min s	s	′	h min	min	′	′
00	− 6 47.1	.8	16.1	$T_{\overline{m}}$ 18 26	2.4	58.2	15.9
12	− 6 38.0	$T_{\overline{m}_\odot}$ 12 h 6.6 min		Starost 7.1 d	Faza ◐		

PLANETE

Pl.	$T_{\overline{m}}$	π	360−α	Vel.	Pl.	$T_{\overline{m}}$	π	360−α	Vel.
	h min	′	°			h min	′	°	
♀	13 11	.1	342	−3.8	♃	11 4	.0	13	−1.9
♂	20 12	.2	236	.0	♄	0 7	.0	178	.7

UT	SUNCE $S_\odot$	SUNCE $\delta_\odot$	PROLJ. TAČKA S_Υ	VENERA S_φ	VENERA δ_φ	MARS S_σ	MARS δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	178 22.7	1 17.4	181 21.4	162 10.1	7 14.2	57 3.5	22 57.2
2	208 23.1	1 19.4	211 26.3	192 9.3	7 16.6	87 7.7	22 56.9
4	238 23.4	1 21.4	241 31.2	222 8.5	7 19.1	117 11.8	22 56.6
6	268 23.8	1 23.3	271 36.2	252 7.8	7 21.6	147 16.0	22 56.2
8	298 24.2	1 25.3	301 41.1	282 7.0	7 24.1	177 20.2	22 55.9
10	328 24.6	1 27.3	331 46.0	312 6.2	7 26.6	207 24.3	22 55.5
12	358 25.0	1 29.2	1 51.0	342 5.4	7 29.0	237 28.5	22 55.2
14	28 25.3	1 31.2	31 55.9	12 4.6	7 31.5	267 32.7	22 54.9
16	58 25.7	1 33.2	62 .8	42 3.8	7 34.0	297 36.8	22 54.5
18	88 26.1	1 35.1	92 5.7	72 3.0	7 36.5	327 41.0	22 54.2
20	118 26.5	1 37.1	122 10.7	102 2.2	7 38.9	357 45.1	22 53.9
22	148 26.8	1 39.1	152 15.6	132 1.4	7 41.4	27 49.2	22 53.5
Δ	2	10		−4	12	21	−2

UT	MJESEC $S_\leftmoon$	MJESEC Δ	MJESEC $\delta_\leftmoon$	MJESEC Δ	JUPITER $S_\jupiter$	JUPITER $\delta_\jupiter$	SATURN $S_\saturn$	SATURN $\delta_\saturn$
h	° ′		° ′		° ′	° ′	° ′	° ′
0	80 12.4	59	23 43.1	−59	194 27.0	− 6 38.9	359 18.3	1 54.4
2	109 2.2	59	23 31.4	−62	224 30.8	− 6 38.5	29 23.6	1 54.6
4	137 52.0	60	23 19.0	−65	254 34.6	− 6 38.0	59 28.9	1 54.7
6	166 41.9	60	23 6.0	−68	284 38.5	− 6 37.6	89 34.2	1 54.9
8	195 32.0	61	22 52.4	−71	314 42.3	− 6 37.1	119 39.5	1 55.1
10	224 22.1	61	22 38.2	−74	344 46.1	− 6 36.7	149 44.7	1 55.2
12	253 12.4	62	22 23.4	−77	14 50.0	− 6 36.2	179 50.0	1 55.4
14	282 2.8	63	22 8.0	−80	44 53.8	− 6 35.8	209 55.3	1 55.5
16	310 53.4	64	21 52.0	−83	74 57.6	− 6 35.3	240 .6	1 55.7
18	339 44.1	64	21 35.4	−86	105 1.5	− 6 34.9	270 5.9	1 55.8
20	8 35.0	65	21 18.3	−89	135 5.3	− 6 34.4	300 11.2	1 56.0
22	37 26.0	66	21 .5	−91	165 9.1	− 6 34.0	330 16.5	1 56.2
Δ					19	2	26	1

φ	SUNCE IZLAZ	SUNCE ZALAZ	TRAJANJE SUMRAKA GRAĐ.	TRAJANJE SUMRAKA ASTR.	MJESEC IZLAZ	MJESEC Δ/24	MJESEC ZALAZ	MJESEC Δ/24
N	h min	h min	h min	h min	h min	min	h min	min
60	5 50	18 24	0 42	2 30	9 59	4.1	4 0	.8
55	5 53	18 21	0 36	2 7	10 40	3.7	3 18	1.3
50	5 55	18 19	0 32	1 51	11 8	3.4	2 49	1.5
45	5 56	18 17	0 29	1 40	11 29	3.2	2 27	1.7
40	5 57	18 16	0 27	1 31	11 47	3.1	2 9	1.8
35	5 58	18 15	0 25	1 25	12 1	2.9	1 54	1.9
30	5 59	18 14	0 24	1 20	12 13	2.8	1 41	2.0
20	6 1	18 12	0 22	1 13	12 35	2.7	1 18	2.2
10	6 2	18 11	0 21	1 10	12 53	2.5	0 58	2.3
0	6 3	18 10	0 21	1 9	13 11	2.4	0 40	2.4
10	6 4	18 9	0 21	1 10	13 28	2.2	0 22	2.5
20	6 5	18 7	0 22	1 13	13 46	2.1	0 2	2.6
30	6 6	18 6	0 24	1 19	14 7	1.9	. . .	.0
35	6 6	18 6	0 25	1 24	14 19	1.8	. . .	.0
40	6 7	18 5	0 27	1 30	14 33	1.7	. . .	.0
45	6 7	18 5	0 29	1 38	14 50	1.5	. . .	.0
50	6 8	18 4	0 32	1 49	15 11	1.3	23 46	3.5
55	6 9	18 3	0 36	2 3	15 37	1.1	23 20	3.8
60	6 9	18 2	0 41	2 23	16 14	.6	22 44	4.2
S								

SUNCE UT	SUNCE $e = T_p - UT$	SUNCE Δ/24	SUNCE r	MJESEC Prolaz	MJESEC Δ/24	MJESEC $\pi_\leftmoon$	MJESEC r
h	min s	s	′	h min	min	′	′
00	− 6 29.0	.8	16.1	$T_{\overline{m}}$ 19 24	2.4	58.9	16.0
12	− 6 20.0	$T_{\overline{m}_\odot}$ 12 h	6.3 min	Starost 8.1 d	Faza ◐		

PLANETE

Pl.	$T_{\overline{m}}$	π	360−α	Vel.	Pl.	$T_{\overline{m}}$	π	360−α	Vel.
	h min	′	°			h min	′	°	
♀	13 12	.1	341	−3.8	♃	11 1	.0	13	−1.9
♂	20 9	.2	236	.0	♄	0 3	.0	178	.7

UT	SUNCE $S_\odot$	SUNCE $\delta_\odot$	PROLJ. TAČKA S_Υ	VENERA S_φ	VENERA δ_φ	MARS S_σ	MARS δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	178 27.2	1 41.0	182 20.5	162 .6	7 43.9	57 53.4	22 53.2
2	208 27.6	1 43.0	212 25.5	191 59.8	7 46.4	87 57.5	22 52.8
4	238 28.0	1 45.0	242 30.4	221 59.1	7 48.8	118 1.6	22 52.5
6	268 28.4	1 46.9	272 35.3	251 58.3	7 51.3	148 5.8	22 52.1
8	298 28.7	1 48.9	302 40.2	281 57.5	7 53.8	178 9.9	22 51.8
10	328 29.1	1 50.9	332 45.2	311 56.7	7 56.2	208 14.0	22 51.4
12	358 29.5	1 52.8	2 50.1	341 55.9	7 58.7	238 18.1	22 51.1
14	28 29.9	1 54.8	32 55.0	11 55.1	8 1.1	268 22.2	22 50.7
16	58 30.2	1 56.8	63 .0	41 54.3	8 3.6	298 26.3	22 50.4
18	88 30.6	1 58.7	93 4.9	71 53.5	8 6.1	328 30.4	22 50.0
20	118 31.0	2 .7	123 9.8	101 52.7	8 8.5	358 34.5	22 49.7
22	148 31.4	2 2.7	153 14.7	131 51.9	8 11.0	28 38.6	22 49.3
Δ	2	10		−4	12	21	−2

UT	MJESEC $S_\leftmoon$	MJESEC Δ	MJESEC $\delta_\leftmoon$	MJESEC Δ	JUPITER $S_\jupiter$	JUPITER $\delta_\jupiter$	SATURN $S_\saturn$	SATURN $\delta_\saturn$
h	° ′		° ′		° ′	° ′	° ′	° ′
0	66 17.2	67	20 42.2	−94	195 13.0	− 6 33.5	0 21.8	1 56.3
2	95 8.5	68	20 23.4	−97	225 16.8	− 6 33.1	30 27.0	1 56.5
4	124 .1	69	20 4.0	−100	255 20.6	− 6 32.6	60 32.3	1 56.6
6	152 51.8	70	19 44.1	−102	285 24.5	− 6 32.2	90 37.6	1 56.8
8	181 43.7	70	19 23.6	−105	315 28.3	− 6 31.7	120 42.9	1 57.0
10	210 35.8	71	19 2.7	−107	345 32.1	− 6 31.3	150 48.2	1 57.1
12	239 28.1	72	18 41.2	−110	15 36.0	− 6 30.8	180 53.5	1 57.3
14	268 20.6	73	18 19.2	−112	45 39.8	− 6 30.4	210 58.8	1 57.4
16	297 13.2	74	17 56.7	−115	75 43.6	− 6 30.0	241 4.1	1 57.6
18	326 6.1	75	17 33.8	−117	105 47.5	− 6 29.5	271 9.3	1 57.7
20	354 59.2	76	17 10.4	−119	135 51.3	− 6 29.1	301 14.6	1 57.9
22	23 52.4	77	16 46.5	−122	165 55.1	− 6 28.6	331 19.9	1 58.1
Δ					19	2	26	1

φ	SUNCE IZLAZ	SUNCE ZALAZ	TRAJANJE SUMRAKA GRAĐ.	TRAJANJE SUMRAKA ASTR.	MJESEC IZLAZ	MJESEC Δ/24	MJESEC ZALAZ	MJESEC Δ/24
N	h min	h min	h min	h min	h min	min	h min	min
60	5 47	18 26	0 42	2 31	11 39	4.3	4 20	.5
55	5 50	18 23	0 37	2 7	12 8	3.8	3 48	.9
50	5 52	18 21	0 32	1 51	12 30	3.5	3 25	1.2
45	5 54	18 19	0 29	1 40	12 46	3.3	3 7	1.4
40	5 56	18 17	0 27	1 32	13 0	3.1	2 53	1.6
35	5 57	18 16	0 25	1 25	13 12	3.0	2 40	1.7
30	5 58	18 14	0 24	1 20	13 22	2.9	2 29	1.8
20	5 60	18 12	0 22	1 13	13 39	2.6	2 10	2.0
10	6 1	18 11	0 21	1 10	13 54	2.5	1 54	2.2
0	6 3	18 9	0 21	1 9	14 8	2.3	1 38	2.3
10	6 4	18 8	0 21	1 10	14 21	2.1	1 22	2.5
20	6 5	18 7	0 22	1 13	14 36	1.9	1 5	2.7
30	6 6	18 5	0 24	1 19	14 53	1.7	0 46	2.9
35	6 7	18 4	0 25	1 24	15 3	1.6	0 34	3.0
40	6 8	18 4	0 27	1 30	15 14	1.5	0 21	3.1
45	6 9	18 3	0 29	1 38	15 27	1.3	0 5	3.3
50	6 9	18 2	0 32	1 48	15 43	1.1	. . .	.0
55	6 11	18 0	0 36	2 3	16 3	.8	. . .	.0
60	6 12	17 59	0 41	2 23	16 29	.4	. . .	.0
S								

SUNCE UT	SUNCE $e = T_p - UT$	SUNCE Δ/24	SUNCE r	MJESEC Prolaz	MJESEC Δ/24	MJESEC $\pi_\leftmoon$	MJESEC r
h	min s	s	′	h min	min	′	′
00	− 6 10.9	.8	16.1	$T_{\overline{m}}$ 20 21	2.2	59.5	16.2
12	− 6 1.8	$T_{\overline{m}_\odot}$ 12 h	6.0 min	Starost 9.1 d	Faza ◐		

PLANETE

Pl.	$T_{\overline{m}}$	π	360−α	Vel.	Pl.	$T_{\overline{m}}$	π	360−α	Vel.
	h min	′	°			h min	′	°	
♀	13 12	.1	340	−3.8	♃	10 58	.0	13	−1.9
♂	20 6	.2	236	.0	♄	23 54	.0	178	.7

UT	SUNCE $S_\odot$	SUNCE $\delta_\odot$	PROLJ. TAČKA S_Υ	VENERA S_φ	VENERA δ_φ	MARS S_σ	MARS δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	178 31.8	2 4.6	183 19.7	161 51.1	8 13.4	58 42.7	22 49.0
2	208 32.1	2 6.6	213 24.6	191 50.2	8 15.9	88 46.7	22 48.6
4	238 32.5	2 8.5	243 29.5	221 49.4	8 18.3	118 50.8	22 48.3
6	268 32.9	2 10.5	273 34.5	251 48.6	8 20.8	148 54.9	22 47.9
8	298 33.3	2 12.5	303 39.4	281 47.8	8 23.2	178 59.0	22 47.6
10	328 33.7	2 14.4	333 44.3	311 47.0	8 25.7	209 3.0	22 47.2
12	358 34.0	2 16.4	3 49.2	341 46.2	8 28.1	239 7.1	22 46.9
14	28 34.4	2 18.3	33 54.2	11 45.4	8 30.6	269 11.1	22 46.5
16	58 34.8	2 20.3	63 59.1	41 44.6	8 33.0	299 15.2	22 46.1
18	88 35.2	2 22.3	94 4.0	71 43.8	8 35.5	329 19.2	22 45.8
20	118 35.6	2 24.2	124 9.0	101 43.0	8 37.9	359 23.3	22 45.4
22	148 35.9	2 26.2	154 13.9	131 42.1	8 40.4	29 27.3	22 45.1
Δ	2	10		−4	12	20	−2

UT	MJESEC $S_\leftmoon$	MJESEC Δ	MJESEC $\delta_\leftmoon$	MJESEC Δ	JUPITER $S_\jupiter$	JUPITER $\delta_\jupiter$	SATURN $S_\saturn$	SATURN $\delta_\saturn$
h	° ′		° ′		° ′	° ′	° ′	° ′
0	52 45.9	78	16 22.2	−124	195 59.0	− 6 28.2	1 25.2	1 58.2
2	81 39.5	79	15 57.5	−126	226 2.8	− 6 27.7	31 30.5	1 58.4
4	110 33.4	80	15 32.3	−128	256 6.7	− 6 27.3	61 35.8	1 58.5
6	139 27.4	81	15 6.7	−130	286 10.5	− 6 26.8	91 41.1	1 58.7
8	168 21.7	82	14 40.7	−132	316 14.3	− 6 26.4	121 46.3	1 58.8
10	197 16.1	83	14 14.3	−134	346 18.2	− 6 25.9	151 51.6	1 59.0
12	226 10.7	84	13 47.6	−136	16 22.0	− 6 25.5	181 56.9	1 59.2
14	255 5.5	85	13 20.5	−137	46 25.8	− 6 25.0	212 2.2	1 59.3
16	284 .5	86	12 53.0	−139	76 29.7	− 6 24.6	242 7.5	1 59.5
18	312 55.7	87	12 25.2	−141	106 33.5	− 6 24.1	272 12.8	1 59.6
20	341 51.0	88	11 57.1	−142	136 37.4	− 6 23.7	302 18.1	1 59.8
22	10 46.5	88	11 28.6	−144	166 41.2	− 6 23.2	332 23.4	1 59.9
Δ					19	2	26	1

φ	SUNCE IZLAZ	SUNCE ZALAZ	TRAJANJE SUMRAKA GRAĐ.	TRAJANJE SUMRAKA ASTR.	MJESEC IZLAZ	MJESEC Δ/24	MJESEC ZALAZ	MJESEC Δ/24
N	h min	h min	h min	h min	h min	min	h min	min
60	5 44	18 29	0 42	2 32	13 21	4.2	4 32	.3
55	5 48	18 25	0 37	2 8	13 40	3.9	4 11	.7
50	5 50	18 22	0 33	1 52	13 55	3.6	3 54	1.0
45	5 52	18 20	0 29	1 40	14 6	3.3	3 41	1.2
40	5 54	18 18	0 27	1 32	14 15	3.1	3 30	1.4
35	5 56	18 16	0 25	1 25	14 23	3.0	3 21	1.5
30	5 57	18 15	0 24	1 20	14 30	2.8	3 13	1.6
20	5 59	18 13	0 22	1 14	14 42	2.6	2 58	1.9
10	6 1	18 11	0 21	1 10	14 53	2.4	2 46	2.1
0	6 2	18 9	0 21	1 9	15 3	2.2	2 34	2.2
10	6 4	18 7	0 21	1 10	15 12	2.0	2 22	2.4
20	6 5	18 6	0 22	1 13	15 23	1.8	2 9	2.6
30	6 7	18 4	0 24	1 19	15 34	1.6	1 54	2.9
35	6 8	18 3	0 25	1 24	15 41	1.5	1 46	3.0
40	6 9	18 2	0 27	1 30	15 49	1.3	1 36	3.1
45	6 10	18 1	0 29	1 38	15 58	1.1	1 24	3.3
50	6 11	17 60	0 32	1 48	16 8	.9	1 10	3.6
55	6 12	17 58	0 36	2 2	16 22	.6	0 52	3.9
60	6 14	17 56	0 41	2 22	16 39	.3	0 28	4.3
S								

SUNCE UT	SUNCE $e = T_p - UT$	SUNCE Δ/24	SUNCE r	MJESEC Prolaz	MJESEC Δ/24	MJESEC $\pi_\leftmoon$	MJESEC r
h	min s	s	′	h min	min	′	′
00	− 5 52.8	.8	16.1	$T_{\overline{m}}$ 21 15	2.2	60.0	16.4
12	− 5 43.7	$T_{\overline{m}_\odot}$ 12 h 5.7 min		Starost 10.1 d	Faza ◐		

PLANETE

Pl.	$T_{\overline{m}}$	π	360−α	Vel.	Pl.	$T_{\overline{m}}$	π	360−α	Vel.
	h min	′	°			h min	′	°	
♀	13 13	.1	339	−3.8	♃	10 55	.0	13	−1.9
♂	20 2	.2	235	.0	♄	23 50	.0	178	.7

UT	SUNCE $S_\odot$	SUNCE $\delta_\odot$	PROLJ. TAČKA S_Υ	VENERA S_φ	VENERA δ_φ	MARS S_σ	MARS δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	178 36.3	2 28.1	184 18.8	161 41.3	8 42.8	59 31.4	22 44.7
2	208 36.7	2 30.1	214 23.7	191 40.5	8 45.2	89 35.4	22 44.3
4	238 37.1	2 32.1	244 28.7	221 39.7	8 47.7	119 39.4	22 44.0
6	268 37.4	2 34.0	274 33.6	251 38.9	8 50.1	149 43.4	22 43.6
8	298 37.8	2 36.0	304 38.5	281 38.1	8 52.5	179 47.5	22 43.2
10	328 38.2	2 37.9	334 43.5	311 37.2	8 55.0	209 51.5	22 42.9
12	358 38.6	2 39.9	4 48.4	341 36.4	8 57.4	239 55.5	22 42.5
14	28 39.0	2 41.8	34 53.3	11 35.6	8 59.8	269 59.5	22 42.1
16	58 39.3	2 43.8	64 58.2	41 34.8	9 2.3	300 3.5	22 41.8
18	88 39.7	2 45.8	95 3.2	71 34.0	9 4.7	330 7.5	22 41.4
20	118 40.1	2 47.7	125 8.1	101 33.1	9 7.1	0 11.5	22 41.0
22	148 40.5	2 49.7	155 13.0	131 32.3	9 9.5	30 15.5	22 40.6
Δ	2	10		−4	12	20	−2

UT	MJESEC $S_\leftmoon$	MJESEC Δ	MJESEC $\delta_\leftmoon$	MJESEC Δ	JUPITER $S_\jupiter$	JUPITER $\delta_\jupiter$	SATURN $S_\saturn$	SATURN $\delta_\saturn$
h	° ′		° ′		° ′	° ′	° ′	° ′
0	39 42.2	89	10 59.9	−145	196 45.0	− 6 22.8	2 28.6	2 .1
2	68 38.0	90	10 30.9	−146	226 48.9	− 6 22.3	32 33.9	2 .3
4	97 34.0	91	10 1.6	−148	256 52.7	− 6 21.9	62 39.2	2 .4
6	126 30.1	91	9 32.0	−149	286 56.6	− 6 21.5	92 44.5	2 .6
8	155 26.4	92	9 2.2	−150	317 .4	− 6 21.0	122 49.8	2 .7
10	184 22.8	93	8 32.2	−151	347 4.2	− 6 20.6	152 55.1	2 .9
12	213 19.4	93	8 1.9	−152	17 8.1	− 6 20.1	183 .4	2 1.0
14	242 16.0	94	7 31.4	−153	47 11.9	− 6 19.7	213 5.6	2 1.2
16	271 12.8	95	7 .8	−154	77 15.8	− 6 19.2	243 10.9	2 1.3
18	300 9.8	95	6 29.9	−155	107 19.6	− 6 18.8	273 16.2	2 1.5
20	329 6.8	96	5 58.9	−156	137 23.5	− 6 18.3	303 21.5	2 1.7
22	358 3.9	96	5 27.8	−156	167 27.3	− 6 17.9	333 26.8	2 1.8
Δ					19	2	26	1

φ	SUNCE IZLAZ	SUNCE ZALAZ	TRAJANJE SUMRAKA GRAĐ.	TRAJANJE SUMRAKA ASTR.	MJESEC IZLAZ	MJESEC Δ/24	MJESEC ZALAZ	MJESEC Δ/24
N	h min	h min	h min	h min	h min	min	h min	min
60	5 41	18 31	0 42	2 33	15 3	4.2	4 40	.3
55	5 45	18 27	0 37	2 8	15 13	3.8	4 28	.6
50	5 48	18 24	0 33	1 52	15 20	3.5	4 18	.9
45	5 51	18 21	0 30	1 41	15 26	3.3	4 10	1.1
40	5 53	18 19	0 27	1 32	15 31	3.1	4 3	1.3
35	5 54	18 17	0 25	1 25	15 35	3.0	3 57	1.4
30	5 56	18 16	0 24	1 20	15 39	2.8	3 52	1.5
20	5 58	18 13	0 22	1 14	15 45	2.6	3 43	1.8
10	6 0	18 11	0 21	1 10	15 50	2.4	3 35	2.0
0	6 2	18 9	0 21	1 9	15 56	2.2	3 28	2.2
10	6 4	18 7	0 21	1 10	16 1	2.0	3 20	2.4
20	6 6	18 5	0 22	1 13	16 6	1.8	3 12	2.6
30	6 8	18 3	0 24	1 19	16 12	1.5	3 3	2.8
35	6 9	18 2	0 25	1 24	16 16	1.4	2 58	3.0
40	6 10	18 0	0 27	1 30	16 20	1.2	2 51	3.1
45	6 11	17 59	0 29	1 38	16 25	1.0	2 44	3.3
50	6 13	17 57	0 32	1 48	16 30	.8	2 36	3.6
55	6 14	17 55	0 36	2 2	16 37	.6	2 25	3.8
60	6 17	17 53	0 41	2 22	16 46	.2	2 10	4.2
S								

SUNCE UT	SUNCE $e = T_p - UT$	SUNCE Δ/24	SUNCE r	MJESEC Prolaz	MJESEC Δ/24	MJESEC $\pi_\leftmoon$	MJESEC r
h	min s	s	′	h min	min	′	′
00	− 5 34.6	.8	16.1	$T_{\overline{m}}$ 22 8	2.2	60.4	16.5
12	− 5 25.5	$T_{\overline{m}_\odot}$ 12 h 5.4 min		Starost 11.1 d	Faza ◐		

PLANETE

Pl.	$T_{\overline{m}}$	π	360−α	Vel.	Pl.	$T_{\overline{m}}$	π	360−α	Vel.
	h min	′	°			h min	′	°	
♀	13 14	.1	337	−3.8	♃	10 52	.0	12	−1.9
♂	19 59	.2	235	.0	♄	23 46	.0	178	.7

UT	SUNCE		PROLJ. TAČKA	VENERA		MARS	
	$S_\odot$	$\delta_\odot$	S_Υ	S_φ	δ_φ	S_σ	δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	178 40.9	2 51.6	185 17.9	161 31.5	9 12.0	60 19.5	22 40.3
2	208 41.2	2 53.6	215 22.9	191 30.6	9 14.4	90 23.5	22 39.9
4	238 41.6	2 55.5	245 27.8	221 29.8	9 16.8	120 27.4	22 39.5
6	268 42.0	2 57.5	275 32.7	251 29.0	9 19.2	150 31.4	22 39.1
8	298 42.4	2 59.4	305 37.7	281 28.2	9 21.6	180 35.4	22 38.8
10	328 42.8	3 1.4	335 42.6	311 27.3	9 24.0	210 39.4	22 38.4
12	358 43.1	3 3.3	5 47.5	341 26.5	9 26.5	240 43.3	22 38.0
14	28 43.5	3 5.3	35 52.4	11 25.7	9 28.9	270 47.3	22 37.6
16	58 43.9	3 7.2	65 57.4	41 24.8	9 31.3	300 51.2	22 37.3
18	88 44.3	3 9.2	96 2.3	71 24.0	9 33.7	330 55.2	22 36.9
20	118 44.7	3 11.1	126 7.2	101 23.1	9 36.1	0 59.1	22 36.5
22	148 45.0	3 13.1	156 12.2	131 22.3	9 38.5	31 3.1	22 36.1
Δ	2	10		−4	12	20	−2

UT	MJESEC				JUPITER		SATURN	
	$S_\leftmoon$	Δ	$\delta_\leftmoon$	Δ	$S_\natural$	$\delta_\natural$	$S_\flat$	$\delta_\flat$
h	° ′		° ′		° ′	° ′	° ′	° ′
0	27 1.1	97	4 56.5	−157	197 31.1	− 6 17.4	3 32.1	2 2.0
2	55 58.4	97	4 25.1	−158	227 35.0	− 6 17.0	33 37.4	2 2.1
4	84 55.8	97	3 53.6	−158	257 38.8	− 6 16.5	63 42.6	2 2.3
6	113 53.3	98	3 22.0	−158	287 42.7	− 6 16.1	93 47.9	2 2.4
8	142 50.8	98	2 50.3	−159	317 46.5	− 6 15.6	123 53.2	2 2.6
10	171 48.4	98	2 18.6	−159	347 50.4	− 6 15.2	153 58.5	2 2.7
12	200 46.1	98	1 46.8	−159	17 54.2	− 6 14.8	184 3.8	2 2.9
14	229 43.7	99	1 15.0	−159	47 58.0	− 6 14.3	214 9.1	2 3.1
16	258 41.5	99	0 43.1	−159	78 1.9	− 6 13.9	244 14.4	2 3.2
18	287 39.2	99	0 11.2	−159	108 5.7	− 6 13.4	274 19.6	2 3.4
20	316 37.0	99	− 0 20.6	−159	138 9.6	− 6 13.0	304 24.9	2 3.5
22	345 34.8	99	− 0 52.4	−159	168 13.4	− 6 12.5	334 30.2	2 3.7
Δ					19	2	26	1

	SUNCE		TRAJANJE SUMRAKA		MJESEC			
φ	IZLAZ	ZALAZ	GRAĐ.	ASTR.	IZLAZ	Δ/24	ZALAZ	Δ/24
N	h min	h min	h min	h min	h min	min	h min	min
60	5 38	18 34	0 42	2 34	16 44	4.2	4 47	.2
55	5 42	18 29	0 37	2 9	16 45	3.8	4 42	.6
50	5 46	18 25	0 33	1 53	16 45	3.5	4 39	.8
45	5 49	18 22	0 30	1 41	16 46	3.3	4 36	1.0
40	5 51	18 20	0 27	1 32	16 46	3.1	4 33	1.2
35	5 53	18 18	0 25	1 26	16 46	3.0	4 31	1.4
30	5 55	18 16	0 24	1 21	16 46	2.8	4 29	1.5
20	5 57	18 13	0 22	1 14	16 47	2.6	4 26	1.7
10	5 60	18 11	0 21	1 10	16 47	2.3	4 23	2.0
0	6 2	18 8	0 21	1 9	16 48	2.1	4 20	2.2
10	6 4	18 6	0 21	1 10	16 48	2.0	4 18	2.4
20	6 6	18 4	0 22	1 13	16 48	1.7	4 15	2.6
30	6 8	18 2	0 24	1 19	16 49	1.5	4 11	2.8
35	6 9	18 0	0 25	1 24	16 49	1.4	4 9	3.0
40	6 11	17 59	0 27	1 30	16 49	1.2	4 7	3.1
45	6 12	17 57	0 29	1 38	16 50	1.0	4 4	3.3
50	6 14	17 55	0 32	1 48	16 50	.8	4 1	3.5
55	6 16	17 53	0 36	2 2	16 51	.6	3 57	3.8
60	6 19	17 50	0 41	2 21	16 51	.2	3 52	4.2
S								

SUNCE				MJESEC			
UT	e = Tp − UT	Δ/24	r	Prolaz	Δ/24	$\pi_\leftmoon$	r
h	min s	s	′	h min	min	′	′
00	− 5 16.4	.8	16.1	$T_{\overline{m}}$ 22 60	2.1	60.6	16.5
12	− 5 7.2	$T_{\overline{m}_\odot}$ 12 h 5.1 min		Starost 12.1 d	Faza ○		

PLANETE								
Pl.	$T_{\overline{m}}$	π	360−α	Vel.	Pl.	$T_{\overline{m}}$	π	360−α	Vel.
	h min	′	°			h min	′	°	
♀	13 14	.1	336	−3.8	♃	10 49	.0	12	−1.9
♂	19 56	.1	235	.1	♄	23 42	.0	178	.7

UT	SUNCE		PROLJ. TAČKA	VENERA		MARS	
	$S_\odot$	$\delta_\odot$	S_Υ	S_φ	δ_φ	S_σ	δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	178 45.4	3 15.0	186 17.1	161 21.5	9 40.9	61 7.0	22 35.7
2	208 45.8	3 17.0	216 22.0	191 20.6	9 43.3	91 11.0	22 35.3
4	238 46.2	3 18.9	246 26.9	221 19.8	9 45.7	121 14.9	22 35.0
6	268 46.6	3 20.9	276 31.9	251 18.9	9 48.1	151 18.8	22 34.6
8	298 46.9	3 22.8	306 36.8	281 18.1	9 50.5	181 22.8	22 34.2
10	328 47.3	3 24.8	336 41.7	311 17.2	9 52.9	211 26.7	22 33.8
12	358 47.7	3 26.7	6 46.7	341 16.4	9 55.3	241 30.6	22 33.4
14	28 48.1	3 28.7	36 51.6	11 15.6	9 57.7	271 34.5	22 33.0
16	58 48.4	3 30.6	66 56.5	41 14.7	10 .1	301 38.4	22 32.6
18	88 48.8	3 32.6	97 1.4	71 13.9	10 2.5	331 42.3	22 32.2
20	118 49.2	3 34.5	127 6.4	101 13.0	10 4.9	1 46.2	22 31.8
22	148 49.6	3 36.4	157 11.3	131 12.2	10 7.3	31 50.1	22 31.5
Δ	2	10		−4	12	20	−2

UT	MJESEC				JUPITER		SATURN	
	$S_\leftmoon$	Δ	$\delta_\leftmoon$	Δ	$S_\natural$	$\delta_\natural$	$S_\flat$	$\delta_\flat$
h	° ′		° ′		° ′	° ′	° ′	° ′
0	14 32.6	99	− 1 24.2	−159	198 17.3	− 6 12.1	4 35.5	2 3.8
2	43 30.4	99	− 1 56.0	−158	228 21.1	− 6 11.6	34 40.8	2 4.0
4	72 28.2	99	− 2 27.7	−158	258 25.0	− 6 11.2	64 46.1	2 4.1
6	101 26.0	99	− 2 59.3	−158	288 28.8	− 6 10.7	94 51.3	2 4.3
8	130 23.8	99	− 3 30.8	−157	318 32.7	− 6 10.3	124 56.6	2 4.5
10	159 21.6	99	− 4 2.2	−156	348 36.5	− 6 9.9	155 1.9	2 4.6
12	188 19.3	98	− 4 33.5	−156	18 40.3	− 6 9.4	185 7.2	2 4.8
14	217 17.0	98	− 5 4.6	−155	48 44.2	− 6 9.0	215 12.5	2 4.9
16	246 14.6	98	− 5 35.6	−154	78 48.0	− 6 8.5	245 17.8	2 5.1
18	275 12.2	98	− 6 6.5	−153	108 51.9	− 6 8.1	275 23.0	2 5.2
20	304 9.7	97	− 6 37.1	−152	138 55.7	− 6 7.6	305 28.3	2 5.4
22	333 7.2	97	− 7 7.6	−151	168 59.6	− 6 7.2	335 33.6	2 5.5
Δ					19	2	26	1

	SUNCE		TRAJANJE SUMRAKA		MJESEC			
φ	IZLAZ	ZALAZ	GRAĐ.	ASTR.	IZLAZ	Δ/24	ZALAZ	Δ/24
N	h min	h min	h min	h min	h min	min	h min	min
60	5 35	18 36	0 43	2 35	18 25	4.2	4 52	.3
55	5 40	18 31	0 37	2 10	18 16	3.8	4 56	.6
50	5 44	18 27	0 33	1 53	18 10	3.5	4 58	.8
45	5 47	18 24	0 30	1 41	18 5	3.3	5 0	1.1
40	5 49	18 21	0 27	1 32	18 1	3.1	5 2	1.2
35	5 51	18 19	0 25	1 26	17 57	2.9	5 4	1.4
30	5 53	18 17	0 24	1 21	17 54	2.8	5 5	1.5
20	5 56	18 13	0 22	1 14	17 48	2.6	5 8	1.8
10	5 59	18 11	0 21	1 10	17 44	2.4	5 10	2.0
0	6 2	18 8	0 21	1 9	17 39	2.2	5 12	2.2
10	6 4	18 6	0 21	1 10	17 35	2.0	5 14	2.4
20	6 6	18 3	0 22	1 13	17 30	1.8	5 16	2.6
30	6 9	18 0	0 24	1 19	17 25	1.6	5 19	2.8
35	6 10	17 59	0 25	1 24	17 22	1.4	5 20	2.9
40	6 12	17 57	0 27	1 30	17 19	1.3	5 22	3.1
45	6 14	17 55	0 29	1 38	17 15	1.1	5 24	3.3
50	6 16	17 53	0 32	1 48	17 10	.9	5 26	3.5
55	6 18	17 50	0 36	2 2	17 4	.6	5 29	3.8
60	6 22	17 47	0 41	2 21	16 57	.3	5 32	4.2
S								

SUNCE				MJESEC			
UT	e = Tp − UT	Δ/24	r	Prolaz	Δ/24	$\pi_\leftmoon$	r
h	min s	s	′	h min	min	′	′
00	− 4 58.2	.8	16.0	$T_{\overline{m}}$ 23 51	2.2	60.5	16.5
12	− 4 49.1	$T_{\overline{m}_\odot}$ 12 h 4.8 min		Starost 13.1 d	Faza ○		

PLANETE								
Pl.	$T_{\overline{m}}$	π	360−α	Vel.	Pl.	$T_{\overline{m}}$	π	360−α	Vel.
	h min	′	°			h min	′	°	
♀	13 15	.1	335	−3.8	♃	10 45	.0	12	−1.9
♂	19 53	.1	235	.1	♄	23 37	.0	178	.7

UT	SUNCE $S_\odot$	SUNCE $\delta_\odot$	PROLJ. TAČKA S_Υ	VENERA S_φ	VENERA δ_φ	MARS S_σ	MARS δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	178 50.0	3 38.4	187 16.2	161 11.3	10 9.6	61 54.0	22 31.1
2	208 50.3	3 40.3	217 21.2	191 10.4	10 12.0	91 57.9	22 30.7
4	238 50.7	3 42.3	247 26.1	221 9.6	10 14.4	122 1.8	22 30.3
6	268 51.1	3 44.2	277 31.0	251 8.7	10 16.8	152 5.7	22 29.9
8	298 51.5	3 46.2	307 35.9	281 7.9	10 19.2	182 9.6	22 29.5
10	328 51.8	3 48.1	337 40.9	311 7.0	10 21.5	212 13.5	22 29.1
12	358 52.2	3 50.0	7 45.8	341 6.2	10 23.9	242 17.3	22 28.7
14	28 52.6	3 52.0	37 50.7	11 5.3	10 26.3	272 21.2	22 28.3
16	58 53.0	3 53.9	67 55.7	41 4.4	10 28.7	302 25.1	22 27.9
18	88 53.4	3 55.9	98 .6	71 3.6	10 31.0	332 28.9	22 27.5
20	118 53.7	3 57.8	128 5.5	101 2.7	10 33.4	2 32.8	22 27.1
22	148 54.1	3 59.7	158 10.4	131 1.8	10 35.8	32 36.6	22 26.7
Δ	2	10		−4	12	19	−2

UT	MJESEC $S_\leftmoon$	MJESEC Δ	MJESEC $\delta_\leftmoon$	MJESEC Δ	JUPITER S_4	JUPITER δ_4	SATURN S_η	SATURN δ_η
h	° ′		° ′		° ′	° ′	° ′	° ′
0	2 4.6	97	−7 37.9	−150	199 3.4	−6 6.7	5 38.9	2 5.7
2	31 1.9	96	−8 8.0	−149	229 7.3	−6 6.3	35 44.2	2 5.8
4	59 59.2	96	−8 37.8	−148	259 11.1	−6 5.9	65 49.5	2 6.0
6	88 56.3	95	−9 7.4	−147	289 15.0	−6 5.4	95 54.7	2 6.1
8	117 53.4	95	−9 36.7	−145	319 18.8	−6 5.0	126 .0	2 6.3
10	146 50.4	94	−10 5.8	−144	349 22.7	−6 4.5	156 5.3	2 6.5
12	175 47.3	94	−10 34.6	−143	19 26.5	−6 4.1	186 10.6	2 6.6
14	204 44.0	93	−11 3.1	−141	49 30.4	−6 3.6	216 15.9	2 6.8
16	233 40.7	93	−11 31.3	−139	79 34.2	−6 3.2	246 21.2	2 6.9
18	262 37.3	92	−11 59.2	−138	109 38.1	−6 2.8	276 26.4	2 7.1
20	291 33.7	92	−12 26.8	−136	139 41.9	−6 2.3	306 31.7	2 7.2
22	320 30.1	91	−12 54.0	−134	169 45.8	−6 1.9	336 37.0	2 7.4
Δ					19	2	26	1

φ	SUNCE IZLAZ	SUNCE ZALAZ	TRAJANJE SUMRAKA GRAĐ.	TRAJANJE SUMRAKA ASTR.	MJESEC IZLAZ	MJESEC Δ/24	MJESEC ZALAZ	MJESEC Δ/24
N	h min	h min	h min	h min	h min	min	h min	min
60	5 32	18 39	0 43	2 37	20 5	4.2	4 58	.3
55	5 37	18 33	0 37	2 10	19 47	3.8	5 10	.7
50	5 42	18 28	0 33	1 53	19 34	3.5	5 19	.9
45	5 45	18 25	0 30	1 41	19 24	3.2	5 26	1.1
40	5 48	18 22	0 27	1 33	19 15	3.1	5 32	1.3
35	5 50	18 20	0 25	1 26	19 8	2.9	5 37	1.5
30	5 52	18 17	0 24	1 21	19 1	2.8	5 42	1.6
20	5 56	18 14	0 22	1 14	18 50	2.6	5 50	1.8
10	5 59	18 11	0 21	1 10	18 40	2.4	5 57	2.0
0	6 1	18 8	0 21	1 9	18 31	2.2	6 4	2.2
10	6 4	18 5	0 21	1 10	18 22	2.0	6 10	2.4
20	6 6	18 2	0 22	1 13	18 13	1.9	6 18	2.6
30	6 9	17 59	0 24	1 19	18 2	1.7	6 26	2.8
35	6 11	17 57	0 25	1 24	17 56	1.5	6 31	2.9
40	6 13	17 56	0 27	1 30	17 49	1.4	6 36	3.1
45	6 15	17 53	0 29	1 38	17 41	1.2	6 43	3.3
50	6 17	17 51	0 32	1 48	17 31	1.0	6 50	3.5
55	6 20	17 48	0 36	2 1	17 19	.8	6 60	3.8
60	6 24	17 44	0 41	2 20	17 4	.4	7 12	4.2
S								

SUNCE UT	SUNCE $e = T_p - UT$	SUNCE Δ/24	SUNCE r	MJESEC Prolaz	MJESEC Δ/24	MJESEC $\pi_\leftmoon$	MJESEC r
h	min s	s	′	h min	min	′	′
00	− 4 40.0	.8	16.0	$T_{\overline{m}}$	1.0	60.2	16.4
12	− 4 30.9	$T_{\overline{m}_\odot}$ 12 h 4.5 min		Starost 14.1 d	Faza ○		

PLANETE

Pl.	$T_{\overline{m}}$	π	360−α	Vel.	Pl.	$T_{\overline{m}}$	π	360−α	Vel.
	h min	′	°			h min	′	°	
♀	13 16	.1	334	−3.8	♃	10 42	.0	12	−1.9
♂	19 50	.1	235	.1	♄	23 33	.0	178	.7

UT	SUNCE $S_\odot$	SUNCE $\delta_\odot$	PROLJ. TAČKA S_Υ	VENERA S_φ	VENERA δ_φ	MARS S_σ	MARS δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	178 54.5	4 1.7	188 15.4	161 1.0	10 38.1	62 40.5	22 26.3
2	208 54.9	4 3.6	218 20.3	191 .1	10 40.5	92 44.3	22 25.9
4	238 55.2	4 5.6	248 25.2	220 59.2	10 42.8	122 48.2	22 25.5
6	268 55.6	4 7.5	278 30.1	250 58.3	10 45.2	152 52.0	22 25.1
8	298 56.0	4 9.4	308 35.1	280 57.5	10 47.6	182 55.9	22 24.7
10	328 56.4	4 11.4	338 40.0	310 56.6	10 49.9	212 59.7	22 24.3
12	358 56.7	4 13.3	8 44.9	340 55.7	10 52.3	243 3.5	22 23.9
14	28 57.1	4 15.2	38 49.9	10 54.9	10 54.6	273 7.4	22 23.4
16	58 57.5	4 17.2	68 54.8	40 54.0	10 57.0	303 11.2	22 23.0
18	88 57.9	4 19.1	98 59.7	70 53.1	10 59.3	333 15.0	22 22.6
20	118 58.2	4 21.0	129 4.6	100 52.2	11 1.7	3 18.8	22 22.2
22	148 58.6	4 23.0	159 9.6	130 51.3	11 4.0	33 22.6	22 21.8
Δ	2	10		−4	12	19	−2

UT	MJESEC $S_\leftmoon$	MJESEC Δ	MJESEC $\delta_\leftmoon$	MJESEC Δ	JUPITER S_4	JUPITER δ_4	SATURN S_η	SATURN δ_η
h	° ′		° ′		° ′	° ′	° ′	° ′
0	349 26.3	90	−13 20.9	−133	199 49.6	−6 1.4	6 42.3	2 7.5
2	18 22.4	90	−13 47.4	−131	229 53.5	−6 1.0	36 47.6	2 7.7
4	47 18.4	89	−14 13.5	−129	259 57.3	−6 .5	66 52.8	2 7.8
6	76 14.2	89	−14 39.2	−127	290 1.2	−6 .1	96 58.1	2 8.0
8	105 10.0	88	−15 4.6	−125	320 5.0	−5 59.7	127 3.4	2 8.1
10	134 5.6	87	−15 29.5	−123	350 8.9	−5 59.2	157 8.7	2 8.3
12	163 1.0	87	−15 54.1	−121	20 12.8	−5 58.8	187 14.0	2 8.4
14	191 56.4	86	−16 18.2	−118	50 16.6	−5 58.3	217 19.3	2 8.6
16	220 51.6	85	−16 41.8	−116	80 20.5	−5 57.9	247 24.5	2 8.7
18	249 46.7	85	−17 5.0	−114	110 24.3	−5 57.4	277 29.8	2 8.9
20	278 41.7	84	−17 27.8	−112	140 28.2	−5 57.0	307 35.1	2 9.0
22	307 36.5	84	−17 50.1	−109	170 32.0	−5 56.6	337 40.4	2 9.2
Δ					19	2	26	1

φ	SUNCE IZLAZ	SUNCE ZALAZ	TRAJANJE SUMRAKA GRAĐ.	TRAJANJE SUMRAKA ASTR.	MJESEC IZLAZ	MJESEC Δ/24	MJESEC ZALAZ	MJESEC Δ/24
N	h min	h min	h min	h min	h min	min	h min	min
60	5 29	18 41	0 43	2 38	21 45	4.0	5 6	.4
55	5 35	18 35	0 37	2 11	21 18	3.6	5 26	.8
50	5 39	18 30	0 33	1 54	20 57	3.3	5 41	1.1
45	5 43	18 26	0 30	1 42	20 42	3.1	5 53	1.3
40	5 46	18 23	0 27	1 33	20 29	3.0	6 4	1.5
35	5 49	18 20	0 25	1 26	20 18	2.8	6 12	1.6
30	5 51	18 18	0 24	1 21	20 8	2.7	6 20	1.7
20	5 55	18 14	0 22	1 14	19 52	2.6	6 34	1.9
10	5 58	18 11	0 21	1 10	19 38	2.4	6 45	2.1
0	6 1	18 7	0 21	1 9	19 25	2.3	6 56	2.3
10	6 4	18 4	0 21	1 10	19 12	2.1	7 8	2.4
20	6 7	18 1	0 22	1 13	18 58	2.0	7 19	2.6
30	6 10	17 58	0 24	1 19	18 42	1.8	7 33	2.8
35	6 12	17 56	0 25	1 24	18 33	1.7	7 41	2.9
40	6 14	17 54	0 27	1 30	18 22	1.6	7 50	3.0
45	6 16	17 52	0 29	1 38	18 10	1.4	8 1	3.2
50	6 19	17 49	0 32	1 48	17 56	1.2	8 14	3.4
55	6 22	17 45	0 36	2 1	17 38	1.0	8 31	3.7
60	6 26	17 41	0 41	2 20	17 13	.6	8 53	4.1
S								

SUNCE UT	SUNCE $e = T_p - UT$	SUNCE Δ/24	SUNCE r	MJESEC Prolaz	MJESEC Δ/24	MJESEC $\pi_\leftmoon$	MJESEC r
h	min s	s	′	h min	min	′	′
00	− 4 21.9	.8	16.0	$T_{\overline{m}}$ 0 44	2.2	59.6	16.2
12	− 4 12.9	$T_{\overline{m}_\odot}$ 12 h 4.2 min		Starost 15.1 d	Faza ○		

PLANETE

Pl.	$T_{\overline{m}}$	π	360−α	Vel.	Pl.	$T_{\overline{m}}$	π	360−α	Vel.
	h min	′	°			h min	′	°	
♀	13 16	.1	333	−3.8	♃	10 39	.0	12	−1.9
♂	19 47	.1	234	.1	♄	23 29	.0	178	.7

1. APRIL 2010. ČETVRTAK

UT	SUNCE		PROLJ. TAČKA	VENERA		MARS	
	$S_\odot$	$\delta_\odot$	S_Υ	S_φ	δ_φ	S_σ	δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	178 59.0	4 24.9	189 14.5	160 50.4	11 6.4	63 26.4	22 21.4
2	208 59.4	4 26.8	219 19.4	190 49.6	11 8.7	93 30.2	22 21.0
4	238 59.7	4 28.8	249 24.4	220 48.7	11 11.0	123 34.0	22 20.6
6	269 .1	4 30.7	279 29.3	250 47.8	11 13.4	153 37.8	22 20.1
8	299 .5	4 32.6	309 34.2	280 46.9	11 15.7	183 41.6	22 19.7
10	329 .9	4 34.5	339 39.1	310 46.0	11 18.1	213 45.4	22 19.3
12	359 1.2	4 36.5	9 44.1	340 45.1	11 20.4	243 49.2	22 18.9
14	29 1.6	4 38.4	39 49.0	10 44.2	11 22.7	273 53.0	22 18.5
16	59 2.0	4 40.3	69 53.9	40 43.3	11 25.0	303 56.8	22 18.1
18	89 2.3	4 42.3	99 58.9	70 42.4	11 27.4	334 .6	22 17.6
20	119 2.7	4 44.2	130 3.8	100 41.5	11 29.7	4 4.3	22 17.2
22	149 3.1	4 46.1	160 8.7	130 40.6	11 32.0	34 8.1	22 16.8
Δ	2	10		−4	12	19	−2

UT	MJESEC				JUPITER		SATURN	
	$S_\leftmoon$	Δ	$\delta_\leftmoon$	Δ	S_4	δ_4	S_η	δ_η
h	° ′		° ′		° ′	° ′	° ′	° ′
0	336 31.2	83	−18 12.0	−107	200 35.9	− 5 56.1	7 45.7	2 9.3
2	5 25.8	82	−18 33.3	−104	230 39.7	− 5 55.7	37 50.9	2 9.5
4	34 20.3	82	−18 54.2	−102	260 43.6	− 5 55.2	67 56.2	2 9.6
6	63 14.7	81	−19 14.5	−99	290 47.4	− 5 54.8	98 1.5	2 9.8
8	92 9.0	81	−19 34.4	−97	320 51.3	− 5 54.3	128 6.8	2 9.9
10	121 3.1	80	−19 53.8	−94	350 55.2	− 5 53.9	158 12.1	2 10.1
12	149 57.2	80	−20 12.6	−92	20 59.0	− 5 53.5	188 17.3	2 10.2
14	178 51.1	79	−20 30.9	−89	51 2.9	− 5 53.0	218 22.6	2 10.4
16	207 45.0	79	−20 48.7	−86	81 6.7	− 5 52.6	248 27.9	2 10.6
18	236 38.7	78	−21 6.0	−84	111 10.6	− 5 52.1	278 33.2	2 10.7
20	265 32.4	78	−21 22.7	−81	141 14.4	− 5 51.7	308 38.4	2 10.9
22	294 26.0	78	−21 38.8	−78	171 18.3	− 5 51.3	338 43.7	2 11.0
Δ					19	2	26	1

φ	SUNCE		TRAJANJE SUMRAKA		MJESEC			
	IZLAZ	ZALAZ	GRAĐ.	ASTR.	IZLAZ	Δ/24	ZALAZ	Δ/24
N	h min	h min	h min	h min	h min	min	h min	min
60	5 26	18 43	0 43	2 40	23 22	3.7	5 17	.7
55	5 32	18 37	0 37	2 12	22 44	3.3	5 46	1.1
50	5 37	18 32	0 33	1 54	22 17	3.0	6 8	1.4
45	5 41	18 27	0 30	1 42	21 57	2.9	6 25	1.6
40	5 44	18 24	0 27	1 33	21 40	2.8	6 39	1.7
35	5 47	18 21	0 26	1 26	21 26	2.7	6 51	1.8
30	5 50	18 19	0 24	1 21	21 14	2.6	7 2	1.9
20	5 54	18 14	0 22	1 14	20 53	2.5	7 20	2.0
10	5 57	18 11	0 21	1 10	20 36	2.4	7 36	2.2
0	6 1	18 7	0 21	1 9	20 19	2.3	7 50	2.3
10	6 4	18 4	0 21	1 10	20 3	2.2	8 5	2.4
20	6 7	18 1	0 22	1 13	19 45	2.1	8 21	2.5
30	6 11	17 57	0 24	1 19	19 25	2.0	8 40	2.7
35	6 13	17 55	0 25	1 24	19 14	1.9	8 51	2.8
40	6 15	17 52	0 27	1 30	19 0	1.8	9 3	2.9
45	6 17	17 50	0 29	1 37	18 45	1.7	9 18	3.0
50	6 20	17 47	0 32	1 48	18 25	1.5	9 36	3.2
55	6 24	17 43	0 36	2 1	18 1	1.3	9 59	3.4
60	6 29	17 38	0 41	2 20	17 27	.9	10 32	3.9
S								

SUNCE				MJESEC			
UT	e = Tp − UT	Δ/24	r	Prolaz	Δ/24	$\pi_\leftmoon$	r
h	min s	s	′	h min	min	′	′
00	− 4 3.9	.7	16.0	$T_{\overline{m}}$ 1 37	2.3	58.8	16.0
12	− 3 54.9	$T_{\overline{m}_\odot}$ 12 h 3.9 min		Starost 16.1 d	Faza ❍		

PLANETE								
Pl.	$T_{\overline{m}}$	π	360−α	Vel.	Pl.	$T_{\overline{m}}$	π	360−α	Vel.
	h min	′	°			h min	′	°	
♀	13 17	.1	332	−3.8	♃	10 36	.0	11	−1.9
♂	19 44	.1	234	.2	♄	23 25	.0	179	.7

2. APRIL PETAK

UT	SUNCE		PROLJ. TAČKA	VENERA		MARS	
	$S_\odot$	$\delta_\odot$	S_Υ	S_φ	δ_φ	S_σ	δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	179 3.5	4 48.0	190 13.6	160 39.7	11 34.3	64 11.9	22 16.4
2	209 3.8	4 50.0	220 18.6	190 38.8	11 36.7	94 15.6	22 16.0
4	239 4.2	4 51.9	250 23.5	220 37.9	11 39.0	124 19.4	22 15.5
6	269 4.6	4 53.8	280 28.4	250 37.0	11 41.3	154 23.1	22 15.1
8	299 4.9	4 55.7	310 33.4	280 36.1	11 43.6	184 26.9	22 14.7
10	329 5.3	4 57.6	340 38.3	310 35.2	11 45.9	214 30.7	22 14.3
12	359 5.7	4 59.6	10 43.2	340 34.3	11 48.2	244 34.4	22 13.8
14	29 6.1	5 1.5	40 48.1	10 33.4	11 50.5	274 38.1	22 13.4
16	59 6.4	5 3.4	70 53.1	40 32.5	11 52.9	304 41.9	22 13.0
18	89 6.8	5 5.3	100 58.0	70 31.6	11 55.2	334 45.6	22 12.5
20	119 7.2	5 7.2	131 2.9	100 30.7	11 57.5	4 49.3	22 12.1
22	149 7.5	5 9.2	161 7.9	130 29.8	11 59.8	34 53.1	22 11.7
Δ	2	10		−5	12	19	−2

UT	MJESEC				JUPITER		SATURN	
	$S_\leftmoon$	Δ	$\delta_\leftmoon$	Δ	S_4	δ_4	S_η	δ_η
h	° ′		° ′		° ′	° ′	° ′	° ′
0	323 19.5	77	−21 54.4	−75	201 22.2	− 5 50.8	8 49.0	2 11.2
2	352 13.0	77	−22 9.5	−72	231 26.0	− 5 50.4	38 54.3	2 11.3
4	21 6.4	77	−22 24.0	−70	261 29.9	− 5 49.9	68 59.6	2 11.5
6	49 59.8	77	−22 37.9	−67	291 33.7	− 5 49.5	99 4.8	2 11.6
8	78 53.1	76	−22 51.3	−64	321 37.6	− 5 49.0	129 10.1	2 11.8
10	107 46.4	76	−23 4.0	−61	351 41.5	− 5 48.6	159 15.4	2 11.9
12	136 39.6	76	−23 16.3	−58	21 45.3	− 5 48.2	189 20.7	2 12.0
14	165 32.9	76	−23 27.9	−55	51 49.2	− 5 47.7	219 25.9	2 12.2
16	194 26.1	76	−23 39.0	−52	81 53.0	− 5 47.3	249 31.2	2 12.3
18	223 19.3	76	−23 49.4	−50	111 56.9	− 5 46.8	279 36.5	2 12.5
20	252 12.5	76	−23 59.3	−47	142 .8	− 5 46.4	309 41.8	2 12.6
22	281 5.8	76	−24 8.6	−44	172 4.6	− 5 46.0	339 47.1	2 12.8
Δ					19	2	26	1

φ	SUNCE		TRAJANJE SUMRAKA		MJESEC			
	IZLAZ	ZALAZ	GRAĐ.	ASTR.	IZLAZ	Δ/24	ZALAZ	Δ/24
N	h min	h min	h min	h min	h min	min	h min	min
60	5 23	18 46	0 43	2 41	. . . .	.0	5 33	1.2
55	5 30	18 39	0 37	2 13	. . . .	.0	6 13	1.5
50	5 35	18 33	0 33	1 55	23 30	2.6	6 41	1.7
45	5 39	18 29	0 30	1 42	23 6	2.5	7 2	1.8
40	5 43	18 25	0 27	1 33	22 47	2.5	7 20	1.9
35	5 46	18 22	0 26	1 26	22 31	2.5	7 34	2.0
30	5 48	18 19	0 24	1 21	22 17	2.4	7 47	2.1
20	5 53	18 15	0 22	1 14	21 54	2.4	8 9	2.2
10	5 57	18 11	0 21	1 10	21 33	2.3	8 28	2.2
0	6 0	18 7	0 21	1 9	21 15	2.3	8 46	2.3
10	6 4	18 3	0 21	1 10	20 56	2.3	9 3	2.4
20	6 7	17 60	0 22	1 13	20 36	2.2	9 22	2.5
30	6 11	17 56	0 24	1 19	20 13	2.1	9 44	2.5
35	6 13	17 53	0 25	1 24	19 59	2.1	9 57	2.6
40	6 16	17 51	0 27	1 30	19 44	2.1	10 12	2.7
45	6 19	17 48	0 29	1 37	19 25	2.0	10 30	2.7
50	6 22	17 44	0 32	1 47	19 2	1.9	10 52	2.8
55	6 26	17 40	0 36	2 1	18 32	1.8	11 22	3.0
60	6 31	17 35	0 41	2 20	17 49	1.5	12 4	3.3
S								

SUNCE				MJESEC			
UT	e = Tp − UT	Δ/24	r	Prolaz	Δ/24	$\pi_\leftmoon$	r
h	min s	s	′	h min	min	′	′
00	− 3 46.0	.7	16.0	$T_{\overline{m}}$ 2 32	2.3	58.0	15.8
12	− 3 37.1	$T_{\overline{m}_\odot}$ 12 h 3.6 min		Starost 17.1 d	Faza ❍		

PLANETE								
Pl.	$T_{\overline{m}}$	π	360−α	Vel.	Pl.	$T_{\overline{m}}$	π	360−α	Vel.
	h min	′	°			h min	′	°	
♀	13 18	.1	330	−3.8	♃	10 33	.0	11	−1.9
♂	19 41	.1	234	.2	♄	23 21	.0	179	.7

UT	SUNCE $S_\odot$	SUNCE $\delta_\odot$	PROLJ. TAČKA S_Υ	VENERA S_φ	VENERA δ_φ	MARS S_σ	MARS δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	179 7.9	5 11.1	191 12.8	160 28.9	12 2.1	64 56.8	22 11.3
2	209 8.3	5 13.0	221 17.7	190 27.9	12 4.4	95 .5	22 10.8
4	239 8.6	5 14.9	251 22.6	220 27.0	12 6.6	125 4.2	22 10.4
6	269 9.0	5 16.8	281 27.6	250 26.1	12 8.9	155 8.0	22 10.0
8	299 9.4	5 18.7	311 32.5	280 25.2	12 11.2	185 11.7	22 9.5
10	329 9.7	5 20.7	341 37.4	310 24.3	12 13.5	215 15.4	22 9.1
12	359 10.1	5 22.6	11 42.4	340 23.3	12 15.8	245 19.1	22 8.6
14	29 10.5	5 24.5	41 47.3	10 22.4	12 18.1	275 22.8	22 8.2
16	59 10.8	5 26.4	71 52.2	40 21.5	12 20.4	305 26.5	22 7.8
18	89 11.2	5 28.3	101 57.1	70 20.6	12 22.7	335 30.2	22 7.3
20	119 11.6	5 30.2	132 2.1	100 19.6	12 24.9	5 33.9	22 6.9
22	149 11.9	5 32.1	162 7.0	130 18.7	12 27.2	35 37.6	22 6.4
Δ	2	10		−5	11	19	−2

UT	MJESEC $S_\leftmoon$	MJESEC Δ	MJESEC $\delta_\leftmoon$	MJESEC Δ	JUPITER $S_\jupiter$	JUPITER $\delta_\jupiter$	SATURN $S_\saturn$	SATURN $\delta_\saturn$
h	° ′		° ′		° ′	° ′	° ′	° ′
0	309 59.1	77	−24 17.4	−41	202 8.5	− 5 45.5	9 52.3	2 12.9
2	338 52.4	77	−24 25.5	−38	232 12.3	− 5 45.1	39 57.6	2 13.1
4	7 45.7	77	−24 33.1	−35	262 16.2	− 5 44.6	70 2.9	2 13.2
6	36 39.1	77	−24 40.1	−32	292 20.1	− 5 44.2	100 8.2	2 13.4
8	65 32.6	78	−24 46.5	−29	322 23.9	− 5 43.8	130 13.4	2 13.5
10	94 26.1	78	−24 52.3	−26	352 27.8	− 5 43.3	160 18.7	2 13.7
12	123 19.7	79	−24 57.5	−23	22 31.7	− 5 42.9	190 24.0	2 13.8
14	152 13.4	79	−25 2.2	−20	52 35.5	− 5 42.4	220 29.3	2 14.0
16	181 7.2	80	−25 6.3	−18	82 39.4	− 5 42.0	250 34.5	2 14.1
18	210 1.1	80	−25 9.8	−15	112 43.3	− 5 41.6	280 39.8	2 14.3
20	238 55.2	81	−25 12.7	−12	142 47.1	− 5 41.1	310 45.1	2 14.4
22	267 49.3	81	−25 15.1	−9	172 51.0	− 5 40.7	340 50.4	2 14.6
Δ					19	2	26	1

φ	SUNCE IZLAZ	SUNCE ZALAZ	TRAJANJE SUMRAKA GRAĐ.	TRAJANJE SUMRAKA ASTR.	MJESEC IZLAZ	MJESEC Δ/24	MJESEC ZALAZ	MJESEC Δ/24
N	h min	h min	h min	h min	h min	min	h min	min
60	5 20	18 48	0 43	2 43	0 50	2.9	6 1	1.9
55	5 27	18 41	0 37	2 14	0 2	2.7	6 50	2.0
50	5 33	18 35	0 33	1 55	. . .	.0	7 22	2.1
45	5 37	18 30	0 30	1 43	. . .	.0	7 47	2.2
40	5 41	18 26	0 27	1 33	23 47	2.2	8 6	2.2
35	5 44	18 23	0 26	1 27	23 30	2.2	8 22	2.2
30	5 47	18 20	0 24	1 21	23 15	2.2	8 37	2.2
20	5 52	18 15	0 22	1 14	22 51	2.2	9 1	2.2
10	5 56	18 11	0 21	1 10	22 29	2.2	9 22	2.3
0	6 0	18 7	0 21	1 9	22 10	2.2	9 41	2.3
10	6 4	18 3	0 21	1 10	21 50	2.2	10 0	2.3
20	6 8	17 59	0 22	1 13	21 29	2.3	10 21	2.3
30	6 12	17 54	0 24	1 19	21 4	2.3	10 45	2.3
35	6 14	17 52	0 25	1 24	20 50	2.3	10 60	2.3
40	6 17	17 49	0 27	1 30	20 33	2.3	11 16	2.3
45	6 20	17 46	0 29	1 37	20 13	2.3	11 36	2.3
50	6 23	17 42	0 32	1 47	19 48	2.3	12 0	2.4
55	6 28	17 38	0 36	2 1	19 15	2.3	12 33	2.4
60	6 34	17 32	0 41	2 19	18 25	2.3	13 24	2.4
S								

SUNCE UT	SUNCE $e = T_p - UT$	SUNCE Δ/24	SUNCE r	MJESEC Prolaz	MJESEC Δ/24	MJESEC $\pi_\leftmoon$	MJESEC r
h	min s	s	′	h min	min	′	′
00	− 3 28.2	.7	16.0	$T_{\overline{m}}$ 3 28	2.3	57.1	15.6
12	− 3 19.4	$T_{\overline{m}_\odot}$ 12 h 3.3 min		Starost 18.1 d	Faza ◑		

PLANETE

Pl.	$T_{\overline{m}}$	π	360−α	Vel.	Pl.	$T_{\overline{m}}$	π	360−α	Vel.
	h min	′	°			h min	′	°	
♀	13 18	.1	329	−3.8	♃	10 30	.0	11	−1.9
♂	19 38	.1	234	.2	♄	23 16	.0	179	.7

UT	SUNCE $S_\odot$	SUNCE $\delta_\odot$	PROLJ. TAČKA S_Υ	VENERA S_φ	VENERA δ_φ	MARS S_σ	MARS δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	179 12.3	5 34.0	192 11.9	160 17.8	12 29.5	65 41.2	22 6.0
2	209 12.7	5 36.0	222 16.8	190 16.8	12 31.8	95 44.9	22 5.6
4	239 13.0	5 37.9	252 21.8	220 15.9	12 34.0	125 48.6	22 5.1
6	269 13.4	5 39.8	282 26.7	250 15.0	12 36.3	155 52.3	22 4.7
8	299 13.8	5 41.7	312 31.6	280 14.0	12 38.6	185 56.0	22 4.2
10	329 14.1	5 43.6	342 36.6	310 13.1	12 40.8	215 59.6	22 3.8
12	359 14.5	5 45.5	12 41.5	340 12.1	12 43.1	246 3.3	22 3.3
14	29 14.9	5 47.4	42 46.4	10 11.2	12 45.3	276 7.0	22 2.9
16	59 15.2	5 49.3	72 51.3	40 10.2	12 47.6	306 10.6	22 2.5
18	89 15.6	5 51.2	102 56.3	70 9.3	12 49.9	336 14.3	22 2.0
20	119 15.9	5 53.1	133 1.2	100 8.4	12 52.1	6 17.9	22 1.6
22	149 16.3	5 55.0	163 6.1	130 7.4	12 54.4	36 21.6	22 1.1
Δ	2	10		−5	11	18	−2

UT	MJESEC $S_\leftmoon$	MJESEC Δ	MJESEC $\delta_\leftmoon$	MJESEC Δ	JUPITER $S_\jupiter$	JUPITER $\delta_\jupiter$	SATURN $S_\saturn$	SATURN $\delta_\saturn$
h	° ′		° ′		° ′	° ′	° ′	° ′
0	296 43.6	82	−25 16.8	−6	202 54.9	− 5 40.3	10 55.6	2 14.7
2	325 38.1	83	−25 18.1	−3	232 58.7	− 5 39.8	41 .9	2 14.9
4	354 32.7	84	−25 18.7	−1	263 2.6	− 5 39.4	71 6.2	2 15.0
6	23 27.4	85	−25 18.9	2	293 6.4	− 5 38.9	101 11.5	2 15.2
8	52 22.4	86	−25 18.4	5	323 10.3	− 5 38.5	131 16.7	2 15.3
10	81 17.5	87	−25 17.4	8	353 14.2	− 5 38.1	161 22.0	2 15.5
12	110 12.8	87	−25 15.9	10	23 18.0	− 5 37.6	191 27.3	2 15.6
14	139 8.3	89	−25 13.8	13	53 21.9	− 5 37.2	221 32.5	2 15.7
16	168 4.0	90	−25 11.2	16	83 25.8	− 5 36.7	251 37.8	2 15.9
18	196 59.9	91	−25 8.1	18	113 29.7	− 5 36.3	281 43.1	2 16.0
20	225 56.0	92	−25 4.4	21	143 33.5	− 5 35.9	311 48.4	2 16.2
22	254 52.4	93	−25 .3	23	173 37.4	− 5 35.4	341 53.6	2 16.3
Δ					19	2	26	1

φ	SUNCE IZLAZ	SUNCE ZALAZ	TRAJANJE SUMRAKA GRAĐ.	TRAJANJE SUMRAKA ASTR.	MJESEC IZLAZ	MJESEC Δ/24	MJESEC ZALAZ	MJESEC Δ/24
N	h min	h min	h min	h min	h min	min	h min	min
60	5 17	18 51	0 44	2 45	1 59	1.9	6 46	2.7
55	5 25	18 43	0 37	2 15	1 7	2.0	7 39	2.5
50	5 31	18 36	0 33	1 56	0 32	2.1	8 13	2.5
45	5 36	18 31	0 30	1 43	0 7	2.1	8 38	2.4
40	5 40	18 27	0 27	1 34	. . .	.0	8 58	2.4
35	5 43	18 24	0 26	1 27	. . .	.0	9 15	2.3
30	5 46	18 20	0 24	1 21	. . .	.0	9 30	2.3
20	5 51	18 15	0 22	1 14	23 44	2.0	9 54	2.3
10	5 56	18 11	0 21	1 10	23 23	2.1	10 16	2.2
0	5 60	18 6	0 21	1 9	23 3	2.1	10 36	2.2
10	6 4	18 2	0 21	1 10	22 44	2.2	10 55	2.2
20	6 8	17 58	0 22	1 13	22 23	2.3	11 17	2.1
30	6 12	17 53	0 24	1 19	21 59	2.3	11 41	2.1
35	6 15	17 51	0 25	1 24	21 44	2.4	11 56	2.0
40	6 18	17 48	0 27	1 30	21 28	2.4	12 12	2.0
45	6 21	17 44	0 29	1 37	21 8	2.5	12 32	1.9
50	6 25	17 40	0 32	1 47	20 43	2.6	12 57	1.9
55	6 30	17 35	0 36	2 1	20 10	2.7	13 30	1.7
60	6 36	17 29	0 41	2 19	19 20	3.0	14 21	1.5
S								

SUNCE UT	SUNCE $e = T_p - UT$	SUNCE Δ/24	SUNCE r	MJESEC Prolaz	MJESEC Δ/24	MJESEC $\pi_\leftmoon$	MJESEC r
h	min s	s	′	h min	min	′	′
00	− 3 10.6	.7	16.0	$T_{\overline{m}}$ 4 23	2.2	56.3	15.3
12	− 3 1.9	$T_{\overline{m}_\odot}$ 12 h 3.0 min		Starost 19.1 d	Faza ◑		

PLANETE

Pl.	$T_{\overline{m}}$	π	360−α	Vel.	Pl.	$T_{\overline{m}}$	π	360−α	Vel.
	h min	′	°			h min	′	°	
♀	13 19	.1	328	−3.8	♃	10 27	.0	11	−1.9
♂	19 35	.1	233	.2	♄	23 12	.0	179	.8

UT	SUNCE $S_\odot$	SUNCE $\delta_\odot$	PROLJ. TAČKA S_Υ	VENERA S_φ	VENERA δ_φ	MARS S_σ	MARS δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	179 16.7	5 56.9	193 11.1	160 6.5	12 56.6	66 25.2	22 .7
2	209 17.0	5 58.8	223 16.0	190 5.5	12 58.9	96 28.9	22 .2
4	239 17.4	6 .7	253 20.9	220 4.5	13 1.1	126 32.5	21 59.7
6	269 17.7	6 2.6	283 25.8	250 3.6	13 3.3	156 36.1	21 59.3
8	299 18.1	6 4.5	313 30.8	280 2.6	13 5.6	186 39.8	21 58.8
10	329 18.5	6 6.4	343 35.7	310 1.7	13 7.8	216 43.4	21 58.4
12	359 18.8	6 8.3	13 40.6	340 .7	13 10.1	246 47.0	21 57.9
14	29 19.2	6 10.2	43 45.6	9 59.8	13 12.3	276 50.6	21 57.5
16	59 19.5	6 12.1	73 50.5	39 58.8	13 14.5	306 54.3	21 57.0
18	89 19.9	6 14.0	103 55.4	69 57.8	13 16.7	336 57.9	21 56.6
20	119 20.3	6 15.9	134 .3	99 56.9	13 19.0	7 1.5	21 56.1
22	149 20.6	6 17.8	164 5.3	129 55.9	13 21.2	37 5.1	21 55.6
Δ	2	9		−5	11	18	−2

UT	MJESEC $S_\leftmoon$	MJESEC Δ	MJESEC $\delta_\leftmoon$	MJESEC Δ	JUPITER $S_\jupiter$	JUPITER $\delta_\jupiter$	SATURN $S_\saturn$	SATURN $\delta_\saturn$
h	° ′		° ′		° ′	° ′	° ′	° ′
0	283 48.9	94	−24 55.6	26	203 41.3	− 5 35.0	11 58.9	2 16.5
2	312 45.7	95	−24 50.4	28	233 45.1	− 5 34.6	42 4.2	2 16.6
4	341 42.8	96	−24 44.7	31	263 49.0	− 5 34.1	72 9.4	2 16.8
6	10 40.1	98	−24 38.5	33	293 52.9	− 5 33.7	102 14.7	2 16.9
8	39 37.7	99	−24 31.8	36	323 56.7	− 5 33.2	132 20.0	2 17.1
10	68 35.5	100	−24 24.6	38	354 .6	− 5 32.8	162 25.3	2 17.2
12	97 33.5	102	−24 17.0	41	24 4.5	− 5 32.4	192 30.5	2 17.3
14	126 31.8	103	−24 8.8	43	54 8.3	− 5 31.9	222 35.8	2 17.5
16	155 30.4	104	−24 .3	45	84 12.2	− 5 31.5	252 41.1	2 17.6
18	184 29.3	106	−23 51.2	47	114 16.1	− 5 31.1	282 46.3	2 17.8
20	213 28.4	107	−23 41.7	50	144 20.0	− 5 30.6	312 51.6	2 17.9
22	242 27.8	108	−23 31.8	52	174 23.8	− 5 30.2	342 56.9	2 18.1
Δ					19	2	26	1

φ	SUNCE IZLAZ	SUNCE ZALAZ	TRAJANJE SUMRAKA GRAĐ.	TRAJANJE SUMRAKA ASTR.	MJESEC IZLAZ	MJESEC Δ/24	MJESEC ZALAZ	MJESEC Δ/24
N	h min	h min	h min	h min	h min	min	h min	min
60	5 14	18 53	0 44	2 47	2 45	1.1	7 51	3.2
55	5 22	18 45	0 38	2 16	1 55	1.5	8 39	2.9
50	5 29	18 38	0 33	1 56	1 23	1.6	9 12	2.7
45	5 34	18 33	0 30	1 43	0 58	1.7	9 36	2.6
40	5 38	18 28	0 28	1 34	0 38	1.8	9 55	2.5
35	5 42	18 24	0 26	1 27	0 22	1.9	10 11	2.4
30	5 45	18 21	0 24	1 22	0 8	1.9	10 25	2.3
20	5 50	18 15	0 22	1 14	.. ..	.0	10 49	2.2
10	5 55	18 10	0 21	1 10	.. ..	.0	11 9	2.2
0	5 59	18 6	0 21	1 9	23 54	2.0	11 28	2.1
10	6 4	18 2	0 21	1 10	23 36	2.1	11 47	2.0
20	6 8	17 57	0 22	1 13	23 17	2.2	12 7	1.9
30	6 13	17 52	0 24	1 19	22 54	2.3	12 31	1.8
35	6 16	17 49	0 25	1 24	22 41	2.4	12 44	1.7
40	6 19	17 46	0 27	1 30	22 26	2.5	12 60	1.7
45	6 22	17 42	0 29	1 37	22 8	2.6	13 19	1.6
50	6 27	17 38	0 32	1 47	21 45	2.7	13 42	1.4
55	6 32	17 33	0 36	2 1	21 15	3.0	14 12	1.2
60	6 38	17 26	0 42	2 19	20 31	3.3	14 57	.9
S								

SUNCE UT	SUNCE $e = T_p - UT$	SUNCE Δ/24	SUNCE r	MJESEC Prolaz	MJESEC Δ/24	MJESEC $\pi_\leftmoon$	MJESEC r
h	min s	s	′	h min	min	′	′
00	− 2 53.2	.7	16.0	$T_{\overline{m}}$ 5 16	2.1	55.5	15.1
12	− 2 44.5	$T_{\overline{m}_\odot}$ 12 h	2.7 min	Starost 20.1 d	Faza ◑		

PLANETE

Pl.	$T_{\overline{m}}$	π	360−α	Vel.	Pl.	$T_{\overline{m}}$	π	360−α	Vel.
	h min	′	°			h min	′	°	
♀	13 20	.1	327	−3.8	♃	10 24	.0	10	−1.9
♂	19 32	.1	233	.2	♄	23 8	.0	179	.8

UT	SUNCE $S_\odot$	SUNCE $\delta_\odot$	PROLJ. TAČKA S_Υ	VENERA S_φ	VENERA δ_φ	MARS S_σ	MARS δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	179 21.0	6 19.7	194 10.2	159 54.9	13 23.4	67 8.7	21 55.2
2	209 21.3	6 21.6	224 15.1	189 54.0	13 25.6	97 12.3	21 54.7
4	239 21.7	6 23.5	254 20.1	219 53.0	13 27.9	127 15.9	21 54.3
6	269 22.0	6 25.3	284 25.0	249 52.0	13 30.1	157 19.5	21 53.8
8	299 22.4	6 27.2	314 29.9	279 51.0	13 32.3	187 23.1	21 53.3
10	329 22.8	6 29.1	344 34.8	309 50.1	13 34.5	217 26.7	21 52.9
12	359 23.1	6 31.0	14 39.8	339 49.1	13 36.7	247 30.3	21 52.4
14	29 23.5	6 32.9	44 44.7	9 48.1	13 38.9	277 33.9	21 51.9
16	59 23.8	6 34.8	74 49.6	39 47.1	13 41.1	307 37.5	21 51.5
18	89 24.2	6 36.7	104 54.6	69 46.1	13 43.3	337 41.0	21 51.0
20	119 24.5	6 38.6	134 59.5	99 45.2	13 45.5	7 44.6	21 50.5
22	149 24.9	6 40.4	165 4.4	129 44.2	13 47.7	37 48.2	21 50.1
Δ	2	9		−5	11	18	−2

UT	MJESEC $S_\leftmoon$	MJESEC Δ	MJESEC $\delta_\leftmoon$	MJESEC Δ	JUPITER $S_\jupiter$	JUPITER $\delta_\jupiter$	SATURN $S_\saturn$	SATURN $\delta_\saturn$
h	° ′		° ′		° ′	° ′	° ′	° ′
0	271 27.5	110	−23 21.4	54	204 27.7	− 5 29.8	13 2.1	2 18.2
2	300 27.5	111	−23 10.6	56	234 31.6	− 5 29.3	43 7.4	2 18.4
4	329 27.7	113	−22 59.4	58	264 35.5	− 5 28.9	73 12.7	2 18.5
6	358 28.2	114	−22 47.7	60	294 39.3	− 5 28.4	103 18.0	2 18.6
8	27 29.0	115	−22 35.6	62	324 43.2	− 5 28.0	133 23.2	2 18.8
10	56 30.1	117	−22 23.2	64	354 47.1	− 5 27.6	163 28.5	2 18.9
12	85 31.5	118	−22 10.3	66	24 51.0	− 5 27.1	193 33.8	2 19.1
14	114 33.1	120	−21 57.0	68	54 54.8	− 5 26.7	223 39.0	2 19.2
16	143 35.0	121	−21 43.4	70	84 58.7	− 5 26.3	253 44.3	2 19.4
18	172 37.2	122	−21 29.4	72	115 2.6	− 5 25.8	283 49.6	2 19.5
20	201 39.7	124	−21 15.0	74	145 6.5	− 5 25.4	313 54.8	2 19.6
22	230 42.5	125	−21 .2	76	175 10.3	− 5 25.0	344 .1	2 19.8
Δ					19	2	26	1

φ	SUNCE IZLAZ	SUNCE ZALAZ	TRAJANJE SUMRAKA GRAĐ.	TRAJANJE SUMRAKA ASTR.	MJESEC IZLAZ	MJESEC Δ/24	MJESEC ZALAZ	MJESEC Δ/24
N	h min	h min	h min	h min	h min	min	h min	min
60	5 11	18 56	0 44	2 49	3 12	.7	9 8	3.4
55	5 20	18 46	0 38	2 17	2 31	1.0	9 48	3.0
50	5 26	18 39	0 33	1 57	2 2	1.3	10 16	2.8
45	5 32	18 34	0 30	1 44	1 40	1.4	10 38	2.6
40	5 36	18 29	0 28	1 34	1 22	1.5	10 55	2.5
35	5 40	18 25	0 26	1 27	1 7	1.6	11 9	2.4
30	5 44	18 22	0 24	1 22	0 54	1.7	11 22	2.3
20	5 50	18 16	0 22	1 14	0 32	1.8	11 43	2.2
10	5 55	18 10	0 21	1 11	0 12	1.9	12 1	2.1
0	5 59	18 6	0 21	1 9	.. ..	.0	12 18	2.0
10	6 4	18 1	0 21	1 10	.. ..	.0	12 35	1.8
20	6 8	17 56	0 22	1 13	.. ..	.0	12 53	1.7
30	6 14	17 51	0 24	1 19	23 51	2.3	13 14	1.6
35	6 17	17 48	0 25	1 24	23 39	2.4	13 26	1.5
40	6 20	17 44	0 27	1 30	23 26	2.5	13 40	1.4
45	6 24	17 41	0 29	1 37	23 10	2.6	13 56	1.3
50	6 28	17 36	0 32	1 47	22 51	2.8	14 16	1.1
55	6 34	17 30	0 36	2 1	22 26	3.0	14 42	.9
60	6 41	17 23	0 42	2 19	21 51	3.4	15 18	.5
S								

SUNCE UT	SUNCE $e = T_p - UT$	SUNCE Δ/24	SUNCE r	MJESEC Prolaz	MJESEC Δ/24	MJESEC $\pi_\leftmoon$	MJESEC r
h	min s	s	′	h min	min	′	′
00	− 2 35.9	.7	16.0	$T_{\overline{m}}$ 6 6	2.0	54.9	15.0
12	− 2 27.4	$T_{\overline{m}_\odot}$ 12 h	2.5 min	Starost 21.1 d	Faza ◑		

PLANETE

Pl.	$T_{\overline{m}}$	π	360−α	Vel.	Pl.	$T_{\overline{m}}$	π	360−α	Vel.
	h min	′	°			h min	′	°	
♀	13 21	.1	326	−3.8	♃	10 21	.0	10	−1.9
♂	19 29	.1	233	.3	♄	23 4	.0	179	.8

UT	SUNCE $S_\odot$	$\delta_\odot$	PROLJ. TAČKA S_Υ	VENERA S_φ	δ_φ	MARS S_σ	δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	179 25.2	6 42.3	195 9.3	159 43.2	13 49.9	67 51.8	21 49.6
2	209 25.6	6 44.2	225 14.3	189 42.2	13 52.1	97 55.3	21 49.1
4	239 25.9	6 46.1	255 19.2	219 41.2	13 54.3	127 58.9	21 48.7
6	269 26.3	6 48.0	285 24.1	249 40.2	13 56.5	158 2.5	21 48.2
8	299 26.6	6 49.9	315 29.0	279 39.2	13 58.7	188 6.0	21 47.7
10	329 27.0	6 51.7	345 34.0	309 38.2	14 .9	218 9.6	21 47.2
12	359 27.3	6 53.6	15 38.9	339 37.2	14 3.0	248 13.1	21 46.8
14	29 27.7	6 55.5	45 43.8	9 36.2	14 5.2	278 16.7	21 46.3
16	59 28.0	6 57.4	75 48.8	39 35.2	14 7.4	308 20.2	21 45.8
18	89 28.4	6 59.3	105 53.7	69 34.2	14 9.6	338 23.8	21 45.3
20	119 28.7	7 1.1	135 58.6	99 33.2	14 11.7	8 27.3	21 44.9
22	149 29.1	7 3.0	166 3.5	129 32.2	14 13.9	38 30.8	21 44.4
Δ	2	9		−5	11	18	−2

UT	MJESEC $S_\leftmoon$	Δ	$\delta_\leftmoon$	Δ	JUPITER S_4	δ_4	SATURN S_5	δ_5
h	° ′		° ′		° ′	° ′	° ′	° ′
0	259 45.5	127	−20 45.1	77	205 14.2	− 5 24.5	14 5.4	2 19.9
2	288 48.8	128	−20 29.6	79	235 18.1	− 5 24.1	44 10.6	2 20.1
4	317 52.4	129	−20 13.8	81	265 22.0	− 5 23.7	74 15.9	2 20.2
6	346 56.2	131	−19 57.7	82	295 25.8	− 5 23.2	104 21.2	2 20.4
8	16 .3	132	−19 41.2	84	325 29.7	− 5 22.8	134 26.4	2 20.5
10	45 4.7	133	−19 24.4	86	355 33.6	− 5 22.4	164 31.7	2 20.6
12	74 9.3	134	−19 7.2	87	25 37.5	− 5 21.9	194 37.0	2 20.8
14	103 14.2	136	−18 49.8	89	55 41.3	− 5 21.5	224 42.2	2 20.9
16	132 19.3	137	−18 32.0	90	85 45.2	− 5 21.0	254 47.5	2 21.1
18	161 24.7	138	−18 14.0	92	115 49.1	− 5 20.6	284 52.8	2 21.2
20	190 30.3	139	−17 55.7	93	145 53.0	− 5 20.2	314 58.0	2 21.3
22	219 36.1	140	−17 37.0	95	175 56.9	− 5 19.7	345 3.3	2 21.5
Δ					19	2	26	1

φ	SUNCE IZLAZ	ZALAZ	TRAJANJE SUMRAKA GRAĐ.	ASTR.	MJESEC IZLAZ	Δ/24	ZALAZ	Δ/24
N	h min	h min	h min	h min	h min	min	h min	min
60	5 8	18 58	0 44	2 51	3 28	.4	10 30	3.4
55	5 17	18 48	0 38	2 18	2 56	.8	11 1	3.1
50	5 24	18 41	0 33	1 58	2 32	1.0	11 23	2.8
45	5 30	18 35	0 30	1 44	2 14	1.2	11 41	2.6
40	5 35	18 30	0 28	1 35	1 58	1.3	11 55	2.5
35	5 39	18 26	0 26	1 27	1 46	1.4	12 7	2.4
30	5 43	18 22	0 24	1 22	1 34	1.5	12 17	2.3
20	5 49	18 16	0 22	1 15	1 15	1.6	12 35	2.1
10	5 54	18 10	0 21	1 11	0 58	1.8	12 51	2.0
0	5 59	18 5	0 21	1 9	0 43	1.9	13 5	1.8
10	6 4	18 1	0 21	1 10	0 27	2.0	13 19	1.7
20	6 9	17 55	0 22	1 13	0 10	2.2	13 34	1.6
30	6 14	17 50	0 24	1 19	. . .	.0	13 52	1.4
35	6 17	17 47	0 25	1 24	. . .	.0	14 2	1.3
40	6 21	17 43	0 27	1 30	. . .	.0	14 13	1.2
45	6 25	17 39	0 29	1 37	. . .	.0	14 27	1.1
50	6 30	17 34	0 32	1 47	23 58	2.8	14 43	.9
55	6 36	17 28	0 36	2 0	23 39	3.0	15 4	.7
60	6 43	17 20	0 42	2 19	23 13	3.4	15 31	.3
S								

SUNCE UT	e = Tp − UT	Δ/24	r	MJESEC Prolaz	Δ/24	$\pi_\leftmoon$	r
h	min s	s	′	h min	min	′	′
00	− 2 18.9	.7	16.0	$T_{\overline{m}}$ 6 54	1.9	54.5	14.9
12	− 2 10.5	$T_{\overline{m}_\odot}$ 12 h	2.2 min	Starost 22.1 d	Faza ◑		

PLANETE

Pl.	$T_{\overline{m}}$	π	360−α	Vel.	Pl.	$T_{\overline{m}}$	π	360−α	Vel.
	h min	′	°			h min	′	°	
♀	13 22	.1	325	−3.8	♃	10 18	.0	10	−1.9
♂	19 26	.1	233	.3	♄	22 60	.0	179	.8

UT	SUNCE $S_\odot$	$\delta_\odot$	PROLJ. TAČKA S_Υ	VENERA S_φ	δ_φ	MARS S_σ	δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	179 29.4	7 4.9	196 8.5	159 31.2	14 16.1	68 34.4	21 43.9
2	209 29.8	7 6.8	226 13.4	189 30.2	14 18.2	98 37.9	21 43.4
4	239 30.1	7 8.6	256 18.3	219 29.2	14 20.4	128 41.4	21 42.9
6	269 30.5	7 10.5	286 23.3	249 28.2	14 22.6	158 45.0	21 42.5
8	299 30.8	7 12.4	316 28.2	279 27.2	14 24.7	188 48.5	21 42.0
10	329 31.2	7 14.2	346 33.1	309 26.2	14 26.9	218 52.0	21 41.5
12	359 31.5	7 16.1	16 38.0	339 25.1	14 29.0	248 55.5	21 41.0
14	29 31.9	7 18.0	46 43.0	9 24.1	14 31.2	278 59.0	21 40.5
16	59 32.2	7 19.8	76 47.9	39 23.1	14 33.3	309 2.5	21 40.0
18	89 32.5	7 21.7	106 52.8	69 22.1	14 35.5	339 6.0	21 39.6
20	119 32.9	7 23.6	136 57.8	99 21.0	14 37.6	9 9.5	21 39.1
22	149 33.2	7 25.4	167 2.7	129 20.0	14 39.7	39 13.0	21 38.6
Δ	2	9		−5	11	18	−2

UT	MJESEC $S_\leftmoon$	Δ	$\delta_\leftmoon$	Δ	JUPITER S_4	δ_4	SATURN S_5	δ_5
h	° ′		° ′		° ′	° ′	° ′	° ′
0	248 42.2	142	−17 18.1	96	206 .7	− 5 19.3	15 8.5	2 21.6
2	277 48.6	143	−16 58.9	97	236 4.6	− 5 18.9	45 13.8	2 21.8
4	306 55.1	144	−16 39.5	99	266 8.5	− 5 18.4	75 19.1	2 21.9
6	336 1.9	145	−16 19.7	100	296 12.4	− 5 18.0	105 24.3	2 22.1
8	5 8.8	146	−15 59.8	101	326 16.3	− 5 17.6	135 29.6	2 22.2
10	34 16.0	147	−15 39.5	102	356 20.2	− 5 17.1	165 34.9	2 22.3
12	63 23.4	148	−15 19.1	104	26 24.0	− 5 16.7	195 40.1	2 22.5
14	92 31.0	149	−14 58.3	105	56 27.9	− 5 16.3	225 45.4	2 22.6
16	121 38.8	150	−14 37.4	106	86 31.8	− 5 15.9	255 50.6	2 22.8
18	150 46.7	151	−14 16.2	107	116 35.7	− 5 15.4	285 55.9	2 22.9
20	179 54.9	152	−13 54.8	108	146 39.6	− 5 15.0	316 1.2	2 23.0
22	209 3.2	152	−13 33.2	109	176 43.5	− 5 14.6	346 6.4	2 23.2
Δ					19	2	26	1

φ	SUNCE IZLAZ	ZALAZ	TRAJANJE SUMRAKA GRAĐ.	ASTR.	MJESEC IZLAZ	Δ/24	ZALAZ	Δ/24
N	h min	h min	h min	h min	h min	min	h min	min
60	5 5	19 1	0 44	2 54	3 38	.3	11 52	3.4
55	5 15	18 50	0 38	2 19	3 14	.6	12 14	3.0
50	5 22	18 43	0 33	1 58	2 56	.8	12 31	2.8
45	5 28	18 36	0 30	1 45	2 41	1.0	12 44	2.6
40	5 33	18 31	0 28	1 35	2 29	1.1	12 55	2.5
35	5 38	18 27	0 26	1 28	2 19	1.2	13 4	2.3
30	5 41	18 23	0 24	1 22	2 10	1.3	13 12	2.2
20	5 48	18 16	0 22	1 15	1 55	1.5	13 26	2.1
10	5 53	18 10	0 21	1 11	1 41	1.7	13 38	1.9
0	5 59	18 5	0 21	1 9	1 28	1.8	13 49	1.8
10	6 4	18 0	0 21	1 10	1 15	1.9	14 0	1.6
20	6 9	17 55	0 22	1 13	1 2	2.1	14 12	1.5
30	6 15	17 49	0 24	1 19	0 46	2.3	14 26	1.3
35	6 18	17 45	0 25	1 24	0 37	2.4	14 33	1.2
40	6 22	17 41	0 27	1 30	0 26	2.5	14 42	1.1
45	6 26	17 37	0 29	1 37	0 14	2.6	14 52	.9
50	6 31	17 32	0 32	1 47	. . .	.0	15 4	.8
55	6 38	17 25	0 36	2 0	. . .	.0	15 20	.5
60	6 46	17 17	0 42	2 19	. . .	.0	15 40	.2
S								

SUNCE UT	e = Tp − UT	Δ/24	r	MJESEC Prolaz	Δ/24	$\pi_\leftmoon$	r
h	min s	s	′	h min	min	′	′
00	− 2 2.1	.7	16.0	$T_{\overline{m}}$ 7 39	1.8	54.2	14.8
12	− 1 53.8	$T_{\overline{m}_\odot}$ 12 h	1.9 min	Starost 23.1 d	Faza ◑		

PLANETE

Pl.	$T_{\overline{m}}$	π	360−α	Vel.	Pl.	$T_{\overline{m}}$	π	360−α	Vel.
	h min	′	°			h min	′	°	
♀	13 22	.1	323	−3.8	♃	10 15	.0	10	−1.9
♂	19 23	.1	232	.3	♄	22 55	.0	179	.8

UT	SUNCE $S_\odot$	SUNCE $\delta_\odot$	PROLJ. TAČKA S_Υ	VENERA S_φ	VENERA δ_φ	MARS S_σ	MARS δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	179 33.6	7 27.3	197 7.6	159 19.0	14 41.9	69 16.5	21 38.1
2	209 33.9	7 29.2	227 12.5	189 18.0	14 44.0	99 20.0	21 37.6
4	239 34.3	7 31.0	257 17.5	219 16.9	14 46.1	129 23.5	21 37.1
6	269 34.6	7 32.9	287 22.4	249 15.9	14 48.3	159 27.0	21 36.6
8	299 34.9	7 34.8	317 27.3	279 14.9	14 50.4	189 30.5	21 36.1
10	329 35.3	7 36.6	347 32.3	309 13.8	14 52.5	219 34.0	21 35.6
12	359 35.6	7 38.5	17 37.2	339 12.8	14 54.7	249 37.5	21 35.1
14	29 36.0	7 40.3	47 42.1	9 11.8	14 56.8	279 40.9	21 34.6
16	59 36.3	7 42.2	77 47.0	39 10.7	14 58.9	309 44.4	21 34.2
18	89 36.6	7 44.0	107 52.0	69 9.7	15 1.0	339 47.9	21 33.7
20	119 37.0	7 45.9	137 56.9	99 8.6	15 3.1	9 51.4	21 33.2
22	149 37.3	7 47.8	168 1.8	129 7.6	15 5.2	39 54.8	21 32.7
Δ	2	9		−5	11	17	−2

UT	MJESEC $S_\leftmoon$	MJESEC Δ	MJESEC $\delta_\leftmoon$	MJESEC Δ	JUPITER S_4	JUPITER δ_4	SATURN S_η	SATURN δ_η
h	° ′		° ′		° ′	° ′	° ′	° ′
0	238 11.7	153	−13 11.3	110	206 47.3	− 5 14.1	16 11.7	2 23.3
2	267 20.4	154	−12 49.3	111	236 51.2	− 5 13.7	46 16.9	2 23.4
4	296 29.2	155	−12 27.1	112	266 55.1	− 5 13.3	76 22.2	2 23.6
6	325 38.1	156	−12 4.6	113	296 59.0	− 5 12.8	106 27.5	2 23.7
8	354 47.2	156	−11 42.0	114	327 2.9	− 5 12.4	136 32.7	2 23.9
10	23 56.5	157	−11 19.2	115	357 6.8	− 5 12.0	166 38.0	2 24.0
12	53 5.9	157	−10 56.2	116	27 10.6	− 5 11.5	196 43.2	2 24.1
14	82 15.4	158	−10 33.0	117	57 14.5	− 5 11.1	226 48.5	2 24.3
16	111 25.0	159	−10 9.7	117	87 18.4	− 5 10.7	256 53.8	2 24.4
18	140 34.7	159	− 9 46.2	118	117 22.3	− 5 10.2	286 59.0	2 24.6
20	169 44.5	160	− 9 22.5	119	147 26.2	− 5 9.8	317 4.3	2 24.7
22	198 54.5	160	− 8 58.7	120	177 30.1	− 5 9.4	347 9.5	2 24.8
Δ					19	2	26	1

φ	SUNCE IZLAZ	SUNCE ZALAZ	TRAJANJE SUMRAKA GRAĐ.	TRAJANJE SUMRAKA ASTR.	MJESEC IZLAZ	MJESEC Δ/24	MJESEC ZALAZ	MJESEC Δ/24
N	h min	h min	h min	h min	h min	min	h min	min
60	5 2	19 3	0 45	2 56	3 45	.2	13 12	3.3
55	5 12	18 52	0 38	2 20	3 28	.5	13 27	3.0
50	5 20	18 44	0 34	1 59	3 15	.7	13 38	2.8
45	5 26	18 38	0 30	1 45	3 5	.9	13 47	2.6
40	5 32	18 32	0 28	1 35	2 56	1.0	13 54	2.5
35	5 36	18 28	0 26	1 28	2 49	1.1	14 1	2.3
30	5 40	18 23	0 24	1 22	2 42	1.2	14 6	2.2
20	5 47	18 16	0 22	1 15	2 31	1.4	14 16	2.0
10	5 53	18 10	0 21	1 11	2 21	1.6	14 24	1.9
0	5 58	18 5	0 21	1 9	2 11	1.7	14 31	1.7
10	6 4	17 59	0 21	1 10	2 2	1.9	14 39	1.6
20	6 9	17 54	0 22	1 13	1 52	2.0	14 47	1.4
30	6 15	17 47	0 24	1 19	1 40	2.2	14 56	1.2
35	6 19	17 44	0 25	1 24	1 33	2.3	15 2	1.1
40	6 23	17 40	0 27	1 30	1 26	2.5	15 8	1.0
45	6 27	17 35	0 29	1 37	1 17	2.6	15 14	.8
50	6 33	17 30	0 32	1 47	1 6	2.8	15 23	.7
55	6 39	17 23	0 36	2 0	0 52	3.0	15 33	.5
60	6 48	17 14	0 42	2 19	0 34	3.3	15 46	.2
S								

SUNCE UT	SUNCE $e = T_p - UT$	SUNCE Δ/24	SUNCE r	MJESEC Prolaz	MJESEC Δ/24	MJESEC $\pi_\leftmoon$	MJESEC r
h	min s	s	′	h min	min	′	′
00	− 1 45.5	.7	16.0	$T_{\overline{m}}$ 8 21	1.7	54.1	14.8
12	− 1 37.4	$T_{\overline{m}_\odot}$ 12 h	1.6 min	Starost 24.1 d	Faza ◑		

PLANETE

Pl.	$T_{\overline{m}}$	π	360−α	Vel.	Pl.	$T_{\overline{m}}$	π	360−α	Vel.
	h min	′	°			h min	′	°	
♀	13 23	.1	322	−3.8	♃	10 12	.0	10	−1.9
♂	19 21	.1	232	.3	♄	22 51	.0	179	.8

UT	SUNCE $S_\odot$	SUNCE $\delta_\odot$	PROLJ. TAČKA S_Υ	VENERA S_φ	VENERA δ_φ	MARS S_σ	MARS δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	179 37.7	7 49.6	198 6.8	159 6.5	15 7.3	69 58.3	21 32.2
2	209 38.0	7 51.5	228 11.7	189 5.5	15 9.4	100 1.7	21 31.7
4	239 38.3	7 53.3	258 16.6	219 4.4	15 11.5	130 5.2	21 31.2
6	269 38.7	7 55.2	288 21.5	249 3.4	15 13.6	160 8.7	21 30.7
8	299 39.0	7 57.0	318 26.5	279 2.3	15 15.7	190 12.1	21 30.2
10	329 39.3	7 58.9	348 31.4	309 1.3	15 17.8	220 15.6	21 29.7
12	359 39.7	8 .7	18 36.3	339 .2	15 19.9	250 19.0	21 29.2
14	29 40.0	8 2.6	48 41.3	8 59.2	15 22.0	280 22.4	21 28.7
16	59 40.3	8 4.4	78 46.2	38 58.1	15 24.1	310 25.9	21 28.2
18	89 40.7	8 6.2	108 51.1	68 57.0	15 26.2	340 29.3	21 27.6
20	119 41.0	8 8.1	138 56.0	98 56.0	15 28.3	10 32.8	21 27.1
22	149 41.3	8 9.9	169 1.0	128 54.9	15 30.3	40 36.2	21 26.6
Δ	2	9		−5	10	17	−3

UT	MJESEC $S_\leftmoon$	MJESEC Δ	MJESEC $\delta_\leftmoon$	MJESEC Δ	JUPITER S_4	JUPITER δ_4	SATURN S_η	SATURN δ_η
h	° ′		° ′		° ′	° ′	° ′	° ′
0	228 4.5	161	− 8 34.8	120	207 34.0	− 5 9.0	17 14.8	2 25.0
2	257 14.6	161	− 8 10.7	121	237 37.9	− 5 8.5	47 20.0	2 25.1
4	286 24.8	161	− 7 46.5	122	267 41.8	− 5 8.1	77 25.3	2 25.2
6	315 35.0	162	− 7 22.1	122	297 45.6	− 5 7.7	107 30.6	2 25.4
8	344 45.3	162	− 6 57.6	123	327 49.5	− 5 7.2	137 35.8	2 25.5
10	13 55.7	162	− 6 33.0	124	357 53.4	− 5 6.8	167 41.1	2 25.6
12	43 6.1	162	− 6 8.3	124	27 57.3	− 5 6.4	197 46.3	2 25.8
14	72 16.6	162	− 5 43.4	125	58 1.2	− 5 5.9	227 51.6	2 25.9
16	101 27.1	163	− 5 18.5	125	88 5.1	− 5 5.5	257 56.8	2 26.1
18	130 37.6	163	− 4 53.5	126	118 9.0	− 5 5.1	288 2.1	2 26.2
20	159 48.1	163	− 4 28.3	126	148 12.9	− 5 4.7	318 7.4	2 26.3
22	188 58.7	163	− 4 3.1	127	178 16.8	− 5 4.2	348 12.6	2 26.5
Δ					19	2	26	1

φ	SUNCE IZLAZ	SUNCE ZALAZ	TRAJANJE SUMRAKA GRAĐ.	TRAJANJE SUMRAKA ASTR.	MJESEC IZLAZ	MJESEC Δ/24	MJESEC ZALAZ	MJESEC Δ/24
N	h min	h min	h min	h min	h min	min	h min	min
60	4 59	19 5	0 45	2 59	3 50	.2	14 32	3.3
55	5 10	18 54	0 38	2 21	3 40	.4	14 39	3.0
50	5 18	18 46	0 34	1 60	3 32	.7	14 45	2.8
45	5 25	18 39	0 30	1 45	3 26	.8	14 49	2.6
40	5 30	18 33	0 28	1 35	3 21	1.0	14 53	2.5
35	5 35	18 28	0 26	1 28	3 16	1.1	14 56	2.3
30	5 39	18 24	0 24	1 22	3 12	1.2	14 59	2.2
20	5 46	18 17	0 22	1 15	3 5	1.4	15 4	2.0
10	5 52	18 10	0 21	1 11	2 59	1.5	15 9	1.9
0	5 58	18 5	0 21	1 9	2 53	1.7	15 13	1.7
10	6 4	17 59	0 21	1 10	2 47	1.9	15 16	1.5
20	6 9	17 53	0 22	1 13	2 41	2.0	15 21	1.4
30	6 16	17 46	0 24	1 20	2 34	2.2	15 25	1.2
35	6 20	17 43	0 25	1 24	2 30	2.3	15 28	1.1
40	6 24	17 38	0 27	1 30	2 25	2.5	15 31	.9
45	6 29	17 33	0 29	1 37	2 19	2.6	15 35	.8
50	6 34	17 28	0 32	1 47	2 13	2.8	15 39	.6
55	6 41	17 20	0 36	2 0	2 5	3.0	15 44	.4
60	6 50	17 11	0 42	2 19	1 54	3.3	15 50	.2
S								

SUNCE UT	SUNCE $e = T_p - UT$	SUNCE Δ/24	SUNCE r	MJESEC Prolaz	MJESEC Δ/24	MJESEC $\pi_\leftmoon$	MJESEC r
h	min s	s	′	h min	min	′	′
00	− 1 29.2	.7	16.0	$T_{\overline{m}}$ 9 3	1.7	54.2	14.8
12	− 1 21.2	$T_{\overline{m}_\odot}$ 12 h	1.4 min	Starost 25.1 d	Faza ◑		

PLANETE

Pl.	$T_{\overline{m}}$	π	360−α	Vel.	Pl.	$T_{\overline{m}}$	π	360−α	Vel.
	h min	′	°			h min	′	°	
♀	13 24	.1	321	−3.8	♃	10 8	.0	9	−1.9
♂	19 18	.1	232	.4	♄	22 47	.0	179	.8

UT	SUNCE $S_\odot$	SUNCE $\delta_\odot$	PROLJ. TAČKA S_Υ	VENERA S_φ	VENERA δ_φ	MARS S_σ	MARS δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	179 41.7	8 11.8	199 5.9	158 53.8	15 32.4	70 39.6	21 26.1
2	209 42.0	8 13.6	229 10.8	188 52.8	15 34.5	100 43.0	21 25.6
4	239 42.3	8 15.5	259 15.7	218 51.7	15 36.6	130 46.5	21 25.1
6	269 42.6	8 17.3	289 20.7	248 50.6	15 38.6	160 49.9	21 24.6
8	299 43.0	8 19.1	319 25.6	278 49.6	15 40.7	190 53.3	21 24.1
10	329 43.3	8 21.0	349 30.5	308 48.5	15 42.7	220 56.7	21 23.6
12	359 43.6	8 22.8	19 35.5	338 47.4	15 44.8	251 .1	21 23.1
14	29 44.0	8 24.6	49 40.4	8 46.3	15 46.9	281 3.5	21 22.6
16	59 44.3	8 26.5	79 45.3	38 45.2	15 48.9	311 7.0	21 22.0
18	89 44.6	8 28.3	109 50.2	68 44.2	15 51.0	341 10.4	21 21.5
20	119 44.9	8 30.1	139 55.2	98 43.1	15 53.0	11 13.8	21 21.0
22	149 45.3	8 32.0	170 .1	128 42.0	15 55.1	41 17.2	21 20.5
Δ	2	9		−5	10	17	−3

UT	MJESEC $S_\leftmoon$	MJESEC Δ	MJESEC $\delta_\leftmoon$	MJESEC Δ	JUPITER S_4	JUPITER δ_4	SATURN S_η	SATURN δ_η
h	° ′		° ′		° ′	° ′	° ′	° ′
0	218 9.3	163	−3 37.8	127	208 20.7	−5 3.8	18 17.9	2 26.6
2	247 19.8	163	−3 12.4	127	238 24.6	−5 3.4	48 23.1	2 26.7
4	276 30.4	163	−2 47.0	128	268 28.4	−5 2.9	78 28.4	2 26.9
6	305 40.9	163	−2 21.4	128	298 32.3	−5 2.5	108 33.6	2 27.0
8	334 51.4	162	−1 55.9	128	328 36.2	−5 2.1	138 38.9	2 27.1
10	4 1.9	162	−1 30.2	128	358 40.1	−5 1.7	168 44.1	2 27.3
12	33 12.3	162	−1 4.5	129	28 44.0	−5 1.2	198 49.4	2 27.4
14	62 22.7	162	−0 38.8	129	58 47.9	−5 .8	228 54.6	2 27.5
16	91 33.0	161	−0 13.0	129	88 51.8	−5 .4	258 59.9	2 27.7
18	120 43.3	161	0 12.8	129	118 55.7	−4 59.9	289 5.1	2 27.8
20	149 53.5	161	0 38.6	129	148 59.6	−4 59.5	319 10.4	2 27.9
22	179 3.7	160	1 4.4	129	179 3.5	−4 59.1	349 15.6	2 28.1
Δ					19	2	26	1

φ	SUNCE IZLAZ	SUNCE ZALAZ	TRAJANJE SUMRAKA GRAĐ.	TRAJANJE SUMRAKA ASTR.	MJESEC IZLAZ	MJESEC Δ/24	MJESEC ZALAZ	MJESEC Δ/24
N	h min	h min	h min	h min	h min	min	h min	min
60	4 56	19 8	0 45	3 2	3 54	.2	15 51	3.3
55	5 7	18 56	0 38	2 22	3 51	.4	15 51	3.1
50	5 16	18 47	0 34	2 0	3 48	.6	15 52	2.8
45	5 23	18 40	0 30	1 46	3 46	.8	15 52	2.6
40	5 29	18 34	0 28	1 36	3 44	1.0	15 52	2.5
35	5 34	18 29	0 26	1 28	3 42	1.1	15 52	2.4
30	5 38	18 25	0 24	1 23	3 40	1.2	15 53	2.3
20	5 45	18 17	0 22	1 15	3 38	1.4	15 53	2.1
10	5 52	18 10	0 21	1 11	3 36	1.5	15 53	1.9
0	5 58	18 4	0 21	1 9	3 34	1.7	15 53	1.7
10	6 4	17 58	0 21	1 10	3 32	1.9	15 53	1.6
20	6 10	17 52	0 22	1 13	3 29	2.0	15 54	1.4
30	6 17	17 45	0 24	1 20	3 27	2.2	15 54	1.2
35	6 20	17 41	0 25	1 24	3 25	2.3	15 54	1.1
40	6 25	17 37	0 27	1 30	3 24	2.5	15 54	1.0
45	6 30	17 32	0 30	1 37	3 22	2.6	15 54	.8
50	6 36	17 25	0 33	1 47	3 20	2.8	15 54	.6
55	6 43	17 18	0 37	2 0	3 17	3.0	15 54	.4
60	6 53	17 8	0 42	2 19	3 13	3.3	15 54	.2
S								

SUNCE UT	SUNCE $e = T_p - UT$	SUNCE Δ/24	SUNCE r	MJESEC Prolaz	MJESEC Δ/24	MJESEC $\pi_\leftmoon$	MJESEC r
h	min s	s	′	h min	min	′	′
00	− 1 13.2	.7	16.0	$T_{\overline{m}}$ 9 43	1.8	54.4	14.8
12	− 1 5.3	$T_{\overline{m}_\odot}$ 12 h	1.1 min	Starost 26.1 d	Faza ●		

PLANETE

Pl.	$T_{\overline{m}}$	π	360−α	Vel.	Pl.	$T_{\overline{m}}$	π	360−α	Vel.
	h min	′	°			h min	′	°	
♀	13 25	.1	320	−3.8	♃	10 5	.0	9	−1.9
♂	19 15	.1	232	.4	♄	22 43	.0	179	.8

UT	SUNCE $S_\odot$	SUNCE $\delta_\odot$	PROLJ. TAČKA S_Υ	VENERA S_φ	VENERA δ_φ	MARS S_σ	MARS δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	179 45.6	8 33.8	200 5.0	158 40.9	15 57.1	71 20.5	21 20.0
2	209 45.9	8 35.6	230 10.0	188 39.8	15 59.1	101 23.9	21 19.5
4	239 46.2	8 37.5	260 14.9	218 38.7	16 1.2	131 27.3	21 18.9
6	269 46.6	8 39.3	290 19.8	248 37.6	16 3.2	161 30.7	21 18.4
8	299 46.9	8 41.1	320 24.7	278 36.5	16 5.2	191 34.1	21 17.9
10	329 47.2	8 42.9	350 29.7	308 35.4	16 7.3	221 37.5	21 17.4
12	359 47.5	8 44.8	20 34.6	338 34.3	16 9.3	251 40.9	21 16.9
14	29 47.8	8 46.6	50 39.5	8 33.2	16 11.3	281 44.2	21 16.3
16	59 48.2	8 48.4	80 44.5	38 32.1	16 13.3	311 47.6	21 15.8
18	89 48.5	8 50.2	110 49.4	68 31.0	16 15.4	341 51.0	21 15.3
20	119 48.8	8 52.1	140 54.3	98 29.9	16 17.4	11 54.4	21 14.8
22	149 49.1	8 53.9	170 59.2	128 28.8	16 19.4	41 57.7	21 14.2
Δ	2	9		−6	10	17	−3

UT	MJESEC $S_\leftmoon$	MJESEC Δ	MJESEC $\delta_\leftmoon$	MJESEC Δ	JUPITER S_4	JUPITER δ_4	SATURN S_η	SATURN δ_η
h	° ′		° ′		° ′	° ′	° ′	° ′
0	208 13.7	160	1 30.3	129	209 7.4	−4 58.7	19 20.9	2 28.2
2	237 23.7	159	1 56.1	129	239 11.3	−4 58.2	49 26.1	2 28.3
4	266 33.5	159	2 22.0	129	269 15.2	−4 57.8	79 31.4	2 28.5
6	295 43.3	158	2 47.9	129	299 19.1	−4 57.4	109 36.6	2 28.6
8	324 52.9	158	3 13.7	129	329 23.0	−4 57.0	139 41.9	2 28.7
10	354 2.4	157	3 39.6	129	359 26.9	−4 56.5	169 47.1	2 28.9
12	23 11.8	156	4 5.4	129	29 30.8	−4 56.1	199 52.4	2 29.0
14	52 21.1	156	4 31.1	129	59 34.7	−4 55.7	229 57.6	2 29.1
16	81 30.2	155	4 56.9	128	89 38.6	−4 55.3	260 2.9	2 29.3
18	110 39.2	154	5 22.6	128	119 42.5	−4 54.8	290 8.1	2 29.4
20	139 48.0	153	5 48.2	128	149 46.4	−4 54.4	320 13.4	2 29.5
22	168 56.7	152	6 13.8	128	179 50.3	−4 54.0	350 18.6	2 29.7
Δ					19	2	26	1

φ	SUNCE IZLAZ	SUNCE ZALAZ	TRAJANJE SUMRAKA GRAĐ.	TRAJANJE SUMRAKA ASTR.	MJESEC IZLAZ	MJESEC Δ/24	MJESEC ZALAZ	MJESEC Δ/24
N	h min	h min	h min	h min	h min	min	h min	min
60	4 53	19 10	0 46	3 5	3 58	.2	17 11	3.5
55	5 5	18 58	0 39	2 23	4 1	.5	17 5	3.1
50	5 14	18 49	0 34	2 1	4 3	.7	16 60	2.9
45	5 21	18 41	0 30	1 46	4 5	.8	16 56	2.7
40	5 27	18 35	0 28	1 36	4 6	1.0	16 52	2.6
35	5 32	18 30	0 26	1 28	4 8	1.1	16 49	2.4
30	5 37	18 25	0 24	1 23	4 9	1.2	16 47	2.3
20	5 45	18 17	0 22	1 15	4 11	1.4	16 42	2.1
10	5 51	18 10	0 21	1 11	4 13	1.6	16 38	1.9
0	5 58	18 4	0 21	1 10	4 15	1.8	16 35	1.8
10	6 4	17 58	0 21	1 10	4 16	1.9	16 31	1.6
20	6 10	17 51	0 22	1 13	4 18	2.1	16 27	1.5
30	6 17	17 44	0 24	1 20	4 20	2.3	16 23	1.3
35	6 21	17 40	0 25	1 24	4 22	2.4	16 20	1.2
40	6 26	17 35	0 27	1 30	4 23	2.5	16 17	1.0
45	6 31	17 30	0 30	1 37	4 25	2.7	16 14	.9
50	6 37	17 23	0 33	1 47	4 27	2.9	16 10	.7
55	6 45	17 16	0 37	2 1	4 30	3.1	16 5	.5
60	6 55	17 5	0 42	2 19	4 33	3.4	15 59	.2
S								

SUNCE UT	SUNCE $e = T_p - UT$	SUNCE Δ/24	SUNCE r	MJESEC Prolaz	MJESEC Δ/24	MJESEC $\pi_\leftmoon$	MJESEC r
h	min s	s	′	h min	min	′	′
00	− 0 57.5	.6	16.0	$T_{\overline{m}}$ 10 25	1.7	54.7	14.9
12	− 0 49.7	$T_{\overline{m}_\odot}$ 12 h	.8 min	Starost 27.1 d	Faza ●		

PLANETE

Pl.	$T_{\overline{m}}$	π	360−α	Vel.	Pl.	$T_{\overline{m}}$	π	360−α	Vel.
	h min	′	°			h min	′	°	
♀	13 26	.1	319	−3.8	♃	10 2	.0	9	−1.9
♂	19 12	.1	231	.4	♄	22 39	.0	179	.8

UT	SUNCE $S_\odot$	SUNCE $\delta_\odot$	PROLJ. TAČKA S_Υ	VENERA S_φ	VENERA δ_φ	MARS S_σ	MARS δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	179 49.4	8 55.7	201 4.2	158 27.7	16 21.4	72 1.1	21 13.7
2	209 49.8	8 57.5	231 9.1	188 26.6	16 23.4	102 4.4	21 13.2
4	239 50.1	8 59.3	261 14.0	218 25.5	16 25.4	132 7.8	21 12.7
6	269 50.4	9 1.1	291 19.0	248 24.3	16 27.4	162 11.2	21 12.1
8	299 50.7	9 3.0	321 23.9	278 23.2	16 29.4	192 14.5	21 11.6
10	329 51.0	9 4.8	351 28.8	308 22.1	16 31.4	222 17.9	21 11.1
12	359 51.3	9 6.6	21 33.7	338 21.0	16 33.4	252 21.2	21 10.5
14	29 51.7	9 8.4	51 38.7	8 19.9	16 35.4	282 24.6	21 10.0
16	59 52.0	9 10.2	81 43.6	38 18.7	16 37.4	312 27.9	21 9.5
18	89 52.3	9 12.0	111 48.5	68 17.6	16 39.3	342 31.2	21 8.9
20	119 52.6	9 13.8	141 53.5	98 16.5	16 41.3	12 34.6	21 8.4
22	149 52.9	9 15.6	171 58.4	128 15.4	16 43.3	42 37.9	21 7.9
Δ	2	9		−6	10	17	−3

UT	MJESEC $S_\leftmoon$	MJESEC Δ	MJESEC $\delta_\leftmoon$	MJESEC Δ	JUPITER $S_\jupiter$	JUPITER $\delta_\jupiter$	SATURN $S_\saturn$	SATURN $\delta_\saturn$
h	° ′		° ′		° ′	° ′	° ′	° ′
0	198 5.1	152	6 39.3	127	209 54.2	− 4 53.5	20 23.9	2 29.8
2	227 13.4	151	7 4.8	127	239 58.1	− 4 53.1	50 29.1	2 29.9
4	256 21.6	150	7 30.1	126	270 2.0	− 4 52.7	80 34.4	2 30.1
6	285 29.5	149	7 55.4	126	300 5.9	− 4 52.3	110 39.6	2 30.2
8	314 37.2	148	8 20.6	125	330 9.8	− 4 51.8	140 44.8	2 30.3
10	343 44.7	147	8 45.7	125	0 13.7	− 4 51.4	170 50.1	2 30.4
12	12 52.0	145	9 10.6	124	30 17.6	− 4 51.0	200 55.3	2 30.6
14	41 59.1	144	9 35.5	124	60 21.5	− 4 50.6	231 .6	2 30.7
16	71 6.0	143	10 .2	123	90 25.4	− 4 50.2	261 5.8	2 30.8
18	100 12.6	142	10 24.8	122	120 29.3	− 4 49.7	291 11.1	2 31.0
20	129 19.0	141	10 49.3	122	150 33.2	− 4 49.3	321 16.3	2 31.1
22	158 25.1	139	11 13.6	121	180 37.1	− 4 48.9	351 21.5	2 31.2
Δ					20	2	26	1

φ	SUNCE IZLAZ	SUNCE ZALAZ	TRAJANJE SUMRAKA GRAĐ.	TRAJANJE SUMRAKA ASTR.	MJESEC IZLAZ	MJESEC Δ/24	MJESEC ZALAZ	MJESEC Δ/24
N	h min	h min	h min	h min	h min	min	h min	min
60	4 50	19 13	0 46	3 9	4 3	.2	18 34	3.6
55	5 2	19 0	0 39	2 25	4 12	.5	18 20	3.2
50	5 12	18 50	0 34	2 2	4 19	.8	18 9	3.0
45	5 19	18 43	0 31	1 47	4 25	.9	18 1	2.8
40	5 26	18 36	0 28	1 36	4 30	1.1	17 54	2.7
35	5 31	18 31	0 26	1 29	4 35	1.2	17 48	2.5
30	5 36	18 26	0 24	1 23	4 38	1.3	17 42	2.4
20	5 44	18 18	0 22	1 15	4 45	1.5	17 33	2.2
10	5 51	18 10	0 21	1 11	4 51	1.7	17 25	2.0
0	5 57	18 4	0 21	1 10	4 57	1.8	17 17	1.9
10	6 4	17 57	0 21	1 10	5 2	2.0	17 10	1.7
20	6 10	17 51	0 22	1 14	5 8	2.2	17 2	1.6
30	6 18	17 43	0 24	1 20	5 15	2.4	16 53	1.4
35	6 22	17 39	0 26	1 24	5 19	2.5	16 48	1.3
40	6 27	17 34	0 27	1 30	5 24	2.6	16 42	1.1
45	6 32	17 28	0 30	1 38	5 29	2.8	16 35	1.0
50	6 39	17 21	0 33	1 47	5 36	3.0	16 27	.8
55	6 47	17 13	0 37	2 1	5 44	3.2	16 17	.6
60	6 58	17 2	0 42	2 19	5 55	3.5	16 3	.3
S								

SUNCE UT	SUNCE $e = T_p - UT$	SUNCE Δ/24	SUNCE r	MJESEC Prolaz	MJESEC Δ/24	MJESEC $\pi_\leftmoon$	MJESEC r
h	min s	s	′	h min	min	′	′
00	− 0 42.0	.6	16.0	$T_{\overline{m}}$ 11 7	1.9	55.1	15.0
12	− 0 34.5	$T_{\overline{m}_\odot}$ 12 h .6 min		Starost 28.1 d	Faza ●		

PLANETE

Pl.	$T_{\overline{m}}$	π	360−α	Vel.	Pl.	$T_{\overline{m}}$	π	360−α	Vel.
	h min	′	°			h min	′	°	
♀	13 27	.1	317	−3.8	♃	9 59	.0	9	−1.9
♂	19 10	.1	231	.4	♄	22 34	.0	179	.8

UT	SUNCE $S_\odot$	SUNCE $\delta_\odot$	PROLJ. TAČKA S_Υ	VENERA S_φ	VENERA δ_φ	MARS S_σ	MARS δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	179 53.2	9 17.4	202 3.3	158 14.2	16 45.3	72 41.2	21 7.3
2	209 53.5	9 19.2	232 8.2	188 13.1	16 47.2	102 44.6	21 6.8
4	239 53.8	9 21.0	262 13.2	218 12.0	16 49.2	132 47.9	21 6.3
6	269 54.1	9 22.9	292 18.1	248 10.8	16 51.2	162 51.2	21 5.7
8	299 54.5	9 24.7	322 23.0	278 9.7	16 53.1	192 54.5	21 5.2
10	329 54.8	9 26.5	352 27.9	308 8.5	16 55.1	222 57.9	21 4.6
12	359 55.1	9 28.3	22 32.9	338 7.4	16 57.1	253 1.2	21 4.1
14	29 55.4	9 30.1	52 37.8	8 6.2	16 59.0	283 4.5	21 3.6
16	59 55.7	9 31.8	82 42.7	38 5.1	17 1.0	313 7.8	21 3.0
18	89 56.0	9 33.6	112 47.7	68 4.0	17 2.9	343 11.1	21 2.5
20	119 56.3	9 35.4	142 52.6	98 2.8	17 4.9	13 14.4	21 1.9
22	149 56.6	9 37.2	172 57.5	128 1.6	17 6.8	43 17.7	21 1.4
Δ	2	9		−6	10	17	−3

UT	MJESEC $S_\leftmoon$	MJESEC Δ	MJESEC $\delta_\leftmoon$	MJESEC Δ	JUPITER $S_\jupiter$	JUPITER $\delta_\jupiter$	SATURN $S_\saturn$	SATURN $\delta_\saturn$
h	° ′		° ′		° ′	° ′	° ′	° ′
0	187 31.0	138	11 37.7	120	210 41.0	− 4 48.5	21 26.8	2 31.3
2	216 36.7	137	12 1.7	119	240 44.9	− 4 48.0	51 32.0	2 31.5
4	245 42.0	135	12 25.5	118	270 48.8	− 4 47.6	81 37.3	2 31.6
6	274 47.1	134	12 49.1	117	300 52.8	− 4 47.2	111 42.5	2 31.7
8	303 51.9	133	13 12.5	116	330 56.7	− 4 46.8	141 47.8	2 31.9
10	332 56.5	131	13 35.7	115	1 .6	− 4 46.3	171 53.0	2 32.0
12	2 .7	130	13 58.7	114	31 4.5	− 4 45.9	201 58.2	2 32.1
14	31 4.7	128	14 21.5	113	61 8.4	− 4 45.5	232 3.5	2 32.2
16	60 8.4	127	14 44.1	112	91 12.3	− 4 45.1	262 8.7	2 32.4
18	89 11.7	125	15 6.4	110	121 16.2	− 4 44.6	292 14.0	2 32.5
20	118 14.8	124	15 28.5	109	151 20.1	− 4 44.2	322 19.2	2 32.6
22	147 17.5	122	15 50.3	108	181 24.0	− 4 43.8	352 24.4	2 32.8
Δ					20	2	26	1

φ	SUNCE IZLAZ	SUNCE ZALAZ	TRAJANJE SUMRAKA GRAĐ.	TRAJANJE SUMRAKA ASTR.	MJESEC IZLAZ	MJESEC Δ/24	MJESEC ZALAZ	MJESEC Δ/24
N	h min	h min	h min	h min	h min	min	h min	min
60	4 47	19 15	0 46	3 13	4 9	.3	20 0	3.7
55	4 60	19 2	0 39	2 26	4 25	.7	19 38	3.3
50	5 10	18 52	0 34	2 3	4 38	.9	19 21	3.1
45	5 18	18 44	0 31	1 47	4 48	1.1	19 8	2.9
40	5 24	18 37	0 28	1 37	4 56	1.2	18 57	2.7
35	5 30	18 32	0 26	1 29	5 4	1.4	18 48	2.6
30	5 35	18 27	0 25	1 23	5 10	1.5	18 40	2.5
20	5 43	18 18	0 22	1 15	5 21	1.6	18 26	2.3
10	5 50	18 11	0 21	1 11	5 31	1.8	18 14	2.2
0	5 57	18 4	0 21	1 10	5 41	2.0	18 3	2.0
10	6 4	17 57	0 21	1 10	5 50	2.1	17 52	1.9
20	6 11	17 50	0 22	1 14	6 0	2.3	17 40	1.7
30	6 18	17 42	0 24	1 20	6 12	2.5	17 26	1.6
35	6 23	17 37	0 26	1 24	6 19	2.6	17 18	1.4
40	6 28	17 32	0 27	1 30	6 27	2.7	17 9	1.3
45	6 34	17 26	0 30	1 38	6 36	2.9	16 59	1.2
50	6 41	17 19	0 33	1 47	6 47	3.0	16 46	1.0
55	6 49	17 11	0 37	2 1	7 1	3.3	16 31	.8
60	6 60	16 60	0 42	2 19	7 19	3.7	16 10	.4
S								

SUNCE UT	SUNCE $e = T_p - UT$	SUNCE Δ/24	SUNCE r	MJESEC Prolaz	MJESEC Δ/24	MJESEC $\pi_\leftmoon$	MJESEC r
h	min s	s	′	h min	min	′	′
00	− 0 27.0	.6	16.0	$T_{\overline{m}}$ 11 52	2.0	55.6	15.1
12	− 0 19.6	$T_{\overline{m}_\odot}$ 12 h .3 min		Starost 29.1 d	Faza ●		

PLANETE

Pl.	$T_{\overline{m}}$	π	360−α	Vel.	Pl.	$T_{\overline{m}}$	π	360−α	Vel.
	h min	′	°			h min	′	°	
♀	13 28	.1	316	−3.8	♃	9 56	.0	9	−1.9
♂	19 7	.1	231	.4	♄	22 30	.0	179	.8

UT	SUNCE		PROLJ. TAČKA	VENERA		MARS	
	$S_\odot$	$\delta_\odot$	S_Υ	S_φ	δ_φ	S_σ	δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	179 56.9	9 39.0	203 2.4	158 .5	17 8.7	73 21.0	21 .8
2	209 57.2	9 40.8	233 7.4	187 59.3	17 10.7	103 24.3	21 .3
4	239 57.5	9 42.6	263 12.3	217 58.2	17 12.6	133 27.6	20 59.8
6	269 57.8	9 44.4	293 17.2	247 57.0	17 14.5	163 30.9	20 59.2
8	299 58.1	9 46.2	323 22.2	277 55.9	17 16.5	193 34.2	20 58.7
10	329 58.4	9 48.0	353 27.1	307 54.7	17 18.4	223 37.5	20 58.1
12	359 58.7	9 49.8	23 32.0	337 53.5	17 20.3	253 40.8	20 57.6
14	29 59.0	9 51.5	53 36.9	7 52.4	17 22.2	283 44.1	20 57.0
16	59 59.3	9 53.3	83 41.9	37 51.2	17 24.1	313 47.3	20 56.5
18	89 59.6	9 55.1	113 46.8	67 50.0	17 26.0	343 50.6	20 55.9
20	119 59.9	9 56.9	143 51.7	97 48.9	17 28.0	13 53.9	20 55.4
22	150 .2	9 58.7	173 56.7	127 47.7	17 29.9	43 57.2	20 54.8
Δ	2	9		−6	10	16	−3

UT	MJESEC				JUPITER		SATURN	
	$S_\leftmoon$	Δ	$\delta_\leftmoon$	Δ	S_4	δ_4	S_η	δ_η
h	° ′		° ′		° ′	° ′	° ′	° ′
0	176 20.0	121	16 11.8	106	211 27.9	− 4 43.4	22 29.7	2 32.9
2	205 22.1	119	16 33.1	105	241 31.8	− 4 43.0	52 34.9	2 33.0
4	234 23.8	117	16 54.1	103	271 35.8	− 4 42.5	82 40.1	2 33.1
6	263 25.3	116	17 14.8	102	301 39.7	− 4 42.1	112 45.4	2 33.3
8	292 26.4	114	17 35.1	100	331 43.6	− 4 41.7	142 50.6	2 33.4
10	321 27.3	112	17 55.2	99	1 47.5	− 4 41.3	172 55.9	2 33.5
12	350 27.7	111	18 14.9	97	31 51.4	− 4 40.9	203 1.1	2 33.6
14	19 27.9	109	18 34.4	95	61 55.3	− 4 40.4	233 6.3	2 33.8
16	48 27.6	107	18 53.4	94	91 59.2	− 4 40.0	263 11.6	2 33.9
18	77 27.1	106	19 12.1	92	122 3.1	− 4 39.6	293 16.8	2 34.0
20	106 26.2	104	19 30.5	90	152 7.1	− 4 39.2	323 22.0	2 34.1
22	135 25.0	102	19 48.4	88	182 11.0	− 4 38.8	353 27.3	2 34.3
Δ					20	2	26	1

φ	SUNCE		TRAJANJE SUMRAKA		MJESEC			
	IZLAZ	ZALAZ	GRAĐ.	ASTR.	IZLAZ	Δ/24	ZALAZ	Δ/24
N	h min	h min	h min	h min	h min	min	h min	min
60	4 44	19 18	0 46	3 18	4 17	.5	21 29	3.7
55	4 57	19 4	0 39	2 28	4 41	.9	20 58	3.3
50	5 8	18 54	0 34	2 3	4 59	1.1	20 35	3.0
45	5 16	18 45	0 31	1 48	5 14	1.3	20 17	2.9
40	5 23	18 38	0 28	1 37	5 26	1.5	20 3	2.8
35	5 28	18 32	0 26	1 29	5 36	1.6	19 51	2.6
30	5 33	18 27	0 25	1 23	5 45	1.7	19 40	2.6
20	5 42	18 18	0 22	1 16	6 1	1.8	19 22	2.4
10	5 50	18 11	0 21	1 11	6 15	2.0	19 6	2.3
0	5 57	18 3	0 21	1 10	6 28	2.1	18 51	2.2
10	6 4	17 56	0 21	1 10	6 41	2.2	18 37	2.1
20	6 11	17 49	0 22	1 14	6 55	2.4	18 21	1.9
30	6 19	17 41	0 24	1 20	7 11	2.5	18 3	1.8
35	6 24	17 36	0 26	1 24	7 20	2.6	17 53	1.7
40	6 29	17 31	0 27	1 30	7 31	2.8	17 41	1.6
45	6 35	17 25	0 30	1 38	7 44	2.9	17 27	1.5
50	6 42	17 17	0 33	1 48	7 60	3.1	17 10	1.3
55	6 51	17 8	0 37	2 1	8 20	3.3	16 49	1.0
60	7 2	16 57	0 43	2 19	8 47	3.8	16 20	.6
S								

UT	SUNCE			MJESEC			
	$e = T_p - UT$	Δ/24	r	Prolaz	Δ/24	$\pi_\leftmoon$	r
h	min s	s	′	h min	min	′	′
00	− 0 12.2	.6	16.0	$T_{\overline{m}}$ 12 39	2.2	56.0	15.3
12	− 0 5.0	$T_{\overline{m}_\odot}$ 12 h .1 min		Starost .5 d	Faza ●		

PLANETE

Pl.	$T_{\overline{m}}$	π	360−α	Vel.	Pl.	$T_{\overline{m}}$	π	360−α	Vel.
	h min	′	°			h min	′	°	
♀	13 28	.1	315	−3.8	♃	9 53	.0	8	−1.9
♂	19 5	.1	230	.5	♄	22 26	.0	179	.8

UT	SUNCE		PROLJ. TAČKA	VENERA		MARS	
	$S_\odot$	$\delta_\odot$	S_Υ	S_φ	δ_φ	S_σ	δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	180 .5	10 .5	204 1.6	157 46.5	17 31.8	74 .4	20 54.2
2	210 .8	10 2.2	234 6.5	187 45.3	17 33.7	104 3.7	20 53.7
4	240 1.1	10 4.0	264 11.4	217 44.1	17 35.6	134 7.0	20 53.1
6	270 1.4	10 5.8	294 16.4	247 43.0	17 37.4	164 10.2	20 52.6
8	300 1.7	10 7.6	324 21.3	277 41.8	17 39.3	194 13.5	20 52.0
10	330 2.0	10 9.3	354 26.2	307 40.6	17 41.2	224 16.7	20 51.5
12	0 2.3	10 11.1	24 31.2	337 39.4	17 43.1	254 20.0	20 50.9
14	30 2.6	10 12.9	54 36.1	7 38.2	17 45.0	284 23.3	20 50.3
16	60 2.9	10 14.6	84 41.0	37 37.0	17 46.9	314 26.5	20 49.8
18	90 3.2	10 16.4	114 45.9	67 35.8	17 48.7	344 29.8	20 49.2
20	120 3.4	10 18.2	144 50.9	97 34.6	17 50.6	14 33.0	20 48.7
22	150 3.7	10 19.9	174 55.8	127 33.4	17 52.5	44 36.2	20 48.1
Δ	1	9		−6	9	16	−3

UT	MJESEC				JUPITER		SATURN	
	$S_\leftmoon$	Δ	$\delta_\leftmoon$	Δ	S_4	δ_4	S_η	δ_η
h	° ′		° ′		° ′	° ′	° ′	° ′
0	164 23.4	100	20 6.0	86	212 14.9	− 4 38.3	23 32.5	2 34.4
2	193 21.5	99	20 23.2	84	242 18.8	− 4 37.9	53 37.7	2 34.5
4	222 19.3	97	20 40.0	82	272 22.7	− 4 37.5	83 43.0	2 34.6
6	251 16.7	95	20 56.4	80	302 26.6	− 4 37.1	113 48.2	2 34.8
8	280 13.8	94	21 12.3	78	332 30.5	− 4 36.7	143 53.4	2 34.9
10	309 10.5	92	21 27.8	75	2 34.5	− 4 36.2	173 58.7	2 35.0
12	338 7.0	90	21 42.9	73	32 38.4	− 4 35.8	204 3.9	2 35.1
14	7 3.0	89	21 57.5	71	62 42.3	− 4 35.4	234 9.1	2 35.3
16	35 58.8	87	22 11.7	68	92 46.2	− 4 35.0	264 14.4	2 35.4
18	64 54.2	86	22 25.3	66	122 50.1	− 4 34.6	294 19.6	2 35.5
20	93 49.4	84	22 38.5	64	152 54.1	− 4 34.1	324 24.8	2 35.6
22	122 44.2	83	22 51.2	61	182 58.0	− 4 33.7	354 30.1	2 35.7
Δ					20	2	26	1

φ	SUNCE		TRAJANJE SUMRAKA		MJESEC			
	IZLAZ	ZALAZ	GRAĐ.	ASTR.	IZLAZ	Δ/24	ZALAZ	Δ/24
N	h min	h min	h min	h min	h min	min	h min	min
60	4 41	19 20	0 47	3 23	4 29	.9	22 58	3.4
55	4 55	19 6	0 39	2 29	5 3	1.3	22 17	3.0
50	5 6	18 55	0 34	2 4	5 27	1.5	21 48	2.9
45	5 14	18 46	0 31	1 48	5 45	1.6	21 26	2.8
40	5 21	18 39	0 28	1 37	6 1	1.7	21 9	2.7
35	5 27	18 33	0 26	1 29	6 14	1.8	20 54	2.6
30	5 32	18 28	0 25	1 24	6 25	1.9	20 42	2.6
20	5 41	18 19	0 23	1 16	6 45	2.0	20 20	2.5
10	5 49	18 11	0 21	1 11	7 2	2.2	20 1	2.4
0	5 57	18 3	0 21	1 10	7 18	2.2	19 44	2.3
10	6 4	17 56	0 21	1 11	7 34	2.3	19 26	2.2
20	6 11	17 48	0 22	1 14	7 52	2.5	19 7	2.2
30	6 20	17 40	0 24	1 20	8 12	2.6	18 46	2.1
35	6 24	17 35	0 26	1 24	8 24	2.6	18 34	2.0
40	6 30	17 29	0 27	1 30	8 37	2.7	18 19	1.9
45	6 36	17 23	0 30	1 38	8 54	2.8	18 2	1.8
50	6 44	17 15	0 33	1 48	9 14	3.0	17 41	1.7
55	6 53	17 6	0 37	2 1	9 40	3.2	17 14	1.5
60	7 5	16 54	0 43	2 19	10 17	3.6	16 35	1.1
S								

UT	SUNCE			MJESEC			
	$e = T_p - UT$	Δ/24	r	Prolaz	Δ/24	$\pi_\leftmoon$	r
h	min s	s	′	h min	min	′	′
00	0 2.2	.6	16.0	$T_{\overline{m}}$ 13 31	2.3	56.6	15.4
12	0 9.3	$T_{\overline{m}_\odot}$ 11 h 59.8 min		Starost 1.5 d	Faza ●		

PLANETE

Pl.	$T_{\overline{m}}$	π	360−α	Vel.	Pl.	$T_{\overline{m}}$	π	360−α	Vel.
	h min	′	°			h min	′	°	
♀	13 29	.1	314	−3.8	♃	9 50	.0	8	−1.9
♂	19 2	.1	230	.5	♄	22 22	.0	180	.8

UT	SUNCE $S_\odot$	$\delta_\odot$	PROLJ. TAČKA S_Υ	VENERA S_φ	δ_φ	MARS S_σ	δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	180 4.0	10 21.7	205 .7	157 32.3	17 54.3	74 39.5	20 47.5
2	210 4.3	10 23.5	235 5.7	187 31.1	17 56.2	104 42.7	20 47.0
4	240 4.6	10 25.2	265 10.6	217 29.8	17 58.1	134 46.0	20 46.4
6	270 4.9	10 27.0	295 15.5	247 28.6	17 59.9	164 49.2	20 45.8
8	300 5.2	10 28.8	325 20.4	277 27.4	18 1.8	194 52.4	20 45.3
10	330 5.5	10 30.5	355 25.4	307 26.2	18 3.6	224 55.7	20 44.7
12	0 5.7	10 32.3	25 30.3	337 25.0	18 5.5	254 58.9	20 44.1
14	30 6.0	10 34.0	55 35.2	7 23.8	18 7.3	285 2.1	20 43.6
16	60 6.3	10 35.8	85 40.2	37 22.6	18 9.1	315 5.3	20 43.0
18	90 6.6	10 37.5	115 45.1	67 21.4	18 11.0	345 8.6	20 42.4
20	120 6.9	10 39.3	145 50.0	97 20.2	18 12.8	15 11.8	20 41.8
22	150 7.2	10 41.1	175 54.9	127 19.0	18 14.6	45 15.0	20 41.3
Δ	1	9		−6	9	16	−3

UT	MJESEC $S_\leftmoon$	Δ	$\delta_\leftmoon$	Δ	JUPITER S_4	δ_4	SATURN S_η	δ_η
h	° ′		° ′		° ′	° ′	° ′	° ′
0	151 38.7	81	23 3.5	59	213 1.9	− 4 33.3	24 35.3	2 35.9
2	180 32.9	80	23 15.2	56	243 5.8	− 4 32.9	54 40.5	2 36.0
4	209 26.8	78	23 26.3	53	273 9.7	− 4 32.5	84 45.7	2 36.1
6	238 20.4	77	23 37.0	51	303 13.7	− 4 32.1	114 51.0	2 36.2
8	267 13.7	75	23 47.1	48	333 17.6	− 4 31.6	144 56.2	2 36.3
10	296 6.8	74	23 56.7	45	3 21.5	− 4 31.2	175 1.4	2 36.5
12	324 59.6	73	24 5.7	42	33 25.4	− 4 30.8	205 6.7	2 36.6
14	353 52.1	71	24 14.2	40	63 29.3	− 4 30.4	235 11.9	2 36.7
16	22 44.4	70	24 22.1	37	93 33.3	− 4 30.0	265 17.1	2 36.8
18	51 36.5	69	24 29.5	34	123 37.2	− 4 29.6	295 22.3	2 36.9
20	80 28.3	68	24 36.3	31	153 41.1	− 4 29.1	325 27.6	2 37.1
22	109 19.9	67	24 42.4	28	183 45.0	− 4 28.7	355 32.8	2 37.2
Δ					20	2	26	1

φ	SUNCE IZLAZ	ZALAZ	TRAJANJE SUMRAKA GRAĐ.	ASTR.	MJESEC IZLAZ	Δ/24	ZALAZ	Δ/24
N	h min	h min	h min	h min	h min	min	h min	min
60	4 38	19 23	0 47	3 29	4 50	1.5	.. ..	.0
55	4 53	19 8	0 40	2 31	5 33	1.8	23 30	2.5
50	5 4	18 57	0 35	2 5	6 2	1.9	22 57	2.5
45	5 12	18 48	0 31	1 49	6 25	2.0	22 33	2.5
40	5 20	18 40	0 28	1 38	6 43	2.1	22 13	2.5
35	5 26	18 34	0 26	1 30	6 58	2.2	21 57	2.5
30	5 31	18 28	0 25	1 24	7 11	2.2	21 43	2.5
20	5 41	18 19	0 23	1 16	7 34	2.3	21 19	2.4
10	5 49	18 11	0 21	1 12	7 54	2.3	20 58	2.4
0	5 56	18 3	0 21	1 10	8 12	2.4	20 39	2.4
10	6 4	17 55	0 21	1 11	8 31	2.4	20 20	2.4
20	6 11	17 48	0 22	1 14	8 51	2.5	19 59	2.4
30	6 20	17 39	0 24	1 20	9 14	2.5	19 35	2.3
35	6 25	17 34	0 26	1 24	9 27	2.6	19 21	2.3
40	6 31	17 28	0 27	1 30	9 43	2.6	19 5	2.3
45	6 37	17 21	0 30	1 38	10 2	2.7	18 46	2.2
50	6 45	17 13	0 33	1 48	10 26	2.7	18 22	2.2
55	6 55	17 4	0 37	2 1	10 57	2.8	17 50	2.1
60	7 7	16 51	0 43	2 19	11 44	3.0	17 2	1.9
S								

SUNCE UT	e = Tp − UT	Δ/24	r	MJESEC Prolaz		Δ/24	$\pi_\leftmoon$	r
h	min s	s	′		h min	min	′	′
00	0 16.3	.6	16.0	$T_{\overline{m}}$	14 25	2.4	57.1	15.5
12	0 23.1	$T_{\overline{m}_\odot}$ 11 h 59.6 min		Starost 2.5 d		Faza ●		

PLANETE

Pl.	$T_{\overline{m}}$	π	360−α	Vel.	Pl.	$T_{\overline{m}}$	π	360−α	Vel.
	h min	′	°			h min	′	°	
♀	13 30	.1	313	−3.8	♃	9 47	.0	8	−1.9
♂	18 59	.1	230	.5	♄	22 18	.0	180	.8

UT	SUNCE $S_\odot$	$\delta_\odot$	PROLJ. TAČKA S_Υ	VENERA S_φ	δ_φ	MARS S_σ	δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	180 7.4	10 42.8	205 59.9	157 17.7	18 16.5	75 18.2	20 40.7
2	210 7.7	10 44.6	236 4.8	187 16.5	18 18.3	105 21.4	20 40.1
4	240 8.0	10 46.3	266 9.7	217 15.3	18 20.1	135 24.6	20 39.6
6	270 8.3	10 48.0	296 14.6	247 14.1	18 21.9	165 27.8	20 39.0
8	300 8.6	10 49.8	326 19.6	277 12.8	18 23.7	195 31.0	20 38.4
10	330 8.8	10 51.5	356 24.5	307 11.6	18 25.5	225 34.2	20 37.8
12	0 9.1	10 53.3	26 29.4	337 10.4	18 27.3	255 37.4	20 37.2
14	30 9.4	10 55.0	56 34.4	7 9.1	18 29.1	285 40.6	20 36.7
16	60 9.7	10 56.8	86 39.3	37 7.9	18 30.9	315 43.8	20 36.1
18	90 9.9	10 58.5	116 44.2	67 6.7	18 32.7	345 47.0	20 35.5
20	120 10.2	11 .2	146 49.1	97 5.4	18 34.5	15 50.2	20 34.9
22	150 10.5	11 2.0	176 54.1	127 4.2	18 36.3	45 53.4	20 34.3
Δ	1	9		−6	9	16	−3

UT	MJESEC $S_\leftmoon$	Δ	$\delta_\leftmoon$	Δ	JUPITER S_4	δ_4	SATURN S_η	δ_η
h	° ′		° ′		° ′	° ′	° ′	° ′
0	138 11.3	66	24 48.0	25	213 49.0	− 4 28.3	25 38.0	2 37.3
2	167 2.5	65	24 53.0	22	243 52.9	− 4 27.9	55 43.2	2 37.4
4	195 53.5	64	24 57.4	19	273 56.8	− 4 27.5	85 48.5	2 37.5
6	224 44.4	63	25 1.2	16	304 .7	− 4 27.1	115 53.7	2 37.7
8	253 35.1	63	25 4.4	13	334 4.7	− 4 26.6	145 58.9	2 37.8
10	282 25.6	62	25 7.0	10	4 8.6	− 4 26.2	176 4.1	2 37.9
12	311 16.1	61	25 8.9	7	34 12.5	− 4 25.8	206 9.4	2 38.0
14	340 6.4	61	25 10.3	4	64 16.5	− 4 25.4	236 14.6	2 38.1
16	8 56.5	60	25 11.0	0	94 20.4	− 4 25.0	266 19.8	2 38.3
18	37 46.6	60	25 11.0	−3	124 24.3	− 4 24.6	296 25.0	2 38.4
20	66 36.6	60	25 10.5	−6	154 28.2	− 4 24.2	326 30.2	2 38.5
22	95 26.6	59	25 9.3	−9	184 32.2	− 4 23.7	356 35.5	2 38.6
Δ					20	2	26	1

φ	SUNCE IZLAZ	ZALAZ	TRAJANJE SUMRAKA GRAĐ.	ASTR.	MJESEC IZLAZ	Δ/24	ZALAZ	Δ/24
N	h min	h min	h min	h min	h min	min	h min	min
60	4 35	19 25	0 48	3 36	5 26	2.5	0 19	2.6
55	4 50	19 10	0 40	2 33	6 16	2.5	.. ..	.0
50	5 2	18 58	0 35	2 6	6 49	2.5	23 58	2.1
45	5 11	18 49	0 31	1 49	7 13	2.5	23 33	2.1
40	5 18	18 41	0 28	1 38	7 33	2.5	23 13	2.2
35	5 25	18 35	0 26	1 30	7 50	2.5	22 56	2.2
30	5 30	18 29	0 25	1 24	8 4	2.5	22 42	2.3
20	5 40	18 19	0 23	1 16	8 28	2.4	22 18	2.3
10	5 48	18 11	0 21	1 12	8 49	2.4	21 57	2.4
0	5 56	18 3	0 21	1 10	9 9	2.4	21 37	2.4
10	6 4	17 55	0 21	1 11	9 29	2.4	21 17	2.5
20	6 12	17 47	0 22	1 14	9 50	2.4	20 56	2.5
30	6 21	17 38	0 24	1 20	10 14	2.4	20 31	2.6
35	6 26	17 32	0 26	1 25	10 29	2.4	20 17	2.6
40	6 32	17 26	0 28	1 30	10 46	2.4	19 60	2.6
45	6 39	17 20	0 30	1 38	11 6	2.3	19 40	2.7
50	6 47	17 11	0 33	1 48	11 31	2.3	19 14	2.7
55	6 57	17 1	0 37	2 1	12 5	2.2	18 40	2.8
60	7 10	16 48	0 43	2 19	12 57	2.1	17 48	3.0
S								

SUNCE UT	e = Tp − UT	Δ/24	r	MJESEC Prolaz		Δ/24	$\pi_\leftmoon$	r
h	min s	s	′		h min	min	′	′
00	0 29.9	.6	16.0	$T_{\overline{m}}$	15 23	2.4	57.5	15.7
12	0 36.6	$T_{\overline{m}_\odot}$ 11 h 59.4 min		Starost 3.5 d		Faza ●		

PLANETE

Pl.	$T_{\overline{m}}$	π	360−α	Vel.	Pl.	$T_{\overline{m}}$	π	360−α	Vel.
	h min	′	°			h min	′	°	
♀	13 31	.1	311	−3.8	♃	9 43	.0	8	−1.9
♂	18 57	.1	229	.5	♄	22 14	.0	180	.8

UT	SUNCE $S_\odot$		SUNCE $\delta_\odot$		PROLJ. TAČKA S_Υ		VENERA S_φ		VENERA δ_φ		MARS S_σ		MARS δ_σ	
h	°	′	°	′	°	′	°	′	°	′	°	′	°	′
0	180	10.8	11	3.7	206	59.0	157	2.9	18	38.1	75	56.6	20	33.8
2	210	11.0	11	5.4	237	3.9	187	1.7	18	39.9	105	59.8	20	33.2
4	240	11.3	11	7.2	267	8.9	217	.5	18	41.7	136	2.9	20	32.6
6	270	11.6	11	8.9	297	13.8	246	59.2	18	43.4	166	6.1	20	32.0
8	300	11.8	11	10.6	327	18.7	276	58.0	18	45.2	196	9.3	20	31.4
10	330	12.1	11	12.4	357	23.6	306	56.7	18	47.0	226	12.5	20	30.8
12	0	12.4	11	14.1	27	28.6	336	55.5	18	48.7	256	15.6	20	30.3
14	30	12.7	11	15.8	57	33.5	6	54.2	18	50.5	286	18.8	20	29.7
16	60	12.9	11	17.6	87	38.4	36	52.9	18	52.3	316	22.0	20	29.1
18	90	13.2	11	19.3	117	43.4	66	51.7	18	54.0	346	25.1	20	28.5
20	120	13.5	11	21.0	147	48.3	96	50.4	18	55.8	16	28.3	20	27.9
22	150	13.7	11	22.7	177	53.2	126	49.2	18	57.5	46	31.5	20	27.3
Δ		1		9				−6		9		16		−3

UT	MJESEC $S_\leftmoon$		MJESEC Δ	MJESEC $\delta_\leftmoon$		MJESEC Δ	JUPITER S_4		JUPITER δ_4		SATURN S_η		SATURN δ_η	
h	°	′		°	′		°	′	°	′	°	′	°	′
0	124	16.5	59	25	7.5	−12	214	36.1	− 4	23.3	26	40.7	2	38.7
2	153	6.3	59	25	5.0	−15	244	40.0	− 4	22.9	56	45.9	2	38.8
4	181	56.1	59	25	2.0	−19	274	44.0	− 4	22.5	86	51.1	2	39.0
6	210	45.9	59	24	58.2	−22	304	47.9	− 4	22.1	116	56.3	2	39.1
8	239	35.7	59	24	53.9	−25	334	51.8	− 4	21.7	147	1.6	2	39.2
10	268	25.5	59	24	48.9	−28	4	55.8	− 4	21.3	177	6.8	2	39.3
12	297	15.3	59	24	43.3	−31	34	59.7	− 4	20.8	207	12.0	2	39.4
14	326	5.2	60	24	37.0	−34	65	3.6	− 4	20.4	237	17.2	2	39.5
16	354	55.1	60	24	30.2	−37	95	7.5	− 4	20.0	267	22.4	2	39.7
18	23	45.0	60	24	22.7	−41	125	11.5	− 4	19.6	297	27.6	2	39.8
20	52	35.1	61	24	14.5	−44	155	15.4	− 4	19.2	327	32.9	2	39.9
22	81	25.2	61	24	5.8	−47	185	19.4	− 4	18.8	357	38.1	2	40.0
Δ								20		2		26		1

φ	SUNCE IZLAZ	SUNCE ZALAZ	TRAJANJE SUMRAKA GRAĐ.	TRAJANJE SUMRAKA ASTR.	MJESEC IZLAZ	MJESEC Δ/24	MJESEC ZALAZ	MJESEC Δ/24
N	h min	h min	h min	h min	h min	min	h min	min
60	4 32	19 28	0 48	3 45	6 25	3.4	1 21	1.7
55	4 48	19 12	0 40	2 34	7 15	3.1	0 31	1.9
50	4 60	18 60	0 35	2 7	7 48	2.9	. . .	.0
45	5 9	18 50	0 31	1 50	8 12	2.8	. . .	.0
40	5 17	18 42	0 28	1 39	8 32	2.8	. . .	.0
35	5 23	18 36	0 26	1 30	8 49	2.7	23 50	2.0
30	5 29	18 30	0 25	1 24	9 3	2.7	23 37	2.1
20	5 39	18 19	0 23	1 16	9 27	2.6	23 14	2.2
10	5 48	18 11	0 21	1 12	9 48	2.5	22 54	2.3
0	5 56	18 3	0 21	1 10	10 7	2.4	22 35	2.4
10	6 4	17 54	0 21	1 11	10 27	2.3	22 16	2.5
20	6 12	17 46	0 22	1 14	10 47	2.3	21 56	2.6
30	6 21	17 37	0 24	1 20	11 12	2.2	21 33	2.7
35	6 27	17 31	0 26	1 25	11 26	2.1	21 19	2.8
40	6 33	17 25	0 28	1 30	11 42	2.0	21 3	2.9
45	6 40	17 18	0 30	1 38	12 2	2.0	20 44	3.0
50	6 48	17 9	0 33	1 48	12 26	1.8	20 20	3.1
55	6 59	16 59	0 37	2 1	12 59	1.6	19 48	3.3
60	7 12	16 45	0 43	2 20	13 47	1.3	18 59	3.7
S								

SUNCE UT	SUNCE $e = T_p - UT$	SUNCE Δ/24	SUNCE r	MJESEC Prolaz	MJESEC Δ/24	MJESEC $\pi_\leftmoon$	MJESEC r
h	min s	s	′	h min	min	′	′
00	0 43.2	.5	16.0	$T_{\overline{m}}$ 16 21	2.4	58.0	15.8
12	0 49.7	$T_{\overline{m}_\odot}$ 11 h 59.2 min		Starost 4.5 d	Faza ◑		

PLANETE

Pl.	$T_{\overline{m}}$	π	360−α	Vel.	Pl.	$T_{\overline{m}}$	π	360−α	Vel.
	h min	′	°			h min	′	°	
♀	13 32	.1	310	−3.8	♃	9 40	.0	8	−1.9
♂	18 54	.1	229	.5	♄	22 9	.0	180	.8

UT	SUNCE $S_\odot$		SUNCE $\delta_\odot$		PROLJ. TAČKA S_Υ		VENERA S_φ		VENERA δ_φ		MARS S_σ		MARS δ_σ	
h	°	′	°	′	°	′	°	′	°	′	°	′	°	′
0	180	14.0	11	24.4	207	58.1	156	47.9	18	59.3	76	34.6	20	26.7
2	210	14.3	11	26.2	238	3.1	186	46.6	19	1.0	106	37.8	20	26.1
4	240	14.5	11	27.9	268	8.0	216	45.4	19	2.7	136	40.9	20	25.5
6	270	14.8	11	29.6	298	12.9	246	44.1	19	4.5	166	44.1	20	24.9
8	300	15.0	11	31.3	328	17.9	276	42.8	19	6.2	196	47.2	20	24.3
10	330	15.3	11	33.0	358	22.8	306	41.5	19	7.9	226	50.4	20	23.7
12	0	15.6	11	34.7	28	27.7	336	40.3	19	9.7	256	53.5	20	23.1
14	30	15.8	11	36.4	58	32.6	6	39.0	19	11.4	286	56.7	20	22.5
16	60	16.1	11	38.2	88	37.6	36	37.7	19	13.1	316	59.8	20	22.0
18	90	16.3	11	39.9	118	42.5	66	36.4	19	14.8	347	3.0	20	21.4
20	120	16.6	11	41.6	148	47.4	96	35.2	19	16.5	17	6.1	20	20.8
22	150	16.9	11	43.3	178	52.4	126	33.9	19	18.2	47	9.2	20	20.2
Δ		1		9				−6		9		16		−3

UT	MJESEC $S_\leftmoon$		MJESEC Δ	MJESEC $\delta_\leftmoon$		MJESEC Δ	JUPITER S_4		JUPITER δ_4		SATURN S_η		SATURN δ_η	
h	°	′		°	′		°	′	°	′	°	′	°	′
0	110	15.4	62	23	56.4	−50	215	23.3	− 4	18.4	27	43.3	2	40.1
2	139	5.7	62	23	46.5	−53	245	27.2	− 4	18.0	57	48.5	2	40.2
4	167	56.2	63	23	35.9	−56	275	31.2	− 4	17.5	87	53.7	2	40.3
6	196	46.7	63	23	24.7	−59	305	35.1	− 4	17.1	117	58.9	2	40.5
8	225	37.4	64	23	12.9	−62	335	39.0	− 4	16.7	148	4.1	2	40.6
10	254	28.3	65	23	.5	−65	5	43.0	− 4	16.3	178	9.4	2	40.7
12	283	19.2	66	22	47.6	−68	35	46.9	− 4	15.9	208	14.6	2	40.8
14	312	10.4	67	22	34.0	−71	65	50.8	− 4	15.5	238	19.8	2	40.9
16	341	1.7	67	22	19.9	−73	95	54.8	− 4	15.1	268	25.0	2	41.0
18	9	53.2	68	22	5.2	−76	125	58.7	− 4	14.7	298	30.2	2	41.1
20	38	44.9	69	21	50.0	−79	156	2.7	− 4	14.3	328	35.4	2	41.2
22	67	36.8	70	21	34.2	−82	186	6.6	− 4	13.9	358	40.6	2	41.4
Δ								20		2		26		1

φ	SUNCE IZLAZ	SUNCE ZALAZ	TRAJANJE SUMRAKA GRAĐ.	TRAJANJE SUMRAKA ASTR.	MJESEC IZLAZ	MJESEC Δ/24	MJESEC ZALAZ	MJESEC Δ/24
N	h min	h min	h min	h min	h min	min	h min	min
60	4 29	19 30	0 48	3 58	7 47	3.9	2 1	1.0
55	4 45	19 14	0 40	2 36	8 29	3.5	1 17	1.4
50	4 58	19 1	0 35	2 8	8 59	3.3	0 47	1.6
45	5 7	18 52	0 31	1 51	9 21	3.1	0 24	1.8
40	5 15	18 43	0 28	1 39	9 39	3.0	0 6	1.9
35	5 22	18 36	0 26	1 31	9 53	2.8	. . .	.0
30	5 28	18 30	0 25	1 24	10 6	2.8	. . .	.0
20	5 38	18 20	0 23	1 16	10 28	2.6	. . .	.0
10	5 47	18 11	0 21	1 12	10 47	2.5	23 49	2.2
0	5 56	18 2	0 21	1 10	11 5	2.4	23 32	2.3
10	6 4	17 54	0 21	1 11	11 23	2.2	23 16	2.4
20	6 12	17 45	0 22	1 14	11 42	2.1	22 58	2.6
30	6 22	17 36	0 24	1 20	12 4	1.9	22 38	2.8
35	6 28	17 30	0 26	1 25	12 16	1.8	22 26	2.9
40	6 34	17 24	0 28	1 31	12 31	1.7	22 12	3.0
45	6 41	17 16	0 30	1 38	12 48	1.6	21 55	3.2
50	6 50	17 7	0 33	1 48	13 10	1.4	21 35	3.4
55	7 0	16 57	0 37	2 1	13 38	1.2	21 8	3.6
60	7 14	16 43	0 43	2 20	14 17	.7	20 29	4.1
S								

SUNCE UT	SUNCE $e = T_p - UT$	SUNCE Δ/24	SUNCE r	MJESEC Prolaz	MJESEC Δ/24	MJESEC $\pi_\leftmoon$	MJESEC r
h	min s	s	′	h min	min	′	′
00	0 56.1	.5	15.9	$T_{\overline{m}}$ 17 19	2.3	58.4	15.9
12	1 2.4	$T_{\overline{m}_\odot}$ 11 h 59.0 min		Starost 5.5 d	Faza ◑		

PLANETE

Pl.	$T_{\overline{m}}$	π	360−α	Vel.	Pl.	$T_{\overline{m}}$	π	360−α	Vel.
	h min	′	°			h min	′	°	
♀	13 33	.1	309	−3.8	♃	9 37	.0	7	−1.9
♂	18 52	.1	229	.5	♄	22 5	.0	180	.8

UT	SUNCE $S_\odot$	$\delta_\odot$	PROLJ. TAČKA S_Υ	VENERA S_φ	δ_φ	MARS S_σ	δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	180 17.1	11 45.0	208 57.3	156 32.6	19 19.9	77 12.4	20 19.6
2	210 17.4	11 46.7	239 2.2	186 31.3	19 21.6	107 15.5	20 19.0
4	240 17.6	11 48.4	269 7.1	216 30.0	19 23.3	137 18.6	20 18.3
6	270 17.9	11 50.1	299 12.1	246 28.7	19 25.0	167 21.7	20 17.7
8	300 18.1	11 51.8	329 17.0	276 27.4	19 26.7	197 24.9	20 17.1
10	330 18.4	11 53.5	359 21.9	306 26.1	19 28.4	227 28.0	20 16.5
12	0 18.6	11 55.2	29 26.8	336 24.8	19 30.1	257 31.1	20 15.9
14	30 18.9	11 56.9	59 31.8	6 23.5	19 31.8	287 34.2	20 15.3
16	60 19.1	11 58.6	89 36.7	36 22.2	19 33.4	317 37.3	20 14.7
18	90 19.4	12 .2	119 41.6	66 20.9	19 35.1	347 40.5	20 14.1
20	120 19.6	12 1.9	149 46.6	96 19.6	19 36.8	17 43.6	20 13.5
22	150 19.9	12 3.6	179 51.5	126 18.3	19 38.4	47 46.7	20 12.9
Δ	1	8		−6	8	16	−3

UT	MJESEC $S_\leftmoon$	Δ	$\delta_\leftmoon$	Δ	JUPITER $S_\jupiter$	$\delta_\jupiter$	SATURN $S_\saturn$	$\delta_\saturn$
h	° ′		° ′		° ′	° ′	° ′	° ′
0	96 28.8	71	21 17.8	−84	216 10.5	− 4 13.4	28 45.8	2 41.5
2	125 21.1	72	21 .9	−87	246 14.5	− 4 13.0	58 51.0	2 41.6
4	154 13.6	73	20 43.5	−90	276 18.4	− 4 12.6	88 56.3	2 41.7
6	183 6.2	74	20 25.5	−92	306 22.4	− 4 12.2	119 1.5	2 41.8
8	211 59.1	76	20 7.1	−95	336 26.3	− 4 11.8	149 6.7	2 41.9
10	240 52.2	77	19 48.1	−97	6 30.2	− 4 11.4	179 11.9	2 42.0
12	269 45.5	78	19 28.7	−100	36 34.2	− 4 11.0	209 17.1	2 42.1
14	298 39.1	79	19 8.7	−102	66 38.1	− 4 10.6	239 22.3	2 42.2
16	327 32.8	80	18 48.3	−104	96 42.1	− 4 10.2	269 27.5	2 42.4
18	356 26.8	81	18 27.4	−107	126 46.0	− 4 9.8	299 32.7	2 42.5
20	25 21.0	82	18 6.1	−109	156 50.0	− 4 9.4	329 37.9	2 42.6
22	54 15.5	83	17 44.3	−111	186 53.9	− 4 8.9	359 43.1	2 42.7
Δ					20	2	26	1

φ	SUNCE IZLAZ	ZALAZ	TRAJANJE SUMRAKA GRAĐ.	ASTR.	MJESEC IZLAZ	Δ/24	ZALAZ	Δ/24
N	h min	h min	h min	h min	h min	min	h min	min
60	4 27	19 33	0 49	: ::	9 21	4.1	2 24	.6
55	4 43	19 16	0 40	2 38	9 54	3.7	1 50	1.0
50	4 56	19 3	0 35	2 9	10 17	3.4	1 26	1.3
45	5 6	18 53	0 31	1 51	10 35	3.2	1 7	1.5
40	5 14	18 44	0 29	1 39	10 49	3.0	0 51	1.6
35	5 21	18 37	0 26	1 31	11 2	2.9	0 38	1.7
30	5 27	18 31	0 25	1 25	11 12	2.8	0 26	1.8
20	5 38	18 20	0 23	1 16	11 31	2.6	0 6	2.0
10	5 47	18 11	0 22	1 12	11 47	2.4	. . .	.0
0	5 55	18 2	0 21	1 10	12 2	2.3	. . .	.0
10	6 4	17 54	0 21	1 11	12 16	2.1	. . .	.0
20	6 13	17 45	0 22	1 14	12 32	1.9	. . .	.0
30	6 23	17 34	0 24	1 20	12 50	1.7	23 44	2.8
35	6 28	17 29	0 26	1 25	13 1	1.6	23 35	2.9
40	6 35	17 22	0 28	1 31	13 13	1.5	23 24	3.0
45	6 42	17 15	0 30	1 38	13 27	1.3	23 11	3.2
50	6 51	17 6	0 33	1 48	13 44	1.1	22 55	3.4
55	7 2	16 54	0 37	2 2	14 6	.9	22 35	3.7
60	7 17	16 40	0 43	2 20	14 35	.5	22 7	4.1
S								

SUNCE UT	e = Tp − UT	Δ/24	r	MJESEC Prolaz		Δ/24	$\pi_\leftmoon$	r
h	min s	s	′		h min	min	′	′
00	1 8.6	.5	15.9	$T_{\overline{m}}$	18 15	2.2	58.8	16.0
12	1 14.7	$T_{\overline{m}_\odot}$ 11 h 58.8 min		Starost 6.5 d		Faza ◐		

PLANETE

Pl.	$T_{\overline{m}}$	π	360−α	Vel.	Pl.	$T_{\overline{m}}$	π	360−α	Vel.
	h min	′	°			h min	′	°	
♀	13 34	.1	308	−3.8	♃	9 34	.0	7	−1.9
♂	18 49	.1	228	.6	♄	22 1	.0	180	.8

UT	SUNCE $S_\odot$	$\delta_\odot$	PROLJ. TAČKA S_Υ	VENERA S_φ	δ_φ	MARS S_σ	δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	180 20.1	12 5.3	209 56.4	156 17.0	19 40.1	77 49.8	20 12.3
2	210 20.4	12 7.0	240 1.3	186 15.7	19 41.8	107 52.9	20 11.7
4	240 20.6	12 8.7	270 6.3	216 14.4	19 43.4	137 56.0	20 11.1
6	270 20.9	12 10.4	300 11.2	246 13.1	19 45.1	167 59.1	20 10.4
8	300 21.1	12 12.1	330 16.1	276 11.8	19 46.7	198 2.2	20 9.8
10	330 21.4	12 13.7	0 21.1	306 10.4	19 48.3	228 5.3	20 9.2
12	0 21.6	12 15.4	30 26.0	336 9.1	19 50.0	258 8.4	20 8.6
14	30 21.9	12 17.1	60 30.9	6 7.8	19 51.6	288 11.5	20 8.0
16	60 22.1	12 18.8	90 35.8	36 6.5	19 53.2	318 14.6	20 7.4
18	90 22.3	12 20.4	120 40.8	66 5.2	19 54.9	348 17.7	20 6.8
20	120 22.6	12 22.1	150 45.7	96 3.8	19 56.5	18 20.7	20 6.1
22	150 22.8	12 23.8	180 50.6	126 2.5	19 58.1	48 23.8	20 5.5
Δ	1	8		−7	8	15	−3

UT	MJESEC $S_\leftmoon$	Δ	$\delta_\leftmoon$	Δ	JUPITER $S_\jupiter$	$\delta_\jupiter$	SATURN $S_\saturn$	$\delta_\saturn$
h	° ′		° ′		° ′	° ′	° ′	° ′
0	83 10.1	84	17 22.0	−113	216 57.9	− 4 8.5	29 48.3	2 42.8
2	112 5.0	85	16 59.4	−115	247 1.8	− 4 8.1	59 53.5	2 42.9
4	141 .1	87	16 36.3	−117	277 5.8	− 4 7.7	89 58.7	2 43.0
6	169 55.4	88	16 12.8	−119	307 9.7	− 4 7.3	120 3.9	2 43.1
8	198 50.9	89	15 48.9	−121	337 13.6	− 4 6.9	150 9.1	2 43.2
10	227 46.6	90	15 24.6	−123	7 17.6	− 4 6.5	180 14.3	2 43.3
12	256 42.6	91	15 .0	−125	37 21.5	− 4 6.1	210 19.5	2 43.4
14	285 38.8	92	14 35.0	−127	67 25.5	− 4 5.7	240 24.8	2 43.5
16	314 35.1	93	14 9.6	−129	97 29.4	− 4 5.3	270 30.0	2 43.7
18	343 31.7	94	13 43.9	−130	127 33.4	− 4 4.9	300 35.2	2 43.8
20	12 28.5	95	13 17.8	−132	157 37.3	− 4 4.5	330 40.4	2 43.9
22	41 25.4	96	12 51.4	−133	187 41.3	− 4 4.1	0 45.6	2 44.0
Δ					20	2	26	1

φ	SUNCE IZLAZ	ZALAZ	TRAJANJE SUMRAKA GRAĐ.	ASTR.	MJESEC IZLAZ	Δ/24	ZALAZ	Δ/24
N	h min	h min	h min	h min	h min	min	h min	min
60	4 24	19 35	0 49	: ::	11 0	4.1	2 39	.4
55	4 41	19 18	0 41	2 41	11 22	3.7	2 14	.8
50	4 54	19 5	0 35	2 10	11 39	3.4	1 56	1.0
45	5 4	18 54	0 31	1 52	11 51	3.2	1 42	1.2
40	5 12	18 45	0 29	1 40	12 2	3.0	1 30	1.4
35	5 20	18 38	0 27	1 31	12 11	2.9	1 19	1.5
30	5 26	18 32	0 25	1 25	12 19	2.8	1 10	1.7
20	5 37	18 20	0 23	1 17	12 33	2.5	0 55	1.9
10	5 46	18 11	0 22	1 12	12 45	2.3	0 41	2.0
0	5 55	18 2	0 21	1 10	12 56	2.2	0 28	2.2
10	6 4	17 53	0 21	1 11	13 7	2.0	0 15	2.4
20	6 13	17 44	0 22	1 14	13 19	1.8	0 1	2.6
30	6 23	17 33	0 24	1 20	13 32	1.6	. . .	.0
35	6 29	17 28	0 26	1 25	13 40	1.5	. . .	.0
40	6 36	17 21	0 28	1 31	13 48	1.3	. . .	.0
45	6 44	17 13	0 30	1 38	13 59	1.1	. . .	.0
50	6 53	17 4	0 33	1 48	14 11	.9	. . .	.0
55	7 4	16 52	0 38	2 2	14 26	.7	. . .	.0
60	7 19	16 37	0 44	2 20	14 46	.3	23 46	4.1
S								

SUNCE UT	e = Tp − UT	Δ/24	r	MJESEC Prolaz		Δ/24	$\pi_\leftmoon$	r
h	min s	s	′		h min	min	′	′
00	1 20.7	.5	15.9	$T_{\overline{m}}$	19 8	2.2	59.2	16.1
12	1 26.6	$T_{\overline{m}_\odot}$ 11 h 58.6 min		Starost 7.5 d		Faza ◐		

PLANETE

Pl.	$T_{\overline{m}}$	π	360−α	Vel.	Pl.	$T_{\overline{m}}$	π	360−α	Vel.
	h min	′	°			h min	′	°	
♀	13 35	.1	306	−3.8	♃	9 31	.0	7	−1.9
♂	18 47	.1	228	.6	♄	21 57	.0	180	.8

UT	SUNCE $S_\odot$	SUNCE $\delta_\odot$	PROLJ. TAČKA S_Υ	VENERA S_φ	VENERA δ_φ	MARS S_σ	MARS δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	180 23.1	12 25.5	210 55.6	156 1.2	19 59.7	78 26.9	20 4.9
2	210 23.3	12 27.1	241 .5	185 59.8	20 1.4	108 30.0	20 4.3
4	240 23.5	12 28.8	271 5.4	215 58.5	20 3.0	138 33.1	20 3.7
6	270 23.8	12 30.5	301 10.3	245 57.2	20 4.6	168 36.2	20 3.0
8	300 24.0	12 32.1	331 15.3	275 55.8	20 6.2	198 39.2	20 2.4
10	330 24.2	12 33.8	1 20.2	305 54.5	20 7.8	228 42.3	20 1.8
12	0 24.5	12 35.4	31 25.1	335 53.2	20 9.4	258 45.4	20 1.2
14	30 24.7	12 37.1	61 30.1	5 51.8	20 11.0	288 48.4	20 .5
16	60 24.9	12 38.8	91 35.0	35 50.5	20 12.5	318 51.5	19 59.9
18	90 25.2	12 40.4	121 39.9	65 49.1	20 14.1	348 54.6	19 59.3
20	120 25.4	12 42.1	151 44.8	95 47.8	20 15.7	18 57.6	19 58.7
22	150 25.6	12 43.7	181 49.8	125 46.4	20 17.3	49 .7	19 58.0
Δ	1	8		−7	8	15	−3

UT	MJESEC $S_\leftmoon$	MJESEC Δ	MJESEC $\delta_\leftmoon$	MJESEC Δ	JUPITER S_4	JUPITER δ_4	SATURN S_η	SATURN δ_η
h	° ′		° ′		° ′	° ′	° ′	° ′
0	70 22.5	97	12 24.8	−135	217 45.2	− 4 3.7	30 50.8	2 44.1
2	99 19.9	97	11 57.8	−136	247 49.2	− 4 3.3	60 56.0	2 44.2
4	128 17.4	98	11 30.5	−138	277 53.1	− 4 2.9	91 1.2	2 44.3
6	157 15.0	99	11 3.0	−139	307 57.1	− 4 2.5	121 6.4	2 44.4
8	186 12.9	100	10 35.1	−140	338 1.0	− 4 2.0	151 11.5	2 44.5
10	215 10.9	101	10 7.1	−142	8 5.0	− 4 1.6	181 16.7	2 44.6
12	244 9.0	101	9 38.8	−143	38 9.0	− 4 1.2	211 21.9	2 44.7
14	273 7.3	102	9 10.2	−144	68 12.9	− 4 .8	241 27.1	2 44.8
16	302 5.7	103	8 41.5	−145	98 16.9	− 4 .4	271 32.3	2 44.9
18	331 4.3	103	8 12.5	−146	128 20.8	− 4 .0	301 37.5	2 45.0
20	0 3.0	104	7 43.3	−147	158 24.8	− 3 59.6	331 42.7	2 45.1
22	29 1.8	105	7 14.0	−148	188 28.7	− 3 59.2	1 47.9	2 45.2
Δ					20	2	26	1

φ	SUNCE IZLAZ	SUNCE ZALAZ	TRAJANJE SUMRAKA GRAĐ.	TRAJANJE SUMRAKA ASTR.	MJESEC IZLAZ	MJESEC Δ/24	MJESEC ZALAZ	MJESEC Δ/24
N	h min	h min	h min	h min	h min	min	h min	min
60	4 21	19 38	0 50	: ::	12 39	4.1	2 48	.3
55	4 38	19 20	0 41	2 43	12 51	3.7	2 33	.6
50	4 52	19 6	0 35	2 11	13 1	3.4	2 21	.9
45	5 2	18 55	0 32	1 52	13 9	3.2	2 11	1.1
40	5 11	18 46	0 29	1 40	13 15	3.0	2 3	1.3
35	5 18	18 39	0 27	1 31	13 21	2.9	1 56	1.4
30	5 25	18 32	0 25	1 25	13 25	2.7	1 50	1.5
20	5 36	18 21	0 23	1 17	13 34	2.5	1 39	1.7
10	5 46	18 11	0 22	1 12	13 41	2.3	1 30	1.9
0	5 55	18 2	0 21	1 10	13 48	2.1	1 21	2.1
10	6 4	17 53	0 21	1 11	13 55	1.9	1 12	2.3
20	6 13	17 43	0 22	1 14	14 2	1.7	1 2	2.5
30	6 24	17 32	0 24	1 20	14 10	1.5	0 51	2.7
35	6 30	17 26	0 26	1 25	14 15	1.4	0 44	2.9
40	6 37	17 19	0 28	1 31	14 20	1.2	0 37	3.0
45	6 45	17 11	0 30	1 38	14 26	1.0	0 28	3.2
50	6 54	17 2	0 33	1 48	14 33	.8	0 18	3.4
55	7 6	16 50	0 38	2 2	14 42	.6	0 5	3.7
60	7 22	16 34	0 44	2 21	14 54	.3	. . .	.0
S								

SUNCE UT	SUNCE $e = T_p - UT$	SUNCE Δ/24	SUNCE r	MJESEC Prolaz	MJESEC Δ/24	MJESEC $\pi_\leftmoon$	MJESEC r
h	min s	s	′	h min	min	′	′
00	1 32.4	.5	15.9	$T_{\overline{m}}$ 19 60	2.1	59.5	16.2
12	1 38.0	$T_{\overline{m}_\odot}$ 11 h 58.4 min		Starost 8.5 d	Faza ◐		

PLANETE

Pl.	$T_{\overline{m}}$	π	360−α	Vel.	Pl.	$T_{\overline{m}}$	π	360−α	Vel.
	h min	′	°			h min	′	°	
♀	13 37	.1	305	−3.8	♃	9 28	.0	7	−1.9
♂	18 44	.1	228	.6	♄	21 53	.0	180	.8

UT	SUNCE $S_\odot$	SUNCE $\delta_\odot$	PROLJ. TAČKA S_Υ	VENERA S_φ	VENERA δ_φ	MARS S_σ	MARS δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	180 25.9	12 45.4	211 54.7	155 45.1	20 18.9	79 3.8	19 57.4
2	210 26.1	12 47.0	241 59.6	185 43.7	20 20.4	109 6.8	19 56.8
4	240 26.3	12 48.7	272 4.6	215 42.4	20 22.0	139 9.9	19 56.2
6	270 26.5	12 50.3	302 9.5	245 41.0	20 23.5	169 12.9	19 55.5
8	300 26.8	12 52.0	332 14.4	275 39.6	20 25.1	199 16.0	19 54.9
10	330 27.0	12 53.6	2 19.3	305 38.3	20 26.7	229 19.0	19 54.3
12	0 27.2	12 55.3	32 24.3	335 36.9	20 28.2	259 22.1	19 53.6
14	30 27.5	12 56.9	62 29.2	5 35.6	20 29.8	289 25.1	19 53.0
16	60 27.7	12 58.6	92 34.1	35 34.2	20 31.3	319 28.2	19 52.4
18	90 27.9	13 .2	122 39.1	65 32.8	20 32.8	349 31.2	19 51.7
20	120 28.1	13 1.8	152 44.0	95 31.5	20 34.4	19 34.2	19 51.1
22	150 28.3	13 3.5	182 48.9	125 30.1	20 35.9	49 37.3	19 50.5
Δ	1	8		−7	8	15	−3

UT	MJESEC $S_\leftmoon$	MJESEC Δ	MJESEC $\delta_\leftmoon$	MJESEC Δ	JUPITER S_4	JUPITER δ_4	SATURN S_η	SATURN δ_η
h	° ′		° ′		° ′	° ′	° ′	° ′
0	58 .7	105	6 44.5	−148	218 32.7	− 3 58.8	31 53.1	2 45.3
2	86 59.7	106	6 14.8	−149	248 36.6	− 3 58.4	61 58.3	2 45.4
4	115 58.8	106	5 45.0	−150	278 40.6	− 3 58.0	92 3.5	2 45.6
6	144 58.0	106	5 15.0	−150	308 44.6	− 3 57.6	122 8.7	2 45.7
8	173 57.3	107	4 44.9	−151	338 48.5	− 3 57.2	152 13.9	2 45.8
10	202 56.6	107	4 14.7	−152	8 52.5	− 3 56.8	182 19.1	2 45.9
12	231 56.0	107	3 44.4	−152	38 56.4	− 3 56.4	212 24.3	2 46.0
14	260 55.5	108	3 14.0	−152	69 .4	− 3 56.0	242 29.5	2 46.1
16	289 55.0	108	2 43.5	−153	99 4.4	− 3 55.6	272 34.7	2 46.2
18	318 54.6	108	2 13.0	−153	129 8.3	− 3 55.2	302 39.8	2 46.3
20	347 54.2	108	1 42.4	−153	159 12.3	− 3 54.8	332 45.0	2 46.4
22	16 53.8	108	1 11.7	−153	189 16.2	− 3 54.4	2 50.2	2 46.5
Δ					20	2	26	1

φ	SUNCE IZLAZ	SUNCE ZALAZ	TRAJANJE SUMRAKA GRAĐ.	TRAJANJE SUMRAKA ASTR.	MJESEC IZLAZ	MJESEC Δ/24	MJESEC ZALAZ	MJESEC Δ/24
N	h min	h min	h min	h min	h min	min	h min	min
60	4 18	19 40	0 50	: ::	14 16	4.0	2 55	.2
55	4 36	19 22	0 41	2 45	14 20	3.7	2 48	.6
50	4 50	19 8	0 36	2 12	14 23	3.4	2 42	.8
45	5 1	18 57	0 32	1 53	14 25	3.2	2 37	1.0
40	5 10	18 47	0 29	1 41	14 28	3.0	2 33	1.2
35	5 17	18 40	0 27	1 32	14 29	2.9	2 30	1.3
30	5 24	18 33	0 25	1 25	14 31	2.7	2 26	1.5
20	5 36	18 21	0 23	1 17	14 34	2.5	2 21	1.7
10	5 46	18 11	0 22	1 12	14 36	2.3	2 16	1.9
0	5 55	18 2	0 21	1 11	14 38	2.1	2 12	2.1
10	6 4	17 52	0 21	1 11	14 40	1.9	2 7	2.3
20	6 14	17 43	0 23	1 14	14 43	1.7	2 2	2.5
30	6 25	17 31	0 24	1 20	14 46	1.5	1 57	2.7
35	6 31	17 25	0 26	1 25	14 47	1.3	1 53	2.9
40	6 38	17 18	0 28	1 31	14 49	1.2	1 50	3.0
45	6 46	17 10	0 30	1 39	14 51	1.0	1 45	3.2
50	6 56	16 60	0 33	1 49	14 53	.8	1 40	3.4
55	7 8	16 48	0 38	2 2	14 56	.6	1 34	3.7
60	7 24	16 31	0 44	2 21	15 0	.2	1 25	4.0
S								

SUNCE UT	SUNCE $e = T_p - UT$	SUNCE Δ/24	SUNCE r	MJESEC Prolaz	MJESEC Δ/24	MJESEC $\pi_\leftmoon$	MJESEC r
h	min s	s	′	h min	min	′	′
00	1 43.6	.4	15.9	$T_{\overline{m}}$ 20 50	2.1	59.7	16.3
12	1 49.0	$T_{\overline{m}_\odot}$ 11 h 58.2 min		Starost 9.5 d	Faza ◐		

PLANETE

Pl.	$T_{\overline{m}}$	π	360−α	Vel.	Pl.	$T_{\overline{m}}$	π	360−α	Vel.
	h min	′	°			h min	′	°	
♀	13 38	.1	304	−3.8	♃	9 25	.0	7	−2.0
♂	18 42	.1	227	.6	♄	21 49	.0	180	.8

UT	SUNCE $S_\odot$	SUNCE $\delta_\odot$	PROLJ. TAČKA S_Υ	VENERA S_φ	VENERA δ_φ	MARS S_σ	MARS δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	180 28.6	13 5.1	212 53.8	155 28.7	20 37.4	79 40.3	19 49.8
2	210 28.8	13 6.7	242 58.8	185 27.3	20 38.9	109 43.4	19 49.2
4	240 29.0	13 8.4	273 3.7	215 26.0	20 40.5	139 46.4	19 48.5
6	270 29.2	13 10.0	303 8.6	245 24.6	20 42.0	169 49.4	19 47.9
8	300 29.4	13 11.6	333 13.5	275 23.2	20 43.5	199 52.4	19 47.3
10	330 29.7	13 13.3	3 18.5	305 21.8	20 45.0	229 55.5	19 46.6
12	0 29.9	13 14.9	33 23.4	335 20.4	20 46.5	259 58.5	19 46.0
14	30 30.1	13 16.5	63 28.3	5 19.1	20 48.0	290 1.5	19 45.3
16	60 30.3	13 18.1	93 33.3	35 17.7	20 49.5	320 4.5	19 44.7
18	90 30.5	13 19.8	123 38.2	65 16.3	20 51.0	350 7.6	19 44.1
20	120 30.7	13 21.4	153 43.1	95 14.9	20 52.5	20 10.6	19 43.4
22	150 30.9	13 23.0	183 48.0	125 13.5	20 54.0	50 13.6	19 42.8
Δ	1	8		−7	8	15	−3

UT	MJESEC $S_\leftmoon$	MJESEC Δ	MJESEC $\delta_\leftmoon$	MJESEC Δ	JUPITER S_4	JUPITER δ_4	SATURN S_η	SATURN δ_η
h	° ′		° ′		° ′	° ′	° ′	° ′
0	45 53.4	108	0 41.1	−153	219 20.2	− 3 54.0	32 55.4	2 46.6
2	74 53.0	108	0 10.4	−153	249 24.2	− 3 53.6	63 .6	2 46.7
4	103 52.7	108	− 0 20.3	−153	279 28.1	− 3 53.2	93 5.8	2 46.8
6	132 52.3	108	− 0 51.0	−153	309 32.1	− 3 52.8	123 11.0	2 46.9
8	161 51.9	108	− 1 21.6	−153	339 36.1	− 3 52.4	153 16.2	2 47.0
10	190 51.5	108	− 1 52.2	−153	9 40.0	− 3 52.0	183 21.3	2 47.1
12	219 51.0	108	− 2 22.8	−153	39 44.0	− 3 51.6	213 26.5	2 47.2
14	248 50.6	107	− 2 53.3	−152	69 47.9	− 3 51.2	243 31.7	2 47.3
16	277 50.0	107	− 3 23.8	−152	99 51.9	− 3 50.8	273 36.9	2 47.4
18	306 49.4	107	− 3 54.1	−151	129 55.9	− 3 50.4	303 42.1	2 47.5
20	335 48.8	106	− 4 24.4	−151	159 59.8	− 3 50.0	333 47.3	2 47.6
22	4 48.1	106	− 4 54.6	−150	190 3.8	− 3 49.6	3 52.5	2 47.7
Δ					20	2	26	0

φ	SUNCE IZLAZ	SUNCE ZALAZ	TRAJANJE SUMRAKA GRAĐ.	TRAJANJE SUMRAKA ASTR.	MJESEC IZLAZ	MJESEC Δ/24	MJESEC ZALAZ	MJESEC Δ/24
N	h min	h min	h min	h min	h min	min	h min	min
60	4 15	19 43	0 50	: ::	15 53	4.1	3 1	.2
55	4 34	19 24	0 41	2 48	15 48	3.7	3 1	.6
50	4 48	19 9	0 36	2 13	15 45	3.4	3 1	.8
45	4 59	18 58	0 32	1 54	15 42	3.2	3 1	1.0
40	5 8	18 48	0 29	1 41	15 40	3.0	3 2	1.2
35	5 16	18 40	0 27	1 32	15 38	2.9	3 2	1.3
30	5 23	18 33	0 25	1 26	15 36	2.7	3 2	1.5
20	5 35	18 21	0 23	1 17	15 33	2.5	3 2	1.7
10	5 45	18 11	0 22	1 12	15 31	2.3	3 2	1.9
0	5 55	18 1	0 21	1 11	15 28	2.1	3 2	2.1
10	6 4	17 52	0 22	1 11	15 26	1.9	3 2	2.3
20	6 14	17 42	0 23	1 14	15 23	1.7	3 2	2.5
30	6 25	17 31	0 25	1 21	15 21	1.5	3 2	2.7
35	6 32	17 24	0 26	1 25	15 19	1.4	3 2	2.9
40	6 39	17 17	0 28	1 31	15 17	1.2	3 2	3.0
45	6 47	17 8	0 30	1 39	15 15	1.0	3 2	3.2
50	6 57	16 58	0 34	1 49	15 13	.8	3 2	3.4
55	7 10	16 45	0 38	2 2	15 10	.6	3 2	3.7
60	7 26	16 29	0 44	2 21	15 6	.3	3 2	4.0
S								

SUNCE UT	SUNCE $e = T_p - UT$	SUNCE Δ/24	SUNCE r	MJESEC Prolaz	MJESEC Δ/24	MJESEC $\pi_\leftmoon$	MJESEC r
h	min s	s	′	h min	min	′	′
00	1 54.4	.4	15.9	$T_{\overline{m}}$ 21 40	2.1	59.7	16.3
12	1 59.6	$T_{\overline{m}_\odot}$ 11 h 58.0 min		Starost 10.5 d	Faza ◐		

PLANETE

Pl.	$T_{\overline{m}}$	π	360−α	Vel.	Pl.	$T_{\overline{m}}$	π	360−α	Vel.
	h min	′	°			h min	′	°	
♀	13 39	.1	303	−3.8	♃	9 21	.0	6	−2.0
♂	18 39	.1	227	.6	♄	21 45	.0	180	.8

UT	SUNCE $S_\odot$	SUNCE $\delta_\odot$	PROLJ. TAČKA S_Υ	VENERA S_φ	VENERA δ_φ	MARS S_σ	MARS δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	180 31.1	13 24.6	213 53.0	155 12.1	20 55.4	80 16.6	19 42.1
2	210 31.4	13 26.2	243 57.9	185 10.7	20 56.9	110 19.6	19 41.5
4	240 31.6	13 27.8	274 2.8	215 9.3	20 58.4	140 22.6	19 40.8
6	270 31.8	13 29.5	304 7.8	245 7.9	20 59.9	170 25.6	19 40.2
8	300 32.0	13 31.1	334 12.7	275 6.5	21 1.3	200 28.7	19 39.5
10	330 32.2	13 32.7	4 17.6	305 5.1	21 2.8	230 31.7	19 38.9
12	0 32.4	13 34.3	34 22.5	335 3.7	21 4.2	260 34.7	19 38.2
14	30 32.6	13 35.9	64 27.5	5 2.3	21 5.7	290 37.7	19 37.6
16	60 32.8	13 37.5	94 32.4	35 .9	21 7.1	320 40.7	19 36.9
18	90 33.0	13 39.1	124 37.3	64 59.5	21 8.6	350 43.7	19 36.3
20	120 33.2	13 40.7	154 42.3	94 58.1	21 10.0	20 46.7	19 35.6
22	150 33.4	13 42.3	184 47.2	124 56.7	21 11.5	50 49.7	19 35.0
Δ	1	8		−7	7	15	−3

UT	MJESEC $S_\leftmoon$	MJESEC Δ	MJESEC $\delta_\leftmoon$	MJESEC Δ	JUPITER S_4	JUPITER δ_4	SATURN S_η	SATURN δ_η
h	° ′		° ′		° ′	° ′	° ′	° ′
0	33 47.3	106	− 5 24.6	−150	220 7.8	− 3 49.2	33 57.6	2 47.8
2	62 46.4	105	− 5 54.5	−149	250 11.7	− 3 48.8	64 2.8	2 47.9
4	91 45.4	105	− 6 24.3	−148	280 15.7	− 3 48.4	94 8.0	2 48.0
6	120 44.4	104	− 6 53.9	−147	310 19.7	− 3 48.0	124 13.2	2 48.1
8	149 43.2	104	− 7 23.4	−146	340 23.7	− 3 47.6	154 18.4	2 48.2
10	178 41.9	103	− 7 52.7	−145	10 27.6	− 3 47.2	184 23.5	2 48.3
12	207 40.5	102	− 8 21.7	−144	40 31.6	− 3 46.8	214 28.7	2 48.4
14	236 39.0	102	− 8 50.6	−143	70 35.6	− 3 46.4	244 33.9	2 48.4
16	265 37.4	101	− 9 19.3	−142	100 39.5	− 3 46.0	274 39.1	2 48.5
18	294 35.6	100	− 9 47.7	−141	130 43.5	− 3 45.6	304 44.3	2 48.6
20	323 33.7	100	−10 15.9	−140	160 47.5	− 3 45.2	334 49.4	2 48.7
22	352 31.6	99	−10 43.8	−138	190 51.5	− 3 44.8	4 54.6	2 48.8
Δ					20	2	26	0

φ	SUNCE IZLAZ	SUNCE ZALAZ	TRAJANJE SUMRAKA GRAĐ.	TRAJANJE SUMRAKA ASTR.	MJESEC IZLAZ	MJESEC Δ/24	MJESEC ZALAZ	MJESEC Δ/24
N	h min	h min	h min	h min	h min	min	h min	min
60	4 12	19 45	0 51	: ::	17 30	4.1	3 7	.3
55	4 31	19 25	0 42	2 50	17 17	3.7	3 15	.6
50	4 46	19 11	0 36	2 14	17 7	3.4	3 21	.9
45	4 57	18 59	0 32	1 54	16 59	3.2	3 26	1.1
40	5 7	18 49	0 29	1 41	16 52	3.0	3 30	1.3
35	5 15	18 41	0 27	1 32	16 47	2.9	3 34	1.4
30	5 22	18 34	0 25	1 26	16 42	2.8	3 37	1.5
20	5 34	18 22	0 23	1 17	16 33	2.5	3 42	1.8
10	5 45	18 11	0 22	1 13	16 26	2.3	3 47	1.9
0	5 54	18 1	0 21	1 11	16 19	2.2	3 52	2.1
10	6 4	17 51	0 22	1 11	16 12	2.0	3 57	2.3
20	6 14	17 41	0 23	1 15	16 5	1.8	4 2	2.5
30	6 26	17 30	0 25	1 21	15 56	1.6	4 7	2.7
35	6 32	17 23	0 26	1 25	15 52	1.5	4 11	2.9
40	6 40	17 15	0 28	1 31	15 46	1.3	4 15	3.0
45	6 48	17 7	0 30	1 39	15 40	1.1	4 19	3.2
50	6 59	16 56	0 34	1 49	15 33	.9	4 24	3.4
55	7 12	16 43	0 38	2 3	15 24	.7	4 31	3.7
60	7 29	16 26	0 44	2 21	15 12	.3	4 39	4.1
S								

SUNCE UT	SUNCE $e = T_p - UT$	SUNCE Δ/24	SUNCE r	MJESEC Prolaz	MJESEC Δ/24	MJESEC $\pi_\leftmoon$	MJESEC r
h	min s	s	′	h min	min	′	′
00	2 4.8	.4	15.9	$T_{\overline{m}}$ 22 31	2.2	59.6	16.2
12	2 9.7	$T_{\overline{m}_\odot}$ 11 h 57.8 min		Starost 11.5 d	Faza ◐		

PLANETE

Pl.	$T_{\overline{m}}$	π	360−α	Vel.	Pl.	$T_{\overline{m}}$	π	360−α	Vel.
	h min	′	°			h min	′	°	
♀	13 40	.1	301	−3.8	♃	9 18	.0	6	−2.0
♂	18 37	.1	226	.6	♄	21 40	.0	180	.8

UT	SUNCE $S_\odot$	SUNCE $\delta_\odot$	PROLJ. TAČKA S_Υ	VENERA S_φ	VENERA δ_φ	MARS S_σ	MARS δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	180 33.6	13 43.9	214 52.1	154 55.3	21 12.9	80 52.6	19 34.3
2	210 33.8	13 45.5	244 57.0	184 53.8	21 14.3	110 55.6	19 33.6
4	240 34.0	13 47.1	275 2.0	214 52.4	21 15.8	140 58.6	19 33.0
6	270 34.2	13 48.7	305 6.9	244 51.0	21 17.2	171 1.6	19 32.3
8	300 34.4	13 50.3	335 11.8	274 49.6	21 18.6	201 4.6	19 31.7
10	330 34.6	13 51.9	5 16.8	304 48.2	21 20.0	231 7.6	19 31.0
12	0 34.8	13 53.5	35 21.7	334 46.7	21 21.4	261 10.6	19 30.4
14	30 35.0	13 55.0	65 26.6	4 45.3	21 22.8	291 13.5	19 29.7
16	60 35.2	13 56.6	95 31.5	34 43.9	21 24.2	321 16.5	19 29.0
18	90 35.4	13 58.2	125 36.5	64 42.5	21 25.6	351 19.5	19 28.4
20	120 35.6	13 59.8	155 41.4	94 41.0	21 27.0	21 22.5	19 27.7
22	150 35.8	14 1.4	185 46.3	124 39.6	21 28.4	51 25.4	19 27.0
Δ	1	8		−7	7	15	−3

UT	MJESEC $S_\leftmoon$	MJESEC Δ	MJESEC $\delta_\leftmoon$	MJESEC Δ	JUPITER S_4	JUPITER δ_4	SATURN S_η	SATURN δ_η
h	° ′		° ′		° ′	° ′	° ′	° ′
0	21 29.4	98	−11 11.5	−137	220 55.4	− 3 44.4	34 59.8	2 48.9
2	50 27.0	97	−11 38.9	−136	250 59.4	− 3 44.1	65 5.0	2 49.0
4	79 24.5	97	−12 6.0	−134	281 3.4	− 3 43.7	95 10.1	2 49.1
6	108 21.9	96	−12 32.8	−132	311 7.4	− 3 43.3	125 15.3	2 49.2
8	137 19.0	95	−12 59.3	−131	341 11.3	− 3 42.9	155 20.5	2 49.3
10	166 16.0	94	−13 25.4	−129	11 15.3	− 3 42.5	185 25.7	2 49.4
12	195 12.9	93	−13 51.2	−127	41 19.3	− 3 42.1	215 30.8	2 49.5
14	224 9.5	92	−14 16.7	−126	71 23.3	− 3 41.7	245 36.0	2 49.6
16	253 6.0	92	−14 41.9	−124	101 27.2	− 3 41.3	275 41.2	2 49.7
18	282 2.3	91	−15 6.6	−122	131 31.2	− 3 40.9	305 46.4	2 49.8
20	310 58.5	90	−15 31.0	−120	161 35.2	− 3 40.5	335 51.5	2 49.9
22	339 54.5	89	−15 55.0	−118	191 39.2	− 3 40.1	5 56.7	2 50.0
Δ					20	2	26	0

φ	SUNCE IZLAZ	SUNCE ZALAZ	TRAJANJE SUMRAKA GRAĐ.	TRAJANJE SUMRAKA ASTR.	MJESEC IZLAZ	MJESEC Δ/24	MJESEC ZALAZ	MJESEC Δ/24
N	h min	h min	h min	h min	h min	min	h min	min
60	4 9	19 48	0 51	: ::	19 9	4.1	3 14	.4
55	4 29	19 27	0 42	2 53	18 46	3.7	3 30	.8
50	4 44	19 12	0 36	2 15	18 29	3.4	3 42	1.0
45	4 56	19 0	0 32	1 55	18 16	3.2	3 52	1.2
40	5 6	18 50	0 29	1 42	18 5	3.0	4 0	1.4
35	5 14	18 42	0 27	1 33	17 56	2.9	4 7	1.5
30	5 21	18 35	0 25	1 26	17 48	2.8	4 14	1.6
20	5 34	18 22	0 23	1 17	17 34	2.6	4 25	1.9
10	5 44	18 11	0 22	1 13	17 22	2.4	4 34	2.0
0	5 54	18 1	0 21	1 11	17 11	2.2	4 43	2.2
10	6 4	17 51	0 22	1 11	16 60	2.1	4 52	2.4
20	6 15	17 41	0 23	1 15	16 48	1.9	5 2	2.5
30	6 26	17 29	0 25	1 21	16 34	1.7	5 13	2.8
35	6 33	17 22	0 26	1 25	16 27	1.6	5 20	2.9
40	6 41	17 14	0 28	1 31	16 18	1.5	5 27	3.0
45	6 50	17 5	0 30	1 39	16 8	1.3	5 36	3.2
50	7 0	16 54	0 34	1 49	15 56	1.1	5 46	3.4
55	7 14	16 41	0 38	2 3	15 40	.9	5 60	3.7
60	7 31	16 23	0 45	2 22	15 20	.5	6 17	4.1
S								

SUNCE UT	SUNCE $e = T_p - UT$	SUNCE Δ/24	SUNCE r	MJESEC Prolaz	MJESEC Δ/24	MJESEC $\pi_\leftmoon$	MJESEC r
h	min s	s	′	h min	min	′	′
00	2 14.6	.4	15.9	$T_{\overline{m}}$ 23 23	2.3	59.3	16.2
12	2 19.3	$T_{\overline{m}_\odot}$ 11 h 57.7 min		Starost 12.5 d	Faza ○		

PLANETE

Pl.	$T_{\overline{m}}$	π	360−α	Vel.	Pl.	$T_{\overline{m}}$	π	360−α	Vel.
	h min	′	°			h min	′	°	
♀	13 41	.1	300	−3.8	♃	9 15	.0	6	−2.0
♂	18 35	.1	226	.7	♄	21 36	.0	180	.8

UT	SUNCE $S_\odot$	SUNCE $\delta_\odot$	PROLJ. TAČKA S_Υ	VENERA S_φ	VENERA δ_φ	MARS S_σ	MARS δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	180 35.9	14 3.0	215 51.3	154 38.2	21 29.8	81 28.4	19 26.4
2	210 36.1	14 4.5	245 56.2	184 36.7	21 31.2	111 31.4	19 25.7
4	240 36.3	14 6.1	276 1.1	214 35.3	21 32.5	141 34.4	19 25.1
6	270 36.5	14 7.7	306 6.0	244 33.8	21 33.9	171 37.3	19 24.4
8	300 36.7	14 9.3	336 11.0	274 32.4	21 35.3	201 40.3	19 23.7
10	330 36.9	14 10.8	6 15.9	304 31.0	21 36.7	231 43.3	19 23.1
12	0 37.1	14 12.4	36 20.8	334 29.5	21 38.0	261 46.2	19 22.4
14	30 37.2	14 14.0	66 25.7	4 28.1	21 39.4	291 49.2	19 21.7
16	60 37.4	14 15.5	96 30.7	34 26.6	21 40.7	321 52.1	19 21.0
18	90 37.6	14 17.1	126 35.6	64 25.2	21 42.1	351 55.1	19 20.4
20	120 37.8	14 18.7	156 40.5	94 23.7	21 43.4	21 58.0	19 19.7
22	150 38.0	14 20.2	186 45.5	124 22.3	21 44.8	52 1.0	19 19.0
Δ	1	8		−7	7	15	−3

UT	MJESEC $S_\leftmoon$	MJESEC Δ	MJESEC $\delta_\leftmoon$	MJESEC Δ	JUPITER S_4	JUPITER δ_4	SATURN S_η	SATURN δ_η
h	° ′		° ′		° ′	° ′	° ′	° ′
0	8 50.2	88	−16 18.6	−116	221 43.1	− 3 39.7	36 1.9	2 50.1
2	37 45.9	87	−16 41.7	−114	251 47.1	− 3 39.3	66 7.1	2 50.1
4	66 41.3	86	−17 4.5	−112	281 51.1	− 3 38.9	96 12.2	2 50.2
6	95 36.6	85	−17 26.8	−109	311 55.1	− 3 38.5	126 17.4	2 50.3
8	124 31.7	85	−17 48.7	−107	341 59.1	− 3 38.1	156 22.6	2 50.4
10	153 26.6	84	−18 10.1	−105	12 3.1	− 3 37.8	186 27.7	2 50.5
12	182 21.3	83	−18 31.1	−103	42 7.0	− 3 37.4	216 32.9	2 50.6
14	211 15.9	82	−18 51.6	−100	72 11.0	− 3 37.0	246 38.1	2 50.7
16	240 10.3	81	−19 11.6	−98	102 15.0	− 3 36.6	276 43.2	2 50.8
18	269 4.6	81	−19 31.2	−95	132 19.0	− 3 36.2	306 48.4	2 50.9
20	297 58.7	80	−19 50.2	−93	162 23.0	− 3 35.8	336 53.6	2 51.0
22	326 52.6	79	−20 8.8	−90	192 27.0	− 3 35.4	6 58.7	2 51.1
Δ					20	2	26	0

φ	SUNCE IZLAZ	SUNCE ZALAZ	TRAJANJE SUMRAKA GRAĐ.	TRAJANJE SUMRAKA ASTR.	MJESEC IZLAZ	MJESEC Δ/24	MJESEC ZALAZ	MJESEC Δ/24
N	h min	h min	h min	h min	h min	min	h min	min
60	4 7	19 50	0 52	: ::	20 47	3.9	3 23	.6
55	4 27	19 29	0 42	2 57	20 14	3.4	3 48	1.0
50	4 42	19 14	0 36	2 16	19 50	3.2	4 7	1.3
45	4 54	19 2	0 32	1 56	19 32	3.0	4 21	1.4
40	5 4	18 51	0 29	1 42	19 17	2.9	4 34	1.6
35	5 13	18 43	0 27	1 33	19 5	2.8	4 44	1.7
30	5 20	18 35	0 25	1 26	18 54	2.7	4 53	1.8
20	5 33	18 22	0 23	1 17	18 35	2.6	5 9	2.0
10	5 44	18 11	0 22	1 13	18 19	2.4	5 23	2.1
0	5 54	18 1	0 21	1 11	18 4	2.3	5 36	2.3
10	6 4	17 51	0 22	1 12	17 50	2.2	5 49	2.4
20	6 15	17 40	0 23	1 15	17 34	2.1	6 3	2.6
30	6 27	17 28	0 25	1 21	17 16	1.9	6 20	2.7
35	6 34	17 21	0 26	1 25	17 5	1.8	6 29	2.8
40	6 42	17 13	0 28	1 31	16 54	1.7	6 40	3.0
45	6 51	17 4	0 31	1 39	16 40	1.6	6 53	3.1
50	7 2	16 53	0 34	1 49	16 23	1.4	7 8	3.3
55	7 16	16 39	0 38	2 3	16 1	1.2	7 28	3.6
60	7 34	16 21	0 45	2 22	15 32	.8	7 56	4.0
S								

SUNCE UT	SUNCE $e = T_p - UT$	SUNCE Δ/24	SUNCE r	MJESEC Prolaz	MJESEC Δ/24	MJESEC $\pi_\leftmoon$	MJESEC r
h	min s	s	′	h min	min	′	′
00	2 24.0	.4	15.9	$T_{\overline{m}}$	1.0	58.9	16.0
12	2 28.4	$T_{\overline{m}_\odot}$ 11 h 57.5 min		Starost 13.5 d	Faza ○		

PLANETE

Pl.	$T_{\overline{m}}$	π	360−α	Vel.	Pl.	$T_{\overline{m}}$	π	360−α	Vel.
	h min	′	°			h min	′	°	
♀	13 42	.1	299	−3.8	♃	9 12	.0	6	−2.0
♂	18 32	.1	226	.7	♄	21 32	.0	180	.8

UT	SUNCE $S_\odot$	SUNCE $\delta_\odot$	PROLJ. TAČKA S_Υ	VENERA S_φ	VENERA δ_φ	MARS S_σ	MARS δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	180 38.2	14 21.8	216 50.4	154 20.8	21 46.1	82 3.9	19 18.4
2	210 38.3	14 23.4	246 55.3	184 19.4	21 47.4	112 6.9	19 17.7
4	240 38.5	14 24.9	277 .2	214 17.9	21 48.8	142 9.8	19 17.0
6	270 38.7	14 26.5	307 5.2	244 16.4	21 50.1	172 12.8	19 16.3
8	300 38.9	14 28.0	337 10.1	274 15.0	21 51.4	202 15.7	19 15.7
10	330 39.0	14 29.6	7 15.0	304 13.5	21 52.7	232 18.7	19 15.0
12	0 39.2	14 31.1	37 20.0	334 12.1	21 54.0	262 21.6	19 14.3
14	30 39.4	14 32.7	67 24.9	4 10.6	21 55.3	292 24.6	19 13.6
16	60 39.6	14 34.2	97 29.8	34 9.1	21 56.6	322 27.5	19 12.9
18	90 39.7	14 35.8	127 34.7	64 7.6	21 57.9	352 30.4	19 12.3
20	120 39.9	14 37.3	157 39.7	94 6.2	21 59.2	22 33.4	19 11.6
22	150 40.1	14 38.8	187 44.6	124 4.7	22 .5	52 36.3	19 10.9
Δ	1	8		−7	7	15	−3

UT	MJESEC $S_\leftmoon$	MJESEC Δ	MJESEC $\delta_\leftmoon$	MJESEC Δ	JUPITER S_4	JUPITER δ_4	SATURN S_η	SATURN δ_η
h	° ′		° ′		° ′	° ′	° ′	° ′
0	355 46.4	78	−20 26.8	−88	222 30.9	− 3 35.0	37 3.9	2 51.1
2	24 40.1	78	−20 44.3	−85	252 34.9	− 3 34.6	67 9.1	2 51.2
4	53 33.6	77	−21 1.3	−82	282 38.9	− 3 34.2	97 14.2	2 51.3
6	82 27.0	76	−21 17.8	−80	312 42.9	− 3 33.8	127 19.4	2 51.4
8	111 20.3	76	−21 33.7	−77	342 46.9	− 3 33.5	157 24.6	2 51.5
10	140 13.5	75	−21 49.1	−74	12 50.9	− 3 33.1	187 29.7	2 51.6
12	169 6.5	75	−22 3.9	−71	42 54.9	− 3 32.7	217 34.9	2 51.7
14	197 59.5	74	−22 18.2	−69	72 58.8	− 3 32.3	247 40.0	2 51.8
16	226 52.3	74	−22 31.9	−66	103 2.8	− 3 31.9	277 45.2	2 51.8
18	255 45.1	74	−22 45.0	−63	133 6.8	− 3 31.5	307 50.4	2 51.9
20	284 37.8	73	−22 57.6	−60	163 10.8	− 3 31.1	337 55.5	2 52.0
22	313 30.5	73	−23 9.6	−57	193 14.8	− 3 30.7	8 .7	2 52.1
Δ					20	2	26	0

φ	SUNCE IZLAZ	SUNCE ZALAZ	TRAJANJE SUMRAKA GRAĐ.	TRAJANJE SUMRAKA ASTR.	MJESEC IZLAZ	MJESEC Δ/24	MJESEC ZALAZ	MJESEC Δ/24
N	h min	h min	h min	h min	h min	min	h min	min
60	4 4	19 53	0 53	: ::	22 20	3.3	3 37	.9
55	4 25	19 31	0 43	2 60	21 37	3.0	4 12	1.3
50	4 40	19 15	0 36	2 18	21 7	2.8	4 37	1.6
45	4 53	19 3	0 32	1 56	20 45	2.7	4 56	1.7
40	5 3	18 52	0 29	1 43	20 27	2.7	5 12	1.8
35	5 12	18 44	0 27	1 33	20 12	2.6	5 25	1.9
30	5 19	18 36	0 25	1 27	19 59	2.6	5 37	2.0
20	5 32	18 23	0 23	1 18	19 37	2.5	5 57	2.1
10	5 44	18 11	0 22	1 13	19 18	2.4	6 14	2.2
0	5 54	18 1	0 21	1 11	18 60	2.3	6 31	2.3
10	6 4	17 50	0 22	1 12	18 42	2.3	6 47	2.4
20	6 15	17 39	0 23	1 15	18 23	2.2	7 5	2.5
30	6 28	17 27	0 25	1 21	18 2	2.1	7 25	2.6
35	6 35	17 20	0 26	1 26	17 49	2.0	7 37	2.7
40	6 43	17 12	0 28	1 32	17 35	2.0	7 51	2.8
45	6 52	17 2	0 31	1 39	17 18	1.9	8 7	2.9
50	7 3	16 51	0 34	1 50	16 56	1.8	8 27	3.0
55	7 17	16 37	0 39	2 3	16 29	1.6	8 54	3.2
60	7 36	16 18	0 45	2 23	15 50	1.2	9 31	3.6
S								

SUNCE UT	SUNCE $e = T_p - UT$	SUNCE Δ/24	SUNCE r	MJESEC Prolaz	MJESEC Δ/24	MJESEC $\pi_\leftmoon$	MJESEC r
h	min s	s	′	h min	min	′	′
00	2 32.8	.3	15.9	$T_{\overline{m}}$ 0 18	2.3	58.3	15.9
12	2 37.0	$T_{\overline{m}_\odot}$ 11 h 57.4 min		Starost 14.5 d	Faza ○		

PLANETE

Pl.	$T_{\overline{m}}$	π	360−α	Vel.	Pl.	$T_{\overline{m}}$	π	360−α	Vel.
	h min	′	°			h min	′	°	
♀	13 43	.1	297	−3.8	♃	9 9	.0	6	−2.0
♂	18 30	.1	225	.7	♄	21 28	.0	180	.8

UT	SUNCE $S_\odot$	SUNCE $\delta_\odot$	PROLJ. TAČKA S_Υ	VENERA S_φ	VENERA δ_φ	MARS S_σ	MARS δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	180 40.2	14 40.4	217 49.5	154 3.2	22 1.8	82 39.2	19 10.2
2	210 40.4	14 41.9	247 54.5	184 1.8	22 3.1	112 42.2	19 9.5
4	240 40.6	14 43.5	277 59.4	214 .3	22 4.4	142 45.1	19 8.9
6	270 40.7	14 45.0	308 4.3	243 58.8	22 5.6	172 48.0	19 8.2
8	300 40.9	14 46.5	338 9.2	273 57.3	22 6.9	202 50.9	19 7.5
10	330 41.1	14 48.1	8 14.2	303 55.8	22 8.2	232 53.9	19 6.8
12	0 41.2	14 49.6	38 19.1	333 54.4	22 9.4	262 56.8	19 6.1
14	30 41.4	14 51.1	68 24.0	3 52.9	22 10.7	292 59.7	19 5.4
16	60 41.5	14 52.6	98 29.0	33 51.4	22 11.9	323 2.6	19 4.7
18	90 41.7	14 54.2	128 33.9	63 49.9	22 13.2	353 5.5	19 4.1
20	120 41.9	14 55.7	158 38.8	93 48.4	22 14.4	23 8.5	19 3.4
22	150 42.0	14 57.2	188 43.7	123 46.9	22 15.7	53 11.4	19 2.7
Δ	1	8		−7	6	15	−3

UT	MJESEC $S_\leftmoon$	MJESEC Δ	MJESEC $\delta_\leftmoon$	MJESEC Δ	JUPITER S_4	JUPITER δ_4	SATURN S_η	SATURN δ_η
h	° ′		° ′		° ′	° ′	° ′	° ′
0	342 23.0	73	−23 21.0	−54	223 18.8	− 3 30.3	38 5.8	2 52.2
2	11 15.6	73	−23 31.9	−51	253 22.8	− 3 30.0	68 11.0	2 52.3
4	40 8.1	72	−23 42.1	−48	283 26.8	− 3 29.6	98 16.2	2 52.4
6	69 .6	72	−23 51.8	−45	313 30.8	− 3 29.2	128 21.3	2 52.5
8	97 53.0	72	−24 .9	−43	343 34.8	− 3 28.8	158 26.5	2 52.5
10	126 45.5	72	−24 9.4	−40	13 38.8	− 3 28.4	188 31.6	2 52.6
12	155 38.0	72	−24 17.3	−37	43 42.8	− 3 28.0	218 36.8	2 52.7
14	184 30.5	73	−24 24.6	−34	73 46.7	− 3 27.6	248 41.9	2 52.8
16	213 23.0	73	−24 31.4	−31	103 50.7	− 3 27.2	278 47.1	2 52.9
18	242 15.5	73	−24 37.5	−28	133 54.7	− 3 26.9	308 52.3	2 53.0
20	271 8.2	73	−24 43.1	−25	163 58.7	− 3 26.5	338 57.4	2 53.0
22	300 .8	74	−24 48.0	−22	194 2.7	− 3 26.1	9 2.6	2 53.1
Δ					20	2	26	0

φ	SUNCE IZLAZ	SUNCE ZALAZ	TRAJANJE SUMRAKA GRAĐ.	TRAJANJE SUMRAKA ASTR.	MJESEC IZLAZ	MJESEC Δ/24	MJESEC ZALAZ	MJESEC Δ/24
N	h min	h min	h min	h min	h min	min	h min	min
60	4 1	19 55	0 53	: ::	23 39	2.4	3 60	1.6
55	4 23	19 33	0 43	3 4	22 49	2.4	4 44	1.8
50	4 39	19 17	0 37	2 19	22 15	2.4	5 14	2.0
45	4 51	19 4	0 32	1 57	21 51	2.4	5 37	2.0
40	5 2	18 53	0 29	1 43	21 31	2.3	5 56	2.1
35	5 11	18 44	0 27	1 34	21 14	2.3	6 11	2.2
30	5 18	18 37	0 25	1 27	21 0	2.3	6 25	2.2
20	5 32	18 23	0 23	1 18	20 36	2.3	6 48	2.2
10	5 43	18 11	0 22	1 13	20 15	2.3	7 8	2.3
0	5 54	18 1	0 21	1 11	19 56	2.3	7 27	2.3
10	6 4	17 50	0 22	1 12	19 37	2.3	7 45	2.4
20	6 16	17 39	0 23	1 15	19 16	2.3	8 5	2.4
30	6 28	17 26	0 25	1 21	18 52	2.3	8 29	2.5
35	6 36	17 19	0 26	1 26	18 38	2.2	8 42	2.5
40	6 44	17 10	0 28	1 32	18 22	2.2	8 58	2.5
45	6 53	17 1	0 31	1 39	18 3	2.2	9 17	2.6
50	7 5	16 49	0 34	1 50	17 39	2.2	9 40	2.6
55	7 19	16 34	0 39	2 4	17 7	2.1	10 12	2.7
60	7 38	16 15	0 45	2 23	16 20	2.0	10 58	2.9
S								

SUNCE UT	SUNCE $e = T_p - UT$	SUNCE Δ/24	SUNCE r	MJESEC Prolaz	MJESEC Δ/24	MJESEC $\pi_\leftmoon$	MJESEC r
h	min s	s	′	h min	min	′	′
00	2 41.1	.3	15.9	$T_{\overline{m}}$ 1 13	2.3	57.6	15.7
12	2 45.0	$T_{\overline{m}_\odot}$ 11 h 57.3 min		Starost 15.5 d	Faza ○		

PLANETE

Pl.	$T_{\overline{m}}$	π	360−α	Vel.	Pl.	$T_{\overline{m}}$	π	360−α	Vel.
	h min	′	°			h min	′	°	
♀	13 44	.1	296	−3.8	♃	9 6	.0	5	−2.0
♂	18 28	.1	225	.7	♄	21 24	.0	180	.8

UT	SUNCE $S_\odot$	SUNCE $\delta_\odot$	PROLJ. TAČKA S_Υ	VENERA S_φ	VENERA δ_φ	MARS S_σ	MARS δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	180 42.2	14 58.7	218 48.7	153 45.4	22 16.9	83 14.3	19 2.0
2	210 42.3	15 .3	248 53.6	183 43.9	22 18.1	113 17.2	19 1.3
4	240 42.5	15 1.8	278 58.5	213 42.4	22 19.4	143 20.1	19 .6
6	270 42.6	15 3.3	309 3.5	243 40.9	22 20.6	173 23.0	18 59.9
8	300 42.8	15 4.8	339 8.4	273 39.4	22 21.8	203 25.9	18 59.2
10	330 43.0	15 6.3	9 13.3	303 37.9	22 23.0	233 28.8	18 58.5
12	0 43.1	15 7.8	39 18.2	333 36.4	22 24.2	263 31.7	18 57.8
14	30 43.3	15 9.3	69 23.2	3 34.9	22 25.5	293 34.6	18 57.1
16	60 43.4	15 10.8	99 28.1	33 33.4	22 26.7	323 37.5	18 56.4
18	90 43.6	15 12.3	129 33.0	63 31.9	22 27.8	353 40.4	18 55.7
20	120 43.7	15 13.8	159 38.0	93 30.4	22 29.0	23 43.3	18 55.0
22	150 43.8	15 15.3	189 42.9	123 28.9	22 30.2	53 46.2	18 54.3
Δ	1	8		−8	6	15	−3

UT	MJESEC $S_\leftmoon$	MJESEC Δ	MJESEC $\delta_\leftmoon$	MJESEC Δ	JUPITER $S_\jupiter$	JUPITER $\delta_\jupiter$	SATURN $S_\saturn$	SATURN $\delta_\saturn$
h	° ′		° ′		° ′	° ′	° ′	° ′
0	328 53.6	74	−24 52.4	−19	224 6.7	− 3 25.7	39 7.7	2 53.2
2	357 46.4	75	−24 56.2	−16	254 10.7	− 3 25.3	69 12.9	2 53.3
4	26 39.4	75	−24 59.3	−13	284 14.7	− 3 24.9	99 18.0	2 53.4
6	55 32.4	76	−25 2.0	−10	314 18.7	− 3 24.5	129 23.2	2 53.5
8	84 25.6	76	−25 4.0	−7	344 22.7	− 3 24.2	159 28.3	2 53.5
10	113 18.9	77	−25 5.4	−4	14 26.7	− 3 23.8	189 33.5	2 53.6
12	142 12.3	78	−25 6.3	−2	44 30.7	− 3 23.4	219 38.6	2 53.7
14	171 5.9	79	−25 6.6	1	74 34.7	− 3 23.0	249 43.8	2 53.8
16	199 59.6	80	−25 6.3	4	104 38.7	− 3 22.6	279 48.9	2 53.9
18	228 53.6	81	−25 5.5	7	134 42.7	− 3 22.2	309 54.1	2 54.0
20	257 47.7	81	−25 4.1	10	164 46.7	− 3 21.9	339 59.2	2 54.0
22	286 42.0	82	−25 2.1	12	194 50.7	− 3 21.5	10 4.4	2 54.1
Δ					20	2	26	0

φ	SUNCE IZLAZ	SUNCE ZALAZ	TRAJANJE SUMRAKA GRAĐ.	TRAJANJE SUMRAKA ASTR.	MJESEC IZLAZ	MJESEC Δ/24	MJESEC ZALAZ	MJESEC Δ/24
N	h min	h min	h min	h min	h min	min	h min	min
60	3 58	19 58	0 54	: ::	.. ..	.0	4 37	2.4
55	4 20	19 35	0 43	3 8	23 45	1.7	5 28	2.4
50	4 37	19 18	0 37	2 20	23 12	1.9	6 2	2.4
45	4 50	19 5	0 32	1 58	22 47	1.9	6 27	2.3
40	5 0	18 55	0 29	1 44	22 27	2.0	6 46	2.3
35	5 9	18 45	0 27	1 34	22 11	2.0	7 3	2.3
30	5 17	18 37	0 25	1 27	21 56	2.1	7 17	2.3
20	5 31	18 24	0 23	1 18	21 32	2.1	7 42	2.3
10	5 43	18 12	0 22	1 13	21 11	2.2	8 3	2.3
0	5 54	18 1	0 21	1 11	20 51	2.2	8 23	2.3
10	6 5	17 50	0 22	1 12	20 32	2.3	8 42	2.3
20	6 16	17 38	0 23	1 15	20 11	2.3	9 3	2.2
30	6 29	17 25	0 25	1 21	19 46	2.4	9 28	2.2
35	6 36	17 18	0 26	1 26	19 32	2.4	9 42	2.2
40	6 45	17 9	0 28	1 32	19 15	2.4	9 58	2.2
45	6 55	16 59	0 31	1 40	18 56	2.5	10 18	2.2
50	7 6	16 47	0 34	1 50	18 31	2.5	10 43	2.1
55	7 21	16 32	0 39	2 4	17 58	2.6	11 16	2.0
60	7 41	16 13	0 46	2 23	17 7	2.8	12 7	1.9
S								

SUNCE UT	SUNCE $e = T_p - UT$	SUNCE Δ/24	SUNCE r	MJESEC Prolaz	MJESEC Δ/24	MJESEC $\pi_\leftmoon$	MJESEC r
h	min s	s	′	h min	min	′	′
00	2 48.9	.3	15.9	$T_{\overline{m}}$ 2 9	2.3	56.9	15.5
12	2 52.5	$T_{\overline{m}_\odot}$ 11 h 57.1 min		Starost 16.5 d	Faza ❍		

PLANETE

Pl.	$T_{\overline{m}}$	π	360−α	Vel.	Pl.	$T_{\overline{m}}$	π	360−α	Vel.
	h min	′	°			h min	′	°	
♀	13 46	.1	295	−3.8	♃	9 2	.0	5	−2.0
♂	18 25	.1	224	.7	♄	21 20	.0	180	.8

UT	SUNCE $S_\odot$	SUNCE $\delta_\odot$	PROLJ. TAČKA S_Υ	VENERA S_φ	VENERA δ_φ	MARS S_σ	MARS δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	180 44.0	15 16.8	219 47.8	153 27.4	22 31.4	83 49.1	18 53.6
2	210 44.1	15 18.3	249 52.7	183 25.9	22 32.6	113 52.0	18 52.9
4	240 44.3	15 19.8	279 57.7	213 24.4	22 33.8	143 54.9	18 52.2
6	270 44.4	15 21.3	310 2.6	243 22.9	22 34.9	173 57.8	18 51.5
8	300 44.6	15 22.8	340 7.5	273 21.3	22 36.1	204 .7	18 50.8
10	330 44.7	15 24.3	10 12.4	303 19.8	22 37.3	234 3.6	18 50.1
12	0 44.8	15 25.8	40 17.4	333 18.3	22 38.4	264 6.4	18 49.4
14	30 45.0	15 27.3	70 22.3	3 16.8	22 39.6	294 9.3	18 48.7
16	60 45.1	15 28.8	100 27.2	33 15.3	22 40.7	324 12.2	18 48.0
18	90 45.3	15 30.3	130 32.2	63 13.7	22 41.9	354 15.1	18 47.3
20	120 45.4	15 31.7	160 37.1	93 12.2	22 43.0	24 18.0	18 46.6
22	150 45.5	15 33.2	190 42.0	123 10.7	22 44.2	54 20.8	18 45.9
Δ	1	7		−8	6	14	−4

UT	MJESEC $S_\leftmoon$	MJESEC Δ	MJESEC $\delta_\leftmoon$	MJESEC Δ	JUPITER $S_\jupiter$	JUPITER $\delta_\jupiter$	SATURN $S_\saturn$	SATURN $\delta_\saturn$
h	° ′		° ′		° ′	° ′	° ′	° ′
0	315 36.5	84	−24 59.6	15	224 54.7	− 3 21.1	40 9.5	2 54.2
2	344 31.2	85	−24 56.6	18	254 58.7	− 3 20.7	70 14.7	2 54.3
4	13 26.1	86	−24 53.0	21	285 2.7	− 3 20.3	100 19.8	2 54.4
6	42 21.3	87	−24 48.9	23	315 6.8	− 3 19.9	130 24.9	2 54.4
8	71 16.7	88	−24 44.2	26	345 10.8	− 3 19.6	160 30.1	2 54.5
10	100 12.3	89	−24 39.0	28	15 14.8	− 3 19.2	190 35.2	2 54.6
12	129 8.2	91	−24 33.3	31	45 18.8	− 3 18.8	220 40.4	2 54.7
14	158 4.3	92	−24 27.1	34	75 22.8	− 3 18.4	250 45.5	2 54.8
16	187 .7	93	−24 20.4	36	105 26.8	− 3 18.0	280 50.7	2 54.8
18	215 57.4	95	−24 13.2	38	135 30.8	− 3 17.7	310 55.8	2 54.9
20	244 54.3	96	−24 5.5	41	165 34.8	− 3 17.3	341 .9	2 55.0
22	273 51.5	97	−23 57.3	43	195 38.8	− 3 16.9	11 6.1	2 55.1
Δ					20	2	26	0

φ	SUNCE IZLAZ	SUNCE ZALAZ	TRAJANJE SUMRAKA GRAĐ.	TRAJANJE SUMRAKA ASTR.	MJESEC IZLAZ	MJESEC Δ/24	MJESEC ZALAZ	MJESEC Δ/24
N	h min	h min	h min	h min	h min	min	h min	min
60	3 56	20 0	0 54	: ::	0 36	1.5	5 35	3.1
55	4 18	19 37	0 43	3 12	.. ..	.0	6 25	2.8
50	4 35	19 20	0 37	2 22	23 56	1.4	6 58	2.7
45	4 48	19 7	0 33	1 59	23 33	1.6	7 23	2.6
40	4 59	18 56	0 29	1 44	23 15	1.7	7 43	2.5
35	5 8	18 46	0 27	1 34	22 60	1.7	7 59	2.4
30	5 17	18 38	0 25	1 27	22 46	1.8	8 13	2.4
20	5 30	18 24	0 23	1 18	22 23	1.9	8 37	2.3
10	5 42	18 12	0 22	1 13	22 3	2.0	8 58	2.2
0	5 54	18 0	0 21	1 11	21 45	2.1	9 17	2.2
10	6 5	17 49	0 22	1 12	21 26	2.2	9 36	2.1
20	6 16	17 38	0 23	1 15	21 6	2.3	9 57	2.0
30	6 30	17 24	0 25	1 21	20 43	2.4	10 21	1.9
35	6 37	17 17	0 26	1 26	20 29	2.4	10 35	1.9
40	6 46	17 8	0 28	1 32	20 13	2.5	10 51	1.8
45	6 56	16 58	0 31	1 40	19 55	2.6	11 10	1.7
50	7 8	16 46	0 34	1 50	19 31	2.7	11 34	1.6
55	7 23	16 30	0 39	2 4	19 0	2.9	12 5	1.5
60	7 43	16 10	0 46	2 24	18 14	3.3	12 52	1.1
S								

SUNCE UT	SUNCE $e = T_p - UT$	SUNCE Δ/24	SUNCE r	MJESEC Prolaz	MJESEC Δ/24	MJESEC $\pi_\leftmoon$	MJESEC r
h	min s	s	′	h min	min	′	′
00	2 56.2	.3	15.9	$T_{\overline{m}}$ 3 4	2.2	56.2	15.3
12	2 59.5	$T_{\overline{m}_\odot}$ 11 h 57.0 min		Starost 17.5 d	Faza ❍		

PLANETE

Pl.	$T_{\overline{m}}$	π	360−α	Vel.	Pl.	$T_{\overline{m}}$	π	360−α	Vel.
	h min	′	°			h min	′	°	
♀	13 47	.1	294	−3.8	♃	8 59	.0	5	−2.0
♂	18 23	.1	224	.7	♄	21 16	.0	180	.8

UT	SUNCE $S_\odot$	SUNCE $\delta_\odot$	PROLJ. TAČKA S_Υ	VENERA S_φ	VENERA δ_φ	MARS S_σ	MARS δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	180 45.7	15 34.7	220 46.9	153 9.2	22 45.3	84 23.7	18 45.2
2	210 45.8	15 36.2	250 51.9	183 7.6	22 46.4	114 26.6	18 44.5
4	240 45.9	15 37.6	280 56.8	213 6.1	22 47.6	144 29.5	18 43.8
6	270 46.1	15 39.1	311 1.7	243 4.6	22 48.7	174 32.3	18 43.0
8	300 46.2	15 40.6	341 6.7	273 3.0	22 49.8	204 35.2	18 42.3
10	330 46.3	15 42.1	11 11.6	303 1.5	22 50.9	234 38.1	18 41.6
12	0 46.4	15 43.5	41 16.5	332 59.9	22 52.0	264 40.9	18 40.9
14	30 46.6	15 45.0	71 21.4	2 58.4	22 53.1	294 43.8	18 40.2
16	60 46.7	15 46.5	101 26.4	32 56.9	22 54.2	324 46.7	18 39.5
18	90 46.8	15 47.9	131 31.3	62 55.3	22 55.3	354 49.5	18 38.8
20	120 47.0	15 49.4	161 36.2	92 53.8	22 56.4	24 52.4	18 38.1
22	150 47.1	15 50.8	191 41.2	122 52.2	22 57.5	54 55.3	18 37.3
Δ	1	7		−8	6	14	−4

UT	MJESEC $S_\leftmoon$	MJESEC Δ	MJESEC $\delta_\leftmoon$	MJESEC Δ	JUPITER S_4	JUPITER δ_4	SATURN S_η	SATURN δ_η
h	° ′		° ′		° ′	° ′	° ′	° ′
0	302 49.0	99	−23 48.7	46	225 42.8	− 3 16.5	41 11.2	2 55.1
2	331 46.8	100	−23 39.5	48	255 46.8	− 3 16.1	71 16.4	2 55.2
4	0 44.9	102	−23 30.0	50	285 50.8	− 3 15.8	101 21.5	2 55.3
6	29 43.3	103	−23 19.9	52	315 54.9	− 3 15.4	131 26.6	2 55.4
8	58 41.9	105	−23 9.4	55	345 58.9	− 3 15.0	161 31.8	2 55.4
10	87 40.9	106	−22 58.5	57	16 2.9	− 3 14.6	191 36.9	2 55.5
12	116 40.2	108	−22 47.1	59	46 6.9	− 3 14.2	221 42.1	2 55.6
14	145 39.7	109	−22 35.3	61	76 10.9	− 3 13.9	251 47.2	2 55.7
16	174 39.6	111	−22 23.1	63	106 14.9	− 3 13.5	281 52.3	2 55.8
18	203 39.8	112	−22 10.5	65	136 18.9	− 3 13.1	311 57.5	2 55.8
20	232 40.3	114	−21 57.5	67	166 22.9	− 3 12.7	342 2.6	2 55.9
22	261 41.1	116	−21 44.0	69	196 27.0	− 3 12.3	12 7.7	2 56.0
Δ					20	2	26	0

φ	SUNCE IZLAZ	SUNCE ZALAZ	TRAJANJE SUMRAKA GRAĐ.	TRAJANJE SUMRAKA ASTR.	MJESEC IZLAZ	MJESEC Δ/24	MJESEC ZALAZ	MJESEC Δ/24
N	h min	h min	h min	h min	h min	min	h min	min
60	3 53	20 2	0 55	: ::	1 11	.9	6 49	3.4
55	4 16	19 39	0 44	3 18	0 27	1.2	7 32	3.0
50	4 33	19 22	0 37	2 23	.. ..	.0	8 2	2.8
45	4 47	19 8	0 33	1 59	.. ..	.0	8 24	2.7
40	4 58	18 57	0 30	1 45	23 55	1.4	8 42	2.5
35	5 7	18 47	0 27	1 35	23 41	1.5	8 57	2.4
30	5 16	18 39	0 25	1 28	23 29	1.6	9 10	2.4
20	5 30	18 24	0 23	1 18	23 9	1.7	9 32	2.2
10	5 42	18 12	0 22	1 13	22 51	1.8	9 51	2.1
0	5 53	18 0	0 21	1 11	22 35	2.0	10 9	2.0
10	6 5	17 49	0 22	1 12	22 18	2.1	10 27	1.9
20	6 17	17 37	0 23	1 15	22 0	2.2	10 46	1.8
30	6 30	17 23	0 25	1 21	21 40	2.3	11 7	1.7
35	6 38	17 16	0 26	1 26	21 28	2.4	11 20	1.6
40	6 47	17 7	0 28	1 32	21 14	2.5	11 35	1.5
45	6 57	16 56	0 31	1 40	20 57	2.7	11 52	1.4
50	7 9	16 44	0 34	1 50	20 37	2.8	12 13	1.3
55	7 25	16 28	0 39	2 4	20 10	3.0	12 41	1.0
60	7 45	16 8	0 46	2 24	19 32	3.4	13 20	.7
S								

SUNCE UT	SUNCE $e = T_p - UT$	SUNCE Δ/24	SUNCE r	MJESEC Prolaz	MJESEC Δ/24	MJESEC $\pi_\leftmoon$	MJESEC r
h	min s	s	′	h min	min	′	′
00	3 2.8	.3	15.9	$T_{\overline{m}}$ 3 57	2.0	55.5	15.1
12	3 5.9	$T_{\overline{m}_\odot}$ 11 h 56.9 min		Starost 18.5 d	Faza ◑		

PLANETE Pl.	$T_{\overline{m}}$	π	360−α	Vel.	Pl.	$T_{\overline{m}}$	π	360−α	Vel.
	h min	′	°			h min	′	°	
♀	13 48	.1	292	−3.8	♃	8 56	.0	5	−2.0
♂	18 21	.1	224	.8	♄	21 12	.0	180	.8

UT	SUNCE $S_\odot$	SUNCE $\delta_\odot$	PROLJ. TAČKA S_Υ	VENERA S_φ	VENERA δ_φ	MARS S_σ	MARS δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	180 47.2	15 52.3	221 46.1	152 50.7	22 58.5	84 58.1	18 36.6
2	210 47.3	15 53.7	251 51.0	182 49.2	22 59.6	115 1.0	18 35.9
4	240 47.4	15 55.2	281 55.9	212 47.6	23 .7	145 3.8	18 35.2
6	270 47.6	15 56.7	312 .9	242 46.1	23 1.8	175 6.7	18 34.5
8	300 47.7	15 58.1	342 5.8	272 44.5	23 2.8	205 9.5	18 33.7
10	330 47.8	15 59.5	12 10.7	302 43.0	23 3.9	235 12.4	18 33.0
12	0 47.9	16 1.0	42 15.7	332 41.4	23 4.9	265 15.2	18 32.3
14	30 48.0	16 2.4	72 20.6	2 39.8	23 6.0	295 18.1	18 31.6
16	60 48.1	16 3.9	102 25.5	32 38.3	23 7.0	325 20.9	18 30.9
18	90 48.3	16 5.3	132 30.4	62 36.7	23 8.1	355 23.8	18 30.1
20	120 48.4	16 6.8	162 35.4	92 35.2	23 9.1	25 26.6	18 29.4
22	150 48.5	16 8.2	192 40.3	122 33.6	23 10.1	55 29.4	18 28.7
Δ	1	7		−8	5	14	−4

UT	MJESEC $S_\leftmoon$	MJESEC Δ	MJESEC $\delta_\leftmoon$	MJESEC Δ	JUPITER S_4	JUPITER δ_4	SATURN S_η	SATURN δ_η
h	° ′		° ′		° ′	° ′	° ′	° ′
0	290 42.2	117	−21 30.2	71	226 31.0	− 3 12.0	42 12.9	2 56.1
2	319 43.6	119	−21 16.0	73	256 35.0	− 3 11.6	72 18.0	2 56.1
4	348 45.3	120	−21 1.5	75	286 39.0	− 3 11.2	102 23.1	2 56.2
6	17 47.3	122	−20 46.6	76	316 43.0	− 3 10.8	132 28.3	2 56.3
8	46 49.7	123	−20 31.3	78	346 47.0	− 3 10.5	162 33.4	2 56.3
10	75 52.3	125	−20 15.6	80	16 51.1	− 3 10.1	192 38.5	2 56.4
12	104 55.2	126	−19 59.7	82	46 55.1	− 3 9.7	222 43.7	2 56.5
14	133 58.4	128	−19 43.3	83	76 59.1	− 3 9.3	252 48.8	2 56.6
16	163 1.9	129	−19 26.7	85	107 3.1	− 3 9.0	282 53.9	2 56.6
18	192 5.7	130	−19 9.7	86	137 7.1	− 3 8.6	312 59.0	2 56.7
20	221 9.8	132	−18 52.4	88	167 11.2	− 3 8.2	343 4.2	2 56.8
22	250 14.1	133	−18 34.8	89	197 15.2	− 3 7.8	13 9.3	2 56.8
Δ					20	2	26	0

φ	SUNCE IZLAZ	SUNCE ZALAZ	TRAJANJE SUMRAKA GRAĐ.	TRAJANJE SUMRAKA ASTR.	MJESEC IZLAZ	MJESEC Δ/24	MJESEC ZALAZ	MJESEC Δ/24
N	h min	h min	h min	h min	h min	min	h min	min
60	3 50	20 5	0 55	: ::	1 32	.5	8 11	3.4
55	4 14	19 41	0 44	3 24	0 56	.9	8 45	3.1
50	4 32	19 23	0 37	2 24	0 31	1.1	9 9	2.8
45	4 45	19 9	0 33	2 0	0 11	1.3	9 28	2.7
40	4 57	18 58	0 30	1 45	.. ..	.0	9 43	2.5
35	5 6	18 48	0 27	1 35	.. ..	.0	9 56	2.4
30	5 15	18 39	0 26	1 28	.. ..	.0	10 7	2.3
20	5 29	18 25	0 23	1 18	23 51	1.6	10 26	2.2
10	5 42	18 12	0 22	1 14	23 36	1.7	10 43	2.0
0	5 53	18 0	0 22	1 12	23 22	1.8	10 58	1.9
10	6 5	17 49	0 22	1 12	23 8	2.0	11 13	1.8
20	6 17	17 36	0 23	1 15	22 53	2.1	11 29	1.6
30	6 31	17 23	0 25	1 22	22 36	2.3	11 48	1.5
35	6 39	17 15	0 26	1 26	22 26	2.4	11 59	1.4
40	6 48	17 5	0 28	1 32	22 15	2.5	12 11	1.3
45	6 58	16 55	0 31	1 40	22 1	2.6	12 26	1.2
50	7 11	16 42	0 34	1 51	21 44	2.8	12 43	1.0
55	7 27	16 26	0 39	2 5	21 23	3.1	13 6	.8
60	7 48	16 5	0 46	2 25	20 54	3.4	13 36	.4
S								

SUNCE UT	SUNCE $e = T_p - UT$	SUNCE Δ/24	SUNCE r	MJESEC Prolaz	MJESEC Δ/24	MJESEC $\pi_\leftmoon$	MJESEC r
h	min s	s	′	h min	min	′	′
00	3 9.0	.2	15.9	$T_{\overline{m}}$ 4 46	2.0	55.0	15.0
12	3 11.8	$T_{\overline{m}_\odot}$ 11 h 56.8 min		Starost 19.5 d	Faza ◑		

PLANETE Pl.	$T_{\overline{m}}$	π	360−α	Vel.	Pl.	$T_{\overline{m}}$	π	360−α	Vel.
	h min	′	°			h min	′	°	
♀	13 49	.1	291	−3.8	♃	8 53	.0	5	−2.0
♂	18 18	.1	223	.8	♄	21 8	.0	180	.8

UT	SUNCE $S_\odot$	$\delta_\odot$	PROLJ. TAČKA S_Υ	VENERA S_φ	δ_φ	MARS S_σ	δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	180 48.6	16 9.6	222 45.2	152 32.0	23 11.2	85 32.3	18 27.9
2	210 48.7	16 11.1	252 50.2	182 30.5	23 12.2	115 35.1	18 27.2
4	240 48.8	16 12.5	282 55.1	212 28.9	23 13.2	145 38.0	18 26.5
6	270 48.9	16 13.9	313 .0	242 27.4	23 14.2	175 40.8	18 25.8
8	300 49.0	16 15.3	343 4.9	272 25.8	23 15.2	205 43.6	18 25.0
10	330 49.1	16 16.8	13 9.9	302 24.2	23 16.2	235 46.5	18 24.3
12	0 49.2	16 18.2	43 14.8	332 22.6	23 17.2	265 49.3	18 23.6
14	30 49.3	16 19.6	73 19.7	2 21.1	23 18.2	295 52.1	18 22.8
16	60 49.4	16 21.0	103 24.6	32 19.5	23 19.2	325 55.0	18 22.1
18	90 49.5	16 22.5	133 29.6	62 17.9	23 20.2	355 57.8	18 21.4
20	120 49.6	16 23.9	163 34.5	92 16.4	23 21.2	26 .6	18 20.6
22	150 49.7	16 25.3	193 39.4	122 14.8	23 22.2	56 3.4	18 19.9
Δ	1	7		−8	5	14	−4

UT	MJESEC $S_\leftmoon$	Δ	$\delta_\leftmoon$	Δ	JUPITER S_4	δ_4	SATURN S_5	δ_5
h	° ′		° ′		° ′	° ′	° ′	° ′
0	279 18.8	135	−18 16.9	91	227 19.2	− 3 7.5	43 14.4	2 56.9
2	308 23.7	136	−17 58.8	92	257 23.2	− 3 7.1	73 19.6	2 57.0
4	337 28.8	137	−17 40.3	94	287 27.3	− 3 6.7	103 24.7	2 57.1
6	6 34.3	138	−17 21.5	95	317 31.3	− 3 6.3	133 29.8	2 57.1
8	35 40.0	140	−17 2.5	96	347 35.3	− 3 6.0	163 34.9	2 57.2
10	64 45.9	141	−16 43.2	98	17 39.3	− 3 5.6	193 40.1	2 57.3
12	93 52.1	142	−16 23.6	99	47 43.4	− 3 5.2	223 45.2	2 57.3
14	122 58.6	143	−16 3.8	100	77 47.4	− 3 4.8	253 50.3	2 57.4
16	152 5.3	145	−15 43.7	102	107 51.4	− 3 4.5	283 55.4	2 57.5
18	181 12.2	146	−15 23.4	103	137 55.4	− 3 4.1	314 .6	2 57.5
20	210 19.3	147	−15 2.9	104	167 59.5	− 3 3.7	344 5.7	2 57.6
22	239 26.7	148	−14 42.1	105	198 3.5	− 3 3.4	14 10.8	2 57.7
Δ					20	2	26	0

φ	SUNCE IZLAZ	ZALAZ	TRAJANJE SUMRAKA GRAĐ.	ASTR.	MJESEC IZLAZ	Δ/24	ZALAZ	Δ/24
N	h min	h min	h min	h min	h min	min	h min	min
60	3 48	20 7	0 56	: ::	1 44	.3	9 33	3.4
55	4 12	19 43	0 44	3 32	1 17	.7	9 59	3.0
50	4 30	19 25	0 38	2 26	0 57	.9	10 17	2.8
45	4 44	19 10	0 33	2 1	0 41	1.1	10 32	2.6
40	4 56	18 59	0 30	1 46	0 28	1.2	10 44	2.5
35	5 5	18 49	0 27	1 35	0 17	1.3	10 54	2.4
30	5 14	18 40	0 26	1 28	0 7	1.4	11 3	2.3
20	5 29	18 25	0 23	1 19	.. ..	.0	11 18	2.1
10	5 41	18 12	0 22	1 14	.. ..	.0	11 31	1.9
0	5 53	18 0	0 22	1 12	.. ..	.0	11 44	1.8
10	6 5	17 48	0 22	1 12	23 56	1.9	11 56	1.7
20	6 17	17 36	0 23	1 15	23 44	2.1	12 9	1.5
30	6 31	17 22	0 25	1 22	23 31	2.2	12 24	1.3
35	6 39	17 14	0 26	1 26	23 23	2.3	12 32	1.2
40	6 49	17 4	0 28	1 32	23 15	2.5	12 42	1.1
45	6 59	16 54	0 31	1 40	23 5	2.6	12 53	1.0
50	7 12	16 41	0 35	1 51	22 52	2.8	13 7	.8
55	7 29	16 24	0 39	2 5	22 36	3.0	13 24	.6
60	7 50	16 3	0 47	2 25	22 15	3.3	13 47	.3
S								

UT	SUNCE $e = T_p - UT$	Δ/24	r	MJESEC Prolaz	Δ/24	$\pi_\leftmoon$	r
h	min s	s	′	h min	min	′	′
00	3 14.5	.2	15.9	$T_{\overline{m}}$ 5 33	1.8	54.6	14.9
12	3 17.0	$T_{\overline{m}_\odot}$ 11 h 56.7 min		Starost 20.5 d	Faza ◑		

PLANETE

Pl.	$T_{\overline{m}}$	π	360−α	Vel.	Pl.	$T_{\overline{m}}$	π	360−α	Vel.
	h min	′	°			h min	′	°	
♀	13 51	.1	290	−3.8	♃	8 50	.0	5	−2.0
♂	18 16	.1	223	.8	♄	21 3	.0	180	.9

UT	SUNCE $S_\odot$	$\delta_\odot$	PROLJ. TAČKA S_Υ	VENERA S_φ	δ_φ	MARS S_σ	δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	180 49.8	16 26.7	223 44.4	152 13.2	23 23.1	86 6.3	18 19.2
2	210 49.9	16 28.1	253 49.3	182 11.6	23 24.1	116 9.1	18 18.4
4	240 50.0	16 29.5	283 54.2	212 10.0	23 25.1	146 11.9	18 17.7
6	270 50.1	16 30.9	313 59.1	242 8.5	23 26.0	176 14.7	18 17.0
8	300 50.2	16 32.3	344 4.1	272 6.9	23 27.0	206 17.5	18 16.2
10	330 50.3	16 33.7	14 9.0	302 5.3	23 27.9	236 20.4	18 15.5
12	0 50.4	16 35.1	44 13.9	332 3.7	23 28.9	266 23.2	18 14.7
14	30 50.5	16 36.5	74 18.9	2 2.1	23 29.8	296 26.0	18 14.0
16	60 50.6	16 37.9	104 23.8	32 .5	23 30.8	326 28.8	18 13.3
18	90 50.7	16 39.3	134 28.7	61 59.0	23 31.7	356 31.6	18 12.5
20	120 50.8	16 40.7	164 33.6	91 57.4	23 32.6	26 34.4	18 11.8
22	150 50.9	16 42.1	194 38.6	121 55.8	23 33.5	56 37.2	18 11.0
Δ	0	7		−8	5	14	−4

UT	MJESEC $S_\leftmoon$	Δ	$\delta_\leftmoon$	Δ	JUPITER S_4	δ_4	SATURN S_5	δ_5
h	° ′		° ′		° ′	° ′	° ′	° ′
0	268 34.3	149	−14 21.1	106	228 7.5	− 3 3.0	44 15.9	2 57.8
2	297 42.1	150	−13 59.9	107	258 11.6	− 3 2.6	74 21.0	2 57.8
4	326 50.1	151	−13 38.5	108	288 15.6	− 3 2.2	104 26.2	2 57.9
6	355 58.2	152	−13 16.8	109	318 19.6	− 3 1.9	134 31.3	2 58.0
8	25 6.6	153	−12 55.0	110	348 23.7	− 3 1.5	164 36.4	2 58.0
10	54 15.2	154	−12 33.0	111	18 27.7	− 3 1.1	194 41.5	2 58.1
12	83 23.9	155	−12 10.7	112	48 31.7	− 3 .8	224 46.6	2 58.2
14	112 32.8	155	−11 48.3	113	78 35.7	− 3 .4	254 51.7	2 58.2
16	141 41.9	156	−11 25.7	114	108 39.8	− 3 .0	284 56.9	2 58.3
18	170 51.1	157	−11 3.0	115	138 43.8	− 2 59.7	315 2.0	2 58.4
20	200 .5	158	−10 40.1	115	168 47.9	− 2 59.3	345 7.1	2 58.4
22	229 10.0	158	−10 17.0	116	198 51.9	− 2 58.9	15 12.2	2 58.5
Δ					20	2	26	0

φ	SUNCE IZLAZ	ZALAZ	TRAJANJE SUMRAKA GRAĐ.	ASTR.	MJESEC IZLAZ	Δ/24	ZALAZ	Δ/24
N	h min	h min	h min	h min	h min	min	h min	min
60	3 45	20 10	0 57	: ::	1 53	.2	10 54	3.3
55	4 10	19 45	0 45	3 42	1 33	.5	11 12	3.0
50	4 28	19 26	0 38	2 28	1 19	.8	11 25	2.8
45	4 43	19 11	0 33	2 2	1 7	.9	11 35	2.6
40	4 54	18 60	0 30	1 46	0 57	1.1	11 44	2.5
35	5 4	18 49	0 27	1 36	0 49	1.2	11 51	2.3
30	5 13	18 41	0 26	1 28	0 41	1.3	11 57	2.2
20	5 28	18 25	0 23	1 19	0 28	1.5	12 8	2.0
10	5 41	18 12	0 22	1 14	0 17	1.6	12 18	1.9
0	5 53	18 0	0 22	1 12	0 6	1.8	12 27	1.7
10	6 5	17 48	0 22	1 12	.. ..	.0	12 36	1.6
20	6 18	17 35	0 23	1 15	.. ..	.0	12 45	1.4
30	6 32	17 21	0 25	1 22	.. ..	.0	12 56	1.2
35	6 40	17 13	0 27	1 26	.. ..	.0	13 2	1.1
40	6 50	17 3	0 29	1 33	.. ..	.0	13 9	1.0
45	7 1	16 52	0 31	1 41	.. ..	.0	13 17	.9
50	7 14	16 39	0 35	1 51	23 59	2.8	13 26	.7
55	7 30	16 22	0 40	2 5	23 49	3.0	13 38	.5
60	7 52	16 0	0 47	2 26	23 35	3.3	13 54	.2
S								

UT	SUNCE $e = T_p - UT$	Δ/24	r	MJESEC Prolaz	Δ/24	$\pi_\leftmoon$	r
h	min s	s	′	h min	min	′	′
00	3 19.5	.2	15.9	$T_{\overline{m}}$ 6 17	1.7	54.3	14.8
12	3 21.7	$T_{\overline{m}_\odot}$ 11 h 56.6 min		Starost 21.5 d	Faza ◑		

PLANETE

Pl.	$T_{\overline{m}}$	π	360−α	Vel.	Pl.	$T_{\overline{m}}$	π	360−α	Vel.
	h min	′	°			h min	′	°	
♀	13 52	.1	288	−3.8	♃	8 46	.0	4	−2.0
♂	18 14	.1	222	.8	♄	20 59	.0	181	.9

UT	SUNCE $S_\odot$	$\delta_\odot$	PROLJ. TAČKA S_Υ	VENERA S_φ	δ_φ	MARS S_σ	δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	180 50.9	16 43.5	224 43.5	151 54.2	23 34.4	86 40.0	18 10.3
2	210 51.0	16 44.9	254 48.4	181 52.6	23 35.4	116 42.8	18 9.5
4	240 51.1	16 46.3	284 53.4	211 51.0	23 36.3	146 45.6	18 8.8
6	270 51.2	16 47.6	314 58.3	241 49.4	23 37.2	176 48.4	18 8.1
8	300 51.3	16 49.0	345 3.2	271 47.8	23 38.1	206 51.2	18 7.3
10	330 51.4	16 50.4	15 8.1	301 46.2	23 39.0	236 54.0	18 6.6
12	0 51.4	16 51.8	45 13.1	331 44.6	23 39.9	266 56.8	18 5.8
14	30 51.5	16 53.2	75 18.0	1 43.0	23 40.7	296 59.6	18 5.1
16	60 51.6	16 54.5	105 22.9	31 41.4	23 41.6	327 2.4	18 4.3
18	90 51.7	16 55.9	135 27.9	61 39.8	23 42.5	357 5.2	18 3.6
20	120 51.7	16 57.3	165 32.8	91 38.2	23 43.4	27 8.0	18 2.8
22	150 51.8	16 58.6	195 37.7	121 36.6	23 44.2	57 10.8	18 2.1
Δ	0	7		−8	4	14	−4

UT	MJESEC $S_\leftmoon$	Δ	$\delta_\leftmoon$	Δ	JUPITER S_4	δ_4	SATURN S_η	δ_η
h	° ′		° ′		° ′	° ′	° ′	° ′
0	258 19.6	159	− 9 53.7	117	228 55.9	− 2 58.5	45 17.3	2 58.5
2	287 29.4	159	− 9 30.3	118	258 60.0	− 2 58.2	75 22.4	2 58.6
4	316 39.2	160	− 9 6.8	118	289 4.0	− 2 57.8	105 27.5	2 58.7
6	345 49.2	160	− 8 43.1	119	319 8.0	− 2 57.4	135 32.7	2 58.7
8	14 59.3	161	− 8 19.2	120	349 12.1	− 2 57.1	165 37.8	2 58.8
10	44 9.5	161	− 7 55.3	120	19 16.1	− 2 56.7	195 42.9	2 58.9
12	73 19.8	162	− 7 31.2	121	49 20.2	− 2 56.3	225 48.0	2 58.9
14	102 30.1	162	− 7 7.0	122	79 24.2	− 2 56.0	255 53.1	2 59.0
16	131 40.6	162	− 6 42.7	122	109 28.2	− 2 55.6	285 58.2	2 59.1
18	160 51.0	163	− 6 18.2	123	139 32.3	− 2 55.2	316 3.3	2 59.1
20	190 1.6	163	− 5 53.7	123	169 36.3	− 2 54.9	346 8.4	2 59.2
22	219 12.2	163	− 5 29.1	124	199 40.4	− 2 54.5	16 13.5	2 59.2
Δ					20	2	26	0

φ	SUNCE IZLAZ	ZALAZ	TRAJANJE SUMRAKA GRAĐ.	ASTR.	MJESEC IZLAZ	Δ/24	ZALAZ	Δ/24
N	h min	h min	h min	h min	h min	min	h min	min
60	3 42	20 12	0 58	: ::	1 59	.2	12 14	3.3
55	4 8	19 47	0 45	4 7	1 46	.5	12 24	3.0
50	4 27	19 28	0 38	2 29	1 37	.7	12 31	2.8
45	4 41	19 13	0 33	2 2	1 29	.8	12 37	2.6
40	4 53	19 1	0 30	1 47	1 22	1.0	12 42	2.4
35	5 3	18 50	0 28	1 36	1 17	1.1	12 47	2.3
30	5 12	18 41	0 26	1 29	1 12	1.2	12 51	2.2
20	5 28	18 26	0 23	1 19	1 3	1.4	12 57	2.0
10	5 41	18 12	0 22	1 14	0 56	1.6	13 3	1.8
0	5 53	18 0	0 22	1 12	0 48	1.7	13 8	1.7
10	6 5	17 48	0 22	1 12	0 41	1.9	13 13	1.5
20	6 18	17 35	0 23	1 16	0 34	2.0	13 19	1.4
30	6 33	17 20	0 25	1 22	0 25	2.2	13 25	1.2
35	6 41	17 12	0 27	1 27	0 20	2.3	13 29	1.1
40	6 51	17 2	0 29	1 33	0 14	2.4	13 33	1.0
45	7 2	16 51	0 31	1 41	0 7	2.6	13 38	.8
50	7 15	16 37	0 35	1 51	. . .	.0	13 43	.7
55	7 32	16 20	0 40	2 6	. . .	.0	13 50	.4
60	7 55	15 58	0 47	2 26	. . .	.0	13 59	.2
S								

SUNCE UT	e = Tp − UT	Δ/24	r	MJESEC Prolaz	Δ/24	$\pi_\leftmoon$	r
h	min s	s	′	h min	min	′	′
00	3 23.9	.2	15.9	$T_{\overline{m}}$ 6 58	1.7	54.2	14.8
12	3 25.9	$T_{\overline{m}_\odot}$ 11 h 56.6 min		Starost 22.5 d	Faza ◑		

PLANETE

Pl.	$T_{\overline{m}}$	π	360−α	Vel.	Pl.	$T_{\overline{m}}$	π	360−α	Vel.
	h min	′	°			h min	′	°	
♀	13 53	.1	287	−3.8	♃	8 43	.0	4	−2.0
♂	18 12	.1	222	.8	♄	20 55	.0	181	.9

UT	SUNCE $S_\odot$	$\delta_\odot$	PROLJ. TAČKA S_Υ	VENERA S_φ	δ_φ	MARS S_σ	δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	180 51.9	17 .0	225 42.6	151 35.0	23 45.1	87 13.6	18 1.3
2	210 52.0	17 1.4	255 47.6	181 33.4	23 46.0	117 16.4	18 .5
4	240 52.0	17 2.7	285 52.5	211 31.8	23 46.8	147 19.2	17 59.8
6	270 52.1	17 4.1	315 57.4	241 30.2	23 47.7	177 22.0	17 59.0
8	300 52.2	17 5.5	346 2.4	271 28.6	23 48.5	207 24.8	17 58.3
10	330 52.3	17 6.8	16 7.3	301 27.0	23 49.3	237 27.5	17 57.5
12	0 52.3	17 8.2	46 12.2	331 25.3	23 50.2	267 30.3	17 56.8
14	30 52.4	17 9.5	76 17.1	1 23.7	23 51.0	297 33.1	17 56.0
16	60 52.5	17 10.9	106 22.1	31 22.1	23 51.8	327 35.9	17 55.3
18	90 52.5	17 12.2	136 27.0	61 20.5	23 52.7	357 38.7	17 54.5
20	120 52.6	17 13.6	166 31.9	91 18.9	23 53.5	27 41.4	17 53.7
22	150 52.6	17 14.9	196 36.9	121 17.3	23 54.3	57 44.2	17 53.0
Δ	0	7		−8	4	14	−4

UT	MJESEC $S_\leftmoon$	Δ	$\delta_\leftmoon$	Δ	JUPITER S_4	δ_4	SATURN S_η	δ_η
h	° ′		° ′		° ′	° ′	° ′	° ′
0	248 22.8	163	− 5 4.3	124	229 44.4	− 2 54.1	46 18.6	2 59.3
2	277 33.5	163	− 4 39.5	125	259 48.4	− 2 53.8	76 23.7	2 59.4
4	306 44.2	164	− 4 14.6	125	289 52.5	− 2 53.4	106 28.9	2 59.4
6	335 54.9	164	− 3 49.6	125	319 56.5	− 2 53.0	136 34.0	2 59.5
8	5 5.6	164	− 3 24.5	126	350 .6	− 2 52.7	166 39.1	2 59.5
10	34 16.3	164	− 2 59.3	126	20 4.6	− 2 52.3	196 44.2	2 59.6
12	63 27.1	163	− 2 34.1	126	50 8.7	− 2 52.0	226 49.3	2 59.7
14	92 37.8	163	− 2 8.8	127	80 12.7	− 2 51.6	256 54.4	2 59.7
16	121 48.4	163	− 1 43.5	127	110 16.8	− 2 51.2	286 59.5	2 59.8
18	150 59.1	163	− 1 18.1	127	140 20.8	− 2 50.9	317 4.6	2 59.8
20	180 9.7	163	− 0 52.7	127	170 24.9	− 2 50.5	347 9.7	2 59.9
22	209 20.2	163	− 0 27.2	128	200 28.9	− 2 50.1	17 14.8	2 60.0
Δ					20	2	26	0

φ	SUNCE IZLAZ	ZALAZ	TRAJANJE SUMRAKA GRAĐ.	ASTR.	MJESEC IZLAZ	Δ/24	ZALAZ	Δ/24
N	h min	h min	h min	h min	h min	min	h min	min
60	3 40	20 15	0 58	: ::	2 3	.2	13 32	3.3
55	4 6	19 48	0 45	: ::	1 57	.4	13 35	3.0
50	4 25	19 29	0 38	2 31	1 53	.6	13 38	2.8
45	4 40	19 14	0 33	2 3	1 49	.8	13 39	2.6
40	4 52	19 2	0 30	1 47	1 46	1.0	13 41	2.5
35	5 3	18 51	0 28	1 36	1 43	1.1	13 42	2.3
30	5 12	18 42	0 26	1 29	1 41	1.2	13 44	2.2
20	5 27	18 26	0 23	1 19	1 36	1.4	13 45	2.0
10	5 41	18 13	0 22	1 14	1 33	1.5	13 47	1.9
0	5 53	17 60	0 22	1 12	1 29	1.7	13 49	1.7
10	6 5	17 48	0 22	1 13	1 26	1.8	13 50	1.5
20	6 18	17 34	0 23	1 16	1 22	2.0	13 52	1.4
30	6 33	17 19	0 25	1 22	1 18	2.2	13 54	1.2
35	6 42	17 11	0 27	1 27	1 16	2.3	13 55	1.1
40	6 52	17 1	0 29	1 33	1 13	2.5	13 56	1.0
45	7 3	16 50	0 31	1 41	1 10	2.6	13 57	.8
50	7 17	16 36	0 35	1 52	1 6	2.8	13 59	.6
55	7 34	16 18	0 40	2 6	1 1	3.0	14 1	.4
60	7 57	15 55	0 47	2 27	0 55	3.3	14 4	.2
S								

SUNCE UT	e = Tp − UT	Δ/24	r	MJESEC Prolaz	Δ/24	$\pi_\leftmoon$	r
h	min s	s	′	h min	min	′	′
00	3 27.8	.1	15.9	$T_{\overline{m}}$ 7 39	1.7	54.3	14.8
12	3 29.4	$T_{\overline{m}_\odot}$ 11 h 56.5 min		Starost 23.5 d	Faza ◑		

PLANETE

Pl.	$T_{\overline{m}}$	π	360−α	Vel.	Pl.	$T_{\overline{m}}$	π	360−α	Vel.
	h min	′	°			h min	′	°	
♀	13 54	.1	286	−3.8	♃	8 40	.0	4	−2.0
♂	18 9	.1	222	.8	♄	20 51	.0	181	.9

UT	SUNCE $S_\odot$	$\delta_\odot$	PROLJ. TAČKA S_Υ	VENERA S_φ	δ_φ	MARS S_σ	δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	180 52.7	17 16.2	226 41.8	151 15.7	23 55.1	87 47.0	17 52.2
2	210 52.8	17 17.6	256 46.7	181 14.0	23 55.9	117 49.8	17 51.4
4	240 52.8	17 18.9	286 51.6	211 12.4	23 56.7	147 52.5	17 50.7
6	270 52.9	17 20.3	316 56.6	241 10.8	23 57.5	177 55.3	17 49.9
8	300 52.9	17 21.6	347 1.5	271 9.2	23 58.3	207 58.1	17 49.2
10	330 53.0	17 22.9	17 6.4	301 7.5	23 59.1	238 .8	17 48.4
12	0 53.1	17 24.3	47 11.3	331 5.9	23 59.8	268 3.6	17 47.6
14	30 53.1	17 25.6	77 16.3	1 4.3	24 .6	298 6.4	17 46.9
16	60 53.2	17 26.9	107 21.2	31 2.7	24 1.4	328 9.1	17 46.1
18	90 53.2	17 28.2	137 26.1	61 1.0	24 2.1	358 11.9	17 45.3
20	120 53.3	17 29.6	167 31.1	90 59.4	24 2.9	28 14.7	17 44.5
22	150 53.3	17 30.9	197 36.0	120 57.8	24 3.7	58 17.4	17 43.8
Δ	0	7		−8	4	14	−4

UT	MJESEC $S_\leftmoon$	Δ	$\delta_\leftmoon$	Δ	JUPITER S_4	δ_4	SATURN S_η	δ_η
h	° ′		° ′		° ′	° ′	° ′	° ′
0	238 30.7	162	− 0 1.7	128	230 33.0	− 2 49.8	47 19.9	3 .0
2	267 41.2	162	0 23.8	128	260 37.0	− 2 49.4	77 25.0	3 .1
4	296 51.5	161	0 49.4	128	290 41.1	− 2 49.1	107 30.1	3 .1
6	326 1.8	161	1 14.9	128	320 45.1	− 2 48.7	137 35.2	3 .2
8	355 12.0	161	1 40.5	128	350 49.2	− 2 48.3	167 40.3	3 .3
10	24 22.1	160	2 6.1	128	20 53.2	− 2 48.0	197 45.4	3 .3
12	53 32.1	159	2 31.7	128	50 57.3	− 2 47.6	227 50.5	3 .4
14	82 42.0	159	2 57.3	128	81 1.3	− 2 47.3	257 55.6	3 .4
16	111 51.8	158	3 22.9	128	111 5.4	− 2 46.9	288 .7	3 .5
18	141 1.4	157	3 48.5	128	141 9.4	− 2 46.5	318 5.8	3 .5
20	170 10.9	157	4 14.0	128	171 13.5	− 2 46.2	348 10.8	3 .6
22	199 20.3	156	4 39.5	127	201 17.6	− 2 45.8	18 15.9	3 .6
Δ					20	2	25	0

φ	SUNCE IZLAZ	ZALAZ	TRAJANJE SUMRAKA GRAĐ.	ASTR.	MJESEC IZLAZ	Δ/24	ZALAZ	Δ/24
N	h min	h min	h min	h min	h min	min	h min	min
60	3 37	20 17	0 59	: ::	2 8	.2	14 52	3.4
55	4 4	19 50	0 46	: ::	2 8	.5	14 48	3.1
50	4 23	19 31	0 38	2 33	2 8	.7	14 45	2.9
45	4 39	19 15	0 33	2 4	2 8	.8	14 42	2.7
40	4 51	19 2	0 30	1 48	2 9	1.0	14 40	2.5
35	5 2	18 52	0 28	1 37	2 9	1.1	14 38	2.4
30	5 11	18 42	0 26	1 29	2 9	1.2	14 37	2.3
20	5 27	18 27	0 23	1 19	2 9	1.4	14 34	2.1
10	5 40	18 13	0 22	1 14	2 10	1.6	14 32	1.9
0	5 53	17 60	0 22	1 12	2 10	1.7	14 30	1.8
10	6 6	17 47	0 22	1 13	2 10	1.9	14 27	1.6
20	6 19	17 34	0 23	1 16	2 11	2.1	14 25	1.4
30	6 34	17 19	0 25	1 22	2 11	2.3	14 22	1.2
35	6 43	17 10	0 27	1 27	2 11	2.4	14 21	1.1
40	6 53	16 60	0 29	1 33	2 12	2.5	14 19	1.0
45	7 4	16 48	0 31	1 41	2 12	2.6	14 17	.9
50	7 18	16 34	0 35	1 52	2 12	2.8	14 15	.7
55	7 36	16 17	0 40	2 6	2 13	3.0	14 12	.5
60	7 59	15 53	0 48	2 27	2 14	3.3	14 8	.2
S								

SUNCE UT	e = Tp − UT	Δ/24	r	MJESEC Prolaz		Δ/24	$\pi_\leftmoon$	r
h	min s	s	′		h min	min	′	′
00	3 31.0	.1	15.9	$T_{\overline{m}}$	8 20	1.7	54.6	14.9
12	3 32.3	$T_{\overline{m}_\odot}$	11 h 56.5 min	Starost 24.5 d		Faza ◑		

PLANETE

Pl.	$T_{\overline{m}}$	π	360−α	Vel.	Pl.	$T_{\overline{m}}$	π	360−α	Vel.
	h min	′	°			h min	′	°	
♀	13 56	.1	285	−3.8	♃	8 37	.0	4	−2.0
♂	18 7	.1	221	.8	♄	20 47	.0	181	.9

UT	SUNCE $S_\odot$	$\delta_\odot$	PROLJ. TAČKA S_Υ	VENERA S_φ	δ_φ	MARS S_σ	δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	180 53.4	17 32.2	227 40.9	150 56.2	24 4.4	88 20.2	17 43.0
2	210 53.4	17 33.5	257 45.8	180 54.5	24 5.2	118 22.9	17 42.2
4	240 53.5	17 34.8	287 50.8	210 52.9	24 5.9	148 25.7	17 41.5
6	270 53.5	17 36.1	317 55.7	240 51.3	24 6.6	178 28.5	17 40.7
8	300 53.6	17 37.4	348 .6	270 49.6	24 7.4	208 31.2	17 39.9
10	330 53.6	17 38.7	18 5.6	300 48.0	24 8.1	238 34.0	17 39.1
12	0 53.6	17 40.1	48 10.5	330 46.4	24 8.8	268 36.7	17 38.4
14	30 53.7	17 41.4	78 15.4	0 44.7	24 9.5	298 39.5	17 37.6
16	60 53.7	17 42.7	108 20.3	30 43.1	24 10.2	328 42.2	17 36.8
18	90 53.8	17 44.0	138 25.3	60 41.5	24 10.9	358 45.0	17 36.0
20	120 53.8	17 45.3	168 30.2	90 39.8	24 11.6	28 47.7	17 35.3
22	150 53.9	17 46.6	198 35.1	120 38.2	24 12.3	58 50.5	17 34.5
Δ	0	7		−8	4	14	−4

UT	MJESEC $S_\leftmoon$	Δ	$\delta_\leftmoon$	Δ	JUPITER S_4	δ_4	SATURN S_η	δ_η
h	° ′		° ′		° ′	° ′	° ′	° ′
0	228 29.5	155	5 5.0	127	231 21.6	− 2 45.5	48 21.0	3 .7
2	257 38.5	154	5 30.5	127	261 25.7	− 2 45.1	78 26.1	3 .8
4	286 47.4	153	5 55.8	127	291 29.7	− 2 44.7	108 31.2	3 .8
6	315 56.0	153	6 21.2	126	321 33.8	− 2 44.4	138 36.3	3 .9
8	345 4.6	152	6 46.5	126	351 37.8	− 2 44.0	168 41.4	3 .9
10	14 12.9	151	7 11.7	126	21 41.9	− 2 43.7	198 46.5	3 1.0
12	43 21.0	150	7 36.8	125	51 46.0	− 2 43.3	228 51.6	3 1.0
14	72 28.9	148	8 1.9	125	81 50.0	− 2 42.9	258 56.7	3 1.1
16	101 36.6	147	8 26.8	124	111 54.1	− 2 42.6	289 1.8	3 1.1
18	130 44.0	146	8 51.7	124	141 58.1	− 2 42.2	319 6.8	3 1.2
20	159 51.2	145	9 16.5	123	172 2.2	− 2 41.9	349 11.9	3 1.2
22	188 58.2	144	9 41.1	123	202 6.3	− 2 41.5	19 17.0	3 1.3
Δ					20	2	25	0

φ	SUNCE IZLAZ	ZALAZ	TRAJANJE SUMRAKA GRAĐ.	ASTR.	MJESEC IZLAZ	Δ/24	ZALAZ	Δ/24
N	h min	h min	h min	h min	h min	min	h min	min
60	3 35	20 20	0 60	: ::	2 12	.2	16 13	3.5
55	4 2	19 52	0 46	: ::	2 19	.5	16 2	3.2
50	4 22	19 32	0 39	2 34	2 24	.7	15 53	3.0
45	4 37	19 16	0 34	2 5	2 28	.9	15 47	2.8
40	4 50	19 3	0 30	1 48	2 32	1.0	15 41	2.6
35	5 1	18 53	0 28	1 37	2 35	1.2	15 36	2.5
30	5 10	18 43	0 26	1 29	2 38	1.3	15 32	2.4
20	5 26	18 27	0 23	1 20	2 43	1.5	15 24	2.2
10	5 40	18 13	0 22	1 14	2 47	1.6	15 18	2.0
0	5 53	17 60	0 22	1 12	2 51	1.8	15 12	1.9
10	6 6	17 47	0 22	1 13	2 55	2.0	15 6	1.7
20	6 19	17 33	0 23	1 16	2 60	2.1	14 59	1.5
30	6 35	17 18	0 25	1 22	3 5	2.3	14 52	1.3
35	6 43	17 9	0 27	1 27	3 8	2.4	14 48	1.2
40	6 54	16 59	0 29	1 33	3 11	2.6	14 43	1.1
45	7 5	16 47	0 31	1 41	3 15	2.7	14 38	1.0
50	7 20	16 33	0 35	1 52	3 20	2.9	14 31	.8
55	7 38	16 15	0 40	2 7	3 26	3.1	14 23	.6
60	8 2	15 50	0 48	2 28	3 34	3.5	14 13	.3
S								

SUNCE UT	e = Tp − UT	Δ/24	r	MJESEC Prolaz		Δ/24	$\pi_\leftmoon$	r
h	min s	s	′		h min	min	′	′
00	3 33.7	.1	15.9	$T_{\overline{m}}$	9 1	1.8	55.0	15.0
12	3 34.7	$T_{\overline{m}_\odot}$	11 h 56.4 min	Starost 25.5 d		Faza ◑		

PLANETE

Pl.	$T_{\overline{m}}$	π	360−α	Vel.	Pl.	$T_{\overline{m}}$	π	360−α	Vel.
	h min	′	°			h min	′	°	
♀	13 57	.1	283	−3.8	♃	8 33	.0	4	−2.0
♂	18 5	.1	221	.9	♄	20 43	.0	181	.9

UT	SUNCE $S_\odot$	$\delta_\odot$	PROLJ. TAČKA S_Υ	VENERA S_φ	δ_φ	MARS S_σ	δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	180 53.9	17 47.8	228 40.1	150 36.5	24 13.0	88 53.2	17 33.7
2	210 53.9	17 49.1	258 45.0	180 34.9	24 13.7	118 55.9	17 32.9
4	240 54.0	17 50.4	288 49.9	210 33.3	24 14.4	148 58.7	17 32.1
6	270 54.0	17 51.7	318 54.8	240 31.6	24 15.1	179 1.4	17 31.4
8	300 54.0	17 53.0	348 59.8	270 30.0	24 15.8	209 4.2	17 30.6
10	330 54.1	17 54.3	19 4.7	300 28.3	24 16.4	239 6.9	17 29.8
12	0 54.1	17 55.6	49 9.6	330 26.7	24 17.1	269 9.6	17 29.0
14	30 54.1	17 56.8	79 14.6	0 25.0	24 17.8	299 12.4	17 28.2
16	60 54.2	17 58.1	109 19.5	30 23.4	24 18.4	329 15.1	17 27.4
18	90 54.2	17 59.4	139 24.4	60 21.7	24 19.1	359 17.9	17 26.6
20	120 54.2	18 .7	169 29.3	90 20.1	24 19.7	29 20.6	17 25.9
22	150 54.2	18 1.9	199 34.3	120 18.4	24 20.3	59 23.3	17 25.1
Δ	0	6		−8	3	14	−4

UT	MJESEC $S_\leftmoon$	Δ	$\delta_\leftmoon$	Δ	JUPITER $S_\jupiter$	$\delta_\jupiter$	SATURN $S_\saturn$	$\delta_\saturn$
h	° ′		° ′		° ′	° ′	° ′	° ′
0	218 5.0	142	10 5.7	122	232 10.3	− 2 41.2	49 22.1	3 1.3
2	247 11.4	141	10 30.1	121	262 14.4	− 2 40.8	79 27.2	3 1.4
4	276 17.7	140	10 54.4	121	292 18.5	− 2 40.5	109 32.3	3 1.4
6	305 23.6	138	11 18.5	120	322 22.5	− 2 40.1	139 37.4	3 1.5
8	334 29.3	137	11 42.5	119	352 26.6	− 2 39.7	169 42.4	3 1.5
10	3 34.7	136	12 6.3	118	22 30.7	− 2 39.4	199 47.5	3 1.6
12	32 39.8	134	12 29.9	117	52 34.7	− 2 39.0	229 52.6	3 1.6
14	61 44.6	133	12 53.4	116	82 38.8	− 2 38.7	259 57.7	3 1.7
16	90 49.1	131	13 16.7	115	112 42.9	− 2 38.3	290 2.8	3 1.7
18	119 53.3	129	13 39.8	114	142 46.9	− 2 38.0	320 7.8	3 1.8
20	148 57.2	128	14 2.7	113	172 51.0	− 2 37.6	350 12.9	3 1.8
22	178 .7	126	14 25.4	112	202 55.1	− 2 37.3	20 18.0	3 1.9
Δ					20	2	25	0

φ	SUNCE IZLAZ	ZALAZ	TRAJANJE SUMRAKA GRAĐ.	ASTR.	MJESEC IZLAZ	Δ/24	ZALAZ	Δ/24
N	h min	h min	h min	h min	h min	min	h min	min
60	3 32	20 22	1 1	: ::	2 18	.3	17 38	3.7
55	4 0	19 54	0 46	: ::	2 31	.6	17 19	3.3
50	4 20	19 33	0 39	2 36	2 42	.9	17 4	3.1
45	4 36	19 18	0 34	2 6	2 50	1.0	16 53	2.9
40	4 49	19 4	0 30	1 49	2 57	1.2	16 44	2.7
35	4 60	18 53	0 28	1 38	3 3	1.3	16 36	2.6
30	5 9	18 44	0 26	1 30	3 9	1.4	16 29	2.5
20	5 26	18 27	0 23	1 20	3 18	1.6	16 17	2.3
10	5 40	18 13	0 22	1 14	3 27	1.8	16 6	2.1
0	5 53	17 60	0 22	1 12	3 34	1.9	15 56	2.0
10	6 6	17 47	0 22	1 13	3 42	2.1	15 46	1.8
20	6 20	17 33	0 23	1 16	3 51	2.2	15 36	1.7
30	6 35	17 17	0 25	1 22	4 1	2.4	15 24	1.5
35	6 44	17 8	0 27	1 27	4 7	2.5	15 17	1.4
40	6 54	16 58	0 29	1 33	4 13	2.7	15 9	1.3
45	7 6	16 46	0 32	1 41	4 21	2.8	15 0	1.1
50	7 21	16 31	0 35	1 52	4 30	3.0	14 50	.9
55	7 39	16 13	0 40	2 7	4 42	3.3	14 36	.7
60	8 4	15 48	0 48	2 28	4 57	3.6	14 19	.4
S								

SUNCE UT	e = Tp − UT	Δ/24	r	MJESEC Prolaz		Δ/24	$\pi_\leftmoon$	r
h	min s	s	′		h min	min	′	′
00	3 35.7	.1	15.9	$T_{\overline{m}}$	9 45	2.0	55.5	15.1
12	3 36.5	$T_{\overline{m}_\odot}$	11 h 56.4 min	Starost 26.5 d		Faza ●		

PLANETE

Pl.	$T_{\overline{m}}$	π	360 − α	Vel.	Pl.	$T_{\overline{m}}$	π	360 − α	Vel.
	h min	′	°			h min	′	°	
♀	13 58	.1	282	−3.8	♃	8 30	.0	3	−2.0
♂	18 3	.1	220	.9	♄	20 39	.0	181	.9

UT	SUNCE $S_\odot$	$\delta_\odot$	PROLJ. TAČKA S_Υ	VENERA S_φ	δ_φ	MARS S_σ	δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	180 54.3	18 3.2	229 39.2	150 16.8	24 21.0	89 26.0	17 24.3
2	210 54.3	18 4.5	259 44.1	180 15.1	24 21.6	119 28.8	17 23.5
4	240 54.3	18 5.7	289 49.1	210 13.5	24 22.2	149 31.5	17 22.7
6	270 54.3	18 7.0	319 54.0	240 11.8	24 22.9	179 34.2	17 21.9
8	300 54.4	18 8.2	349 58.9	270 10.2	24 23.5	209 37.0	17 21.1
10	330 54.4	18 9.5	20 3.8	300 8.5	24 24.1	239 39.7	17 20.3
12	0 54.4	18 10.8	50 8.8	330 6.9	24 24.7	269 42.4	17 19.5
14	30 54.4	18 12.0	80 13.7	0 5.2	24 25.3	299 45.1	17 18.7
16	60 54.4	18 13.3	110 18.6	30 3.6	24 25.9	329 47.8	17 17.9
18	90 54.4	18 14.5	140 23.6	60 1.9	24 26.5	359 50.6	17 17.1
20	120 54.5	18 15.8	170 28.5	90 .3	24 27.1	29 53.3	17 16.4
22	150 54.5	18 17.0	200 33.4	119 58.6	24 27.7	59 56.0	17 15.6
Δ	0	6		−8	3	14	−4

UT	MJESEC $S_\leftmoon$	Δ	$\delta_\leftmoon$	Δ	JUPITER $S_\jupiter$	$\delta_\jupiter$	SATURN $S_\saturn$	$\delta_\saturn$
h	° ′		° ′		° ′	° ′	° ′	° ′
0	207 3.9	124	14 47.8	111	232 59.2	− 2 36.9	50 23.1	3 1.9
2	236 6.8	123	15 10.0	110	263 3.2	− 2 36.6	80 28.2	3 2.0
4	265 9.4	121	15 32.0	109	293 7.3	− 2 36.2	110 33.2	3 2.0
6	294 11.6	119	15 53.7	107	323 11.4	− 2 35.9	140 38.3	3 2.1
8	323 13.5	118	16 15.2	106	353 15.4	− 2 35.5	170 43.4	3 2.1
10	352 15.0	116	16 36.4	105	23 19.5	− 2 35.2	200 48.5	3 2.2
12	21 16.1	114	16 57.3	103	53 23.6	− 2 34.8	230 53.5	3 2.2
14	50 16.9	112	17 17.9	102	83 27.7	− 2 34.5	260 58.6	3 2.3
16	79 17.4	110	17 38.2	100	113 31.8	− 2 34.1	291 3.7	3 2.3
18	108 17.4	108	17 58.2	98	143 35.8	− 2 33.8	321 8.8	3 2.4
20	137 17.1	107	18 17.9	97	173 39.9	− 2 33.4	351 13.8	3 2.4
22	166 16.4	105	18 37.2	95	203 44.0	− 2 33.1	21 18.9	3 2.4
Δ					20	2	25	0

φ	SUNCE IZLAZ	ZALAZ	TRAJANJE SUMRAKA GRAĐ.	ASTR.	MJESEC IZLAZ	Δ/24	ZALAZ	Δ/24
N	h min	h min	h min	h min	h min	min	h min	min
60	3 30	20 25	1 1	: ::	2 25	.5	19 6	3.8
55	3 58	19 56	0 47	: ::	2 46	.8	18 38	3.4
50	4 19	19 35	0 39	2 38	3 2	1.1	18 18	3.1
45	4 35	19 19	0 34	2 7	3 15	1.2	18 2	2.9
40	4 48	19 5	0 30	1 49	3 25	1.4	17 49	2.8
35	4 59	18 54	0 28	1 38	3 35	1.5	17 38	2.7
30	5 9	18 44	0 26	1 30	3 43	1.6	17 28	2.6
20	5 25	18 28	0 24	1 20	3 57	1.8	17 12	2.4
10	5 40	18 13	0 22	1 15	4 9	1.9	16 57	2.3
0	5 53	17 60	0 22	1 12	4 21	2.1	16 44	2.1
10	6 6	17 47	0 22	1 13	4 32	2.2	16 30	2.0
20	6 20	17 33	0 23	1 16	4 45	2.4	16 16	1.9
30	6 36	17 17	0 25	1 22	4 59	2.5	15 60	1.7
35	6 45	17 7	0 27	1 27	5 8	2.6	15 51	1.6
40	6 55	16 57	0 29	1 33	5 17	2.8	15 40	1.5
45	7 8	16 45	0 32	1 42	5 29	2.9	15 27	1.4
50	7 22	16 30	0 35	1 53	5 43	3.1	15 12	1.2
55	7 41	16 11	0 41	2 7	6 0	3.4	14 53	.9
60	8 6	15 46	0 49	2 29	6 24	3.8	14 27	.6
S								

SUNCE UT	e = Tp − UT	Δ/24	r	MJESEC Prolaz		Δ/24	$\pi_\leftmoon$	r
h	min s	s	′		h min	min	′	′
00	3 37.2	.0	15.9	$T_{\overline{m}}$	10 32	2.1	56.1	15.3
12	3 37.7	$T_{\overline{m}_\odot}$	11 h 56.4 min	Starost 27.5 d		Faza ●		

PLANETE

Pl.	$T_{\overline{m}}$	π	360 − α	Vel.	Pl.	$T_{\overline{m}}$	π	360 − α	Vel.
	h min	′	°			h min	′	°	
♀	13 60	.1	281	−3.8	♃	8 27	.0	3	−2.0
♂	18 1	.1	220	.9	♄	20 35	.0	181	.9

UT	SUNCE $S_\odot$	SUNCE $\delta_\odot$	PROLJ. TAČKA S_Υ	VENERA S_φ	VENERA δ_φ	MARS S_σ	MARS δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	180 54.5	18 18.2	230 38.3	149 57.0	24 28.2	89 58.7	17 14.8
2	210 54.5	18 19.5	260 43.3	179 55.3	24 28.8	120 1.4	17 14.0
4	240 54.5	18 20.7	290 48.2	209 53.6	24 29.4	150 4.1	17 13.2
6	270 54.5	18 22.0	320 53.1	239 52.0	24 29.9	180 6.9	17 12.4
8	300 54.5	18 23.2	350 58.0	269 50.3	24 30.5	210 9.6	17 11.6
10	330 54.5	18 24.4	21 3.0	299 48.7	24 31.1	240 12.3	17 10.8
12	0 54.5	18 25.7	51 7.9	329 47.0	24 31.6	270 15.0	17 10.0
14	30 54.6	18 26.9	81 12.8	359 45.3	24 32.2	300 17.7	17 9.2
16	60 54.6	18 28.1	111 17.8	29 43.7	24 32.7	330 20.4	17 8.3
18	90 54.6	18 29.3	141 22.7	59 42.0	24 33.2	0 23.1	17 7.5
20	120 54.6	18 30.6	171 27.6	89 40.3	24 33.8	30 25.8	17 6.7
22	150 54.6	18 31.8	201 32.5	119 38.7	24 34.3	60 28.5	17 5.9
Δ	0	6		−8	3	14	−4

UT	MJESEC $S_\leftmoon$	MJESEC Δ	MJESEC $\delta_\leftmoon$	MJESEC Δ	JUPITER $S_\jupiter$	JUPITER $\delta_\jupiter$	SATURN $S_\saturn$	SATURN $\delta_\saturn$
h	° ′		° ′		° ′	° ′	° ′	° ′
0	195 15.4	103	18 56.2	93	233 48.1	− 2 32.7	51 24.0	3 2.5
2	224 14.0	101	19 14.8	91	263 52.1	− 2 32.4	81 29.1	3 2.5
4	253 12.2	99	19 33.1	89	293 56.2	− 2 32.0	111 34.1	3 2.6
6	282 10.0	97	19 51.0	88	324 .3	− 2 31.7	141 39.2	3 2.6
8	311 7.4	95	20 8.5	86	354 4.4	− 2 31.3	171 44.3	3 2.7
10	340 4.5	93	20 25.6	83	24 8.5	− 2 31.0	201 49.3	3 2.7
12	9 1.2	92	20 42.3	81	54 12.6	− 2 30.6	231 54.4	3 2.8
14	37 57.5	90	20 58.5	79	84 16.6	− 2 30.3	261 59.5	3 2.8
16	66 53.5	88	21 14.4	77	114 20.7	− 2 29.9	292 4.5	3 2.8
18	95 49.1	86	21 29.8	75	144 24.8	− 2 29.6	322 9.6	3 2.9
20	124 44.3	84	21 44.7	72	174 28.9	− 2 29.2	352 14.7	3 2.9
22	153 39.1	82	21 59.2	70	204 33.0	− 2 28.9	22 19.7	3 3.0
Δ					20	2	25	0

φ	SUNCE IZLAZ	SUNCE ZALAZ	TRAJANJE SUMRAKA GRAĐ.	TRAJANJE SUMRAKA ASTR.	MJESEC IZLAZ	MJESEC Δ/24	MJESEC ZALAZ	MJESEC Δ/24
N	h min	h min	h min	h min	h min	min	h min	min
60	3 27	20 27	1 2	: ::	2 36	.7	20 36	3.6
55	3 56	19 58	0 47	: ::	3 6	1.1	19 59	3.2
50	4 17	19 36	0 39	2 40	3 27	1.4	19 32	3.0
45	4 34	19 20	0 34	2 7	3 44	1.5	19 12	2.9
40	4 47	19 6	0 31	1 50	3 59	1.7	18 56	2.8
35	4 58	18 55	0 28	1 38	4 11	1.8	18 42	2.7
30	5 8	18 45	0 26	1 30	4 21	1.9	18 30	2.6
20	5 25	18 28	0 24	1 20	4 39	2.0	18 10	2.5
10	5 39	18 13	0 22	1 15	4 55	2.1	17 52	2.4
0	5 53	17 60	0 22	1 13	5 10	2.2	17 35	2.3
10	6 6	17 46	0 22	1 13	5 25	2.3	17 19	2.2
20	6 20	17 32	0 23	1 16	5 41	2.5	17 1	2.1
30	6 36	17 16	0 25	1 23	6 0	2.6	16 41	2.0
35	6 46	17 7	0 27	1 27	6 11	2.7	16 29	1.9
40	6 56	16 56	0 29	1 34	6 24	2.8	16 16	1.8
45	7 9	16 44	0 32	1 42	6 39	2.9	16 0	1.7
50	7 24	16 28	0 35	1 53	6 57	3.1	15 41	1.6
55	7 43	16 9	0 41	2 8	7 21	3.3	15 16	1.3
60	8 9	15 44	0 49	2 29	7 54	3.7	14 41	1.0
S								

SUNCE UT	SUNCE $e = T_p - UT$	SUNCE Δ/24	SUNCE r	MJESEC Prolaz	MJESEC Δ/24	MJESEC $\pi_\leftmoon$	MJESEC r
h	min s	s	′	h min	min	′	′
00	3 38.1	.0	15.9	$T_{\overline{m}}$ 11 23	2.3	56.7	15.5
12	3 38.3	$T_{\overline{m}_\odot}$ 11 h 56.4 min		Starost 28.5 d	Faza ●		

PLANETE

Pl.	$T_{\overline{m}}$	π	360−α	Vel.	Pl.	$T_{\overline{m}}$	π	360−α	Vel.
	h min	′	°			h min	′	°	
♀	14 1	.1	279	−3.8	♃	8 24	.0	3	−2.0
♂	17 58	.1	219	.9	♄	20 31	.0	181	.9

UT	SUNCE $S_\odot$	SUNCE $\delta_\odot$	PROLJ. TAČKA S_Υ	VENERA S_φ	VENERA δ_φ	MARS S_σ	MARS δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	180 54.6	18 33.0	231 37.5	149 37.0	24 34.8	90 31.2	17 5.1
2	210 54.6	18 34.2	261 42.4	179 35.4	24 35.3	120 33.9	17 4.3
4	240 54.6	18 35.4	291 47.3	209 33.7	24 35.8	150 36.6	17 3.5
6	270 54.6	18 36.6	321 52.3	239 32.0	24 36.3	180 39.3	17 2.7
8	300 54.6	18 37.8	351 57.2	269 30.4	24 36.8	210 42.0	17 1.9
10	330 54.6	18 39.0	22 2.1	299 28.7	24 37.3	240 44.7	17 1.1
12	0 54.6	18 40.2	52 7.0	329 27.0	24 37.8	270 47.4	17 .3
14	30 54.5	18 41.4	82 12.0	359 25.3	24 38.3	300 50.1	16 59.5
16	60 54.5	18 42.6	112 16.9	29 23.7	24 38.8	330 52.8	16 58.6
18	90 54.5	18 43.8	142 21.8	59 22.0	24 39.3	0 55.5	16 57.8
20	120 54.5	18 45.0	172 26.8	89 20.3	24 39.7	30 58.2	16 57.0
22	150 54.5	18 46.2	202 31.7	119 18.7	24 40.2	61 .9	16 56.2
Δ	0	6		−8	2	13	−4

UT	MJESEC $S_\leftmoon$	MJESEC Δ	MJESEC $\delta_\leftmoon$	MJESEC Δ	JUPITER $S_\jupiter$	JUPITER $\delta_\jupiter$	SATURN $S_\saturn$	SATURN $\delta_\saturn$
h	° ′		° ′		° ′	° ′	° ′	° ′
0	182 33.6	81	22 13.2	68	234 37.1	− 2 28.5	52 24.8	3 3.0
2	211 27.8	79	22 26.7	65	264 41.2	− 2 28.2	82 29.9	3 3.1
4	240 21.6	77	22 39.7	63	294 45.2	− 2 27.8	112 34.9	3 3.1
6	269 15.0	76	22 52.2	60	324 49.3	− 2 27.5	142 40.0	3 3.1
8	298 8.1	74	23 4.2	57	354 53.4	− 2 27.2	172 45.0	3 3.2
10	327 .9	72	23 15.7	55	24 57.5	− 2 26.8	202 50.1	3 3.2
12	355 53.4	71	23 26.7	52	55 1.6	− 2 26.5	232 55.2	3 3.3
14	24 45.5	69	23 37.0	49	85 5.7	− 2 26.1	263 .2	3 3.3
16	53 37.4	68	23 46.9	46	115 9.8	− 2 25.8	293 5.3	3 3.3
18	82 28.9	66	23 56.2	44	145 13.9	− 2 25.4	323 10.3	3 3.4
20	111 20.2	65	24 4.9	41	175 18.0	− 2 25.1	353 15.4	3 3.4
22	140 11.2	64	24 13.0	38	205 22.1	− 2 24.7	23 20.5	3 3.4
Δ					20	2	25	0

φ	SUNCE IZLAZ	SUNCE ZALAZ	TRAJANJE SUMRAKA GRAĐ.	TRAJANJE SUMRAKA ASTR.	MJESEC IZLAZ	MJESEC Δ/24	MJESEC ZALAZ	MJESEC Δ/24
N	h min	h min	h min	h min	h min	min	h min	min
60	3 25	20 29	1 3	: ::	2 54	1.3	22 2	2.9
55	3 54	19 59	0 48	: ::	3 33	1.6	21 16	2.8
50	4 16	19 38	0 39	2 42	4 0	1.8	20 44	2.7
45	4 32	19 21	0 34	2 8	4 21	1.9	20 21	2.7
40	4 46	19 7	0 31	1 50	4 38	2.0	20 2	2.6
35	4 57	18 56	0 28	1 39	4 53	2.1	19 46	2.6
30	5 7	18 46	0 26	1 30	5 6	2.1	19 33	2.6
20	5 24	18 29	0 24	1 20	5 27	2.2	19 9	2.5
10	5 39	18 14	0 22	1 15	5 46	2.3	18 49	2.5
0	5 53	17 60	0 22	1 13	6 4	2.4	18 31	2.4
10	6 6	17 46	0 22	1 13	6 21	2.4	18 12	2.4
20	6 21	17 32	0 23	1 16	6 41	2.5	17 52	2.3
30	6 37	17 15	0 25	1 23	7 3	2.6	17 29	2.3
35	6 47	17 6	0 27	1 28	7 16	2.7	17 15	2.2
40	6 57	16 55	0 29	1 34	7 31	2.7	16 60	2.2
45	7 10	16 42	0 32	1 42	7 49	2.8	16 41	2.1
50	7 25	16 27	0 36	1 53	8 11	2.9	16 18	2.1
55	7 45	16 8	0 41	2 8	8 41	3.0	15 48	1.9
60	8 11	15 41	0 49	2 30	9 24	3.3	15 4	1.7
S								

SUNCE UT	SUNCE $e = T_p - UT$	SUNCE Δ/24	SUNCE r	MJESEC Prolaz	MJESEC Δ/24	MJESEC $\pi_\leftmoon$	MJESEC r
h	min s	s	′	h min	min	′	′
00	3 38.5	.0	15.9	$T_{\overline{m}}$ 12 17	2.4	57.3	15.6
12	3 38.3	$T_{\overline{m}_\odot}$ 11 h 56.4 min		Starost 29.5 d	Faza ●		

PLANETE

Pl.	$T_{\overline{m}}$	π	360−α	Vel.	Pl.	$T_{\overline{m}}$	π	360−α	Vel.
	h min	′	°			h min	′	°	
♀	14 2	.1	278	−3.8	♃	8 20	.0	3	−2.0
♂	17 56	.1	219	.9	♄	20 27	.0	181	.9

UT	SUNCE $S_\odot$	SUNCE $\delta_\odot$	PROLJ. TAČKA S_Υ	VENERA S_φ	VENERA δ_φ	MARS S_σ	MARS δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	180 54.5	18 47.4	232 36.6	149 17.0	24 40.7	91 3.5	16 55.4
2	210 54.5	18 48.6	262 41.5	179 15.3	24 41.1	121 6.2	16 54.6
4	240 54.5	18 49.8	292 46.5	209 13.7	24 41.6	151 8.9	16 53.8
6	270 54.5	18 51.0	322 51.4	239 12.0	24 42.0	181 11.6	16 52.9
8	300 54.5	18 52.2	352 56.3	269 10.3	24 42.5	211 14.3	16 52.1
10	330 54.4	18 53.3	23 1.3	299 8.6	24 42.9	241 17.0	16 51.3
12	0 54.4	18 54.5	53 6.2	329 7.0	24 43.3	271 19.6	16 50.5
14	30 54.4	18 55.7	83 11.1	359 5.3	24 43.8	301 22.3	16 49.7
16	60 54.4	18 56.9	113 16.0	29 3.6	24 44.2	331 25.0	16 48.8
18	90 54.4	18 58.0	143 21.0	59 2.0	24 44.6	1 27.7	16 48.0
20	120 54.3	18 59.2	173 25.9	89 .3	24 45.0	31 30.4	16 47.2
22	150 54.3	19 .4	203 30.8	118 58.6	24 45.4	61 33.0	16 46.4
Δ	0	6		−8	2	13	−4

UT	MJESEC $S_\leftmoon$	MJESEC Δ	MJESEC $\delta_\leftmoon$	MJESEC Δ	JUPITER $S_\jupiter$	JUPITER $\delta_\jupiter$	SATURN $S_\saturn$	SATURN $\delta_\saturn$
h	° ′		° ′		° ′	° ′	° ′	° ′
0	169 1.9	62	24 20.5	35	235 26.2	− 2 24.4	53 25.5	3 3.5
2	197 52.4	61	24 27.5	32	265 30.3	− 2 24.1	83 30.6	3 3.5
4	226 42.7	60	24 33.8	29	295 34.3	− 2 23.7	113 35.6	3 3.6
6	255 32.7	59	24 39.6	26	325 38.4	− 2 23.4	143 40.7	3 3.6
8	284 22.5	58	24 44.7	23	355 42.5	− 2 23.0	173 45.7	3 3.6
10	313 12.1	57	24 49.2	19	25 46.6	− 2 22.7	203 50.8	3 3.7
12	342 1.5	56	24 53.1	16	55 50.7	− 2 22.4	233 55.8	3 3.7
14	10 50.8	55	24 56.3	13	85 54.8	− 2 22.0	264 .9	3 3.7
16	39 39.9	55	24 59.0	10	115 58.9	− 2 21.7	294 5.9	3 3.8
18	68 28.9	54	25 .9	7	146 3.0	− 2 21.3	324 11.0	3 3.8
20	97 17.7	54	25 2.3	3	176 7.1	− 2 21.0	354 16.0	3 3.9
22	126 6.4	53	25 2.9	0	206 11.2	− 2 20.7	24 21.1	3 3.9
Δ					20	2	25	0

φ	SUNCE IZLAZ	SUNCE ZALAZ	TRAJANJE SUMRAKA GRAĐ.	TRAJANJE SUMRAKA ASTR.	MJESEC IZLAZ	MJESEC Δ/24	MJESEC ZALAZ	MJESEC Δ/24
N	h min	h min	h min	h min	h min	min	h min	min
60	3 23	20 32	1 4	: ::	3 25	2.2	23 13	2.0
55	3 53	20 1	0 48	: ::	4 12	2.3	22 23	2.2
50	4 14	19 39	0 40	2 44	4 44	2.3	21 49	2.3
45	4 31	19 22	0 34	2 9	5 8	2.4	21 25	2.3
40	4 45	19 8	0 31	1 51	5 27	2.4	21 5	2.3
35	4 57	18 57	0 28	1 39	5 43	2.4	20 48	2.4
30	5 7	18 46	0 26	1 31	5 57	2.4	20 34	2.4
20	5 24	18 29	0 24	1 20	6 21	2.4	20 10	2.4
10	5 39	18 14	0 22	1 15	6 41	2.5	19 49	2.5
0	5 53	17 60	0 22	1 13	7 1	2.5	19 29	2.5
10	6 7	17 46	0 22	1 13	7 20	2.5	19 9	2.5
20	6 21	17 31	0 23	1 16	7 41	2.5	18 48	2.5
30	6 38	17 15	0 25	1 23	8 5	2.5	18 24	2.5
35	6 47	17 5	0 27	1 28	8 19	2.5	18 9	2.6
40	6 58	16 54	0 29	1 34	8 36	2.5	17 53	2.6
45	7 11	16 41	0 32	1 42	8 56	2.5	17 33	2.6
50	7 27	16 26	0 36	1 53	9 20	2.5	17 8	2.6
55	7 46	16 6	0 41	2 9	9 54	2.5	16 34	2.6
60	8 13	15 39	0 49	2 31	10 44	2.5	15 43	2.7
S								

SUNCE UT	SUNCE $e = T_p - UT$	SUNCE Δ/24	SUNCE r	MJESEC Prolaz	MJESEC Δ/24	MJESEC $\pi_\leftmoon$	MJESEC r
h	min s	s	′	h min	min	′	′
00	3 38.2	.0	15.8	$T_{\overline{m}}$ 13 15	2.5	57.9	15.8
12	3 37.8	$T_{\overline{m}_\odot}$ 11 h 56.4 min		Starost 1.0 d	Faza ●		

PLANETE

Pl.	$T_{\overline{m}}$	π	360−α	Vel.	Pl.	$T_{\overline{m}}$	π	360−α	Vel.
	h min	′	°			h min	′	°	
♀	14 4	.1	277	−3.8	♃	8 17	.0	3	−2.0
♂	17 54	.1	218	.9	♄	20 23	.0	181	.9

UT	SUNCE $S_\odot$	SUNCE $\delta_\odot$	PROLJ. TAČKA S_Υ	VENERA S_φ	VENERA δ_φ	MARS S_σ	MARS δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	180 54.3	19 1.5	233 35.8	148 56.9	24 45.8	91 35.7	16 45.6
2	210 54.3	19 2.7	263 40.7	178 55.3	24 46.2	121 38.4	16 44.7
4	240 54.3	19 3.9	293 45.6	208 53.6	24 46.6	151 41.1	16 43.9
6	270 54.2	19 5.0	323 50.5	238 51.9	24 47.0	181 43.7	16 43.1
8	300 54.2	19 6.2	353 55.5	268 50.2	24 47.4	211 46.4	16 42.3
10	330 54.2	19 7.3	24 .4	298 48.6	24 47.8	241 49.1	16 41.4
12	0 54.1	19 8.5	54 5.3	328 46.9	24 48.1	271 51.7	16 40.6
14	30 54.1	19 9.6	84 10.2	358 45.2	24 48.5	301 54.4	16 39.8
16	60 54.1	19 10.8	114 15.2	28 43.5	24 48.9	331 57.1	16 38.9
18	90 54.1	19 11.9	144 20.1	58 41.8	24 49.2	1 59.7	16 38.1
20	120 54.0	19 13.0	174 25.0	88 40.2	24 49.6	32 2.4	16 37.3
22	150 54.0	19 14.2	204 30.0	118 38.5	24 49.9	62 5.1	16 36.4
Δ	0	6		−8	2	13	−4

UT	MJESEC $S_\leftmoon$	MJESEC Δ	MJESEC $\delta_\leftmoon$	MJESEC Δ	JUPITER $S_\jupiter$	JUPITER $\delta_\jupiter$	SATURN $S_\saturn$	SATURN $\delta_\saturn$
h	° ′		° ′		° ′	° ′	° ′	° ′
0	154 55.0	53	25 3.0	−3	236 15.3	− 2 20.3	54 26.1	3 3.9
2	183 43.6	52	25 2.3	−6	266 19.4	− 2 20.0	84 31.2	3 4.0
4	212 32.0	52	25 1.1	−10	296 23.5	− 2 19.6	114 36.2	3 4.0
6	241 20.5	52	24 59.1	−13	326 27.7	− 2 19.3	144 41.3	3 4.0
8	270 8.9	52	24 56.6	−16	356 31.8	− 2 19.0	174 46.3	3 4.1
10	298 57.2	52	24 53.3	−19	26 35.9	− 2 18.6	204 51.4	3 4.1
12	327 45.6	52	24 49.4	−23	56 40.0	− 2 18.3	234 56.4	3 4.1
14	356 34.0	52	24 44.9	−26	86 44.1	− 2 18.0	265 1.5	3 4.2
16	25 22.4	52	24 39.7	−29	116 48.2	− 2 17.6	295 6.5	3 4.2
18	54 10.9	53	24 33.8	−32	146 52.3	− 2 17.3	325 11.6	3 4.2
20	82 59.4	53	24 27.3	−36	176 56.4	− 2 16.9	355 16.6	3 4.3
22	111 48.0	53	24 20.2	−39	207 .5	− 2 16.6	25 21.6	3 4.3
Δ					21	2	25	0

φ	SUNCE IZLAZ	SUNCE ZALAZ	TRAJANJE SUMRAKA GRAĐ.	TRAJANJE SUMRAKA ASTR.	MJESEC IZLAZ	MJESEC Δ/24	MJESEC ZALAZ	MJESEC Δ/24
N	h min	h min	h min	h min	h min	min	h min	min
60	3 20	20 34	1 5	: ::	4 17	3.2	.. ..	.0
55	3 51	20 3	0 48	: ::	5 7	3.0	23 15	1.6
50	4 13	19 41	0 40	2 47	5 40	2.9	22 44	1.8
45	4 30	19 23	0 34	2 10	6 5	2.8	22 20	1.9
40	4 44	19 9	0 31	1 51	6 24	2.7	22 1	2.0
35	4 56	18 57	0 28	1 39	6 41	2.7	21 45	2.1
30	5 6	18 47	0 26	1 31	6 55	2.7	21 32	2.2
20	5 24	18 29	0 24	1 21	7 19	2.6	21 8	2.3
10	5 39	18 14	0 22	1 15	7 40	2.5	20 48	2.4
0	5 53	17 60	0 22	1 13	8 0	2.5	20 29	2.4
10	6 7	17 46	0 22	1 13	8 20	2.4	20 9	2.5
20	6 22	17 31	0 23	1 17	8 41	2.4	19 49	2.6
30	6 38	17 14	0 25	1 23	9 5	2.3	19 25	2.7
35	6 48	17 4	0 27	1 28	9 19	2.2	19 11	2.8
40	6 59	16 53	0 29	1 34	9 36	2.2	18 55	2.9
45	7 12	16 40	0 32	1 42	9 56	2.1	18 35	3.0
50	7 28	16 24	0 36	1 54	10 20	2.0	18 11	3.1
55	7 48	16 4	0 41	2 9	10 53	1.8	17 38	3.3
60	8 15	15 37	0 50	2 31	11 44	1.5	16 48	3.6
S								

SUNCE UT	SUNCE $e = T_p - UT$	SUNCE Δ/24	SUNCE r	MJESEC Prolaz	MJESEC Δ/24	MJESEC $\pi_\leftmoon$	MJESEC r
h	min s	s	′	h min	min	′	′
00	3 37.4	−.1	15.8	$T_{\overline{m}}$ 14 14	2.5	58.4	15.9
12	3 36.7	$T_{\overline{m}_\odot}$ 11 h 56.4 min		Starost 2.0 d	Faza ●		

PLANETE

Pl.	$T_{\overline{m}}$	π	360−α	Vel.	Pl.	$T_{\overline{m}}$	π	360−α	Vel.
	h min	′	°			h min	′	°	
♀	14 5	.1	275	−3.8	♃	8 14	.0	3	−2.0
♂	17 52	.1	218	.9	♄	20 19	.0	181	.9

UT	SUNCE $S_\odot$	SUNCE $\delta_\odot$	PROLJ. TAČKA S_Υ	VENERA S_φ	VENERA δ_φ	MARS S_σ	MARS δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	180 54.0	19 15.3	234 34.9	148 36.8	24 50.3	92 7.7	16 35.6
2	210 53.9	19 16.5	264 39.8	178 35.1	24 50.6	122 10.4	16 34.8
4	240 53.9	19 17.6	294 44.7	208 33.5	24 50.9	152 13.1	16 33.9
6	270 53.8	19 18.7	324 49.7	238 31.8	24 51.3	182 15.7	16 33.1
8	300 53.8	19 19.8	354 54.6	268 30.1	24 51.6	212 18.4	16 32.3
10	330 53.8	19 21.0	24 59.5	298 28.4	24 51.9	242 21.0	16 31.4
12	0 53.7	19 22.1	55 4.5	328 26.7	24 52.2	272 23.7	16 30.6
14	30 53.7	19 23.2	85 9.4	358 25.1	24 52.5	302 26.3	16 29.8
16	60 53.6	19 24.3	115 14.3	28 23.4	24 52.8	332 29.0	16 28.9
18	90 53.6	19 25.4	145 19.2	58 21.7	24 53.1	2 31.7	16 28.1
20	120 53.6	19 26.6	175 24.2	88 20.0	24 53.4	32 34.3	16 27.2
22	150 53.5	19 27.7	205 29.1	118 18.4	24 53.7	62 37.0	16 26.4
Δ	0	6		−8	2	13	−4

UT	MJESEC $S_\leftmoon$	MJESEC Δ	MJESEC $\delta_\leftmoon$	MJESEC Δ	JUPITER $S_\jupiter$	JUPITER $\delta_\jupiter$	SATURN $S_\saturn$	SATURN $\delta_\saturn$
h	° ′		° ′		° ′	° ′	° ′	° ′
0	140 36.6	54	24 12.4	−42	237 4.6	− 2 16.3	55 26.7	3 4.3
2	169 25.4	54	24 3.9	−45	267 8.7	− 2 15.9	85 31.7	3 4.3
4	198 14.3	55	23 54.9	−48	297 12.8	− 2 15.6	115 36.8	3 4.4
6	227 3.3	56	23 45.2	−52	327 17.0	− 2 15.3	145 41.8	3 4.4
8	255 52.5	57	23 34.8	−55	357 21.1	− 2 14.9	175 46.8	3 4.4
10	284 41.8	57	23 23.9	−58	27 25.2	− 2 14.6	205 51.9	3 4.5
12	313 31.3	58	23 12.3	−61	57 29.3	− 2 14.3	235 56.9	3 4.5
14	342 20.9	59	23 .2	−64	87 33.4	− 2 13.9	266 2.0	3 4.5
16	11 10.8	60	22 47.4	−67	117 37.5	− 2 13.6	296 7.0	3 4.6
18	40 .8	61	22 34.1	−70	147 41.6	− 2 13.3	326 12.0	3 4.6
20	68 51.0	62	22 20.1	−73	177 45.8	− 2 12.9	356 17.1	3 4.6
22	97 41.5	63	22 5.6	−75	207 49.9	− 2 12.6	26 22.1	3 4.6
Δ					21	2	25	0

φ	SUNCE IZLAZ	SUNCE ZALAZ	TRAJANJE SUMRAKA GRAĐ.	TRAJANJE SUMRAKA ASTR.	MJESEC IZLAZ	MJESEC Δ/24	MJESEC ZALAZ	MJESEC Δ/24
N	h min	h min	h min	h min	h min	min	h min	min
60	3 18	20 36	1 6	: ::	5 34	3.9	0 0	1.2
55	3 49	20 5	0 49	: ::	6 18	3.5	23 52	1.1
50	4 12	19 42	0 40	2 49	6 49	3.2	23 26	1.4
45	4 29	19 24	0 35	2 11	7 12	3.1	23 6	1.6
40	4 43	19 10	0 31	1 52	7 30	3.0	22 49	1.7
35	4 55	18 58	0 28	1 40	7 45	2.9	22 36	1.8
30	5 6	18 48	0 26	1 31	7 59	2.8	22 23	1.9
20	5 23	18 30	0 24	1 21	8 22	2.6	22 3	2.1
10	5 39	18 14	0 22	1 15	8 41	2.5	21 44	2.2
0	5 53	17 60	0 22	1 13	8 59	2.4	21 27	2.4
10	6 7	17 46	0 22	1 13	9 18	2.3	21 10	2.5
20	6 22	17 31	0 23	1 17	9 37	2.2	20 52	2.6
30	6 39	17 14	0 25	1 23	9 60	2.0	20 30	2.8
35	6 49	17 4	0 27	1 28	10 13	2.0	20 18	2.9
40	7 0	16 52	0 29	1 34	10 28	1.8	20 3	3.0
45	7 13	16 39	0 32	1 43	10 46	1.7	19 46	3.1
50	7 29	16 23	0 36	1 54	11 9	1.6	19 24	3.3
55	7 50	16 3	0 41	2 9	11 38	1.3	18 56	3.6
60	8 17	15 35	0 50	2 32	12 20	.9	18 15	4.0
S								

SUNCE UT	SUNCE $e = T_p - UT$	SUNCE Δ/24	SUNCE r	MJESEC Prolaz	MJESEC Δ/24	MJESEC $\pi_\leftmoon$	MJESEC r
h	min s	s	′	h min	min	′	′
00	3 36.0	−.1	15.8	$T_{\overline{m}}$ 15 13	2.4	58.8	16.0
12	3 35.0	$T_{\overline{m}_\odot}$ 11 h 56.4 min		Starost 3.0 d	Faza ●		

PLANETE

Pl.	$T_{\overline{m}}$	π	360−α	Vel.	Pl.	$T_{\overline{m}}$	π	360−α	Vel.
	h min	′	°			h min	′	°	
♀	14 6	.1	274	−3.8	♃	8 11	.0	2	−2.0
♂	17 50	.1	218	.9	♄	20 15	.0	181	.9

UT	SUNCE $S_\odot$	SUNCE $\delta_\odot$	PROLJ. TAČKA S_Υ	VENERA S_φ	VENERA δ_φ	MARS S_σ	MARS δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	180 53.5	19 28.8	235 34.0	148 16.7	24 54.0	92 39.6	16 25.6
2	210 53.4	19 29.9	265 39.0	178 15.0	24 54.3	122 42.3	16 24.7
4	240 53.4	19 31.0	295 43.9	208 13.3	24 54.6	152 44.9	16 23.9
6	270 53.3	19 32.1	325 48.8	238 11.6	24 54.8	182 47.6	16 23.0
8	300 53.3	19 33.2	355 53.7	268 10.0	24 55.1	212 50.2	16 22.2
10	330 53.2	19 34.3	25 58.7	298 8.3	24 55.4	242 52.8	16 21.3
12	0 53.2	19 35.4	56 3.6	328 6.6	24 55.6	272 55.5	16 20.5
14	30 53.1	19 36.5	86 8.5	358 4.9	24 55.9	302 58.1	16 19.7
16	60 53.1	19 37.6	116 13.5	28 3.2	24 56.1	333 .8	16 18.8
18	90 53.0	19 38.7	146 18.4	58 1.6	24 56.4	3 3.4	16 18.0
20	120 53.0	19 39.7	176 23.3	87 59.9	24 56.6	33 6.1	16 17.1
22	150 52.9	19 40.8	206 28.2	117 58.2	24 56.8	63 8.7	16 16.3
Δ	0	5		−8	1	13	−4

UT	MJESEC $S_\leftmoon$	MJESEC Δ	MJESEC $\delta_\leftmoon$	MJESEC Δ	JUPITER $S_\jupiter$	JUPITER $\delta_\jupiter$	SATURN $S_\saturn$	SATURN $\delta_\saturn$
h	° ′		° ′		° ′	° ′	° ′	° ′
0	126 32.2	65	21 50.5	−78	237 54.0	− 2 12.3	56 27.1	3 4.7
2	155 23.1	66	21 34.9	−81	267 58.1	− 2 11.9	86 32.2	3 4.7
4	184 14.2	67	21 18.7	−84	298 2.2	− 2 11.6	116 37.2	3 4.7
6	213 5.6	68	21 1.9	−86	328 6.4	− 2 11.3	146 42.2	3 4.7
8	241 57.2	69	20 44.7	−89	358 10.5	− 2 10.9	176 47.3	3 4.8
10	270 49.1	71	20 26.9	−92	28 14.6	− 2 10.6	206 52.3	3 4.8
12	299 41.3	72	20 8.5	−94	58 18.7	− 2 10.3	236 57.3	3 4.8
14	328 33.7	73	19 49.7	−97	88 22.8	− 2 10.0	267 2.4	3 4.9
16	357 26.3	75	19 30.4	−99	118 27.0	− 2 9.6	297 7.4	3 4.9
18	26 19.3	76	19 10.6	−101	148 31.1	− 2 9.3	327 12.4	3 4.9
20	55 12.5	77	18 50.4	−104	178 35.2	− 2 9.0	357 17.4	3 4.9
22	84 6.0	79	18 29.6	−106	208 39.3	− 2 8.6	27 22.5	3 5.0
Δ					21	2	25	0

φ	SUNCE IZLAZ	SUNCE ZALAZ	TRAJANJE SUMRAKA GRAĐ.	TRAJANJE SUMRAKA ASTR.	MJESEC IZLAZ	MJESEC Δ/24	MJESEC ZALAZ	MJESEC Δ/24
N	h min	h min	h min	h min	h min	min	h min	min
60	3 16	20 39	1 7	: ::	7 7	4.1	0 29	.7
55	3 48	20 6	0 49	: ::	7 42	3.7	.. ..	.0
50	4 10	19 43	0 40	2 51	8 6	3.4	23 59	1.1
45	4 28	19 26	0 35	2 12	8 25	3.2	23 43	1.3
40	4 42	19 11	0 31	1 52	8 41	3.0	23 30	1.4
35	4 54	18 59	0 28	1 40	8 54	2.9	23 19	1.6
30	5 5	18 48	0 26	1 32	9 5	2.8	23 9	1.7
20	5 23	18 30	0 24	1 21	9 25	2.6	22 53	1.9
10	5 38	18 15	0 22	1 15	9 42	2.4	22 38	2.1
0	5 53	18 0	0 22	1 13	9 57	2.3	22 24	2.2
10	6 7	17 46	0 22	1 14	10 13	2.1	22 10	2.4
20	6 22	17 30	0 23	1 17	10 30	2.0	21 55	2.6
30	6 40	17 13	0 26	1 23	10 49	1.8	21 37	2.8
35	6 50	17 3	0 27	1 28	10 60	1.7	21 27	2.9
40	7 1	16 52	0 29	1 34	11 13	1.6	21 15	3.0
45	7 14	16 38	0 32	1 43	11 27	1.4	21 1	3.2
50	7 31	16 22	0 36	1 54	11 46	1.2	20 44	3.4
55	7 51	16 1	0 42	2 10	12 9	.9	20 22	3.7
60	8 20	15 33	0 50	2 32	12 41	.5	19 52	4.1
S								

SUNCE UT	SUNCE $e = T_p - UT$	SUNCE Δ/24	SUNCE r	MJESEC Prolaz	MJESEC Δ/24	MJESEC $\pi_\leftmoon$	MJESEC r
h	min s	s	′	h min	min	′	′
00	3 34.1	−.1	15.8	$T_{\overline{m}}$ 16 11	2.3	59.0	16.1
12	3 32.8	$T_{\overline{m}_\odot}$ 11 h 56.5 min		Starost 4.0 d	Faza ●		

PLANETE

Pl.	$T_{\overline{m}}$	π	360−α	Vel.	Pl.	$T_{\overline{m}}$	π	360−α	Vel.
	h min	′	°			h min	′	°	
♀	14 8	.1	273	−3.8	♃	8 7	.0	2	−2.1
♂	17 48	.1	217	1.0	♄	20 11	.0	181	.9

UT	SUNCE $S_\odot$	SUNCE $\delta_\odot$	PROLJ. TAČKA S_Υ	VENERA S_φ	VENERA δ_φ	MARS S_σ	MARS δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	180 52.9	19 41.9	236 33.2	147 56.5	24 57.0	93 11.3	16 15.4
2	210 52.8	19 43.0	266 38.1	177 54.8	24 57.3	123 14.0	16 14.6
4	240 52.7	19 44.1	296 43.0	207 53.2	24 57.5	153 16.6	16 13.7
6	270 52.7	19 45.1	326 48.0	237 51.5	24 57.7	183 19.2	16 12.9
8	300 52.6	19 46.2	356 52.9	267 49.8	24 57.9	213 21.9	16 12.0
10	330 52.6	19 47.3	26 57.8	297 48.1	24 58.1	243 24.5	16 11.2
12	0 52.5	19 48.3	57 2.7	327 46.4	24 58.3	273 27.1	16 10.3
14	30 52.4	19 49.4	87 7.7	357 44.8	24 58.5	303 29.8	16 9.4
16	60 52.4	19 50.5	117 12.6	27 43.1	24 58.7	333 32.4	16 8.6
18	90 52.3	19 51.5	147 17.5	57 41.4	24 58.8	3 35.0	16 7.7
20	120 52.2	19 52.6	177 22.5	87 39.7	24 59.0	33 37.7	16 6.9
22	150 52.2	19 53.7	207 27.4	117 38.1	24 59.2	63 40.3	16 6.0
Δ	0	5		−8	1	13	−4

UT	MJESEC $S_\leftmoon$	MJESEC Δ	MJESEC $\delta_\leftmoon$	MJESEC Δ	JUPITER S_4	JUPITER δ_4	SATURN S_η	SATURN δ_η
h	° ′		° ′		° ′	° ′	° ′	° ′
0	112 59.7	80	18 8.5	−108	238 43.5	− 2 8.3	57 27.5	3 5.0
2	141 53.8	82	17 46.8	−110	268 47.6	− 2 8.0	87 32.5	3 5.0
4	170 48.1	83	17 24.8	−112	298 51.7	− 2 7.7	117 37.5	3 5.0
6	199 42.6	84	17 2.3	−114	328 55.9	− 2 7.3	147 42.6	3 5.0
8	228 37.5	86	16 39.5	−116	358 60.0	− 2 7.0	177 47.6	3 5.1
10	257 32.6	87	16 16.2	−118	29 4.1	− 2 6.7	207 52.6	3 5.1
12	286 28.0	88	15 52.6	−120	59 8.2	− 2 6.4	237 57.6	3 5.1
14	315 23.6	90	15 28.5	−122	89 12.4	− 2 6.0	268 2.7	3 5.1
16	344 19.5	91	15 4.2	−124	119 16.5	− 2 5.7	298 7.7	3 5.2
18	13 15.7	92	14 39.4	−125	149 20.6	− 2 5.4	328 12.7	3 5.2
20	42 12.1	93	14 14.4	−127	179 24.8	− 2 5.1	358 17.7	3 5.2
22	71 8.8	95	13 49.0	−129	209 28.9	− 2 4.7	28 22.7	3 5.2
Δ					21	2	25	0

φ	SUNCE IZLAZ	SUNCE ZALAZ	TRAJANJE SUMRAKA GRAĐ.	TRAJANJE SUMRAKA ASTR.	MJESEC IZLAZ	MJESEC Δ/24	MJESEC ZALAZ	MJESEC Δ/24
N	h min	h min	h min	h min	h min	min	h min	min
60	3 14	20 41	1 8	: ::	8 45	4.1	0 46	.5
55	3 46	20 8	0 49	: ::	9 10	3.7	0 19	.8
50	4 9	19 45	0 40	2 54	9 28	3.4	.. ..	.0
45	4 27	19 27	0 35	2 13	9 42	3.2	.. ..	.0
40	4 42	19 12	0 31	1 53	9 54	3.0	.. ..	.0
35	4 54	18 60	0 28	1 40	10 4	2.9	23 57	1.4
30	5 4	18 49	0 26	1 32	10 12	2.8	23 50	1.5
20	5 23	18 31	0 24	1 21	10 27	2.5	23 38	1.8
10	5 38	18 15	0 22	1 15	10 40	2.4	23 28	2.0
0	5 53	18 0	0 22	1 13	10 52	2.2	23 18	2.1
10	6 7	17 46	0 22	1 14	11 4	2.0	23 7	2.3
20	6 23	17 30	0 23	1 17	11 17	1.8	22 56	2.5
30	6 40	17 13	0 26	1 23	11 32	1.6	22 44	2.7
35	6 50	17 2	0 27	1 28	11 40	1.5	22 37	2.9
40	7 2	16 51	0 29	1 35	11 50	1.3	22 28	3.0
45	7 15	16 37	0 32	1 43	12 1	1.2	22 18	3.2
50	7 32	16 21	0 36	1 54	12 15	1.0	22 6	3.4
55	7 53	15 60	0 42	2 10	12 32	.7	21 51	3.7
60	8 22	15 31	0 51	2 33	12 54	.4	21 31	4.1
S								

SUNCE UT	SUNCE $e = T_p - UT$	SUNCE Δ/24	SUNCE r	MJESEC Prolaz	MJESEC Δ/24	MJESEC $\pi_\leftmoon$	MJESEC r
h	min s	s	′	h min	min	′	′
00	3 31.6	−.1	15.8	$T_{\overline{m}}$ 17 5	2.2	59.2	16.1
12	3 30.1	$T_{\overline{m}_\odot}$ 11 h 56.5 min		Starost 5.0 d	Faza ◐		

PLANETE

Pl.	$T_{\overline{m}}$	π	360−α	Vel.	Pl.	$T_{\overline{m}}$	π	360−α	Vel.
	h min	′	°			h min	′	°	
♀	14 9	.1	271	−3.8	♃	8 4	.0	2	−2.1
♂	17 46	.1	217	1.0	♄	20 7	.0	181	.9

UT	SUNCE $S_\odot$	SUNCE $\delta_\odot$	PROLJ. TAČKA S_Υ	VENERA S_φ	VENERA δ_φ	MARS S_σ	MARS δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	180 52.1	19 54.7	237 32.3	147 36.4	24 59.4	93 42.9	16 5.2
2	210 52.0	19 55.8	267 37.2	177 34.7	24 59.5	123 45.5	16 4.3
4	240 52.0	19 56.8	297 42.2	207 33.0	24 59.7	153 48.2	16 3.4
6	270 51.9	19 57.8	327 47.1	237 31.3	24 59.8	183 50.8	16 2.6
8	300 51.8	19 58.9	357 52.0	267 29.7	24 60.0	213 53.4	16 1.7
10	330 51.8	19 59.9	27 56.9	297 28.0	25 .1	243 56.0	16 .9
12	0 51.7	20 1.0	58 1.9	327 26.3	25 .3	273 58.7	16 .0
14	30 51.6	20 2.0	88 6.8	357 24.6	25 .4	304 1.3	15 59.1
16	60 51.5	20 3.0	118 11.7	27 23.0	25 .5	334 3.9	15 58.3
18	90 51.5	20 4.1	148 16.7	57 21.3	25 .6	4 6.5	15 57.4
20	120 51.4	20 5.1	178 21.6	87 19.6	25 .7	34 9.1	15 56.5
22	150 51.3	20 6.1	208 26.5	117 17.9	25 .9	64 11.7	15 55.7
Δ	0	5		−8	1	13	−4

UT	MJESEC $S_\leftmoon$	MJESEC Δ	MJESEC $\delta_\leftmoon$	MJESEC Δ	JUPITER S_4	JUPITER δ_4	SATURN S_η	SATURN δ_η
h	° ′		° ′		° ′	° ′	° ′	° ′
0	100 5.7	96	13 23.3	−130	239 33.0	− 2 4.4	58 27.8	3 5.2
2	129 2.9	97	12 57.3	−131	269 37.2	− 2 4.1	88 32.8	3 5.3
4	158 .3	98	12 31.0	−133	299 41.3	− 2 3.8	118 37.8	3 5.3
6	186 57.9	99	12 4.4	−134	329 45.5	− 2 3.4	148 42.8	3 5.3
8	215 55.8	100	11 37.5	−136	359 49.6	− 2 3.1	178 47.8	3 5.3
10	244 53.9	101	11 10.4	−137	29 53.7	− 2 2.8	208 52.8	3 5.3
12	273 52.2	102	10 43.1	−138	59 57.9	− 2 2.5	238 57.9	3 5.4
14	302 50.7	103	10 15.5	−139	90 2.0	− 2 2.1	269 2.9	3 5.4
16	331 49.4	104	9 47.7	−140	120 6.2	− 2 1.8	299 7.9	3 5.4
18	0 48.2	105	9 19.7	−141	150 10.3	− 2 1.5	329 12.9	3 5.4
20	29 47.3	106	8 51.4	−142	180 14.4	− 2 1.2	359 17.9	3 5.4
22	58 46.6	107	8 23.0	−143	210 18.6	− 2 .9	29 22.9	3 5.5
Δ					21	2	25	0

φ	SUNCE IZLAZ	SUNCE ZALAZ	TRAJANJE SUMRAKA GRAĐ.	TRAJANJE SUMRAKA ASTR.	MJESEC IZLAZ	MJESEC Δ/24	MJESEC ZALAZ	MJESEC Δ/24
N	h min	h min	h min	h min	h min	min	h min	min
60	3 12	20 43	1 9	: ::	10 23	4.0	0 57	.3
55	3 44	20 10	0 50	: ::	10 38	3.6	0 39	.7
50	4 8	19 46	0 41	2 56	10 50	3.4	0 25	.9
45	4 26	19 28	0 35	2 14	10 59	3.2	0 14	1.1
40	4 41	19 13	0 31	1 53	11 6	3.0	0 5	1.3
35	4 53	19 0	0 28	1 41	11 13	2.8	.. ..	.0
30	5 4	18 49	0 26	1 32	11 18	2.7	.. ..	.0
20	5 22	18 31	0 24	1 21	11 28	2.5	.. ..	.0
10	5 38	18 15	0 22	1 16	11 37	2.3	.. ..	.0
0	5 53	18 0	0 22	1 13	11 45	2.1	.. ..	.0
10	6 8	17 45	0 22	1 14	11 53	1.9	.. ..	.0
20	6 23	17 30	0 23	1 17	12 1	1.7	23 57	2.4
30	6 41	17 12	0 26	1 23	12 11	1.5	23 49	2.7
35	6 51	17 2	0 27	1 28	12 16	1.4	23 45	2.8
40	7 3	16 50	0 29	1 35	12 22	1.2	23 40	3.0
45	7 16	16 36	0 32	1 43	12 30	1.1	23 35	3.1
50	7 33	16 20	0 36	1 55	12 38	.8	23 28	3.4
55	7 55	15 58	0 42	2 10	12 49	.6	23 19	3.6
60	8 24	15 29	0 51	2 34	13 3	.3	23 8	4.0
S								

SUNCE UT	SUNCE $e = T_p - UT$	SUNCE Δ/24	SUNCE r	MJESEC Prolaz	MJESEC Δ/24	MJESEC $\pi_\leftmoon$	MJESEC r
h	min s	s	′	h min	min	′	′
00	3 28.6	−.1	15.8	$T_{\overline{m}}$ 17 57	2.0	59.3	16.2
12	3 26.9	$T_{\overline{m}_\odot}$ 11 h 56.6 min		Starost 6.0 d	Faza ◐		

PLANETE

Pl.	$T_{\overline{m}}$	π	360−α	Vel.	Pl.	$T_{\overline{m}}$	π	360−α	Vel.
	h min	′	°			h min	′	°	
♀	14 10	.1	270	−3.8	♃	8 1	.0	2	−2.1
♂	17 44	.1	216	1.0	♄	20 3	.0	181	.9

UT	SUNCE $S_\odot$	$\delta_\odot$	PROLJ. TAČKA S_Υ	VENERA S_φ	δ_φ	MARS S_σ	δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	180 51.2	20 7.2	238 31.4	147 16.3	25 1.0	94 14.4	15 54.8
2	210 51.2	20 8.2	268 36.4	177 14.6	25 1.1	124 17.0	15 53.9
4	240 51.1	20 9.2	298 41.3	207 12.9	25 1.2	154 19.6	15 53.1
6	270 51.0	20 10.2	328 46.2	237 11.2	25 1.3	184 22.2	15 52.2
8	300 50.9	20 11.2	358 51.2	267 9.6	25 1.3	214 24.8	15 51.3
10	330 50.8	20 12.2	28 56.1	297 7.9	25 1.4	244 27.4	15 50.5
12	0 50.7	20 13.3	59 1.0	327 6.2	25 1.5	274 30.0	15 49.6
14	30 50.7	20 14.3	89 5.9	357 4.5	25 1.6	304 32.6	15 48.7
16	60 50.6	20 15.3	119 10.9	27 2.9	25 1.6	334 35.3	15 47.9
18	90 50.5	20 16.3	149 15.8	57 1.2	25 1.7	4 37.9	15 47.0
20	120 50.4	20 17.3	179 20.7	86 59.5	25 1.8	34 40.5	15 46.1
22	150 50.3	20 18.3	209 25.7	116 57.8	25 1.8	64 43.1	15 45.2
Δ	0	5		−8	0	13	−4

UT	MJESEC $S_\leftmoon$	Δ	$\delta_\leftmoon$	Δ	JUPITER S_4	δ_4	SATURN S_5	δ_5
h	° ′		° ′		° ′	° ′	° ′	° ′
0	87 46.0	108	7 54.5	−144	240 22.7	− 2 .5	59 27.9	3 5.5
2	116 45.5	109	7 25.7	−145	270 26.9	− 2 .2	89 32.9	3 5.5
4	145 45.3	109	6 56.8	−145	300 31.0	− 1 59.9	119 38.0	3 5.5
6	174 45.1	110	6 27.8	−146	330 35.2	− 1 59.6	149 43.0	3 5.5
8	203 45.2	111	5 58.6	−146	0 39.3	− 1 59.3	179 48.0	3 5.5
10	232 45.3	111	5 29.3	−147	30 43.5	− 1 58.9	209 53.0	3 5.6
12	261 45.6	112	4 59.9	−148	60 47.6	− 1 58.6	239 58.0	3 5.6
14	290 45.9	112	4 30.4	−148	90 51.7	− 1 58.3	270 3.0	3 5.6
16	319 46.4	113	4 .8	−148	120 55.9	− 1 58.0	300 8.0	3 5.6
18	348 47.0	113	3 31.1	−149	151 .0	− 1 57.7	330 13.0	3 5.6
20	17 47.6	114	3 1.4	−149	181 4.2	− 1 57.3	0 18.0	3 5.6
22	46 48.3	114	2 31.6	−149	211 8.3	− 1 57.0	30 23.0	3 5.6
Δ					21	2	25	0

φ	SUNCE IZLAZ	ZALAZ	TRAJANJE SUMRAKA GRAĐ.	ASTR.	MJESEC IZLAZ	Δ/24	ZALAZ	Δ/24
N	h min	h min	h min	h min	h min	min	h min	min
60	3 9	20 45	1 10	: ::	11 59	3.9	1 4	.3
55	3 43	20 11	0 50	: ::	12 6	3.6	0 55	.6
50	4 7	19 47	0 41	2 59	12 11	3.3	0 47	.8
45	4 25	19 29	0 35	2 15	12 14	3.1	0 41	1.0
40	4 40	19 14	0 31	1 54	12 18	2.9	0 36	1.2
35	4 53	19 1	0 29	1 41	12 21	2.8	0 31	1.3
30	5 3	18 50	0 27	1 32	12 23	2.7	0 27	1.5
20	5 22	18 31	0 24	1 21	12 27	2.4	0 20	1.7
10	5 38	18 15	0 23	1 16	12 31	2.2	0 14	1.9
0	5 53	18 0	0 22	1 13	12 35	2.0	0 9	2.1
10	6 8	17 45	0 22	1 14	12 38	1.9	0 3	2.2
20	6 24	17 30	0 23	1 17	12 42	1.7	. . .	.0
30	6 41	17 12	0 26	1 24	12 46	1.4	. . .	.0
35	6 52	17 1	0 27	1 28	12 49	1.3	. . .	.0
40	7 4	16 49	0 29	1 35	12 52	1.2	. . .	.0
45	7 17	16 35	0 32	1 43	12 55	1.0	. . .	.0
50	7 34	16 18	0 36	1 55	12 59	.8	. . .	.0
55	7 56	15 57	0 42	2 11	13 3	.6	. . .	.0
60	8 26	15 27	0 51	2 34	13 9	.2	. . .	.0
S								

SUNCE UT	e = Tp − UT	Δ/24	r	MJESEC Prolaz	Δ/24	$\pi_\leftmoon$	r
h	min s	s	′	h min	min	′	′
00	3 25.1	−.2	15.8	$T_{\overline{m}}$ 18 46	2.0	59.3	16.2
12	3 23.1	$T_{\overline{m}_\odot}$ 11 h 56.6 min		Starost 7.0 d	Faza ◐		

PLANETE

Pl.	$T_{\overline{m}}$	π	360−α	Vel.	Pl.	$T_{\overline{m}}$	π	360−α	Vel.
	h min	′	°			h min	′	°	
♀	14 12	.1	269	−3.8	♃	7 57	.0	2	−2.1
♂	17 42	.1	216	1.0	♄	19 59	.0	181	.9

UT	SUNCE $S_\odot$	$\delta_\odot$	PROLJ. TAČKA S_Υ	VENERA S_φ	δ_φ	MARS S_σ	δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	180 50.2	20 19.3	239 30.6	146 56.2	25 1.9	94 45.7	15 44.4
2	210 50.1	20 20.3	269 35.5	176 54.5	25 1.9	124 48.3	15 43.5
4	240 50.1	20 21.2	299 40.4	206 52.8	25 1.9	154 50.9	15 42.6
6	270 50.0	20 22.2	329 45.4	236 51.2	25 2.0	184 53.5	15 41.7
8	300 49.9	20 23.2	359 50.3	266 49.5	25 2.0	214 56.1	15 40.9
10	330 49.8	20 24.2	29 55.2	296 47.8	25 2.0	244 58.7	15 40.0
12	0 49.7	20 25.2	60 .2	326 46.2	25 2.0	275 1.3	15 39.1
14	30 49.6	20 26.2	90 5.1	356 44.5	25 2.0	305 3.9	15 38.2
16	60 49.5	20 27.1	120 10.0	26 42.8	25 2.1	335 6.5	15 37.3
18	90 49.4	20 28.1	150 14.9	56 41.1	25 2.1	5 9.1	15 36.5
20	120 49.3	20 29.1	180 19.9	86 39.5	25 2.1	35 11.7	15 35.6
22	150 49.2	20 30.1	210 24.8	116 37.8	25 2.0	65 14.3	15 34.7
Δ	0	5		−8	0	13	−4

UT	MJESEC $S_\leftmoon$	Δ	$\delta_\leftmoon$	Δ	JUPITER S_4	δ_4	SATURN S_5	δ_5
h	° ′		° ′		° ′	° ′	° ′	° ′
0	75 49.1	114	2 1.8	−149	241 12.5	− 1 56.7	60 28.0	3 5.7
2	104 50.0	115	1 31.9	−149	271 16.7	− 1 56.4	90 33.0	3 5.7
4	133 50.9	115	1 2.0	−150	301 20.8	− 1 56.1	120 38.0	3 5.7
6	162 51.8	115	0 32.1	−150	331 25.0	− 1 55.8	150 43.0	3 5.7
8	191 52.8	115	0 2.2	−149	1 29.1	− 1 55.5	180 48.0	3 5.7
10	220 53.8	115 − 0	27.7	−149	31 33.3	− 1 55.1	210 53.0	3 5.7
12	249 54.8	115 − 0	57.6	−149	61 37.4	− 1 54.8	240 58.0	3 5.7
14	278 55.9	115 − 1	27.4	−149	91 41.6	− 1 54.5	271 3.0	3 5.7
16	307 56.9	115 − 1	57.2	−149	121 45.7	− 1 54.2	301 8.0	3 5.8
18	336 57.9	115 − 2	26.9	−148	151 49.9	− 1 53.9	331 13.0	3 5.8
20	5 58.9	115 − 2	56.6	−148	181 54.1	− 1 53.6	1 18.0	3 5.8
22	34 59.9	115 − 3	26.2	−148	211 58.2	− 1 53.3	31 23.0	3 5.8
Δ					21	2	25	0

φ	SUNCE IZLAZ	ZALAZ	TRAJANJE SUMRAKA GRAĐ.	ASTR.	MJESEC IZLAZ	Δ/24	ZALAZ	Δ/24
N	h min	h min	h min	h min	h min	min	h min	min
60	3 7	20 48	1 11	: ::	13 34	3.9	1 10	.2
55	3 41	20 13	0 51	: ::	13 32	3.6	1 8	.6
50	4 5	19 49	0 41	3 2	13 31	3.3	1 7	.8
45	4 24	19 30	0 35	2 16	13 29	3.1	1 5	1.0
40	4 39	19 15	0 31	1 54	13 28	2.9	1 4	1.2
35	4 52	19 2	0 29	1 41	13 28	2.8	1 3	1.3
30	5 3	18 51	0 27	1 33	13 27	2.7	1 2	1.4
20	5 22	18 32	0 24	1 22	13 26	2.4	1 1	1.7
10	5 38	18 15	0 23	1 16	13 25	2.2	0 59	1.8
0	5 53	18 0	0 22	1 13	13 24	2.0	0 58	2.0
10	6 8	17 45	0 22	1 14	13 23	1.9	0 57	2.2
20	6 24	17 29	0 23	1 17	13 22	1.7	0 55	2.4
30	6 42	17 11	0 26	1 24	13 21	1.4	0 54	2.7
35	6 52	17 1	0 27	1 29	13 20	1.3	0 53	2.8
40	7 4	16 49	0 30	1 35	13 19	1.2	0 52	2.9
45	7 19	16 34	0 32	1 44	13 19	1.0	0 50	3.1
50	7 36	16 17	0 37	1 55	13 18	.8	0 49	3.3
55	7 58	15 55	0 42	2 11	13 17	.6	0 47	3.6
60	8 28	15 25	0 52	2 35	13 15	.3	0 45	3.9
S								

SUNCE UT	e = Tp − UT	Δ/24	r	MJESEC Prolaz	Δ/24	$\pi_\leftmoon$	r
h	min s	s	′	h min	min	′	′
00	3 21.1	−.2	15.8	$T_{\overline{m}}$ 19 35	2.0	59.2	16.1
12	3 18.8	$T_{\overline{m}_\odot}$ 11 h 56.7 min		Starost 8.0 d	Faza ◐		

PLANETE

Pl.	$T_{\overline{m}}$	π	360−α	Vel.	Pl.	$T_{\overline{m}}$	π	360−α	Vel.
	h min	′	°			h min	′	°	
♀	14 13	.1	267	−3.8	♃	7 54	.0	2	−2.1
♂	17 39	.1	215	1.0	♄	19 55	.0	181	.9

UT	SUNCE $S_\odot$	$\delta_\odot$	PROLJ. TAČKA S_Υ	VENERA S_φ	δ_φ	MARS S_σ	δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	180 49.1	20 31.0	240 29.7	146 36.1	25 2.0	95 16.9	15 33.8
2	210 49.0	20 32.0	270 34.7	176 34.5	25 2.0	125 19.5	15 32.9
4	240 48.9	20 32.9	300 39.6	206 32.8	25 2.0	155 22.1	15 32.0
6	270 48.8	20 33.9	330 44.5	236 31.2	25 2.0	185 24.6	15 31.2
8	300 48.7	20 34.9	0 49.4	266 29.5	25 1.9	215 27.2	15 30.3
10	330 48.6	20 35.8	30 54.4	296 27.8	25 1.9	245 29.8	15 29.4
12	0 48.5	20 36.8	60 59.3	326 26.2	25 1.9	275 32.4	15 28.5
14	30 48.4	20 37.7	91 4.2	356 24.5	25 1.8	305 35.0	15 27.6
16	60 48.3	20 38.7	121 9.1	26 22.8	25 1.8	335 37.6	15 26.7
18	90 48.2	20 39.6	151 14.1	56 21.2	25 1.7	5 40.2	15 25.8
20	120 48.1	20 40.5	181 19.0	86 19.5	25 1.6	35 42.8	15 24.9
22	150 48.0	20 41.5	211 23.9	116 17.9	25 1.6	65 45.3	15 24.1
Δ	−1	5		−8	0	13	−4

UT	MJESEC $S_\leftmoon$	Δ	$\delta_\leftmoon$	Δ	JUPITER S_4	δ_4	SATURN S_η	δ_η
h	° ′		° ′		° ′	° ′	° ′	° ′
0	64 .8	114	− 3 55.7	−147	242 2.4	− 1 52.9	61 28.0	3 5.8
2	93 1.7	114	− 4 25.1	−147	272 6.5	− 1 52.6	91 33.0	3 5.8
4	122 2.5	114	− 4 54.5	−146	302 10.7	− 1 52.3	121 38.0	3 5.8
6	151 3.3	114	− 5 23.7	−145	332 14.9	− 1 52.0	151 43.0	3 5.8
8	180 4.0	113	− 5 52.7	−145	2 19.0	− 1 51.7	181 48.0	3 5.8
10	209 4.6	113	− 6 21.6	−144	32 23.2	− 1 51.4	211 53.0	3 5.9
12	238 5.1	112	− 6 50.4	−143	62 27.4	− 1 51.1	241 58.0	3 5.9
14	267 5.6	112	− 7 19.0	−142	92 31.5	− 1 50.8	272 3.0	3 5.9
16	296 5.9	111	− 7 47.5	−141	122 35.7	− 1 50.5	302 8.0	3 5.9
18	325 6.2	111	− 8 15.8	−140	152 39.9	− 1 50.1	332 13.0	3 5.9
20	354 6.3	110	− 8 43.8	−139	182 44.0	− 1 49.8	2 17.9	3 5.9
22	23 6.3	109	− 9 11.7	−138	212 48.2	− 1 49.5	32 22.9	3 5.9
Δ					21	2	25	0

φ	SUNCE IZLAZ	ZALAZ	TRAJANJE SUMRAKA GRAĐ.	ASTR.	MJESEC IZLAZ	Δ/24	ZALAZ	Δ/24
N	h min	h min	h min	h min	h min	min	h min	min
60	3 5	20 50	1 13	: ::	15 8	4.0	1 16	.3
55	3 40	20 15	0 51	: ::	14 58	3.6	1 22	.6
50	4 4	19 50	0 41	3 5	14 50	3.3	1 26	.8
45	4 23	19 31	0 35	2 16	14 44	3.1	1 29	1.0
40	4 38	19 16	0 31	1 55	14 39	2.9	1 32	1.2
35	4 51	19 3	0 29	1 42	14 35	2.8	1 34	1.3
30	5 3	18 51	0 27	1 33	14 31	2.7	1 36	1.5
20	5 22	18 32	0 24	1 22	14 24	2.5	1 40	1.7
10	5 38	18 16	0 23	1 16	14 18	2.3	1 44	1.9
0	5 53	18 0	0 22	1 14	14 13	2.1	1 47	2.1
10	6 8	17 45	0 22	1 14	14 7	1.9	1 50	2.2
20	6 24	17 29	0 24	1 17	14 2	1.7	1 53	2.4
30	6 43	17 11	0 26	1 24	13 55	1.5	1 57	2.7
35	6 53	17 0	0 27	1 29	13 52	1.4	1 60	2.8
40	7 5	16 48	0 30	1 35	13 47	1.2	2 2	2.9
45	7 20	16 34	0 33	1 44	13 43	1.1	2 5	3.1
50	7 37	16 16	0 37	1 55	13 37	.9	2 9	3.3
55	7 59	15 54	0 43	2 11	13 30	.6	2 13	3.6
60	8 30	15 23	0 52	2 35	13 21	.3	2 19	3.9
S								

SUNCE UT	e = Tp − UT	Δ/24	r	MJESEC Prolaz		Δ/24	$\pi_\leftmoon$	r
h	min s	s	′		h min	min	′	′
00	3 16.6	−.2	15.8	$T_{\overline{m}}$	20 24	2.1	59.0	16.1
12	3 14.1	$T_{\overline{m}_\odot}$	11 h 56.8 min	Starost	9.0 d	Faza	◐	

PLANETE

Pl.	$T_{\overline{m}}$	π	360−α	Vel.	Pl.	$T_{\overline{m}}$	π	360−α	Vel.
	h min	′	°			h min	′	°	
♀	14 14	.1	266	−3.8	♃	7 51	.0	2	−2.1
♂	17 37	.1	215	1.0	♄	19 51	.0	181	.9

UT	SUNCE $S_\odot$	$\delta_\odot$	PROLJ. TAČKA S_Υ	VENERA S_φ	δ_φ	MARS S_σ	δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	180 47.8	20 42.4	241 28.9	146 16.2	25 1.5	95 47.9	15 23.2
2	210 47.7	20 43.4	271 33.8	176 14.5	25 1.4	125 50.5	15 22.3
4	240 47.6	20 44.3	301 38.7	206 12.9	25 1.3	155 53.1	15 21.4
6	270 47.5	20 45.2	331 43.6	236 11.2	25 1.3	185 55.7	15 20.5
8	300 47.4	20 46.1	1 48.6	266 9.6	25 1.2	215 58.3	15 19.6
10	330 47.3	20 47.1	31 53.5	296 7.9	25 1.1	246 .8	15 18.7
12	0 47.2	20 48.0	61 58.4	326 6.3	25 1.0	276 3.4	15 17.8
14	30 47.1	20 48.9	92 3.4	356 4.6	25 .9	306 6.0	15 16.9
16	60 46.9	20 49.8	122 8.3	26 2.9	25 .7	336 8.6	15 16.0
18	90 46.8	20 50.7	152 13.2	56 1.3	25 .6	6 11.2	15 15.1
20	120 46.7	20 51.7	182 18.1	85 59.6	25 .5	36 13.7	15 14.2
22	150 46.6	20 52.6	212 23.1	115 58.0	25 .4	66 16.3	15 13.3
Δ	−1	5		−8	−1	13	−4

UT	MJESEC $S_\leftmoon$	Δ	$\delta_\leftmoon$	Δ	JUPITER S_4	δ_4	SATURN S_η	δ_η
h	° ′		° ′		° ′	° ′	° ′	° ′
0	52 6.2	109	− 9 39.4	−137	242 52.4	− 1 49.2	62 27.9	3 5.9
2	81 6.0	108	−10 6.8	−136	272 56.5	− 1 48.9	92 32.9	3 5.9
4	110 5.6	107	−10 34.0	−135	303 .7	− 1 48.6	122 37.9	3 5.9
6	139 5.0	107	−11 .9	−134	333 4.9	− 1 48.3	152 42.9	3 5.9
8	168 4.4	106	−11 27.6	−132	3 9.0	− 1 48.0	182 47.9	3 5.9
10	197 3.5	105	−11 54.1	−131	33 13.2	− 1 47.7	212 52.8	3 5.9
12	226 2.5	104	−12 20.2	−129	63 17.4	− 1 47.4	242 57.8	3 5.9
14	255 1.4	103	−12 46.1	−128	93 21.6	− 1 47.1	273 2.8	3 5.9
16	284 .1	103	−13 11.7	−126	123 25.7	− 1 46.8	303 7.8	3 6.0
18	312 58.6	102	−13 36.9	−125	153 29.9	− 1 46.4	333 12.8	3 6.0
20	341 56.9	101	−14 1.9	−123	183 34.1	− 1 46.1	3 17.8	3 6.0
22	10 55.0	100	−14 26.5	−121	213 38.3	− 1 45.8	33 22.7	3 6.0
Δ					21	2	25	0

φ	SUNCE IZLAZ	ZALAZ	TRAJANJE SUMRAKA GRAĐ.	ASTR.	MJESEC IZLAZ	Δ/24	ZALAZ	Δ/24
N	h min	h min	h min	h min	h min	min	h min	min
60	3 3	20 52	1 14	: ::	16 44	4.0	1 23	.3
55	3 38	20 16	0 51	: ::	16 25	3.6	1 36	.7
50	4 3	19 51	0 41	3 9	16 10	3.3	1 46	.9
45	4 22	19 32	0 35	2 17	15 59	3.1	1 54	1.1
40	4 38	19 16	0 32	1 55	15 50	2.9	2 1	1.3
35	4 51	19 3	0 29	1 42	15 42	2.8	2 6	1.4
30	5 2	18 52	0 27	1 33	15 35	2.7	2 12	1.6
20	5 21	18 33	0 24	1 22	15 23	2.5	2 21	1.8
10	5 38	18 16	0 23	1 16	15 12	2.3	2 29	1.9
0	5 53	18 0	0 22	1 14	15 3	2.2	2 36	2.1
10	6 9	17 45	0 22	1 14	14 53	2.0	2 44	2.3
20	6 25	17 29	0 24	1 17	14 43	1.8	2 52	2.5
30	6 43	17 10	0 26	1 24	14 31	1.6	3 1	2.7
35	6 54	16 60	0 27	1 29	14 25	1.5	3 7	2.8
40	7 6	16 47	0 30	1 35	14 17	1.4	3 13	2.9
45	7 21	16 33	0 33	1 44	14 9	1.2	3 20	3.1
50	7 38	16 15	0 37	1 56	13 58	1.0	3 29	3.3
55	8 1	15 53	0 43	2 12	13 45	.8	3 39	3.6
60	8 32	15 21	0 52	2 36	13 29	.4	3 54	4.0
S								

SUNCE UT	e = Tp − UT	Δ/24	r	MJESEC Prolaz		Δ/24	$\pi_\leftmoon$	r
h	min s	s	′		h min	min	′	′
00	3 11.6	−.2	15.8	$T_{\overline{m}}$	21 15	2.2	58.8	16.0
12	3 8.8	$T_{\overline{m}_\odot}$	11 h 56.9 min	Starost	10.0 d	Faza	◐	

PLANETE

Pl.	$T_{\overline{m}}$	π	360−α	Vel.	Pl.	$T_{\overline{m}}$	π	360−α	Vel.
	h min	′	°			h min	′	°	
♀	14 16	.1	265	−3.9	♃	7 47	.0	1	−2.1
♂	17 35	.1	214	1.0	♄	19 47	.0	181	.9

UT	SUNCE $S_\odot$	SUNCE $\delta_\odot$	PROLJ. TAČKA S_Υ	VENERA S_φ	VENERA δ_φ	MARS S_σ	MARS δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	180 46.5	20 53.5	242 28.0	145 56.3	25 .3	96 18.9	15 12.4
2	210 46.4	20 54.4	272 32.9	175 54.7	25 .1	126 21.5	15 11.5
4	240 46.2	20 55.3	302 37.9	205 53.0	24 60.0	156 24.0	15 10.6
6	270 46.1	20 56.2	332 42.8	235 51.4	24 59.8	186 26.6	15 9.7
8	300 46.0	20 57.1	2 47.7	265 49.7	24 59.7	216 29.2	15 8.8
10	330 45.9	20 58.0	32 52.6	295 48.1	24 59.5	246 31.7	15 7.9
12	0 45.7	20 58.9	62 57.6	325 46.4	24 59.4	276 34.3	15 7.0
14	30 45.6	20 59.8	93 2.5	355 44.8	24 59.2	306 36.9	15 6.1
16	60 45.5	21 .6	123 7.4	25 43.1	24 59.0	336 39.4	15 5.2
18	90 45.4	21 1.5	153 12.4	55 41.5	24 58.9	6 42.0	15 4.3
20	120 45.2	21 2.4	183 17.3	85 39.9	24 58.7	36 44.6	15 3.4
22	150 45.1	21 3.3	213 22.2	115 38.2	24 58.5	66 47.1	15 2.5
Δ	-1	4		-8	-1	13	-5

UT	MJESEC $S_\leftmoon$	MJESEC Δ	MJESEC $\delta_\leftmoon$	MJESEC Δ	JUPITER $S_\jupiter$	JUPITER $\delta_\jupiter$	SATURN $S_\saturn$	SATURN $\delta_\saturn$
h	° ′		° ′		° ′	° ′	° ′	° ′
0	39 53.0	99	-14 50.8	-120	243 42.5	- 1 45.5	63 27.7	3 6.0
2	68 50.8	98	-15 14.7	-118	273 46.6	- 1 45.2	93 32.7	3 6.0
4	97 48.4	97	-15 38.3	-116	303 50.8	- 1 44.9	123 37.7	3 6.0
6	126 45.7	96	-16 1.5	-114	333 55.0	- 1 44.6	153 42.7	3 6.0
8	155 43.0	95	-16 24.3	-112	3 59.2	- 1 44.3	183 47.6	3 6.0
10	184 40.0	94	-16 46.8	-110	34 3.4	- 1 44.0	213 52.6	3 6.0
12	213 36.8	93	-17 8.8	-108	64 7.5	- 1 43.7	243 57.6	3 6.0
14	242 33.4	92	-17 30.5	-106	94 11.7	- 1 43.4	274 2.6	3 6.0
16	271 29.8	91	-17 51.7	-104	124 15.9	- 1 43.1	304 7.5	3 6.0
18	300 26.1	90	-18 12.5	-102	154 20.1	- 1 42.8	334 12.5	3 6.0
20	329 22.1	89	-18 32.9	-100	184 24.3	- 1 42.5	4 17.5	3 6.0
22	358 18.0	88	-18 52.8	-97	214 28.5	- 1 42.2	34 22.5	3 6.0
Δ					21	2	25	0

φ	SUNCE IZLAZ	SUNCE ZALAZ	TRAJANJE SUMRAKA GRAĐ.	TRAJANJE SUMRAKA ASTR.	MJESEC IZLAZ	MJESEC Δ/24	MJESEC ZALAZ	MJESEC Δ/24
N	h min	h min	h min	h min	h min	min	h min	min
60	3 1	20 54	1 15	: ::	18 20	3.9	1 31	.5
55	3 37	20 18	0 52	: ::	17 51	3.5	1 52	.9
50	4 2	19 52	0 42	3 12	17 30	3.2	2 8	1.1
45	4 22	19 33	0 36	2 18	17 14	3.0	2 21	1.3
40	4 37	19 17	0 32	1 56	17 0	2.9	2 32	1.5
35	4 50	19 4	0 29	1 42	16 49	2.8	2 41	1.6
30	5 2	18 53	0 27	1 33	16 39	2.7	2 49	1.7
20	5 21	18 33	0 24	1 22	16 22	2.5	3 3	1.9
10	5 38	18 16	0 23	1 16	16 8	2.4	3 15	2.1
0	5 53	18 1	0 22	1 14	15 54	2.2	3 27	2.2
10	6 9	17 45	0 22	1 14	15 41	2.1	3 39	2.3
20	6 25	17 29	0 24	1 17	15 27	2.0	3 51	2.5
30	6 44	17 10	0 26	1 24	15 10	1.8	4 6	2.7
35	6 55	16 59	0 27	1 29	15 1	1.7	4 14	2.8
40	7 7	16 47	0 30	1 35	14 50	1.6	4 23	2.9
45	7 22	16 32	0 33	1 44	14 38	1.4	4 35	3.1
50	7 39	16 14	0 37	1 56	14 23	1.3	4 48	3.3
55	8 2	15 51	0 43	2 12	14 4	1.0	5 6	3.5
60	8 34	15 20	0 53	2 37	13 38	.6	5 29	4.0
S								

SUNCE UT	SUNCE $e = T_p - UT$	SUNCE Δ/24	SUNCE r	MJESEC Prolaz	MJESEC Δ/24	MJESEC $\pi_\leftmoon$	MJESEC r
h	min s	s	′	h min	min	′	′
00	3 6.1	-.2	15.8	$T_{\overline{m}}$ 22 7	2.2	58.4	15.9
12	3 3.1	$T_{\overline{m}_\odot}$ 11 h 57.0 min		Starost 11.0 d	Faza ◐		

PLANETE

Pl.	$T_{\overline{m}}$	π	360−α	Vel.	Pl.	$T_{\overline{m}}$	π	360−α	Vel.
	h min	′	°			h min	′	°	
♀	14 17	.1	263	-3.9	♃	7 44	.0	1	-2.1
♂	17 33	.1	214	1.0	♄	19 43	.0	181	.9

UT	SUNCE $S_\odot$	SUNCE $\delta_\odot$	PROLJ. TAČKA S_Υ	VENERA S_φ	VENERA δ_φ	MARS S_σ	MARS δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	180 45.0	21 4.2	243 27.1	145 36.6	24 58.3	96 49.7	15 1.6
2	210 44.8	21 5.0	273 32.1	175 34.9	24 58.1	126 52.3	15 .7
4	240 44.7	21 5.9	303 37.0	205 33.3	24 57.9	156 54.8	14 59.8
6	270 44.6	21 6.8	333 41.9	235 31.7	24 57.7	186 57.4	14 58.9
8	300 44.4	21 7.6	3 46.9	265 30.0	24 57.5	216 60.0	14 57.9
10	330 44.3	21 8.5	33 51.8	295 28.4	24 57.3	247 2.5	14 57.0
12	0 44.2	21 9.4	63 56.7	325 26.7	24 57.1	277 5.1	14 56.1
14	30 44.0	21 10.2	94 1.6	355 25.1	24 56.8	307 7.6	14 55.2
16	60 43.9	21 11.1	124 6.6	25 23.5	24 56.6	337 10.2	14 54.3
18	90 43.8	21 11.9	154 11.5	55 21.8	24 56.4	7 12.8	14 53.4
20	120 43.6	21 12.8	184 16.4	85 20.2	24 56.1	37 15.3	14 52.5
22	150 43.5	21 13.6	214 21.4	115 18.6	24 55.9	67 17.9	14 51.6
Δ	-1	4		-8	-1	13	-5

UT	MJESEC $S_\leftmoon$	MJESEC Δ	MJESEC $\delta_\leftmoon$	MJESEC Δ	JUPITER $S_\jupiter$	JUPITER $\delta_\jupiter$	SATURN $S_\saturn$	SATURN $\delta_\saturn$
h	° ′		° ′		° ′	° ′	° ′	° ′
0	27 13.6	87	-19 12.3	-95	244 32.6	- 1 41.9	64 27.4	3 6.0
2	56 9.1	86	-19 31.3	-93	274 36.8	- 1 41.6	94 32.4	3 6.0
4	85 4.4	86	-19 49.9	-90	304 41.0	- 1 41.3	124 37.4	3 6.0
6	113 59.5	85	-20 7.9	-88	334 45.2	- 1 41.0	154 42.4	3 6.0
8	142 54.5	84	-20 25.5	-86	4 49.4	- 1 40.7	184 47.3	3 6.0
10	171 49.3	83	-20 42.6	-83	34 53.6	- 1 40.4	214 52.3	3 6.0
12	200 43.9	82	-20 59.2	-81	64 57.8	- 1 40.1	244 57.3	3 6.0
14	229 38.3	81	-21 15.3	-78	95 2.0	- 1 39.8	275 2.2	3 6.0
16	258 32.6	81	-21 30.9	-75	125 6.2	- 1 39.5	305 7.2	3 6.0
18	287 26.7	80	-21 46.0	-73	155 10.4	- 1 39.2	335 12.2	3 6.0
20	316 20.7	79	-22 .5	-70	185 14.6	- 1 38.9	5 17.1	3 6.0
22	345 14.6	79	-22 14.5	-67	215 18.8	- 1 38.6	35 22.1	3 6.0
Δ					21	1	25	0

φ	SUNCE IZLAZ	SUNCE ZALAZ	TRAJANJE SUMRAKA GRAĐ.	TRAJANJE SUMRAKA ASTR.	MJESEC IZLAZ	MJESEC Δ/24	MJESEC ZALAZ	MJESEC Δ/24
N	h min	h min	h min	h min	h min	min	h min	min
60	2 60	20 56	1 16	: ::	19 53	3.5	1 43	.8
55	3 36	20 19	0 52	: ::	19 14	3.2	2 13	1.2
50	4 1	19 54	0 42	3 16	18 47	3.0	2 35	1.4
45	4 21	19 34	0 36	2 19	18 26	2.8	2 53	1.6
40	4 36	19 18	0 32	1 56	18 10	2.7	3 7	1.7
35	4 50	19 5	0 29	1 43	17 56	2.7	3 19	1.8
30	5 1	18 53	0 27	1 33	17 44	2.6	3 30	1.9
20	5 21	18 33	0 24	1 22	17 23	2.5	3 49	2.0
10	5 38	18 16	0 23	1 16	17 5	2.4	4 5	2.2
0	5 53	18 1	0 22	1 14	16 48	2.3	4 20	2.3
10	6 9	17 45	0 22	1 14	16 32	2.2	4 35	2.4
20	6 26	17 28	0 24	1 17	16 14	2.1	4 51	2.5
30	6 44	17 10	0 26	1 24	15 54	2.0	5 10	2.6
35	6 55	16 59	0 28	1 29	15 42	1.9	5 21	2.7
40	7 8	16 46	0 30	1 36	15 28	1.8	5 34	2.8
45	7 22	16 31	0 33	1 44	15 13	1.7	5 49	3.0
50	7 40	16 13	0 37	1 56	14 53	1.6	6 7	3.1
55	8 4	15 50	0 43	2 13	14 28	1.4	6 31	3.3
60	8 36	15 18	0 53	2 37	13 53	1.0	7 4	3.7
S								

SUNCE UT	SUNCE $e = T_p - UT$	SUNCE Δ/24	SUNCE r	MJESEC Prolaz	MJESEC Δ/24	MJESEC $\pi_\leftmoon$	MJESEC r
h	min s	s	′	h min	min	′	′
00	3 .1	-.3	15.8	$T_{\overline{m}}$ 23 1	2.3	58.0	15.8
12	2 56.8	$T_{\overline{m}_\odot}$ 11 h 57.1 min		Starost 12.0 d	Faza ◐		

PLANETE

Pl.	$T_{\overline{m}}$	π	360−α	Vel.	Pl.	$T_{\overline{m}}$	π	360−α	Vel.
	h min	′	°			h min	′	°	
♀	14 18	.1	262	-3.9	♃	7 41	.0	1	-2.1
♂	17 31	.1	213	1.1	♄	19 39	.0	181	.9

UT	SUNCE $S_\odot$	SUNCE $\delta_\odot$	PROLJ. TAČKA S_Υ	VENERA S_φ	VENERA δ_φ	MARS S_σ	MARS δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	180 43.4	21 14.5	244 26.3	145 16.9	24 55.6	97 20.4	14 50.6
2	210 43.2	21 15.3	274 31.2	175 15.3	24 55.4	127 23.0	14 49.7
4	240 43.1	21 16.2	304 36.1	205 13.7	24 55.1	157 25.5	14 48.8
6	270 42.9	21 17.0	334 41.1	235 12.1	24 54.9	187 28.1	14 47.9
8	300 42.8	21 17.9	4 46.0	265 10.4	24 54.6	217 30.6	14 47.0
10	330 42.6	21 18.7	34 50.9	295 8.8	24 54.3	247 33.2	14 46.1
12	0 42.5	21 19.5	64 55.8	325 7.2	24 54.0	277 35.7	14 45.1
14	30 42.4	21 20.3	95 .8	355 5.5	24 53.7	307 38.3	14 44.2
16	60 42.2	21 21.2	125 5.7	25 3.9	24 53.5	337 40.8	14 43.3
18	90 42.1	21 22.0	155 10.6	55 2.3	24 53.2	7 43.4	14 42.4
20	120 41.9	21 22.8	185 15.6	85 .7	24 52.9	37 45.9	14 41.4
22	150 41.8	21 23.6	215 20.5	114 59.1	24 52.6	67 48.5	14 40.5
Δ	-1	4		-8	-1	13	-5

UT	MJESEC $S_\leftmoon$	MJESEC Δ	MJESEC $\delta_\leftmoon$	MJESEC Δ	JUPITER S_4	JUPITER δ_4	SATURN S_η	SATURN δ_η
h	° ′		° ′		° ′	° ′	° ′	° ′
0	14 8.3	78	-22 28.0	-65	245 23.0	- 1 38.3	65 27.1	3 6.0
2	43 1.9	77	-22 40.9	-62	275 27.2	- 1 38.0	95 32.0	3 6.0
4	71 55.4	77	-22 53.3	-59	305 31.3	- 1 37.7	125 37.0	3 6.0
6	100 48.8	76	-23 5.2	-56	335 35.5	- 1 37.4	155 42.0	3 6.0
8	129 42.1	76	-23 16.4	-54	5 39.7	- 1 37.1	185 46.9	3 6.0
10	158 35.3	76	-23 27.2	-51	35 43.9	- 1 36.8	215 51.9	3 5.9
12	187 28.4	75	-23 37.3	-48	65 48.1	- 1 36.5	245 56.8	3 5.9
14	216 21.5	75	-23 46.9	-45	95 52.3	- 1 36.3	276 1.8	3 5.9
16	245 14.5	75	-23 55.9	-42	125 56.5	- 1 36.0	306 6.8	3 5.9
18	274 7.4	75	-24 4.3	-39	156 .8	- 1 35.7	336 11.7	3 5.9
20	303 .4	75	-24 12.2	-36	186 5.0	- 1 35.4	6 16.7	3 5.9
22	331 53.3	74	-24 19.5	-34	216 9.2	- 1 35.1	36 21.6	3 5.9
Δ					21	1	25	0

φ	SUNCE IZLAZ	SUNCE ZALAZ	TRAJANJE SUMRAKA GRAĐ.	TRAJANJE SUMRAKA ASTR.	MJESEC IZLAZ	MJESEC Δ/24	MJESEC ZALAZ	MJESEC Δ/24
N	h min	h min	h min	h min	h min	min	h min	min
60	2 58	20 58	1 18	: ::	21 18	2.8	2 1	1.3
55	3 34	20 21	0 53	: ::	20 30	2.6	2 41	1.6
50	4 0	19 55	0 42	3 21	19 58	2.6	3 9	1.8
45	4 20	19 35	0 36	2 20	19 35	2.5	3 31	1.9
40	4 36	19 19	0 32	1 57	19 16	2.5	3 48	2.0
35	4 49	19 5	0 29	1 43	18 60	2.5	4 3	2.0
30	5 1	18 54	0 27	1 34	18 46	2.4	4 16	2.1
20	5 21	18 34	0 24	1 22	18 22	2.4	4 38	2.2
10	5 38	18 17	0 23	1 16	18 2	2.4	4 57	2.3
0	5 54	18 1	0 22	1 14	17 43	2.3	5 14	2.3
10	6 9	17 45	0 22	1 14	17 25	2.3	5 32	2.4
20	6 26	17 28	0 24	1 18	17 5	2.2	5 52	2.4
30	6 45	17 9	0 26	1 24	16 42	2.2	6 14	2.5
35	6 56	16 58	0 28	1 29	16 28	2.2	6 27	2.6
40	7 9	16 45	0 30	1 36	16 13	2.1	6 42	2.6
45	7 23	16 31	0 33	1 45	15 54	2.1	6 59	2.7
50	7 42	16 12	0 37	1 56	15 32	2.0	7 22	2.8
55	8 5	15 49	0 43	2 13	15 1	1.9	7 51	2.9
60	8 38	15 16	0 53	2 38	14 18	1.6	8 34	3.2
S								

SUNCE UT	SUNCE $e = T_p - UT$	SUNCE Δ/24	SUNCE r	MJESEC Prolaz	MJESEC Δ/24	MJESEC $\pi_\leftmoon$	MJESEC r
h	min s	s	′	h min	min	′	′
00	2 53.6	-.3	15.8	$T_{\overline{m}}$ 23 57	2.3	57.5	15.7
12	2 50.1	$T_{\overline{m}_\odot}$ 11 h 57.2 min		Starost 13.0 d	Faza ○		

PLANETE

Pl.	$T_{\overline{m}}$	π	360−α	Vel.	Pl.	$T_{\overline{m}}$	π	360−α	Vel.
	h min	′	°			h min	′	°	
♀	14 20	.1	261	-3.9	♃	7 37	.0	1	-2.1
♂	17 29	.1	213	1.1	♄	19 35	.0	181	.9

UT	SUNCE $S_\odot$	SUNCE $\delta_\odot$	PROLJ. TAČKA S_Υ	VENERA S_φ	VENERA δ_φ	MARS S_σ	MARS δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	180 41.6	21 24.4	245 25.4	144 57.4	24 52.3	97 51.0	14 39.6
2	210 41.5	21 25.3	275 30.3	174 55.8	24 51.9	127 53.6	14 38.7
4	240 41.3	21 26.1	305 35.3	204 54.2	24 51.6	157 56.1	14 37.8
6	270 41.2	21 26.9	335 40.2	234 52.6	24 51.3	187 58.7	14 36.8
8	300 41.0	21 27.7	5 45.1	264 51.0	24 51.0	218 1.2	14 35.9
10	330 40.9	21 28.5	35 50.1	294 49.4	24 50.6	248 3.8	14 35.0
12	0 40.7	21 29.3	65 55.0	324 47.7	24 50.3	278 6.3	14 34.0
14	30 40.5	21 30.1	95 59.9	354 46.1	24 50.0	308 8.8	14 33.1
16	60 40.4	21 30.9	126 4.8	24 44.5	24 49.6	338 11.4	14 32.2
18	90 40.2	21 31.7	156 9.8	54 42.9	24 49.3	8 13.9	14 31.3
20	120 40.1	21 32.5	186 14.7	84 41.3	24 48.9	38 16.5	14 30.3
22	150 39.9	21 33.3	216 19.6	114 39.7	24 48.6	68 19.0	14 29.4
Δ	-1	4		-8	-2	13	-5

UT	MJESEC $S_\leftmoon$	MJESEC Δ	MJESEC $\delta_\leftmoon$	MJESEC Δ	JUPITER S_4	JUPITER δ_4	SATURN S_η	SATURN δ_η
h	° ′		° ′		° ′	° ′	° ′	° ′
0	0 46.2	74	-24 26.2	-31	246 13.4	- 1 34.8	66 26.6	3 5.9
2	29 39.0	75	-24 32.3	-28	276 17.6	- 1 34.5	96 31.5	3 5.9
4	58 31.9	75	-24 37.9	-25	306 21.8	- 1 34.2	126 36.5	3 5.9
6	87 24.9	75	-24 42.8	-22	336 26.0	- 1 33.9	156 41.5	3 5.9
8	116 17.8	75	-24 47.2	-19	6 30.2	- 1 33.6	186 46.4	3 5.9
10	145 10.8	75	-24 51.0	-16	36 34.4	- 1 33.3	216 51.4	3 5.9
12	174 3.9	76	-24 54.2	-13	66 38.6	- 1 33.0	246 56.3	3 5.9
14	202 57.0	76	-24 56.9	-10	96 42.8	- 1 32.7	277 1.3	3 5.9
16	231 50.2	77	-24 58.9	-7	126 47.0	- 1 32.5	307 6.2	3 5.8
18	260 43.5	77	-25 .4	-5	156 51.2	- 1 32.2	337 11.2	3 5.8
20	289 36.9	78	-25 1.3	-2	186 55.5	- 1 31.9	7 16.1	3 5.8
22	318 30.5	78	-25 1.7	1	216 59.7	- 1 31.6	37 21.1	3 5.8
Δ					21	1	25	0

φ	SUNCE IZLAZ	SUNCE ZALAZ	TRAJANJE SUMRAKA GRAĐ.	TRAJANJE SUMRAKA ASTR.	MJESEC IZLAZ	MJESEC Δ/24	MJESEC ZALAZ	MJESEC Δ/24
N	h min	h min	h min	h min	h min	min	h min	min
60	2 56	20 60	1 19	: ::	22 25	1.8	2 31	2.0
55	3 33	20 22	0 53	: ::	21 34	2.0	3 20	2.2
50	3 59	19 56	0 42	3 26	21 0	2.1	3 52	2.2
45	4 19	19 36	0 36	2 21	20 35	2.1	4 16	2.2
40	4 35	19 20	0 32	1 57	20 15	2.1	4 36	2.2
35	4 49	19 6	0 29	1 43	19 58	2.2	4 52	2.3
30	5 1	18 54	0 27	1 34	19 44	2.2	5 6	2.3
20	5 21	18 34	0 24	1 22	19 20	2.2	5 30	2.3
10	5 38	18 17	0 23	1 16	18 59	2.2	5 51	2.3
0	5 54	18 1	0 22	1 14	18 39	2.3	6 10	2.3
10	6 10	17 45	0 23	1 14	18 20	2.3	6 30	2.3
20	6 26	17 28	0 24	1 18	17 59	2.3	6 50	2.3
30	6 45	17 9	0 26	1 24	17 34	2.3	7 14	2.3
35	6 57	16 58	0 28	1 29	17 20	2.3	7 28	2.3
40	7 9	16 45	0 30	1 36	17 4	2.4	7 45	2.3
45	7 24	16 30	0 33	1 45	16 44	2.4	8 4	2.3
50	7 43	16 11	0 37	1 57	16 19	2.4	8 29	2.3
55	8 6	15 48	0 43	2 13	15 47	2.4	9 1	2.3
60	8 39	15 15	0 54	2 38	14 57	2.5	9 50	2.3
S								

SUNCE UT	SUNCE $e = T_p - UT$	SUNCE Δ/24	SUNCE r	MJESEC Prolaz	MJESEC Δ/24	MJESEC $\pi_\leftmoon$	MJESEC r
h	min s	s	′	h min	min	′	′
00	2 46.6	-.3	15.8	$T_{\overline{m}}$	1.0	56.9	15.5
12	2 42.9	$T_{\overline{m}_\odot}$ 11 h 57.3 min		Starost 14.0 d	Faza ○		

PLANETE

Pl.	$T_{\overline{m}}$	π	360−α	Vel.	Pl.	$T_{\overline{m}}$	π	360−α	Vel.
	h min	′	°			h min	′	°	
♀	14 21	.1	260	-3.9	♃	7 34	.0	1	-2.1
♂	17 27	.1	212	1.1	♄	19 31	.0	181	.9

UT	SUNCE		PROLJ. TAČKA	VENERA		MARS	
	$S_\odot$	$\delta_\odot$	S_Υ	S_φ	δ_φ	S_σ	δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	180 39.8	21 34.0	246 24.6	144 38.1	24 48.2	98 21.5	14 28.5
2	210 39.6	21 34.8	276 29.5	174 36.5	24 47.8	128 24.1	14 27.5
4	240 39.4	21 35.6	306 34.4	204 34.9	24 47.4	158 26.6	14 26.6
6	270 39.3	21 36.4	336 39.3	234 33.3	24 47.1	188 29.1	14 25.7
8	300 39.1	21 37.2	6 44.3	264 31.7	24 46.7	218 31.7	14 24.7
10	330 39.0	21 37.9	36 49.2	294 30.1	24 46.3	248 34.2	14 23.8
12	0 38.8	21 38.7	66 54.1	324 28.5	24 45.9	278 36.7	14 22.9
14	30 38.6	21 39.5	96 59.1	354 26.9	24 45.5	308 39.3	14 21.9
16	60 38.5	21 40.2	127 4.0	24 25.3	24 45.1	338 41.8	14 21.0
18	90 38.3	21 41.0	157 8.9	54 23.7	24 44.7	8 44.3	14 20.1
20	120 38.1	21 41.7	187 13.8	84 22.1	24 44.3	38 46.9	14 19.1
22	150 38.0	21 42.5	217 18.8	114 20.5	24 43.8	68 49.4	14 18.2
Δ	-1	4		-8	-2	13	-5

UT	MJESEC				JUPITER		SATURN	
	$S_\leftmoon$	Δ	$\delta_\leftmoon$	Δ	S_{4}	δ_{4}	S_{5}	δ_{5}
h	° ′		° ′		° ′	° ′	° ′	° ′
0	347 24.1	79	-25 1.4	4	247 3.9	- 1 31.3	67 26.0	3 5.8
2	16 17.9	80	-25 .7	7	277 8.1	- 1 31.0	97 31.0	3 5.8
4	45 11.8	80	-24 59.3	10	307 12.3	- 1 30.7	127 35.9	3 5.8
6	74 5.9	81	-24 57.4	12	337 16.5	- 1 30.4	157 40.9	3 5.8
8	103 .2	82	-24 54.9	15	7 20.8	- 1 30.1	187 45.8	3 5.8
10	131 54.6	83	-24 51.9	18	37 25.0	- 1 29.9	217 50.8	3 5.7
12	160 49.3	84	-24 48.3	20	67 29.2	- 1 29.6	247 55.7	3 5.7
14	189 44.1	85	-24 44.2	23	97 33.4	- 1 29.3	278 .7	3 5.7
16	218 39.2	86	-24 39.6	26	127 37.6	- 1 29.0	308 5.6	3 5.7
18	247 34.4	87	-24 34.4	28	157 41.9	- 1 28.7	338 10.5	3 5.7
20	276 29.9	89	-24 28.7	31	187 46.1	- 1 28.4	8 15.5	3 5.7
22	305 25.6	90	-24 22.5	34	217 50.3	- 1 28.1	38 20.4	3 5.7
Δ					21	1	25	0

φ	SUNCE		TRAJANJE SUMRAKA		MJESEC			
	IZLAZ	ZALAZ	GRAĐ.	ASTR.	IZLAZ	Δ/24	ZALAZ	Δ/24
N	h min	h min	h min	h min	h min	min	h min	min
60	2 54	21 2	1 20	: ::	23 8	1.1	3 21	2.9
55	3 32	20 24	0 53	: ::	22 21	1.4	4 12	2.7
50	3 58	19 57	0 42	3 32	21 50	1.6	4 45	2.6
45	4 19	19 37	0 36	2 22	21 26	1.7	5 10	2.5
40	4 35	19 20	0 32	1 58	21 7	1.8	5 30	2.4
35	4 48	19 7	0 29	1 44	20 51	1.9	5 46	2.4
30	5 0	18 55	0 27	1 34	20 37	1.9	6 1	2.4
20	5 20	18 35	0 24	1 23	20 13	2.0	6 25	2.3
10	5 38	18 17	0 23	1 17	19 53	2.1	6 46	2.3
0	5 54	18 1	0 22	1 14	19 34	2.2	7 5	2.2
10	6 10	17 45	0 23	1 15	19 14	2.2	7 25	2.2
20	6 27	17 28	0 24	1 18	18 54	2.3	7 46	2.1
30	6 46	17 9	0 26	1 24	18 30	2.4	8 10	2.1
35	6 57	16 57	0 28	1 29	18 16	2.4	8 24	2.0
40	7 10	16 44	0 30	1 36	18 0	2.5	8 40	2.0
45	7 25	16 29	0 33	1 45	17 41	2.6	8 60	1.9
50	7 44	16 11	0 37	1 57	17 17	2.7	9 24	1.8
55	8 8	15 47	0 44	2 14	16 45	2.8	9 57	1.7
60	8 41	15 13	0 54	2 39	15 56	3.1	10 46	1.4
S								

UT	SUNCE				MJESEC			
	$e = T_p - UT$		Δ/24	r	Prolaz		Δ/24	$\pi_\leftmoon$	r
h	min	s	s	′	h	min	min	′	′
00	2 39.2		-.3	15.8	$T_{\overline{m}}$	0 52	2.3	56.4	15.4
12	2 35.3		$T_{\overline{m}_\odot}$	11 h 57.4 min	Starost 15.0 d		Faza ○		

PLANETE

Pl.	$T_{\overline{m}}$	π	360−α	Vel.	Pl.	$T_{\overline{m}}$	π	360−α	Vel.
	h min	′	°			h min	′	°	
♀	14 22	.1	258	-3.9	♃	7 31	.0	1	-2.1
♂	17 25	.1	212	1.1	♄	19 27	.0	181	.9

UT	SUNCE		PROLJ. TAČKA	VENERA		MARS	
	$S_\odot$	$\delta_\odot$	S_Υ	S_φ	δ_φ	S_σ	δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	180 37.8	21 43.3	247 23.7	144 18.9	24 43.4	98 51.9	14 17.2
2	210 37.6	21 44.0	277 28.6	174 17.3	24 43.0	128 54.5	14 16.3
4	240 37.5	21 44.8	307 33.6	204 15.7	24 42.6	158 57.0	14 15.4
6	270 37.3	21 45.5	337 38.5	234 14.1	24 42.1	188 59.5	14 14.4
8	300 37.1	21 46.2	7 43.4	264 12.6	24 41.7	219 2.0	14 13.5
10	330 36.9	21 47.0	37 48.3	294 11.0	24 41.2	249 4.6	14 12.5
12	0 36.8	21 47.7	67 53.3	324 9.4	24 40.8	279 7.1	14 11.6
14	30 36.6	21 48.5	97 58.2	354 7.8	24 40.3	309 9.6	14 10.7
16	60 36.4	21 49.2	128 3.1	24 6.2	24 39.9	339 12.1	14 9.7
18	90 36.2	21 49.9	158 8.0	54 4.6	24 39.4	9 14.7	14 8.8
20	120 36.1	21 50.7	188 13.0	84 3.1	24 38.9	39 17.2	14 7.8
22	150 35.9	21 51.4	218 17.9	114 1.5	24 38.4	69 19.7	14 6.9
Δ	-1	4		-8	-2	13	-5

UT	MJESEC				JUPITER		SATURN	
	$S_\leftmoon$	Δ	$\delta_\leftmoon$	Δ	S_{4}	δ_{4}	S_{5}	δ_{5}
h	° ′		° ′		° ′	° ′	° ′	° ′
0	334 21.6	91	-24 15.8	36	247 54.5	- 1 27.9	68 25.4	3 5.7
2	3 17.8	92	-24 8.6	39	277 58.8	- 1 27.6	98 30.3	3 5.6
4	32 14.3	94	-24 .9	41	308 3.0	- 1 27.3	128 35.3	3 5.6
6	61 11.0	95	-23 52.7	43	338 7.2	- 1 27.0	158 40.2	3 5.6
8	90 8.0	96	-23 44.0	46	8 11.4	- 1 26.7	188 45.1	3 5.6
10	119 5.3	98	-23 34.8	48	38 15.7	- 1 26.4	218 50.1	3 5.6
12	148 2.8	99	-23 25.1	51	68 19.9	- 1 26.2	248 55.0	3 5.6
14	177 .7	101	-23 15.0	53	98 24.1	- 1 25.9	278 59.9	3 5.6
16	205 58.8	102	-23 4.5	55	128 28.3	- 1 25.6	309 4.9	3 5.5
18	234 57.2	104	-22 53.5	57	158 32.6	- 1 25.3	339 9.8	3 5.5
20	263 56.0	105	-22 42.0	59	188 36.8	- 1 25.0	9 14.8	3 5.5
22	292 55.0	107	-22 30.1	62	218 41.0	- 1 24.8	39 19.7	3 5.5
Δ					21	1	25	0

φ	SUNCE		TRAJANJE SUMRAKA		MJESEC			
	IZLAZ	ZALAZ	GRAĐ.	ASTR.	IZLAZ	Δ/24	ZALAZ	Δ/24
N	h min	h min	h min	h min	h min	min	h min	min
60	2 53	21 4	1 22	: ::	23 34	.6	4 29	3.3
55	3 31	20 25	0 54	: ::	22 55	1.0	5 15	3.0
50	3 58	19 58	0 43	3 40	22 28	1.2	5 46	2.8
45	4 18	19 38	0 36	2 23	22 7	1.4	6 10	2.6
40	4 34	19 21	0 32	1 58	21 50	1.5	6 29	2.5
35	4 48	19 7	0 29	1 44	21 36	1.6	6 44	2.5
30	4 60	18 55	0 27	1 34	21 23	1.7	6 58	2.4
20	5 20	18 35	0 24	1 23	21 2	1.8	7 21	2.3
10	5 38	18 17	0 23	1 17	20 43	1.9	7 40	2.2
0	5 54	18 1	0 22	1 14	20 26	2.0	7 59	2.1
10	6 10	17 45	0 23	1 15	20 8	2.1	8 17	2.0
20	6 27	17 28	0 24	1 18	19 49	2.3	8 37	1.9
30	6 47	17 8	0 26	1 24	19 28	2.4	8 60	1.8
35	6 58	16 57	0 28	1 30	19 15	2.5	9 13	1.7
40	7 11	16 44	0 30	1 36	19 0	2.6	9 28	1.7
45	7 26	16 29	0 33	1 45	18 43	2.7	9 46	1.6
50	7 45	16 10	0 37	1 57	18 21	2.8	10 8	1.4
55	8 9	15 46	0 44	2 14	17 52	3.0	10 38	1.2
60	8 43	15 12	0 54	2 39	17 11	3.4	11 20	.9
S								

UT	SUNCE				MJESEC			
	$e = T_p - UT$		Δ/24	r	Prolaz		Δ/24	$\pi_\leftmoon$	r
h	min	s	s	′	h	min	min	′	′
00	2 31.4		-.3	15.8	$T_{\overline{m}}$	1 46	2.2	55.8	15.2
12	2 27.2		$T_{\overline{m}_\odot}$	11 h 57.5 min	Starost 16.0 d		Faza ○		

PLANETE

Pl.	$T_{\overline{m}}$	π	360−α	Vel.	Pl.	$T_{\overline{m}}$	π	360−α	Vel.
	h min	′	°			h min	′	°	
♀	14 23	.1	257	-3.9	♃	7 27	.0	1	-2.1
♂	17 23	.1	211	1.1	♄	19 23	.0	181	.9

UT	SUNCE $S_\odot$	SUNCE $\delta_\odot$	PROLJ. TAČKA S_Υ	VENERA S_φ	VENERA δ_φ	MARS S_σ	MARS δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	180 35.7	21 52.1	248 22.8	143 59.9	24 38.0	99 22.2	14 5.9
2	210 35.5	21 52.8	278 27.8	173 58.3	24 37.5	129 24.8	14 5.0
4	240 35.4	21 53.5	308 32.7	203 56.8	24 37.0	159 27.3	14 4.0
6	270 35.2	21 54.2	338 37.6	233 55.2	24 36.5	189 29.8	14 3.1
8	300 35.0	21 55.0	8 42.5	263 53.6	24 36.0	219 32.3	14 2.1
10	330 34.8	21 55.7	38 47.5	293 52.1	24 35.5	249 34.8	14 1.2
12	0 34.6	21 56.4	68 52.4	323 50.5	24 35.0	279 37.3	14 .2
14	30 34.5	21 57.1	98 57.3	353 48.9	24 34.4	309 39.9	13 59.3
16	60 34.3	21 57.8	129 2.3	23 47.4	24 33.9	339 42.4	13 58.3
18	90 34.1	21 58.5	159 7.2	53 45.8	24 33.4	9 44.9	13 57.4
20	120 33.9	21 59.2	189 12.1	83 44.2	24 32.9	39 47.4	13 56.4
22	150 33.7	21 59.9	219 17.0	113 42.7	24 32.3	69 49.9	13 55.5
Δ	−1	4		−8	−3	13	−5

UT	MJESEC $S_\leftmoon$	MJESEC Δ	MJESEC $\delta_\leftmoon$	MJESEC Δ	JUPITER S_4	JUPITER δ_4	SATURN S_η	SATURN δ_η
h	° ′		° ′		° ′	° ′	° ′	° ′
0	321 54.3	108	−22 17.8	64	248 45.3	− 1 24.5	69 24.6	3 5.5
2	350 53.9	110	−22 5.1	66	278 49.5	− 1 24.2	99 29.6	3 5.5
4	19 53.8	111	−21 51.9	68	308 53.7	− 1 23.9	129 34.5	3 5.4
6	48 54.1	113	−21 38.4	70	338 58.0	− 1 23.6	159 39.4	3 5.4
8	77 54.6	114	−21 24.5	72	9 2.2	− 1 23.4	189 44.3	3 5.4
10	106 55.5	116	−21 10.1	73	39 6.5	− 1 23.1	219 49.3	3 5.4
12	135 56.6	117	−20 55.4	75	69 10.7	− 1 22.8	249 54.2	3 5.4
14	164 58.1	119	−20 40.4	77	99 14.9	− 1 22.5	279 59.1	3 5.3
16	193 59.9	120	−20 24.9	79	129 19.2	− 1 22.3	310 4.1	3 5.3
18	223 2.0	122	−20 9.2	81	159 23.4	− 1 22.0	340 9.0	3 5.3
20	252 4.3	123	−19 53.0	82	189 27.7	− 1 21.7	10 13.9	3 5.3
22	281 7.0	125	−19 36.5	84	219 31.9	− 1 21.4	40 18.9	3 5.3
Δ					21	1	25	0

φ	SUNCE IZLAZ	SUNCE ZALAZ	TRAJANJE SUMRAKA GRAĐ.	TRAJANJE SUMRAKA ASTR.	MJESEC IZLAZ	MJESEC Δ/24	MJESEC ZALAZ	MJESEC Δ/24
N	h min	h min	h min	h min	h min	min	h min	min
60	2 51	21 6	1 23	: ::	23 50	.4	5 49	3.5
55	3 30	20 26	0 54	: ::	23 20	.7	6 27	3.1
50	3 57	19 59	0 43	: ::	22 58	1.0	6 53	2.9
45	4 17	19 39	0 36	2 24	22 40	1.1	7 13	2.7
40	4 34	19 22	0 32	1 59	22 26	1.3	7 30	2.6
35	4 48	19 8	0 29	1 44	22 14	1.4	7 43	2.5
30	4 60	18 56	0 27	1 34	22 4	1.5	7 55	2.4
20	5 20	18 35	0 24	1 23	21 45	1.6	8 16	2.2
10	5 38	18 18	0 23	1 17	21 29	1.8	8 33	2.1
0	5 54	18 1	0 22	1 14	21 15	1.9	8 50	2.0
10	6 10	17 45	0 23	1 15	20 60	2.0	9 6	1.9
20	6 27	17 28	0 24	1 18	20 43	2.2	9 23	1.7
30	6 47	17 8	0 26	1 25	20 25	2.3	9 43	1.6
35	6 59	16 57	0 28	1 30	20 14	2.4	9 55	1.5
40	7 12	16 44	0 30	1 36	20 2	2.5	10 8	1.4
45	7 27	16 28	0 33	1 45	19 47	2.7	10 23	1.3
50	7 46	16 9	0 37	1 57	19 29	2.8	10 42	1.1
55	8 10	15 45	0 44	2 14	19 5	3.1	11 7	.9
60	8 45	15 10	0 54	2 40	18 33	3.4	11 41	.5
S								

SUNCE UT	SUNCE $e = T_p - UT$	SUNCE Δ/24	SUNCE r	MJESEC Prolaz	MJESEC Δ/24	MJESEC $\pi_\leftmoon$	MJESEC r
h	min s	s	′	h min	min	′	′
00	2 23.1	−.4	15.8	$T_{\overline{m}}$ 2 38	2.0	55.3	15.1
12	2 18.7	$T_{\overline{m}_\odot}$ 11 h 57.7 min		Starost 17.0 d	Faza ❍		

PLANETE

Pl.	$T_{\overline{m}}$	π	360−α	Vel.	Pl.	$T_{\overline{m}}$	π	360−α	Vel.
	h min	′	°			h min	′	°	
♀	14 25	.1	256	−3.9	♃	7 24	.0	0	−2.1
♂	17 21	.1	211	1.1	♄	19 19	.0	181	1.0

UT	SUNCE $S_\odot$	SUNCE $\delta_\odot$	PROLJ. TAČKA S_Υ	VENERA S_φ	VENERA δ_φ	MARS S_σ	MARS δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	180 33.5	22 .6	249 22.0	143 41.1	24 31.8	99 52.4	13 54.5
2	210 33.3	22 1.2	279 26.9	173 39.6	24 31.3	129 54.9	13 53.6
4	240 33.2	22 1.9	309 31.8	203 38.0	24 30.7	159 57.4	13 52.6
6	270 33.0	22 2.6	339 36.8	233 36.4	24 30.2	189 60.0	13 51.6
8	300 32.8	22 3.3	9 41.7	263 34.9	24 29.6	220 2.5	13 50.7
10	330 32.6	22 4.0	39 46.6	293 33.3	24 29.0	250 5.0	13 49.7
12	0 32.4	22 4.6	69 51.5	323 31.8	24 28.5	280 7.5	13 48.8
14	30 32.2	22 5.3	99 56.5	353 30.2	24 27.9	310 10.0	13 47.8
16	60 32.0	22 6.0	130 1.4	23 28.7	24 27.3	340 12.5	13 46.9
18	90 31.8	22 6.7	160 6.3	53 27.1	24 26.7	10 15.0	13 45.9
20	120 31.6	22 7.3	190 11.3	83 25.6	24 26.1	40 17.5	13 44.9
22	150 31.4	22 8.0	220 16.2	113 24.1	24 25.6	70 20.0	13 44.0
Δ	−1	3		−8	−3	13	−5

UT	MJESEC $S_\leftmoon$	MJESEC Δ	MJESEC $\delta_\leftmoon$	MJESEC Δ	JUPITER S_4	JUPITER δ_4	SATURN S_η	SATURN δ_η
h	° ′		° ′		° ′	° ′	° ′	° ′
0	310 10.0	126	−19 19.7	86	249 36.1	− 1 21.1	70 23.8	3 5.2
2	339 13.3	128	−19 2.6	87	279 40.4	− 1 20.9	100 28.7	3 5.2
4	8 16.9	129	−18 45.2	89	309 44.6	− 1 20.6	130 33.6	3 5.2
6	37 20.8	131	−18 27.4	90	339 48.9	− 1 20.3	160 38.6	3 5.2
8	66 25.0	132	−18 9.3	92	9 53.1	− 1 20.1	190 43.5	3 5.2
10	95 29.4	134	−17 51.0	93	39 57.4	− 1 19.8	220 48.4	3 5.1
12	124 34.2	135	−17 32.3	95	70 1.6	− 1 19.5	250 53.3	3 5.1
14	153 39.2	136	−17 13.4	96	100 5.9	− 1 19.2	280 58.2	3 5.1
16	182 44.5	138	−16 54.2	97	130 10.1	− 1 19.0	311 3.2	3 5.1
18	211 50.0	139	−16 34.8	99	160 14.4	− 1 18.7	341 8.1	3 5.0
20	240 55.9	140	−16 15.1	100	190 18.6	− 1 18.4	11 13.0	3 5.0
22	270 2.0	142	−15 55.1	101	220 22.9	− 1 18.1	41 17.9	3 5.0
Δ					21	1	25	0

φ	SUNCE IZLAZ	SUNCE ZALAZ	TRAJANJE SUMRAKA GRAĐ.	TRAJANJE SUMRAKA ASTR.	MJESEC IZLAZ	MJESEC Δ/24	MJESEC ZALAZ	MJESEC Δ/24
N	h min	h min	h min	h min	h min	min	h min	min
60	2 50	21 7	1 24	: ::	23 59	.3	7 12	3.4
55	3 29	20 28	0 54	: ::	23 38	.6	7 41	3.1
50	3 56	20 0	0 43	: ::	23 21	.8	8 2	2.8
45	4 17	19 39	0 36	2 24	23 8	1.0	8 18	2.7
40	4 33	19 23	0 32	1 59	22 57	1.1	8 31	2.5
35	4 47	19 9	0 29	1 44	22 47	1.2	8 42	2.4
30	4 59	18 56	0 27	1 35	22 39	1.3	8 52	2.3
20	5 20	18 36	0 24	1 23	22 25	1.5	9 9	2.1
10	5 38	18 18	0 23	1 17	22 12	1.7	9 23	2.0
0	5 54	18 1	0 22	1 14	22 0	1.8	9 37	1.9
10	6 11	17 45	0 23	1 15	21 48	1.9	9 50	1.7
20	6 28	17 28	0 24	1 18	21 36	2.1	10 5	1.6
30	6 48	17 8	0 26	1 25	21 21	2.3	10 21	1.4
35	6 59	16 56	0 28	1 30	21 12	2.4	10 30	1.3
40	7 12	16 43	0 30	1 36	21 3	2.5	10 41	1.2
45	7 28	16 28	0 33	1 45	20 51	2.6	10 54	1.1
50	7 47	16 8	0 38	1 57	20 37	2.8	11 9	.9
55	8 12	15 44	0 44	2 14	20 19	3.0	11 28	.7
60	8 46	15 9	0 55	2 40	19 55	3.4	11 53	.4
S								

SUNCE UT	SUNCE $e = T_p - UT$	SUNCE Δ/24	SUNCE r	MJESEC Prolaz	MJESEC Δ/24	MJESEC $\pi_\leftmoon$	MJESEC r
h	min s	s	′	h min	min	′	′
00	2 14.3	−.4	15.8	$T_{\overline{m}}$ 3 26	1.9	54.8	14.9
12	2 9.7	$T_{\overline{m}_\odot}$ 11 h 57.8 min		Starost 18.0 d	Faza ❍		

PLANETE

Pl.	$T_{\overline{m}}$	π	360−α	Vel.	Pl.	$T_{\overline{m}}$	π	360−α	Vel.
	h min	′	°			h min	′	°	
♀	14 26	.1	254	−3.9	♃	7 21	.0	0	−2.1
♂	17 19	.1	210	1.1	♄	19 15	.0	181	1.0

UT	SUNCE $S_\odot$	SUNCE $\delta_\odot$	PROLJ. TAČKA S_Υ	VENERA S_φ	VENERA δ_φ	MARS S_σ	MARS δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	180 31.2	22 8.6	250 21.1	143 22.5	24 25.0	100 22.5	13 43.0
2	210 31.1	22 9.3	280 26.0	173 21.0	24 24.4	130 25.0	13 42.0
4	240 30.9	22 9.9	310 31.0	203 19.4	24 23.8	160 27.5	13 41.1
6	270 30.7	22 10.6	340 35.9	233 17.9	24 23.1	190 30.0	13 40.1
8	300 30.5	22 11.2	10 40.8	263 16.4	24 22.5	220 32.5	13 39.2
10	330 30.3	22 11.9	40 45.8	293 14.8	24 21.9	250 35.0	13 38.2
12	0 30.1	22 12.5	70 50.7	323 13.3	24 21.3	280 37.5	13 37.2
14	30 29.9	22 13.2	100 55.6	353 11.8	24 20.7	310 40.0	13 36.3
16	60 29.7	22 13.8	131 .5	23 10.2	24 20.0	340 42.5	13 35.3
18	90 29.5	22 14.4	161 5.5	53 8.7	24 19.4	10 45.0	13 34.3
20	120 29.3	22 15.1	191 10.4	83 7.2	24 18.7	40 47.5	13 33.3
22	150 29.1	22 15.7	221 15.3	113 5.7	24 18.1	70 50.0	13 32.4
Δ	−1	3		−8	−3	12	−5

UT	MJESEC $S_\leftmoon$	MJESEC Δ	MJESEC $\delta_\leftmoon$	MJESEC Δ	JUPITER S_4	JUPITER δ_4	SATURN S_η	SATURN δ_η
h	° ′		° ′		° ′	° ′	° ′	° ′
0	299 8.3	143	−15 34.9	102	250 27.1	− 1 17.9	71 22.8	3 5.0
2	328 14.9	144	−15 14.4	103	280 31.4	− 1 17.6	101 27.8	3 4.9
4	357 21.7	145	−14 53.8	105	310 35.6	− 1 17.3	131 32.7	3 4.9
6	26 28.8	147	−14 32.9	106	340 39.9	− 1 17.1	161 37.6	3 4.9
8	55 36.1	148	−14 11.7	107	10 44.1	− 1 16.8	191 42.5	3 4.9
10	84 43.7	149	−13 50.4	108	40 48.4	− 1 16.5	221 47.4	3 4.8
12	113 51.4	150	−13 28.9	109	70 52.7	− 1 16.3	251 52.3	3 4.8
14	142 59.4	151	−13 7.1	110	100 56.9	− 1 16.0	281 57.3	3 4.8
16	172 7.6	152	−12 45.2	111	131 1.2	− 1 15.7	312 2.2	3 4.8
18	201 15.9	153	−12 23.1	111	161 5.4	− 1 15.4	342 7.1	3 4.7
20	230 24.5	154	−12 .8	112	191 9.7	− 1 15.2	12 12.0	3 4.7
22	259 33.3	155	−11 38.3	113	221 14.0	− 1 14.9	42 16.9	3 4.7
Δ					21	1	25	0

φ	SUNCE IZLAZ	SUNCE ZALAZ	TRAJANJE SUMRAKA GRAĐ.	TRAJANJE SUMRAKA ASTR.	MJESEC IZLAZ	MJESEC Δ/24	MJESEC ZALAZ	MJESEC Δ/24
N	h min	h min	h min	h min	h min	min	h min	min
60	2 48	21 9	1 26	: ::	.. ..	.0	8 35	3.3
55	3 28	20 29	0 55	: ::	23 52	.5	8 55	3.0
50	3 55	20 1	0 43	: ::	23 40	.7	9 10	2.8
45	4 16	19 40	0 36	2 25	23 31	.9	9 22	2.6
40	4 33	19 23	0 32	1 59	23 23	1.0	9 32	2.5
35	4 47	19 9	0 29	1 45	23 17	1.1	9 40	2.3
30	4 59	18 57	0 27	1 35	23 11	1.2	9 47	2.2
20	5 20	18 36	0 24	1 23	23 1	1.4	10 0	2.1
10	5 38	18 18	0 23	1 17	22 52	1.6	10 11	1.9
0	5 54	18 2	0 22	1 14	22 43	1.7	10 21	1.8
10	6 11	17 45	0 23	1 15	22 35	1.9	10 32	1.6
20	6 28	17 28	0 24	1 18	22 26	2.0	10 42	1.5
30	6 48	17 8	0 26	1 25	22 15	2.2	10 55	1.3
35	6 60	16 56	0 28	1 30	22 9	2.3	11 2	1.2
40	7 13	16 43	0 30	1 37	22 3	2.4	11 10	1.1
45	7 29	16 27	0 33	1 45	21 54	2.6	11 19	.9
50	7 48	16 8	0 38	1 58	21 45	2.8	11 30	.7
55	8 13	15 43	0 44	2 15	21 33	3.0	11 44	.5
60	8 48	15 8	0 55	2 41	21 16	3.3	12 2	.3
S								

SUNCE UT	SUNCE $e = T_p - UT$	SUNCE Δ/24	SUNCE r	MJESEC Prolaz	MJESEC Δ/24	MJESEC $\pi_\leftmoon$	MJESEC r
h	min s	s	′	h min	min	′	′
00	2 5.2	−.4	15.8	$T_{\overline{m}}$ 4 11	1.7	54.5	14.8
12	2 .4	$T_{\overline{m}_\odot}$ 11 h 58.0 min		Starost 19.0 d	Faza ◑		

PLANETE Pl.	$T_{\overline{m}}$	π	360−α	Vel.	Pl.	$T_{\overline{m}}$	π	360−α	Vel.
	h min	′	°			h min	′	°	
♀	14 27	.1	253	−3.9	♃	7 17	.0	0	−2.1
♂	17 17	.1	210	1.1	♄	19 11	.0	181	1.0

UT	SUNCE $S_\odot$	SUNCE $\delta_\odot$	PROLJ. TAČKA S_Υ	VENERA S_φ	VENERA δ_φ	MARS S_σ	MARS δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	180 28.9	22 16.3	251 20.3	143 4.1	24 17.4	100 52.5	13 31.4
2	210 28.7	22 17.0	281 25.2	173 2.6	24 16.8	130 55.0	13 30.4
4	240 28.5	22 17.6	311 30.1	203 1.1	24 16.1	160 57.5	13 29.5
6	270 28.3	22 18.2	341 35.0	232 59.6	24 15.5	191 .0	13 28.5
8	300 28.0	22 18.8	11 40.0	262 58.1	24 14.8	221 2.5	13 27.5
10	330 27.8	22 19.4	41 44.9	292 56.6	24 14.1	251 5.0	13 26.5
12	0 27.6	22 20.0	71 49.8	322 55.0	24 13.4	281 7.5	13 25.6
14	30 27.4	22 20.6	101 54.7	352 53.5	24 12.7	311 10.0	13 24.6
16	60 27.2	22 21.2	131 59.7	22 52.0	24 12.1	341 12.5	13 23.6
18	90 27.0	22 21.8	162 4.6	52 50.5	24 11.4	11 15.0	13 22.7
20	120 26.8	22 22.4	192 9.5	82 49.0	24 10.7	41 17.4	13 21.7
22	150 26.6	22 23.0	222 14.5	112 47.5	24 10.0	71 19.9	13 20.7
Δ	−1	3		−8	−3	12	−5

UT	MJESEC $S_\leftmoon$	MJESEC Δ	MJESEC $\delta_\leftmoon$	MJESEC Δ	JUPITER S_4	JUPITER δ_4	SATURN S_η	SATURN δ_η
h	° ′		° ′		° ′	° ′	° ′	° ′
0	288 42.2	156	−11 15.6	114	251 18.2	− 1 14.6	72 21.8	3 4.7
2	317 51.3	156	−10 52.8	115	281 22.5	− 1 14.4	102 26.7	3 4.6
4	347 .6	157	−10 29.9	116	311 26.7	− 1 14.1	132 31.6	3 4.6
6	16 10.1	158	−10 6.7	116	341 31.0	− 1 13.9	162 36.5	3 4.6
8	45 19.7	159	− 9 43.5	117	11 35.3	− 1 13.6	192 41.4	3 4.6
10	74 29.4	159	− 9 20.1	118	41 39.5	− 1 13.3	222 46.4	3 4.5
12	103 39.3	160	− 8 56.5	118	71 43.8	− 1 13.1	252 51.3	3 4.5
14	132 49.3	161	− 8 32.8	119	101 48.1	− 1 12.8	282 56.2	3 4.5
16	161 59.4	161	− 8 9.0	120	131 52.4	− 1 12.5	313 1.1	3 4.4
18	191 9.6	162	− 7 45.1	120	161 56.6	− 1 12.3	343 6.0	3 4.4
20	220 20.0	162	− 7 21.1	121	192 .9	− 1 12.0	13 10.9	3 4.4
22	249 30.4	163	− 6 56.9	121	222 5.2	− 1 11.7	43 15.8	3 4.3
Δ					21	1	25	0

φ	SUNCE IZLAZ	SUNCE ZALAZ	TRAJANJE SUMRAKA GRAĐ.	TRAJANJE SUMRAKA ASTR.	MJESEC IZLAZ	MJESEC Δ/24	MJESEC ZALAZ	MJESEC Δ/24
N	h min	h min	h min	h min	h min	min	h min	min
60	2 47	21 11	1 27	: ::	0 7	.2	9 55	3.3
55	3 27	20 30	0 55	: ::	.. ..	.0	10 7	3.0
50	3 55	20 2	0 43	: ::	23 57	.6	10 17	2.8
45	4 16	19 41	0 37	2 26	23 52	.8	10 25	2.6
40	4 33	19 24	0 32	1 60	23 48	1.0	10 31	2.4
35	4 47	19 10	0 29	1 45	23 44	1.1	10 37	2.3
30	4 59	18 57	0 27	1 35	23 40	1.2	10 41	2.2
20	5 20	18 37	0 24	1 23	23 35	1.4	10 50	2.0
10	5 38	18 19	0 23	1 17	23 30	1.5	10 57	1.9
0	5 55	18 2	0 22	1 14	23 25	1.7	11 3	1.7
10	6 11	17 45	0 23	1 15	23 20	1.8	11 10	1.5
20	6 29	17 28	0 24	1 18	23 15	2.0	11 17	1.4
30	6 49	17 8	0 26	1 25	23 9	2.2	11 25	1.2
35	7 0	16 56	0 28	1 30	23 5	2.3	11 30	1.1
40	7 14	16 42	0 30	1 37	23 1	2.4	11 35	1.0
45	7 29	16 27	0 33	1 46	22 57	2.6	11 41	.8
50	7 49	16 7	0 38	1 58	22 51	2.8	11 48	.7
55	8 14	15 42	0 44	2 15	22 44	3.0	11 57	.5
60	8 49	15 7	0 55	2 41	22 35	3.3	12 8	.2
S								

SUNCE UT	SUNCE $e = T_p - UT$	SUNCE Δ/24	SUNCE r	MJESEC Prolaz	MJESEC Δ/24	MJESEC $\pi_\leftmoon$	MJESEC r
h	min s	s	′	h min	min	′	′
00	1 55.6	−.4	15.8	$T_{\overline{m}}$ 4 53	1.7	54.3	14.8
12	1 50.7	$T_{\overline{m}_\odot}$ 11 h 58.2 min		Starost 20.0 d	Faza ◑		

PLANETE Pl.	$T_{\overline{m}}$	π	360−α	Vel.	Pl.	$T_{\overline{m}}$	π	360−α	Vel.
	h min	′	°			h min	′	°	
♀	14 28	.1	252	−3.9	♃	7 14	.0	360	−2.1
♂	17 15	.1	210	1.1	♄	19 7	.0	181	1.0

UT	SUNCE $S_\odot$	SUNCE $\delta_\odot$	PROLJ. TAČKA S_Υ	VENERA S_φ	VENERA δ_φ	MARS S_σ	MARS δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	180 26.4	22 23.6	252 19.4	142 46.0	24 9.3	101 22.4	13 19.7
2	210 26.2	22 24.2	282 24.3	172 44.5	24 8.5	131 24.9	13 18.7
4	240 26.0	22 24.8	312 29.2	202 43.0	24 7.8	161 27.4	13 17.8
6	270 25.7	22 25.4	342 34.2	232 41.5	24 7.1	191 29.9	13 16.8
8	300 25.5	22 26.0	12 39.1	262 40.0	24 6.4	221 32.4	13 15.8
10	330 25.3	22 26.6	42 44.0	292 38.5	24 5.6	251 34.9	13 14.8
12	0 25.1	22 27.1	72 49.0	322 37.0	24 4.9	281 37.3	13 13.8
14	30 24.9	22 27.7	102 53.9	352 35.5	24 4.2	311 39.8	13 12.9
16	60 24.7	22 28.3	132 58.8	22 34.0	24 3.4	341 42.3	13 11.9
18	90 24.5	22 28.9	163 3.7	52 32.6	24 2.7	11 44.8	13 10.9
20	120 24.2	22 29.4	193 8.7	82 31.1	24 1.9	41 47.3	13 9.9
22	150 24.0	22 30.0	223 13.6	112 29.6	24 1.2	71 49.8	13 8.9
Δ	−1	3		−7	−4	12	−5

UT	MJESEC $S_\leftmoon$	MJESEC Δ	MJESEC $\delta_\leftmoon$	MJESEC Δ	JUPITER S_4	JUPITER δ_4	SATURN S_η	SATURN δ_η
h	° ′		° ′		° ′	° ′	° ′	° ′
0	278 41.0	163	− 6 32.7	122	252 9.4	− 1 11.5	73 20.7	3 4.3
2	307 51.6	163	− 6 8.3	122	282 13.7	− 1 11.2	103 25.6	3 4.3
4	337 2.3	164	− 5 43.9	123	312 18.0	− 1 11.0	133 30.5	3 4.3
6	6 13.0	164	− 5 19.4	123	342 22.3	− 1 10.7	163 35.4	3 4.2
8	35 23.9	164	− 4 54.7	123	12 26.5	− 1 10.4	193 40.3	3 4.2
10	64 34.7	165	− 4 30.0	124	42 30.8	− 1 10.2	223 45.2	3 4.2
12	93 45.6	165	− 4 5.3	124	72 35.1	− 1 9.9	253 50.1	3 4.1
14	122 56.6	165	− 3 40.4	125	102 39.4	− 1 9.7	283 55.0	3 4.1
16	152 7.6	165	− 3 15.5	125	132 43.7	− 1 9.4	313 59.9	3 4.1
18	181 18.6	165	− 2 50.5	125	162 47.9	− 1 9.1	344 4.8	3 4.0
20	210 29.6	165	− 2 25.5	125	192 52.2	− 1 8.9	14 9.7	3 4.0
22	239 40.6	165	− 2 .4	126	222 56.5	− 1 8.6	44 14.6	3 4.0
Δ					21	1	24	0

φ	SUNCE IZLAZ	SUNCE ZALAZ	TRAJANJE SUMRAKA GRAĐ.	TRAJANJE SUMRAKA ASTR.	MJESEC IZLAZ	MJESEC Δ/24	MJESEC ZALAZ	MJESEC Δ/24
N	h min	h min	h min	h min	h min	min	h min	min
60	2 45	21 12	1 29	: ::	0 12	.2	11 13	3.3
55	3 26	20 31	0 55	: ::	0 4	.4	11 19	3.0
50	3 54	20 3	0 43	: ::	.. ..	.0	11 23	2.8
45	4 15	19 42	0 37	2 27	.. ..	.0	11 27	2.6
40	4 32	19 25	0 32	2 0	.. ..	.0	11 30	2.4
35	4 47	19 10	0 29	1 45	.. ..	.0	11 32	2.3
30	4 59	18 58	0 27	1 35	.. ..	.0	11 34	2.2
20	5 20	18 37	0 24	1 23	.. ..	.0	11 38	2.0
10	5 38	18 19	0 23	1 17	.. ..	.0	11 41	1.8
0	5 55	18 2	0 22	1 15	.. ..	.0	11 44	1.7
10	6 11	17 45	0 23	1 15	.. ..	.0	11 47	1.5
20	6 29	17 28	0 24	1 18	.. ..	.0	11 50	1.4
30	6 49	17 7	0 26	1 25	.. ..	.0	11 54	1.2
35	7 1	16 56	0 28	1 30	.. ..	.0	11 56	1.1
40	7 14	16 42	0 30	1 37	23 60	2.4	11 58	.9
45	7 30	16 26	0 33	1 46	23 59	2.6	12 1	.8
50	7 50	16 7	0 38	1 58	23 57	2.8	12 4	.6
55	8 15	15 41	0 44	2 15	23 56	3.0	12 8	.4
60	8 51	15 5	0 55	2 42	23 54	3.3	12 13	.2
S								

SUNCE UT	SUNCE $e = T_p - UT$	SUNCE Δ/24	SUNCE r	MJESEC Prolaz	MJESEC Δ/24	MJESEC $\pi_\leftmoon$	MJESEC r
h	min s	s	′	h min	min	′	′
00	1 45.7	−.4	15.8	$T_{\overline{m}}$ 5 34	1.7	54.2	14.8
12	1 40.6	$T_{\overline{m}_\odot}$ 11 h 58.3 min		Starost 21.0 d	Faza ◑		

PLANETE Pl.	$T_{\overline{m}}$	π	360−α	Vel.	Pl.	$T_{\overline{m}}$	π	360−α	Vel.
	h min	′	°			h min	′	°	
♀	14 30	.1	250	−3.9	♃	7 10	.0	360	−2.1
♂	17 13	.1	209	1.1	♄	19 4	.0	181	1.0

UT	SUNCE $S_\odot$	SUNCE $\delta_\odot$	PROLJ. TAČKA S_Υ	VENERA S_φ	VENERA δ_φ	MARS S_σ	MARS δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	180 23.8	22 30.5	253 18.5	142 28.1	24 .4	101 52.2	13 7.9
2	210 23.6	22 31.1	283 23.5	172 26.6	23 59.6	131 54.7	13 7.0
4	240 23.4	22 31.7	313 28.4	202 25.2	23 58.9	161 57.2	13 6.0
6	270 23.1	22 32.2	343 33.3	232 23.7	23 58.1	191 59.7	13 5.0
8	300 22.9	22 32.8	13 38.2	262 22.2	23 57.3	222 2.2	13 4.0
10	330 22.7	22 33.3	43 43.2	292 20.7	23 56.5	252 4.6	13 3.0
12	0 22.5	22 33.9	73 48.1	322 19.3	23 55.7	282 7.1	13 2.0
14	30 22.3	22 34.4	103 53.0	352 17.8	23 54.9	312 9.6	13 1.0
16	60 22.0	22 34.9	133 58.0	22 16.3	23 54.1	342 12.1	13 .0
18	90 21.8	22 35.5	164 2.9	52 14.9	23 53.3	12 14.5	12 59.0
20	120 21.6	22 36.0	194 7.8	82 13.4	23 52.5	42 17.0	12 58.0
22	150 21.4	22 36.5	224 12.7	112 11.9	23 51.7	72 19.5	12 57.1
Δ	−1	3		−7	−4	12	−5

UT	MJESEC $S_\leftmoon$	MJESEC Δ	MJESEC $\delta_\leftmoon$	MJESEC Δ	JUPITER S_4	JUPITER δ_4	SATURN S_η	SATURN δ_η
h	° ′		° ′		° ′	° ′	° ′	° ′
0	268 51.6	165	− 1 35.3	126	253 .8	− 1 8.4	74 19.5	3 3.9
2	298 2.6	165	− 1 10.1	126	283 5.1	− 1 8.1	104 24.4	3 3.9
4	327 13.5	165	− 0 44.9	126	313 9.3	− 1 7.8	134 29.3	3 3.9
6	356 24.4	164	− 0 19.7	126	343 13.6	− 1 7.6	164 34.2	3 3.8
8	25 35.3	164	0 5.5	126	13 17.9	− 1 7.3	194 39.0	3 3.8
10	54 46.2	164	0 30.8	126	43 22.2	− 1 7.1	224 43.9	3 3.7
12	83 57.0	164	0 56.1	127	73 26.5	− 1 6.8	254 48.8	3 3.7
14	113 7.7	163	1 21.4	127	103 30.8	− 1 6.6	284 53.7	3 3.7
16	142 18.3	163	1 46.7	127	133 35.1	− 1 6.3	314 58.6	3 3.6
18	171 28.9	162	2 12.0	127	163 39.4	− 1 6.1	345 3.5	3 3.6
20	200 39.3	162	2 37.3	126	193 43.7	− 1 5.8	15 8.4	3 3.6
22	229 49.7	161	3 2.6	126	223 48.0	− 1 5.6	45 13.3	3 3.5
Δ					21	1	24	0

φ	SUNCE IZLAZ	SUNCE ZALAZ	TRAJANJE SUMRAKA GRAĐ.	TRAJANJE SUMRAKA ASTR.	MJESEC IZLAZ	MJESEC Δ/24	MJESEC ZALAZ	MJESEC Δ/24
N	h min	h min	h min	h min	h min	min	h min	min
60	2 44	21 14	1 30	: ::	0 17	.2	12 32	3.3
55	3 25	20 32	0 56	: ::	0 15	.4	12 30	3.0
50	3 53	20 4	0 44	: ::	0 13	.6	12 29	2.8
45	4 15	19 43	0 37	2 27	0 12	.8	12 29	2.6
40	4 32	19 25	0 32	2 1	0 11	1.0	12 28	2.5
35	4 46	19 11	0 29	1 45	0 10	1.1	12 27	2.3
30	4 59	18 58	0 27	1 35	0 9	1.2	12 27	2.2
20	5 20	18 37	0 24	1 23	0 7	1.4	12 26	2.0
10	5 38	18 19	0 23	1 17	0 6	1.5	12 25	1.9
0	5 55	18 2	0 22	1 15	0 5	1.7	12 25	1.7
10	6 12	17 45	0 23	1 15	0 4	1.8	12 24	1.6
20	6 29	17 28	0 24	1 18	0 3	2.0	12 23	1.4
30	6 50	17 7	0 26	1 25	0 1	2.2	12 22	1.2
35	7 1	16 55	0 28	1 30	0 1	2.3	12 22	1.1
40	7 15	16 42	0 30	1 37	.. ..	.0	12 21	1.0
45	7 31	16 26	0 33	1 46	.. ..	.0	12 20	.8
50	7 51	16 6	0 38	1 58	.. ..	.0	12 19	.7
55	8 16	15 41	0 45	2 16	.. ..	.0	12 18	.5
60	8 52	15 4	0 56	2 42	.. ..	.0	12 17	.2
S								

SUNCE UT	SUNCE $e = T_p - UT$	SUNCE Δ/24	SUNCE r	MJESEC Prolaz	MJESEC Δ/24	MJESEC $\pi_\leftmoon$	MJESEC r
h	min s	s	′	h min	min	′	′
00	1 35.4	−.4	15.8	$T_{\overline{m}}$ 6 15	1.7	54.4	14.8
12	1 30.1	$T_{\overline{m}_\odot}$ 11 h 58.5 min		Starost 22.0 d	Faza ◑		

PLANETE Pl.	$T_{\overline{m}}$	π	360−α	Vel.	Pl.	$T_{\overline{m}}$	π	360−α	Vel.
	h min	′	°			h min	′	°	
♀	14 31	.1	249	−3.9	♃	7 7	.0	360	−2.2
♂	17 11	.1	209	1.2	♄	18 60	.0	181	1.0

UT	SUNCE $S_\odot$	SUNCE $\delta_\odot$	PROLJ. TAČKA S_Υ	VENERA S_φ	VENERA δ_φ	MARS S_σ	MARS δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	180 21.1	22 37.1	254 17.7	142 10.5	23 50.9	102 22.0	12 56.1
2	210 20.9	22 37.6	284 22.6	172 9.0	23 50.1	132 24.4	12 55.1
4	240 20.7	22 38.1	314 27.5	202 7.6	23 49.2	162 26.9	12 54.1
6	270 20.5	22 38.6	344 32.5	232 6.1	23 48.4	192 29.4	12 53.1
8	300 20.2	22 39.1	14 37.4	262 4.7	23 47.6	222 31.8	12 52.1
10	330 20.0	22 39.7	44 42.3	292 3.2	23 46.7	252 34.3	12 51.1
12	0 19.8	22 40.2	74 47.2	322 1.8	23 45.9	282 36.8	12 50.1
14	30 19.6	22 40.7	104 52.2	352 .3	23 45.0	312 39.3	12 49.1
16	60 19.3	22 41.2	134 57.1	21 58.9	23 44.2	342 41.7	12 48.1
18	90 19.1	22 41.7	165 2.0	51 57.4	23 43.3	12 44.2	12 47.1
20	120 18.9	22 42.2	195 6.9	81 56.0	23 42.4	42 46.7	12 46.1
22	150 18.6	22 42.7	225 11.9	111 54.6	23 41.6	72 49.1	12 45.1
Δ	−1	3		−7	−4	12	−5

UT	MJESEC $S_\leftmoon$	MJESEC Δ	MJESEC $\delta_\leftmoon$	MJESEC Δ	JUPITER $S_\jupiter$	JUPITER $\delta_\jupiter$	SATURN $S_\saturn$	SATURN $\delta_\saturn$
h	° ′		° ′		° ′	° ′	° ′	° ′
0	259 .0	161	3 27.9	126	253 52.2	− 1 5.3	75 18.2	3 3.5
2	288 10.1	160	3 53.2	126	283 56.5	− 1 5.1	105 23.0	3 3.5
4	317 20.1	159	4 18.4	126	314 .8	− 1 4.8	135 27.9	3 3.4
6	346 30.0	159	4 43.6	126	344 5.1	− 1 4.5	165 32.8	3 3.4
8	15 39.7	158	5 8.7	126	14 9.4	− 1 4.3	195 37.7	3 3.3
10	44 49.3	157	5 33.9	125	44 13.7	− 1 4.0	225 42.6	3 3.3
12	73 58.7	156	5 58.9	125	74 18.0	− 1 3.8	255 47.5	3 3.3
14	103 8.0	155	6 23.9	125	104 22.3	− 1 3.5	285 52.4	3 3.2
16	132 17.1	154	6 48.9	124	134 26.6	− 1 3.3	315 57.2	3 3.2
18	161 25.9	153	7 13.8	124	164 30.9	− 1 3.0	346 2.1	3 3.1
20	190 34.6	152	7 38.6	124	194 35.2	− 1 2.8	16 7.0	3 3.1
22	219 43.1	151	8 3.3	123	224 39.5	− 1 2.5	46 11.9	3 3.1
Δ					21	1	24	0

φ	SUNCE IZLAZ	SUNCE ZALAZ	TRAJANJE SUMRAKA GRAĐ.	TRAJANJE SUMRAKA ASTR.	MJESEC IZLAZ	MJESEC Δ/24	MJESEC ZALAZ	MJESEC Δ/24
N	h min	h min	h min	h min	h min	min	h min	min
60	2 43	21 15	1 32	: ::	0 21	.2	13 51	3.4
55	3 24	20 33	0 56	: ::	0 25	.5	13 43	3.1
50	3 53	20 5	0 44	: ::	0 29	.7	13 36	2.9
45	4 14	19 43	0 37	2 28	0 31	.9	13 31	2.7
40	4 32	19 26	0 32	2 1	0 33	1.0	13 27	2.5
35	4 46	19 11	0 29	1 46	0 35	1.1	13 24	2.4
30	4 59	18 59	0 27	1 36	0 37	1.2	13 20	2.3
20	5 20	18 38	0 24	1 23	0 40	1.4	13 15	2.1
10	5 38	18 19	0 23	1 17	0 43	1.6	13 10	1.9
0	5 55	18 2	0 22	1 15	0 46	1.7	13 6	1.8
10	6 12	17 45	0 23	1 15	0 48	1.9	13 1	1.6
20	6 30	17 28	0 24	1 18	0 51	2.1	12 56	1.5
30	6 50	17 7	0 26	1 25	0 54	2.3	12 51	1.3
35	7 2	16 55	0 28	1 30	0 56	2.4	12 48	1.2
40	7 16	16 42	0 30	1 37	0 59	2.5	12 44	1.0
45	7 32	16 25	0 33	1 46	1 1	2.7	12 40	.9
50	7 52	16 6	0 38	1 58	1 4	2.8	12 35	.7
55	8 17	15 40	0 45	2 16	1 8	3.1	12 29	.5
60	8 54	15 3	0 56	2 43	1 13	3.4	12 22	.2
S								

SUNCE UT	SUNCE $e = T_p - UT$	SUNCE Δ/24	SUNCE r	MJESEC Prolaz	MJESEC Δ/24	MJESEC $\pi_\leftmoon$	MJESEC r
h	min s	s	′	h min	min	′	′
00	1 24.8	−.5	15.8	$T_{\overline{m}}$ 6 56	1.7	54.7	14.9
12	1 19.3	$T_{\overline{m}_\odot}$ 11 h 58.7 min		Starost 23.0 d	Faza ◑		

PLANETE

Pl.	$T_{\overline{m}}$	π	360−α	Vel.	Pl.	$T_{\overline{m}}$	π	360−α	Vel.
	h min	′	°			h min	′	°	
♀	14 32	.1	248	−3.9	♃	7 4	.0	360	−2.2
♂	17 9	.1	208	1.2	♄	18 56	.0	181	1.0

UT	SUNCE $S_\odot$	SUNCE $\delta_\odot$	PROLJ. TAČKA S_Υ	VENERA S_φ	VENERA δ_φ	MARS S_σ	MARS δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	180 18.4	22 43.2	255 16.8	141 53.1	23 40.7	102 51.6	12 44.1
2	210 18.2	22 43.7	285 21.7	171 51.7	23 39.8	132 54.0	12 43.1
4	240 17.9	22 44.2	315 26.7	201 50.3	23 38.9	162 56.5	12 42.1
6	270 17.7	22 44.7	345 31.6	231 48.8	23 38.1	192 59.0	12 41.1
8	300 17.5	22 45.1	15 36.5	261 47.4	23 37.2	223 1.4	12 40.1
10	330 17.2	22 45.6	45 41.4	291 46.0	23 36.3	253 3.9	12 39.1
12	0 17.0	22 46.1	75 46.4	321 44.6	23 35.4	283 6.4	12 38.1
14	30 16.8	22 46.6	105 51.3	351 43.1	23 34.5	313 8.8	12 37.1
16	60 16.5	22 47.0	135 56.2	21 41.7	23 33.6	343 11.3	12 36.1
18	90 16.3	22 47.5	166 1.2	51 40.3	23 32.7	13 13.7	12 35.1
20	120 16.1	22 48.0	196 6.1	81 38.9	23 31.7	43 16.2	12 34.1
22	150 15.8	22 48.4	226 11.0	111 37.5	23 30.8	73 18.7	12 33.1
Δ	−1	2		−7	−5	12	−5

UT	MJESEC $S_\leftmoon$	MJESEC Δ	MJESEC $\delta_\leftmoon$	MJESEC Δ	JUPITER $S_\jupiter$	JUPITER $\delta_\jupiter$	SATURN $S_\saturn$	SATURN $\delta_\saturn$
h	° ′		° ′		° ′	° ′	° ′	° ′
0	248 51.4	150	8 28.0	123	254 43.8	− 1 2.3	76 16.8	3 3.0
2	277 59.5	149	8 52.5	122	284 48.1	− 1 2.1	106 21.6	3 3.0
4	307 7.3	148	9 16.9	122	314 52.4	− 1 1.8	136 26.5	3 2.9
6	336 14.9	147	9 41.3	121	344 56.7	− 1 1.6	166 31.4	3 2.9
8	5 22.2	145	10 5.5	121	15 1.1	− 1 1.3	196 36.3	3 2.9
10	34 29.3	144	10 29.6	120	45 5.4	− 1 1.1	226 41.1	3 2.8
12	63 36.2	143	10 53.6	119	75 9.7	− 1 .8	256 46.0	3 2.8
14	92 42.7	141	11 17.4	118	105 14.0	− 1 .6	286 50.9	3 2.7
16	121 49.0	140	11 41.1	118	135 18.3	− 1 .3	316 55.8	3 2.7
18	150 55.0	139	12 4.7	117	165 22.6	− 1 .1	347 .6	3 2.6
20	180 .7	137	12 28.0	116	195 26.9	− 0 59.8	17 5.5	3 2.6
22	209 6.1	135	12 51.3	115	225 31.2	− 0 59.6	47 10.4	3 2.5
Δ					22	1	24	0

φ	SUNCE IZLAZ	SUNCE ZALAZ	TRAJANJE SUMRAKA GRAĐ.	TRAJANJE SUMRAKA ASTR.	MJESEC IZLAZ	MJESEC Δ/24	MJESEC ZALAZ	MJESEC Δ/24
N	h min	h min	h min	h min	h min	min	h min	min
60	2 42	21 17	1 33	: ::	0 26	.3	15 13	3.6
55	3 24	20 35	0 56	: ::	0 37	.6	14 57	3.2
50	3 52	20 6	0 44	: ::	0 45	.8	14 46	3.0
45	4 14	19 44	0 37	2 29	0 52	1.0	14 36	2.8
40	4 31	19 27	0 33	2 1	0 57	1.1	14 28	2.6
35	4 46	19 12	0 29	1 46	1 2	1.2	14 22	2.5
30	4 58	18 59	0 27	1 36	1 7	1.3	14 16	2.4
20	5 20	18 38	0 24	1 23	1 14	1.5	14 6	2.2
10	5 38	18 20	0 23	1 17	1 21	1.7	13 57	2.1
0	5 55	18 3	0 22	1 15	1 28	1.8	13 48	1.9
10	6 12	17 46	0 23	1 15	1 34	2.0	13 40	1.8
20	6 30	17 28	0 24	1 18	1 41	2.2	13 31	1.6
30	6 51	17 7	0 26	1 25	1 49	2.4	13 21	1.4
35	7 3	16 55	0 28	1 30	1 53	2.5	13 16	1.3
40	7 16	16 41	0 30	1 37	1 59	2.6	13 9	1.2
45	7 32	16 25	0 34	1 46	2 5	2.8	13 2	1.0
50	7 52	16 5	0 38	1 58	2 12	2.9	12 53	.9
55	8 18	15 39	0 45	2 16	2 22	3.2	12 41	.6
60	8 55	15 3	0 56	2 43	2 34	3.5	12 27	.3
S								

SUNCE UT	SUNCE $e = T_p - UT$	SUNCE Δ/24	SUNCE r	MJESEC Prolaz	MJESEC Δ/24	MJESEC $\pi_\leftmoon$	MJESEC r
h	min s	s	′	h min	min	′	′
00	1 13.8	−.5	15.8	$T_{\overline{m}}$ 7 38	1.9	55.2	15.0
12	1 8.1	$T_{\overline{m}_\odot}$ 11 h 58.9 min		Starost 24.0 d	Faza ◑		

PLANETE

Pl.	$T_{\overline{m}}$	π	360−α	Vel.	Pl.	$T_{\overline{m}}$	π	360−α	Vel.
	h min	′	°			h min	′	°	
♀	14 33	.1	247	−3.9	♃	7 0	.0	359	−2.2
♂	17 7	.1	208	1.2	♄	18 52	.0	181	1.0

UT	SUNCE $S_\odot$	SUNCE $\delta_\odot$	PROLJ. TAČKA S_Υ	VENERA S_φ	VENERA δ_φ	MARS S_σ	MARS δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	180 15.6	22 48.9	256 15.9	141 36.1	23 29.9	103 21.1	12 32.0
2	210 15.3	22 49.4	286 20.9	171 34.7	23 29.0	133 23.6	12 31.0
4	240 15.1	22 49.8	316 25.8	201 33.2	23 28.0	163 26.0	12 30.0
6	270 14.9	22 50.3	346 30.7	231 31.8	23 27.1	193 28.5	12 29.0
8	300 14.6	22 50.7	16 35.7	261 30.4	23 26.1	223 31.0	12 28.0
10	330 14.4	22 51.2	46 40.6	291 29.0	23 25.2	253 33.4	12 27.0
12	0 14.1	22 51.6	76 45.5	321 27.6	23 24.2	283 35.9	12 26.0
14	30 13.9	22 52.1	106 50.4	351 26.2	23 23.3	313 38.3	12 25.0
16	60 13.7	22 52.5	136 55.4	21 24.8	23 22.3	343 40.8	12 24.0
18	90 13.4	22 52.9	167 .3	51 23.5	23 21.4	13 43.2	12 22.9
20	120 13.2	22 53.4	197 5.2	81 22.1	23 20.4	43 45.7	12 21.9
22	150 12.9	22 53.8	227 10.2	111 20.7	23 19.4	73 48.1	12 20.9
Δ	−1	2		−7	−5	12	−5

UT	MJESEC $S_\leftmoon$	MJESEC Δ	MJESEC $\delta_\leftmoon$	MJESEC Δ	JUPITER S_4	JUPITER δ_4	SATURN S_η	SATURN δ_η
h	° ′		° ′		° ′	° ′	° ′	° ′
0	238 11.2	134	13 14.3	114	255 35.5	− 0 59.4	77 15.3	3 2.5
2	267 16.0	132	13 37.1	113	285 39.9	− 0 59.1	107 20.1	3 2.5
4	296 20.4	131	13 59.8	112	315 44.2	− 0 58.9	137 25.0	3 2.4
6	325 24.5	129	14 22.3	111	345 48.5	− 0 58.6	167 29.9	3 2.4
8	354 28.3	127	14 44.5	110	15 52.8	− 0 58.4	197 34.7	3 2.3
10	23 31.8	125	15 6.5	109	45 57.1	− 0 58.1	227 39.6	3 2.3
12	52 34.8	124	15 28.3	108	76 1.5	− 0 57.9	257 44.5	3 2.2
14	81 37.6	122	15 49.9	107	106 5.8	− 0 57.7	287 49.3	3 2.2
16	110 39.9	120	16 11.2	105	136 10.1	− 0 57.4	317 54.2	3 2.1
18	139 41.9	118	16 32.2	104	166 14.4	− 0 57.2	347 59.1	3 2.1
20	168 43.6	116	16 53.0	103	196 18.7	− 0 56.9	18 3.9	3 2.0
22	197 44.8	114	17 13.5	101	226 23.1	− 0 56.7	48 8.8	3 2.0
Δ					22	1	24	0

φ	SUNCE IZLAZ	SUNCE ZALAZ	TRAJANJE SUMRAKA GRAĐ.	TRAJANJE SUMRAKA ASTR.	MJESEC IZLAZ	MJESEC Δ/24	MJESEC ZALAZ	MJESEC Δ/24
N	h min	h min	h min	h min	h min	min	h min	min
60	2 41	21 18	1 35	: ::	0 33	.4	16 39	3.7
55	3 23	20 35	0 57	: ::	0 50	.7	16 15	3.3
50	3 52	20 7	0 44	: ::	1 4	1.0	15 57	3.1
45	4 14	19 45	0 37	2 29	1 15	1.1	15 43	2.9
40	4 31	19 27	0 33	2 2	1 24	1.3	15 32	2.7
35	4 46	19 13	0 30	1 46	1 32	1.4	15 22	2.6
30	4 58	18 60	0 27	1 36	1 39	1.5	15 14	2.5
20	5 20	18 38	0 24	1 24	1 51	1.7	14 59	2.4
10	5 38	18 20	0 23	1 17	2 2	1.8	14 46	2.2
0	5 55	18 3	0 22	1 15	2 12	2.0	14 34	2.1
10	6 12	17 46	0 23	1 15	2 22	2.1	14 22	1.9
20	6 30	17 28	0 24	1 18	2 33	2.3	14 10	1.8
30	6 51	17 7	0 26	1 25	2 45	2.5	13 55	1.6
35	7 3	16 55	0 28	1 30	2 53	2.6	13 47	1.5
40	7 17	16 41	0 30	1 37	3 1	2.7	13 37	1.4
45	7 33	16 25	0 34	1 46	3 11	2.9	13 26	1.2
50	7 53	16 5	0 38	1 59	3 23	3.0	13 13	1.1
55	8 19	15 39	0 45	2 16	3 38	3.3	12 56	.8
60	8 56	15 2	0 56	2 44	3 58	3.7	12 34	.5
S								

SUNCE UT	SUNCE $e = T_p - UT$	SUNCE Δ/24	SUNCE r	MJESEC Prolaz	MJESEC Δ/24	MJESEC $\pi_\leftmoon$	MJESEC r
h	min s	s	′	h min	min	′	′
00	1 2.5	−.5	15.8	$T_{\overline{m}}$ 8 23	2.0	55.8	15.2
12	0 56.7	$T_{\overline{m}_\odot}$ 11 h 59.1 min		Starost 25.0 d	Faza ◑		

PLANETE

Pl.	$T_{\overline{m}}$	π	360−α	Vel.	Pl.	$T_{\overline{m}}$	π	360−α	Vel.
	h min	′	°			h min	′	°	
♀	14 34	.1	245	−3.9	♃	6 57	.0	359	−2.2
♂	17 5	.1	207	1.2	♄	18 48	.0	181	1.0

UT	SUNCE $S_\odot$	SUNCE $\delta_\odot$	PROLJ. TAČKA S_Υ	VENERA S_φ	VENERA δ_φ	MARS S_σ	MARS δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	180 12.7	22 54.2	257 15.1	141 19.3	23 18.4	103 50.6	12 19.9
2	210 12.4	22 54.7	287 20.0	171 17.9	23 17.4	133 53.0	12 18.9
4	240 12.2	22 55.1	317 24.9	201 16.5	23 16.5	163 55.5	12 17.9
6	270 11.9	22 55.5	347 29.9	231 15.1	23 15.5	193 57.9	12 16.8
8	300 11.7	22 55.9	17 34.8	261 13.8	23 14.5	224 .4	12 15.8
10	330 11.5	22 56.3	47 39.7	291 12.4	23 13.5	254 2.8	12 14.8
12	0 11.2	22 56.7	77 44.7	321 11.0	23 12.5	284 5.3	12 13.8
14	30 11.0	22 57.1	107 49.6	351 9.6	23 11.5	314 7.7	12 12.8
16	60 10.7	22 57.5	137 54.5	21 8.3	23 10.4	344 10.2	12 11.8
18	90 10.5	22 58.0	167 59.4	51 6.9	23 9.4	14 12.6	12 10.7
20	120 10.2	22 58.4	198 4.4	81 5.5	23 8.4	44 15.1	12 9.7
22	150 10.0	22 58.7	228 9.3	111 4.2	23 7.4	74 17.5	12 8.7
Δ	−1	2		−7	−5	12	−5

UT	MJESEC $S_\leftmoon$	MJESEC Δ	MJESEC $\delta_\leftmoon$	MJESEC Δ	JUPITER S_4	JUPITER δ_4	SATURN S_η	SATURN δ_η
h	° ′		° ′		° ′	° ′	° ′	° ′
0	226 45.7	112	17 33.7	100	256 27.4	− 0 56.5	78 13.7	3 2.0
2	255 46.1	110	17 53.6	98	286 31.7	− 0 56.2	108 18.5	3 1.9
4	284 46.2	108	18 13.3	96	316 36.0	− 0 56.0	138 23.4	3 1.9
6	313 45.9	106	18 32.5	95	346 40.4	− 0 55.8	168 28.3	3 1.8
8	342 45.2	104	18 51.5	93	16 44.7	− 0 55.5	198 33.1	3 1.8
10	11 44.0	102	19 10.1	91	46 49.0	− 0 55.3	228 38.0	3 1.7
12	40 42.5	100	19 28.4	90	76 53.4	− 0 55.0	258 42.8	3 1.7
14	69 40.6	98	19 46.3	88	106 57.7	− 0 54.8	288 47.7	3 1.6
16	98 38.2	96	20 3.8	86	137 2.0	− 0 54.6	318 52.6	3 1.6
18	127 35.5	94	20 20.9	84	167 6.4	− 0 54.3	348 57.4	3 1.5
20	156 32.3	92	20 37.7	82	197 10.7	− 0 54.1	19 2.3	3 1.5
22	185 28.7	90	20 54.0	80	227 15.0	− 0 53.9	49 7.1	3 1.4
Δ					22	1	24	0

φ	SUNCE IZLAZ	SUNCE ZALAZ	TRAJANJE SUMRAKA GRAĐ.	TRAJANJE SUMRAKA ASTR.	MJESEC IZLAZ	MJESEC Δ/24	MJESEC ZALAZ	MJESEC Δ/24
N	h min	h min	h min	h min	h min	min	h min	min
60	2 40	21 19	1 36	: ::	0 42	.6	18 8	3.7
55	3 23	20 36	0 57	: ::	1 8	1.0	17 35	3.3
50	3 52	20 7	0 44	: ::	1 27	1.2	17 11	3.1
45	4 13	19 45	0 37	2 30	1 42	1.4	16 53	2.9
40	4 31	19 28	0 33	2 2	1 55	1.5	16 38	2.8
35	4 46	19 13	0 30	1 46	2 5	1.6	16 25	2.7
30	4 58	19 0	0 27	1 36	2 15	1.7	16 14	2.6
20	5 20	18 39	0 24	1 24	2 31	1.9	15 55	2.5
10	5 38	18 20	0 23	1 17	2 46	2.0	15 39	2.4
0	5 56	18 3	0 22	1 15	2 59	2.2	15 24	2.2
10	6 13	17 46	0 23	1 15	3 13	2.3	15 8	2.1
20	6 31	17 28	0 24	1 18	3 28	2.4	14 52	2.0
30	6 51	17 7	0 26	1 25	3 45	2.6	14 34	1.9
35	7 4	16 55	0 28	1 30	3 55	2.7	14 23	1.8
40	7 17	16 41	0 30	1 37	4 6	2.8	14 11	1.7
45	7 34	16 25	0 34	1 46	4 20	2.9	13 56	1.6
50	7 54	16 4	0 38	1 59	4 36	3.1	13 39	1.4
55	8 20	15 38	0 45	2 16	4 57	3.4	13 16	1.2
60	8 57	15 1	0 57	2 44	5 27	3.8	12 45	.8
S								

SUNCE UT	SUNCE $e = T_p - UT$	SUNCE Δ/24	SUNCE r	MJESEC Prolaz	MJESEC Δ/24	MJESEC $\pi_\leftmoon$	MJESEC r
h	min s	s	′	h min	min	′	′
00	0 50.9	−.5	15.8	$T_{\overline{m}}$ 9 11	2.2	56.5	15.4
12	0 45.0	$T_{\overline{m}_\odot}$ 11 h 59.3 min		Starost 26.0 d	Faza ◑		

PLANETE

Pl.	$T_{\overline{m}}$	π	360−α	Vel.	Pl.	$T_{\overline{m}}$	π	360−α	Vel.
	h min	′	°			h min	′	°	
♀	14 35	.1	244	−3.9	♃	6 53	.0	359	−2.2
♂	17 3	.1	207	1.2	♄	18 44	.0	181	1.0

UT	SUNCE				PROLJ. TAČKA	VENERA				MARS			
	$S_\odot$		$\delta_\odot$		S_Υ	S_φ		δ_φ		S_σ		δ_σ	
h	°	′	°	′	°	°	′	°	′	°	′	°	′
0	180	9.7	22	59.1	258	14.2	141	2.8	23	6.3	104	19.9	12	7.7
2	210	9.5	22	59.5	288	19.2	171	1.5	23	5.3	134	22.4	12	6.6
4	240	9.2	22	59.9	318	24.1	201	.1	23	4.3	164	24.8	12	5.6
6	270	9.0	23	.3	348	29.0	230	58.7	23	3.2	194	27.3	12	4.6
8	300	8.7	23	.7	18	33.9	260	57.4	23	2.2	224	29.7	12	3.6
10	330	8.5	23	1.1	48	38.9	290	56.0	23	1.1	254	32.2	12	2.5
12	0	8.2	23	1.5	78	43.8	320	54.7	23	.1	284	34.6	12	1.5
14	30	8.0	23	1.8	108	48.7	350	53.4	22	59.0	314	37.0	12	.5
16	60	7.7	23	2.2	138	53.6	20	52.0	22	57.9	344	39.5	11	59.5
18	90	7.5	23	2.6	168	58.6	50	50.7	22	56.9	14	41.9	11	58.4
20	120	7.2	23	2.9	199	3.5	80	49.3	22	55.8	44	44.3	11	57.4
22	150	6.9	23	3.3	229	8.4	110	48.0	22	54.7	74	46.8	11	56.4
Δ		−1		2				−7		−5		12		−5

UT	MJESEC					JUPITER				SATURN			
	$S_\leftmoon$		Δ	$\delta_\leftmoon$		Δ	$S_{\mathrm{♃}}$		$\delta_{\mathrm{♃}}$		$S_{\mathrm{♄}}$		$\delta_{\mathrm{♄}}$	
h	°	′		°	′		°	′	°	′	°	′	°	′
0	214	24.8	88	21	9.9	77	257	19.4	− 0	53.6	79	12.0	3	1.4
2	243	20.4	86	21	25.4	75	287	23.7	− 0	53.4	109	16.8	3	1.3
4	272	15.5	84	21	40.4	73	317	28.0	− 0	53.2	139	21.7	3	1.3
6	301	10.3	82	21	55.0	71	347	32.4	− 0	52.9	169	26.6	3	1.2
8	330	4.7	80	22	9.1	68	17	36.7	− 0	52.7	199	31.4	3	1.1
10	358	58.7	78	22	22.8	66	47	41.1	− 0	52.5	229	36.3	3	1.1
12	27	52.3	76	22	35.9	63	77	45.4	− 0	52.2	259	41.1	3	1.0
14	56	45.5	74	22	48.6	61	107	49.7	− 0	52.0	289	46.0	3	1.0
16	85	38.3	72	23	.7	58	137	54.1	− 0	51.8	319	50.8	3	.9
18	114	30.8	70	23	12.4	56	167	58.4	− 0	51.6	349	55.7	3	.9
20	143	22.8	69	23	23.5	53	198	2.8	− 0	51.3	20	.5	3	.8
22	172	14.5	67	23	34.0	50	228	7.1	− 0	51.1	50	5.4	3	.8
Δ								22		1		24		0

φ	SUNCE		TRAJANJE SUMRAKA		MJESEC			
	IZLAZ	ZALAZ	GRAĐ.	ASTR.	IZLAZ	Δ/24	ZALAZ	Δ/24
N	h min	h min	h min	h min	h min	min	h min	min
60	2 39	21 20	1 38	: ::	0 56	1.0	19 37	3.3
55	3 22	20 37	0 57	: ::	1 31	1.4	18 54	3.0
50	3 51	20 8	0 44	: ::	1 56	1.6	18 25	2.9
45	4 13	19 46	0 37	2 31	2 16	1.8	18 3	2.8
40	4 31	19 28	0 33	2 2	2 31	1.9	17 45	2.7
35	4 46	19 13	0 30	1 46	2 45	2.0	17 30	2.7
30	4 58	19 1	0 27	1 36	2 57	2.0	17 17	2.6
20	5 20	18 39	0 24	1 24	3 17	2.1	16 55	2.5
10	5 39	18 20	0 23	1 17	3 35	2.2	16 35	2.5
0	5 56	18 3	0 22	1 15	3 51	2.3	16 18	2.4
10	6 13	17 46	0 23	1 15	4 8	2.4	15 60	2.3
20	6 31	17 28	0 24	1 18	4 26	2.5	15 41	2.3
30	6 52	17 7	0 26	1 25	4 47	2.6	15 19	2.2
35	7 4	16 55	0 28	1 30	4 59	2.7	15 6	2.1
40	7 18	16 41	0 30	1 37	5 13	2.8	14 51	2.1
45	7 34	16 24	0 34	1 46	5 30	2.9	14 34	2.0
50	7 55	16 4	0 38	1 59	5 50	3.0	14 12	1.9
55	8 21	15 38	0 45	2 17	6 18	3.2	13 44	1.7
60	8 58	15 0	0 57	2 44	6 57	3.6	13 3	1.3
S								

SUNCE				MJESEC				
UT	e = Tp − UT	Δ/24	r	Prolaz		Δ/24	$\pi_\leftmoon$	r
h	min s	s	′	h	min	min	′	′
00	0 39.1	−.5	15.8	$T_{\overline{m}}$	10 4	2.4	57.2	15.6
12	0 33.0	$T_{\overline{m}_\odot}$	11 h 59.5 min	Starost 27.0 d		Faza ●		

PLANETE

Pl.	$T_{\overline{m}}$	π	360−α	Vel.	Pl.	$T_{\overline{m}}$	π	360−α	Vel.
	h min	′	°			h min	′	°	
♀	14 36	.1	243	−3.9	♃	6 50	.0	359	−2.2
♂	17 1	.1	206	1.2	♄	18 40	.0	181	1.0

UT	SUNCE				PROLJ. TAČKA	VENERA				MARS			
	$S_\odot$		$\delta_\odot$		S_Υ	S_φ		δ_φ		S_σ		δ_σ	
h	°	′	°	′	°	°	′	°	′	°	′	°	′
0	180	6.7	23	3.7	259	13.4	140	46.7	22	53.6	104	49.2	11	55.3
2	210	6.4	23	4.0	289	18.3	170	45.3	22	52.6	134	51.7	11	54.3
4	240	6.2	23	4.4	319	23.2	200	44.0	22	51.5	164	54.1	11	53.3
6	270	5.9	23	4.7	349	28.1	230	42.7	22	50.4	194	56.5	11	52.3
8	300	5.7	23	5.1	19	33.1	260	41.3	22	49.3	224	59.0	11	51.2
10	330	5.4	23	5.4	49	38.0	290	40.0	22	48.2	255	1.4	11	50.2
12	0	5.2	23	5.8	79	42.9	320	38.7	22	47.1	285	3.8	11	49.2
14	30	4.9	23	6.1	109	47.9	350	37.4	22	45.9	315	6.3	11	48.1
16	60	4.6	23	6.4	139	52.8	20	36.1	22	44.8	345	8.7	11	47.1
18	90	4.4	23	6.8	169	57.7	50	34.8	22	43.7	15	11.1	11	46.0
20	120	4.1	23	7.1	200	2.6	80	33.4	22	42.6	45	13.6	11	45.0
22	150	3.9	23	7.4	230	7.6	110	32.1	22	41.5	75	16.0	11	44.0
Δ		−1		2				−7		−6		12		−5

UT	MJESEC					JUPITER				SATURN			
	$S_\leftmoon$		Δ	$\delta_\leftmoon$		Δ	$S_{\mathrm{♃}}$		$\delta_{\mathrm{♃}}$		$S_{\mathrm{♄}}$		$\delta_{\mathrm{♄}}$	
h	°	′		°	′		°	′	°	′	°	′	°	′
0	201	5.9	65	23	44.0	47	258	11.5	− 0	50.9	80	10.2	3	.7
2	229	56.9	63	23	53.5	44	288	15.8	− 0	50.6	110	15.1	3	.7
4	258	47.5	62	24	2.3	41	318	20.2	− 0	50.4	140	19.9	3	.6
6	287	37.9	60	24	10.6	39	348	24.5	− 0	50.2	170	24.8	3	.6
8	316	27.9	59	24	18.3	36	18	28.9	− 0	50.0	200	29.6	3	.5
10	345	17.6	57	24	25.4	32	48	33.2	− 0	49.7	230	34.4	3	.4
12	14	7.0	56	24	31.9	29	78	37.6	− 0	49.5	260	39.3	3	.4
14	42	56.2	54	24	37.8	26	108	41.9	− 0	49.3	290	44.1	3	.3
16	71	45.1	53	24	43.0	23	138	46.3	− 0	49.1	320	49.0	3	.3
18	100	33.7	52	24	47.6	20	168	50.6	− 0	48.8	350	53.8	3	.2
20	129	22.1	51	24	51.6	17	198	55.0	− 0	48.6	20	58.7	3	.2
22	158	10.2	50	24	54.9	13	228	59.3	− 0	48.4	51	3.5	3	.1
Δ								22		1		24		0

φ	SUNCE		TRAJANJE SUMRAKA		MJESEC			
	IZLAZ	ZALAZ	GRAĐ.	ASTR.	IZLAZ	Δ/24	ZALAZ	Δ/24
N	h min	h min	h min	h min	h min	min	h min	min
60	2 38	21 22	1 39	: ::	1 21	1.8	20 57	2.4
55	3 22	20 38	0 57	: ::	2 5	2.0	20 7	2.5
50	3 51	20 9	0 44	: ::	2 35	2.1	19 34	2.5
45	4 13	19 47	0 37	2 31	2 58	2.2	19 10	2.5
40	4 31	19 29	0 33	2 2	3 16	2.3	18 50	2.5
35	4 46	19 14	0 30	1 46	3 32	2.3	18 34	2.5
30	4 58	19 1	0 27	1 36	3 45	2.3	18 20	2.5
20	5 20	18 39	0 25	1 24	4 8	2.4	17 56	2.5
10	5 39	18 21	0 23	1 17	4 28	2.4	17 35	2.5
0	5 56	18 3	0 22	1 15	4 47	2.5	17 15	2.5
10	6 13	17 46	0 23	1 15	5 6	2.5	16 56	2.5
20	6 31	17 28	0 24	1 19	5 26	2.5	16 35	2.5
30	6 52	17 7	0 26	1 25	5 50	2.6	16 11	2.5
35	7 4	16 55	0 28	1 30	6 4	2.6	15 57	2.5
40	7 18	16 41	0 30	1 37	6 20	2.6	15 41	2.5
45	7 35	16 24	0 34	1 46	6 39	2.7	15 21	2.5
50	7 55	16 4	0 38	1 59	7 3	2.7	14 57	2.4
55	8 22	15 37	0 45	2 17	7 35	2.8	14 24	2.4
60	8 60	14 60	0 57	2 45	8 23	2.9	13 35	2.3
S								

SUNCE				MJESEC				
UT	e = Tp − UT	Δ/24	r	Prolaz		Δ/24	$\pi_\leftmoon$	r
h	min s	s	′	h	min	min	′	′
00	0 27.0	−.5	15.8	$T_{\overline{m}}$	11 1	2.5	58.0	15.8
12	0 20.8	$T_{\overline{m}_\odot}$	11 h 59.7 min	Starost 28.0 d		Faza ●		

PLANETE

Pl.	$T_{\overline{m}}$	π	360−α	Vel.	Pl.	$T_{\overline{m}}$	π	360−α	Vel.
	h min	′	°			h min	′	°	
♀	14 38	.1	242	−3.9	♃	6 46	.0	359	−2.2
♂	16 59	.1	206	1.2	♄	18 36	.0	181	1.0

UT	SUNCE $S_\odot$	SUNCE $\delta_\odot$	PROLJ. TAČKA S_Υ	VENERA S_φ	VENERA δ_φ	MARS S_σ	MARS δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	180 3.6	23 7.8	260 12.5	140 30.8	22 40.3	105 18.4	11 42.9
2	210 3.4	23 8.1	290 17.4	170 29.5	22 39.2	135 20.9	11 41.9
4	240 3.1	23 8.4	320 22.4	200 28.2	22 38.0	165 23.3	11 40.9
6	270 2.8	23 8.7	350 27.3	230 26.9	22 36.9	195 25.7	11 39.8
8	300 2.6	23 9.0	20 32.2	260 25.6	22 35.8	225 28.1	11 38.8
10	330 2.3	23 9.4	50 37.1	290 24.3	22 34.6	255 30.6	11 37.7
12	0 2.1	23 9.7	80 42.1	320 23.0	22 33.4	285 33.0	11 36.7
14	30 1.8	23 10.0	110 47.0	350 21.8	22 32.3	315 35.4	11 35.7
16	60 1.5	23 10.3	140 51.9	20 20.5	22 31.1	345 37.8	11 34.6
18	90 1.3	23 10.6	170 56.9	50 19.2	22 29.9	15 40.3	11 33.6
20	120 1.0	23 10.9	201 1.8	80 17.9	22 28.8	45 42.7	11 32.5
22	150 .7	23 11.2	231 6.7	110 16.6	22 27.6	75 45.1	11 31.5
Δ	-1	2		-6	-6	12	-5

UT	MJESEC $S_\leftmoon$	MJESEC Δ	MJESEC $\delta_\leftmoon$	MJESEC Δ	JUPITER S_4	JUPITER δ_4	SATURN S_η	SATURN δ_η
h	° ′		° ′		° ′	° ′	° ′	° ′
0	186 58.2	49	24 57.6	10	259 3.7	- 0 48.2	81 8.3	3 .0
2	215 45.9	48	24 59.6	7	289 8.1	- 0 47.9	111 13.2	2 60.0
4	244 33.5	47	25 1.0	3	319 12.4	- 0 47.7	141 18.0	2 59.9
6	273 21.0	46	25 1.7	0	349 16.8	- 0 47.5	171 22.9	2 59.9
8	302 8.2	46	25 1.7	-3	19 21.1	- 0 47.3	201 27.7	2 59.8
10	330 55.4	45	25 1.0	-7	49 25.5	- 0 47.0	231 32.5	2 59.7
12	359 42.4	45	24 59.7	-10	79 29.9	- 0 46.8	261 37.4	2 59.7
14	28 29.4	44	24 57.7	-13	109 34.2	- 0 46.6	291 42.2	2 59.6
16	57 16.3	44	24 55.0	-17	139 38.6	- 0 46.4	321 47.0	2 59.6
18	86 3.1	44	24 51.6	-20	169 43.0	- 0 46.2	351 51.9	2 59.5
20	114 49.9	44	24 47.6	-24	199 47.3	- 0 45.9	21 56.7	2 59.4
22	143 36.7	44	24 42.8	-27	229 51.7	- 0 45.7	52 1.5	2 59.4
Δ					22	1	24	0

φ	SUNCE IZLAZ	SUNCE ZALAZ	TRAJANJE SUMRAKA GRAĐ.	TRAJANJE SUMRAKA ASTR.	MJESEC IZLAZ	MJESEC Δ/24	MJESEC ZALAZ	MJESEC Δ/24
N	h min	h min	h min	h min	h min	min	h min	min
60	2 38	21 23	1 41	: ::	2 4	2.9	21 55	1.5
55	3 21	20 39	0 57	: ::	2 54	2.8	21 7	1.8
50	3 51	20 9	0 44	: ::	3 26	2.7	20 34	2.0
45	4 13	19 47	0 37	2 32	3 51	2.7	20 10	2.1
40	4 31	19 29	0 33	2 3	4 11	2.7	19 51	2.2
35	4 45	19 14	0 30	1 47	4 27	2.6	19 34	2.3
30	4 58	19 2	0 27	1 36	4 42	2.6	19 20	2.3
20	5 20	18 40	0 25	1 24	5 6	2.6	18 56	2.4
10	5 39	18 21	0 23	1 18	5 27	2.6	18 35	2.5
0	5 56	18 4	0 22	1 15	5 47	2.5	18 16	2.5
10	6 13	17 46	0 23	1 15	6 6	2.5	17 56	2.6
20	6 32	17 28	0 24	1 19	6 28	2.5	17 35	2.7
30	6 53	17 7	0 26	1 25	6 52	2.4	17 11	2.7
35	7 5	16 55	0 28	1 31	7 6	2.4	16 57	2.8
40	7 19	16 41	0 30	1 37	7 23	2.4	16 40	2.8
45	7 35	16 24	0 34	1 47	7 43	2.3	16 20	2.9
50	7 56	16 4	0 38	1 59	8 8	2.3	15 55	3.0
55	8 23	15 37	0 45	2 17	8 42	2.2	15 21	3.1
60	9 0	14 59	0 57	2 45	9 33	1.9	14 30	3.4
S								

SUNCE UT	SUNCE $e = T_p - UT$	SUNCE Δ/24	SUNCE r	MJESEC Prolaz	MJESEC Δ/24	MJESEC $\pi_\leftmoon$	MJESEC r
h	min s	s	′	h min	min	′	′
00	0 14.6	-.5	15.8	$T_{\overline{m}}$ 12 1	2.5	58.7	16.0
12	0 8.4	$T_{\overline{m}_\odot}$ 11 h 59.9 min		Starost 29.0 d	Faza ●		

PLANETE Pl.	$T_{\overline{m}}$	π	360−α	Vel.	Pl.	$T_{\overline{m}}$	π	360−α	Vel.
	h min	′	°			h min	′	°	
♀	14 39	.1	240	-3.9	♃	6 43	.0	359	-2.2
♂	16 57	.1	205	1.2	♄	18 32	.0	181	1.0

UT	SUNCE $S_\odot$	SUNCE $\delta_\odot$	PROLJ. TAČKA S_Υ	VENERA S_φ	VENERA δ_φ	MARS S_σ	MARS δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	180 .5	23 11.5	261 11.6	140 15.3	22 26.4	105 47.5	11 30.4
2	210 .2	23 11.7	291 16.6	170 14.1	22 25.2	135 50.0	11 29.4
4	240 .0	23 12.0	321 21.5	200 12.8	22 24.0	165 52.4	11 28.3
6	269 59.7	23 12.3	351 26.4	230 11.5	22 22.8	195 54.8	11 27.3
8	299 59.4	23 12.6	21 31.4	260 10.3	22 21.6	225 57.2	11 26.3
10	329 59.2	23 12.9	51 36.3	290 9.0	22 20.4	255 59.6	11 25.2
12	359 58.9	23 13.2	81 41.2	320 7.7	22 19.2	286 2.1	11 24.2
14	29 58.6	23 13.4	111 46.1	350 6.5	22 18.0	316 4.5	11 23.1
16	59 58.4	23 13.7	141 51.1	20 5.2	22 16.8	346 6.9	11 22.1
18	89 58.1	23 14.0	171 56.0	50 3.9	22 15.6	16 9.3	11 21.0
20	119 57.8	23 14.2	202 .9	80 2.7	22 14.4	46 11.7	11 20.0
22	149 57.6	23 14.5	232 5.8	110 1.4	22 13.1	76 14.2	11 18.9
Δ	-1	1		-6	-6	12	-5

UT	MJESEC $S_\leftmoon$	MJESEC Δ	MJESEC $\delta_\leftmoon$	MJESEC Δ	JUPITER S_4	JUPITER δ_4	SATURN S_η	SATURN δ_η
h	° ′		° ′		° ′	° ′	° ′	° ′
0	172 23.4	44	24 37.4	-31	259 56.1	- 0 45.5	82 6.4	2 59.3
2	201 10.2	44	24 31.3	-34	290 .4	- 0 45.3	112 11.2	2 59.3
4	229 57.0	44	24 24.5	-37	320 4.8	- 0 45.1	142 16.0	2 59.2
6	258 43.9	45	24 17.0	-41	350 9.2	- 0 44.9	172 20.9	2 59.1
8	287 30.8	45	24 8.9	-44	20 13.6	- 0 44.6	202 25.7	2 59.1
10	316 17.8	45	24 .1	-47	50 17.9	- 0 44.4	232 30.5	2 59.0
12	345 4.9	46	23 50.6	-51	80 22.3	- 0 44.2	262 35.4	2 59.0
14	13 52.1	47	23 40.5	-54	110 26.7	- 0 44.0	292 40.2	2 58.9
16	42 39.4	47	23 29.7	-57	140 31.1	- 0 43.8	322 45.0	2 58.8
18	71 26.9	48	23 18.2	-60	170 35.4	- 0 43.6	352 49.8	2 58.8
20	100 14.5	49	23 6.2	-64	200 39.8	- 0 43.3	22 54.7	2 58.7
22	129 2.4	50	22 53.4	-67	230 44.2	- 0 43.1	52 59.5	2 58.6
Δ					22	1	24	0

φ	SUNCE IZLAZ	SUNCE ZALAZ	TRAJANJE SUMRAKA GRAĐ.	TRAJANJE SUMRAKA ASTR.	MJESEC IZLAZ	MJESEC Δ/24	MJESEC ZALAZ	MJESEC Δ/24
N	h min	h min	h min	h min	h min	min	h min	min
60	2 37	21 24	1 42	: ::	3 13	3.8	22 30	.9
55	3 21	20 40	0 58	: ::	4 0	3.4	21 50	1.3
50	3 51	20 10	0 44	: ::	4 32	3.2	21 22	1.5
45	4 13	19 48	0 37	2 32	4 56	3.1	21 1	1.7
40	4 31	19 30	0 33	2 3	5 15	3.0	20 43	1.9
35	4 45	19 15	0 30	1 47	5 31	2.9	20 29	2.0
30	4 58	19 2	0 27	1 36	5 45	2.8	20 16	2.1
20	5 20	18 40	0 25	1 24	6 8	2.7	19 54	2.2
10	5 39	18 21	0 23	1 18	6 29	2.6	19 35	2.3
0	5 56	18 4	0 23	1 15	6 48	2.5	19 17	2.5
10	6 14	17 46	0 23	1 15	7 7	2.4	18 59	2.6
20	6 32	17 28	0 24	1 19	7 27	2.3	18 39	2.7
30	6 53	17 7	0 26	1 25	7 50	2.2	18 17	2.9
35	7 5	16 55	0 28	1 31	8 4	2.1	18 3	2.9
40	7 19	16 41	0 31	1 37	8 20	2.0	17 48	3.1
45	7 36	16 24	0 34	1 47	8 39	1.9	17 30	3.2
50	7 56	16 4	0 38	1 59	9 2	1.8	17 7	3.4
55	8 23	15 37	0 45	2 17	9 34	1.5	16 36	3.6
60	9 1	14 59	0 57	2 45	10 19	1.1	15 51	4.1
S								

SUNCE UT	SUNCE $e = T_p - UT$	SUNCE Δ/24	SUNCE r	MJESEC Prolaz	MJESEC Δ/24	MJESEC $\pi_\leftmoon$	MJESEC r
h	min s	s	′	h min	min	′	′
00	0 2.1	-.5	15.8	$T_{\overline{m}}$ 13 2	2.5	59.3	16.1
12	- 0 4.2	$T_{\overline{m}_\odot}$ 12 h .1 min		Starost .5 d	Faza ●		

PLANETE Pl.	$T_{\overline{m}}$	π	360−α	Vel.	Pl.	$T_{\overline{m}}$	π	360−α	Vel.
	h min	′	°			h min	′	°	
♀	14 40	.1	239	-3.9	♃	6 39	.0	359	-2.2
♂	16 55	.1	205	1.2	♄	18 29	.0	181	1.0

UT	SUNCE $S_\odot$	SUNCE $\delta_\odot$	PROLJ. TAČKA S_Υ	VENERA S_φ	VENERA δ_φ	MARS S_σ	MARS δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	179 57.3	23 14.7	262 10.8	140 .2	22 11.9	106 16.6	11 17.9
2	209 57.0	23 15.0	292 15.7	169 58.9	22 10.7	136 19.0	11 16.8
4	239 56.8	23 15.3	322 20.6	199 57.7	22 9.4	166 21.4	11 15.8
6	269 56.5	23 15.5	352 25.6	229 56.5	22 8.2	196 23.8	11 14.7
8	299 56.2	23 15.8	22 30.5	259 55.2	22 6.9	226 26.2	11 13.6
10	329 56.0	23 16.0	52 35.4	289 54.0	22 5.7	256 28.6	11 12.6
12	359 55.7	23 16.2	82 40.3	319 52.7	22 4.4	286 31.1	11 11.5
14	29 55.4	23 16.5	112 45.3	349 51.5	22 3.2	316 33.5	11 10.5
16	59 55.2	23 16.7	142 50.2	19 50.3	22 1.9	346 35.9	11 9.4
18	89 54.9	23 16.9	172 55.1	49 49.1	22 .6	16 38.3	11 8.4
20	119 54.6	23 17.2	203 .1	79 47.8	21 59.4	46 40.7	11 7.3
22	149 54.4	23 17.4	233 5.0	109 46.6	21 58.1	76 43.1	11 6.3
Δ	-1	1		-6	-6	12	-5

UT	MJESEC $S_\leftmoon$	MJESEC Δ	MJESEC $\delta_\leftmoon$	MJESEC Δ	JUPITER S_4	JUPITER δ_4	SATURN S_η	SATURN δ_η
h	° ′		° ′		° ′	° ′	° ′	° ′
0	157 50.3	51	22 40.1	-70	260 48.6	- 0 42.9	83 4.3	2 58.6
2	186 38.5	52	22 26.1	-73	290 53.0	- 0 42.7	113 9.1	2 58.5
4	215 26.9	53	22 11.5	-76	320 57.3	- 0 42.5	143 14.0	2 58.4
6	244 15.5	54	21 56.3	-79	351 1.7	- 0 42.3	173 18.8	2 58.4
8	273 4.4	55	21 40.5	-82	21 6.1	- 0 42.1	203 23.6	2 58.3
10	301 53.4	57	21 24.1	-85	51 10.5	- 0 41.9	233 28.4	2 58.2
12	330 42.8	58	21 7.2	-88	81 14.9	- 0 41.6	263 33.3	2 58.2
14	359 32.4	59	20 49.7	-90	111 19.3	- 0 41.4	293 38.1	2 58.1
16	28 22.2	61	20 31.6	-93	141 23.7	- 0 41.2	323 42.9	2 58.0
18	57 12.3	62	20 13.0	-96	171 28.1	- 0 41.0	353 47.7	2 58.0
20	86 2.7	63	19 53.8	-98	201 32.4	- 0 40.8	23 52.5	2 57.9
22	114 53.4	65	19 34.1	-101	231 36.8	- 0 40.6	53 57.4	2 57.8
Δ					22	1	24	0

φ	SUNCE IZLAZ	SUNCE ZALAZ	TRAJANJE SUMRAKA GRAĐ.	TRAJANJE SUMRAKA ASTR.	MJESEC IZLAZ	MJESEC Δ/24	MJESEC ZALAZ	MJESEC Δ/24
N	h min	h min	h min	h min	h min	min	h min	min
60	2 37	21 24	1 43	: ::	4 43	4.2	22 51	.5
55	3 21	20 40	0 58	: ::	5 22	3.7	22 21	.9
50	3 50	20 10	0 44	: ::	5 49	3.5	21 59	1.2
45	4 13	19 48	0 37	2 32	6 10	3.3	21 42	1.4
40	4 31	19 30	0 33	2 3	6 26	3.1	21 28	1.6
35	4 46	19 15	0 30	1 47	6 40	3.0	21 16	1.7
30	4 58	19 2	0 27	1 36	6 52	2.9	21 5	1.8
20	5 20	18 40	0 25	1 24	7 13	2.7	20 47	2.0
10	5 39	18 21	0 23	1 18	7 31	2.5	20 31	2.2
0	5 57	18 4	0 23	1 15	7 48	2.4	20 16	2.3
10	6 14	17 47	0 23	1 15	8 5	2.3	20 1	2.5
20	6 32	17 28	0 24	1 19	8 23	2.1	19 44	2.7
30	6 53	17 7	0 26	1 25	8 43	1.9	19 25	2.9
35	7 6	16 55	0 28	1 31	8 55	1.8	19 14	3.0
40	7 20	16 41	0 31	1 38	9 9	1.7	19 1	3.1
45	7 36	16 24	0 34	1 47	9 25	1.6	18 46	3.3
50	7 57	16 3	0 38	1 59	9 45	1.4	18 27	3.5
55	8 24	15 37	0 45	2 17	10 10	1.1	18 3	3.8
60	9 2	14 58	0 57	2 45	10 46	.7	17 29	4.2
S								

SUNCE UT	SUNCE $e = T_p - UT$	SUNCE Δ/24	SUNCE r	MJESEC Prolaz	MJESEC Δ/24	MJESEC $\pi_\leftmoon$	MJESEC r
h	min s	s	′	h min	min	′	′
00	- 0 10.6	-.5	15.8	$T_{\overline{m}}$ 14 2	2.4	59.7	16.3
12	- 0 17.0	$T_{\overline{m}_\odot}$ 12 h .3 min		Starost 1.5 d	Faza ●		

PLANETE

Pl.	$T_{\overline{m}}$	π	360−α	Vel.	Pl.	$T_{\overline{m}}$	π	360−α	Vel.
	h min	′	°			h min	′	°	
♀	14 41	.1	238	-3.9	♃	6 36	.0	359	-2.2
♂	16 54	.1	204	1.2	♄	18 25	.0	181	1.0

UT	SUNCE $S_\odot$	SUNCE $\delta_\odot$	PROLJ. TAČKA S_Υ	VENERA S_φ	VENERA δ_φ	MARS S_σ	MARS δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	179 54.1	23 17.6	263 9.9	139 45.4	21 56.8	106 45.5	11 5.2
2	209 53.8	23 17.8	293 14.8	169 44.2	21 55.5	136 47.9	11 4.1
4	239 53.6	23 18.1	323 19.8	199 43.0	21 54.2	166 50.3	11 3.1
6	269 53.3	23 18.3	353 24.7	229 41.8	21 52.9	196 52.8	11 2.0
8	299 53.0	23 18.5	23 29.6	259 40.5	21 51.7	226 55.2	11 1.0
10	329 52.8	23 18.7	53 34.6	289 39.3	21 50.4	256 57.6	10 59.9
12	359 52.5	23 18.9	83 39.5	319 38.1	21 49.0	286 60.0	10 58.8
14	29 52.2	23 19.1	113 44.4	349 36.9	21 47.7	317 2.4	10 57.8
16	59 52.0	23 19.3	143 49.3	19 35.7	21 46.4	347 4.8	10 56.7
18	89 51.7	23 19.5	173 54.3	49 34.5	21 45.1	17 7.2	10 55.6
20	119 51.4	23 19.7	203 59.2	79 33.3	21 43.8	47 9.6	10 54.6
22	149 51.2	23 19.9	234 4.1	109 32.1	21 42.5	77 12.0	10 53.5
Δ	-1	1		-6	-7	12	-5

UT	MJESEC $S_\leftmoon$	MJESEC Δ	MJESEC $\delta_\leftmoon$	MJESEC Δ	JUPITER S_4	JUPITER δ_4	SATURN S_η	SATURN δ_η
h	° ′		° ′		° ′	° ′	° ′	° ′
0	143 44.3	66	19 14.0	-103	261 41.2	- 0 40.4	84 2.2	2 57.8
2	172 35.6	68	18 53.3	-106	291 45.6	- 0 40.2	114 7.0	2 57.7
4	201 27.1	69	18 32.1	-108	321 50.0	- 0 40.0	144 11.8	2 57.6
6	230 19.0	71	18 10.5	-110	351 54.4	- 0 39.8	174 16.6	2 57.6
8	259 11.1	72	17 48.4	-113	21 58.8	- 0 39.6	204 21.4	2 57.5
10	288 3.6	74	17 25.8	-115	52 3.2	- 0 39.4	234 26.3	2 57.4
12	316 56.3	75	17 2.8	-117	82 7.6	- 0 39.2	264 31.1	2 57.4
14	345 49.4	77	16 39.4	-119	112 12.0	- 0 38.9	294 35.9	2 57.3
16	14 42.8	78	16 15.6	-121	142 16.4	- 0 38.7	324 40.7	2 57.2
18	43 36.4	80	15 51.4	-123	172 20.8	- 0 38.5	354 45.5	2 57.2
20	72 30.4	81	15 26.8	-125	202 25.2	- 0 38.3	24 50.3	2 57.1
22	101 24.7	83	15 1.9	-127	232 29.6	- 0 38.1	54 55.1	2 57.0
Δ					22	1	24	0

φ	SUNCE IZLAZ	SUNCE ZALAZ	TRAJANJE SUMRAKA GRAĐ.	TRAJANJE SUMRAKA ASTR.	MJESEC IZLAZ	MJESEC Δ/24	MJESEC ZALAZ	MJESEC Δ/24
N	h min	h min	h min	h min	h min	min	h min	min
60	2 36	21 25	1 44	: ::	6 24	4.2	23 4	.4
55	3 20	20 41	0 58	: ::	6 51	3.8	22 44	.7
50	3 50	20 11	0 45	: ::	7 12	3.5	22 28	1.0
45	4 13	19 48	0 37	2 33	7 28	3.3	22 16	1.2
40	4 31	19 31	0 33	2 3	7 41	3.1	22 6	1.4
35	4 46	19 16	0 30	1 47	7 52	3.0	21 57	1.5
30	4 59	19 3	0 27	1 36	8 1	2.8	21 49	1.6
20	5 20	18 41	0 25	1 24	8 18	2.6	21 35	1.8
10	5 39	18 22	0 23	1 18	8 32	2.4	21 23	2.0
0	5 57	18 4	0 23	1 15	8 46	2.3	21 12	2.2
10	6 14	17 47	0 23	1 15	8 59	2.1	21 0	2.4
20	6 33	17 28	0 24	1 19	9 13	1.9	20 48	2.6
30	6 54	17 7	0 26	1 25	9 29	1.7	20 34	2.8
35	7 6	16 55	0 28	1 31	9 39	1.6	20 26	2.9
40	7 20	16 41	0 31	1 38	9 50	1.4	20 16	3.1
45	7 37	16 24	0 34	1 47	10 2	1.3	20 5	3.3
50	7 58	16 3	0 38	1 59	10 17	1.1	19 51	3.5
55	8 24	15 36	0 45	2 17	10 36	.8	19 34	3.8
60	9 3	14 58	0 57	2 46	11 2	.4	19 10	4.2
S								

SUNCE UT	SUNCE $e = T_p - UT$	SUNCE Δ/24	SUNCE r	MJESEC Prolaz	MJESEC Δ/24	MJESEC $\pi_\leftmoon$	MJESEC r
h	min s	s	′	h min	min	′	′
00	- 0 23.4	-.5	15.8	$T_{\overline{m}}$ 14 59	2.2	59.9	16.3
12	- 0 29.8	$T_{\overline{m}_\odot}$ 12 h .5 min		Starost 2.5 d	Faza ●		

PLANETE

Pl.	$T_{\overline{m}}$	π	360−α	Vel.	Pl.	$T_{\overline{m}}$	π	360−α	Vel.
	h min	′	°			h min	′	°	
♀	14 42	.1	237	-3.9	♃	6 32	.0	359	-2.2
♂	16 52	.1	204	1.2	♄	18 21	.0	181	1.0

UT	SUNCE $S_\odot$	SUNCE $\delta_\odot$	PROLJ. TAČKA S_Υ	VENERA S_φ	VENERA δ_φ	MARS S_σ	MARS δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	179 50.9	23 20.1	264 9.1	139 31.0	21 41.1	107 14.4	10 52.5
2	209 50.6	23 20.3	294 14.0	169 29.8	21 39.8	137 16.8	10 51.4
4	239 50.3	23 20.5	324 18.9	199 28.6	21 38.5	167 19.2	10 50.3
6	269 50.1	23 20.6	354 23.8	229 27.4	21 37.1	197 21.6	10 49.3
8	299 49.8	23 20.8	24 28.8	259 26.2	21 35.8	227 24.0	10 48.2
10	329 49.5	23 21.0	54 33.7	289 25.1	21 34.5	257 26.4	10 47.1
12	359 49.3	23 21.2	84 38.6	319 23.9	21 33.1	287 28.8	10 46.0
14	29 49.0	23 21.3	114 43.6	349 22.7	21 31.8	317 31.2	10 45.0
16	59 48.7	23 21.5	144 48.5	19 21.5	21 30.4	347 33.6	10 43.9
18	89 48.4	23 21.7	174 53.4	49 20.4	21 29.0	17 36.0	10 42.8
20	119 48.2	23 21.8	204 58.3	79 19.2	21 27.7	47 38.4	10 41.8
22	149 47.9	23 22.0	235 3.3	109 18.1	21 26.3	77 40.8	10 40.7
Δ	−1	1		−6	−7	12	−5

UT	MJESEC $S_\leftmoon$	MJESEC Δ	MJESEC $\delta_\leftmoon$	MJESEC Δ	JUPITER S_4	JUPITER δ_4	SATURN S_η	SATURN δ_η
h	° ′		° ′		° ′	° ′	° ′	° ′
0	130 19.2	84	14 36.6	−128	262 34.0	− 0 37.9	84 59.9	2 56.9
2	159 14.1	86	14 10.9	−130	292 38.4	− 0 37.7	115 4.7	2 56.9
4	188 9.2	87	13 44.9	−131	322 42.8	− 0 37.5	145 9.6	2 56.8
6	217 4.6	89	13 18.6	−133	352 47.2	− 0 37.3	175 14.4	2 56.7
8	246 .4	90	12 52.0	−134	22 51.6	− 0 37.1	205 19.2	2 56.7
10	274 56.4	91	12 25.1	−136	52 56.1	− 0 36.9	235 24.0	2 56.6
12	303 52.6	93	11 58.0	−137	83 .5	− 0 36.7	265 28.8	2 56.5
14	332 49.2	94	11 30.5	−138	113 4.9	− 0 36.5	295 33.6	2 56.4
16	1 46.0	95	11 2.9	−140	143 9.3	− 0 36.3	325 38.4	2 56.4
18	30 43.0	97	10 35.0	−141	173 13.7	− 0 36.1	355 43.2	2 56.3
20	59 40.3	98	10 6.8	−142	203 18.1	− 0 35.9	25 48.0	2 56.2
22	88 37.9	99	9 38.5	−143	233 22.5	− 0 35.7	55 52.8	2 56.1
Δ					22	1	24	0

φ	SUNCE IZLAZ	SUNCE ZALAZ	TRAJANJE SUMRAKA GRAĐ.	TRAJANJE SUMRAKA ASTR.	MJESEC IZLAZ	MJESEC Δ/24	MJESEC ZALAZ	MJESEC Δ/24
N	h min	h min	h min	h min	h min	min	h min	min
60	2 36	21 26	1 45	: ::	8 5	4.1	23 12	.3
55	3 20	20 41	0 58	: ::	8 22	3.7	23 1	.6
50	3 50	20 11	0 45	: ::	8 36	3.5	22 52	.9
45	4 13	19 49	0 37	2 33	8 47	3.2	22 44	1.1
40	4 31	19 31	0 33	2 3	8 55	3.1	22 38	1.2
35	4 46	19 16	0 30	1 47	9 3	2.9	22 33	1.4
30	4 59	19 3	0 27	1 37	9 10	2.8	22 28	1.5
20	5 21	18 41	0 25	1 24	9 21	2.5	22 20	1.7
10	5 40	18 22	0 23	1 18	9 31	2.3	22 12	1.9
0	5 57	18 4	0 23	1 15	9 40	2.2	22 5	2.1
10	6 14	17 47	0 23	1 15	9 49	2.0	21 58	2.3
20	6 33	17 28	0 24	1 19	9 59	1.8	21 50	2.5
30	6 54	17 7	0 26	1 25	10 11	1.5	21 41	2.7
35	7 6	16 55	0 28	1 31	10 17	1.4	21 36	2.9
40	7 21	16 41	0 31	1 38	10 24	1.3	21 30	3.0
45	7 37	16 24	0 34	1 47	10 33	1.1	21 23	3.2
50	7 58	16 3	0 38	1 59	10 43	.9	21 15	3.4
55	8 25	15 36	0 45	2 18	10 55	.6	21 5	3.7
60	9 4	14 58	0 58	2 46	11 12	.3	20 51	4.1
S								

SUNCE UT	SUNCE $e = T_p - UT$	SUNCE Δ/24	SUNCE r	MJESEC Prolaz	MJESEC Δ/24	MJESEC $\pi_\leftmoon$	MJESEC r
h	min s	s	′	h min	min	′	′
00	− 0 36.3	−.5	15.8	$T_{\overline{m}}$ 15 53	2.1	59.9	16.3
12	− 0 42.8	$T_{\overline{m}_\odot}$ 12 h .7 min		Starost 3.5 d	Faza ◐		

PLANETE

Pl.	$T_{\overline{m}}$	π	360−α	Vel.	Pl.	$T_{\overline{m}}$	π	360−α	Vel.
	h min	′	°			h min	′	°	
♀	14 43	.1	235	−3.9	♃	6 29	.0	358	−2.2
♂	16 50	.1	203	1.2	♄	18 17	.0	181	1.0

UT	SUNCE $S_\odot$	SUNCE $\delta_\odot$	PROLJ. TAČKA S_Υ	VENERA S_φ	VENERA δ_φ	MARS S_σ	MARS δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	179 47.6	23 22.2	265 8.2	139 16.9	21 24.9	107 43.2	10 39.6
2	209 47.4	23 22.3	295 13.1	169 15.7	21 23.5	137 45.6	10 38.6
4	239 47.1	23 22.5	325 18.1	199 14.6	21 22.2	167 48.0	10 37.5
6	269 46.8	23 22.6	355 23.0	229 13.4	21 20.8	197 50.4	10 36.4
8	299 46.5	23 22.7	25 27.9	259 12.3	21 19.4	227 52.8	10 35.3
10	329 46.3	23 22.9	55 32.8	289 11.1	21 18.0	257 55.2	10 34.3
12	359 46.0	23 23.0	85 37.8	319 10.0	21 16.6	287 57.6	10 33.2
14	29 45.7	23 23.2	115 42.7	349 8.9	21 15.2	317 60.0	10 32.1
16	59 45.5	23 23.3	145 47.6	19 7.7	21 13.8	348 2.4	10 31.0
18	89 45.2	23 23.4	175 52.5	49 6.6	21 12.4	18 4.8	10 30.0
20	119 44.9	23 23.6	205 57.5	79 5.5	21 11.0	48 7.2	10 28.9
22	149 44.6	23 23.7	236 2.4	109 4.3	21 9.6	78 9.6	10 27.8
Δ	−1	1		−6	−7	12	−5

UT	MJESEC $S_\leftmoon$	MJESEC Δ	MJESEC $\delta_\leftmoon$	MJESEC Δ	JUPITER S_4	JUPITER δ_4	SATURN S_η	SATURN δ_η
h	° ′		° ′		° ′	° ′	° ′	° ′
0	117 35.6	100	9 9.9	−144	263 26.9	− 0 35.5	85 57.6	2 56.1
2	146 33.6	101	8 41.2	−145	293 31.4	− 0 35.3	116 2.4	2 56.0
4	175 31.9	102	8 12.3	−145	323 35.8	− 0 35.1	146 7.2	2 55.9
6	204 30.3	103	7 43.2	−146	353 40.2	− 0 34.9	176 12.0	2 55.8
8	233 29.0	104	7 14.0	−147	23 44.6	− 0 34.7	206 16.8	2 55.8
10	262 27.8	105	6 44.7	−147	53 49.0	− 0 34.5	236 21.6	2 55.7
12	291 26.9	106	6 15.2	−148	83 53.5	− 0 34.4	266 26.4	2 55.6
14	320 26.1	107	5 45.6	−148	113 57.9	− 0 34.2	296 31.2	2 55.5
16	349 25.5	108	5 15.9	−149	144 2.3	− 0 34.0	326 36.0	2 55.5
18	18 25.1	109	4 46.2	−149	174 6.7	− 0 33.8	356 40.8	2 55.4
20	47 24.8	109	4 16.4	−149	204 11.2	− 0 33.6	26 45.6	2 55.3
22	76 24.7	110	3 46.5	−150	234 15.6	− 0 33.4	56 50.4	2 55.2
Δ					22	1	24	0

φ	SUNCE IZLAZ	SUNCE ZALAZ	TRAJANJE SUMRAKA GRAĐ.	TRAJANJE SUMRAKA ASTR.	MJESEC IZLAZ	MJESEC Δ/24	MJESEC ZALAZ	MJESEC Δ/24
N	h min	h min	h min	h min	h min	min	h min	min
60	2 36	21 26	1 46	: ::	9 43	4.0	23 19	.2
55	3 20	20 42	0 58	: ::	9 52	3.6	23 15	.6
50	3 50	20 12	0 45	: ::	9 59	3.4	23 12	.8
45	4 13	19 49	0 37	2 33	10 4	3.2	23 10	1.0
40	4 31	19 31	0 33	2 3	10 9	3.0	23 7	1.2
35	4 46	19 16	0 30	1 47	10 13	2.8	23 5	1.3
30	4 59	19 3	0 27	1 37	10 16	2.7	23 4	1.4
20	5 21	18 41	0 25	1 24	10 22	2.5	23 1	1.7
10	5 40	18 22	0 23	1 18	10 27	2.3	22 58	1.9
0	5 57	18 5	0 23	1 15	10 32	2.1	22 56	2.0
10	6 15	17 47	0 23	1 15	10 37	1.9	22 53	2.2
20	6 33	17 29	0 24	1 19	10 42	1.7	22 50	2.4
30	6 54	17 7	0 26	1 26	10 48	1.5	22 47	2.7
35	7 7	16 55	0 28	1 31	10 51	1.3	22 45	2.8
40	7 21	16 41	0 31	1 38	10 55	1.2	22 43	3.0
45	7 38	16 24	0 34	1 47	10 59	1.0	22 40	3.1
50	7 58	16 3	0 38	1 59	11 4	.8	22 37	3.3
55	8 25	15 36	0 46	2 18	11 11	.6	22 33	3.6
60	9 4	14 58	0 58	2 46	11 19	.3	22 28	4.0
S								

SUNCE UT	SUNCE $e = T_p - UT$	SUNCE Δ/24	SUNCE r	MJESEC Prolaz	MJESEC Δ/24	MJESEC $\pi_\leftmoon$	MJESEC r
h	min s	s	′	h min	min	′	′
00	− 0 49.3	−.5	15.8	$T_{\overline{m}}$ 16 44	2.0	59.8	16.3
12	− 0 55.8	$T_{\overline{m}_\odot}$ 12 h .9 min		Starost 4.5 d	Faza ◐		

PLANETE

Pl.	$T_{\overline{m}}$	π	360−α	Vel.	Pl.	$T_{\overline{m}}$	π	360−α	Vel.
	h min	′	°			h min	′	°	
♀	14 43	.1	234	−3.9	♃	6 25	.0	358	−2.2
♂	16 48	.1	203	1.3	♄	18 13	.0	181	1.0

UT	SUNCE $S_\odot$	SUNCE $\delta_\odot$	PROLJ. TAČKA S_Υ	VENERA S_φ	VENERA δ_φ	MARS S_σ	MARS δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	179 44.4	23 23.8	266 7.3	139 3.2	21 8.2	108 11.9	10 26.7
2	209 44.1	23 23.9	296 12.3	169 2.1	21 6.7	138 14.3	10 25.6
4	239 43.8	23 24.0	326 17.2	199 1.0	21 5.3	168 16.7	10 24.6
6	269 43.6	23 24.1	356 22.1	228 59.8	21 3.9	198 19.1	10 23.5
8	299 43.3	23 24.3	26 27.0	258 58.7	21 2.4	228 21.5	10 22.4
10	329 43.0	23 24.4	56 32.0	288 57.6	21 1.0	258 23.9	10 21.3
12	359 42.7	23 24.5	86 36.9	318 56.5	20 59.6	288 26.3	10 20.2
14	29 42.5	23 24.6	116 41.8	348 55.4	20 58.1	318 28.7	10 19.2
16	59 42.2	23 24.7	146 46.8	18 54.3	20 56.7	348 31.1	10 18.1
18	89 41.9	23 24.8	176 51.7	48 53.2	20 55.2	18 33.5	10 17.0
20	119 41.7	23 24.8	206 56.6	78 52.1	20 53.8	48 35.8	10 15.9
22	149 41.4	23 24.9	237 1.5	108 51.0	20 52.3	78 38.2	10 14.8
Δ	−1	1		−6	−7	12	−5

UT	MJESEC $S_\leftmoon$	MJESEC Δ	MJESEC $\delta_\leftmoon$	MJESEC Δ	JUPITER $S_\jupiter$	JUPITER $\delta_\jupiter$	SATURN $S_\saturn$	SATURN $\delta_\saturn$
h	° ′		° ′		° ′	° ′	° ′	° ′
0	105 24.7	111	3 16.5	−150	264 20.0	− 0 33.2	86 55.2	2 55.2
2	134 24.8	111	2 46.5	−150	294 24.4	− 0 33.0	116 60.0	2 55.1
4	163 25.1	112	2 16.5	−150	324 28.9	− 0 32.8	147 4.8	2 55.0
6	192 25.4	112	1 46.5	−150	354 33.3	− 0 32.6	177 9.6	2 54.9
8	221 25.9	113	1 16.4	−150	24 37.7	− 0 32.4	207 14.4	2 54.8
10	250 26.5	113	0 46.4	−150	54 42.2	− 0 32.2	237 19.2	2 54.8
12	279 27.1	114	0 16.4	−150	84 46.6	− 0 32.1	267 23.9	2 54.7
14	308 27.9	114	− 0 13.6	−150	114 51.0	− 0 31.9	297 28.7	2 54.6
16	337 28.7	114	− 0 43.6	−150	144 55.5	− 0 31.7	327 33.5	2 54.5
18	6 29.5	115	− 1 13.5	−149	174 59.9	− 0 31.5	357 38.3	2 54.4
20	35 30.4	115	− 1 43.3	−149	205 4.4	− 0 31.3	27 43.1	2 54.4
22	64 31.4	115	− 2 13.1	−148	235 8.8	− 0 31.1	57 47.9	2 54.3
Δ					22	1	24	0

φ	SUNCE IZLAZ	SUNCE ZALAZ	TRAJANJE SUMRAKA GRAĐ.	TRAJANJE SUMRAKA ASTR.	MJESEC IZLAZ	MJESEC Δ/24	MJESEC ZALAZ	MJESEC Δ/24
N	h min	h min	h min	h min	h min	min	h min	min
60	2 36	21 27	1 46	: ::	11 19	3.9	23 25	.3
55	3 20	20 42	0 58	: ::	11 19	3.6	23 29	.6
50	3 50	20 12	0 45	: ::	11 20	3.3	23 31	.8
45	4 13	19 50	0 37	2 33	11 20	3.1	23 33	1.0
40	4 31	19 32	0 33	2 3	11 20	2.9	23 35	1.2
35	4 46	19 16	0 30	1 47	11 20	2.8	23 37	1.3
30	4 59	19 3	0 27	1 37	11 21	2.7	23 38	1.4
20	5 21	18 41	0 25	1 24	11 21	2.4	23 41	1.7
10	5 40	18 22	0 23	1 18	11 21	2.2	23 43	1.9
0	5 57	18 5	0 23	1 15	11 22	2.0	23 45	2.0
10	6 15	17 47	0 23	1 15	11 22	1.8	23 47	2.2
20	6 33	17 29	0 24	1 19	11 22	1.7	23 49	2.4
30	6 55	17 8	0 26	1 26	11 23	1.4	23 51	2.6
35	7 7	16 55	0 28	1 31	11 23	1.3	23 52	2.8
40	7 21	16 41	0 31	1 38	11 23	1.2	23 54	2.9
45	7 38	16 24	0 34	1 47	11 24	1.0	23 55	3.1
50	7 59	16 3	0 39	1 60	11 24	.8	23 57	3.3
55	8 26	15 36	0 46	2 18	11 25	.6	23 60	3.6
60	9 5	14 58	0 58	2 46	11 25	.2	. . .	.0
S								

SUNCE UT	SUNCE e = Tp − UT	SUNCE Δ/24	SUNCE r	MJESEC Prolaz	MJESEC Δ/24	MJESEC $\pi_\leftmoon$	MJESEC r
h	min s	s	′	h min	min	′	′
00	− 1 2.3	−.5	15.8	$T_{\overline{m}}$ 17 33	2.0	59.5	16.2
12	− 1 8.9	$T_{\overline{m}_\odot}$ 12 h	1.2 min	Starost 5.5 d	Faza ◑		

PLANETE

Pl.	$T_{\overline{m}}$	π	360 − α	Vel.	Pl.	$T_{\overline{m}}$	π	360 − α	Vel.
	h min	′	°			h min	′	°	
♀	14 44	.1	233	−3.9	♃	6 22	.0	358	−2.2
♂	16 46	.1	202	1.3	♄	18 9	.0	181	1.0

UT	SUNCE $S_\odot$	SUNCE $\delta_\odot$	PROLJ. TAČKA S_Υ	VENERA S_φ	VENERA δ_φ	MARS S_σ	MARS δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	179 41.1	23 25.0	267 6.5	138 49.9	20 50.8	108 40.6	10 13.7
2	209 40.8	23 25.1	297 11.4	168 48.8	20 49.4	138 43.0	10 12.6
4	239 40.6	23 25.2	327 16.3	198 47.7	20 47.9	168 45.4	10 11.6
6	269 40.3	23 25.3	357 21.3	228 46.6	20 46.4	198 47.8	10 10.5
8	299 40.0	23 25.3	27 26.2	258 45.5	20 45.0	228 50.1	10 9.4
10	329 39.7	23 25.4	57 31.1	288 44.5	20 43.5	258 52.5	10 8.3
12	359 39.5	23 25.5	87 36.0	318 43.4	20 42.0	288 54.9	10 7.2
14	29 39.2	23 25.6	117 41.0	348 42.3	20 40.5	318 57.3	10 6.1
16	59 38.9	23 25.6	147 45.9	18 41.2	20 39.0	348 59.7	10 5.0
18	89 38.7	23 25.7	177 50.8	48 40.2	20 37.5	19 2.1	10 3.9
20	119 38.4	23 25.7	207 55.8	78 39.1	20 36.0	49 4.4	10 2.9
22	149 38.1	23 25.8	238 .7	108 38.0	20 34.5	79 6.8	10 1.8
Δ	−1	0		−5	−7	12	−5

UT	MJESEC $S_\leftmoon$	MJESEC Δ	MJESEC $\delta_\leftmoon$	MJESEC Δ	JUPITER $S_\jupiter$	JUPITER $\delta_\jupiter$	SATURN $S_\saturn$	SATURN $\delta_\saturn$
h	° ′		° ′		° ′	° ′	° ′	° ′
0	93 32.4	115	− 2 42.8	−148	265 13.2	− 0 30.9	87 52.7	2 54.2
2	122 33.4	115	− 3 12.4	−148	295 17.7	− 0 30.7	117 57.5	2 54.1
4	151 34.4	115	− 3 41.9	−147	325 22.1	− 0 30.6	148 2.2	2 54.0
6	180 35.4	115	− 4 11.3	−146	355 26.6	− 0 30.4	178 7.0	2 54.0
8	209 36.4	115	− 4 40.6	−146	25 31.0	− 0 30.2	208 11.8	2 53.9
10	238 37.4	115	− 5 9.7	−145	55 35.4	− 0 30.0	238 16.6	2 53.8
12	267 38.4	115	− 5 38.7	−144	85 39.9	− 0 29.8	268 21.4	2 53.7
14	296 39.4	115	− 6 7.5	−143	115 44.3	− 0 29.6	298 26.2	2 53.6
16	325 40.3	114	− 6 36.2	−143	145 48.8	− 0 29.4	328 31.0	2 53.6
18	354 41.2	114	− 7 4.7	−142	175 53.2	− 0 29.3	358 35.7	2 53.5
20	23 42.0	114	− 7 33.1	−141	205 57.7	− 0 29.1	28 40.5	2 53.4
22	52 42.8	113	− 8 1.2	−140	236 2.1	− 0 28.9	58 45.3	2 53.3
Δ					22	1	24	0

φ	SUNCE IZLAZ	SUNCE ZALAZ	TRAJANJE SUMRAKA GRAĐ.	TRAJANJE SUMRAKA ASTR.	MJESEC IZLAZ	MJESEC Δ/24	MJESEC ZALAZ	MJESEC Δ/24
N	h min	h min	h min	h min	h min	min	h min	min
60	2 36	21 27	1 46	: ::	12 53	3.9	23 31	.3
55	3 20	20 43	0 58	: ::	12 45	3.6	23 42	.6
50	3 50	20 12	0 45	: ::	12 39	3.3	23 51	.9
45	4 13	19 50	0 37	2 33	12 35	3.1	23 58	1.1
40	4 31	19 32	0 33	2 3	12 31	2.9	. . .	.0
35	4 46	19 17	0 30	1 47	12 27	2.8	. . .	.0
30	4 59	19 4	0 27	1 37	12 24	2.6	. . .	.0
20	5 21	18 42	0 25	1 24	12 19	2.4	. . .	.0
10	5 40	18 23	0 23	1 18	12 15	2.2	. . .	.0
0	5 58	18 5	0 23	1 15	12 10	2.0	. . .	.0
10	6 15	17 48	0 23	1 15	12 6	1.9	. . .	.0
20	6 34	17 29	0 24	1 19	12 2	1.7	. . .	.0
30	6 55	17 8	0 26	1 26	11 57	1.5	. . .	.0
35	7 7	16 55	0 28	1 31	11 54	1.3	. . .	.0
40	7 22	16 41	0 31	1 38	11 51	1.2	. . .	.0
45	7 38	16 24	0 34	1 47	11 47	1.0	. . .	.0
50	7 59	16 4	0 39	1 60	11 43	.8	. . .	.0
55	8 26	15 36	0 46	2 18	11 38	.6	. . .	.0
60	9 5	14 58	0 58	2 46	11 31	.3	0 4	3.9
S								

SUNCE UT	SUNCE e = Tp − UT	SUNCE Δ/24	SUNCE r	MJESEC Prolaz	MJESEC Δ/24	MJESEC $\pi_\leftmoon$	MJESEC r
h	min s	s	′	h min	min	′	′
00	− 1 15.4	−.5	15.8	$T_{\overline{m}}$ 18 22	2.0	59.1	16.1
12	− 1 21.9	$T_{\overline{m}_\odot}$ 12 h	1.4 min	Starost 6.5 d	Faza ◑		

PLANETE

Pl.	$T_{\overline{m}}$	π	360 − α	Vel.	Pl.	$T_{\overline{m}}$	π	360 − α	Vel.
	h min	′	°			h min	′	°	
♀	14 45	.1	232	−3.9	♃	6 18	.0	358	−2.2
♂	16 44	.1	202	1.3	♄	18 6	.0	181	1.0

UT	SUNCE $S_\odot$	SUNCE $\delta_\odot$	PROLJ. TAČKA S_Υ	VENERA S_φ	VENERA δ_φ	MARS S_σ	MARS δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	179 37.8	23 25.8	268 5.6	138 37.0	20 33.0	109 9.2	10 .7
2	209 37.6	23 25.9	298 10.5	168 35.9	20 31.5	139 11.6	9 59.6
4	239 37.3	23 25.9	328 15.5	198 34.9	20 30.0	169 14.0	9 58.5
6	269 37.0	23 26.0	358 20.4	228 33.8	20 28.5	199 16.3	9 57.4
8	299 36.8	23 26.0	28 25.3	258 32.8	20 26.9	229 18.7	9 56.3
10	329 36.5	23 26.1	58 30.3	288 31.7	20 25.4	259 21.1	9 55.2
12	359 36.2	23 26.1	88 35.2	318 30.7	20 23.9	289 23.5	9 54.1
14	29 35.9	23 26.1	118 40.1	348 29.6	20 22.4	319 25.8	9 53.0
16	59 35.7	23 26.2	148 45.0	18 28.6	20 20.8	349 28.2	9 51.9
18	89 35.4	23 26.2	178 50.0	48 27.5	20 19.3	19 30.6	9 50.8
20	119 35.1	23 26.2	208 54.9	78 26.5	20 17.7	49 33.0	9 49.7
22	149 34.8	23 26.2	238 59.8	108 25.5	20 16.2	79 35.4	9 48.6
Δ	-1	0		-5	-8	12	-5

UT	MJESEC $S_\leftmoon$	MJESEC Δ	MJESEC $\delta_\leftmoon$	MJESEC Δ	JUPITER S_4	JUPITER δ_4	SATURN S_η	SATURN δ_η
h	° ′		° ′		° ′	° ′	° ′	° ′
0	81 43.5	113	- 8 29.1	-139	266 6.6	- 0 28.7	88 50.1	2 53.2
2	110 44.1	113	- 8 56.9	-138	296 11.0	- 0 28.5	118 54.9	2 53.1
4	139 44.6	112	- 9 24.4	-136	326 15.5	- 0 28.4	148 59.6	2 53.1
6	168 45.1	112	- 9 51.6	-135	356 20.0	- 0 28.2	179 4.4	2 53.0
8	197 45.5	111	-10 18.7	-134	26 24.4	- 0 28.0	209 9.2	2 52.9
10	226 45.7	111	-10 45.5	-133	56 28.9	- 0 27.8	239 14.0	2 52.8
12	255 45.9	110	-11 12.0	-131	86 33.3	- 0 27.6	269 18.7	2 52.7
14	284 45.9	110	-11 38.3	-130	116 37.8	- 0 27.5	299 23.5	2 52.6
16	313 45.8	109	-12 4.3	-129	146 42.2	- 0 27.3	329 28.3	2 52.5
18	342 45.6	108	-12 30.0	-127	176 46.7	- 0 27.1	359 33.1	2 52.5
20	11 45.2	108	-12 55.4	-126	206 51.2	- 0 26.9	29 37.8	2 52.4
22	40 44.7	107	-13 20.5	-124	236 55.6	- 0 26.8	59 42.6	2 52.3
Δ					22	1	24	0

φ	SUNCE IZLAZ	SUNCE ZALAZ	TRAJANJE SUMRAKA GRAĐ.	TRAJANJE SUMRAKA ASTR.	MJESEC IZLAZ	MJESEC Δ/24	MJESEC ZALAZ	MJESEC Δ/24
N	h min	h min	h min	h min	h min	min	h min	min
60	2 36	21 28	1 47	: ::	14 27	3.9	23 39	.4
55	3 20	20 43	0 58	: ::	14 11	3.5	23 58	.8
50	3 50	20 13	0 45	: ::	13 59	3.3	.. ..	.0
45	4 13	19 50	0 37	2 33	13 49	3.1	.. ..	.0
40	4 31	19 32	0 33	2 3	13 41	2.9	0 4	1.2
35	4 46	19 17	0 30	1 47	13 34	2.8	0 9	1.4
30	4 59	19 4	0 27	1 37	13 28	2.6	0 13	1.5
20	5 21	18 42	0 25	1 24	13 17	2.4	0 21	1.7
10	5 40	18 23	0 23	1 18	13 8	2.3	0 27	1.9
0	5 58	18 5	0 23	1 15	12 60	2.1	0 34	2.1
10	6 15	17 48	0 23	1 15	12 51	1.9	0 40	2.2
20	6 34	17 29	0 24	1 19	12 42	1.8	0 47	2.4
30	6 55	17 8	0 26	1 26	12 32	1.6	0 55	2.6
35	7 8	16 56	0 28	1 31	12 26	1.4	0 59	2.8
40	7 22	16 41	0 31	1 38	12 20	1.3	1 4	2.9
45	7 39	16 25	0 34	1 47	12 12	1.2	1 10	3.1
50	7 59	16 4	0 39	1 60	12 3	1.0	1 17	3.3
55	8 27	15 37	0 46	2 18	11 52	.7	1 26	3.6
60	9 5	14 58	0 58	2 46	11 38	.4	1 38	3.9
S								

SUNCE UT	SUNCE $e = T_p - UT$	SUNCE Δ/24	SUNCE r	MJESEC Prolaz	MJESEC Δ/24	MJESEC $\pi_\leftmoon$	MJESEC r
h	min s	s	′	h min	min	′	′
00	- 1 28.5	-.5	15.8	$T_{\overline{m}}$ 19 11	2.1	58.7	16.0
12	- 1 35.0	$T_{\overline{m}_\odot}$ 12 h	1.6 min	Starost 7.5 d	Faza ◐		

PLANETE

Pl.	$T_{\overline{m}}$	π	360−α	Vel.	Pl.	$T_{\overline{m}}$	π	360−α	Vel.
	h min	′	°			h min	′	°	
♀	14 46	.1	231	-3.9	♃	6 15	.0	358	-2.3
♂	16 42	.1	201	1.3	♄	18 2	.0	181	1.0

UT	SUNCE $S_\odot$	SUNCE $\delta_\odot$	PROLJ. TAČKA S_Υ	VENERA S_φ	VENERA δ_φ	MARS S_σ	MARS δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	179 34.6	23 26.2	269 4.7	138 24.5	20 14.7	109 37.7	9 47.5
2	209 34.3	23 26.3	299 9.7	168 23.4	20 13.1	139 40.1	9 46.4
4	239 34.0	23 26.3	329 14.6	198 22.4	20 11.5	169 42.5	9 45.3
6	269 33.8	23 26.3	359 19.5	228 21.4	20 10.0	199 44.8	9 44.2
8	299 33.5	23 26.3	29 24.5	258 20.4	20 8.4	229 47.2	9 43.1
10	329 33.2	23 26.3	59 29.4	288 19.3	20 6.9	259 49.6	9 42.0
12	359 32.9	23 26.3	89 34.3	318 18.3	20 5.3	289 52.0	9 40.9
14	29 32.7	23 26.3	119 39.2	348 17.3	20 3.7	319 54.3	9 39.8
16	59 32.4	23 26.3	149 44.2	18 16.3	20 2.1	349 56.7	9 38.7
18	89 32.1	23 26.3	179 49.1	48 15.3	20 .6	19 59.1	9 37.6
20	119 31.9	23 26.3	209 54.0	78 14.3	19 59.0	50 1.4	9 36.5
22	149 31.6	23 26.3	239 59.0	108 13.3	19 57.4	80 3.8	9 35.4
Δ	-1	0		-5	-8	12	-6

UT	MJESEC $S_\leftmoon$	MJESEC Δ	MJESEC $\delta_\leftmoon$	MJESEC Δ	JUPITER S_4	JUPITER δ_4	SATURN S_η	SATURN δ_η
h	° ′		° ′		° ′	° ′	° ′	° ′
0	69 44.1	106	-13 45.3	-122	267 .1	- 0 26.6	89 47.4	2 52.2
2	98 43.3	105	-14 9.8	-121	297 4.6	- 0 26.4	119 52.2	2 52.1
4	127 42.4	105	-14 33.9	-119	327 9.0	- 0 26.2	149 56.9	2 52.0
6	156 41.3	104	-14 57.7	-117	357 13.5	- 0 26.1	180 1.7	2 51.9
8	185 40.1	103	-15 21.2	-116	27 18.0	- 0 25.9	210 6.5	2 51.8
10	214 38.7	102	-15 44.3	-114	57 22.4	- 0 25.7	240 11.2	2 51.8
12	243 37.2	101	-16 7.0	-112	87 26.9	- 0 25.5	270 16.0	2 51.7
14	272 35.4	101	-16 29.4	-110	117 31.4	- 0 25.4	300 20.8	2 51.6
16	301 33.5	100	-16 51.4	-108	147 35.8	- 0 25.2	330 25.5	2 51.5
18	330 31.5	99	-17 13.0	-106	177 40.3	- 0 25.0	0 30.3	2 51.4
20	359 29.2	98	-17 34.2	-104	207 44.8	- 0 24.8	30 35.1	2 51.3
22	28 26.8	97	-17 54.9	-102	237 49.3	- 0 24.7	60 39.8	2 51.2
Δ					22	1	24	0

φ	SUNCE IZLAZ	SUNCE ZALAZ	TRAJANJE SUMRAKA GRAĐ.	TRAJANJE SUMRAKA ASTR.	MJESEC IZLAZ	MJESEC Δ/24	MJESEC ZALAZ	MJESEC Δ/24
N	h min	h min	h min	h min	h min	min	h min	min
60	2 36	21 28	1 47	: ::	16 2	3.9	23 49	.7
55	3 21	20 43	0 58	: ::	15 36	3.5	.. ..	.0
50	3 51	20 13	0 45	: ::	15 17	3.2	0 13	1.0
45	4 13	19 50	0 37	2 33	15 2	3.0	0 24	1.2
40	4 31	19 32	0 33	2 3	14 50	2.9	0 34	1.4
35	4 46	19 17	0 30	1 47	14 40	2.7	0 42	1.5
30	4 59	19 4	0 27	1 37	14 31	2.6	0 49	1.6
20	5 22	18 42	0 25	1 24	14 16	2.5	1 2	1.8
10	5 41	18 23	0 23	1 18	14 2	2.3	1 13	2.0
0	5 58	18 5	0 23	1 15	13 50	2.2	1 23	2.1
10	6 16	17 48	0 23	1 15	13 38	2.0	1 34	2.3
20	6 34	17 29	0 24	1 19	13 24	1.9	1 45	2.5
30	6 55	17 8	0 26	1 26	13 10	1.7	1 58	2.6
35	7 8	16 56	0 28	1 31	13 1	1.6	2 5	2.8
40	7 22	16 42	0 31	1 38	12 51	1.5	2 14	2.9
45	7 39	16 25	0 34	1 47	12 40	1.3	2 24	3.0
50	7 60	16 4	0 39	1 60	12 26	1.2	2 36	3.2
55	8 27	15 37	0 46	2 18	12 9	.9	2 52	3.5
60	9 6	14 58	0 58	2 46	11 47	.5	3 12	3.9
S								

SUNCE UT	SUNCE $e = T_p - UT$	SUNCE Δ/24	SUNCE r	MJESEC Prolaz	MJESEC Δ/24	MJESEC $\pi_\leftmoon$	MJESEC r
h	min s	s	′	h min	min	′	′
00	- 1 41.5	-.5	15.8	$T_{\overline{m}}$ 20 2	2.2	58.2	15.9
12	- 1 48.0	$T_{\overline{m}_\odot}$ 12 h	1.8 min	Starost 8.5 d	Faza ◐		

PLANETE

Pl.	$T_{\overline{m}}$	π	360−α	Vel.	Pl.	$T_{\overline{m}}$	π	360−α	Vel.
	h min	′	°			h min	′	°	
♀	14 47	.1	229	-3.9	♃	6 11	.0	358	-2.3
♂	16 40	.1	201	1.3	♄	17 58	.0	181	1.0

UT	SUNCE $S_\odot$	SUNCE $\delta_\odot$	PROLJ. TAČKA S_Υ	VENERA S_φ	VENERA δ_φ	MARS S_σ	MARS δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	179 31.3	23 26.2	270 3.9	138 12.3	19 55.8	110 6.2	9 34.3
2	209 31.1	23 26.2	300 8.8	168 11.3	19 54.2	140 8.5	9 33.2
4	239 30.8	23 26.2	330 13.7	198 10.3	19 52.6	170 10.9	9 32.1
6	269 30.5	23 26.2	0 18.7	228 9.3	19 51.0	200 13.3	9 31.0
8	299 30.2	23 26.1	30 23.6	258 8.4	19 49.4	230 15.7	9 29.9
10	329 30.0	23 26.1	60 28.5	288 7.4	19 47.8	260 18.0	9 28.8
12	359 29.7	23 26.1	90 33.5	318 6.4	19 46.2	290 20.4	9 27.7
14	29 29.4	23 26.0	120 38.4	348 5.4	19 44.6	320 22.8	9 26.6
16	59 29.2	23 26.0	150 43.3	18 4.5	19 42.9	350 25.1	9 25.5
18	89 28.9	23 26.0	180 48.2	48 3.5	19 41.3	20 27.5	9 24.4
20	119 28.6	23 25.9	210 53.2	78 2.5	19 39.7	50 29.8	9 23.2
22	149 28.4	23 25.9	240 58.1	108 1.5	19 38.1	80 32.2	9 22.1
Δ	−1	0		−5	−8	12	−6

UT	MJESEC $S_\leftmoon$	MJESEC Δ	MJESEC $\delta_\leftmoon$	MJESEC Δ	JUPITER $S_\jupiter$	JUPITER $\delta_\jupiter$	SATURN $S_\saturn$	SATURN $\delta_\saturn$
h	° ′		° ′		° ′	° ′	° ′	° ′
0	57 24.2	96	−18 15.3	−100	267 53.7	− 0 24.5	90 44.6	2 51.1
2	86 21.5	95	−18 35.3	−98	297 58.2	− 0 24.3	120 49.4	2 51.0
4	115 18.5	94	−18 54.8	−95	328 2.7	− 0 24.2	150 54.1	2 50.9
6	144 15.4	94	−19 13.9	−93	358 7.2	− 0 24.0	180 58.9	2 50.9
8	173 12.1	93	−19 32.5	−91	28 11.7	− 0 23.8	211 3.7	2 50.8
10	202 8.7	92	−19 50.7	−89	58 16.1	− 0 23.7	241 8.4	2 50.7
12	231 5.1	91	−20 8.5	−86	88 20.6	− 0 23.5	271 13.2	2 50.6
14	260 1.3	90	−20 25.7	−84	118 25.1	− 0 23.3	301 17.9	2 50.5
16	288 57.3	89	−20 42.5	−82	148 29.6	− 0 23.2	331 22.7	2 50.4
18	317 53.2	89	−20 58.8	−79	178 34.1	− 0 23.0	1 27.5	2 50.3
20	346 49.0	88	−21 14.7	−77	208 38.6	− 0 22.8	31 32.2	2 50.2
22	15 44.5	87	−21 30.0	−74	238 43.1	− 0 22.7	61 37.0	2 50.1
Δ					22	1	24	0

φ	SUNCE IZLAZ	SUNCE ZALAZ	TRAJANJE SUMRAKA GRAĐ.	TRAJANJE SUMRAKA ASTR.	MJESEC IZLAZ	MJESEC Δ/24	MJESEC ZALAZ	MJESEC Δ/24
N	h min	h min	h min	h min	h min	min	h min	min
60	2 36	21 28	1 46	: ::	17 35	3.6	.. ..	.0
55	3 21	20 43	0 58	: ::	16 59	3.2	0 17	1.0
50	3 51	20 13	0 45	: ::	16 34	3.0	0 38	1.3
45	4 13	19 51	0 37	2 33	16 15	2.9	0 54	1.5
40	4 32	19 33	0 33	2 3	15 59	2.7	1 7	1.6
35	4 47	19 17	0 30	1 47	15 46	2.7	1 18	1.7
30	4 60	19 4	0 27	1 37	15 34	2.6	1 28	1.8
20	5 22	18 42	0 25	1 24	15 15	2.5	1 45	2.0
10	5 41	18 23	0 23	1 18	14 58	2.3	2 0	2.1
0	5 58	18 6	0 23	1 15	14 42	2.2	2 15	2.2
10	6 16	17 48	0 23	1 15	14 26	2.1	2 29	2.3
20	6 34	17 30	0 24	1 19	14 10	2.0	2 44	2.5
30	6 56	17 8	0 26	1 26	13 51	1.9	3 1	2.6
35	7 8	16 56	0 28	1 31	13 40	1.8	3 12	2.7
40	7 22	16 42	0 31	1 38	13 27	1.7	3 23	2.8
45	7 39	16 25	0 34	1 47	13 12	1.6	3 37	2.9
50	7 60	16 4	0 39	1 60	12 54	1.4	3 54	3.1
55	8 27	15 37	0 46	2 18	12 31	1.2	4 16	3.4
60	9 6	14 58	0 58	2 46	11 59	.8	4 46	3.8
S								

SUNCE UT	SUNCE $e = T_p - UT$	SUNCE Δ/24	SUNCE r	MJESEC Prolaz	MJESEC Δ/24	MJESEC $\pi_\leftmoon$	MJESEC r
h	min s	s	′	h min	min	′	′
00	− 1 54.5	−.5	15.8	$T_{\overline{m}}$ 20 55	2.3	57.7	15.7
12	− 2 1.0	$T_{\overline{m}_\odot}$ 12 h 2.0 min		Starost 9.5 d	Faza ◐		

PLANETE

Pl.	$T_{\overline{m}}$	π	360−α	Vel.	Pl.	$T_{\overline{m}}$	π	360−α	Vel.
	h min	′	°			h min	′	°	
♀	14 48	.1	228	−3.9	♃	6 8	.0	358	−2.3
♂	16 38	.1	200	1.3	♄	17 54	.0	181	1.0

UT	SUNCE $S_\odot$	SUNCE $\delta_\odot$	PROLJ. TAČKA S_Υ	VENERA S_φ	VENERA δ_φ	MARS S_σ	MARS δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	179 28.1	23 25.8	271 3.0	138 .6	19 36.4	110 34.6	9 21.0
2	209 27.8	23 25.8	301 8.0	167 59.6	19 34.8	140 36.9	9 19.9
4	239 27.5	23 25.7	331 12.9	197 58.7	19 33.2	170 39.3	9 18.8
6	269 27.3	23 25.6	1 17.8	227 57.7	19 31.5	200 41.7	9 17.7
8	299 27.0	23 25.6	31 22.7	257 56.8	19 29.9	230 44.0	9 16.6
10	329 26.7	23 25.5	61 27.7	287 55.8	19 28.2	260 46.4	9 15.5
12	359 26.5	23 25.4	91 32.6	317 54.9	19 26.6	290 48.7	9 14.3
14	29 26.2	23 25.4	121 37.5	347 53.9	19 24.9	320 51.1	9 13.2
16	59 25.9	23 25.3	151 42.5	17 53.0	19 23.3	350 53.5	9 12.1
18	89 25.7	23 25.2	181 47.4	47 52.0	19 21.6	20 55.8	9 11.0
20	119 25.4	23 25.1	211 52.3	77 51.1	19 19.9	50 58.2	9 9.9
22	149 25.1	23 25.1	241 57.2	107 50.2	19 18.3	81 .5	9 8.8
Δ	−1	0		−5	−8	12	−6

UT	MJESEC $S_\leftmoon$	MJESEC Δ	MJESEC $\delta_\leftmoon$	MJESEC Δ	JUPITER $S_\jupiter$	JUPITER $\delta_\jupiter$	SATURN $S_\saturn$	SATURN $\delta_\saturn$
h	° ′		° ′		° ′	° ′	° ′	° ′
0	44 40.0	86	−21 44.8	−72	268 47.5	− 0 22.5	91 41.7	2 50.0
2	73 35.2	86	−21 59.2	−69	298 52.0	− 0 22.3	121 46.5	2 49.9
4	102 30.4	85	−22 13.0	−67	328 56.5	− 0 22.2	151 51.3	2 49.8
6	131 25.4	84	−22 26.3	−64	359 1.0	− 0 22.0	181 56.0	2 49.7
8	160 20.3	84	−22 39.1	−61	29 5.5	− 0 21.8	212 .8	2 49.7
10	189 15.1	83	−22 51.4	−59	59 10.0	− 0 21.7	242 5.5	2 49.6
12	218 9.7	83	−23 3.1	−56	89 14.5	− 0 21.5	272 10.3	2 49.5
14	247 4.2	82	−23 14.3	−53	119 19.0	− 0 21.3	302 15.0	2 49.4
16	275 58.7	82	−23 25.0	−51	149 23.5	− 0 21.2	332 19.8	2 49.3
18	304 53.0	81	−23 35.1	−48	179 28.0	− 0 21.0	2 24.5	2 49.2
20	333 47.3	81	−23 44.7	−45	209 32.5	− 0 20.9	32 29.3	2 49.1
22	2 41.5	81	−23 53.7	−42	239 37.0	− 0 20.7	62 34.0	2 49.0
Δ					22	1	24	0

φ	SUNCE IZLAZ	SUNCE ZALAZ	TRAJANJE SUMRAKA GRAĐ.	TRAJANJE SUMRAKA ASTR.	MJESEC IZLAZ	MJESEC Δ/24	MJESEC ZALAZ	MJESEC Δ/24
N	h min	h min	h min	h min	h min	min	h min	min
60	2 36	21 28	1 46	: ::	19 2	3.0	0 5	1.0
55	3 21	20 43	0 58	: ::	18 17	2.8	0 42	1.4
50	3 51	20 13	0 45	: ::	17 46	2.7	1 9	1.6
45	4 14	19 51	0 37	2 33	17 23	2.6	1 29	1.8
40	4 32	19 33	0 33	2 3	17 5	2.5	1 45	1.9
35	4 47	19 18	0 30	1 47	16 49	2.5	1 59	1.9
30	4 60	19 5	0 27	1 37	16 36	2.5	2 11	2.0
20	5 22	18 42	0 25	1 24	16 13	2.4	2 32	2.1
10	5 41	18 24	0 23	1 18	15 54	2.3	2 51	2.2
0	5 59	18 6	0 23	1 15	15 36	2.3	3 8	2.3
10	6 16	17 48	0 23	1 15	15 18	2.2	3 25	2.3
20	6 35	17 30	0 24	1 19	14 58	2.2	3 43	2.4
30	6 56	17 9	0 26	1 26	14 36	2.1	4 4	2.5
35	7 8	16 56	0 28	1 31	14 23	2.0	4 16	2.6
40	7 22	16 42	0 31	1 38	14 8	2.0	4 31	2.7
45	7 39	16 25	0 34	1 47	13 51	1.9	4 48	2.7
50	8 0	16 4	0 39	1 60	13 29	1.8	5 9	2.9
55	8 27	15 37	0 46	2 18	13 0	1.7	5 37	3.0
60	9 6	14 58	0 58	2 46	12 19	1.4	6 16	3.4
S								

SUNCE UT	SUNCE $e = T_p - UT$	SUNCE Δ/24	SUNCE r	MJESEC Prolaz	MJESEC Δ/24	MJESEC $\pi_\leftmoon$	MJESEC r
h	min s	s	′	h min	min	′	′
00	− 2 7.5	−.5	15.8	$T_{\overline{m}}$ 21 49	2.3	57.2	15.6
12	− 2 13.9	$T_{\overline{m}_\odot}$ 12 h 2.2 min		Starost 10.5 d	Faza ◐		

PLANETE

Pl.	$T_{\overline{m}}$	π	360−α	Vel.	Pl.	$T_{\overline{m}}$	π	360−α	Vel.
	h min	′	°			h min	′	°	
♀	14 48	.1	227	−3.9	♃	6 4	.0	358	−2.3
♂	16 36	.1	200	1.3	♄	17 50	.0	181	1.0

UT	SUNCE $S_\odot$	SUNCE $\delta_\odot$	PROLJ. TAČKA S_Υ	VENERA S_φ	VENERA δ_φ	MARS S_σ	MARS δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	179 24.9	23 25.0	272 2.2	137 49.3	19 16.6	111 2.9	9 7.7
2	209 24.6	23 24.9	302 7.1	167 48.3	19 14.9	141 5.3	9 6.5
4	239 24.3	23 24.8	332 12.0	197 47.4	19 13.3	171 7.6	9 5.4
6	269 24.1	23 24.7	2 17.0	227 46.5	19 11.6	201 10.0	9 4.3
8	299 23.8	23 24.6	32 21.9	257 45.6	19 9.9	231 12.3	9 3.2
10	329 23.5	23 24.5	62 26.8	287 44.7	19 8.2	261 14.7	9 2.1
12	359 23.3	23 24.4	92 31.7	317 43.7	19 6.5	291 17.0	9 .9
14	29 23.0	23 24.3	122 36.7	347 42.8	19 4.8	321 19.4	8 59.8
16	59 22.7	23 24.2	152 41.6	17 41.9	19 3.1	351 21.7	8 58.7
18	89 22.5	23 24.1	182 46.5	47 41.0	19 1.4	21 24.1	8 57.6
20	119 22.2	23 24.0	212 51.4	77 40.1	18 59.7	51 26.5	8 56.5
22	149 21.9	23 23.9	242 56.4	107 39.2	18 58.0	81 28.8	8 55.3
Δ	-1	-1		-5	-8	12	-6

UT	MJESEC $S_\leftmoon$	MJESEC Δ	MJESEC $\delta_\leftmoon$	MJESEC Δ	JUPITER S_4	JUPITER δ_4	SATURN S_η	SATURN δ_η
h	° ′		° ′		° ′	° ′	° ′	° ′
0	31 35.7	80	-24 2.2	-40	269 41.5	- 0 20.5	92 38.8	2 48.9
2	60 29.7	80	-24 10.1	-37	299 46.0	- 0 20.4	122 43.5	2 48.8
4	89 23.8	80	-24 17.5	-34	329 50.5	- 0 20.2	152 48.3	2 48.7
6	118 17.8	80	-24 24.3	-31	359 55.0	- 0 20.1	182 53.0	2 48.6
8	147 11.7	80	-24 30.5	-28	29 59.5	- 0 19.9	212 57.8	2 48.5
10	176 5.7	80	-24 36.2	-26	60 4.0	- 0 19.8	243 2.5	2 48.4
12	204 59.6	80	-24 41.3	-23	90 8.5	- 0 19.6	273 7.3	2 48.3
14	233 53.6	80	-24 45.9	-20	120 13.0	- 0 19.4	303 12.0	2 48.2
16	262 47.5	80	-24 49.9	-17	150 17.5	- 0 19.3	333 16.8	2 48.1
18	291 41.5	80	-24 53.3	-14	180 22.1	- 0 19.1	3 21.5	2 48.0
20	320 35.6	80	-24 56.2	-12	210 26.6	- 0 19.0	33 26.3	2 47.9
22	349 29.6	81	-24 58.5	-9	240 31.1	- 0 18.8	63 31.0	2 47.8
Δ					23	1	24	0

φ	SUNCE IZLAZ	SUNCE ZALAZ	TRAJANJE SUMRAKA GRAĐ.	TRAJANJE SUMRAKA ASTR.	MJESEC IZLAZ	MJESEC Δ/24	MJESEC ZALAZ	MJESEC Δ/24
N	h min	h min	h min	h min	h min	min	h min	min
60	2 37	21 28	1 45	: ::	20 15	2.1	0 30	1.7
55	3 21	20 43	0 58	: ::	19 24	2.2	1 16	1.9
50	3 51	20 13	0 45	: ::	18 50	2.2	1 47	2.0
45	4 14	19 51	0 37	2 33	18 26	2.2	2 11	2.1
40	4 32	19 33	0 33	2 3	18 6	2.2	2 30	2.1
35	4 47	19 18	0 30	1 47	17 49	2.3	2 46	2.2
30	5 0	19 5	0 27	1 37	17 35	2.3	2 59	2.2
20	5 22	18 43	0 25	1 24	17 11	2.3	3 23	2.2
10	5 41	18 24	0 23	1 18	16 50	2.3	3 43	2.3
0	5 59	18 6	0 23	1 15	16 30	2.3	4 2	2.3
10	6 16	17 49	0 23	1 15	16 11	2.3	4 21	2.3
20	6 35	17 30	0 24	1 19	15 50	2.3	4 41	2.3
30	6 56	17 9	0 26	1 26	15 26	2.3	5 5	2.4
35	7 8	16 57	0 28	1 31	15 12	2.3	5 19	2.4
40	7 23	16 42	0 31	1 38	14 56	2.2	5 35	2.4
45	7 39	16 26	0 34	1 47	14 37	2.2	5 54	2.4
50	8 0	16 5	0 39	1 60	14 12	2.2	6 18	2.5
55	8 27	15 38	0 46	2 18	13 40	2.2	6 49	2.5
60	9 6	14 59	0 58	2 46	12 52	2.1	7 37	2.6
S								

SUNCE UT	SUNCE $e = T_p - UT$	SUNCE Δ/24	SUNCE r	MJESEC Prolaz	MJESEC Δ/24	MJESEC $\pi_\leftmoon$	MJESEC r
h	min s	s	′	h min	min	′	′
00	- 2 20.4	-.5	15.8	$T_{\overline{m}}$ 22 44	2.2	56.7	15.4
12	- 2 26.8	$T_{\overline{m}_\odot}$ 12 h 2.4 min		Starost 11.5 d	Faza ◐		

PLANETE Pl.	$T_{\overline{m}}$	π	360−α	Vel.	Pl.	$T_{\overline{m}}$	π	360−α	Vel.
	h min	′	°			h min	′	°	
♀	14 49	.1	226	-3.9	♃	6 0	.0	358	-2.3
♂	16 35	.1	199	1.3	♄	17 47	.0	181	1.0

UT	SUNCE $S_\odot$	SUNCE $\delta_\odot$	PROLJ. TAČKA S_Υ	VENERA S_φ	VENERA δ_φ	MARS S_σ	MARS δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	179 21.7	23 23.7	273 1.3	137 38.3	18 56.3	111 31.2	8 54.2
2	209 21.4	23 23.6	303 6.2	167 37.4	18 54.6	141 33.5	8 53.1
4	239 21.1	23 23.5	333 11.2	197 36.5	18 52.9	171 35.9	8 52.0
6	269 20.9	23 23.4	3 16.1	227 35.7	18 51.2	201 38.2	8 50.9
8	299 20.6	23 23.2	33 21.0	257 34.8	18 49.4	231 40.6	8 49.7
10	329 20.3	23 23.1	63 25.9	287 33.9	18 47.7	261 42.9	8 48.6
12	359 20.1	23 23.0	93 30.9	317 33.0	18 46.0	291 45.3	8 47.5
14	29 19.8	23 22.8	123 35.8	347 32.1	18 44.2	321 47.6	8 46.4
16	59 19.6	23 22.7	153 40.7	17 31.3	18 42.5	351 50.0	8 45.2
18	89 19.3	23 22.5	183 45.7	47 30.4	18 40.8	21 52.3	8 44.1
20	119 19.0	23 22.4	213 50.6	77 29.5	18 39.0	51 54.7	8 43.0
22	149 18.8	23 22.2	243 55.5	107 28.7	18 37.3	81 57.0	8 41.8
Δ	-1	-1		-4	-9	12	-6

UT	MJESEC $S_\leftmoon$	MJESEC Δ	MJESEC $\delta_\leftmoon$	MJESEC Δ	JUPITER S_4	JUPITER δ_4	SATURN S_η	SATURN δ_η
h	° ′		° ′		° ′	° ′	° ′	° ′
0	18 23.8	81	-25 .3	-6	270 35.6	- 0 18.7	93 35.8	2 47.7
2	47 18.0	81	-25 1.4	-3	300 40.1	- 0 18.5	123 40.5	2 47.6
4	76 12.3	82	-25 2.1	0	330 44.6	- 0 18.4	153 45.2	2 47.5
6	105 6.6	82	-25 2.1	2	0 49.1	- 0 18.2	183 50.0	2 47.4
8	134 1.1	83	-25 1.7	5	30 53.7	- 0 18.1	213 54.7	2 47.3
10	162 55.7	84	-25 .6	8	60 58.2	- 0 17.9	243 59.5	2 47.2
12	191 50.4	84	-24 59.1	11	91 2.7	- 0 17.8	274 4.2	2 47.1
14	220 45.2	85	-24 56.9	13	121 7.2	- 0 17.6	304 8.9	2 47.0
16	249 40.2	86	-24 54.3	16	151 11.7	- 0 17.5	334 13.7	2 46.9
18	278 35.3	86	-24 51.0	19	181 16.3	- 0 17.3	4 18.4	2 46.8
20	307 30.6	87	-24 47.3	21	211 20.8	- 0 17.2	34 23.2	2 46.7
22	336 26.1	88	-24 43.0	24	241 25.3	- 0 17.0	64 27.9	2 46.6
Δ					23	1	24	-1

φ	SUNCE IZLAZ	SUNCE ZALAZ	TRAJANJE SUMRAKA GRAĐ.	TRAJANJE SUMRAKA ASTR.	MJESEC IZLAZ	MJESEC Δ/24	MJESEC ZALAZ	MJESEC Δ/24
N	h min	h min	h min	h min	h min	min	h min	min
60	2 37	21 28	1 45	: ::	21 6	1.3	1 12	2.5
55	3 22	20 43	0 58	: ::	20 17	1.6	2 2	2.5
50	3 52	20 13	0 45	: ::	19 44	1.8	2 36	2.4
45	4 14	19 51	0 37	2 33	19 19	1.9	3 1	2.4
40	4 32	19 33	0 33	2 3	18 60	1.9	3 21	2.4
35	4 47	19 18	0 30	1 47	18 43	2.0	3 37	2.3
30	5 0	19 5	0 27	1 37	18 29	2.0	3 52	2.3
20	5 22	18 43	0 25	1 24	18 5	2.1	4 16	2.3
10	5 41	18 24	0 23	1 18	17 44	2.1	4 37	2.3
0	5 59	18 6	0 23	1 15	17 25	2.2	4 57	2.2
10	6 16	17 49	0 23	1 15	17 5	2.2	5 16	2.2
20	6 35	17 30	0 24	1 19	16 45	2.3	5 37	2.2
30	6 56	17 9	0 26	1 26	16 20	2.4	6 2	2.1
35	7 8	16 57	0 28	1 31	16 6	2.4	6 16	2.1
40	7 23	16 43	0 31	1 38	15 50	2.4	6 32	2.1
45	7 39	16 26	0 34	1 47	15 30	2.5	6 52	2.1
50	8 0	16 5	0 38	1 59	15 6	2.6	7 17	2.0
55	8 27	15 38	0 46	2 18	14 33	2.7	7 50	1.9
60	9 6	14 59	0 58	2 46	13 43	2.9	8 39	1.7
S								

SUNCE UT	SUNCE $e = T_p - UT$	SUNCE Δ/24	SUNCE r	MJESEC Prolaz	MJESEC Δ/24	MJESEC $\pi_\leftmoon$	MJESEC r
h	min s	s	′	h min	min	′	′
00	- 2 33.1	-.5	15.8	$T_{\overline{m}}$ 23 38	2.2	56.2	15.3
12	- 2 39.5	$T_{\overline{m}_\odot}$ 12 h 2.7 min		Starost 12.5 d	Faza ○		

PLANETE Pl.	$T_{\overline{m}}$	π	360−α	Vel.	Pl.	$T_{\overline{m}}$	π	360−α	Vel.
	h min	′	°			h min	′	°	
♀	14 50	.1	225	-3.9	♃	5 57	.0	358	-2.3
♂	16 33	.1	198	1.3	♄	17 43	.0	181	1.0

UT	SUNCE $S_\odot$	SUNCE $\delta_\odot$	PROLJ. TAČKA S_Υ	VENERA S_φ	VENERA δ_φ	MARS S_σ	MARS δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	179 18.5	23 22.1	274 .4	137 27.8	18 35.5	111 59.4	8 40.7
2	209 18.2	23 21.9	304 5.4	167 26.9	18 33.8	142 1.7	8 39.6
4	239 18.0	23 21.8	334 10.3	197 26.1	18 32.0	172 4.1	8 38.5
6	269 17.7	23 21.6	4 15.2	227 25.2	18 30.3	202 6.4	8 37.3
8	299 17.5	23 21.4	34 20.2	257 24.4	18 28.5	232 8.7	8 36.2
10	329 17.2	23 21.3	64 25.1	287 23.5	18 26.8	262 11.1	8 35.1
12	359 16.9	23 21.1	94 30.0	317 22.7	18 25.0	292 13.4	8 33.9
14	29 16.7	23 20.9	124 34.9	347 21.9	18 23.2	322 15.8	8 32.8
16	59 16.4	23 20.7	154 39.9	17 21.0	18 21.4	352 18.1	8 31.7
18	89 16.2	23 20.6	184 44.8	47 20.2	18 19.7	22 20.5	8 30.5
20	119 15.9	23 20.4	214 49.7	77 19.3	18 17.9	52 22.8	8 29.4
22	149 15.6	23 20.2	244 54.7	107 18.5	18 16.1	82 25.2	8 28.3
Δ	-1	-1		-4	-9	12	-6

UT	MJESEC $S_\leftmoon$	MJESEC Δ	MJESEC $\delta_\leftmoon$	MJESEC Δ	JUPITER $S_\jupiter$	JUPITER $\delta_\jupiter$	SATURN $S_\saturn$	SATURN $\delta_\saturn$
h	° ′		° ′		° ′	° ′	° ′	° ′
0	5 21.7	89	-24 38.2	27	271 29.9	- 0 16.9	94 32.6	2 46.5
2	34 17.6	90	-24 32.9	29	301 34.4	- 0 16.7	124 37.4	2 46.4
4	63 13.6	91	-24 27.1	32	331 38.9	- 0 16.6	154 42.1	2 46.3
6	92 9.8	92	-24 20.7	34	1 43.4	- 0 16.4	184 46.8	2 46.2
8	121 6.3	93	-24 13.9	37	31 48.0	- 0 16.3	214 51.6	2 46.1
10	150 3.0	95	-24 6.5	39	61 52.5	- 0 16.1	244 56.3	2 46.0
12	178 59.9	96	-23 58.7	42	91 57.0	- 0 16.0	275 1.0	2 45.9
14	207 57.0	97	-23 50.3	44	122 1.6	- 0 15.8	305 5.8	2 45.8
16	236 54.4	98	-23 41.5	46	152 6.1	- 0 15.7	335 10.5	2 45.7
18	265 52.0	99	-23 32.2	49	182 10.6	- 0 15.5	5 15.2	2 45.6
20	294 49.9	101	-23 22.5	51	212 15.2	- 0 15.4	35 20.0	2 45.5
22	323 48.0	102	-23 12.3	53	242 19.7	- 0 15.3	65 24.7	2 45.4
Δ					23	1	24	-1

φ	SUNCE IZLAZ	SUNCE ZALAZ	TRAJANJE SUMRAKA GRAĐ.	TRAJANJE SUMRAKA ASTR.	MJESEC IZLAZ	MJESEC Δ/24	MJESEC ZALAZ	MJESEC Δ/24
N	h min	h min	h min	h min	h min	min	h min	min
60	2 38	21 28	1 44	: ::	21 37	.8	2 13	3.2
55	3 22	20 43	0 58	: ::	20 55	1.1	3 2	2.9
50	3 52	20 13	0 45	: ::	20 26	1.4	3 34	2.7
45	4 15	19 51	0 37	2 33	20 4	1.5	3 58	2.6
40	4 33	19 33	0 33	2 3	19 46	1.6	4 17	2.5
35	4 48	19 18	0 30	1 47	19 31	1.7	4 34	2.4
30	5 1	19 5	0 27	1 36	19 18	1.8	4 47	2.4
20	5 23	18 43	0 25	1 24	18 55	1.9	5 11	2.3
10	5 42	18 24	0 23	1 18	18 36	2.0	5 32	2.2
0	5 59	18 7	0 23	1 15	18 18	2.1	5 51	2.1
10	6 17	17 49	0 23	1 15	17 59	2.2	6 9	2.1
20	6 35	17 31	0 24	1 19	17 40	2.3	6 30	2.0
30	6 56	17 10	0 26	1 25	17 17	2.4	6 53	1.9
35	7 9	16 57	0 28	1 31	17 4	2.5	7 7	1.8
40	7 23	16 43	0 31	1 38	16 49	2.5	7 23	1.8
45	7 40	16 26	0 34	1 47	16 30	2.6	7 41	1.7
50	8 0	16 6	0 38	1 59	16 7	2.8	8 5	1.6
55	8 27	15 39	0 45	2 18	15 37	3.0	8 35	1.4
60	9 6	15 0	0 58	2 46	14 53	3.3	9 21	1.0
S								

SUNCE UT	SUNCE $e = T_p - UT$	SUNCE Δ/24	SUNCE r	MJESEC Prolaz	MJESEC Δ/24	MJESEC $\pi_\leftmoon$	MJESEC r
h	min s	s	′	h min	min	′	′
00	- 2 45.8	-.5	15.8	.. ..	1.0	55.7	15.2
12	- 2 52.1	$T_{\overline{m}_\odot}$ 12 h 2.9 min		Starost 13.5 d	Faza ○		

PLANETE

Pl.	$T_{\overline{m}}$	π	360−α	Vel.	Pl.	$T_{\overline{m}}$	π	360−α	Vel.
	h min	′	°			h min	′	°	
♀	14 51	.1	223	-3.9	♃	5 53	.0	357	-2.3
♂	16 31	.1	198	1.3	♄	17 39	.0	181	1.0

UT	SUNCE $S_\odot$	SUNCE $\delta_\odot$	PROLJ. TAČKA S_Υ	VENERA S_φ	VENERA δ_φ	MARS S_σ	MARS δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	179 15.4	23 20.0	274 59.6	137 17.7	18 14.3	112 27.5	8 27.1
2	209 15.1	23 19.8	305 4.5	167 16.9	18 12.5	142 29.8	8 26.0
4	239 14.9	23 19.6	335 9.4	197 16.0	18 10.7	172 32.2	8 24.9
6	269 14.6	23 19.4	5 14.4	227 15.2	18 9.0	202 34.5	8 23.7
8	299 14.3	23 19.2	35 19.3	257 14.4	18 7.2	232 36.9	8 22.6
10	329 14.1	23 19.0	65 24.2	287 13.6	18 5.4	262 39.2	8 21.5
12	359 13.8	23 18.8	95 29.2	317 12.8	18 3.6	292 41.5	8 20.3
14	29 13.6	23 18.6	125 34.1	347 12.0	18 1.8	322 43.9	8 19.2
16	59 13.3	23 18.4	155 39.0	17 11.2	17 59.9	352 46.2	8 18.0
18	89 13.1	23 18.2	185 43.9	47 10.4	17 58.1	22 48.6	8 16.9
20	119 12.8	23 18.0	215 48.9	77 9.6	17 56.3	52 50.9	8 15.8
22	149 12.5	23 17.8	245 53.8	107 8.8	17 54.5	82 53.2	8 14.6
Δ	-1	-1		-4	-9	12	-6

UT	MJESEC $S_\leftmoon$	MJESEC Δ	MJESEC $\delta_\leftmoon$	MJESEC Δ	JUPITER $S_\jupiter$	JUPITER $\delta_\jupiter$	SATURN $S_\saturn$	SATURN $\delta_\saturn$
h	° ′		° ′		° ′	° ′	° ′	° ′
0	352 46.4	103	-23 1.6	56	272 24.3	- 0 15.1	95 29.4	2 45.3
2	21 45.1	105	-22 50.5	58	302 28.8	- 0 15.0	125 34.1	2 45.2
4	50 44.0	106	-22 38.9	60	332 33.3	- 0 14.8	155 38.9	2 45.1
6	79 43.2	107	-22 26.9	62	2 37.9	- 0 14.7	185 43.6	2 44.9
8	108 42.7	109	-22 14.5	64	32 42.4	- 0 14.6	215 48.3	2 44.8
10	137 42.5	110	-22 1.7	66	62 47.0	- 0 14.4	245 53.1	2 44.7
12	166 42.6	112	-21 48.4	68	92 51.5	- 0 14.3	275 57.8	2 44.6
14	195 42.9	113	-21 34.8	70	122 56.1	- 0 14.1	306 2.5	2 44.5
16	224 43.6	115	-21 20.7	72	153 .6	- 0 14.0	336 7.2	2 44.4
18	253 44.5	116	-21 6.3	74	183 5.2	- 0 13.9	6 12.0	2 44.3
20	282 45.7	118	-20 51.5	76	213 9.7	- 0 13.7	36 16.7	2 44.2
22	311 47.2	119	-20 36.3	78	243 14.3	- 0 13.6	66 21.4	2 44.1
Δ					23	1	24	-1

φ	SUNCE IZLAZ	SUNCE ZALAZ	TRAJANJE SUMRAKA GRAĐ.	TRAJANJE SUMRAKA ASTR.	MJESEC IZLAZ	MJESEC Δ/24	MJESEC ZALAZ	MJESEC Δ/24
N	h min	h min	h min	h min	h min	min	h min	min
60	2 38	21 27	1 43	: ::	21 56	.5	3 29	3.5
55	3 23	20 43	0 58	: ::	21 23	.8	4 10	3.1
50	3 53	20 13	0 44	: ::	20 59	1.1	4 39	2.8
45	4 15	19 51	0 37	2 32	20 40	1.2	5 0	2.7
40	4 33	19 33	0 33	2 3	20 25	1.4	5 18	2.6
35	4 48	19 18	0 30	1 47	20 12	1.5	5 32	2.5
30	5 1	19 5	0 27	1 36	20 0	1.6	5 45	2.4
20	5 23	18 43	0 25	1 24	19 41	1.7	6 6	2.3
10	5 42	18 24	0 23	1 18	19 24	1.8	6 25	2.1
0	5 59	18 7	0 23	1 15	19 8	2.0	6 42	2.0
10	6 17	17 49	0 23	1 15	18 52	2.1	6 59	1.9
20	6 35	17 31	0 24	1 19	18 34	2.2	7 18	1.8
30	6 56	17 10	0 26	1 25	18 15	2.4	7 39	1.7
35	7 9	16 58	0 28	1 31	18 3	2.5	7 51	1.6
40	7 23	16 43	0 31	1 38	17 50	2.6	8 5	1.5
45	7 40	16 27	0 34	1 47	17 34	2.7	8 22	1.4
50	8 0	16 6	0 38	1 59	17 14	2.9	8 42	1.2
55	8 27	15 39	0 45	2 17	16 49	3.1	9 8	1.0
60	9 6	15 1	0 58	2 46	16 12	3.5	9 46	.6
S								

SUNCE UT	SUNCE $e = T_p - UT$	SUNCE Δ/24	SUNCE r	MJESEC Prolaz	MJESEC Δ/24	MJESEC $\pi_\leftmoon$	MJESEC r
h	min s	s	′	h min	min	′	′
00	- 2 58.3	-.5	15.8	0 30	2.0	55.3	15.1
12	- 3 4.5	$T_{\overline{m}_\odot}$ 12 h 3.1 min		Starost 14.5 d	Faza ○		

PLANETE

Pl.	$T_{\overline{m}}$	π	360−α	Vel.	Pl.	$T_{\overline{m}}$	π	360−α	Vel.
	h min	′	°			h min	′	°	
♀	14 51	.1	222	-3.9	♃	5 49	.0	357	-2.3
♂	16 29	.1	197	1.3	♄	17 35	.0	180	1.0

UT	SUNCE $S_\odot$	SUNCE $\delta_\odot$	PROLJ. TAČKA S_Υ	VENERA S_φ	VENERA δ_φ	MARS S_σ	MARS δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	179 12.3	23 17.5	275 58.7	137 8.0	17 52.7	112 55.6	8 13.5
2	209 12.0	23 17.3	306 3.6	167 7.2	17 50.9	142 57.9	8 12.4
4	239 11.8	23 17.1	336 8.6	197 6.4	17 49.0	173 .2	8 11.2
6	269 11.5	23 16.9	6 13.5	227 5.6	17 47.2	203 2.6	8 10.1
8	299 11.3	23 16.6	36 18.4	257 4.8	17 45.4	233 4.9	8 8.9
10	329 11.0	23 16.4	66 23.4	287 4.0	17 43.5	263 7.2	8 7.8
12	359 10.8	23 16.1	96 28.3	317 3.3	17 41.7	293 9.6	8 6.6
14	29 10.5	23 15.9	126 33.2	347 2.5	17 39.9	323 11.9	8 5.5
16	59 10.3	23 15.7	156 38.1	17 1.7	17 38.0	353 14.2	8 4.4
18	89 10.0	23 15.4	186 43.1	47 1.0	17 36.2	23 16.6	8 3.2
20	119 9.7	23 15.2	216 48.0	77 .2	17 34.3	53 18.9	8 2.1
22	149 9.5	23 14.9	246 52.9	106 59.4	17 32.5	83 21.2	8 .9
Δ	-1	-1		-4	-9	12	-6

UT	MJESEC $S_\leftmoon$	MJESEC Δ	MJESEC $\delta_\leftmoon$	MJESEC Δ	JUPITER S_4	JUPITER δ_4	SATURN S_η	SATURN δ_η
h	° ′		° ′		° ′	° ′	° ′	° ′
0	340 49.0	120	-20 20.8	80	273 18.8	- 0 13.4	96 26.1	2 44.0
2	9 51.1	122	-20 4.9	81	303 23.4	- 0 13.3	126 30.8	2 43.9
4	38 53.5	123	-19 48.6	83	333 27.9	- 0 13.2	156 35.6	2 43.8
6	67 56.2	125	-19 32.0	85	3 32.5	- 0 13.0	186 40.3	2 43.7
8	96 59.1	126	-19 15.1	86	33 37.0	- 0 12.9	216 45.0	2 43.5
10	126 2.4	128	-18 57.8	88	63 41.6	- 0 12.8	246 49.7	2 43.4
12	155 5.9	129	-18 40.2	89	93 46.2	- 0 12.6	276 54.4	2 43.3
14	184 9.7	131	-18 22.4	91	123 50.7	- 0 12.5	306 59.2	2 43.2
16	213 13.9	132	-18 4.2	92	153 55.3	- 0 12.4	337 3.9	2 43.1
18	242 18.2	133	-17 45.7	94	183 59.8	- 0 12.2	7 8.6	2 43.0
20	271 22.9	135	-17 26.9	95	214 4.4	- 0 12.1	37 13.3	2 42.9
22	300 27.8	136	-17 7.9	97	244 9.0	- 0 12.0	67 18.0	2 42.8
Δ					23	1	24	-1

φ	SUNCE IZLAZ	SUNCE ZALAZ	TRAJANJE SUMRAKA GRAĐ.	TRAJANJE SUMRAKA ASTR.	MJESEC IZLAZ	MJESEC Δ/24	MJESEC ZALAZ	MJESEC Δ/24
N	h min	h min	h min	h min	h min	min	h min	min
60	2 39	21 27	1 42	: ::	22 8	.3	4 52	3.5
55	3 23	20 43	0 58	: ::	21 43	.6	5 24	3.1
50	3 53	20 13	0 44	: ::	21 24	.9	5 47	2.9
45	4 16	19 51	0 37	2 32	21 10	1.0	6 5	2.7
40	4 33	19 33	0 33	2 3	20 57	1.2	6 19	2.5
35	4 48	19 18	0 30	1 47	20 47	1.3	6 31	2.4
30	5 1	19 5	0 27	1 36	20 38	1.4	6 42	2.3
20	5 23	18 43	0 25	1 24	20 22	1.6	7 0	2.2
10	5 42	18 24	0 23	1 18	20 8	1.7	7 16	2.0
0	5 60	18 7	0 23	1 15	19 55	1.8	7 31	1.9
10	6 17	17 50	0 23	1 15	19 42	2.0	7 45	1.8
20	6 35	17 31	0 24	1 19	19 27	2.1	8 1	1.6
30	6 56	17 10	0 26	1 25	19 11	2.3	8 19	1.5
35	7 9	16 58	0 28	1 31	19 2	2.4	8 29	1.4
40	7 23	16 44	0 31	1 38	18 51	2.5	8 41	1.3
45	7 40	16 27	0 34	1 47	18 38	2.7	8 54	1.1
50	8 0	16 7	0 38	1 59	18 23	2.8	9 11	1.0
55	8 27	15 40	0 45	2 17	18 3	3.1	9 32	.7
60	9 5	15 1	0 57	2 45	17 35	3.4	10 1	.4
S								

SUNCE UT	SUNCE $e = T_p - UT$	SUNCE Δ/24	SUNCE r	MJESEC Prolaz	MJESEC Δ/24	MJESEC $\pi_\leftmoon$	MJESEC r
h	min s	s	′	h min	min	′	′
00	- 3 10.7	-.5	15.8	$T_{\overline{m}}$ 1 19	2.0	54.9	14.9
12	- 3 16.8	$T_{\overline{m}_\odot}$ 12 h 3.3 min		Starost 15.5 d	Faza ○		

PLANETE

Pl.	$T_{\overline{m}}$	π	360−α	Vel.	Pl.	$T_{\overline{m}}$	π	360−α	Vel.
	h min	′	°			h min	′	°	
♀	14 52	.1	221	-3.9	♃	5 46	.0	357	-2.3
♂	16 27	.1	197	1.3	♄	17 32	.0	180	1.0

UT	SUNCE $S_\odot$	SUNCE $\delta_\odot$	PROLJ. TAČKA S_Υ	VENERA S_φ	VENERA δ_φ	MARS S_σ	MARS δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	179 9.2	23 14.6	276 57.9	136 58.7	17 30.6	113 23.6	7 59.8
2	209 9.0	23 14.4	307 2.8	166 57.9	17 28.8	143 25.9	7 58.6
4	239 8.7	23 14.1	337 7.7	196 57.2	17 26.9	173 28.2	7 57.5
6	269 8.5	23 13.9	7 12.6	226 56.4	17 25.0	203 30.6	7 56.3
8	299 8.2	23 13.6	37 17.6	256 55.7	17 23.2	233 32.9	7 55.2
10	329 8.0	23 13.3	67 22.5	286 54.9	17 21.3	263 35.2	7 54.0
12	359 7.7	23 13.1	97 27.4	316 54.2	17 19.4	293 37.6	7 52.9
14	29 7.5	23 12.8	127 32.4	346 53.4	17 17.5	323 39.9	7 51.7
16	59 7.2	23 12.5	157 37.3	16 52.7	17 15.7	353 42.2	7 50.6
18	89 7.0	23 12.2	187 42.2	46 52.0	17 13.8	23 44.5	7 49.4
20	119 6.7	23 11.9	217 47.1	76 51.2	17 11.9	53 46.9	7 48.3
22	149 6.5	23 11.6	247 52.1	106 50.5	17 10.0	83 49.2	7 47.1
Δ	-1	-1		-4	-9	12	-6

UT	MJESEC $S_\leftmoon$	MJESEC Δ	MJESEC $\delta_\leftmoon$	MJESEC Δ	JUPITER S_4	JUPITER δ_4	SATURN S_η	SATURN δ_η
h	° ′		° ′		° ′	° ′	° ′	° ′
0	329 33.0	137	-16 48.5	98	274 13.5	- 0 11.8	97 22.7	2 42.7
2	358 38.5	139	-16 28.9	99	304 18.1	- 0 11.7	127 27.5	2 42.6
4	27 44.2	140	-16 9.1	100	334 22.7	- 0 11.6	157 32.2	2 42.4
6	56 50.2	141	-15 49.0	102	4 27.2	- 0 11.5	187 36.9	2 42.3
8	85 56.4	142	-15 28.7	103	34 31.8	- 0 11.3	217 41.6	2 42.2
10	115 2.9	144	-15 8.1	104	64 36.4	- 0 11.2	247 46.3	2 42.1
12	144 9.7	145	-14 47.3	105	94 41.0	- 0 11.1	277 51.0	2 42.0
14	173 16.6	146	-14 26.2	106	124 45.5	- 0 10.9	307 55.7	2 41.9
16	202 23.8	147	-14 5.0	107	154 50.1	- 0 10.8	338 .4	2 41.8
18	231 31.3	148	-13 43.5	108	184 54.7	- 0 10.7	8 5.2	2 41.7
20	260 38.9	149	-13 21.8	109	214 59.3	- 0 10.6	38 9.9	2 41.5
22	289 46.8	150	-13 .0	110	245 3.8	- 0 10.4	68 14.6	2 41.4
Δ					23	1	24	-1

φ	SUNCE IZLAZ	SUNCE ZALAZ	TRAJANJE SUMRAKA GRAĐ.	TRAJANJE SUMRAKA ASTR.	MJESEC IZLAZ	MJESEC Δ/24	MJESEC ZALAZ	MJESEC Δ/24
N	h min	h min	h min	h min	h min	min	h min	min
60	2 40	21 26	1 40	: ::	22 16	.2	6 15	3.4
55	3 24	20 43	0 57	: ::	21 58	.5	6 38	3.1
50	3 54	20 13	0 44	: ::	21 45	.7	6 56	2.8
45	4 16	19 51	0 37	2 32	21 34	.9	7 9	2.6
40	4 34	19 33	0 33	2 3	21 25	1.0	7 20	2.5
35	4 49	19 18	0 30	1 47	21 18	1.2	7 30	2.4
30	5 2	19 5	0 27	1 36	21 11	1.3	7 38	2.3
20	5 24	18 43	0 25	1 24	20 59	1.4	7 52	2.1
10	5 42	18 25	0 23	1 18	20 49	1.6	8 5	1.9
0	5 60	18 7	0 22	1 15	20 39	1.7	8 16	1.8
10	6 17	17 50	0 23	1 15	20 29	1.9	8 28	1.6
20	6 35	17 32	0 24	1 19	20 19	2.1	8 40	1.5
30	6 57	17 11	0 26	1 25	20 7	2.2	8 54	1.3
35	7 9	16 58	0 28	1 31	19 60	2.3	9 2	1.2
40	7 23	16 44	0 31	1 37	19 52	2.5	9 11	1.1
45	7 39	16 28	0 34	1 47	19 42	2.6	9 21	1.0
50	7 60	16 7	0 38	1 59	19 31	2.8	9 34	.8
55	8 27	15 40	0 45	2 17	19 17	3.0	9 50	.6
60	9 5	15 2	0 57	2 45	18 57	3.3	10 11	.3
S								

SUNCE UT	SUNCE $e = T_p - UT$	SUNCE Δ/24	SUNCE r	MJESEC Prolaz	MJESEC Δ/24	MJESEC $\pi_\leftmoon$	MJESEC r
h	min s	s	′	h min	min	′	′
00	- 3 22.8	-.5	15.8	$T_{\overline{m}}$ 2 6	1.8	54.5	14.9
12	- 3 28.8	$T_{\overline{m}_\odot}$ 12 h 3.5 min		Starost 16.5 d	Faza ○		

PLANETE

Pl.	$T_{\overline{m}}$	π	360−α	Vel.	Pl.	$T_{\overline{m}}$	π	360−α	Vel.
	h min	′	°			h min	′	°	
♀	14 52	.1	220	-3.9	♃	5 42	.0	357	-2.3
♂	16 25	.1	196	1.3	♄	17 28	.0	180	1.0

UT	SUNCE $S_\odot$	SUNCE $\delta_\odot$	PROLJ. TAČKA S_Υ	VENERA S_φ	VENERA δ_φ	MARS S_σ	MARS δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	179 6.2	23 11.4	277 57.0	136 49.8	17 8.1	113 51.5	7 46.0
2	209 6.0	23 11.1	308 1.9	166 49.0	17 6.2	143 53.9	7 44.8
4	239 5.8	23 10.8	338 6.9	196 48.3	17 4.3	173 56.2	7 43.7
6	269 5.5	23 10.5	8 11.8	226 47.6	17 2.4	203 58.5	7 42.5
8	299 5.3	23 10.2	38 16.7	256 46.9	17 .5	234 .8	7 41.4
10	329 5.0	23 9.9	68 21.6	286 46.2	16 58.6	264 3.2	7 40.2
12	359 4.8	23 9.6	98 26.6	316 45.5	16 56.7	294 5.5	7 39.1
14	29 4.5	23 9.2	128 31.5	346 44.8	16 54.8	324 7.8	7 37.9
16	59 4.3	23 8.9	158 36.4	16 44.1	16 52.9	354 10.1	7 36.8
18	89 4.0	23 8.6	188 41.4	46 43.4	16 51.0	24 12.4	7 35.6
20	119 3.8	23 8.3	218 46.3	76 42.7	16 49.1	54 14.8	7 34.5
22	149 3.6	23 8.0	248 51.2	106 42.0	16 47.2	84 17.1	7 33.3
Δ	-1	-2		-4	-10	12	-6

UT	MJESEC $S_\leftmoon$	MJESEC Δ	MJESEC $\delta_\leftmoon$	MJESEC Δ	JUPITER S_4	JUPITER δ_4	SATURN S_η	SATURN δ_η
h	° ′		° ′		° ′	° ′	° ′	° ′
0	318 54.9	151	-12 37.9	111	275 8.4	- 0 10.3	98 19.3	2 41.3
2	348 3.2	152	-12 15.7	112	305 13.0	- 0 10.2	128 24.0	2 41.2
4	17 11.7	153	-11 53.3	113	335 17.6	- 0 10.1	158 28.7	2 41.1
6	46 20.4	154	-11 30.7	114	5 22.2	- 0 9.9	188 33.4	2 41.0
8	75 29.3	155	-11 8.0	115	35 26.7	- 0 9.8	218 38.1	2 40.9
10	104 38.3	156	-10 45.0	115	65 31.3	- 0 9.7	248 42.8	2 40.7
12	133 47.5	157	-10 22.0	116	95 35.9	- 0 9.6	278 47.5	2 40.6
14	162 56.9	158	- 9 58.8	117	125 40.5	- 0 9.5	308 52.2	2 40.5
16	192 6.5	159	- 9 35.4	117	155 45.1	- 0 9.3	338 56.9	2 40.4
18	221 16.2	159	- 9 12.0	118	185 49.7	- 0 9.2	9 1.6	2 40.3
20	250 26.1	160	- 8 48.4	119	215 54.3	- 0 9.1	39 6.3	2 40.2
22	279 36.1	161	- 8 24.6	119	245 58.9	- 0 9.0	69 11.0	2 40.0
Δ					23	1	24	-1

φ	SUNCE IZLAZ	SUNCE ZALAZ	TRAJANJE SUMRAKA GRAĐ.	TRAJANJE SUMRAKA ASTR.	MJESEC IZLAZ	MJESEC Δ/24	MJESEC ZALAZ	MJESEC Δ/24
N	h min	h min	h min	h min	h min	min	h min	min
60	2 41	21 26	1 39	: ::	22 21	.2	7 36	3.3
55	3 25	20 42	0 57	: ::	22 11	.5	7 52	3.0
50	3 54	20 13	0 44	: ::	22 3	.7	8 3	2.8
45	4 17	19 51	0 37	2 31	21 56	.8	8 13	2.6
40	4 34	19 33	0 33	2 2	21 50	1.0	8 20	2.4
35	4 49	19 18	0 30	1 46	21 45	1.1	8 27	2.3
30	5 2	19 5	0 27	1 36	21 41	1.2	8 33	2.2
20	5 24	18 43	0 25	1 24	21 34	1.4	8 43	2.0
10	5 43	18 25	0 23	1 18	21 27	1.5	8 51	1.9
0	6 0	18 7	0 22	1 15	21 21	1.7	8 59	1.7
10	6 17	17 50	0 23	1 15	21 15	1.8	9 7	1.6
20	6 36	17 32	0 24	1 19	21 8	2.0	9 16	1.4
30	6 57	17 11	0 26	1 25	21 0	2.2	9 25	1.2
35	7 9	16 59	0 28	1 31	20 56	2.3	9 31	1.1
40	7 23	16 45	0 30	1 37	20 51	2.4	9 37	1.0
45	7 39	16 28	0 34	1 47	20 45	2.6	9 44	.9
50	7 60	16 8	0 38	1 59	20 38	2.8	9 53	.7
55	8 26	15 41	0 45	2 17	20 29	3.0	10 4	.5
60	9 4	15 3	0 57	2 45	20 17	3.3	10 18	.2
S								

SUNCE UT	SUNCE $e = T_p - UT$	SUNCE Δ/24	SUNCE r	MJESEC Prolaz	MJESEC Δ/24	MJESEC $\pi_\leftmoon$	MJESEC r
h	min s	s	′	h min	min	′	′
00	- 3 34.8	-.5	15.8	$T_{\overline{m}}$ 2 49	1.8	54.3	14.8
12	- 3 40.7	$T_{\overline{m}_\odot}$ 12 h 3.7 min		Starost 17.5 d	Faza ❍		

PLANETE Pl.	$T_{\overline{m}}$	π	360−α	Vel.	Pl.	$T_{\overline{m}}$	π	360−α	Vel.
	h min	′	°			h min	′	°	
♀	14 53	.1	219	-3.9	♃	5 39	.0	357	-2.3
♂	16 23	.1	196	1.3	♄	17 24	.0	180	1.0

UT	SUNCE $S_\odot$	SUNCE $\delta_\odot$	PROLJ. TAČKA S_Υ	VENERA S_φ	VENERA δ_φ	MARS S_σ	MARS δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	179 3.3	23 7.7	278 56.1	136 41.3	16 45.2	114 19.4	7 32.1
2	209 3.1	23 7.3	309 1.1	166 40.6	16 43.3	144 21.7	7 31.0
4	239 2.8	23 7.0	339 6.0	196 39.9	16 41.4	174 24.1	7 29.8
6	269 2.6	23 6.7	9 10.9	226 39.2	16 39.5	204 26.4	7 28.7
8	299 2.3	23 6.3	39 15.9	256 38.5	16 37.5	234 28.7	7 27.5
10	329 2.1	23 6.0	69 20.8	286 37.8	16 35.6	264 31.0	7 26.4
12	359 1.9	23 5.7	99 25.7	316 37.2	16 33.7	294 33.3	7 25.2
14	29 1.6	23 5.3	129 30.6	346 36.5	16 31.7	324 35.6	7 24.0
16	59 1.4	23 5.0	159 35.6	16 35.8	16 29.8	354 38.0	7 22.9
18	89 1.1	23 4.6	189 40.5	46 35.2	16 27.8	24 40.3	7 21.7
20	119 .9	23 4.3	219 45.4	76 34.5	16 25.9	54 42.6	7 20.6
22	149 .7	23 3.9	249 50.3	106 33.8	16 23.9	84 44.9	7 19.4
Δ	-1	-2		-3	-10	12	-6

UT	MJESEC $S_\leftmoon$	MJESEC Δ	MJESEC $\delta_\leftmoon$	MJESEC Δ	JUPITER S_4	JUPITER δ_4	SATURN S_η	SATURN δ_η
h	° ′		° ′		° ′	° ′	° ′	° ′
0	308 46.2	161	- 8 .8	120	276 3.5	- 0 8.9	99 15.7	2 39.9
2	337 56.5	162	- 7 36.8	120	306 8.1	- 0 8.7	129 20.4	2 39.8
4	7 6.9	162	- 7 12.8	121	336 12.6	- 0 8.6	159 25.1	2 39.7
6	36 17.4	163	- 6 48.6	121	6 17.2	- 0 8.5	189 29.8	2 39.6
8	65 28.0	163	- 6 24.3	122	36 21.8	- 0 8.4	219 34.5	2 39.5
10	94 38.7	164	- 6 .0	122	66 26.4	- 0 8.3	249 39.2	2 39.3
12	123 49.5	164	- 5 35.5	123	96 31.0	- 0 8.1	279 43.9	2 39.2
14	153 .3	165	- 5 11.0	123	126 35.6	- 0 8.0	309 48.6	2 39.1
16	182 11.3	165	- 4 46.4	123	156 40.2	- 0 7.9	339 53.3	2 39.0
18	211 22.3	165	- 4 21.8	124	186 44.8	- 0 7.8	9 58.0	2 38.9
20	240 33.4	166	- 3 57.0	124	216 49.4	- 0 7.7	40 2.7	2 38.7
22	269 44.5	166	- 3 32.3	124	246 54.1	- 0 7.6	70 7.4	2 38.6
Δ					23	1	23	-1

φ	SUNCE IZLAZ	SUNCE ZALAZ	TRAJANJE SUMRAKA GRAĐ.	TRAJANJE SUMRAKA ASTR.	MJESEC IZLAZ	MJESEC Δ/24	MJESEC ZALAZ	MJESEC Δ/24
N	h min	h min	h min	h min	h min	min	h min	min
60	2 42	21 25	1 38	: ::	22 26	.2	8 56	3.2
55	3 25	20 42	0 57	: ::	22 22	.4	9 4	3.0
50	3 55	20 13	0 44	: ::	22 19	.6	9 10	2.7
45	4 17	19 50	0 37	2 31	22 16	.8	9 15	2.6
40	4 35	19 33	0 33	2 2	22 14	.9	9 19	2.4
35	4 50	19 18	0 30	1 46	22 12	1.1	9 23	2.3
30	5 2	19 5	0 27	1 36	22 10	1.2	9 26	2.2
20	5 24	18 44	0 24	1 24	22 7	1.4	9 31	2.0
10	5 43	18 25	0 23	1 17	22 4	1.5	9 36	1.8
0	6 0	18 8	0 22	1 15	22 1	1.7	9 41	1.7
10	6 17	17 50	0 23	1 15	21 59	1.8	9 45	1.5
20	6 36	17 32	0 24	1 19	21 56	2.0	9 50	1.4
30	6 57	17 11	0 26	1 25	21 53	2.2	9 55	1.2
35	7 9	16 59	0 28	1 30	21 51	2.3	9 58	1.1
40	7 23	16 45	0 30	1 37	21 49	2.4	10 1	.9
45	7 39	16 29	0 34	1 47	21 47	2.6	10 5	.8
50	7 60	16 8	0 38	1 59	21 44	2.7	10 10	.6
55	8 26	15 42	0 45	2 17	21 40	3.0	10 15	.4
60	9 4	15 4	0 57	2 45	21 36	3.2	10 23	.2
S								

SUNCE UT	SUNCE $e = T_p - UT$	SUNCE Δ/24	SUNCE r	MJESEC Prolaz	MJESEC Δ/24	MJESEC $\pi_\leftmoon$	MJESEC r
h	min s	s	′	h min	min	′	′
00	- 3 46.6	-.5	15.8	$T_{\overline{m}}$ 3 31	1.7	54.1	14.8
12	- 3 52.3	$T_{\overline{m}_\odot}$ 12 h 3.9 min		Starost 18.5 d	Faza ❍		

PLANETE Pl.	$T_{\overline{m}}$	π	360−α	Vel.	Pl.	$T_{\overline{m}}$	π	360−α	Vel.
	h min	′	°			h min	′	°	
♀	14 54	.1	218	-3.9	♃	5 35	.0	357	-2.3
♂	16 21	.1	195	1.3	♄	17 20	.0	180	1.1

UT	SUNCE $S_\odot$	SUNCE $\delta_\odot$	PROLJ. TAČKA S_Υ	VENERA S_φ	VENERA δ_φ	MARS S_σ	MARS δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	179 .4	23 3.6	279 55.3	136 33.2	16 22.0	114 47.2	7 18.2
2	209 .2	23 3.2	310 .2	166 32.5	16 20.0	144 49.5	7 17.1
4	239 .0	23 2.8	340 5.1	196 31.9	16 18.1	174 51.9	7 15.9
6	268 59.7	23 2.5	10 10.1	226 31.2	16 16.1	204 54.2	7 14.7
8	298 59.5	23 2.1	40 15.0	256 30.6	16 14.1	234 56.5	7 13.6
10	328 59.2	23 1.7	70 19.9	286 29.9	16 12.2	264 58.8	7 12.4
12	358 59.0	23 1.4	100 24.8	316 29.3	16 10.2	295 1.1	7 11.3
14	28 58.8	23 1.0	130 29.8	346 28.6	16 8.2	325 3.4	7 10.1
16	58 58.5	23 .6	160 34.7	16 28.0	16 6.3	355 5.7	7 8.9
18	88 58.3	23 .2	190 39.6	46 27.4	16 4.3	25 8.1	7 7.8
20	118 58.1	22 59.8	220 44.6	76 26.7	16 2.3	55 10.4	7 6.6
22	148 57.8	22 59.4	250 49.5	106 26.1	16 .3	85 12.7	7 5.4
Δ	-1	-2		-3	-10	12	-6

UT	MJESEC $S_\leftmoon$	MJESEC Δ	MJESEC $\delta_\leftmoon$	MJESEC Δ	JUPITER S_4	JUPITER δ_4	SATURN S_η	SATURN δ_η
h	° ′		° ′		° ′	° ′	° ′	° ′
0	298 55.6	166 -3 7.4	124		276 58.7	-0 7.5	100 12.1	2 38.5
2	328 6.8	166 -2 42.5	125		307 3.3	-0 7.4	130 16.8	2 38.4
4	357 18.1	166 -2 17.6	125		337 7.9	-0 7.2	160 21.5	2 38.3
6	26 29.3	166 -1 52.6	125		7 12.5	-0 7.1	190 26.2	2 38.1
8	55 40.6	166 -1 27.6	125		37 17.1	-0 7.0	220 30.9	2 38.0
10	84 51.8	166 -1 2.6	125		67 21.7	-0 6.9	250 35.6	2 37.9
12	114 3.1	166 -0 37.5	125		97 26.3	-0 6.8	280 40.3	2 37.8
14	143 14.4	166 -0 12.5	125		127 30.9	-0 6.7	310 44.9	2 37.7
16	172 25.6	166 0 12.6	125		157 35.5	-0 6.6	340 49.6	2 37.5
18	201 36.8	166 0 37.7	126		187 40.2	-0 6.5	10 54.3	2 37.4
20	230 47.9	166 1 2.8	126		217 44.8	-0 6.4	40 59.0	2 37.3
22	259 59.1	165 1 27.9	125		247 49.4	-0 6.3	71 3.7	2 37.2
Δ					23	1	23	-1

φ	SUNCE IZLAZ	SUNCE ZALAZ	TRAJANJE SUMRAKA GRAĐ.	TRAJANJE SUMRAKA ASTR.	MJESEC IZLAZ	MJESEC Δ/24	MJESEC ZALAZ	MJESEC Δ/24
N	h min	h min	h min	h min	h min	min	h min	min
60	2 43	21 24	1 36	: ::	22 30	.2	10 13	3.2
55	3 26	20 41	0 57	: ::	22 32	.5	10 15	3.0
50	3 56	20 12	0 44	: ::	22 34	.7	10 16	2.8
45	4 18	19 50	0 37	2 30	22 35	.8	10 17	2.6
40	4 35	19 33	0 33	2 2	22 36	1.0	10 17	2.4
35	4 50	19 18	0 30	1 46	22 37	1.1	10 18	2.3
30	5 3	19 5	0 27	1 36	22 38	1.2	10 18	2.2
20	5 24	18 44	0 24	1 24	22 39	1.4	10 19	2.0
10	5 43	18 25	0 23	1 17	22 40	1.5	10 20	1.8
0	6 0	18 8	0 22	1 15	22 42	1.7	10 21	1.7
10	6 18	17 51	0 23	1 15	22 43	1.9	10 21	1.5
20	6 36	17 32	0 24	1 18	22 44	2.0	10 22	1.4
30	6 57	17 12	0 26	1 25	22 45	2.2	10 23	1.2
35	7 9	16 60	0 28	1 30	22 46	2.3	10 23	1.1
40	7 23	16 46	0 30	1 37	22 47	2.4	10 24	.9
45	7 39	16 29	0 34	1 46	22 48	2.6	10 25	.8
50	7 59	16 9	0 38	1 59	22 50	2.8	10 25	.6
55	8 26	15 43	0 45	2 17	22 51	3.0	10 26	.4
60	9 3	15 5	0 57	2 44	22 53	3.3	10 27	.2
S								

SUNCE UT	SUNCE $e = T_p - UT$	SUNCE Δ/24	SUNCE r	MJESEC Prolaz	MJESEC Δ/24	MJESEC $\pi_\leftmoon$	MJESEC r
h	min s	s	′	h min	min	′	′
00	- 3 58.1	-.5	15.8	$T_{\overline{m}}$ 4 11	1.7	54.2	14.8
12	- 4 3.7	$T_{\overline{m}_\odot}$ 12 h 4.1 min		Starost 19.5 d	Faza ◑		

PLANETE

Pl.	$T_{\overline{m}}$	π	360−α	Vel.	Pl.	$T_{\overline{m}}$	π	360−α	Vel.
	h min	′	°			h min	′	°	
♀	14 54	.1	217	-3.9	♃	5 31	.0	357	-2.3
♂	16 20	.1	195	1.4	♄	17 16	.0	180	1.1

UT	SUNCE $S_\odot$	SUNCE $\delta_\odot$	PROLJ. TAČKA S_Υ	VENERA S_φ	VENERA δ_φ	MARS S_σ	MARS δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	178 57.6	22 59.0	280 54.4	136 25.5	15 58.3	115 15.0	7 4.3
2	208 57.4	22 58.7	310 59.3	166 24.8	15 56.3	145 17.3	7 3.1
4	238 57.2	22 58.3	341 4.3	196 24.2	15 54.3	175 19.6	7 1.9
6	268 56.9	22 57.9	11 9.2	226 23.6	15 52.4	205 21.9	7 .8
8	298 56.7	22 57.5	41 14.1	256 23.0	15 50.4	235 24.2	6 59.6
10	328 56.5	22 57.0	71 19.1	286 22.4	15 48.4	265 26.5	6 58.4
12	358 56.2	22 56.6	101 24.0	316 21.8	15 46.4	295 28.8	6 57.2
14	28 56.0	22 56.2	131 28.9	346 21.2	15 44.4	325 31.2	6 56.1
16	58 55.8	22 55.8	161 33.8	16 20.6	15 42.4	355 33.5	6 54.9
18	88 55.5	22 55.4	191 38.8	46 20.0	15 40.3	25 35.8	6 53.7
20	118 55.3	22 55.0	221 43.7	76 19.4	15 38.3	55 38.1	6 52.6
22	148 55.1	22 54.6	251 48.6	106 18.8	15 36.3	85 40.4	6 51.4
Δ	-1	-2		-3	-10	12	-6

UT	MJESEC $S_\leftmoon$	MJESEC Δ	MJESEC $\delta_\leftmoon$	MJESEC Δ	JUPITER S_4	JUPITER δ_4	SATURN S_η	SATURN δ_η
h	° ′		° ′		° ′	° ′	° ′	° ′
0	289 10.1	165 1 53.0	125		277 54.0	-0 6.1	101 8.4	2 37.1
2	318 21.1	165 2 18.1	125		307 58.6	-0 6.0	131 13.1	2 36.9
4	347 32.1	164 2 43.2	125		338 3.3	-0 5.9	161 17.8	2 36.8
6	16 42.9	164 3 8.2	125		8 7.9	-0 5.8	191 22.4	2 36.7
8	45 53.7	163 3 33.2	125		38 12.5	-0 5.7	221 27.1	2 36.6
10	75 4.4	163 3 58.2	125		68 17.1	-0 5.6	251 31.8	2 36.4
12	104 14.9	162 4 23.2	125		98 21.8	-0 5.5	281 36.5	2 36.3
14	133 25.4	162 4 48.1	124		128 26.4	-0 5.4	311 41.2	2 36.2
16	162 35.7	161 5 12.9	124		158 31.0	-0 5.3	341 45.9	2 36.1
18	191 45.9	160 5 37.7	124		188 35.6	-0 5.2	11 50.6	2 35.9
20	220 56.0	160 6 2.5	123		218 40.3	-0 5.1	41 55.2	2 35.8
22	250 5.9	159 6 27.2	123		248 44.9	-0 5.0	71 59.9	2 35.7
Δ					23	1	23	-1

φ	SUNCE IZLAZ	SUNCE ZALAZ	TRAJANJE SUMRAKA GRAĐ.	TRAJANJE SUMRAKA ASTR.	MJESEC IZLAZ	MJESEC Δ/24	MJESEC ZALAZ	MJESEC Δ/24
N	h min	h min	h min	h min	h min	min	h min	min
60	2 44	21 23	1 35	: ::	22 35	.2	11 31	3.3
55	3 27	20 41	0 57	: ::	22 43	.5	11 26	3.0
50	3 56	20 12	0 44	: ::	22 50	.7	11 22	2.8
45	4 18	19 50	0 37	2 29	22 55	.9	11 18	2.6
40	4 36	19 32	0 33	2 2	22 59	1.0	11 16	2.5
35	4 51	19 18	0 30	1 46	23 3	1.2	11 13	2.3
30	5 3	19 5	0 27	1 36	23 6	1.3	11 11	2.2
20	5 25	18 44	0 24	1 24	23 12	1.5	11 7	2.0
10	5 43	18 25	0 23	1 17	23 17	1.6	11 4	1.9
0	6 1	18 8	0 22	1 15	23 22	1.8	11 1	1.7
10	6 18	17 51	0 23	1 15	23 27	1.9	10 58	1.6
20	6 36	17 33	0 24	1 18	23 32	2.1	10 55	1.4
30	6 57	17 12	0 26	1 25	23 39	2.3	10 51	1.2
35	7 9	16 60	0 28	1 30	23 42	2.4	10 49	1.1
40	7 22	16 46	0 30	1 37	23 46	2.5	10 47	1.0
45	7 39	16 30	0 34	1 46	23 51	2.7	10 44	.8
50	7 59	16 10	0 38	1 59	23 56	2.8	10 41	.7
55	8 25	15 43	0 45	2 17	.. ..	.0	10 37	.5
60	9 3	15 6	0 57	2 44	.. ..	.0	10 32	.2
S								

SUNCE UT	SUNCE $e = T_p - UT$	SUNCE Δ/24	SUNCE r	MJESEC Prolaz	MJESEC Δ/24	MJESEC $\pi_\leftmoon$	MJESEC r
h	min s	s	′	h min	min	′	′
00	- 4 9.4	-.5	15.8	$T_{\overline{m}}$ 4 51	1.7	54.3	14.8
12	- 4 14.9	$T_{\overline{m}_\odot}$ 12 h 4.3 min		Starost 20.5 d	Faza ◑		

PLANETE

Pl.	$T_{\overline{m}}$	π	360−α	Vel.	Pl.	$T_{\overline{m}}$	π	360−α	Vel.
	h min	′	°			h min	′	°	
♀	14 55	.1	216	-3.9	♃	5 28	.0	357	-2.3
♂	16 18	.1	194	1.4	♄	17 13	.0	180	1.1

UT	SUNCE $S_\odot$	SUNCE $\delta_\odot$	PROLJ. TAČKA S_Υ	VENERA S_φ	VENERA δ_φ	MARS S_σ	MARS δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	178 54.9	22 54.1	281 53.6	136 18.2	15 34.3	115 42.7	6 50.2
2	208 54.6	22 53.7	311 58.5	166 17.6	15 32.3	145 45.0	6 49.0
4	238 54.4	22 53.3	342 3.4	196 17.0	15 30.3	175 47.3	6 47.9
6	268 54.2	22 52.8	12 8.3	226 16.4	15 28.3	205 49.6	6 46.7
8	298 54.0	22 52.4	42 13.3	256 15.8	15 26.2	235 51.9	6 45.5
10	328 53.7	22 52.0	72 18.2	286 15.2	15 24.2	265 54.2	6 44.3
12	358 53.5	22 51.5	102 23.1	316 14.7	15 22.2	295 56.5	6 43.2
14	28 53.3	22 51.1	132 28.1	346 14.1	15 20.1	325 58.8	6 42.0
16	58 53.1	22 50.6	162 33.0	16 13.5	15 18.1	356 1.1	6 40.8
18	88 52.9	22 50.2	192 37.9	46 12.9	15 16.1	26 3.4	6 39.6
20	118 52.6	22 49.7	222 42.8	76 12.4	15 14.0	56 5.7	6 38.5
22	148 52.4	22 49.3	252 47.8	106 11.8	15 12.0	86 8.0	6 37.3
Δ	-1	-2		-3	-10	12	-6

UT	MJESEC $S_\leftmoon$	MJESEC Δ	MJESEC $\delta_\leftmoon$	MJESEC Δ	JUPITER $S_\jupiter$	JUPITER $\delta_\jupiter$	SATURN $S_\saturn$	SATURN $\delta_\saturn$
h	° ′		° ′		° ′	° ′	° ′	° ′
0	279 15.7	158	6 51.8	123	278 49.5	- 0 4.9	102 4.6	2 35.6
2	308 25.3	157	7 16.3	122	308 54.2	- 0 4.8	132 9.3	2 35.4
4	337 34.8	156	7 40.8	122	338 58.8	- 0 4.7	162 14.0	2 35.3
6	6 44.0	155	8 5.2	121	9 3.4	- 0 4.6	192 18.6	2 35.2
8	35 53.1	154	8 29.4	121	39 8.1	- 0 4.5	222 23.3	2 35.1
10	65 2.0	153	8 53.6	120	69 12.7	- 0 4.4	252 28.0	2 34.9
12	94 10.7	152	9 17.7	120	99 17.4	- 0 4.3	282 32.7	2 34.8
14	123 19.1	151	9 41.7	119	129 22.0	- 0 4.2	312 37.3	2 34.7
16	152 27.4	150	10 5.5	119	159 26.7	- 0 4.1	342 42.0	2 34.6
18	181 35.4	149	10 29.2	118	189 31.3	- 0 4.0	12 46.7	2 34.4
20	210 43.1	148	10 52.8	117	219 35.9	- 0 3.9	42 51.4	2 34.3
22	239 50.7	146	11 16.3	117	249 40.6	- 0 3.8	72 56.1	2 34.2
Δ					23	0	23	-1

φ	SUNCE IZLAZ	SUNCE ZALAZ	TRAJANJE SUMRAKA GRAĐ.	TRAJANJE SUMRAKA ASTR.	MJESEC IZLAZ	MJESEC Δ/24	MJESEC ZALAZ	MJESEC Δ/24
N	h min	h min	h min	h min	h min	min	h min	min
60	2 45	21 23	1 33	: ::	22 40	.3	12 51	3.4
55	3 28	20 40	0 56	: ::	22 55	.6	12 39	3.1
50	3 57	20 11	0 44	: ::	23 7	.9	12 29	2.9
45	4 19	19 50	0 37	2 29	23 16	1.0	12 21	2.7
40	4 36	19 32	0 33	2 1	23 24	1.2	12 15	2.6
35	4 51	19 18	0 29	1 46	23 31	1.3	12 9	2.4
30	5 4	19 5	0 27	1 36	23 37	1.4	12 5	2.3
20	5 25	18 44	0 24	1 24	23 47	1.6	11 56	2.1
10	5 44	18 25	0 23	1 17	23 56	1.7	11 49	2.0
0	6 1	18 8	0 22	1 15	.. ..	.0	11 42	1.8
10	6 18	17 51	0 23	1 15	.. ..	.0	11 36	1.7
20	6 36	17 33	0 24	1 18	.. ..	.0	11 28	1.5
30	6 56	17 12	0 26	1 25	.. ..	.0	11 20	1.3
35	7 9	17 0	0 28	1 30	.. ..	.0	11 16	1.2
40	7 22	16 47	0 30	1 37	.. ..	.0	11 10	1.1
45	7 39	16 30	0 34	1 46	.. ..	.0	11 4	.9
50	7 59	16 10	0 38	1 59	.. ..	.0	10 57	.8
55	8 25	15 44	0 45	2 16	0 4	3.1	10 48	.6
60	9 2	15 7	0 56	2 44	0 13	3.4	10 36	.3
S								

SUNCE UT	SUNCE e = Tp − UT	SUNCE Δ/24	SUNCE r	MJESEC Prolaz	MJESEC Δ/24	MJESEC $\pi_\leftmoon$	MJESEC r
h	min s	s	′	h min	min	′	′
00	- 4 20.3	-.4	15.8	$T_{\overline{m}}$ 5 32	1.8	54.7	14.9
12	- 4 25.7	$T_{\overline{m}_\odot}$ 12 h 4.4 min		Starost 21.5 d	Faza ◑		

PLANETE

Pl.	$T_{\overline{m}}$	π	360−α	Vel.	Pl.	$T_{\overline{m}}$	π	360−α	Vel.
	h min	′	°			h min	′	°	
♀	14 55	.1	214	-3.9	♃	5 24	.0	357	-2.3
♂	16 16	.1	194	1.4	♄	17 9	.0	180	1.1

UT	SUNCE $S_\odot$	SUNCE $\delta_\odot$	PROLJ. TAČKA S_Υ	VENERA S_φ	VENERA δ_φ	MARS S_σ	MARS δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	178 52.2	22 48.8	282 52.7	136 11.3	15 9.9	116 10.3	6 36.1
2	208 52.0	22 48.4	312 57.6	166 10.7	15 7.9	146 12.6	6 34.9
4	238 51.8	22 47.9	343 2.5	196 10.1	15 5.8	176 14.9	6 33.7
6	268 51.5	22 47.4	13 7.5	226 9.6	15 3.8	206 17.2	6 32.6
8	298 51.3	22 47.0	43 12.4	256 9.0	15 1.7	236 19.5	6 31.4
10	328 51.1	22 46.5	73 17.3	286 8.5	14 59.7	266 21.8	6 30.2
12	358 50.9	22 46.0	103 22.3	316 7.9	14 57.6	296 24.1	6 29.0
14	28 50.7	22 45.5	133 27.2	346 7.4	14 55.6	326 26.4	6 27.8
16	58 50.5	22 45.1	163 32.1	16 6.9	14 53.5	356 28.7	6 26.7
18	88 50.2	22 44.6	193 37.0	46 6.3	14 51.4	26 31.0	6 25.5
20	118 50.0	22 44.1	223 42.0	76 5.8	14 49.4	56 33.3	6 24.3
22	148 49.8	22 43.6	253 46.9	106 5.3	14 47.3	86 35.6	6 23.1
Δ	-1	-2		-3	-10	11	-6

UT	MJESEC $S_\leftmoon$	MJESEC Δ	MJESEC $\delta_\leftmoon$	MJESEC Δ	JUPITER $S_\jupiter$	JUPITER $\delta_\jupiter$	SATURN $S_\saturn$	SATURN $\delta_\saturn$
h	° ′		° ′		° ′	° ′	° ′	° ′
0	268 57.9	145	11 39.6	116	279 45.2	- 0 3.7	103 .7	2 34.0
2	298 4.9	144	12 2.7	115	309 49.9	- 0 3.6	133 5.4	2 33.9
4	327 11.7	142	12 25.7	114	339 54.5	- 0 3.5	163 10.1	2 33.8
6	356 18.1	141	12 48.6	113	9 59.2	- 0 3.4	193 14.7	2 33.7
8	25 24.3	139	13 11.2	112	40 3.8	- 0 3.4	223 19.4	2 33.5
10	54 30.1	138	13 33.7	111	70 8.5	- 0 3.3	253 24.1	2 33.4
12	83 35.7	136	13 56.0	110	100 13.1	- 0 3.2	283 28.8	2 33.3
14	112 41.0	135	14 18.1	109	130 17.8	- 0 3.1	313 33.4	2 33.1
16	141 45.9	133	14 40.0	108	160 22.5	- 0 3.0	343 38.1	2 33.0
18	170 50.5	131	15 1.7	107	190 27.1	- 0 2.9	13 42.8	2 32.9
20	199 54.8	130	15 23.1	106	220 31.8	- 0 2.8	43 47.4	2 32.7
22	228 58.8	128	15 44.4	105	250 36.4	- 0 2.7	73 52.1	2 32.6
Δ					23	0	23	-1

φ	SUNCE IZLAZ	SUNCE ZALAZ	TRAJANJE SUMRAKA GRAĐ.	TRAJANJE SUMRAKA ASTR.	MJESEC IZLAZ	MJESEC Δ/24	MJESEC ZALAZ	MJESEC Δ/24
N	h min	h min	h min	h min	h min	min	h min	min
60	2 47	21 22	1 32	: ::	22 48	.5	14 14	3.6
55	3 29	20 40	0 56	: ::	23 10	.8	13 54	3.2
50	3 58	20 11	0 44	: ::	23 27	1.1	13 38	3.0
45	4 19	19 49	0 37	2 28	23 41	1.2	13 26	2.8
40	4 37	19 32	0 32	2 1	23 52	1.4	13 16	2.7
35	4 51	19 18	0 29	1 46	.. ..	.0	13 8	2.5
30	5 4	19 5	0 27	1 36	.. ..	.0	13 0	2.4
20	5 25	18 44	0 24	1 23	.. ..	.0	12 48	2.2
10	5 44	18 25	0 23	1 17	.. ..	.0	12 36	2.1
0	6 1	18 8	0 22	1 15	0 5	1.9	12 26	2.0
10	6 18	17 51	0 23	1 15	0 13	2.0	12 16	1.8
20	6 36	17 33	0 24	1 18	0 23	2.2	12 5	1.7
30	6 56	17 13	0 26	1 25	0 33	2.4	11 52	1.5
35	7 8	17 1	0 28	1 30	0 39	2.5	11 45	1.4
40	7 22	16 47	0 30	1 37	0 47	2.6	11 37	1.3
45	7 38	16 31	0 34	1 46	0 55	2.8	11 27	1.1
50	7 58	16 11	0 38	1 58	1 5	2.9	11 16	.9
55	8 24	15 45	0 45	2 16	1 18	3.2	11 1	.7
60	9 1	15 9	0 56	2 43	1 34	3.5	10 43	.4
S								

SUNCE UT	SUNCE e = Tp − UT	SUNCE Δ/24	SUNCE r	MJESEC Prolaz	MJESEC Δ/24	MJESEC $\pi_\leftmoon$	MJESEC r
h	min s	s	′	h min	min	′	′
00	- 4 31.0	-.4	15.8	$T_{\overline{m}}$ 6 15	1.9	55.1	15.0
12	- 4 36.2	$T_{\overline{m}_\odot}$ 12 h 4.6 min		Starost 22.5 d	Faza ◑		

PLANETE

Pl.	$T_{\overline{m}}$	π	360−α	Vel.	Pl.	$T_{\overline{m}}$	π	360−α	Vel.
	h min	′	°			h min	′	°	
♀	14 56	.1	213	-4.0	♃	5 20	.0	357	-2.4
♂	16 14	.1	193	1.4	♄	17 5	.0	180	1.1

UT	SUNCE $S_\odot$	SUNCE $\delta_\odot$	PROLJ. TAČKA S_Υ	VENERA S_φ	VENERA δ_φ	MARS S_σ	MARS δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	178 49.6	22 43.1	283 51.8	136 4.7	14 45.2	116 37.9	6 21.9
2	208 49.4	22 42.6	313 56.8	166 4.2	14 43.2	146 40.2	6 20.8
4	238 49.2	22 42.1	344 1.7	196 3.7	14 41.1	176 42.5	6 19.6
6	268 49.0	22 41.6	14 6.6	226 3.2	14 39.0	206 44.8	6 18.4
8	298 48.8	22 41.1	44 11.5	256 2.7	14 36.9	236 47.1	6 17.2
10	328 48.5	22 40.6	74 16.5	286 2.1	14 34.8	266 49.4	6 16.0
12	358 48.3	22 40.1	104 21.4	316 1.6	14 32.7	296 51.6	6 14.8
14	28 48.1	22 39.6	134 26.3	346 1.1	14 30.7	326 53.9	6 13.6
16	58 47.9	22 39.1	164 31.3	16 .6	14 28.6	356 56.2	6 12.5
18	88 47.7	22 38.6	194 36.2	46 .1	14 26.5	26 58.5	6 11.3
20	118 47.5	22 38.1	224 41.1	75 59.6	14 24.4	57 .8	6 10.1
22	148 47.3	22 37.5	254 46.0	105 59.1	14 22.3	87 3.1	6 8.9
Δ	-1	-3		-3	-10	11	-6

UT	MJESEC $S_\leftmoon$	MJESEC Δ	MJESEC $\delta_\leftmoon$	MJESEC Δ	JUPITER $S_\jupiter$	JUPITER $\delta_\jupiter$	SATURN $S_\saturn$	SATURN $\delta_\saturn$
h	° ′		° ′		° ′	° ′	° ′	° ′
0	258 2.4	126	16 5.3	104	280 41.1	- 0 2.6	103 56.8	2 32.5
2	287 5.6	124	16 26.1	102	310 45.8	- 0 2.5	134 1.4	2 32.4
4	316 8.5	123	16 46.6	101	340 50.4	- 0 2.5	164 6.1	2 32.2
6	345 11.0	121	17 6.8	100	10 55.1	- 0 2.4	194 10.8	2 32.1
8	14 13.2	119	17 26.8	98	40 59.7	- 0 2.3	224 15.4	2 32.0
10	43 14.9	117	17 46.4	97	71 4.4	- 0 2.2	254 20.1	2 31.8
12	72 16.3	115	18 5.8	95	101 9.1	- 0 2.1	284 24.8	2 31.7
14	101 17.3	113	18 24.9	94	131 13.7	- 0 2.0	314 29.4	2 31.6
16	130 17.9	111	18 43.6	92	161 18.4	- 0 1.9	344 34.1	2 31.4
18	159 18.1	109	19 2.1	91	191 23.1	- 0 1.9	14 38.8	2 31.3
20	188 18.0	107	19 20.2	89	221 27.8	- 0 1.8	44 43.4	2 31.2
22	217 17.4	105	19 38.0	87	251 32.4	- 0 1.7	74 48.1	2 31.0
Δ					23	0	23	-1

φ	SUNCE IZLAZ	SUNCE ZALAZ	TRAJANJE SUMRAKA GRAĐ.	TRAJANJE SUMRAKA ASTR.	MJESEC IZLAZ	MJESEC Δ/24	MJESEC ZALAZ	MJESEC Δ/24
N	h min	h min	h min	h min	h min	min	h min	min
60	2 48	21 20	1 30	: ::	22 60	.8	15 40	3.7
55	3 30	20 39	0 56	: ::	23 30	1.2	15 11	3.3
50	3 59	20 11	0 43	: ::	23 53	1.4	14 50	3.0
45	4 20	19 49	0 37	2 27	.. ..	.0	14 33	2.9
40	4 37	19 32	0 32	2 1	.. ..	.0	14 20	2.7
35	4 52	19 17	0 29	1 45	0 2	1.5	14 9	2.6
30	5 5	19 5	0 27	1 35	0 10	1.6	13 59	2.5
20	5 26	18 44	0 24	1 23	0 25	1.8	13 42	2.4
10	5 44	18 25	0 23	1 17	0 38	1.9	13 27	2.2
0	6 1	18 8	0 22	1 15	0 50	2.0	13 13	2.1
10	6 18	17 52	0 23	1 15	1 2	2.2	12 59	2.0
20	6 36	17 34	0 24	1 18	1 15	2.3	12 44	1.9
30	6 56	17 13	0 26	1 25	1 30	2.5	12 28	1.7
35	7 8	17 1	0 28	1 30	1 39	2.6	12 18	1.6
40	7 22	16 48	0 30	1 37	1 49	2.7	12 7	1.5
45	7 38	16 32	0 33	1 46	2 1	2.8	11 54	1.4
50	7 58	16 12	0 38	1 58	2 16	3.0	11 38	1.2
55	8 24	15 46	0 45	2 16	2 34	3.3	11 18	1.0
60	9 0	15 10	0 56	2 43	2 59	3.7	10 51	.6
S								

SUNCE UT	SUNCE $e = T_p - UT$	SUNCE Δ/24	SUNCE r	MJESEC Prolaz	MJESEC Δ/24	MJESEC $\pi_\leftmoon$	MJESEC r
h	min s	s	′	h min	min	′	′
00	- 4 41.4	-.4	15.8	$T_{\overline{m}}$ 7 1	2.1	55.8	15.2
12	- 4 46.4	$T_{\overline{m}_\odot}$ 12 h 4.8 min		Starost 23.5 d	Faza ◑		

PLANETE

Pl.	$T_{\overline{m}}$	π	360−α	Vel.	Pl.	$T_{\overline{m}}$	π	360−α	Vel.
	h min	′	°			h min	′	°	
♀	14 56	.1	212	-4.0	♃	5 16	.0	357	-2.4
♂	16 12	.1	193	1.4	♄	17 2	.0	180	1.1

UT	SUNCE $S_\odot$	SUNCE $\delta_\odot$	PROLJ. TAČKA S_Υ	VENERA S_φ	VENERA δ_φ	MARS S_σ	MARS δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	178 47.1	22 37.0	284 51.0	135 58.6	14 20.2	117 5.4	6 7.7
2	208 46.9	22 36.5	314 55.9	165 58.1	14 18.1	147 7.7	6 6.5
4	238 46.7	22 36.0	345 .8	195 57.6	14 16.0	177 10.0	6 5.3
6	268 46.5	22 35.4	15 5.8	225 57.1	14 13.9	207 12.3	6 4.1
8	298 46.3	22 34.9	45 10.7	255 56.7	14 11.8	237 14.5	6 3.0
10	328 46.1	22 34.4	75 15.6	285 56.2	14 9.7	267 16.8	6 1.8
12	358 45.9	22 33.8	105 20.5	315 55.7	14 7.5	297 19.1	6 .6
14	28 45.7	22 33.3	135 25.5	345 55.2	14 5.4	327 21.4	5 59.4
16	58 45.5	22 32.7	165 30.4	15 54.7	14 3.3	357 23.7	5 58.2
18	88 45.3	22 32.2	195 35.3	45 54.3	14 1.2	27 26.0	5 57.0
20	118 45.1	22 31.6	225 40.3	75 53.8	13 59.1	57 28.3	5 55.8
22	148 44.9	22 31.1	255 45.2	105 53.3	13 56.9	87 30.5	5 54.6
Δ	-1	-3		-2	-11	11	-6

UT	MJESEC $S_\leftmoon$	MJESEC Δ	MJESEC $\delta_\leftmoon$	MJESEC Δ	JUPITER $S_\jupiter$	JUPITER $\delta_\jupiter$	SATURN $S_\saturn$	SATURN $\delta_\saturn$
h	° ′		° ′		° ′	° ′	° ′	° ′
0	246 16.4	103	19 55.4	85	281 37.1	- 0 1.6	104 52.7	2 30.9
2	275 15.0	101	20 12.4	83	311 41.8	- 0 1.5	134 57.4	2 30.8
4	304 13.1	99	20 29.1	81	341 46.5	- 0 1.4	165 2.1	2 30.6
6	333 10.9	97	20 45.4	80	11 51.1	- 0 1.4	195 6.7	2 30.5
8	2 8.2	95	21 1.3	77	41 55.8	- 0 1.3	225 11.4	2 30.4
10	31 5.2	93	21 16.8	75	72 .5	- 0 1.2	255 16.0	2 30.2
12	60 1.7	90	21 31.8	73	102 5.2	- 0 1.1	285 20.7	2 30.1
14	88 57.8	88	21 46.5	71	132 9.9	- 0 1.0	315 25.3	2 30.0
16	117 53.5	86	22 .7	69	162 14.6	- 0 1.0	345 30.0	2 29.8
18	146 48.7	84	22 14.5	67	192 19.2	- 0 .9	15 34.7	2 29.7
20	175 43.6	82	22 27.8	64	222 23.9	- 0 .8	45 39.3	2 29.6
22	204 38.0	80	22 40.6	62	252 28.6	- 0 .7	75 44.0	2 29.4
Δ					23	0	23	-1

φ	SUNCE IZLAZ	SUNCE ZALAZ	TRAJANJE SUMRAKA GRAĐ.	TRAJANJE SUMRAKA ASTR.	MJESEC IZLAZ	MJESEC Δ/24	MJESEC ZALAZ	MJESEC Δ/24
N	h min	h min	h min	h min	h min	min	h min	min
60	2 50	21 19	1 29	: ::	23 18	1.4	17 9	3.5
55	3 31	20 38	0 55	: ::	23 59	1.7	16 30	3.2
50	3 59	20 10	0 43	: ::	.. ..	.0	16 3	3.0
45	4 21	19 49	0 37	2 27	0 11	1.6	15 42	2.8
40	4 38	19 32	0 32	2 0	0 25	1.7	15 26	2.7
35	4 53	19 17	0 29	1 45	0 38	1.8	15 11	2.7
30	5 5	19 5	0 27	1 35	0 49	1.9	14 59	2.6
20	5 26	18 44	0 24	1 23	1 7	2.0	14 39	2.5
10	5 44	18 25	0 23	1 17	1 23	2.1	14 21	2.4
0	6 1	18 9	0 22	1 15	1 39	2.2	14 4	2.3
10	6 18	17 52	0 23	1 15	1 54	2.3	13 47	2.2
20	6 36	17 34	0 24	1 18	2 11	2.4	13 29	2.1
30	6 56	17 14	0 26	1 25	2 30	2.6	13 9	2.0
35	7 8	17 2	0 28	1 30	2 41	2.7	12 57	1.9
40	7 22	16 48	0 30	1 37	2 54	2.8	12 43	1.9
45	7 38	16 32	0 33	1 46	3 9	2.9	12 27	1.7
50	7 57	16 13	0 38	1 58	3 28	3.0	12 7	1.6
55	8 23	15 47	0 45	2 16	3 53	3.3	11 41	1.4
60	8 59	15 11	0 56	2 42	4 28	3.7	11 5	1.0
S								

SUNCE UT	SUNCE $e = T_p - UT$	SUNCE Δ/24	SUNCE r	MJESEC Prolaz	MJESEC Δ/24	MJESEC $\pi_\leftmoon$	MJESEC r
h	min s	s	′	h min	min	′	′
00	- 4 51.5	-.4	15.8	$T_{\overline{m}}$ 7 51	2.3	56.6	15.4
12	- 4 56.3	$T_{\overline{m}_\odot}$ 12 h 4.9 min		Starost 24.5 d	Faza ◑		

PLANETE

Pl.	$T_{\overline{m}}$	π	360−α	Vel.	Pl.	$T_{\overline{m}}$	π	360−α	Vel.
	h min	′	°			h min	′	°	
♀	14 56	.1	211	-4.0	♃	5 13	.0	357	-2.4
♂	16 10	.1	192	1.4	♄	16 58	.0	180	1.1

UT	SUNCE $S_\odot$	SUNCE $\delta_\odot$	PROLJ. TAČKA S_Υ	VENERA S_φ	VENERA δ_φ	MARS S_σ	MARS δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	178 44.7	22 30.5	285 50.1	135 52.9	13 54.8	117 32.8	5 53.4
2	208 44.5	22 30.0	315 55.0	165 52.4	13 52.7	147 35.1	5 52.2
4	238 44.3	22 29.4	346 .0	195 51.9	13 50.6	177 37.4	5 51.0
6	268 44.1	22 28.8	16 4.9	225 51.5	13 48.4	207 39.7	5 49.8
8	298 43.9	22 28.3	46 9.8	255 51.0	13 46.3	237 42.0	5 48.6
10	328 43.7	22 27.7	76 14.8	285 50.6	13 44.2	267 44.2	5 47.4
12	358 43.5	22 27.1	106 19.7	315 50.1	13 42.0	297 46.5	5 46.3
14	28 43.3	22 26.6	136 24.6	345 49.7	13 39.9	327 48.8	5 45.1
16	58 43.1	22 26.0	166 29.5	15 49.2	13 37.7	357 51.1	5 43.9
18	88 42.9	22 25.4	196 34.5	45 48.8	13 35.6	27 53.4	5 42.7
20	118 42.7	22 24.8	226 39.4	75 48.4	13 33.4	57 55.6	5 41.5
22	148 42.5	22 24.2	256 44.3	105 47.9	13 31.3	87 57.9	5 40.3
Δ	-1	-3		-2	-11	11	-6

UT	MJESEC $S_\leftmoon$	MJESEC Δ	MJESEC $\delta_\leftmoon$	MJESEC Δ	JUPITER $S_\jupiter$	JUPITER $\delta_\jupiter$	SATURN $S_\saturn$	SATURN $\delta_\saturn$
h	° ′		° ′		° ′	° ′	° ′	° ′
0	233 32.0	78	22 52.9	59	282 33.3	- 0 .7	105 48.6	2 29.3
2	262 25.6	76	23 4.8	57	312 38.0	- 0 .6	135 53.3	2 29.1
4	291 18.9	74	23 16.1	54	342 42.7	- 0 .5	165 57.9	2 29.0
6	320 11.7	72	23 26.9	52	12 47.4	- 0 .4	196 2.6	2 28.9
8	349 4.1	70	23 37.2	49	42 52.1	- 0 .4	226 7.2	2 28.7
10	17 56.2	68	23 47.0	46	72 56.8	- 0 .3	256 11.9	2 28.6
12	46 47.8	66	23 56.2	43	103 1.5	- 0 .2	286 16.5	2 28.5
14	75 39.1	65	24 4.9	40	133 6.2	- 0 .1	316 21.2	2 28.3
16	104 30.1	63	24 13.0	38	163 10.9	- 0 .1	346 25.8	2 28.2
18	133 20.6	61	24 20.5	35	193 15.6	0 .0	16 30.5	2 28.0
20	162 10.9	60	24 27.4	32	223 20.3	0 .1	46 35.1	2 27.9
22	191 .8	58	24 33.8	29	253 25.0	0 .1	76 39.8	2 27.8
Δ					23	0	23	-1

φ	SUNCE IZLAZ	SUNCE ZALAZ	TRAJANJE SUMRAKA GRAĐ.	TRAJANJE SUMRAKA ASTR.	MJESEC IZLAZ	MJESEC Δ/24	MJESEC ZALAZ	MJESEC Δ/24
N	h min	h min	h min	h min	h min	min	h min	min
60	2 51	21 18	1 27	: ::	23 52	2.3	18 33	2.9
55	3 32	20 37	0 55	: ::	.. ..	.0	17 46	2.8
50	4 0	20 9	0 43	: ::	0 27	1.9	17 14	2.7
45	4 22	19 48	0 37	2 26	0 48	2.0	16 50	2.7
40	4 39	19 31	0 32	1 60	1 6	2.1	16 31	2.6
35	4 53	19 17	0 29	1 45	1 20	2.1	16 15	2.6
30	5 5	19 5	0 27	1 35	1 33	2.2	16 2	2.6
20	5 27	18 44	0 24	1 23	1 55	2.3	15 38	2.5
10	5 45	18 26	0 23	1 17	2 14	2.3	15 18	2.5
0	6 1	18 9	0 22	1 15	2 32	2.4	14 59	2.5
10	6 18	17 52	0 23	1 15	2 50	2.5	14 40	2.4
20	6 36	17 34	0 24	1 18	3 9	2.5	14 20	2.4
30	6 56	17 14	0 26	1 25	3 32	2.6	13 57	2.3
35	7 8	17 3	0 28	1 30	3 45	2.6	13 43	2.3
40	7 21	16 49	0 30	1 37	4 0	2.7	13 27	2.3
45	7 37	16 33	0 33	1 46	4 18	2.8	13 9	2.2
50	7 57	16 14	0 38	1 58	4 41	2.9	12 45	2.1
55	8 22	15 48	0 44	2 15	5 11	3.0	12 15	2.0
60	8 58	15 13	0 55	2 42	5 56	3.3	11 29	1.8
S								

SUNCE UT	SUNCE $e = T_p - UT$	SUNCE Δ/24	SUNCE r	MJESEC Prolaz	MJESEC Δ/24	MJESEC $\pi_\leftmoon$	MJESEC r
h	min s	s	′	h min	min	′	′
00	- 5 1.2	-.4	15.8	$T_{\overline{m}}$ 8 45	2.5	57.4	15.7
12	- 5 5.8	$T_{\overline{m}_\odot}$ 12 h 5.1 min		Starost 25.5 d	Faza ●		

PLANETE

Pl.	$T_{\overline{m}}$	π	360−α	Vel.	Pl.	$T_{\overline{m}}$	π	360−α	Vel.
	h min	′	°			h min	′	°	
♀	14 57	.1	210	-4.0	♃	5 9	.0	357	-2.4
♂	16 9	.1	192	1.4	♄	16 54	.0	180	1.1

UT	SUNCE $S_\odot$	SUNCE $\delta_\odot$	PROLJ. TAČKA S_Υ	VENERA S_φ	VENERA δ_φ	MARS S_σ	MARS δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	178 42.3	22 23.6	286 49.2	135 47.5	13 29.1	118 .2	5 39.1
2	208 42.1	22 23.0	316 54.2	165 47.1	13 27.0	148 2.5	5 37.9
4	238 42.0	22 22.4	346 59.1	195 46.6	13 24.8	178 4.8	5 36.7
6	268 41.8	22 21.9	17 4.0	225 46.2	13 22.7	208 7.0	5 35.5
8	298 41.6	22 21.3	47 9.0	255 45.8	13 20.5	238 9.3	5 34.3
10	328 41.4	22 20.7	77 13.9	285 45.4	13 18.4	268 11.6	5 33.1
12	358 41.2	22 20.0	107 18.8	315 45.0	13 16.2	298 13.9	5 31.9
14	28 41.0	22 19.4	137 23.7	345 44.5	13 14.0	328 16.1	5 30.7
16	58 40.8	22 18.8	167 28.7	15 44.1	13 11.9	358 18.4	5 29.5
18	88 40.6	22 18.2	197 33.6	45 43.7	13 9.7	28 20.7	5 28.3
20	118 40.5	22 17.6	227 38.5	75 43.3	13 7.5	58 23.0	5 27.1
22	148 40.3	22 17.0	257 43.5	105 42.9	13 5.4	88 25.2	5 25.9
Δ	-1	-3		-2	-11	11	-6

UT	MJESEC $S_\leftmoon$	MJESEC Δ	MJESEC $\delta_\leftmoon$	MJESEC Δ	JUPITER $S_\jupiter$	JUPITER $\delta_\jupiter$	SATURN $S_\saturn$	SATURN $\delta_\saturn$
h	° ′		° ′		° ′	° ′	° ′	° ′
0	219 50.4	56	24 39.5	26	283 29.7	0 .2	106 44.4	2 27.6
2	248 39.6	55	24 44.6	22	313 34.4	0 .3	136 49.1	2 27.5
4	277 28.6	53	24 49.1	19	343 39.1	0 .4	166 53.7	2 27.3
6	306 17.3	52	24 52.9	16	13 43.8	0 .4	196 58.4	2 27.2
8	335 5.7	51	24 56.2	13	43 48.5	0 .5	227 3.0	2 27.1
10	3 53.9	50	24 58.7	10	73 53.2	0 .6	257 7.7	2 26.9
12	32 41.8	48	25 .7	6	103 57.9	0 .6	287 12.3	2 26.8
14	61 29.5	47	25 1.9	3	134 2.6	0 .7	317 16.9	2 26.6
16	90 17.0	46	25 2.5	0	164 7.3	0 .8	347 21.6	2 26.5
18	119 4.2	45	25 2.5	-4	194 12.1	0 .8	17 26.2	2 26.4
20	147 51.3	45	25 1.7	-7	224 16.8	0 .9	47 30.9	2 26.2
22	176 38.3	44	25 .3	-11	254 21.5	0 1.0	77 35.5	2 26.1
Δ					24	0	23	-1

φ	SUNCE IZLAZ	SUNCE ZALAZ	TRAJANJE SUMRAKA GRAĐ.	TRAJANJE SUMRAKA ASTR.	MJESEC IZLAZ	MJESEC Δ/24	MJESEC ZALAZ	MJESEC Δ/24
N	h min	h min	h min	h min	h min	min	h min	min
60	2 53	21 17	1 26	: ::	.. ..	.0	19 42	1.9
55	3 33	20 36	0 55	: ::	0 40	2.4	18 52	2.1
50	4 1	20 9	0 43	: ::	1 12	2.5	18 19	2.3
45	4 22	19 48	0 36	2 25	1 36	2.5	17 54	2.3
40	4 39	19 31	0 32	1 59	1 55	2.5	17 34	2.4
35	4 54	19 17	0 29	1 45	2 11	2.5	17 18	2.4
30	5 6	19 4	0 27	1 35	2 25	2.5	17 3	2.4
20	5 27	18 44	0 24	1 23	2 49	2.5	16 39	2.5
10	5 45	18 26	0 23	1 17	3 10	2.5	16 18	2.5
0	6 2	18 9	0 22	1 14	3 30	2.5	15 58	2.6
10	6 18	17 52	0 23	1 15	3 49	2.5	15 38	2.6
20	6 36	17 35	0 24	1 18	4 10	2.5	15 17	2.6
30	6 56	17 15	0 26	1 25	4 34	2.5	14 53	2.6
35	7 8	17 3	0 28	1 30	4 48	2.5	14 38	2.7
40	7 21	16 50	0 30	1 37	5 5	2.5	14 22	2.7
45	7 37	16 34	0 33	1 46	5 25	2.5	14 2	2.7
50	7 56	16 15	0 38	1 58	5 50	2.5	13 37	2.7
55	8 21	15 49	0 44	2 15	6 23	2.5	13 3	2.8
60	8 57	15 14	0 55	2 42	7 14	2.4	12 12	2.9
S								

SUNCE UT	SUNCE $e = T_p - UT$	SUNCE Δ/24	SUNCE r	MJESEC Prolaz	MJESEC Δ/24	MJESEC $\pi_\leftmoon$	MJESEC r
h	min s	s	′	h min	min	′	′
00	- 5 10.5	-.4	15.8	$T_{\overline{m}}$ 9 44	2.5	58.3	15.9
12	- 5 15.0	$T_{\overline{m}_\odot}$ 12 h 5.3 min		Starost 26.5 d	Faza ●		

PLANETE

Pl.	$T_{\overline{m}}$	π	360−α	Vel.	Pl.	$T_{\overline{m}}$	π	360−α	Vel.
	h min	′	°			h min	′	°	
♀	14 57	.1	209	-4.0	♃	5 5	.0	357	-2.4
♂	16 7	.1	191	1.4	♄	16 50	.0	180	1.1

UT	SUNCE $S_\odot$	SUNCE $\delta_\odot$	PROLJ. TAČKA S_Υ	VENERA S_φ	VENERA δ_φ	MARS S_σ	MARS δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	178 40.1	22 16.4	287 48.4	135 42.5	13 3.2	118 27.5	5 24.7
2	208 39.9	22 15.7	317 53.3	165 42.1	13 1.0	148 29.8	5 23.5
4	238 39.7	22 15.1	347 58.2	195 41.7	12 58.8	178 32.0	5 22.3
6	268 39.6	22 14.5	18 3.2	225 41.3	12 56.6	208 34.3	5 21.0
8	298 39.4	22 13.9	48 8.1	255 40.9	12 54.5	238 36.6	5 19.8
10	328 39.2	22 13.2	78 13.0	285 40.5	12 52.3	268 38.9	5 18.6
12	358 39.0	22 12.6	108 18.0	315 40.2	12 50.1	298 41.1	5 17.4
14	28 38.8	22 11.9	138 22.9	345 39.8	12 47.9	328 43.4	5 16.2
16	58 38.7	22 11.3	168 27.8	15 39.4	12 45.7	358 45.7	5 15.0
18	88 38.5	22 10.7	198 32.7	45 39.0	12 43.5	28 47.9	5 13.8
20	118 38.3	22 10.0	228 37.7	75 38.6	12 41.3	58 50.2	5 12.6
22	148 38.1	22 9.4	258 42.6	105 38.3	12 39.1	88 52.5	5 11.4
Δ	-1	-3		-2	-11	11	-6

UT	MJESEC $S_\leftmoon$	MJESEC Δ	MJESEC $\delta_\leftmoon$	MJESEC Δ	JUPITER S_4	JUPITER δ_4	SATURN S_η	SATURN δ_η
h	° ′		° ′		° ′	° ′	° ′	° ′
0	205 25.0	43	24 58.2	-14	284 26.2	0 1.0	107 40.2	2 25.9
2	234 11.7	43	24 55.4	-17	314 30.9	0 1.1	137 44.8	2 25.8
4	262 58.2	42	24 51.9	-21	344 35.7	0 1.1	167 49.4	2 25.7
6	291 44.7	42	24 47.7	-24	14 40.4	0 1.2	197 54.1	2 25.5
8	320 31.0	41	24 42.9	-28	44 45.1	0 1.3	227 58.7	2 25.4
10	349 17.3	41	24 37.3	-31	74 49.8	0 1.3	258 3.4	2 25.2
12	18 3.5	41	24 31.0	-35	104 54.5	0 1.4	288 8.0	2 25.1
14	46 49.8	41	24 24.1	-38	134 59.3	0 1.5	318 12.6	2 24.9
16	75 36.0	41	24 16.5	-42	165 4.0	0 1.5	348 17.3	2 24.8
18	104 22.2	41	24 8.1	-45	195 8.7	0 1.6	18 21.9	2 24.7
20	133 8.4	41	23 59.1	-49	225 13.5	0 1.6	48 26.5	2 24.5
22	161 54.7	42	23 49.4	-52	255 18.2	0 1.7	78 31.2	2 24.4
Δ					24	0	23	-1

φ	SUNCE IZLAZ	SUNCE ZALAZ	TRAJANJE SUMRAKA GRAĐ.	TRAJANJE SUMRAKA ASTR.	MJESEC IZLAZ	MJESEC Δ/24	MJESEC ZALAZ	MJESEC Δ/24
N	h min	h min	h min	h min	h min	min	h min	min
60	2 54	21 15	1 24	: ::	0 48	3.4	20 28	1.1
55	3 34	20 36	0 54	: ::	1 37	3.2	19 43	1.5
50	4 2	20 8	0 43	: ::	2 10	3.0	19 13	1.8
45	4 23	19 47	0 36	2 24	2 35	2.9	18 50	1.9
40	4 40	19 30	0 32	1 59	2 55	2.9	18 31	2.0
35	4 54	19 16	0 29	1 44	3 11	2.8	18 15	2.1
30	5 6	19 4	0 27	1 35	3 25	2.8	18 2	2.2
20	5 27	18 43	0 24	1 23	3 50	2.7	17 39	2.3
10	5 45	18 26	0 23	1 17	4 10	2.6	17 18	2.4
0	6 2	18 9	0 22	1 14	4 30	2.6	16 59	2.5
10	6 18	17 53	0 23	1 15	4 50	2.5	16 40	2.6
20	6 36	17 35	0 24	1 18	5 10	2.4	16 20	2.7
30	6 56	17 15	0 26	1 25	5 35	2.3	15 56	2.9
35	7 7	17 4	0 28	1 30	5 49	2.3	15 42	2.9
40	7 21	16 50	0 30	1 37	6 5	2.2	15 26	3.0
45	7 36	16 35	0 33	1 45	6 25	2.1	15 7	3.1
50	7 56	16 15	0 38	1 58	6 50	2.0	14 43	3.3
55	8 21	15 51	0 44	2 15	7 23	1.8	14 10	3.5
60	8 56	15 16	0 55	2 41	8 12	1.5	13 21	3.9
S								

SUNCE UT	SUNCE $e = T_p - UT$	SUNCE Δ/24	SUNCE r	MJESEC Prolaz	MJESEC Δ/24	MJESEC $\pi_\leftmoon$	MJESEC r
h	min s	s	′	h min	min	′	′
00	- 5 19.4	-.4	15.8	$T_{\overline{m}}$ 10 45	2.5	59.2	16.1
12	- 5 23.7	$T_{\overline{m}_\odot}$ 12 h 5.4 min		Starost 27.5 d	Faza ●		

PLANETE

Pl.	$T_{\overline{m}}$	π	360−α	Vel.	Pl.	$T_{\overline{m}}$	π	360−α	Vel.
	h min	′	°			h min	′	°	
♀	14 57	.1	208	-4.0	♃	5 1	.0	357	-2.4
♂	16 5	.1	191	1.4	♄	16 47	.0	180	1.1

UT	SUNCE $S_\odot$	SUNCE $\delta_\odot$	PROLJ. TAČKA S_Υ	VENERA S_φ	VENERA δ_φ	MARS S_σ	MARS δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	178 38.0	22 8.7	288 47.5	135 37.9	12 36.9	118 54.7	5 10.2
2	208 37.8	22 8.0	318 52.5	165 37.5	12 34.7	148 57.0	5 9.0
4	238 37.6	22 7.4	348 57.4	195 37.2	12 32.5	178 59.3	5 7.8
6	268 37.5	22 6.7	19 2.3	225 36.8	12 30.3	209 1.5	5 6.6
8	298 37.3	22 6.1	49 7.2	255 36.4	12 28.1	239 3.8	5 5.4
10	328 37.1	22 5.4	79 12.2	285 36.1	12 25.9	269 6.1	5 4.2
12	358 36.9	22 4.7	109 17.1	315 35.7	12 23.7	299 8.3	5 2.9
14	28 36.8	22 4.1	139 22.0	345 35.4	12 21.5	329 10.6	5 1.7
16	58 36.6	22 3.4	169 27.0	15 35.0	12 19.3	359 12.9	5 .5
18	88 36.4	22 2.7	199 31.9	45 34.7	12 17.1	29 15.1	4 59.3
20	118 36.3	22 2.0	229 36.8	75 34.3	12 14.8	59 17.4	4 58.1
22	148 36.1	22 1.4	259 41.7	105 34.0	12 12.6	89 19.7	4 56.9
Δ	-1	-3		-2	-11	11	-6

UT	MJESEC $S_\leftmoon$	MJESEC Δ	MJESEC $\delta_\leftmoon$	MJESEC Δ	JUPITER S_4	JUPITER δ_4	SATURN S_η	SATURN δ_η
h	° ′		° ′		° ′	° ′	° ′	° ′
0	190 41.0	42	23 39.0	-55	285 22.9	0 1.7	108 35.8	2 24.2
2	219 27.4	42	23 27.9	-59	315 27.7	0 1.8	138 40.5	2 24.1
4	248 13.9	43	23 16.2	-62	345 32.4	0 1.9	168 45.1	2 23.9
6	277 .5	44	23 3.8	-65	15 37.1	0 1.9	198 49.7	2 23.8
8	305 47.2	44	22 50.7	-69	45 41.9	0 2.0	228 54.4	2 23.6
10	334 34.1	45	22 37.0	-72	75 46.6	0 2.0	258 59.0	2 23.5
12	3 21.1	46	22 22.6	-75	105 51.3	0 2.1	289 3.6	2 23.3
14	32 8.3	47	22 7.5	-78	135 56.1	0 2.1	319 8.2	2 23.2
16	60 55.6	48	21 51.9	-81	166 .8	0 2.2	349 12.9	2 23.1
18	89 43.1	49	21 35.6	-84	196 5.6	0 2.2	19 17.5	2 22.9
20	118 30.8	50	21 18.7	-88	226 10.3	0 2.3	49 22.1	2 22.8
22	147 18.7	51	21 1.2	-90	256 15.1	0 2.3	79 26.8	2 22.6
Δ					24	0	23	-1

φ	SUNCE IZLAZ	SUNCE ZALAZ	TRAJANJE SUMRAKA GRAĐ.	TRAJANJE SUMRAKA ASTR.	MJESEC IZLAZ	MJESEC Δ/24	MJESEC ZALAZ	MJESEC Δ/24
N	h min	h min	h min	h min	h min	min	h min	min
60	2 56	21 14	1 23	: ::	2 10	4.1	20 55	.7
55	3 36	20 35	0 54	: ::	2 54	3.7	20 20	1.1
50	4 3	20 7	0 43	: ::	3 23	3.4	19 55	1.4
45	4 24	19 47	0 36	2 24	3 46	3.3	19 36	1.6
40	4 41	19 30	0 32	1 59	4 4	3.1	19 20	1.7
35	4 55	19 16	0 29	1 44	4 19	3.0	19 7	1.9
30	5 7	19 4	0 27	1 35	4 32	2.9	18 55	2.0
20	5 28	18 43	0 24	1 23	4 54	2.8	18 35	2.2
10	5 45	18 26	0 23	1 17	5 13	2.6	18 17	2.3
0	6 2	18 9	0 22	1 14	5 31	2.5	18 0	2.5
10	6 18	17 53	0 23	1 15	5 49	2.4	17 44	2.6
20	6 36	17 36	0 24	1 18	6 9	2.3	17 26	2.8
30	6 55	17 16	0 26	1 25	6 31	2.1	17 5	2.9
35	7 7	17 4	0 28	1 30	6 44	2.0	16 53	3.1
40	7 20	16 51	0 30	1 36	6 59	1.9	16 39	3.2
45	7 36	16 36	0 33	1 45	7 16	1.7	16 22	3.3
50	7 55	16 16	0 38	1 57	7 38	1.6	16 1	3.5
55	8 20	15 52	0 44	2 15	8 7	1.3	15 33	3.8
60	8 54	15 17	0 55	2 41	8 47	.9	14 54	4.3
S								

SUNCE UT	SUNCE $e = T_p - UT$	SUNCE Δ/24	SUNCE r	MJESEC Prolaz	MJESEC Δ/24	MJESEC $\pi_\leftmoon$	MJESEC r
h	min s	s	′	h min	min	′	′
00	- 5 27.9	-.3	15.8	$T_{\overline{m}}$ 11 46	2.5	59.9	16.3
12	- 5 32.0	$T_{\overline{m}_\odot}$ 12 h 5.5 min		Starost 28.5 d	Faza ●		

PLANETE

Pl.	$T_{\overline{m}}$	π	360−α	Vel.	Pl.	$T_{\overline{m}}$	π	360−α	Vel.
	h min	′	°			h min	′	°	
♀	14 58	.1	207	-4.0	♃	4 58	.0	357	-2.4
♂	16 3	.1	190	1.4	♄	16 43	.0	180	1.1

UT	SUNCE		PROLJ. TAČKA	VENERA		MARS	
	$S_\odot$	$\delta_\odot$	S_Υ	S_φ	δ_φ	S_σ	δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	178 36.0	22 .7	289 46.7	135 33.7	12 10.4	119 21.9	4 55.7
2	208 35.8	22 .0	319 51.6	165 33.3	12 8.2	149 24.2	4 54.5
4	238 35.6	21 59.3	349 56.5	195 33.0	12 6.0	179 26.4	4 53.3
6	268 35.5	21 58.6	20 1.5	225 32.7	12 3.7	209 28.7	4 52.0
8	298 35.3	21 57.9	50 6.4	255 32.3	12 1.5	239 31.0	4 50.8
10	328 35.1	21 57.2	80 11.3	285 32.0	11 59.3	269 33.2	4 49.6
12	358 35.0	21 56.5	110 16.2	315 31.7	11 57.0	299 35.5	4 48.4
14	28 34.8	21 55.8	140 21.2	345 31.4	11 54.8	329 37.7	4 47.2
16	58 34.7	21 55.1	170 26.1	15 31.0	11 52.6	359 40.0	4 46.0
18	88 34.5	21 54.4	200 31.0	45 30.7	11 50.3	29 42.3	4 44.8
20	118 34.4	21 53.7	230 35.9	75 30.4	11 48.1	59 44.5	4 43.5
22	148 34.2	21 53.0	260 40.9	105 30.1	11 45.9	89 46.8	4 42.3
Δ	-1	-4		-2	-11	11	-6

UT	MJESEC				JUPITER		SATURN	
	$S_\leftmoon$	Δ	$\delta_\leftmoon$	Δ	S_4	δ_4	S_η	δ_η
h	° ′		° ′		° ′	° ′	° ′	° ′
0	176 6.9	52	20 43.1	-93	286 19.8	0 2.4	109 31.4	2 22.5
2	204 55.2	53	20 24.4	-96	316 24.6	0 2.4	139 36.0	2 22.3
4	233 43.8	54	20 5.1	-99	346 29.3	0 2.5	169 40.6	2 22.2
6	262 32.7	55	19 45.3	-102	16 34.1	0 2.5	199 45.3	2 22.0
8	291 21.8	57	19 24.9	-105	46 38.8	0 2.6	229 49.9	2 21.9
10	320 11.1	58	19 4.0	-107	76 43.6	0 2.6	259 54.5	2 21.7
12	349 .8	59	18 42.6	-110	106 48.3	0 2.7	289 59.2	2 21.6
14	17 50.6	61	18 20.6	-112	136 53.1	0 2.7	320 3.8	2 21.4
16	46 40.8	62	17 58.2	-115	166 57.8	0 2.8	350 8.4	2 21.3
18	75 31.2	64	17 35.2	-117	197 2.6	0 2.8	20 13.0	2 21.1
20	104 22.0	65	17 11.8	-119	227 7.3	0 2.9	50 17.6	2 21.0
22	133 13.0	66	16 47.9	-122	257 12.1	0 2.9	80 22.3	2 20.8
Δ					24	0	23	-1

φ	SUNCE		TRAJANJE SUMRAKA		MJESEC			
	IZLAZ	ZALAZ	GRAĐ.	ASTR.	IZLAZ	Δ/24	ZALAZ	Δ/24
N	h min	h min	h min	h min	h min	min	h min	min
60	2 58	21 12	1 22	: ::	3 49	4.3	21 11	.4
55	3 37	20 34	0 54	: ::	4 22	3.9	20 47	.8
50	4 4	20 7	0 43	3 40	4 46	3.6	20 28	1.1
45	4 25	19 46	0 36	2 23	5 4	3.4	20 14	1.3
40	4 41	19 30	0 32	1 58	5 19	3.2	20 2	1.5
35	4 55	19 16	0 29	1 44	5 31	3.1	19 51	1.6
30	5 7	19 4	0 27	1 34	5 42	2.9	19 42	1.8
20	5 28	18 43	0 24	1 23	6 1	2.7	19 27	2.0
10	5 46	18 26	0 23	1 17	6 17	2.6	19 13	2.2
0	6 2	18 9	0 22	1 14	6 32	2.4	18 60	2.3
10	6 18	17 53	0 23	1 15	6 47	2.2	18 46	2.5
20	6 36	17 36	0 24	1 18	7 3	2.1	18 32	2.7
30	6 55	17 16	0 26	1 25	7 21	1.9	18 16	2.9
35	7 7	17 5	0 28	1 30	7 32	1.7	18 6	3.1
40	7 20	16 52	0 30	1 36	7 44	1.6	17 55	3.2
45	7 35	16 36	0 33	1 45	7 58	1.4	17 42	3.4
50	7 54	16 17	0 37	1 57	8 16	1.2	17 26	3.6
55	8 19	15 53	0 44	2 14	8 38	.9	17 5	3.9
60	8 53	15 19	0 54	2 40	9 8	.5	16 37	4.4
S								

SUNCE				MJESEC			
UT	$e = T_p - UT$	Δ/24	r	Prolaz	Δ/24	$\pi_\leftmoon$	r
h	min s	s	′	h min	min	′	′
00	- 5 36.0	-.3	15.8	$T_{\overline{m}}$ 12 46	2.4	60.4	16.5
12	- 5 39.8	$T_{\overline{m}_\odot}$ 12 h 5.7 min		Starost .2 d	Faza ●		

PLANETE								
Pl.	$T_{\overline{m}}$	π	360−α	Vel.	Pl.	$T_{\overline{m}}$	π	360−α	Vel.
	h min	′	°			h min	′	°	
♀	14 58	.1	206	-4.0	♃	4 54	.0	357	-2.4
♂	16 1	.1	190	1.4	♄	16 39	.0	180	1.1

UT	SUNCE		PROLJ. TAČKA	VENERA		MARS	
	$S_\odot$	$\delta_\odot$	S_Υ	S_φ	δ_φ	S_σ	δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	178 34.0	21 52.3	290 45.8	135 29.8	11 43.6	119 49.0	4 41.1
2	208 33.9	21 51.5	320 50.7	165 29.5	11 41.4	149 51.3	4 39.9
4	238 33.7	21 50.8	350 55.7	195 29.2	11 39.1	179 53.5	4 38.7
6	268 33.6	21 50.1	21 .6	225 28.9	11 36.9	209 55.8	4 37.5
8	298 33.4	21 49.4	51 5.5	255 28.6	11 34.6	239 58.0	4 36.2
10	328 33.3	21 48.6	81 10.4	285 28.3	11 32.4	270 .3	4 35.0
12	358 33.1	21 47.9	111 15.4	315 28.0	11 30.1	300 2.6	4 33.8
14	28 33.0	21 47.2	141 20.3	345 27.7	11 27.9	330 4.8	4 32.6
16	58 32.8	21 46.4	171 25.2	15 27.4	11 25.6	0 7.1	4 31.4
18	88 32.7	21 45.7	201 30.2	45 27.1	11 23.4	30 9.3	4 30.1
20	118 32.5	21 45.0	231 35.1	75 26.8	11 21.1	60 11.6	4 28.9
22	148 32.4	21 44.2	261 40.0	105 26.6	11 18.8	90 13.8	4 27.7
Δ	-1	-4		-1	-11	11	-6

UT	MJESEC				JUPITER		SATURN	
	$S_\leftmoon$	Δ	$\delta_\leftmoon$	Δ	S_4	δ_4	S_η	δ_η
h	° ′		° ′		° ′	° ′	° ′	° ′
0	162 4.3	68	16 23.6	-124	287 16.9	0 3.0	110 26.9	2 20.7
2	190 55.8	69	15 58.8	-126	317 21.6	0 3.0	140 31.5	2 20.5
4	219 47.7	71	15 33.6	-128	347 26.4	0 3.1	170 36.1	2 20.4
6	248 39.9	72	15 8.1	-130	17 31.2	0 3.1	200 40.8	2 20.2
8	277 32.3	74	14 42.1	-132	47 35.9	0 3.1	230 45.4	2 20.1
10	306 25.1	75	14 15.8	-133	77 40.7	0 3.2	260 50.0	2 19.9
12	335 18.1	77	13 49.1	-135	107 45.5	0 3.2	290 54.6	2 19.8
14	4 11.4	78	13 22.0	-137	137 50.2	0 3.3	320 59.2	2 19.6
16	33 5.0	79	12 54.6	-138	167 55.0	0 3.3	351 3.9	2 19.5
18	61 58.8	81	12 27.0	-140	197 59.8	0 3.3	21 8.5	2 19.3
20	90 53.0	82	11 59.0	-141	228 4.6	0 3.4	51 13.1	2 19.2
22	119 47.4	83	11 30.7	-143	258 9.3	0 3.4	81 17.7	2 19.0
Δ					24	0	23	-1

φ	SUNCE		TRAJANJE SUMRAKA		MJESEC			
	IZLAZ	ZALAZ	GRAĐ.	ASTR.	IZLAZ	Δ/24	ZALAZ	Δ/24
N	h min	h min	h min	h min	h min	min	h min	min
60	2 60	21 11	1 20	: ::	5 34	4.3	21 21	.3
55	3 38	20 32	0 53	: ::	5 56	3.9	21 6	.7
50	4 5	20 6	0 42	3 32	6 12	3.6	20 55	.9
45	4 26	19 45	0 36	2 22	6 25	3.4	20 45	1.1
40	4 42	19 29	0 32	1 58	6 36	3.2	20 37	1.3
35	4 56	19 15	0 29	1 44	6 45	3.0	20 30	1.5
30	5 8	19 3	0 27	1 34	6 53	2.9	20 24	1.6
20	5 28	18 43	0 24	1 23	7 6	2.7	20 14	1.8
10	5 46	18 26	0 23	1 17	7 18	2.5	20 4	2.0
0	6 2	18 9	0 22	1 14	7 29	2.3	19 56	2.2
10	6 18	17 53	0 23	1 15	7 40	2.1	19 47	2.4
20	6 35	17 36	0 24	1 18	7 52	1.9	19 37	2.6
30	6 55	17 17	0 26	1 24	8 6	1.7	19 26	2.9
35	7 6	17 5	0 28	1 30	8 13	1.5	19 19	3.0
40	7 19	16 52	0 30	1 36	8 22	1.4	19 12	3.2
45	7 35	16 37	0 33	1 45	8 32	1.2	19 3	3.3
50	7 53	16 18	0 37	1 57	8 45	1.0	18 53	3.6
55	8 18	15 54	0 44	2 14	9 0	.7	18 39	3.9
60	8 52	15 20	0 54	2 39	9 20	.4	18 22	4.2
S								

SUNCE				MJESEC			
UT	$e = T_p - UT$	Δ/24	r	Prolaz	Δ/24	$\pi_\leftmoon$	r
h	min s	s	′	h min	min	′	′
00	- 5 43.6	-.3	15.8	$T_{\overline{m}}$ 13 43	2.2	60.7	16.5
12	- 5 47.2	$T_{\overline{m}_\odot}$ 12 h 5.8 min		Starost 1.2 d	Faza ●		

PLANETE								
Pl.	$T_{\overline{m}}$	π	360−α	Vel.	Pl.	$T_{\overline{m}}$	π	360−α	Vel.
	h min	′	°			h min	′	°	
♀	14 58	.1	205	-4.0	♃	4 50	.0	357	-2.4
♂	15 60	.1	189	1.4	♄	16 36	.0	180	1.1

UT	SUNCE $S_\odot$	SUNCE $\delta_\odot$	PROLJ. TAČKA S_Υ	VENERA S_φ	VENERA δ_φ	MARS S_σ	MARS δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	178 32.3	21 43.5	291 44.9	135 26.3	11 16.6	120 16.1	4 26.5
2	208 32.1	21 42.7	321 49.9	165 26.0	11 14.3	150 18.3	4 25.3
4	238 32.0	21 42.0	351 54.8	195 25.7	11 12.1	180 20.6	4 24.0
6	268 31.8	21 41.2	21 59.7	225 25.5	11 9.8	210 22.8	4 22.8
8	298 31.7	21 40.4	52 4.7	255 25.2	11 7.5	240 25.1	4 21.6
10	328 31.6	21 39.7	82 9.6	285 24.9	11 5.3	270 27.3	4 20.4
12	358 31.4	21 38.9	112 14.5	315 24.7	11 3.0	300 29.6	4 19.1
14	28 31.3	21 38.2	142 19.4	345 24.4	11 .7	330 31.8	4 17.9
16	58 31.1	21 37.4	172 24.4	15 24.1	10 58.4	0 34.1	4 16.7
18	88 31.0	21 36.6	202 29.3	45 23.9	10 56.2	30 36.3	4 15.5
20	118 30.9	21 35.9	232 34.2	75 23.6	10 53.9	60 38.6	4 14.3
22	148 30.7	21 35.1	262 39.2	105 23.4	10 51.6	90 40.8	4 13.0
Δ	-1	-4		-1	-11	11	-6

UT	MJESEC $S_\leftmoon$	MJESEC Δ	MJESEC $\delta_\leftmoon$	MJESEC Δ	JUPITER S_4	JUPITER δ_4	SATURN S_η	SATURN δ_η
h	° ′		° ′		° ′	° ′	° ′	° ′
0	148 42.1	85	11 2.2	-144	288 14.1	0 3.5	111 22.3	2 18.9
2	177 37.0	86	10 33.4	-145	318 18.9	0 3.5	141 26.9	2 18.7
4	206 32.2	87	10 4.3	-146	348 23.7	0 3.5	171 31.6	2 18.6
6	235 27.7	89	9 35.1	-147	18 28.4	0 3.6	201 36.2	2 18.4
8	264 23.4	90	9 5.6	-148	48 33.2	0 3.6	231 40.8	2 18.3
10	293 19.3	91	8 35.9	-149	78 38.0	0 3.6	261 45.4	2 18.1
12	322 15.5	92	8 6.1	-150	108 42.8	0 3.7	291 50.0	2 18.0
14	351 11.9	93	7 36.1	-151	138 47.6	0 3.7	321 54.6	2 17.8
16	20 8.5	94	7 5.9	-151	168 52.4	0 3.7	351 59.2	2 17.7
18	49 5.4	95	6 35.6	-152	198 57.1	0 3.8	22 3.8	2 17.5
20	78 2.4	96	6 5.2	-153	229 1.9	0 3.8	52 8.5	2 17.4
22	106 59.7	97	5 34.7	-153	259 6.7	0 3.8	82 13.1	2 17.2
Δ					24	0	23	-1

φ	SUNCE IZLAZ	SUNCE ZALAZ	TRAJANJE SUMRAKA GRAĐ.	TRAJANJE SUMRAKA ASTR.	MJESEC IZLAZ	MJESEC Δ/24	MJESEC ZALAZ	MJESEC Δ/24
N	h min	h min	h min	h min	h min	min	h min	min
60	3 1	21 9	1 19	: ::	7 17	4.2	21 29	.3
55	3 40	20 31	0 53	: ::	7 29	3.8	21 22	.6
50	4 6	20 5	0 42	3 26	7 38	3.5	21 17	.8
45	4 27	19 45	0 36	2 21	7 46	3.3	21 12	1.0
40	4 43	19 29	0 32	1 57	7 52	3.1	21 9	1.2
35	4 57	19 15	0 29	1 43	7 57	3.0	21 6	1.4
30	5 9	19 3	0 27	1 34	8 2	2.8	21 3	1.5
20	5 29	18 43	0 24	1 22	8 10	2.6	20 58	1.7
10	5 46	18 26	0 23	1 16	8 17	2.4	20 53	1.9
0	6 2	18 10	0 22	1 14	8 24	2.2	20 49	2.1
10	6 18	17 54	0 23	1 14	8 31	2.0	20 45	2.3
20	6 35	17 37	0 24	1 18	8 38	1.8	20 40	2.5
30	6 55	17 17	0 26	1 24	8 46	1.5	20 34	2.8
35	7 6	17 6	0 28	1 29	8 50	1.4	20 31	2.9
40	7 19	16 53	0 30	1 36	8 55	1.3	20 28	3.1
45	7 34	16 38	0 33	1 45	9 1	1.1	20 23	3.3
50	7 53	16 19	0 37	1 57	9 9	.9	20 18	3.5
55	8 17	15 55	0 44	2 14	9 17	.6	20 12	3.8
60	8 50	15 22	0 54	2 39	9 29	.3	20 4	4.1
S								

SUNCE UT	SUNCE $e = T_p - UT$	SUNCE Δ/24	SUNCE r	MJESEC Prolaz	MJESEC Δ/24	MJESEC $\pi_\leftmoon$	MJESEC r
h	min s	s	′	h min	min	′	′
00	- 5 50.8	-.3	15.8	$T_{\overline{m}}$ 14 36	2.2	60.7	16.5
12	- 5 54.1	$T_{\overline{m}_\odot}$ 12 h 5.9 min		Starost 2.2 d	Faza ●		

PLANETE

Pl.	$T_{\overline{m}}$	π	360−α	Vel.	Pl.	$T_{\overline{m}}$	π	360−α	Vel.
	h min	′	°			h min	′	°	
♀	14 58	.1	204	-4.0	♃	4 46	.0	356	-2.4
♂	15 58	.1	189	1.4	♄	16 32	.0	180	1.1

UT	SUNCE $S_\odot$	SUNCE $\delta_\odot$	PROLJ. TAČKA S_Υ	VENERA S_φ	VENERA δ_φ	MARS S_σ	MARS δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	178 30.6	21 34.3	292 44.1	135 23.1	10 49.3	120 43.0	4 11.8
2	208 30.5	21 33.5	322 49.0	165 22.9	10 47.0	150 45.3	4 10.6
4	238 30.3	21 32.7	352 53.9	195 22.6	10 44.7	180 47.5	4 9.4
6	268 30.2	21 32.0	22 58.9	225 22.4	10 42.5	210 49.8	4 8.1
8	298 30.1	21 31.2	53 3.8	255 22.2	10 40.2	240 52.0	4 6.9
10	328 29.9	21 30.4	83 8.7	285 21.9	10 37.9	270 54.3	4 5.7
12	358 29.8	21 29.6	113 13.7	315 21.7	10 35.6	300 56.5	4 4.4
14	28 29.7	21 28.8	143 18.6	345 21.5	10 33.3	330 58.7	4 3.2
16	58 29.6	21 28.0	173 23.5	15 21.2	10 31.0	1 1.0	4 2.0
18	88 29.4	21 27.2	203 28.4	45 21.0	10 28.7	31 3.2	4 .8
20	118 29.3	21 26.4	233 33.4	75 20.8	10 26.4	61 5.5	3 59.5
22	148 29.2	21 25.6	263 38.3	105 20.6	10 24.1	91 7.7	3 58.3
Δ	-1	-4		-1	-11	11	-6

UT	MJESEC $S_\leftmoon$	MJESEC Δ	MJESEC $\delta_\leftmoon$	MJESEC Δ	JUPITER S_4	JUPITER δ_4	SATURN S_η	SATURN δ_η
h	° ′		° ′		° ′	° ′	° ′	° ′
0	135 57.1	98	5 4.1	-154	289 11.5	0 3.9	112 17.7	2 17.0
2	164 54.8	99	4 33.4	-154	319 16.3	0 3.9	142 22.3	2 16.9
4	193 52.6	100	4 2.6	-154	349 21.1	0 3.9	172 26.9	2 16.7
6	222 50.5	101	3 31.8	-154	19 25.9	0 4.0	202 31.5	2 16.6
8	251 48.7	101	3 .9	-154	49 30.7	0 4.0	232 36.1	2 16.4
10	280 47.0	102	2 30.0	-155	79 35.5	0 4.0	262 40.7	2 16.3
12	309 45.4	103	1 59.1	-155	109 40.3	0 4.1	292 45.3	2 16.1
14	338 44.0	103	1 28.2	-154	139 45.1	0 4.1	322 49.9	2 16.0
16	7 42.6	104	0 57.3	-154	169 49.9	0 4.1	352 54.5	2 15.8
18	36 41.5	105	0 26.5	-154	199 54.7	0 4.1	22 59.1	2 15.6
20	65 40.4	105 - 0	4.3	-154	229 59.5	0 4.2	53 3.7	2 15.5
22	94 39.4	106 - 0	35.1	-154	260 4.3	0 4.2	83 8.4	2 15.3
Δ					24	0	23	-1

φ	SUNCE IZLAZ	SUNCE ZALAZ	TRAJANJE SUMRAKA GRAĐ.	TRAJANJE SUMRAKA ASTR.	MJESEC IZLAZ	MJESEC Δ/24	MJESEC ZALAZ	MJESEC Δ/24
N	h min	h min	h min	h min	h min	min	h min	min
60	3 3	21 7	1 18	: ::	8 57	4.1	21 35	.3
55	3 41	20 30	0 53	: ::	9 0	3.7	21 36	.6
50	4 7	20 4	0 42	3 21	9 3	3.4	21 37	.8
45	4 27	19 44	0 36	2 20	9 5	3.2	21 38	1.0
40	4 44	19 28	0 32	1 57	9 7	3.0	21 38	1.2
35	4 57	19 14	0 29	1 43	9 8	2.9	21 38	1.3
30	5 9	19 3	0 27	1 34	9 10	2.7	21 39	1.5
20	5 29	18 43	0 24	1 22	9 12	2.5	21 39	1.7
10	5 46	18 26	0 23	1 16	9 14	2.3	21 40	1.9
0	6 2	18 10	0 22	1 14	9 16	2.1	21 40	2.1
10	6 18	17 54	0 23	1 14	9 18	1.9	21 40	2.3
20	6 35	17 37	0 24	1 18	9 20	1.7	21 41	2.5
30	6 54	17 18	0 26	1 24	9 23	1.5	21 41	2.7
35	7 6	17 7	0 28	1 29	9 24	1.3	21 41	2.9
40	7 18	16 54	0 30	1 36	9 25	1.2	21 41	3.0
45	7 33	16 39	0 33	1 45	9 27	1.0	21 42	3.2
50	7 52	16 21	0 37	1 57	9 29	.8	21 42	3.4
55	8 16	15 57	0 43	2 13	9 32	.6	21 42	3.7
60	8 49	15 24	0 54	2 38	9 36	.3	21 42	4.0
S								

SUNCE UT	SUNCE $e = T_p - UT$	SUNCE Δ/24	SUNCE r	MJESEC Prolaz	MJESEC Δ/24	MJESEC $\pi_\leftmoon$	MJESEC r
h	min s	s	′	h min	min	′	′
00	- 5 57.4	-.3	15.8	$T_{\overline{m}}$ 15 28	2.1	60.4	16.5
12	- 6 .5	$T_{\overline{m}_\odot}$ 12 h 6.0 min		Starost 3.2 d	Faza ●		

PLANETE

Pl.	$T_{\overline{m}}$	π	360−α	Vel.	Pl.	$T_{\overline{m}}$	π	360−α	Vel.
	h min	′	°			h min	′	°	
♀	14 59	.2	203	-4.0	♃	4 42	.0	356	-2.4
♂	15 56	.1	188	1.4	♄	16 28	.0	180	1.1

UT	SUNCE $S_\odot$	SUNCE $\delta_\odot$	PROLJ. TAČKA S_Υ	VENERA S_φ	VENERA δ_φ	MARS S_σ	MARS δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	178 29.1	21 24.8	293 43.2	135 20.4	10 21.8	121 10.0	3 57.1
2	208 29.0	21 24.0	323 48.1	165 20.1	10 19.5	151 12.2	3 55.9
4	238 28.8	21 23.2	353 53.1	195 19.9	10 17.2	181 14.4	3 54.6
6	268 28.7	21 22.3	23 58.0	225 19.7	10 14.9	211 16.7	3 53.4
8	298 28.6	21 21.5	54 2.9	255 19.5	10 12.6	241 18.9	3 52.2
10	328 28.5	21 20.7	84 7.9	285 19.3	10 10.3	271 21.1	3 50.9
12	358 28.4	21 19.9	114 12.8	315 19.1	10 8.0	301 23.4	3 49.7
14	28 28.2	21 19.0	144 17.7	345 18.9	10 5.7	331 25.6	3 48.5
16	58 28.1	21 18.2	174 22.6	15 18.7	10 3.4	1 27.9	3 47.2
18	88 28.0	21 17.4	204 27.6	45 18.5	10 1.1	31 30.1	3 46.0
20	118 27.9	21 16.6	234 32.5	75 18.3	9 58.8	61 32.3	3 44.8
22	148 27.8	21 15.7	264 37.4	105 18.1	9 56.4	91 34.6	3 43.5
Δ	-1	-4		-1	-12	11	-6

UT	MJESEC $S_\leftmoon$	MJESEC Δ	MJESEC $\delta_\leftmoon$	MJESEC Δ	JUPITER S_4	JUPITER δ_4	SATURN S_η	SATURN δ_η
h	° ′		° ′		° ′	° ′	° ′	° ′
0	123 38.5	106 - 1	5.8	-153	290 9.1	0 4.2	113 13.0	2 15.2
2	152 37.7	106 - 1	36.5	-153	320 13.9	0 4.2	143 17.6	2 15.0
4	181 37.0	107 - 2	7.0	-152	350 18.7	0 4.3	173 22.2	2 14.9
6	210 36.4	107 - 2	37.5	-152	20 23.5	0 4.3	203 26.8	2 14.7
8	239 35.8	107 - 3	7.8	-151	50 28.3	0 4.3	233 31.4	2 14.5
10	268 35.2	108 - 3	38.0	-150	80 33.2	0 4.3	263 36.0	2 14.4
12	297 34.7	108 - 4	8.1	-150	110 38.0	0 4.4	293 40.6	2 14.2
14	326 34.3	108 - 4	38.1	-149	140 42.8	0 4.4	323 45.2	2 14.1
16	355 33.9	108 - 5	7.9	-148	170 47.6	0 4.4	353 49.8	2 13.9
18	24 33.4	108 - 5	37.5	-147	200 52.4	0 4.4	23 54.4	2 13.8
20	53 33.0	108 - 6	6.9	-146	230 57.2	0 4.4	53 59.0	2 13.6
22	82 32.6	108 - 6	36.2	-145	261 2.1	0 4.5	84 3.6	2 13.4
Δ					24	0	23	-1

φ	SUNCE IZLAZ	SUNCE ZALAZ	TRAJANJE SUMRAKA GRAĐ.	TRAJANJE SUMRAKA ASTR.	MJESEC IZLAZ	MJESEC Δ/24	MJESEC ZALAZ	MJESEC Δ/24
N	h min	h min	h min	h min	h min	min	h min	min
60	3 5	21 6	1 16	: ::	10 34	4.0	21 42	.3
55	3 42	20 29	0 52	: ::	10 29	3.6	21 50	.6
50	4 8	20 3	0 42	3 16	10 25	3.4	21 57	.9
45	4 28	19 43	0 36	2 19	10 22	3.2	22 2	1.1
40	4 44	19 27	0 32	1 56	10 20	3.0	22 7	1.2
35	4 58	19 14	0 29	1 43	10 17	2.8	22 11	1.4
30	5 10	19 2	0 27	1 33	10 15	2.7	22 14	1.5
20	5 29	18 43	0 24	1 22	10 12	2.5	22 20	1.7
10	5 47	18 26	0 23	1 16	10 9	2.3	22 25	1.9
0	6 3	18 10	0 22	1 14	10 7	2.1	22 30	2.1
10	6 18	17 54	0 22	1 14	10 4	1.9	22 35	2.3
20	6 35	17 37	0 24	1 18	10 1	1.7	22 40	2.5
30	6 54	17 18	0 26	1 24	9 58	1.5	22 46	2.7
35	7 5	17 7	0 28	1 29	9 56	1.4	22 50	2.8
40	7 18	16 55	0 30	1 36	9 54	1.2	22 54	3.0
45	7 33	16 40	0 33	1 45	9 52	1.0	22 58	3.1
50	7 51	16 22	0 37	1 56	9 49	.8	23 4	3.4
55	8 14	15 58	0 43	2 13	9 46	.6	23 10	3.6
60	8 47	15 26	0 53	2 38	9 42	.3	23 19	4.0
S								

SUNCE UT	SUNCE $e = T_p - UT$	SUNCE Δ/24	SUNCE r	MJESEC Prolaz	MJESEC Δ/24	MJESEC $\pi_\leftmoon$	MJESEC r
h	min s	s	′	h min	min	′	′
00	- 6 3.5	-.2	15.8	$T_{\overline{m}}$ 16 18	2.1	60.0	16.3
12	- 6 6.3	$T_{\overline{m}_\odot}$ 12 h	6.1 min	Starost 4.2 d	Faza ◑		

PLANETE

Pl.	$T_{\overline{m}}$	π	360−α	Vel.	Pl.	$T_{\overline{m}}$	π	360−α	Vel.
	h min	′	°			h min	′	°	
♀	14 59	.2	202	-4.0	♃	4 39	.0	356	-2.4
♂	15 54	.1	187	1.4	♄	16 25	.0	179	1.1

UT	SUNCE $S_\odot$	SUNCE $\delta_\odot$	PROLJ. TAČKA S_Υ	VENERA S_φ	VENERA δ_φ	MARS S_σ	MARS δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	178 27.7	21 14.9	294 42.4	135 17.9	9 54.1	121 36.8	3 42.3
2	208 27.6	21 14.0	324 47.3	165 17.7	9 51.8	151 39.0	3 41.1
4	238 27.5	21 13.2	354 52.2	195 17.6	9 49.5	181 41.3	3 39.8
6	268 27.4	21 12.4	24 57.1	225 17.4	9 47.2	211 43.5	3 38.6
8	298 27.2	21 11.5	55 2.1	255 17.2	9 44.8	241 45.7	3 37.4
10	328 27.1	21 10.7	85 7.0	285 17.0	9 42.5	271 48.0	3 36.1
12	358 27.0	21 9.8	115 11.9	315 16.8	9 40.2	301 50.2	3 34.9
14	28 26.9	21 8.9	145 16.9	345 16.7	9 37.9	331 52.4	3 33.7
16	58 26.8	21 8.1	175 21.8	15 16.5	9 35.5	1 54.7	3 32.4
18	88 26.7	21 7.2	205 26.7	45 16.3	9 33.2	31 56.9	3 31.2
20	118 26.6	21 6.4	235 31.6	75 16.2	9 30.9	61 59.1	3 30.0
22	148 26.5	21 5.5	265 36.6	105 16.0	9 28.6	92 1.4	3 28.7
Δ	-1	-4		-1	-12	11	-6

UT	MJESEC $S_\leftmoon$	MJESEC Δ	MJESEC $\delta_\leftmoon$	MJESEC Δ	JUPITER S_4	JUPITER δ_4	SATURN S_η	SATURN δ_η
h	° ′		° ′		° ′	° ′	° ′	° ′
0	111 32.2	108 - 7	5.3	-144	291 6.9	0 4.5	114 8.2	2 13.3
2	140 31.8	108 - 7	34.1	-143	321 11.7	0 4.5	144 12.8	2 13.1
4	169 31.4	108 - 8	2.8	-142	351 16.5	0 4.5	174 17.4	2 13.0
6	198 30.9	108 - 8	31.2	-141	21 21.3	0 4.5	204 22.0	2 12.8
8	227 30.4	107 - 8	59.3	-140	51 26.2	0 4.6	234 26.6	2 12.6
10	256 29.9	107 - 9	27.3	-138	81 31.0	0 4.6	264 31.1	2 12.5
12	285 29.3	107 - 9	54.9	-137	111 35.8	0 4.6	294 35.7	2 12.3
14	314 28.7	107 -10	22.3	-136	141 40.7	0 4.6	324 40.3	2 12.2
16	343 28.0	106 -10	49.5	-134	171 45.5	0 4.6	354 44.9	2 12.0
18	12 27.2	106 -11	16.3	-133	201 50.3	0 4.6	24 49.5	2 11.8
20	41 26.4	105 -11	42.9	-131	231 55.2	0 4.6	54 54.1	2 11.7
22	70 25.5	105 -12	9.1	-130	261 60.0	0 4.7	84 58.7	2 11.5
Δ					24	0	23	-1

φ	SUNCE IZLAZ	SUNCE ZALAZ	TRAJANJE SUMRAKA GRAĐ.	TRAJANJE SUMRAKA ASTR.	MJESEC IZLAZ	MJESEC Δ/24	MJESEC ZALAZ	MJESEC Δ/24
N	h min	h min	h min	h min	h min	min	h min	min
60	3 7	21 4	1 15	: ::	12 10	4.0	21 49	.4
55	3 44	20 28	0 52	: ::	11 57	3.6	22 5	.7
50	4 10	20 2	0 42	3 12	11 46	3.3	22 18	1.0
45	4 29	19 43	0 36	2 18	11 38	3.1	22 28	1.2
40	4 45	19 27	0 32	1 56	11 31	2.9	22 36	1.4
35	4 59	19 14	0 29	1 42	11 25	2.8	22 44	1.5
30	5 10	19 2	0 27	1 33	11 20	2.7	22 50	1.6
20	5 30	18 42	0 24	1 22	11 11	2.5	23 1	1.8
10	5 47	18 25	0 23	1 16	11 4	2.3	23 11	2.0
0	6 3	18 10	0 22	1 14	10 57	2.1	23 20	2.1
10	6 18	17 54	0 22	1 14	10 49	1.9	23 30	2.3
20	6 35	17 38	0 24	1 17	10 42	1.8	23 40	2.5
30	6 54	17 19	0 26	1 24	10 33	1.5	23 51	2.7
35	7 5	17 8	0 28	1 29	10 29	1.4	23 57	2.8
40	7 17	16 55	0 30	1 36	10 23	1.3	. . .	.0
45	7 32	16 41	0 33	1 44	10 17	1.1	. . .	.0
50	7 50	16 23	0 37	1 56	10 9	.9	. . .	.0
55	8 13	15 60	0 43	2 13	10 0	.7	. . .	.0
60	8 45	15 27	0 53	2 37	9 48	.3	. . .	.0
S								

SUNCE UT	SUNCE $e = T_p - UT$	SUNCE Δ/24	SUNCE r	MJESEC Prolaz	MJESEC Δ/24	MJESEC $\pi_\leftmoon$	MJESEC r
h	min s	s	′	h min	min	′	′
00	- 6 9.1	-.2	15.8	$T_{\overline{m}}$ 17 8	2.1	59.4	16.2
12	- 6 11.6	$T_{\overline{m}_\odot}$ 12 h	6.2 min	Starost 5.2 d	Faza ◑		

PLANETE

Pl.	$T_{\overline{m}}$	π	360−α	Vel.	Pl.	$T_{\overline{m}}$	π	360−α	Vel.
	h min	′	°			h min	′	°	
♀	14 59	.2	201	-4.0	♃	4 35	.0	356	-2.4
♂	15 52	.1	187	1.4	♄	16 21	.0	179	1.1

UT	SUNCE $S_\odot$		$\delta_\odot$		PROLJ. TAČKA S_Υ		VENERA S_φ		δ_φ		MARS S_σ		δ_σ	
h	°	′	°	′	°	′	°	′	°	′	°	′	°	′
0	178	26.4	21	4.6	295	41.5	135	15.8	9	26.2	122	3.6	3	27.5
2	208	26.3	21	3.8	325	46.4	165	15.7	9	23.9	152	5.8	3	26.3
4	238	26.2	21	2.9	355	51.4	195	15.5	9	21.5	182	8.0	3	25.0
6	268	26.1	21	2.0	25	56.3	225	15.4	9	19.2	212	10.3	3	23.8
8	298	26.0	21	1.1	56	1.2	255	15.2	9	16.9	242	12.5	3	22.5
10	328	25.9	21	.3	86	6.1	285	15.1	9	14.5	272	14.7	3	21.3
12	358	25.8	20	59.4	116	11.1	315	14.9	9	12.2	302	16.9	3	20.1
14	28	25.7	20	58.5	146	16.0	345	14.8	9	9.9	332	19.2	3	18.8
16	58	25.7	20	57.6	176	20.9	15	14.7	9	7.5	2	21.4	3	17.6
18	88	25.6	20	56.7	206	25.9	45	14.5	9	5.2	32	23.6	3	16.4
20	118	25.5	20	55.8	236	30.8	75	14.4	9	2.8	62	25.8	3	15.1
22	148	25.4	20	54.9	266	35.7	105	14.3	9	.5	92	28.1	3	13.9
Δ		0		−4				−1		−12		11		−6

UT	MJESEC $S_\leftmoon$		Δ	$\delta_\leftmoon$		Δ	JUPITER $S_{\mathrm{♃}}$		$\delta_{\mathrm{♃}}$		SATURN $S_{\mathrm{♄}}$		$\delta_{\mathrm{♄}}$	
h	°	′		°	′		°	′	°	′	°	′	°	′
0	99	24.5	105	−12	35.0	−128	292	4.8	0	4.7	115	3.3	2	11.4
2	128	23.4	104	−13	.6	−126	322	9.7	0	4.7	145	7.9	2	11.2
4	157	22.2	104	−13	25.9	−125	352	14.5	0	4.7	175	12.5	2	11.0
6	186	21.0	103	−13	50.9	−123	22	19.3	0	4.7	205	17.1	2	10.9
8	215	19.6	103	−14	15.5	−121	52	24.2	0	4.7	235	21.7	2	10.7
10	244	18.1	102	−14	39.7	−119	82	29.0	0	4.7	265	26.3	2	10.5
12	273	16.5	101	−15	3.6	−118	112	33.9	0	4.7	295	30.8	2	10.4
14	302	14.8	101	−15	27.1	−116	142	38.7	0	4.7	325	35.4	2	10.2
16	331	13.0	100	−15	50.2	−114	172	43.6	0	4.7	355	40.0	2	10.1
18	0	11.0	100	−16	13.0	−112	202	48.4	0	4.8	25	44.6	2	9.9
20	29	9.0	99	−16	35.3	−110	232	53.3	0	4.8	55	49.2	2	9.7
22	58	6.8	98	−16	57.3	−108	262	58.1	0	4.8	85	53.8	2	9.6
Δ								24		0		23		−1

φ	SUNCE IZLAZ		ZALAZ		TRAJANJE SUMRAKA GRAĐ.		ASTR.		MJESEC IZLAZ	Δ/24	ZALAZ	Δ/24
N	h	min	h	min	h	min	h	min	h min	min	h min	min
60	3	9	21	2	1	14	:	::	13 46	3.9	21 58	.6
55	3	45	20	26	0	51	:	::	13 23	3.5	22 23	1.0
50	4	11	20	1	0	41	3	9	13 6	3.2	22 42	1.2
45	4	30	19	42	0	35	2	17	12 53	3.0	22 57	1.4
40	4	46	19	26	0	32	1	55	12 42	2.9	23 9	1.5
35	4	59	19	13	0	29	1	42	12 33	2.8	23 19	1.6
30	5	11	19	2	0	27	1	33	12 24	2.6	23 29	1.7
20	5	30	18	42	0	24	1	22	12 10	2.5	23 45	1.9
10	5	47	18	25	0	23	1	16	11 58	2.3	23 58	2.1
0	6	3	18	10	0	22	1	14	11 47	2.2	.. ..	.0
10	6	18	17	54	0	22	1	14	11 36	2.0	.. ..	.0
20	6	35	17	38	0	24	1	17	11 24	1.8	.. ..	.0
30	6	53	17	19	0	26	1	24	11 11	1.7	.. ..	.0
35	7	4	17	9	0	27	1	29	11 3	1.6	.. ..	.0
40	7	17	16	56	0	30	1	36	10 54	1.4	0 5	2.9
45	7	31	16	42	0	33	1	44	10 44	1.3	0 14	3.1
50	7	49	16	24	0	37	1	56	10 32	1.1	0 25	3.3
55	8	12	16	1	0	43	2	12	10 16	.8	0 38	3.6
60	8	44	15	29	0	53	2	37	9 56	.5	0 56	3.9
S												

SUNCE UT	e = Tp − UT		Δ/24	r	MJESEC Prolaz		Δ/24	$\pi_\leftmoon$	r
h	min	s	s	′		h min	min	′	′
00	− 6	14.1	−.2	15.8	$T_{\overline{m}}$	17 59	2.2	58.7	16.0
12	− 6	16.4	$T_{\overline{m}_\odot}$	12 h 6.3 min	Starost	6.2 d	Faza ◐		

PLANETE

Pl.	$T_{\overline{m}}$		π	360−α	Vel.	Pl.	$T_{\overline{m}}$		π	360−α	Vel.
	h	min	′	°			h	min	′	°	
♀	14	59	.2	200	−4.0	♃	4	31	.0	356	−2.5
♂	15	51	.1	186	1.4	♄	16	17	.0	179	1.1

UT	SUNCE $S_\odot$		$\delta_\odot$		PROLJ. TAČKA S_Υ		VENERA S_φ		δ_φ		MARS S_σ		δ_σ	
h	°	′	°	′	°	′	°	′	°	′	°	′	°	′
0	178	25.3	20	54.0	296	40.6	135	14.1	8	58.1	122	30.3	3	12.6
2	208	25.2	20	53.1	326	45.6	165	14.0	8	55.8	152	32.5	3	11.4
4	238	25.1	20	52.2	356	50.5	195	13.9	8	53.4	182	34.7	3	10.2
6	268	25.0	20	51.3	26	55.4	225	13.7	8	51.1	212	37.0	3	8.9
8	298	25.0	20	50.4	57	.4	255	13.6	8	48.7	242	39.2	3	7.7
10	328	24.9	20	49.5	87	5.3	285	13.5	8	46.4	272	41.4	3	6.4
12	358	24.8	20	48.6	117	10.2	315	13.4	8	44.0	302	43.6	3	5.2
14	28	24.7	20	47.7	147	15.1	345	13.3	8	41.7	332	45.9	3	3.9
16	58	24.6	20	46.8	177	20.1	15	13.2	8	39.3	2	48.1	3	2.7
18	88	24.5	20	45.8	207	25.0	45	13.1	8	36.9	32	50.3	3	1.5
20	118	24.5	20	44.9	237	29.9	75	13.0	8	34.6	62	52.5	3	.2
22	148	24.4	20	44.0	267	34.8	105	12.8	8	32.2	92	54.7	2	59.0
Δ		0		−5				−1		−12		11		−6

UT	MJESEC $S_\leftmoon$		Δ	$\delta_\leftmoon$		Δ	JUPITER $S_{\mathrm{♃}}$		$\delta_{\mathrm{♃}}$		SATURN $S_{\mathrm{♄}}$		$\delta_{\mathrm{♄}}$	
h	°	′		°	′		°	′	°	′	°	′	°	′
0	87	4.4	98	−17	18.8	−106	293	3.0	0	4.8	115	58.4	2	9.4
2	116	2.0	97	−17	39.9	−104	323	7.8	0	4.8	146	3.0	2	9.2
4	144	59.4	96	−18	.6	−101	353	12.7	0	4.8	176	7.5	2	9.1
6	173	56.7	96	−18	20.9	−99	23	17.5	0	4.8	206	12.1	2	8.9
8	202	53.9	95	−18	40.7	−97	53	22.4	0	4.8	236	16.7	2	8.7
10	231	50.9	94	−19	.1	−95	83	27.2	0	4.8	266	21.3	2	8.6
12	260	47.8	94	−19	19.1	−92	113	32.1	0	4.8	296	25.9	2	8.4
14	289	44.5	93	−19	37.5	−90	143	36.9	0	4.8	326	30.5	2	8.2
16	318	41.2	93	−19	55.6	−88	173	41.8	0	4.8	356	35.0	2	8.1
18	347	37.7	92	−20	13.1	−85	203	46.7	0	4.8	26	39.6	2	7.9
20	16	34.1	91	−20	30.2	−83	233	51.5	0	4.8	56	44.2	2	7.7
22	45	30.3	91	−20	46.8	−81	263	56.4	0	4.8	86	48.8	2	7.6
Δ								24		0		23		−1

φ	SUNCE IZLAZ		ZALAZ		TRAJANJE SUMRAKA GRAĐ.		ASTR.		MJESEC IZLAZ	Δ/24	ZALAZ	Δ/24
N	h	min	h	min	h	min	h	min	h min	min	h min	min
60	3	11	20	60	1	13	:	::	15 20	3.7	22 12	.9
55	3	47	20	25	0	51	:	::	14 47	3.3	22 46	1.3
50	4	12	19	60	0	41	3	6	14 24	3.1	23 11	1.5
45	4	31	19	41	0	35	2	17	14 6	2.9	23 30	1.6
40	4	47	19	25	0	31	1	55	13 51	2.8	23 46	1.8
35	4	60	19	12	0	29	1	42	13 39	2.7	23 59	1.8
30	5	11	19	1	0	27	1	33	13 28	2.6	.. ..	.0
20	5	31	18	42	0	24	1	22	13 9	2.4	.. ..	.0
10	5	47	18	25	0	23	1	16	12 54	2.3	.. ..	.0
0	6	3	18	10	0	22	1	14	12 39	2.2	0 12	2.2
10	6	18	17	55	0	22	1	14	12 24	2.1	0 25	2.3
20	6	34	17	38	0	24	1	17	12 8	2.0	0 39	2.5
30	6	53	17	20	0	26	1	24	11 51	1.8	0 55	2.6
35	7	4	17	9	0	27	1	29	11 40	1.7	1 4	2.7
40	7	16	16	57	0	30	1	35	11 28	1.6	1 15	2.8
45	7	30	16	43	0	33	1	44	11 15	1.5	1 28	3.0
50	7	48	16	25	0	37	1	56	10 58	1.3	1 43	3.2
55	8	11	16	2	0	43	2	12	10 37	1.1	2 3	3.4
60	8	42	15	31	0	52	2	36	10 8	.7	2 31	3.8
S												

SUNCE UT	e = Tp − UT		Δ/24	r	MJESEC Prolaz		Δ/24	$\pi_\leftmoon$	r
h	min	s	s	′		h min	min	′	′
00	− 6	18.6	−.2	15.8	$T_{\overline{m}}$	18 51	2.2	58.0	15.8
12	− 6	20.6	$T_{\overline{m}_\odot}$	12 h 6.3 min	Starost	7.2 d	Faza ◐		

PLANETE

Pl.	$T_{\overline{m}}$		π	360−α	Vel.	Pl.	$T_{\overline{m}}$		π	360−α	Vel.
	h	min	′	°			h	min	′	°	
♀	14	59	.2	199	−4.0	♃	4	27	.0	356	−2.5
♂	15	49	.1	186	1.4	♄	16	14	.0	179	1.1

UT	SUNCE $S_\odot$	SUNCE $\delta_\odot$	PROLJ. TAČKA S_Υ	VENERA S_φ	VENERA δ_φ	MARS S_σ	MARS δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	178 24.3	20 43.1	297 39.8	135 12.7	8 29.9	122 56.9	2 57.7
2	208 24.2	20 42.1	327 44.7	165 12.6	8 27.5	152 59.2	2 56.5
4	238 24.2	20 41.2	357 49.6	195 12.5	8 25.1	183 1.4	2 55.2
6	268 24.1	20 40.3	27 54.6	225 12.5	8 22.8	213 3.6	2 54.0
8	298 24.0	20 39.3	57 59.5	255 12.4	8 20.4	243 5.8	2 52.7
10	328 23.9	20 38.4	88 4.4	285 12.3	8 18.0	273 8.0	2 51.5
12	358 23.9	20 37.5	118 9.3	315 12.2	8 15.7	303 10.2	2 50.3
14	28 23.8	20 36.5	148 14.3	345 12.1	8 13.3	333 12.5	2 49.0
16	58 23.7	20 35.6	178 19.2	15 12.0	8 10.9	3 14.7	2 47.8
18	88 23.7	20 34.6	208 24.1	45 11.9	8 8.5	33 16.9	2 46.5
20	118 23.6	20 33.7	238 29.1	75 11.9	8 6.2	63 19.1	2 45.3
22	148 23.5	20 32.7	268 34.0	105 11.8	8 3.8	93 21.3	2 44.0
Δ	0	-5		0	-12	11	-6

UT	MJESEC $S_\leftmoon$	MJESEC Δ	MJESEC $\delta_\leftmoon$	MJESEC Δ	JUPITER S_4	JUPITER δ_4	SATURN S_η	SATURN δ_η
h	° ′		° ′		° ′	° ′	° ′	° ′
0	74 26.4	90	-21 2.9	-78	294 1.3	0 4.8	116 53.4	2 7.4
2	103 22.5	89	-21 18.5	-76	324 6.1	0 4.8	146 57.9	2 7.2
4	132 18.4	89	-21 33.6	-73	354 11.0	0 4.8	177 2.5	2 7.1
6	161 14.1	88	-21 48.3	-71	24 15.9	0 4.8	207 7.1	2 6.9
8	190 9.8	88	-22 2.4	-68	54 20.7	0 4.8	237 11.7	2 6.7
10	219 5.4	87	-22 16.0	-65	84 25.6	0 4.8	267 16.3	2 6.6
12	248 .9	87	-22 29.1	-63	114 30.5	0 4.8	297 20.8	2 6.4
14	276 56.2	86	-22 41.7	-60	144 35.3	0 4.8	327 25.4	2 6.2
16	305 51.5	86	-22 53.7	-58	174 40.2	0 4.8	357 30.0	2 6.1
18	334 46.7	86	-23 5.2	-55	204 45.1	0 4.8	27 34.6	2 5.9
20	3 41.9	85	-23 16.2	-52	234 50.0	0 4.8	57 39.1	2 5.7
22	32 36.9	85	-23 26.7	-50	264 54.9	0 4.8	87 43.7	2 5.6
Δ					24	0	23	-1

φ	SUNCE IZLAZ	SUNCE ZALAZ	TRAJANJE SUMRAKA GRAĐ.	TRAJANJE SUMRAKA ASTR.	MJESEC IZLAZ	MJESEC Δ/24	MJESEC ZALAZ	MJESEC Δ/24
N	h min	h min	h min	h min	h min	min	h min	min
60	3 13	20 58	1 11	: ::	16 49	3.2	22 33	1.5
55	3 48	20 23	0 51	: ::	16 6	2.9	23 17	1.7
50	4 13	19 59	0 41	3 2	15 37	2.8	23 47	1.9
45	4 32	19 40	0 35	2 16	15 15	2.7	.. ..	.0
40	4 48	19 25	0 31	1 54	14 58	2.6	.. ..	.0
35	5 1	19 12	0 29	1 41	14 43	2.5	.. ..	.0
30	5 12	19 1	0 27	1 33	14 30	2.5	0 11	1.9
20	5 31	18 42	0 24	1 22	14 8	2.4	0 30	2.0
10	5 48	18 25	0 23	1 16	13 49	2.3	0 48	2.1
0	6 3	18 10	0 22	1 14	13 32	2.2	1 4	2.2
10	6 18	17 55	0 22	1 14	13 14	2.2	1 20	2.3
20	6 34	17 39	0 24	1 17	12 56	2.1	1 38	2.4
30	6 52	17 21	0 26	1 24	12 34	2.0	1 58	2.5
35	7 3	17 10	0 27	1 29	12 22	2.0	2 10	2.6
40	7 15	16 58	0 30	1 35	12 8	1.9	2 23	2.7
45	7 30	16 44	0 33	1 44	11 51	1.8	2 39	2.8
50	7 47	16 26	0 37	1 55	11 30	1.7	2 59	2.9
55	8 9	16 4	0 43	2 12	11 3	1.5	3 25	3.1
60	8 40	15 33	0 52	2 36	10 25	1.2	4 2	3.5
S								

SUNCE UT	SUNCE $e = T_p - UT$	SUNCE Δ/24	SUNCE r	MJESEC Prolaz	MJESEC Δ/24	MJESEC $\pi_\leftmoon$	MJESEC r
h	min s	s	′	h min	min	′	′
00	- 6 22.5	-.1	15.8	$T_{\overline{m}}$ 19 45	2.2	57.3	15.6
12	- 6 24.2	$T_{\overline{m}_\odot}$ 12 h 6.4 min		Starost 8.2 d	Faza ◐		

PLANETE

Pl.	$T_{\overline{m}}$	π	360−α	Vel.	Pl.	$T_{\overline{m}}$	π	360−α	Vel.
	h min	′	°			h min	′	°	
♀	14 59	.2	198	-4.0	♃	4 23	.0	356	-2.5
♂	15 47	.1	185	1.4	♄	16 10	.0	179	1.1

UT	SUNCE $S_\odot$	SUNCE $\delta_\odot$	PROLJ. TAČKA S_Υ	VENERA S_φ	VENERA δ_φ	MARS S_σ	MARS δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	178 23.5	20 31.8	298 38.9	135 11.7	8 1.4	123 23.5	2 42.8
2	208 23.4	20 30.8	328 43.8	165 11.6	7 59.0	153 25.7	2 41.5
4	238 23.4	20 29.9	358 48.8	195 11.6	7 56.7	183 28.0	2 40.3
6	268 23.3	20 28.9	28 53.7	225 11.5	7 54.3	213 30.2	2 39.0
8	298 23.2	20 27.9	58 58.6	255 11.4	7 51.9	243 32.4	2 37.8
10	328 23.2	20 27.0	89 3.6	285 11.4	7 49.5	273 34.6	2 36.5
12	358 23.1	20 26.0	119 8.5	315 11.3	7 47.1	303 36.8	2 35.3
14	28 23.1	20 25.0	149 13.4	345 11.3	7 44.8	333 39.0	2 34.0
16	58 23.0	20 24.0	179 18.3	15 11.2	7 42.4	3 41.2	2 32.8
18	88 22.9	20 23.1	209 23.3	45 11.2	7 40.0	33 43.4	2 31.5
20	118 22.9	20 22.1	239 28.2	75 11.1	7 37.6	63 45.6	2 30.3
22	148 22.8	20 21.1	269 33.1	105 11.1	7 35.2	93 47.8	2 29.0
Δ	0	-5		0	-12	11	-6

UT	MJESEC $S_\leftmoon$	MJESEC Δ	MJESEC $\delta_\leftmoon$	MJESEC Δ	JUPITER S_4	JUPITER δ_4	SATURN S_η	SATURN δ_η
h	° ′		° ′		° ′	° ′	° ′	° ′
0	61 31.9	85	-23 36.6	-47	294 59.7	0 4.8	117 48.3	2 5.4
2	90 26.8	84	-23 46.0	-44	325 4.6	0 4.8	147 52.9	2 5.2
4	119 21.7	84	-23 54.9	-42	355 9.5	0 4.8	177 57.4	2 5.1
6	148 16.6	84	-24 3.2	-39	25 14.4	0 4.7	208 2.0	2 4.9
8	177 11.4	84	-24 10.9	-36	55 19.3	0 4.7	238 6.6	2 4.7
10	206 6.1	84	-24 18.2	-33	85 24.2	0 4.7	268 11.2	2 4.6
12	235 .9	84	-24 24.8	-31	115 29.0	0 4.7	298 15.7	2 4.4
14	263 55.7	84	-24 30.9	-28	145 33.9	0 4.7	328 20.3	2 4.2
16	292 50.4	84	-24 36.5	-25	175 38.8	0 4.7	358 24.9	2 4.0
18	321 45.2	84	-24 41.5	-22	205 43.7	0 4.7	28 29.4	2 3.9
20	350 39.9	84	-24 46.0	-20	235 48.6	0 4.7	58 34.0	2 3.7
22	19 34.7	84	-24 49.9	-17	265 53.5	0 4.7	88 38.6	2 3.5
Δ					24	0	23	-1

φ	SUNCE IZLAZ	SUNCE ZALAZ	TRAJANJE SUMRAKA GRAĐ.	TRAJANJE SUMRAKA ASTR.	MJESEC IZLAZ	MJESEC Δ/24	MJESEC ZALAZ	MJESEC Δ/24
N	h min	h min	h min	h min	h min	min	h min	min
60	3 15	20 56	1 10	: ::	18 6	2.4	23 9	2.2
55	3 50	20 22	0 50	: ::	17 17	2.4	23 59	2.3
50	4 14	19 58	0 41	2 59	16 44	2.3	.. ..	.0
45	4 33	19 39	0 35	2 15	16 19	2.3	0 10	2.0
40	4 48	19 24	0 31	1 54	15 60	2.3	0 28	2.0
35	5 1	19 11	0 29	1 41	15 44	2.3	0 43	2.1
30	5 12	19 0	0 27	1 32	15 29	2.3	0 57	2.1
20	5 31	18 41	0 24	1 21	15 6	2.3	1 19	2.2
10	5 48	18 25	0 23	1 16	14 45	2.3	1 39	2.2
0	6 3	18 10	0 22	1 13	14 26	2.2	1 58	2.3
10	6 18	17 55	0 22	1 14	14 7	2.2	2 16	2.3
20	6 34	17 39	0 23	1 17	13 46	2.2	2 36	2.3
30	6 52	17 21	0 26	1 24	13 23	2.2	2 59	2.4
35	7 3	17 11	0 27	1 29	13 9	2.2	3 12	2.4
40	7 15	16 59	0 30	1 35	12 53	2.1	3 28	2.5
45	7 29	16 45	0 32	1 44	12 34	2.1	3 46	2.5
50	7 46	16 27	0 37	1 55	12 10	2.1	4 10	2.6
55	8 8	16 5	0 42	2 11	11 39	2.0	4 40	2.7
60	8 38	15 35	0 52	2 35	10 53	1.8	5 26	2.8
S								

SUNCE UT	SUNCE $e = T_p - UT$	SUNCE Δ/24	SUNCE r	MJESEC Prolaz	MJESEC Δ/24	MJESEC $\pi_\leftmoon$	MJESEC r
h	min s	s	′	h min	min	′	′
00	- 6 25.9	-.1	15.8	$T_{\overline{m}}$ 20 39	2.2	56.7	15.4
12	- 6 27.3	$T_{\overline{m}_\odot}$ 12 h 6.5 min		Starost 9.2 d	Faza ◐		

PLANETE

Pl.	$T_{\overline{m}}$	π	360−α	Vel.	Pl.	$T_{\overline{m}}$	π	360−α	Vel.
	h min	′	°			h min	′	°	
♀	14 59	.2	197	-4.0	♃	4 19	.0	356	-2.5
♂	15 45	.1	185	1.4	♄	16 6	.0	179	1.1

UT	SUNCE		PROLJ. TAČKA	VENERA		MARS	
	$S_\odot$	$\delta_\odot$	S_Υ	S_φ	δ_φ	S_σ	δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	178 22.8	20 20.1	299 38.1	135 11.0	7 32.8	123 50.1	2 27.8
2	208 22.7	20 19.1	329 43.0	165 11.0	7 30.4	153 52.3	2 26.5
4	238 22.7	20 18.2	359 47.9	195 10.9	7 28.0	183 54.5	2 25.3
6	268 22.6	20 17.2	29 52.8	225 10.9	7 25.7	213 56.7	2 24.0
8	298 22.6	20 16.2	59 57.8	255 10.9	7 23.3	243 58.9	2 22.8
10	328 22.5	20 15.2	90 2.7	285 10.8	7 20.9	274 1.1	2 21.5
12	358 22.5	20 14.2	120 7.6	315 10.8	7 18.5	304 3.3	2 20.3
14	28 22.4	20 13.2	150 12.6	345 10.8	7 16.1	334 5.5	2 19.0
16	58 22.4	20 12.2	180 17.5	15 10.7	7 13.7	4 7.7	2 17.8
18	88 22.4	20 11.2	210 22.4	45 10.7	7 11.3	34 9.9	2 16.5
20	118 22.3	20 10.2	240 27.3	75 10.7	7 8.9	64 12.1	2 15.3
22	148 22.3	20 9.2	270 32.3	105 10.7	7 6.5	94 14.3	2 14.0
Δ	0	−5		0	−12	11	−6

UT	MJESEC				JUPITER		SATURN	
	$S_\leftmoon$	Δ	$\delta_\leftmoon$	Δ	S_4	δ_4	S_η	δ_η
h	° ′		° ′		° ′	° ′	° ′	° ′
0	48 29.6	84	−24 53.3	−14	295 58.4	0 4.6	118 43.2	2 3.4
2	77 24.4	85	−24 56.1	−11	326 3.3	0 4.6	148 47.7	2 3.2
4	106 19.4	85	−24 58.4	−9	356 8.2	0 4.6	178 52.3	2 3.0
6	135 14.3	85	−25 .1	−6	26 13.1	0 4.6	208 56.9	2 2.9
8	164 9.4	86	−25 1.3	−3	56 18.0	0 4.6	239 1.4	2 2.7
10	193 4.5	86	−25 1.9	0	86 22.9	0 4.6	269 6.0	2 2.5
12	221 59.8	87	−25 2.0	2	116 27.8	0 4.6	299 10.6	2 2.3
14	250 55.1	87	−25 1.6	5	146 32.7	0 4.5	329 15.1	2 2.2
16	279 50.5	88	−25 .6	8	176 37.6	0 4.5	359 19.7	2 2.0
18	308 46.1	88	−24 59.1	10	206 42.5	0 4.5	29 24.3	2 1.8
20	337 41.8	89	−24 57.0	13	236 47.4	0 4.5	59 28.8	2 1.6
22	6 37.6	90	−24 54.4	16	266 52.3	0 4.5	89 33.4	2 1.5
Δ					25	0	23	−1

φ	SUNCE		TRAJANJE SUMRAKA		MJESEC			
	IZLAZ	ZALAZ	GRAĐ.	ASTR.	IZLAZ	Δ/24	ZALAZ	Δ/24
N	h min	h min	h min	h min	h min	min	h min	min
60	3 18	20 54	1 9	: ::	19 4	1.5	.. ..	.0
55	3 52	20 20	0 50	: ::	18 13	1.8	.. ..	.0
50	4 16	19 57	0 41	2 57	17 40	1.9	0 32	2.3
45	4 34	19 38	0 35	2 14	17 15	2.0	0 57	2.3
40	4 49	19 23	0 31	1 53	16 55	2.0	1 16	2.3
35	5 2	19 11	0 28	1 41	16 39	2.0	1 33	2.3
30	5 13	18 60	0 26	1 32	16 25	2.1	1 47	2.3
20	5 32	18 41	0 24	1 21	16 0	2.1	2 11	2.2
10	5 48	18 25	0 23	1 16	15 39	2.2	2 32	2.2
0	6 3	18 10	0 22	1 13	15 20	2.2	2 52	2.2
10	6 18	17 55	0 22	1 14	15 0	2.2	3 11	2.2
20	6 34	17 40	0 23	1 17	14 39	2.3	3 32	2.2
30	6 52	17 22	0 26	1 24	14 15	2.3	3 56	2.2
35	7 2	17 11	0 27	1 28	14 1	2.3	4 11	2.2
40	7 14	16 59	0 29	1 35	13 44	2.4	4 27	2.2
45	7 28	16 46	0 32	1 43	13 25	2.4	4 47	2.2
50	7 45	16 29	0 36	1 55	12 60	2.4	5 11	2.1
55	8 7	16 7	0 42	2 11	12 27	2.5	5 44	2.1
60	8 36	15 37	0 51	2 34	11 37	2.6	6 34	2.0
S								

SUNCE				MJESEC				
UT	$e = T_p - UT$	Δ/24	r	Prolaz		Δ/24	$\pi_\leftmoon$	r
h	min s	s	′		h min	min	′	′
00	− 6 28.7	−.1	15.8	$T_{\overline{m}}$	21 33	2.2	56.1	15.3
12	− 6 29.8	$T_{\overline{m}_\odot}$	12 h 6.5 min	Starost 10.2 d		Faza ◐		

PLANETE

Pl.	$T_{\overline{m}}$	π	360−α	Vel.	Pl.	$T_{\overline{m}}$	π	360−α	Vel.
	h min	′	°			h min	′	°	
♀	14 59	.2	196	−4.0	♃	4 15	.0	356	−2.5
♂	15 44	.1	184	1.4	♄	16 3	.0	179	1.1

UT	SUNCE		PROLJ. TAČKA	VENERA		MARS	
	$S_\odot$	$\delta_\odot$	S_Υ	S_φ	δ_φ	S_σ	δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	178 22.2	20 8.1	300 37.2	135 10.7	7 4.1	124 16.5	2 12.8
2	208 22.2	20 7.1	330 42.1	165 10.6	7 1.7	154 18.7	2 11.5
4	238 22.2	20 6.1	0 47.0	195 10.6	6 59.3	184 20.9	2 10.3
6	268 22.1	20 5.1	30 52.0	225 10.6	6 56.9	214 23.1	2 9.0
8	298 22.1	20 4.1	60 56.9	255 10.6	6 54.5	244 25.3	2 7.8
10	328 22.1	20 3.0	91 1.8	285 10.6	6 52.1	274 27.5	2 6.5
12	358 22.0	20 2.0	121 6.8	315 10.6	6 49.7	304 29.7	2 5.2
14	28 22.0	20 1.0	151 11.7	345 10.6	6 47.3	334 31.9	2 4.0
16	58 22.0	20 .0	181 16.6	15 10.6	6 44.9	4 34.1	2 2.7
18	88 21.9	19 58.9	211 21.5	45 10.6	6 42.5	34 36.3	2 1.5
20	118 21.9	19 57.9	241 26.5	75 10.6	6 40.0	64 38.5	2 .2
22	148 21.9	19 56.9	271 31.4	105 10.6	6 37.6	94 40.7	1 59.0
Δ	0	−5		0	−12	11	−6

UT	MJESEC				JUPITER		SATURN	
	$S_\leftmoon$	Δ	$\delta_\leftmoon$	Δ	S_4	δ_4	S_η	δ_η
h	° ′		° ′		° ′	° ′	° ′	° ′
0	35 33.5	91	−24 51.3	18	296 57.2	0 4.4	119 37.9	2 1.3
2	64 29.6	91	−24 47.7	21	327 2.2	0 4.4	149 42.5	2 1.1
4	93 25.9	92	−24 43.5	23	357 7.1	0 4.4	179 47.1	2 1.0
6	122 22.3	93	−24 38.9	26	27 12.0	0 4.4	209 51.6	2 .8
8	151 18.9	94	−24 33.7	28	57 16.9	0 4.4	239 56.2	2 .6
10	180 15.7	95	−24 28.0	31	87 21.8	0 4.3	270 .8	2 .4
12	209 12.7	96	−24 21.9	33	117 26.7	0 4.3	300 5.3	2 .3
14	238 9.8	97	−24 15.2	36	147 31.6	0 4.3	330 9.9	2 .1
16	267 7.2	98	−24 8.0	38	177 36.6	0 4.3	0 14.4	1 59.9
18	296 4.8	99	−24 .4	41	207 41.5	0 4.2	30 19.0	1 59.7
20	325 2.6	100	−23 52.2	43	237 46.4	0 4.2	60 23.6	1 59.6
22	354 .6	101	−23 43.6	45	267 51.3	0 4.2	90 28.1	1 59.4
Δ					25	0	23	−1

φ	SUNCE		TRAJANJE SUMRAKA		MJESEC			
	IZLAZ	ZALAZ	GRAĐ.	ASTR.	IZLAZ	Δ/24	ZALAZ	Δ/24
N	h min	h min	h min	h min	h min	min	h min	min
60	3 20	20 52	1 8	: ::	19 41	.9	0 3	3.0
55	3 53	20 19	0 49	: ::	18 56	1.3	0 53	2.7
50	4 17	19 55	0 40	2 54	18 25	1.5	1 26	2.6
45	4 35	19 37	0 35	2 13	18 2	1.6	1 51	2.5
40	4 50	19 22	0 31	1 53	17 44	1.7	2 11	2.4
35	5 3	19 10	0 28	1 40	17 28	1.8	2 27	2.4
30	5 14	18 59	0 26	1 32	17 14	1.8	2 41	2.3
20	5 32	18 41	0 24	1 21	16 51	1.9	3 5	2.3
10	5 48	18 25	0 22	1 15	16 31	2.0	3 26	2.2
0	6 3	18 10	0 22	1 13	16 12	2.1	3 45	2.2
10	6 18	17 55	0 22	1 14	15 54	2.2	4 5	2.1
20	6 33	17 40	0 23	1 17	15 34	2.3	4 25	2.0
30	6 51	17 22	0 26	1 23	15 10	2.4	4 49	2.0
35	7 1	17 12	0 27	1 28	14 57	2.4	5 3	1.9
40	7 13	17 0	0 29	1 35	14 41	2.5	5 19	1.9
45	7 27	16 47	0 32	1 43	14 22	2.6	5 38	1.8
50	7 44	16 30	0 36	1 55	13 58	2.7	6 2	1.7
55	8 5	16 8	0 42	2 10	13 27	2.9	6 34	1.5
60	8 34	15 39	0 51	2 34	12 40	3.2	7 22	1.2
S								

SUNCE				MJESEC				
UT	$e = T_p - UT$	Δ/24	r	Prolaz		Δ/24	$\pi_\leftmoon$	r
h	min s	s	′		h min	min	′	′
00	− 6 30.9	−.1	15.8	$T_{\overline{m}}$	22 25	2.1	55.6	15.1
12	− 6 31.7	$T_{\overline{m}_\odot}$	12 h 6.5 min	Starost 11.2 d		Faza ◐		

PLANETE

Pl.	$T_{\overline{m}}$	π	360−α	Vel.	Pl.	$T_{\overline{m}}$	π	360−α	Vel.
	h min	′	°			h min	′	°	
♀	14 59	.2	195	−4.0	♃	4 11	.0	356	−2.5
♂	15 42	.1	184	1.5	♄	15 59	.0	179	1.1

UT	SUNCE $S_\odot$	SUNCE $\delta_\odot$	PROLJ. TAČKA S_Υ	VENERA S_φ	VENERA δ_φ	MARS S_σ	MARS δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	178 21.8	19 55.8	301 36.3	135 10.6	6 35.2	124 42.9	1 57.7
2	208 21.8	19 54.8	331 41.3	165 10.6	6 32.8	154 45.1	1 56.4
4	238 21.8	19 53.7	1 46.2	195 10.6	6 30.4	184 47.3	1 55.2
6	268 21.8	19 52.7	31 51.1	225 10.7	6 28.0	214 49.5	1 53.9
8	298 21.7	19 51.6	61 56.0	255 10.7	6 25.6	244 51.7	1 52.7
10	328 21.7	19 50.6	92 1.0	285 10.7	6 23.2	274 53.9	1 51.4
12	358 21.7	19 49.5	122 5.9	315 10.7	6 20.7	304 56.1	1 50.2
14	28 21.7	19 48.5	152 10.8	345 10.8	6 18.3	334 58.3	1 48.9
16	58 21.7	19 47.4	182 15.8	15 10.8	6 15.9	5 .5	1 47.6
18	88 21.6	19 46.4	212 20.7	45 10.8	6 13.5	35 2.6	1 46.4
20	118 21.6	19 45.3	242 25.6	75 10.8	6 11.1	65 4.8	1 45.1
22	148 21.6	19 44.2	272 30.5	105 10.9	6 8.7	95 7.0	1 43.9
Δ	0	−5		0	−12	11	−6

UT	MJESEC $S_\leftmoon$	MJESEC Δ	MJESEC $\delta_\leftmoon$	MJESEC Δ	JUPITER S_4	JUPITER δ_4	SATURN S_η	SATURN δ_η
h	° ′		° ′		° ′	° ′	° ′	° ′
0	22 58.8	102	−23 34.6	48	297 56.3	0 4.2	120 32.7	1 59.2
2	51 57.3	104	−23 25.0	50	328 1.2	0 4.1	150 37.2	1 59.0
4	80 56.0	105	−23 15.1	52	358 6.1	0 4.1	180 41.8	1 58.9
6	109 55.0	106	−23 4.6	54	28 11.0	0 4.1	210 46.3	1 58.7
8	138 54.2	107	−22 53.8	57	58 16.0	0 4.1	240 50.9	1 58.5
10	167 53.6	109	−22 42.4	59	88 20.9	0 4.0	270 55.5	1 58.3
12	196 53.3	110	−22 30.7	61	118 25.8	0 4.0	301 .0	1 58.2
14	225 53.3	111	−22 18.5	63	148 30.8	0 4.0	331 4.6	1 58.0
16	254 53.5	112	−22 6.0	65	178 35.7	0 3.9	1 9.1	1 57.8
18	283 54.0	114	−21 53.0	67	208 40.6	0 3.9	31 13.7	1 57.6
20	312 54.7	115	−21 39.6	69	238 45.6	0 3.9	61 18.2	1 57.4
22	341 55.7	116	−21 25.8	71	268 50.5	0 3.9	91 22.8	1 57.3
Δ					25	0	23	−1

φ	SUNCE IZLAZ	SUNCE ZALAZ	TRAJANJE SUMRAKA GRAĐ.	TRAJANJE SUMRAKA ASTR.	MJESEC IZLAZ	MJESEC Δ/24	MJESEC ZALAZ	MJESEC Δ/24
N	h min	h min	h min	h min	h min	min	h min	min
60	3 22	20 50	1 7	: ::	20 3	.6	1 14	3.4
55	3 55	20 17	0 49	: ::	19 27	.9	1 58	3.0
50	4 18	19 54	0 40	2 51	19 1	1.2	2 28	2.8
45	4 36	19 36	0 35	2 12	18 41	1.3	2 51	2.6
40	4 51	19 22	0 31	1 52	18 24	1.4	3 9	2.5
35	5 3	19 9	0 28	1 40	18 11	1.5	3 24	2.4
30	5 14	18 59	0 26	1 32	17 59	1.6	3 37	2.4
20	5 32	18 40	0 24	1 21	17 38	1.8	3 60	2.3
10	5 48	18 25	0 22	1 15	17 20	1.9	4 19	2.1
0	6 3	18 10	0 22	1 13	17 3	2.0	4 37	2.1
10	6 18	17 56	0 22	1 14	16 46	2.1	4 55	2.0
20	6 33	17 40	0 23	1 17	16 28	2.2	5 14	1.9
30	6 51	17 23	0 26	1 23	16 7	2.4	5 36	1.7
35	7 1	17 13	0 27	1 28	15 55	2.4	5 49	1.7
40	7 12	17 1	0 29	1 35	15 41	2.5	6 4	1.6
45	7 26	16 48	0 32	1 43	15 24	2.7	6 21	1.5
50	7 42	16 31	0 36	1 54	15 3	2.8	6 43	1.3
55	8 4	16 10	0 42	2 10	14 36	3.0	7 11	1.1
60	8 32	15 41	0 51	2 33	13 56	3.4	7 51	.7
S								

SUNCE UT	SUNCE $e = T_p - UT$	SUNCE Δ/24	SUNCE r	MJESEC Prolaz	MJESEC Δ/24	MJESEC $\pi_\leftmoon$	MJESEC r
h	min s	s	′	h min	min	′	′
00	− 6 32.5	.0	15.8	$T_{\overline{m}}$ 23 15	2.0	55.1	15.0
12	− 6 33.0	$T_{\overline{m}_\odot}$ 12 h 6.6 min		Starost 12.2 d	Faza ○		

PLANETE

Pl.	$T_{\overline{m}}$	π	360−α	Vel.	Pl.	$T_{\overline{m}}$	π	360−α	Vel.
	h min	′	°			h min	′	°	
♀	14 59	.2	194	−4.0	♃	4 8	.0	356	−2.5
♂	15 40	.1	183	1.5	♄	15 55	.0	179	1.1

UT	SUNCE $S_\odot$	SUNCE $\delta_\odot$	PROLJ. TAČKA S_Υ	VENERA S_φ	VENERA δ_φ	MARS S_σ	MARS δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	178 21.6	19 43.2	302 35.5	135 10.9	6 6.2	125 9.2	1 42.6
2	208 21.6	19 42.1	332 40.4	165 11.0	6 3.8	155 11.4	1 41.3
4	238 21.6	19 41.0	2 45.3	195 11.0	6 1.4	185 13.6	1 40.1
6	268 21.5	19 40.0	32 50.3	225 11.0	5 59.0	215 15.8	1 38.8
8	298 21.5	19 38.9	62 55.2	255 11.1	5 56.6	245 18.0	1 37.6
10	328 21.5	19 37.8	93 .1	285 11.1	5 54.1	275 20.2	1 36.3
12	358 21.5	19 36.7	123 5.0	315 11.2	5 51.7	305 22.4	1 35.0
14	28 21.5	19 35.6	153 10.0	345 11.2	5 49.3	335 24.5	1 33.8
16	58 21.5	19 34.6	183 14.9	15 11.3	5 46.9	5 26.7	1 32.5
18	88 21.5	19 33.5	213 19.8	45 11.4	5 44.4	35 28.9	1 31.3
20	118 21.5	19 32.4	243 24.8	75 11.4	5 42.0	65 31.1	1 30.0
22	148 21.5	19 31.3	273 29.7	105 11.5	5 39.6	95 33.3	1 28.7
Δ	0	−5		0	−12	11	−6

UT	MJESEC $S_\leftmoon$	MJESEC Δ	MJESEC $\delta_\leftmoon$	MJESEC Δ	JUPITER S_4	JUPITER δ_4	SATURN S_η	SATURN δ_η
h	° ′		° ′		° ′	° ′	° ′	° ′
0	10 57.0	118	−21 11.6	73	298 55.5	0 3.8	121 27.3	1 57.1
2	39 58.5	119	−20 57.1	75	329 .4	0 3.8	151 31.9	1 56.9
4	69 .4	120	−20 42.1	76	359 5.3	0 3.8	181 36.4	1 56.7
6	98 2.4	122	−20 26.8	78	29 10.3	0 3.7	211 41.0	1 56.6
8	127 4.8	123	−20 11.2	80	59 15.2	0 3.7	241 45.5	1 56.4
10	156 7.4	124	−19 55.2	82	89 20.2	0 3.7	271 50.1	1 56.2
12	185 10.3	126	−19 38.8	83	119 25.1	0 3.6	301 54.6	1 56.0
14	214 13.5	127	−19 22.1	85	149 30.1	0 3.6	331 59.2	1 55.8
16	243 16.9	128	−19 5.1	87	179 35.0	0 3.5	2 3.7	1 55.7
18	272 20.6	130	−18 47.8	88	209 40.0	0 3.5	32 8.3	1 55.5
20	301 24.6	131	−18 30.1	90	239 44.9	0 3.5	62 12.8	1 55.3
22	330 28.8	132	−18 12.2	91	269 49.9	0 3.4	92 17.4	1 55.1
Δ					25	0	23	−1

φ	SUNCE IZLAZ	SUNCE ZALAZ	TRAJANJE SUMRAKA GRAĐ.	TRAJANJE SUMRAKA ASTR.	MJESEC IZLAZ	MJESEC Δ/24	MJESEC ZALAZ	MJESEC Δ/24
N	h min	h min	h min	h min	h min	min	h min	min
60	3 24	20 47	1 6	: ::	20 17	.4	2 35	3.5
55	3 56	20 16	0 49	: ::	19 49	.7	3 10	3.1
50	4 20	19 53	0 40	2 49	19 28	.9	3 35	2.8
45	4 37	19 35	0 35	2 11	19 12	1.1	3 54	2.7
40	4 52	19 21	0 31	1 52	18 59	1.2	4 10	2.5
35	5 4	19 9	0 28	1 40	18 47	1.3	4 23	2.4
30	5 15	18 58	0 26	1 31	18 37	1.4	4 34	2.3
20	5 33	18 40	0 24	1 21	18 20	1.6	4 54	2.2
10	5 49	18 25	0 22	1 15	18 5	1.7	5 11	2.1
0	6 3	18 10	0 22	1 13	17 51	1.9	5 26	1.9
10	6 17	17 56	0 22	1 14	17 37	2.0	5 42	1.8
20	6 33	17 41	0 23	1 17	17 21	2.2	5 59	1.7
30	6 50	17 23	0 26	1 23	17 4	2.3	6 18	1.5
35	7 0	17 13	0 27	1 28	16 53	2.4	6 29	1.4
40	7 11	17 2	0 29	1 34	16 42	2.5	6 41	1.3
45	7 25	16 49	0 32	1 43	16 28	2.7	6 56	1.2
50	7 41	16 32	0 36	1 54	16 11	2.8	7 14	1.0
55	8 2	16 12	0 42	2 10	15 49	3.1	7 37	.8
60	8 30	15 43	0 50	2 33	15 18	3.4	8 9	.5
S								

SUNCE UT	SUNCE $e = T_p - UT$	SUNCE Δ/24	SUNCE r	MJESEC Prolaz	MJESEC Δ/24	MJESEC $\pi_\leftmoon$	MJESEC r
h	min s	s	′	h min	min	′	′
00	− 6 33.5	.0	15.8	$T_{\overline{m}}$	1.0	54.8	14.9
12	− 6 33.7	$T_{\overline{m}_\odot}$ 12 h 6.6 min		Starost 13.2 d	Faza ○		

PLANETE

Pl.	$T_{\overline{m}}$	π	360−α	Vel.	Pl.	$T_{\overline{m}}$	π	360−α	Vel.
	h min	′	°			h min	′	°	
♀	14 59	.2	193	−4.0	♃	4 4	.0	356	−2.5
♂	15 38	.1	183	1.5	♄	15 52	.0	179	1.1

UT	SUNCE $S_\odot$	SUNCE $\delta_\odot$	PROLJ. TAČKA S_Υ	VENERA S_φ	VENERA δ_φ	MARS S_σ	MARS δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	178 21.5	19 30.2	303 34.6	135 11.5	5 37.1	125 35.5	1 27.5
2	208 21.5	19 29.1	333 39.5	165 11.6	5 34.7	155 37.7	1 26.2
4	238 21.5	19 28.0	3 44.5	195 11.7	5 32.3	185 39.8	1 24.9
6	268 21.5	19 26.9	33 49.4	225 11.7	5 29.8	215 42.0	1 23.7
8	298 21.5	19 25.8	63 54.3	255 11.8	5 27.4	245 44.2	1 22.4
10	328 21.5	19 24.7	93 59.3	285 11.9	5 25.0	275 46.4	1 21.2
12	358 21.5	19 23.6	124 4.2	315 12.0	5 22.6	305 48.6	1 19.9
14	28 21.5	19 22.5	154 9.1	345 12.1	5 20.1	335 50.8	1 18.6
16	58 21.5	19 21.4	184 14.0	15 12.1	5 17.7	5 52.9	1 17.4
18	88 21.5	19 20.2	214 19.0	45 12.2	5 15.2	35 55.1	1 16.1
20	118 21.5	19 19.1	244 23.9	75 12.3	5 12.8	65 57.3	1 14.8
22	148 21.5	19 18.0	274 28.8	105 12.4	5 10.4	95 59.5	1 13.6
Δ	0	−6		0	−12	11	−6

UT	MJESEC $S_\leftmoon$	MJESEC Δ	MJESEC $\delta_\leftmoon$	MJESEC Δ	JUPITER S_4	JUPITER δ_4	SATURN S_η	SATURN δ_η
h	° ′		° ′		° ′	° ′	° ′	° ′
0	359 33.3	134	−17 53.9	93	299 54.8	0 3.4	122 21.9	1 55.0
2	28 38.0	135	−17 35.3	94	329 59.8	0 3.4	152 26.5	1 54.8
4	57 43.0	136	−17 16.5	96	0 4.8	0 3.3	182 31.0	1 54.6
6	86 48.3	138	−16 57.4	97	30 9.7	0 3.3	212 35.6	1 54.4
8	115 53.8	139	−16 38.0	98	60 14.7	0 3.2	242 40.1	1 54.2
10	144 59.5	140	−16 18.3	100	90 19.6	0 3.2	272 44.7	1 54.1
12	174 5.5	141	−15 58.4	101	120 24.6	0 3.1	302 49.2	1 53.9
14	203 11.8	142	−15 38.2	102	150 29.6	0 3.1	332 53.8	1 53.7
16	232 18.2	144	−15 17.8	103	180 34.5	0 3.1	2 58.3	1 53.5
18	261 24.9	145	−14 57.2	104	210 39.5	0 3.0	33 2.8	1 53.3
20	290 31.9	146	−14 36.3	105	240 44.5	0 3.0	63 7.4	1 53.1
22	319 39.0	147	−14 15.2	107	270 49.4	0 2.9	93 11.9	1 53.0
Δ					25	0	23	−1

φ	SUNCE IZLAZ	SUNCE ZALAZ	TRAJANJE SUMRAKA GRAĐ.	TRAJANJE SUMRAKA ASTR.	MJESEC IZLAZ	MJESEC Δ/24	MJESEC ZALAZ	MJESEC Δ/24
N	h min	h min	h min	h min	h min	min	h min	min
60	3 26	20 45	1 5	: ::	20 26	.3	3 58	3.4
55	3 58	20 14	0 48	: ::	20 6	.6	4 24	3.1
50	4 21	19 51	0 40	2 47	19 51	.8	4 44	2.8
45	4 38	19 34	0 34	2 10	19 38	.9	4 59	2.7
40	4 53	19 20	0 31	1 51	19 28	1.1	5 11	2.5
35	5 5	19 8	0 28	1 39	19 20	1.2	5 22	2.4
30	5 15	18 57	0 26	1 31	19 12	1.3	5 31	2.3
20	5 33	18 40	0 24	1 21	18 59	1.5	5 46	2.1
10	5 49	18 24	0 22	1 15	18 47	1.6	6 0	2.0
0	6 3	18 10	0 22	1 13	18 36	1.8	6 13	1.8
10	6 17	17 56	0 22	1 13	18 25	1.9	6 25	1.7
20	6 32	17 41	0 23	1 17	18 13	2.1	6 39	1.5
30	6 49	17 24	0 25	1 23	17 59	2.3	6 54	1.4
35	6 59	17 14	0 27	1 28	17 51	2.4	7 3	1.3
40	7 11	17 3	0 29	1 34	17 42	2.5	7 13	1.2
45	7 24	16 50	0 32	1 43	17 32	2.6	7 25	1.0
50	7 40	16 34	0 36	1 54	17 19	2.8	7 39	.8
55	8 0	16 13	0 42	2 9	17 2	3.0	7 57	.6
60	8 28	15 45	0 50	2 32	16 41	3.4	8 20	.3
S								

SUNCE UT	SUNCE $e = T_p - UT$	SUNCE Δ/24	SUNCE r	MJESEC Prolaz	MJESEC Δ/24	MJESEC $\pi_\leftmoon$	MJESEC r
h	min s	s	′	h min	min	′	′
00	− 6 33.9	.0	15.8	$T_{\overline{m}}$ 0 2	1.8	54.4	14.8
12	− 6 33.8	$T_{\overline{m}_\odot}$ 12 h 6.6 min		Starost 14.2 d	Faza ○		

PLANETE

Pl.	$T_{\overline{m}}$	π	360−α	Vel.	Pl.	$T_{\overline{m}}$	π	360−α	Vel.
	h min	′	°			h min	′	°	
♀	14 59	.2	192	−4.1	♃	3 60	.0	356	−2.5
♂	15 37	.1	182	1.5	♄	15 48	.0	179	1.1

UT	SUNCE $S_\odot$	SUNCE $\delta_\odot$	PROLJ. TAČKA S_Υ	VENERA S_φ	VENERA δ_φ	MARS S_σ	MARS δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	178 21.5	19 16.9	304 33.7	135 12.5	5 7.9	126 1.7	1 12.3
2	208 21.5	19 15.8	334 38.7	165 12.6	5 5.5	156 3.8	1 11.0
4	238 21.6	19 14.6	4 43.6	195 12.7	5 3.1	186 6.0	1 9.8
6	268 21.6	19 13.5	34 48.5	225 12.8	5 .6	216 8.2	1 8.5
8	298 21.6	19 12.4	64 53.5	255 12.9	4 58.2	246 10.4	1 7.2
10	328 21.6	19 11.2	94 58.4	285 13.0	4 55.7	276 12.5	1 6.0
12	358 21.6	19 10.1	125 3.3	315 13.1	4 53.3	306 14.7	1 4.7
14	28 21.6	19 9.0	155 8.2	345 13.2	4 50.9	336 16.9	1 3.4
16	58 21.6	19 7.8	185 13.2	15 13.3	4 48.4	6 19.1	1 2.2
18	88 21.7	19 6.7	215 18.1	45 13.4	4 46.0	36 21.2	1 .9
20	118 21.7	19 5.6	245 23.0	75 13.5	4 43.5	66 23.4	0 59.6
22	148 21.7	19 4.4	275 28.0	105 13.6	4 41.1	96 25.6	0 58.4
Δ	0	−6		1	−12	11	−6

UT	MJESEC $S_\leftmoon$	MJESEC Δ	MJESEC $\delta_\leftmoon$	MJESEC Δ	JUPITER S_4	JUPITER δ_4	SATURN S_η	SATURN δ_η
h	° ′		° ′		° ′	° ′	° ′	° ′
0	348 46.4	148	−13 53.9	108	300 54.4	0 2.9	123 16.5	1 52.8
2	17 54.0	149	−13 32.4	109	330 59.4	0 2.8	153 21.0	1 52.6
4	47 1.8	150	−13 10.6	110	1 4.4	0 2.8	183 25.6	1 52.4
6	76 9.8	151	−12 48.7	111	31 9.3	0 2.7	213 30.1	1 52.2
8	105 18.0	152	−12 26.6	111	61 14.3	0 2.7	243 34.6	1 52.1
10	134 26.4	153	−12 4.3	112	91 19.3	0 2.7	273 39.2	1 51.9
12	163 35.0	154	−11 41.8	113	121 24.3	0 2.6	303 43.7	1 51.7
14	192 43.8	155	−11 19.2	114	151 29.2	0 2.6	333 48.3	1 51.5
16	221 52.7	156	−10 56.4	115	181 34.2	0 2.5	3 52.8	1 51.3
18	251 1.9	156	−10 33.4	116	211 39.2	0 2.5	33 57.3	1 51.1
20	280 11.2	157	−10 10.3	116	241 44.2	0 2.4	64 1.9	1 51.0
22	309 20.6	158	− 9 47.1	117	271 49.2	0 2.4	94 6.4	1 50.8
Δ					25	0	23	−1

φ	SUNCE IZLAZ	SUNCE ZALAZ	TRAJANJE SUMRAKA GRAĐ.	TRAJANJE SUMRAKA ASTR.	MJESEC IZLAZ	MJESEC Δ/24	MJESEC ZALAZ	MJESEC Δ/24
N	h min	h min	h min	h min	h min	min	h min	min
60	3 29	20 43	1 4	: ::	20 32	.2	5 20	3.3
55	3 60	20 12	0 48	: ::	20 19	.5	5 38	3.0
50	4 22	19 50	0 40	2 45	20 9	.7	5 52	2.8
45	4 40	19 33	0 34	2 9	20 1	.9	6 2	2.6
40	4 54	19 19	0 31	1 51	19 54	1.0	6 11	2.5
35	5 6	19 7	0 28	1 39	19 48	1.1	6 19	2.3
30	5 16	18 57	0 26	1 31	19 43	1.2	6 26	2.2
20	5 34	18 39	0 24	1 20	19 34	1.4	6 37	2.0
10	5 49	18 24	0 22	1 15	19 26	1.6	6 47	1.9
0	6 3	18 10	0 22	1 13	19 18	1.7	6 57	1.7
10	6 17	17 56	0 22	1 13	19 11	1.9	7 6	1.6
20	6 32	17 41	0 23	1 17	19 3	2.0	7 16	1.4
30	6 49	17 25	0 25	1 23	18 53	2.2	7 27	1.3
35	6 59	17 15	0 27	1 28	18 48	2.3	7 33	1.1
40	7 10	17 4	0 29	1 34	18 42	2.4	7 41	1.0
45	7 23	16 51	0 32	1 43	18 35	2.6	7 49	.9
50	7 39	16 35	0 36	1 54	18 26	2.8	7 59	.7
55	7 59	16 15	0 41	2 9	18 15	3.0	8 12	.5
60	8 26	15 48	0 50	2 31	18 1	3.3	8 28	.2
S								

SUNCE UT	SUNCE $e = T_p - UT$	SUNCE Δ/24	SUNCE r	MJESEC Prolaz	MJESEC Δ/24	MJESEC $\pi_\leftmoon$	MJESEC r
h	min s	s	′	h min	min	′	′
00	− 6 33.7	.0	15.8	$T_{\overline{m}}$ 0 46	1.8	54.2	14.8
12	− 6 33.3	$T_{\overline{m}_\odot}$ 12 h 6.6 min		Starost 15.2 d	Faza ○		

PLANETE

Pl.	$T_{\overline{m}}$	π	360−α	Vel.	Pl.	$T_{\overline{m}}$	π	360−α	Vel.
	h min	′	°			h min	′	°	
♀	14 59	.2	191	−4.1	♃	3 56	.0	356	−2.5
♂	15 35	.1	181	1.5	♄	15 45	.0	179	1.1

UT	SUNCE $S_\odot$	SUNCE $\delta_\odot$	PROLJ. TAČKA S_Υ	VENERA S_φ	VENERA δ_φ	MARS S_σ	MARS δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	178 21.7	19 3.3	305 32.9	135 13.7	4 38.6	126 27.8	0 57.1
2	208 21.8	19 2.1	335 37.8	165 13.9	4 36.2	156 29.9	0 55.8
4	238 21.8	19 1.0	5 42.7	195 14.0	4 33.8	186 32.1	0 54.6
6	268 21.8	18 59.8	35 47.7	225 14.1	4 31.3	216 34.3	0 53.3
8	298 21.8	18 58.7	65 52.6	255 14.2	4 28.9	246 36.5	0 52.0
10	328 21.9	18 57.5	95 57.5	285 14.4	4 26.4	276 38.6	0 50.8
12	358 21.9	18 56.3	126 2.5	315 14.5	4 24.0	306 40.8	0 49.5
14	28 21.9	18 55.2	156 7.4	345 14.6	4 21.5	336 43.0	0 48.2
16	58 21.9	18 54.0	186 12.3	15 14.7	4 19.1	6 45.1	0 47.0
18	88 22.0	18 52.8	216 17.2	45 14.9	4 16.6	36 47.3	0 45.7
20	118 22.0	18 51.7	246 22.2	75 15.0	4 14.2	66 49.5	0 44.4
22	148 22.0	18 50.5	276 27.1	105 15.2	4 11.7	96 51.6	0 43.1
Δ	0	−6		1	−12	11	−6

UT	MJESEC $S_\leftmoon$	MJESEC Δ	MJESEC $\delta_\leftmoon$	MJESEC Δ	JUPITER S_4	JUPITER δ_4	SATURN S_η	SATURN δ_η
h	° ′		° ′		° ′	° ′	° ′	° ′
0	338 30.2	159	− 9 23.7	118	301 54.1	0 2.3	124 11.0	1 50.6
2	7 40.0	160	− 9 .2	118	331 59.1	0 2.2	154 15.5	1 50.4
4	36 49.9	160	− 8 36.5	119	2 4.1	0 2.2	184 20.0	1 50.2
6	65 59.9	161	− 8 12.8	119	32 9.1	0 2.1	214 24.6	1 50.0
8	95 10.1	161	− 7 48.9	120	62 14.1	0 2.1	244 29.1	1 49.9
10	124 20.4	162	− 7 24.9	120	92 19.1	0 2.0	274 33.6	1 49.7
12	153 30.8	163	− 7 .8	121	122 24.1	0 2.0	304 38.2	1 49.5
14	182 41.3	163	− 6 36.6	121	152 29.1	0 1.9	334 42.7	1 49.3
16	211 51.9	164	− 6 12.3	122	182 34.1	0 1.9	4 47.2	1 49.1
18	241 2.7	164	− 5 47.9	122	212 39.1	0 1.8	34 51.8	1 48.9
20	270 13.5	164	− 5 23.5	123	242 44.1	0 1.8	64 56.3	1 48.8
22	299 24.4	165	− 4 59.0	123	272 49.1	0 1.7	95 .8	1 48.6
Δ					25	0	23	−1

φ	SUNCE IZLAZ	SUNCE ZALAZ	TRAJANJE SUMRAKA GRAĐ.	TRAJANJE SUMRAKA ASTR.	MJESEC IZLAZ	MJESEC Δ/24	MJESEC ZALAZ	MJESEC Δ/24
N	h min	h min	h min	h min	h min	min	h min	min
60	3 31	20 40	1 3	: ::	20 37	.2	6 40	3.3
55	4 1	20 10	0 48	: ::	20 31	.4	6 50	3.0
50	4 24	19 49	0 39	2 42	20 26	.6	6 58	2.7
45	4 41	19 32	0 34	2 8	20 21	.8	7 5	2.6
40	4 55	19 18	0 31	1 50	20 18	.9	7 11	2.4
35	5 6	19 6	0 28	1 39	20 15	1.1	7 15	2.3
30	5 17	18 56	0 26	1 30	20 12	1.2	7 19	2.2
20	5 34	18 39	0 24	1 20	20 8	1.4	7 26	2.0
10	5 49	18 24	0 22	1 15	20 3	1.5	7 33	1.8
0	6 3	18 10	0 22	1 13	19 59	1.7	7 38	1.7
10	6 17	17 56	0 22	1 13	19 56	1.8	7 44	1.5
20	6 32	17 42	0 23	1 16	19 51	2.0	7 50	1.4
30	6 48	17 25	0 25	1 23	19 47	2.2	7 57	1.2
35	6 58	17 16	0 27	1 28	19 44	2.3	8 1	1.1
40	7 9	17 5	0 29	1 34	19 41	2.4	8 5	1.0
45	7 22	16 52	0 32	1 42	19 37	2.6	8 11	.8
50	7 37	16 36	0 36	1 53	19 33	2.7	8 17	.7
55	7 57	16 16	0 41	2 9	19 27	3.0	8 24	.5
60	8 24	15 50	0 50	2 31	19 20	3.2	8 34	.2
S								

SUNCE UT	SUNCE $e = T_p - UT$	SUNCE Δ/24	SUNCE r	MJESEC Prolaz	MJESEC Δ/24	MJESEC $\pi_\leftmoon$	MJESEC r
h	min s	s	′	h min	min	′	′
00	− 6 32.9	.1	15.8	$T_{\overline{m}}$ 1 28	1.7	54.1	14.7
12	− 6 32.2	$T_{\overline{m}_\odot}$ 12 h 6.5 min		Starost 16.2 d	Faza ❍		

PLANETE

Pl.	$T_{\overline{m}}$	π	360−α	Vel.	Pl.	$T_{\overline{m}}$	π	360−α	Vel.
	h min	′	°			h min	′	°	
♀	14 59	.2	190	−4.1	♃	3 52	.0	356	−2.5
♂	15 33	.1	181	1.5	♄	15 41	.0	179	1.1

UT	SUNCE $S_\odot$	SUNCE $\delta_\odot$	PROLJ. TAČKA S_Υ	VENERA S_φ	VENERA δ_φ	MARS S_σ	MARS δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	178 22.1	18 49.3	306 32.0	135 15.3	4 9.3	126 53.8	0 41.9
2	208 22.1	18 48.2	336 37.0	165 15.4	4 6.8	156 56.0	0 40.6
4	238 22.1	18 47.0	6 41.9	195 15.6	4 4.4	186 58.1	0 39.3
6	268 22.2	18 45.8	36 46.8	225 15.7	4 1.9	217 .3	0 38.1
8	298 22.2	18 44.6	66 51.7	255 15.9	3 59.5	247 2.5	0 36.8
10	328 22.3	18 43.4	96 56.7	285 16.0	3 57.0	277 4.6	0 35.5
12	358 22.3	18 42.2	127 1.6	315 16.2	3 54.6	307 6.8	0 34.3
14	28 22.3	18 41.1	157 6.5	345 16.4	3 52.1	337 9.0	0 33.0
16	58 22.4	18 39.9	187 11.5	15 16.5	3 49.7	7 11.1	0 31.7
18	88 22.4	18 38.7	217 16.4	45 16.7	3 47.2	37 13.3	0 30.4
20	118 22.5	18 37.5	247 21.3	75 16.8	3 44.7	67 15.5	0 29.2
22	148 22.5	18 36.3	277 26.2	105 17.0	3 42.3	97 17.6	0 27.9
Δ	0	−6		1	−12	11	−6

UT	MJESEC $S_\leftmoon$	MJESEC Δ	MJESEC $\delta_\leftmoon$	MJESEC Δ	JUPITER S_4	JUPITER δ_4	SATURN S_η	SATURN δ_η
h	° ′		° ′		° ′	° ′	° ′	° ′
0	328 35.3	165	− 4 34.4	123	302 54.1	0 1.6	125 5.4	1 48.4
2	357 46.4	166	− 4 9.7	124	332 59.1	0 1.6	155 9.9	1 48.2
4	26 57.5	166	− 3 45.0	124	3 4.1	0 1.5	185 14.4	1 48.0
6	56 8.6	166	− 3 20.3	124	33 9.1	0 1.5	215 19.0	1 47.8
8	85 19.8	166	− 2 55.5	124	63 14.1	0 1.4	245 23.5	1 47.6
10	114 31.1	166	− 2 30.6	124	93 19.1	0 1.3	275 28.0	1 47.5
12	143 42.4	167	− 2 5.7	125	123 24.1	0 1.3	305 32.5	1 47.3
14	172 53.7	167	− 1 40.8	125	153 29.1	0 1.2	335 37.1	1 47.1
16	202 5.0	167	− 1 15.9	125	183 34.1	0 1.2	5 41.6	1 46.9
18	231 16.3	167	− 0 50.9	125	213 39.1	0 1.1	35 46.1	1 46.7
20	260 27.7	167	− 0 25.9	125	243 44.1	0 1.0	65 50.7	1 46.5
22	289 39.0	167	− 0 1.0	125	273 49.2	0 1.0	95 55.2	1 46.3
Δ					25	0	23	−1

φ	SUNCE IZLAZ	SUNCE ZALAZ	TRAJANJE SUMRAKA GRAĐ.	TRAJANJE SUMRAKA ASTR.	MJESEC IZLAZ	MJESEC Δ/24	MJESEC ZALAZ	MJESEC Δ/24
N	h min	h min	h min	h min	h min	min	h min	min
60	3 33	20 38	1 2	: ::	20 42	.2	7 58	3.2
55	4 3	20 9	0 47	: ::	20 41	.4	8 1	2.9
50	4 25	19 47	0 39	2 40	20 41	.6	8 4	2.7
45	4 42	19 31	0 34	2 8	20 41	.8	8 7	2.6
40	4 55	19 17	0 31	1 50	20 41	.9	8 9	2.4
35	5 7	19 6	0 28	1 38	20 40	1.1	8 10	2.3
30	5 17	18 56	0 26	1 30	20 40	1.2	8 12	2.2
20	5 34	18 38	0 24	1 20	20 40	1.4	8 15	2.0
10	5 49	18 24	0 22	1 15	20 40	1.5	8 17	1.8
0	6 3	18 10	0 22	1 13	20 40	1.7	8 19	1.7
10	6 17	17 56	0 22	1 13	20 39	1.8	8 21	1.5
20	6 31	17 42	0 23	1 16	20 39	2.0	8 23	1.3
30	6 48	17 26	0 25	1 23	20 39	2.2	8 26	1.2
35	6 57	17 16	0 27	1 28	20 39	2.3	8 27	1.1
40	7 8	17 5	0 29	1 34	20 39	2.4	8 29	.9
45	7 21	16 53	0 32	1 42	20 38	2.6	8 30	.8
50	7 36	16 38	0 36	1 53	20 38	2.7	8 32	.6
55	7 56	16 18	0 41	2 8	20 38	3.0	8 35	.4
60	8 22	15 52	0 49	2 30	20 37	3.2	8 39	.2
S								

SUNCE UT	SUNCE $e = T_p - UT$	SUNCE Δ/24	SUNCE r	MJESEC Prolaz	MJESEC Δ/24	MJESEC $\pi_\leftmoon$	MJESEC r
h	min s	s	′	h min	min	′	′
00	− 6 31.5	.1	15.8	$T_{\overline{m}}$ 2 9	1.7	54.0	14.7
12	− 6 30.5	$T_{\overline{m}_\odot}$ 12 h 6.5 min		Starost 17.2 d	Faza ❍		

PLANETE

Pl.	$T_{\overline{m}}$	π	360−α	Vel.	Pl.	$T_{\overline{m}}$	π	360−α	Vel.
	h min	′	°			h min	′	°	
♀	14 59	.2	189	−4.1	♃	3 48	.0	356	−2.5
♂	15 31	.1	180	1.5	♄	15 37	.0	179	1.1

UT	SUNCE $S_\odot$	SUNCE $\delta_\odot$	PROLJ. TAČKA S_Υ	VENERA S_φ	VENERA δ_φ	MARS S_σ	MARS δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	178 22.6	18 35.1	307 31.2	135 17.2	3 39.8	127 19.8	0 26.6
2	208 22.6	18 33.9	337 36.1	165 17.3	3 37.4	157 21.9	0 25.3
4	238 22.7	18 32.7	7 41.0	195 17.5	3 34.9	187 24.1	0 24.1
6	268 22.7	18 31.5	37 45.9	225 17.7	3 32.5	217 26.3	0 22.8
8	298 22.8	18 30.3	67 50.9	255 17.9	3 30.0	247 28.4	0 21.5
10	328 22.8	18 29.1	97 55.8	285 18.1	3 27.6	277 30.6	0 20.3
12	358 22.9	18 27.8	128 .7	315 18.2	3 25.1	307 32.7	0 19.0
14	28 22.9	18 26.6	158 5.7	345 18.4	3 22.6	337 34.9	0 17.7
16	58 23.0	18 25.4	188 10.6	15 18.6	3 20.2	7 37.0	0 16.4
18	88 23.0	18 24.2	218 15.5	45 18.8	3 17.7	37 39.2	0 15.2
20	118 23.1	18 23.0	248 20.4	75 19.0	3 15.3	67 41.4	0 13.9
22	148 23.2	18 21.8	278 25.4	105 19.2	3 12.8	97 43.5	0 12.6
Δ	0	−6		1	−12	11	−6

UT	MJESEC $S_\leftmoon$	MJESEC Δ	MJESEC $\delta_\leftmoon$	MJESEC Δ	JUPITER $S_\jupiter$	JUPITER $\delta_\jupiter$	SATURN $S_\saturn$	SATURN $\delta_\saturn$
h	° ′		° ′		° ′	° ′	° ′	° ′
0	318 50.4	167	0 24.0	125	303 54.2	0 .9	125 59.7	1 46.1
2	348 1.7	166	0 49.0	125	333 59.2	0 .8	156 4.2	1 46.0
4	17 13.0	166	1 14.0	125	4 4.2	0 .8	186 8.8	1 45.8
6	46 24.2	166	1 39.0	125	34 9.2	0 .7	216 13.3	1 45.6
8	75 35.5	166	2 3.9	125	64 14.2	0 .6	246 17.8	1 45.4
10	104 46.6	166	2 28.9	125	94 19.3	0 .6	276 22.3	1 45.2
12	133 57.8	165	2 53.8	124	124 24.3	0 .5	306 26.9	1 45.0
14	163 8.8	165	3 18.6	124	154 29.3	0 .4	336 31.4	1 44.8
16	192 19.8	165	3 43.5	124	184 34.3	0 .4	6 35.9	1 44.6
18	221 30.7	164	4 8.3	124	214 39.4	0 .3	36 40.4	1 44.4
20	250 41.6	164	4 33.0	123	244 44.4	0 .2	66 45.0	1 44.3
22	279 52.3	163	4 57.7	123	274 49.4	0 .2	96 49.5	1 44.1
Δ					25	0	23	−1

φ	SUNCE IZLAZ	SUNCE ZALAZ	TRAJANJE SUMRAKA GRAĐ.	TRAJANJE SUMRAKA ASTR.	MJESEC IZLAZ	MJESEC Δ/24	MJESEC ZALAZ	MJESEC Δ/24
N	h min	h min	h min	h min	h min	min	h min	min
60	3 36	20 36	1 2	: ::	20 46	.2	9 15	3.3
55	4 5	20 7	0 47	: ::	20 52	.5	9 12	3.0
50	4 26	19 46	0 39	2 38	20 56	.7	9 10	2.8
45	4 43	19 29	0 34	2 7	21 0	.9	9 8	2.6
40	4 56	19 16	0 30	1 49	21 3	1.0	9 7	2.4
35	5 8	19 5	0 28	1 38	21 6	1.1	9 5	2.3
30	5 18	18 55	0 26	1 30	21 8	1.2	9 4	2.2
20	5 35	18 38	0 24	1 20	21 13	1.4	9 2	2.0
10	5 49	18 23	0 22	1 15	21 16	1.6	9 1	1.8
0	6 3	18 10	0 22	1 13	21 20	1.7	8 59	1.7
10	6 16	17 57	0 22	1 13	21 23	1.9	8 57	1.5
20	6 31	17 42	0 23	1 16	21 27	2.0	8 55	1.4
30	6 47	17 26	0 25	1 23	21 31	2.2	8 53	1.2
35	6 56	17 17	0 27	1 27	21 34	2.3	8 52	1.1
40	7 7	17 6	0 29	1 34	21 37	2.5	8 51	1.0
45	7 19	16 54	0 32	1 42	21 40	2.6	8 50	.8
50	7 35	16 39	0 36	1 53	21 44	2.8	8 48	.7
55	7 54	16 20	0 41	2 8	21 49	3.0	8 46	.5
60	8 20	15 54	0 49	2 30	21 55	3.3	8 43	.2
S								

SUNCE UT	SUNCE $e = T_p - UT$	SUNCE Δ/24	SUNCE r	MJESEC Prolaz	MJESEC Δ/24	MJESEC $\pi_\leftmoon$	MJESEC r
h	min s	s	′	h min	min	′	′
00	− 6 29.5	.1	15.8	$T_{\overline{m}}$ 2 49	1.7	54.1	14.7
12	− 6 28.2	$T_{\overline{m}_\odot}$ 12 h 6.5 min		Starost 18.2 d	Faza ◑		

PLANETE

Pl.	$T_{\overline{m}}$	π	360−α	Vel.	Pl.	$T_{\overline{m}}$	π	360−α	Vel.
	h min	′	°			h min	′	°	
♀	14 59	.2	188	−4.1	♃	3 44	.0	356	−2.5
♂	15 30	.1	180	1.5	♄	15 34	.0	178	1.1

UT	SUNCE $S_\odot$	SUNCE $\delta_\odot$	PROLJ. TAČKA S_Υ	VENERA S_φ	VENERA δ_φ	MARS S_σ	MARS δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	178 23.2	18 20.5	308 30.3	135 19.4	3 10.3	127 45.7	0 11.3
2	208 23.3	18 19.3	338 35.2	165 19.6	3 7.9	157 47.8	0 10.1
4	238 23.3	18 18.1	8 40.2	195 19.7	3 5.4	187 50.0	0 8.8
6	268 23.4	18 16.8	38 45.1	225 19.9	3 3.0	217 52.1	0 7.5
8	298 23.5	18 15.6	68 50.0	255 20.2	3 .5	247 54.3	0 6.2
10	328 23.5	18 14.4	98 54.9	285 20.4	2 58.0	277 56.4	0 5.0
12	358 23.6	18 13.1	128 59.9	315 20.6	2 55.6	307 58.6	0 3.7
14	28 23.7	18 11.9	159 4.8	345 20.8	2 53.1	338 .7	0 2.4
16	58 23.7	18 10.7	189 9.7	15 21.0	2 50.6	8 2.9	0 1.1
18	88 23.8	18 9.4	219 14.7	45 21.2	2 48.2	38 5.0	− 0 .2
20	118 23.9	18 8.2	249 19.6	75 21.4	2 45.7	68 7.2	− 0 1.4
22	148 23.9	18 6.9	279 24.5	105 21.6	2 43.3	98 9.3	− 0 2.7
Δ	0	−6		1	−12	11	−6

UT	MJESEC $S_\leftmoon$	MJESEC Δ	MJESEC $\delta_\leftmoon$	MJESEC Δ	JUPITER $S_\jupiter$	JUPITER $\delta_\jupiter$	SATURN $S_\saturn$	SATURN $\delta_\saturn$
h	° ′		° ′		° ′	° ′	° ′	° ′
0	309 2.9	163	5 22.3	123	304 54.5	0 .1	126 54.0	1 43.9
2	338 13.5	162	5 46.9	122	334 59.5	0 .0	156 58.5	1 43.7
4	7 23.9	161	6 11.4	122	5 4.5	− 0 .1	187 3.0	1 43.5
6	36 34.2	161	6 35.8	122	35 9.6	− 0 .1	217 7.6	1 43.3
8	65 44.3	160	7 .1	121	65 14.6	− 0 .2	247 12.1	1 43.1
10	94 54.3	159	7 24.4	121	95 19.6	− 0 .3	277 16.6	1 42.9
12	124 4.2	159	7 48.5	120	125 24.7	− 0 .3	307 21.1	1 42.7
14	153 13.9	158	8 12.6	120	155 29.7	− 0 .4	337 25.6	1 42.6
16	182 23.5	157	8 36.5	119	185 34.7	− 0 .5	7 30.2	1 42.4
18	211 32.9	156	9 .4	119	215 39.8	− 0 .6	37 34.7	1 42.2
20	240 42.1	155	9 24.1	118	245 44.8	− 0 .7	67 39.2	1 42.0
22	269 51.1	154	9 47.7	117	275 49.9	− 0 .7	97 43.7	1 41.8
Δ					25	0	23	−1

φ	SUNCE IZLAZ	SUNCE ZALAZ	TRAJANJE SUMRAKA GRAĐ.	TRAJANJE SUMRAKA ASTR.	MJESEC IZLAZ	MJESEC Δ/24	MJESEC ZALAZ	MJESEC Δ/24
N	h min	h min	h min	h min	h min	min	h min	min
60	3 38	20 33	1 1	: ::	20 51	.3	10 33	3.3
55	4 7	20 5	0 46	: ::	21 3	.6	10 24	3.0
50	4 28	19 44	0 39	2 36	21 13	.8	10 16	2.8
45	4 44	19 28	0 34	2 6	21 21	1.0	10 10	2.6
40	4 57	19 15	0 30	1 49	21 27	1.1	10 5	2.5
35	5 9	19 4	0 28	1 38	21 33	1.2	10 1	2.4
30	5 18	18 54	0 26	1 30	21 38	1.3	9 57	2.3
20	5 35	18 38	0 24	1 20	21 46	1.5	9 51	2.1
10	5 50	18 23	0 22	1 14	21 54	1.7	9 45	1.9
0	6 3	18 10	0 22	1 12	22 1	1.8	9 39	1.8
10	6 16	17 57	0 22	1 13	22 8	2.0	9 34	1.6
20	6 30	17 43	0 23	1 16	22 16	2.1	9 28	1.4
30	6 46	17 27	0 25	1 22	22 25	2.3	9 22	1.3
35	6 56	17 18	0 27	1 27	22 30	2.4	9 18	1.2
40	7 6	17 7	0 29	1 34	22 36	2.5	9 14	1.0
45	7 18	16 55	0 32	1 42	22 43	2.7	9 9	.9
50	7 33	16 40	0 35	1 53	22 51	2.9	9 4	.7
55	7 52	16 21	0 41	2 8	23 1	3.1	8 57	.5
60	8 17	15 56	0 49	2 29	23 15	3.4	8 47	.2
S								

SUNCE UT	SUNCE $e = T_p - UT$	SUNCE Δ/24	SUNCE r	MJESEC Prolaz	MJESEC Δ/24	MJESEC $\pi_\leftmoon$	MJESEC r
h	min s	s	′	h min	min	′	′
00	− 6 27.0	.1	15.8	$T_{\overline{m}}$ 3 30	1.7	54.3	14.8
12	− 6 25.4	$T_{\overline{m}_\odot}$ 12 h 6.4 min		Starost 19.2 d	Faza ◑		

PLANETE

Pl.	$T_{\overline{m}}$	π	360−α	Vel.	Pl.	$T_{\overline{m}}$	π	360−α	Vel.
	h min	′	°			h min	′	°	
♀	14 59	.2	187	−4.1	♃	3 40	.0	356	−2.5
♂	15 28	.1	179	1.5	♄	15 30	.0	178	1.1

1. AVGUST 2010. NEDJELJA

UT	SUNCE $S_\odot$	SUNCE $\delta_\odot$	PROLJ. TAČKA S_Υ	VENERA S_φ	VENERA δ_φ	MARS S_σ	MARS δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	178 24.0	18 5.7	309 29.4	135 21.8	2 40.8	128 11.5	− 0 4.0
2	208 24.1	18 4.4	339 34.4	165 22.1	2 38.3	158 13.6	− 0 5.3
4	238 24.2	18 3.2	9 39.3	195 22.3	2 35.9	188 15.8	− 0 6.5
6	268 24.2	18 1.9	39 44.2	225 22.5	2 33.4	218 17.9	− 0 7.8
8	298 24.3	18 .7	69 49.2	255 22.7	2 30.9	248 20.1	− 0 9.1
10	328 24.4	17 59.4	99 54.1	285 23.0	2 28.5	278 22.2	− 0 10.4
12	358 24.5	17 58.1	129 59.0	315 23.2	2 26.0	308 24.4	− 0 11.7
14	28 24.5	17 56.9	160 3.9	345 23.4	2 23.5	338 26.5	− 0 12.9
16	58 24.6	17 55.6	190 8.9	15 23.7	2 21.1	8 28.7	− 0 14.2
18	88 24.7	17 54.3	220 13.8	45 23.9	2 18.6	38 30.8	− 0 15.5
20	118 24.8	17 53.1	250 18.7	75 24.1	2 16.1	68 32.9	− 0 16.8
22	148 24.9	17 51.8	280 23.7	105 24.4	2 13.7	98 35.1	− 0 18.0
Δ	0	−6		1	−12	11	−6

UT	MJESEC $S_\leftmoon$	MJESEC Δ	MJESEC $\delta_\leftmoon$	MJESEC Δ	JUPITER $S_\jupiter$	JUPITER $\delta_\jupiter$	SATURN $S_\saturn$	SATURN $\delta_\saturn$
h	° ′		° ′		° ′	° ′	° ′	° ′
0	298 59.9	153	10 11.2	117	305 54.9	− 0 .8	127 48.2	1 41.6
2	328 8.5	152	10 34.5	116	335 60.0	− 0 .9	157 52.8	1 41.4
4	357 17.0	151	10 57.7	115	6 5.0	− 0 1.0	187 57.3	1 41.2
6	26 25.2	150	11 20.8	115	36 10.1	− 0 1.0	218 1.8	1 41.0
8	55 33.1	149	11 43.7	114	66 15.1	− 0 1.1	248 6.3	1 40.8
10	84 40.9	148	12 6.4	113	96 20.2	− 0 1.2	278 10.8	1 40.6
12	113 48.4	146	12 29.0	112	126 25.2	− 0 1.3	308 15.3	1 40.4
14	142 55.7	145	12 51.4	111	156 30.3	− 0 1.4	338 19.8	1 40.3
16	172 2.7	144	13 13.6	110	186 35.3	− 0 1.4	8 24.4	1 40.1
18	201 9.4	142	13 35.7	109	216 40.4	− 0 1.5	38 28.9	1 39.9
20	230 15.9	141	13 57.5	108	246 45.4	− 0 1.6	68 33.4	1 39.7
22	259 22.1	140	14 19.2	107	276 50.5	− 0 1.7	98 37.9	1 39.5
Δ					25	0	23	−1

φ	SUNCE IZLAZ	SUNCE ZALAZ	TRAJANJE SUMRAKA GRAĐ.	TRAJANJE SUMRAKA ASTR.	MJESEC IZLAZ	MJESEC Δ/24	MJESEC ZALAZ	MJESEC Δ/24
N	h min	h min	h min	h min	h min	min	h min	min
60	3 40	20 31	0 60	: ::	20 58	.4	11 54	3.5
55	4 8	20 3	0 46	: ::	21 17	.7	11 37	3.1
50	4 29	19 43	0 39	2 35	21 32	.9	11 24	2.9
45	4 45	19 27	0 34	2 5	21 44	1.1	11 13	2.7
40	4 58	19 14	0 30	1 48	21 53	1.3	11 5	2.6
35	5 9	19 3	0 28	1 37	22 2	1.4	10 58	2.4
30	5 19	18 53	0 26	1 29	22 9	1.5	10 51	2.3
20	5 35	18 37	0 23	1 20	22 22	1.6	10 40	2.2
10	5 50	18 23	0 22	1 14	22 34	1.8	10 31	2.0
0	6 3	18 10	0 22	1 12	22 44	1.9	10 22	1.9
10	6 16	17 57	0 22	1 13	22 55	2.1	10 13	1.7
20	6 30	17 43	0 23	1 16	23 7	2.2	10 3	1.6
30	6 46	17 27	0 25	1 22	23 20	2.4	9 52	1.4
35	6 55	17 18	0 27	1 27	23 28	2.5	9 46	1.3
40	7 5	17 8	0 29	1 33	23 36	2.6	9 39	1.2
45	7 17	16 56	0 32	1 42	23 47	2.8	9 31	1.0
50	7 32	16 42	0 35	1 52	23 59	2.9	9 21	.8
55	7 50	16 23	0 41	2 7	. . .	.0	9 9	.6
60	8 15	15 58	0 48	2 29	. . .	.0	8 53	.3
S								

SUNCE UT	SUNCE $e = T_p - UT$	SUNCE Δ/24	SUNCE r	MJESEC Prolaz	MJESEC Δ/24	MJESEC $\pi_\leftmoon$	MJESEC r
h	min s	s	′	h min	min	′	′
00	− 6 23.8	.2	15.8	$T_{\overline{m}}$ 4 11	1.8	54.6	14.9
12	− 6 21.9	$T_{\overline{m}_\odot}$ 12 h 6.4 min		Starost 20.2 d	Faza ◑		

PLANETE

Pl.	$T_{\overline{m}}$	π	360−α	Vel.	Pl.	$T_{\overline{m}}$	π	360−α	Vel.
	h min	′	°			h min	′	°	
♀	14 58	.2	186	−4.1	♃	3 36	.0	356	−2.6
♂	15 26	.1	179	1.5	♄	15 26	.0	178	1.1

2. AVGUST PONEDJELJAK

UT	SUNCE $S_\odot$	SUNCE $\delta_\odot$	PROLJ. TAČKA S_Υ	VENERA S_φ	VENERA δ_φ	MARS S_σ	MARS δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	178 25.0	17 50.5	310 28.6	135 24.6	2 11.2	128 37.2	− 0 19.3
2	208 25.0	17 49.3	340 33.5	165 24.9	2 8.7	158 39.4	− 0 20.6
4	238 25.1	17 48.0	10 38.4	195 25.1	2 6.3	188 41.5	− 0 21.9
6	268 25.2	17 46.7	40 43.4	225 25.4	2 3.8	218 43.7	− 0 23.2
8	298 25.3	17 45.4	70 48.3	255 25.6	2 1.3	248 45.8	− 0 24.4
10	328 25.4	17 44.1	100 53.2	285 25.9	1 58.9	278 47.9	− 0 25.7
12	358 25.5	17 42.8	130 58.2	315 26.1	1 56.4	308 50.1	− 0 27.0
14	28 25.6	17 41.6	161 3.1	345 26.4	1 53.9	338 52.2	− 0 28.3
16	58 25.7	17 40.3	191 8.0	15 26.6	1 51.5	8 54.4	− 0 29.6
18	88 25.8	17 39.0	221 12.9	45 26.9	1 49.0	38 56.5	− 0 30.8
20	118 25.8	17 37.7	251 17.9	75 27.1	1 46.5	68 58.6	− 0 32.1
22	148 25.9	17 36.4	281 22.8	105 27.4	1 44.1	99 .8	− 0 33.4
Δ	0	−6		1	−12	11	−6

UT	MJESEC $S_\leftmoon$	MJESEC Δ	MJESEC $\delta_\leftmoon$	MJESEC Δ	JUPITER $S_\jupiter$	JUPITER $\delta_\jupiter$	SATURN $S_\saturn$	SATURN $\delta_\saturn$
h	° ′		° ′		° ′	° ′	° ′	° ′
0	288 28.1	138	14 40.6	106	306 55.6	− 0 1.8	128 42.4	1 39.3
2	317 33.7	137	15 1.8	105	337 .6	− 0 1.9	158 46.9	1 39.1
4	346 39.1	135	15 22.8	104	7 5.7	− 0 1.9	188 51.4	1 38.9
6	15 44.1	134	15 43.6	103	37 10.8	− 0 2.0	218 55.9	1 38.7
8	44 48.8	132	16 4.1	101	67 15.8	− 0 2.1	249 .5	1 38.5
10	73 53.3	131	16 24.4	100	97 20.9	− 0 2.2	279 5.0	1 38.3
12	102 57.4	129	16 44.4	99	127 26.0	− 0 2.3	309 9.5	1 38.1
14	132 1.1	127	17 4.2	98	157 31.0	− 0 2.4	339 14.0	1 37.9
16	161 4.6	126	17 23.7	96	187 36.1	− 0 2.5	9 18.5	1 37.7
18	190 7.7	124	17 43.0	95	217 41.2	− 0 2.5	39 23.0	1 37.5
20	219 10.5	122	18 1.9	93	247 46.2	− 0 2.6	69 27.5	1 37.3
22	248 12.9	120	18 20.5	92	277 51.3	− 0 2.7	99 32.0	1 37.2
Δ					25	0	23	−1

φ	SUNCE IZLAZ	SUNCE ZALAZ	TRAJANJE SUMRAKA GRAĐ.	TRAJANJE SUMRAKA ASTR.	MJESEC IZLAZ	MJESEC Δ/24	MJESEC ZALAZ	MJESEC Δ/24
N	h min	h min	h min	h min	h min	min	h min	min
60	3 43	20 28	0 59	: ::	21 7	.6	13 17	3.6
55	4 10	20 1	0 46	: ::	21 34	1.0	12 52	3.2
50	4 30	19 41	0 38	2 33	21 55	1.2	12 33	2.9
45	4 46	19 26	0 34	2 4	22 10	1.4	12 18	2.8
40	4 59	19 13	0 30	1 48	22 24	1.5	12 6	2.6
35	5 10	19 2	0 28	1 37	22 35	1.6	11 56	2.5
30	5 20	18 53	0 26	1 29	22 45	1.7	11 47	2.4
20	5 36	18 37	0 23	1 19	23 2	1.8	11 32	2.3
10	5 50	18 23	0 22	1 14	23 16	2.0	11 19	2.1
0	6 3	18 10	0 22	1 12	23 30	2.1	11 6	2.0
10	6 16	17 57	0 22	1 13	23 45	2.2	10 54	1.9
20	6 29	17 43	0 23	1 16	23 60	2.3	10 40	1.7
30	6 45	17 28	0 25	1 22	. . .	.0	10 25	1.6
35	6 54	17 19	0 27	1 27	. . .	.0	10 17	1.5
40	7 4	17 9	0 29	1 33	. . .	.0	10 7	1.4
45	7 16	16 57	0 32	1 41	. . .	.0	9 55	1.2
50	7 30	16 43	0 35	1 52	. . .	.0	9 41	1.1
55	7 48	16 25	0 40	2 7	0 16	3.2	9 24	.8
60	8 13	16 1	0 48	2 28	0 37	3.5	9 1	.5
S								

SUNCE UT	SUNCE $e = T_p - UT$	SUNCE Δ/24	SUNCE r	MJESEC Prolaz	MJESEC Δ/24	MJESEC $\pi_\leftmoon$	MJESEC r
h	min s	s	′	h min	min	′	′
00	− 6 20.0	.2	15.8	$T_{\overline{m}}$ 4 55	2.0	55.1	15.0
12	− 6 17.8	$T_{\overline{m}_\odot}$ 12 h 6.3 min		Starost 21.2 d	Faza ◑		

PLANETE

Pl.	$T_{\overline{m}}$	π	360−α	Vel.	Pl.	$T_{\overline{m}}$	π	360−α	Vel.
	h min	′	°			h min	′	°	
♀	14 58	.2	185	−4.1	♃	3 32	.0	356	−2.6
♂	15 24	.1	178	1.5	♄	15 23	.0	178	1.1

UT	SUNCE $S_\odot$	SUNCE $\delta_\odot$	PROLJ. TAČKA S_Υ	VENERA S_φ	VENERA δ_φ	MARS S_σ	MARS δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	178 26.0	17 35.1	311 27.7	135 27.7	1 41.6	129 2.9	− 0 34.7
2	208 26.1	17 33.8	341 32.6	165 27.9	1 39.1	159 5.0	− 0 36.0
4	238 26.2	17 32.5	11 37.6	195 28.2	1 36.6	189 7.2	− 0 37.3
6	268 26.3	17 31.2	41 42.5	225 28.5	1 34.2	219 9.3	− 0 38.5
8	298 26.4	17 29.9	71 47.4	255 28.8	1 31.7	249 11.4	− 0 39.8
10	328 26.5	17 28.6	101 52.4	285 29.0	1 29.2	279 13.6	− 0 41.1
12	358 26.6	17 27.3	131 57.3	315 29.3	1 26.8	309 15.7	− 0 42.4
14	28 26.7	17 25.9	162 2.2	345 29.6	1 24.3	339 17.8	− 0 43.7
16	58 26.8	17 24.6	192 7.1	15 29.9	1 21.8	9 20.0	− 0 45.0
18	88 27.0	17 23.3	222 12.1	45 30.2	1 19.4	39 22.1	− 0 46.2
20	118 27.1	17 22.0	252 17.0	75 30.5	1 16.9	69 24.2	− 0 47.5
22	148 27.2	17 20.7	282 21.9	105 30.7	1 14.4	99 26.4	− 0 48.8
Δ	1	−7		1	−12	11	−6

UT	MJESEC $S_\leftmoon$	MJESEC Δ	MJESEC $\delta_\leftmoon$	MJESEC Δ	JUPITER $S_\jupiter$	JUPITER $\delta_\jupiter$	SATURN $S_\saturn$	SATURN $\delta_\saturn$
h	° ′		° ′		° ′	° ′	° ′	° ′
0	277 14.9	119	18 38.9	90	307 56.4	− 0 2.8	129 36.5	1 37.0
2	306 16.6	117	18 56.9	89	338 1.5	− 0 2.9	159 41.0	1 36.8
4	335 18.0	115	19 14.6	87	8 6.5	− 0 3.0	189 45.5	1 36.6
6	4 18.9	113	19 32.0	85	38 11.6	− 0 3.1	219 50.0	1 36.4
8	33 19.5	111	19 49.0	83	68 16.7	− 0 3.2	249 54.5	1 36.2
10	62 19.8	109	20 5.7	82	98 21.8	− 0 3.3	279 59.1	1 36.0
12	91 19.6	107	20 22.1	80	128 26.9	− 0 3.4	310 3.6	1 35.8
14	120 19.1	105	20 38.0	78	158 31.9	− 0 3.5	340 8.1	1 35.6
16	149 18.2	104	20 53.6	76	188 37.0	− 0 3.6	10 12.6	1 35.4
18	178 16.9	102	21 8.8	74	218 42.1	− 0 3.6	40 17.1	1 35.2
20	207 15.2	100	21 23.6	72	248 47.2	− 0 3.7	70 21.6	1 35.0
22	236 13.1	98	21 38.0	70	278 52.3	− 0 3.8	100 26.1	1 34.8
Δ					25	0	23	−1

φ	SUNCE IZLAZ	SUNCE ZALAZ	TRAJANJE SUMRAKA GRAĐ.	TRAJANJE SUMRAKA ASTR.	MJESEC IZLAZ	MJESEC Δ/24	MJESEC ZALAZ	MJESEC Δ/24
N	h min	h min	h min	h min	h min	min	h min	min
60	3 45	20 26	0 58	: ::	21 22	1.0	14 43	3.5
55	4 12	19 59	0 45	: ::	21 58	1.4	14 8	3.1
50	4 32	19 40	0 38	2 31	22 24	1.6	13 44	2.9
45	4 47	19 24	0 33	2 3	22 43	1.7	13 25	2.8
40	5 0	19 12	0 30	1 47	22 60	1.8	13 10	2.7
35	5 11	19 1	0 28	1 37	23 13	1.9	12 57	2.6
30	5 20	18 52	0 26	1 29	23 25	2.0	12 45	2.5
20	5 36	18 36	0 23	1 19	23 46	2.1	12 26	2.4
10	5 50	18 22	0 22	1 14	.. ...	.0	12 10	2.3
0	6 3	18 10	0 22	1 12	.. ...	.0	11 54	2.2
10	6 15	17 57	0 22	1 13	.. ...	.0	11 39	2.1
20	6 29	17 44	0 23	1 16	.. ...	.0	11 22	2.0
30	6 44	17 29	0 25	1 22	0 17	2.5	11 3	1.8
35	6 53	17 20	0 27	1 27	0 27	2.6	10 52	1.7
40	7 3	17 10	0 29	1 33	0 39	2.7	10 39	1.6
45	7 15	16 58	0 31	1 41	0 53	2.8	10 25	1.5
50	7 29	16 44	0 35	1 52	1 10	3.0	10 7	1.4
55	7 47	16 27	0 40	2 7	1 32	3.2	9 44	1.1
60	8 10	16 3	0 48	2 28	2 2	3.6	9 12	.8
S								

SUNCE UT	SUNCE $e = T_p - UT$	SUNCE Δ/24	SUNCE r	MJESEC Prolaz	MJESEC Δ/24	MJESEC $\pi_\leftmoon$	MJESEC r
h	min s	s	′	h min	min	′	′
00	− 6 15.7	.2	15.8	$T_{\overline{m}}$ 5 42	2.1	55.7	15.2
12	− 6 13.2	$T_{\overline{m}_\odot}$ 12 h	6.2 min	Starost 22.2 d	Faza ◑		

PLANETE

Pl.	$T_{\overline{m}}$	π	360−α	Vel.	Pl.	$T_{\overline{m}}$	π	360−α	Vel.
	h min	′	°			h min	′	°	
♀	14 58	.2	184	−4.1	♃	3 28	.0	356	−2.6
♂	15 23	.1	178	1.5	♄	15 19	.0	178	1.1

UT	SUNCE $S_\odot$	SUNCE $\delta_\odot$	PROLJ. TAČKA S_Υ	VENERA S_φ	VENERA δ_φ	MARS S_σ	MARS δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	178 27.3	17 19.4	312 26.9	135 31.0	1 11.9	129 28.5	− 0 50.1
2	208 27.4	17 18.0	342 31.8	165 31.3	1 9.5	159 30.6	− 0 51.4
4	238 27.5	17 16.7	12 36.7	195 31.6	1 7.0	189 32.7	− 0 52.7
6	268 27.6	17 15.4	42 41.6	225 31.9	1 4.5	219 34.9	− 0 53.9
8	298 27.7	17 14.0	72 46.6	255 32.2	1 2.1	249 37.0	− 0 55.2
10	328 27.8	17 12.7	102 51.5	285 32.5	0 59.6	279 39.1	− 0 56.5
12	358 27.9	17 11.4	132 56.4	315 32.8	0 57.1	309 41.2	− 0 57.8
14	28 28.1	17 10.0	163 1.4	345 33.1	0 54.7	339 43.4	− 0 59.1
16	58 28.2	17 8.7	193 6.3	15 33.4	0 52.2	9 45.5	− 1 .4
18	88 28.3	17 7.4	223 11.2	45 33.8	0 49.7	39 47.6	− 1 1.6
20	118 28.4	17 6.0	253 16.1	75 34.1	0 47.2	69 49.7	− 1 2.9
22	148 28.5	17 4.7	283 21.1	105 34.4	0 44.8	99 51.9	− 1 4.2
Δ	1	−7		2	−12	11	−6

UT	MJESEC $S_\leftmoon$	MJESEC Δ	MJESEC $\delta_\leftmoon$	MJESEC Δ	JUPITER $S_\jupiter$	JUPITER $\delta_\jupiter$	SATURN $S_\saturn$	SATURN $\delta_\saturn$
h	° ′		° ′		° ′	° ′	° ′	° ′
0	265 10.7	96	21 52.0	68	308 57.4	− 0 3.9	130 30.6	1 34.6
2	294 7.8	94	22 5.6	66	339 2.5	− 0 4.0	160 35.1	1 34.4
4	323 4.6	92	22 18.7	63	9 7.6	− 0 4.1	190 39.6	1 34.2
6	352 1.0	90	22 31.4	61	39 12.7	− 0 4.2	220 44.1	1 34.0
8	20 57.0	88	22 43.7	59	69 17.8	− 0 4.3	250 48.6	1 33.8
10	49 52.6	86	22 55.4	57	99 22.9	− 0 4.4	280 53.1	1 33.6
12	78 47.8	84	23 6.7	54	129 28.0	− 0 4.5	310 57.6	1 33.4
14	107 42.7	82	23 17.6	52	159 33.1	− 0 4.6	341 2.1	1 33.2
16	136 37.2	81	23 27.9	49	189 38.2	− 0 4.7	11 6.6	1 33.0
18	165 31.3	79	23 37.7	47	219 43.3	− 0 4.8	41 11.1	1 32.8
20	194 25.0	77	23 47.0	44	249 48.4	− 0 4.9	71 15.6	1 32.6
22	223 18.4	75	23 55.8	41	279 53.5	− 0 5.0	101 20.1	1 32.4
Δ					25	0	23	−1

φ	SUNCE IZLAZ	SUNCE ZALAZ	TRAJANJE SUMRAKA GRAĐ.	TRAJANJE SUMRAKA ASTR.	MJESEC IZLAZ	MJESEC Δ/24	MJESEC ZALAZ	MJESEC Δ/24
N	h min	h min	h min	h min	h min	min	h min	min
60	3 47	20 23	0 58	: ::	21 47	1.8	16 7	3.1
55	4 14	19 57	0 45	: ::	22 31	2.0	15 24	2.9
50	4 33	19 38	0 38	2 29	23 2	2.1	14 54	2.8
45	4 49	19 23	0 33	2 3	23 25	2.2	14 32	2.7
40	5 1	19 11	0 30	1 47	23 43	2.2	14 14	2.6
35	5 12	19 0	0 28	1 36	23 59	2.3	13 59	2.6
30	5 21	18 51	0 26	1 29	.. ...	.0	13 46	2.5
20	5 36	18 36	0 23	1 19	.. ...	.0	13 23	2.5
10	5 50	18 22	0 22	1 14	0 4	2.2	13 4	2.4
0	6 3	18 10	0 22	1 12	0 21	2.3	12 46	2.3
10	6 15	17 57	0 22	1 13	0 37	2.3	12 28	2.3
20	6 28	17 44	0 23	1 16	0 56	2.4	12 9	2.2
30	6 43	17 29	0 25	1 22	1 17	2.5	11 47	2.1
35	6 52	17 21	0 27	1 27	1 29	2.6	11 34	2.1
40	7 2	17 11	0 29	1 33	1 43	2.7	11 19	2.0
45	7 13	16 59	0 31	1 41	2 0	2.8	11 1	1.9
50	7 27	16 46	0 35	1 52	2 21	2.9	10 40	1.8
55	7 45	16 28	0 40	2 6	2 49	3.1	10 11	1.7
60	8 8	16 5	0 48	2 27	3 29	3.4	9 30	1.3
S								

SUNCE UT	SUNCE $e = T_p - UT$	SUNCE Δ/24	SUNCE r	MJESEC Prolaz	MJESEC Δ/24	MJESEC $\pi_\leftmoon$	MJESEC r
h	min s	s	′	h min	min	′	′
00	− 6 10.7	.2	15.8	$T_{\overline{m}}$ 6 33	2.3	56.5	15.4
12	− 6 8.0	$T_{\overline{m}_\odot}$ 12 h	6.1 min	Starost 23.2 d	Faza ◑		

PLANETE

Pl.	$T_{\overline{m}}$	π	360−α	Vel.	Pl.	$T_{\overline{m}}$	π	360−α	Vel.
	h min	′	°			h min	′	°	
♀	14 58	.2	183	−4.1	♃	3 24	.0	357	−2.6
♂	15 21	.1	177	1.5	♄	15 16	.0	178	1.1

UT	SUNCE $S_\odot$	SUNCE $\delta_\odot$	PROLJ. TAČKA S_Υ	VENERA S_φ	VENERA δ_φ	MARS S_σ	MARS δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	178 28.7	17 3.3	313 26.0	135 34.7	0 42.3	129 54.0	− 1 5.5
2	208 28.8	17 2.0	343 30.9	165 35.0	0 39.8	159 56.1	− 1 6.8
4	238 28.9	17 .6	13 35.9	195 35.3	0 37.4	189 58.2	− 1 8.1
6	268 29.0	16 59.3	43 40.8	225 35.6	0 34.9	220 .4	− 1 9.4
8	298 29.1	16 57.9	73 45.7	255 36.0	0 32.4	250 2.5	− 1 10.6
10	328 29.3	16 56.6	103 50.6	285 36.3	0 29.9	280 4.6	− 1 11.9
12	358 29.4	16 55.2	133 55.6	315 36.6	0 27.5	310 6.7	− 1 13.2
14	28 29.5	16 53.9	164 .5	345 37.0	0 25.0	340 8.8	− 1 14.5
16	58 29.7	16 52.5	194 5.4	15 37.3	0 22.5	10 10.9	− 1 15.8
18	88 29.8	16 51.2	224 10.4	45 37.6	0 20.1	40 13.1	− 1 17.1
20	118 29.9	16 49.8	254 15.3	75 38.0	0 17.6	70 15.2	− 1 18.4
22	148 30.0	16 48.4	284 20.2	105 38.3	0 15.1	100 17.3	− 1 19.6
Δ	1	−7		2	−12	11	−6

UT	MJESEC $S_\leftmoon$	MJESEC Δ	MJESEC $\delta_\leftmoon$	MJESEC Δ	JUPITER S_4	JUPITER δ_4	SATURN S_η	SATURN δ_η
h	° ′		° ′		° ′	° ′	° ′	° ′
0	252 11.4	73	24 4.1	39	309 58.6	− 0 5.1	131 24.6	1 32.2
2	281 4.1	72	24 11.8	36	340 3.7	− 0 5.2	161 29.1	1 32.0
4	309 56.4	70	24 18.9	33	10 8.8	− 0 5.3	191 33.6	1 31.8
6	338 48.4	68	24 25.6	30	40 13.9	− 0 5.4	221 38.1	1 31.6
8	7 40.0	67	24 31.6	27	70 19.0	− 0 5.5	251 42.6	1 31.4
10	36 31.4	65	24 37.1	24	100 24.1	− 0 5.6	281 47.1	1 31.2
12	65 22.4	64	24 41.9	21	130 29.2	− 0 5.8	311 51.6	1 31.0
14	94 13.1	62	24 46.2	18	160 34.3	− 0 5.9	341 56.1	1 30.8
16	123 3.5	61	24 49.9	15	190 39.4	− 0 6.0	12 .5	1 30.6
18	151 53.7	59	24 53.0	12	220 44.6	− 0 6.1	42 5.0	1 30.4
20	180 43.5	58	24 55.5	9	250 49.7	− 0 6.2	72 9.5	1 30.2
22	209 33.2	57	24 57.3	6	280 54.8	− 0 6.3	102 14.0	1 30.0
Δ					26	−1	22	−1

φ	SUNCE IZLAZ	SUNCE ZALAZ	TRAJANJE SUMRAKA GRAĐ.	TRAJANJE SUMRAKA ASTR.	MJESEC IZLAZ	MJESEC Δ/24	MJESEC ZALAZ	MJESEC Δ/24
N	h min	h min	h min	h min	h min	min	h min	min
60	3 50	20 21	0 57	: ::	22 30	2.8	17 23	2.3
55	4 16	19 55	0 45	3 45	23 19	2.7	16 33	2.4
50	4 35	19 36	0 38	2 28	23 52	2.7	16 1	2.4
45	4 50	19 22	0 33	2 2	.. ..	.0	15 36	2.4
40	5 2	19 10	0 30	1 46	.. ..	.0	15 17	2.5
35	5 12	18 59	0 27	1 36	.. ..	.0	15 0	2.5
30	5 21	18 50	0 26	1 28	0 13	2.3	14 46	2.5
20	5 37	18 35	0 23	1 19	0 36	2.3	14 22	2.5
10	5 50	18 22	0 22	1 14	0 56	2.4	14 1	2.5
0	6 3	18 9	0 22	1 12	1 15	2.4	13 42	2.5
10	6 15	17 57	0 22	1 12	1 33	2.4	13 22	2.5
20	6 28	17 44	0 23	1 16	1 54	2.5	13 2	2.4
30	6 43	17 30	0 25	1 22	2 17	2.5	12 38	2.4
35	6 51	17 21	0 27	1 27	2 31	2.5	12 23	2.4
40	7 1	17 12	0 29	1 33	2 47	2.6	12 7	2.4
45	7 12	17 1	0 31	1 41	3 6	2.6	11 48	2.4
50	7 26	16 47	0 35	1 51	3 30	2.6	11 23	2.4
55	7 43	16 30	0 40	2 6	4 2	2.7	10 51	2.4
60	8 6	16 7	0 47	2 27	4 51	2.8	10 2	2.3
S								

SUNCE UT	SUNCE $e = T_p - UT$	SUNCE Δ/24	SUNCE r	MJESEC Prolaz	MJESEC Δ/24	MJESEC $\pi_\leftmoon$	MJESEC r
h	min s	s	′	h min	min	′	′
00	− 6 5.2	.3	15.8	$T_{\overline{m}}$ 7 28	2.5	57.4	15.6
12	− 6 2.1	$T_{\overline{m}_\odot}$ 12 h 6.0 min		Starost 24.2 d	Faza ◑		

PLANETE

Pl.	$T_{\overline{m}}$	π	360−α	Vel.	Pl.	$T_{\overline{m}}$	π	360−α	Vel.
	h min	′	°			h min	′	°	
♀	14 58	.2	182	−4.1	♃	3 20	.0	357	−2.6
♂	15 19	.1	176	1.5	♄	15 12	.0	178	1.1

UT	SUNCE $S_\odot$	SUNCE $\delta_\odot$	PROLJ. TAČKA S_Υ	VENERA S_φ	VENERA δ_φ	MARS S_σ	MARS δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	178 30.2	16 47.1	314 25.1	135 38.6	0 12.7	130 19.4	− 1 20.9
2	208 30.3	16 45.7	344 30.1	165 39.0	0 10.2	160 21.5	− 1 22.2
4	238 30.4	16 44.3	14 35.0	195 39.3	0 7.7	190 23.6	− 1 23.5
6	268 30.6	16 42.9	44 39.9	225 39.7	0 5.2	220 25.8	− 1 24.8
8	298 30.7	16 41.6	74 44.8	255 40.0	0 2.8	250 27.9	− 1 26.1
10	328 30.9	16 40.2	104 49.8	285 40.4	0 .3	280 30.0	− 1 27.4
12	358 31.0	16 38.8	134 54.7	315 40.7	− 0 2.2	310 32.1	− 1 28.7
14	28 31.1	16 37.4	164 59.6	345 41.1	− 0 4.6	340 34.2	− 1 29.9
16	58 31.3	16 36.0	195 4.6	15 41.4	− 0 7.1	10 36.3	− 1 31.2
18	88 31.4	16 34.7	225 9.5	45 41.8	− 0 9.6	40 38.4	− 1 32.5
20	118 31.6	16 33.3	255 14.4	75 42.1	− 0 12.0	70 40.5	− 1 33.8
22	148 31.7	16 31.9	285 19.3	105 42.5	− 0 14.5	100 42.6	− 1 35.1
Δ	1	−7		2	−12	11	−6

UT	MJESEC $S_\leftmoon$	MJESEC Δ	MJESEC $\delta_\leftmoon$	MJESEC Δ	JUPITER S_4	JUPITER δ_4	SATURN S_η	SATURN δ_η
h	° ′		° ′		° ′	° ′	° ′	° ′
0	238 22.5	56	24 58.5	3	310 59.9	− 0 6.4	132 18.5	1 29.8
2	267 11.6	55	24 59.1	0	341 5.0	− 0 6.5	162 23.0	1 29.6
4	296 .5	53	24 59.1	−3	11 10.2	− 0 6.6	192 27.5	1 29.4
6	324 49.2	52	24 58.4	−7	41 15.3	− 0 6.7	222 32.0	1 29.2
8	353 37.7	52	24 57.0	−10	71 20.4	− 0 6.8	252 36.5	1 29.0
10	22 26.0	51	24 55.0	−13	101 25.5	− 0 6.9	282 41.0	1 28.8
12	51 14.2	50	24 52.3	−17	131 30.7	− 0 7.1	312 45.5	1 28.6
14	80 2.2	49	24 49.0	−20	161 35.8	− 0 7.2	342 50.0	1 28.4
16	108 50.0	49	24 45.0	−23	191 40.9	− 0 7.3	12 54.5	1 28.2
18	137 37.7	48	24 40.3	−27	221 46.1	− 0 7.4	42 58.9	1 28.0
20	166 25.3	48	24 35.0	−30	251 51.2	− 0 7.5	73 3.4	1 27.8
22	195 12.9	47	24 29.0	−33	281 56.3	− 0 7.6	103 7.9	1 27.6
Δ					26	−1	22	−1

φ	SUNCE IZLAZ	SUNCE ZALAZ	TRAJANJE SUMRAKA GRAĐ.	TRAJANJE SUMRAKA ASTR.	MJESEC IZLAZ	MJESEC Δ/24	MJESEC ZALAZ	MJESEC Δ/24
N	h min	h min	h min	h min	h min	min	h min	min
60	3 52	20 18	0 56	: ::	23 38	3.8	18 19	1.5
55	4 17	19 53	0 44	3 33	.. ..	.0	17 31	1.8
50	4 36	19 35	0 38	2 26	.. ..	.0	16 59	2.0
45	4 51	19 20	0 33	2 1	0 17	2.7	16 35	2.1
40	5 3	19 8	0 30	1 46	0 37	2.6	16 15	2.2
35	5 13	18 58	0 27	1 35	0 53	2.6	15 59	2.2
30	5 22	18 50	0 26	1 28	1 7	2.6	15 45	2.3
20	5 37	18 35	0 23	1 19	1 32	2.6	15 21	2.4
10	5 50	18 21	0 22	1 14	1 53	2.5	15 0	2.5
0	6 2	18 9	0 22	1 12	2 12	2.5	14 41	2.5
10	6 15	17 57	0 22	1 12	2 32	2.5	14 21	2.6
20	6 27	17 45	0 23	1 15	2 53	2.4	14 0	2.6
30	6 42	17 30	0 25	1 22	3 17	2.4	13 36	2.7
35	6 50	17 22	0 27	1 27	3 32	2.4	13 22	2.8
40	6 60	17 13	0 29	1 33	3 48	2.3	13 5	2.8
45	7 11	17 2	0 31	1 41	4 8	2.3	12 46	2.9
50	7 24	16 48	0 35	1 51	4 33	2.2	12 21	3.0
55	7 41	16 32	0 40	2 6	5 7	2.1	11 47	3.1
60	8 3	16 10	0 47	2 26	5 58	1.9	10 56	3.4
S								

SUNCE UT	SUNCE $e = T_p - UT$	SUNCE Δ/24	SUNCE r	MJESEC Prolaz	MJESEC Δ/24	MJESEC $\pi_\leftmoon$	MJESEC r
h	min s	s	′	h min	min	′	′
00	− 5 59.1	.3	15.8	$T_{\overline{m}}$ 8 27	2.5	58.3	15.9
12	− 5 55.8	$T_{\overline{m}_\odot}$ 12 h 5.9 min		Starost 25.2 d	Faza ◑		

PLANETE

Pl.	$T_{\overline{m}}$	π	360−α	Vel.	Pl.	$T_{\overline{m}}$	π	360−α	Vel.
	h min	′	°			h min	′	°	
♀	14 57	.2	181	−4.1	♃	3 15	.0	357	−2.6
♂	15 18	.1	176	1.5	♄	15 8	.0	178	1.1

7. AVGUST 2010. SUBOTA

UT	SUNCE $S_\odot$	SUNCE $\delta_\odot$	PROLJ. TAČKA S_Υ	VENERA S_φ	VENERA δ_φ	MARS S_σ	MARS δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	178 31.8	16 30.5	315 24.3	135 42.8	− 0 17.0	130 44.8	− 1 36.4
2	208 32.0	16 29.1	345 29.2	165 43.2	− 0 19.5	160 46.9	− 1 37.7
4	238 32.1	16 27.7	15 34.1	195 43.6	− 0 21.9	190 49.0	− 1 39.0
6	268 32.3	16 26.3	45 39.1	225 43.9	− 0 24.4	220 51.1	− 1 40.2
8	298 32.4	16 24.9	75 44.0	255 44.3	− 0 26.9	250 53.2	− 1 41.5
10	328 32.6	16 23.5	105 48.9	285 44.7	− 0 29.3	280 55.3	− 1 42.8
12	358 32.7	16 22.1	135 53.8	315 45.1	− 0 31.8	310 57.4	− 1 44.1
14	28 32.9	16 20.7	165 58.8	345 45.4	− 0 34.3	340 59.5	− 1 45.4
16	58 33.0	16 19.3	196 3.7	15 45.8	− 0 36.7	11 1.6	− 1 46.7
18	88 33.2	16 17.9	226 8.6	45 46.2	− 0 39.2	41 3.7	− 1 48.0
20	118 33.3	16 16.5	256 13.6	75 46.6	− 0 41.7	71 5.8	− 1 49.3
22	148 33.5	16 15.1	286 18.5	105 47.0	− 0 44.1	101 7.9	− 1 50.6
Δ	1	−7		2	−12	11	−6

UT	MJESEC $S_\leftmoon$	MJESEC Δ	MJESEC $\delta_\leftmoon$	MJESEC Δ	JUPITER S_4	JUPITER δ_4	SATURN S_η	SATURN δ_η
h	° ′		° ′		° ′	° ′	° ′	° ′
0	224 .3	47	24 22.3	−37	312 1.5	− 0 7.7	133 12.4	1 27.4
2	252 47.7	47	24 14.9	−40	342 6.6	− 0 7.9	163 16.9	1 27.2
4	281 35.0	46	24 6.9	−44	12 11.7	− 0 8.0	193 21.4	1 27.0
6	310 22.3	46	23 58.2	−47	42 16.9	− 0 8.1	223 25.9	1 26.8
8	339 9.5	46	23 48.8	−50	72 22.0	− 0 8.2	253 30.4	1 26.6
10	7 56.8	46	23 38.7	−54	102 27.1	− 0 8.3	283 34.9	1 26.4
12	36 44.0	46	23 28.0	−57	132 32.3	− 0 8.4	313 39.3	1 26.2
14	65 31.3	47	23 16.6	−60	162 37.4	− 0 8.6	343 43.8	1 26.0
16	94 18.6	47	23 4.5	−64	192 42.6	− 0 8.7	13 48.3	1 25.8
18	123 6.0	47	22 51.8	−67	222 47.7	− 0 8.8	43 52.8	1 25.6
20	151 53.4	48	22 38.4	−70	252 52.9	− 0 8.9	73 57.3	1 25.4
22	180 40.9	48	22 24.4	−73	282 58.0	− 0 9.0	104 1.8	1 25.2
Δ					26	−1	22	−1

φ	SUNCE IZLAZ	SUNCE ZALAZ	TRAJANJE SUMRAKA GRAĐ.	TRAJANJE SUMRAKA ASTR.	MJESEC IZLAZ	MJESEC Δ/24	MJESEC ZALAZ	MJESEC Δ/24
N	h min	h min	h min	h min	h min	min	h min	min
60	3 55	20 15	0 56	: ::	.. ..	.0	18 54	.9
55	4 19	19 51	0 44	3 25	0 26	3.4	18 15	1.3
50	4 38	19 33	0 37	2 25	0 57	3.2	17 47	1.6
45	4 52	19 19	0 33	2 0	1 21	3.1	17 25	1.7
40	5 4	19 7	0 30	1 45	1 40	3.0	17 8	1.9
35	5 14	18 57	0 27	1 35	1 56	2.9	16 53	2.0
30	5 23	18 49	0 26	1 28	2 10	2.8	16 40	2.1
20	5 37	18 34	0 23	1 19	2 33	2.7	16 18	2.2
10	5 50	18 21	0 22	1 14	2 53	2.6	15 59	2.4
0	6 2	18 9	0 22	1 12	3 12	2.5	15 41	2.5
10	6 14	17 57	0 22	1 12	3 31	2.4	15 23	2.6
20	6 27	17 45	0 23	1 15	3 52	2.3	15 4	2.8
30	6 41	17 31	0 25	1 22	4 15	2.2	14 41	2.9
35	6 49	17 23	0 26	1 26	4 29	2.1	14 28	3.0
40	6 58	17 14	0 28	1 33	4 44	2.0	14 13	3.1
45	7 9	17 3	0 31	1 40	5 3	1.9	13 55	3.2
50	7 22	16 50	0 35	1 51	5 27	1.8	13 32	3.4
55	7 39	16 34	0 40	2 5	5 58	1.5	13 2	3.7
60	8 1	16 12	0 47	2 26	6 43	1.1	12 17	4.1
S								

SUNCE UT	SUNCE $e = T_p - UT$	SUNCE Δ/24	SUNCE r	MJESEC Prolaz	MJESEC Δ/24	MJESEC $\pi_\leftmoon$	MJESEC r
h	min s	s	′	h min	min	′	′
00	− 5 52.4	.3	15.8	$T_{\overline{m}}$ 9 27	2.5	59.3	16.1
12	− 5 48.8	$T_{\overline{m}_\odot}$ 12 h 5.8 min		Starost 26.2 d	Faza ●		

PLANETE

Pl.	$T_{\overline{m}}$	π	360−α	Vel.	Pl.	$T_{\overline{m}}$	π	360−α	Vel.
	h min	′	°			h min	′	°	
♀	14 57	.2	180	−4.1	♃	3 11	.0	357	−2.6
♂	15 16	.1	175	1.5	♄	15 5	.0	178	1.1

8. AVGUST NEDJELJA

UT	SUNCE $S_\odot$	SUNCE $\delta_\odot$	PROLJ. TAČKA S_Υ	VENERA S_φ	VENERA δ_φ	MARS S_σ	MARS δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	178 33.7	16 13.7	316 23.4	135 47.4	− 0 46.6	131 10.0	− 1 51.8
2	208 33.8	16 12.2	346 28.3	165 47.7	− 0 49.1	161 12.1	− 1 53.1
4	238 34.0	16 10.8	16 33.3	195 48.1	− 0 51.5	191 14.2	− 1 54.4
6	268 34.1	16 9.4	46 38.2	225 48.5	− 0 54.0	221 16.3	− 1 55.7
8	298 34.3	16 8.0	76 43.1	255 48.9	− 0 56.5	251 18.4	− 1 57.0
10	328 34.5	16 6.6	106 48.1	285 49.3	− 0 58.9	281 20.5	− 1 58.3
12	358 34.6	16 5.1	136 53.0	315 49.7	− 1 1.4	311 22.6	− 1 59.6
14	28 34.8	16 3.7	166 57.9	345 50.1	− 1 3.9	341 24.7	− 2 .9
16	58 35.0	16 2.3	197 2.8	15 50.5	− 1 6.3	11 26.8	− 2 2.2
18	88 35.1	16 .9	227 7.8	45 50.9	− 1 8.8	41 28.9	− 2 3.5
20	118 35.3	15 59.4	257 12.7	75 51.3	− 1 11.2	71 31.0	− 2 4.8
22	148 35.5	15 58.0	287 17.6	105 51.7	− 1 13.7	101 33.1	− 2 6.0
Δ	1	−7		2	−12	10	−6

UT	MJESEC $S_\leftmoon$	MJESEC Δ	MJESEC $\delta_\leftmoon$	MJESEC Δ	JUPITER S_4	JUPITER δ_4	SATURN S_η	SATURN δ_η
h	° ′		° ′		° ′	° ′	° ′	° ′
0	209 28.5	48	22 9.7	−77	313 3.2	− 0 9.2	134 6.3	1 25.0
2	238 16.2	49	21 54.4	−80	343 8.3	− 0 9.3	164 10.7	1 24.8
4	267 4.0	50	21 38.4	−83	13 13.5	− 0 9.4	194 15.2	1 24.6
6	295 51.9	50	21 21.8	−86	43 18.6	− 0 9.5	224 19.7	1 24.4
8	324 40.0	51	21 4.6	−89	73 23.8	− 0 9.6	254 24.2	1 24.2
10	353 28.2	52	20 46.8	−92	103 28.9	− 0 9.8	284 28.7	1 24.0
12	22 16.6	53	20 28.4	−95	133 34.1	− 0 9.9	314 33.2	1 23.7
14	51 5.1	53	20 9.4	−98	163 39.2	− 0 10.0	344 37.6	1 23.5
16	79 53.8	54	19 49.8	−101	193 44.4	− 0 10.1	14 42.1	1 23.3
18	108 42.6	55	19 29.7	−104	223 49.6	− 0 10.3	44 46.6	1 23.1
20	137 31.7	56	19 8.9	−106	253 54.7	− 0 10.4	74 51.1	1 22.9
22	166 21.0	57	18 47.7	−109	283 59.9	− 0 10.5	104 55.6	1 22.7
Δ					26	−1	22	−1

φ	SUNCE IZLAZ	SUNCE ZALAZ	TRAJANJE SUMRAKA GRAĐ.	TRAJANJE SUMRAKA ASTR.	MJESEC IZLAZ	MJESEC Δ/24	MJESEC ZALAZ	MJESEC Δ/24
N	h min	h min	h min	h min	h min	min	h min	min
60	3 57	20 13	0 55	: ::	1 9	4.3	19 15	.6
55	4 21	19 49	0 44	3 19	1 48	3.8	18 46	1.0
50	4 39	19 31	0 37	2 23	2 15	3.5	18 24	1.2
45	4 53	19 17	0 33	1 59	2 35	3.3	18 7	1.5
40	5 5	19 6	0 30	1 45	2 52	3.2	17 53	1.6
35	5 15	18 56	0 27	1 35	3 6	3.1	17 41	1.8
30	5 23	18 48	0 25	1 28	3 18	3.0	17 31	1.9
20	5 38	18 33	0 23	1 18	3 38	2.8	17 12	2.1
10	5 50	18 21	0 22	1 13	3 56	2.6	16 56	2.3
0	6 2	18 9	0 22	1 12	4 13	2.5	16 41	2.4
10	6 14	17 58	0 22	1 12	4 30	2.3	16 26	2.6
20	6 26	17 45	0 23	1 15	4 47	2.2	16 10	2.8
30	6 40	17 32	0 25	1 22	5 8	2.0	15 51	3.0
35	6 48	17 24	0 26	1 26	5 20	1.9	15 40	3.1
40	6 57	17 15	0 28	1 32	5 33	1.7	15 27	3.2
45	7 8	17 4	0 31	1 40	5 49	1.6	15 12	3.4
50	7 21	16 51	0 35	1 51	6 9	1.4	14 54	3.6
55	7 37	16 35	0 39	2 5	6 35	1.1	14 29	3.9
60	7 58	16 14	0 46	2 25	7 10	.7	13 56	4.4
S								

SUNCE UT	SUNCE $e = T_p - UT$	SUNCE Δ/24	SUNCE r	MJESEC Prolaz	MJESEC Δ/24	MJESEC $\pi_\leftmoon$	MJESEC r
h	min s	s	′	h min	min	′	′
00	− 5 45.2	.3	15.8	$T_{\overline{m}}$ 10 27	2.5	60.1	16.4
12	− 5 41.2	$T_{\overline{m}_\odot}$ 12 h 5.7 min		Starost 27.2 d	Faza ●		

PLANETE

Pl.	$T_{\overline{m}}$	π	360−α	Vel.	Pl.	$T_{\overline{m}}$	π	360−α	Vel.
	h min	′	°			h min	′	°	
♀	14 57	.2	179	−4.1	♃	3 7	.0	357	−2.6
♂	15 14	.1	175	1.5	♄	15 1	.0	178	1.1

UT	SUNCE $S_\odot$	SUNCE $\delta_\odot$	PROLJ. TAČKA S_Υ	VENERA S_φ	VENERA δ_φ	MARS S_σ	MARS δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	178 35.6	15 56.6	317 22.6	135 52.1	− 1 16.2	131 35.2	− 2 7.3
2	208 35.8	15 55.1	347 27.5	165 52.6	− 1 18.6	161 37.3	− 2 8.6
4	238 36.0	15 53.7	17 32.4	195 53.0	− 1 21.1	191 39.4	− 2 9.9
6	268 36.1	15 52.3	47 37.3	225 53.4	− 1 23.6	221 41.5	− 2 11.2
8	298 36.3	15 50.8	77 42.3	255 53.8	− 1 26.0	251 43.5	− 2 12.5
10	328 36.5	15 49.4	107 47.2	285 54.2	− 1 28.5	281 45.6	− 2 13.8
12	358 36.7	15 47.9	137 52.1	315 54.6	− 1 31.0	311 47.7	− 2 15.1
14	28 36.8	15 46.5	167 57.1	345 55.1	− 1 33.4	341 49.8	− 2 16.4
16	58 37.0	15 45.0	198 2.0	15 55.5	− 1 35.9	11 51.9	− 2 17.7
18	88 37.2	15 43.6	228 6.9	45 55.9	− 1 38.3	41 54.0	− 2 19.0
20	118 37.4	15 42.1	258 11.8	75 56.4	− 1 40.8	71 56.1	− 2 20.2
22	148 37.5	15 40.7	288 16.8	105 56.8	− 1 43.3	101 58.2	− 2 21.5
Δ	1	−7		2	−12	10	−6

UT	MJESEC $S_\leftmoon$	MJESEC Δ	MJESEC $\delta_\leftmoon$	MJESEC Δ	JUPITER S_4	JUPITER δ_4	SATURN S_η	SATURN δ_η
h	° ′		° ′		° ′	° ′	° ′	° ′
0	195 10.4	58	18 25.8	−112	314 5.1	− 0 10.6	135 .0	1 22.5
2	224 .1	59	18 3.5	−114	344 10.2	− 0 10.8	165 4.5	1 22.3
4	252 49.9	60	17 40.6	−117	14 15.4	− 0 10.9	195 9.0	1 22.1
6	281 40.0	61	17 17.3	−119	44 20.6	− 0 11.0	225 13.5	1 21.9
8	310 30.3	63	16 53.4	−122	74 25.7	− 0 11.2	255 18.0	1 21.7
10	339 20.8	64	16 29.1	−124	104 30.9	− 0 11.3	285 22.4	1 21.5
12	8 11.6	65	16 4.3	−126	134 36.1	− 0 11.4	315 26.9	1 21.3
14	37 2.5	66	15 39.0	−128	164 41.2	− 0 11.5	345 31.4	1 21.1
16	65 53.7	67	15 13.3	−131	194 46.4	− 0 11.7	15 35.9	1 20.9
18	94 45.2	68	14 47.2	−133	224 51.6	− 0 11.8	45 40.3	1 20.7
20	123 36.8	69	14 20.7	−135	254 56.8	− 0 11.9	75 44.8	1 20.5
22	152 28.7	71	13 53.8	−136	285 1.9	− 0 12.1	105 49.3	1 20.2
Δ					26	−1	22	−1

φ	SUNCE IZLAZ	SUNCE ZALAZ	TRAJANJE SUMRAKA GRAĐ.	TRAJANJE SUMRAKA ASTR.	MJESEC IZLAZ	MJESEC Δ/24	MJESEC ZALAZ	MJESEC Δ/24
N	h min	h min	h min	h min	h min	min	h min	min
60	3 59	20 10	0 54	: ::	2 52	4.4	19 28	.4
55	4 23	19 47	0 43	3 14	3 20	4.0	19 9	.8
50	4 41	19 30	0 37	2 22	3 40	3.7	18 54	1.0
45	4 54	19 16	0 33	1 59	3 55	3.4	18 42	1.2
40	5 6	19 5	0 29	1 44	4 8	3.3	18 32	1.4
35	5 15	18 55	0 27	1 34	4 19	3.1	18 23	1.6
30	5 24	18 47	0 25	1 27	4 28	3.0	18 16	1.7
20	5 38	18 33	0 23	1 18	4 45	2.7	18 2	1.9
10	5 51	18 20	0 22	1 13	4 59	2.6	17 51	2.1
0	6 2	18 9	0 21	1 11	5 12	2.4	17 40	2.3
10	6 14	17 58	0 22	1 12	5 25	2.2	17 28	2.5
20	6 26	17 46	0 23	1 15	5 39	2.0	17 16	2.7
30	6 39	17 32	0 25	1 21	5 55	1.8	17 2	3.0
35	6 47	17 24	0 26	1 26	6 5	1.7	16 54	3.1
40	6 56	17 15	0 28	1 32	6 15	1.5	16 45	3.2
45	7 6	17 5	0 31	1 40	6 28	1.3	16 34	3.4
50	7 19	16 53	0 34	1 51	6 43	1.1	16 21	3.7
55	7 35	16 37	0 39	2 5	7 1	.8	16 4	4.0
60	7 55	16 16	0 46	2 25	7 27	.4	15 41	4.4
S								

SUNCE UT	SUNCE $e = T_p - UT$	SUNCE Δ/24	SUNCE r	MJESEC Prolaz	MJESEC Δ/24	MJESEC $\pi_\leftmoon$	MJESEC r
h	min s	s	′	h min	min	′	′
00	− 5 37.3	.4	15.8	$T_{\overline{m}}$ 11 26	2.3	60.8	16.6
12	− 5 33.1	$T_{\overline{m}_\odot}$ 12 h 5.6 min		Starost 28.2 d	Faza ●		

PLANETE

Pl.	$T_{\overline{m}}$	π	360−α	Vel.	Pl.	$T_{\overline{m}}$	π	360−α	Vel.
	h min	′	°			h min	′	°	
♀	14 56	.2	178	−4.1	♃	3 3	.0	357	−2.6
♂	15 13	.1	174	1.5	♄	14 58	.0	178	1.1

UT	SUNCE $S_\odot$	SUNCE $\delta_\odot$	PROLJ. TAČKA S_Υ	VENERA S_φ	VENERA δ_φ	MARS S_σ	MARS δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	178 37.7	15 39.2	318 21.7	135 57.2	− 1 45.7	132 .3	− 2 22.8
2	208 37.9	15 37.8	348 26.6	165 57.7	− 1 48.2	162 2.3	− 2 24.1
4	238 38.1	15 36.3	18 31.5	195 58.1	− 1 50.6	192 4.4	− 2 25.4
6	268 38.3	15 34.8	48 36.5	225 58.5	− 1 53.1	222 6.5	− 2 26.7
8	298 38.5	15 33.4	78 41.4	255 59.0	− 1 55.5	252 8.6	− 2 28.0
10	328 38.6	15 31.9	108 46.3	285 59.4	− 1 58.0	282 10.7	− 2 29.3
12	358 38.8	15 30.5	138 51.3	315 59.9	− 2 .5	312 12.8	− 2 30.6
14	28 39.0	15 29.0	168 56.2	346 .3	− 2 2.9	342 14.8	− 2 31.9
16	58 39.2	15 27.5	199 1.1	16 .8	− 2 5.4	12 16.9	− 2 33.2
18	88 39.4	15 26.0	229 6.0	46 1.2	− 2 7.8	42 19.0	− 2 34.5
20	118 39.6	15 24.6	259 11.0	76 1.7	− 2 10.3	72 21.1	− 2 35.8
22	148 39.8	15 23.1	289 15.9	106 2.1	− 2 12.7	102 23.2	− 2 37.0
Δ	1	−7		2	−12	10	−6

UT	MJESEC $S_\leftmoon$	MJESEC Δ	MJESEC $\delta_\leftmoon$	MJESEC Δ	JUPITER S_4	JUPITER δ_4	SATURN S_η	SATURN δ_η
h	° ′		° ′		° ′	° ′	° ′	° ′
0	181 20.8	72	13 26.5	−138	315 7.1	− 0 12.2	135 53.8	1 20.0
2	210 13.2	73	12 58.8	−140	345 12.3	− 0 12.3	165 58.2	1 19.8
4	239 5.8	74	12 30.8	−142	15 17.5	− 0 12.5	196 2.7	1 19.6
6	267 58.6	75	12 2.4	−143	45 22.7	− 0 12.6	226 7.2	1 19.4
8	296 51.6	76	11 33.8	−145	75 27.8	− 0 12.7	256 11.7	1 19.2
10	325 44.8	77	11 4.8	−146	105 33.0	− 0 12.9	286 16.1	1 19.0
12	354 38.3	78	10 35.5	−148	135 38.2	− 0 13.0	316 20.6	1 18.8
14	23 32.0	79	10 6.0	−149	165 43.4	− 0 13.1	346 25.1	1 18.6
16	52 25.9	80	9 36.2	−150	195 48.6	− 0 13.3	16 29.6	1 18.4
18	81 19.9	81	9 6.2	−151	225 53.8	− 0 13.4	46 34.0	1 18.2
20	110 14.2	82	8 35.9	−152	255 59.0	− 0 13.6	76 38.5	1 18.0
22	139 8.7	83	8 5.5	−153	286 4.2	− 0 13.7	106 43.0	1 17.7
Δ					26	−1	22	−1

φ	SUNCE IZLAZ	SUNCE ZALAZ	TRAJANJE SUMRAKA GRAĐ.	TRAJANJE SUMRAKA ASTR.	MJESEC IZLAZ	MJESEC Δ/24	MJESEC ZALAZ	MJESEC Δ/24
N	h min	h min	h min	h min	h min	min	h min	min
60	4 2	20 7	0 54	: ::	4 38	4.3	19 38	.3
55	4 25	19 45	0 43	3 9	4 55	3.9	19 27	.6
50	4 42	19 28	0 37	2 21	5 7	3.6	19 19	.9
45	4 56	19 15	0 32	1 58	5 18	3.4	19 12	1.1
40	5 7	19 4	0 29	1 44	5 26	3.2	19 6	1.3
35	5 16	18 54	0 27	1 34	5 33	3.1	19 1	1.5
30	5 24	18 46	0 25	1 27	5 40	2.9	18 57	1.6
20	5 38	18 32	0 23	1 18	5 51	2.7	18 49	1.8
10	5 51	18 20	0 22	1 13	6 0	2.5	18 42	2.0
0	6 2	18 9	0 21	1 11	6 9	2.3	18 35	2.2
10	6 13	17 58	0 22	1 12	6 18	2.1	18 29	2.4
20	6 25	17 46	0 23	1 15	6 28	1.9	18 21	2.7
30	6 38	17 33	0 25	1 21	6 38	1.6	18 13	2.9
35	6 46	17 25	0 26	1 26	6 45	1.5	18 8	3.0
40	6 55	17 16	0 28	1 32	6 52	1.3	18 3	3.2
45	7 5	17 6	0 31	1 40	6 60	1.2	17 56	3.4
50	7 17	16 54	0 34	1 50	7 9	1.0	17 49	3.6
55	7 33	16 39	0 39	2 4	7 22	.7	17 39	3.9
60	7 53	16 19	0 46	2 24	7 37	.3	17 26	4.3
S								

SUNCE UT	SUNCE $e = T_p - UT$	SUNCE Δ/24	SUNCE r	MJESEC Prolaz	MJESEC Δ/24	MJESEC $\pi_\leftmoon$	MJESEC r
h	min s	s	′	h min	min	′	′
00	− 5 28.9	.4	15.8	$T_{\overline{m}}$ 12 22	2.2	61.2	16.7
12	− 5 24.4	$T_{\overline{m}_\odot}$ 12 h 5.4 min		Starost 29.2 d	Faza ●		

PLANETE

Pl.	$T_{\overline{m}}$	π	360−α	Vel.	Pl.	$T_{\overline{m}}$	π	360−α	Vel.
	h min	′	°			h min	′	°	
♀	14 56	.2	178	−4.1	♃	2 59	.0	357	−2.6
♂	15 11	.1	174	1.5	♄	14 54	.0	178	1.1

UT	SUNCE $S_\odot$	SUNCE $\delta_\odot$	PROLJ. TAČKA S_Υ	VENERA S_φ	VENERA δ_φ	MARS S_σ	MARS δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	178 40.0	15 21.6	319 20.8	136 2.6	− 2 15.2	132 25.3	− 2 38.3
2	208 40.2	15 20.1	349 25.8	166 3.0	− 2 17.7	162 27.3	− 2 39.6
4	238 40.4	15 18.7	19 30.7	196 3.5	− 2 20.1	192 29.4	− 2 40.9
6	268 40.6	15 17.2	49 35.6	226 4.0	− 2 22.6	222 31.5	− 2 42.2
8	298 40.8	15 15.7	79 40.5	256 4.4	− 2 25.0	252 33.6	− 2 43.5
10	328 41.0	15 14.2	109 45.5	286 4.9	− 2 27.5	282 35.6	− 2 44.8
12	358 41.2	15 12.7	139 50.4	316 5.4	− 2 29.9	312 37.7	− 2 46.1
14	28 41.4	15 11.2	169 55.3	346 5.8	− 2 32.4	342 39.8	− 2 47.4
16	58 41.6	15 9.8	200 .3	16 6.3	− 2 34.8	12 41.9	− 2 48.7
18	88 41.8	15 8.3	230 5.2	46 6.8	− 2 37.3	42 43.9	− 2 50.0
20	118 42.0	15 6.8	260 10.1	76 7.3	− 2 39.7	72 46.0	− 2 51.3
22	148 42.2	15 5.3	290 15.0	106 7.8	− 2 42.2	102 48.1	− 2 52.6
Δ	1	−7		2	−12	10	−6

UT	MJESEC $S_\leftmoon$	MJESEC Δ	MJESEC $\delta_\leftmoon$	MJESEC Δ	JUPITER S_4	JUPITER δ_4	SATURN S_η	SATURN δ_η
h	° ′		° ′		° ′	° ′	° ′	° ′
0	168 3.4	84	7 34.8	−154	316 9.3	− 0 13.8	136 47.5	1 17.5
2	196 58.3	85	7 4.0	−155	346 14.5	− 0 14.0	166 51.9	1 17.3
4	225 53.3	86	6 33.0	−156	16 19.7	− 0 14.1	196 56.4	1 17.1
6	254 48.5	87	6 1.8	−156	46 24.9	− 0 14.3	227 .9	1 16.9
8	283 43.9	88	5 30.6	−157	76 30.1	− 0 14.4	257 5.3	1 16.7
10	312 39.5	89	4 59.2	−157	106 35.3	− 0 14.5	287 9.8	1 16.5
12	341 35.2	89	4 27.7	−158	136 40.5	− 0 14.7	317 14.3	1 16.3
14	10 31.1	90	3 56.1	−158	166 45.7	− 0 14.8	347 18.7	1 16.1
16	39 27.1	91	3 24.5	−158	196 50.9	− 0 15.0	17 23.2	1 15.9
18	68 23.2	91	2 52.8	−159	226 56.1	− 0 15.1	47 27.7	1 15.7
20	97 19.5	92	2 21.0	−159	257 1.3	− 0 15.2	77 32.1	1 15.4
22	126 15.9	93	1 49.3	−159	287 6.5	− 0 15.4	107 36.6	1 15.2
Δ					26	−1	22	−1

φ	SUNCE IZLAZ	SUNCE ZALAZ	TRAJANJE SUMRAKA GRAĐ.	TRAJANJE SUMRAKA ASTR.	MJESEC IZLAZ	MJESEC Δ/24	MJESEC ZALAZ	MJESEC Δ/24
N	h min	h min	h min	h min	h min	min	h min	min
60	4 4	20 5	0 53	: ::	6 22	4.2	19 45	.3
55	4 27	19 43	0 43	3 5	6 29	3.9	19 42	.6
50	4 43	19 26	0 37	2 19	6 35	3.6	19 40	.9
45	4 57	19 13	0 32	1 57	6 40	3.4	19 39	1.1
40	5 8	19 2	0 29	1 43	6 44	3.2	19 37	1.2
35	5 17	18 53	0 27	1 34	6 47	3.0	19 36	1.4
30	5 25	18 45	0 25	1 27	6 50	2.9	19 35	1.5
20	5 39	18 32	0 23	1 18	6 55	2.6	19 33	1.8
10	5 51	18 20	0 22	1 13	6 60	2.4	19 31	2.0
0	6 2	18 9	0 21	1 11	7 4	2.2	19 29	2.2
10	6 13	17 58	0 22	1 12	7 8	2.0	19 27	2.4
20	6 24	17 46	0 23	1 15	7 12	1.8	19 25	2.6
30	6 38	17 33	0 25	1 21	7 18	1.6	19 23	2.8
35	6 45	17 26	0 26	1 26	7 21	1.4	19 21	3.0
40	6 54	17 17	0 28	1 32	7 24	1.3	19 20	3.1
45	7 4	17 7	0 31	1 40	7 28	1.1	19 18	3.3
50	7 16	16 56	0 34	1 50	7 32	.9	19 16	3.6
55	7 31	16 41	0 39	2 4	7 38	.6	19 13	3.8
60	7 50	16 21	0 46	2 24	7 45	.3	19 9	4.2
S								

SUNCE UT	SUNCE e = Tp − UT	SUNCE Δ/24	SUNCE r	MJESEC Prolaz	MJESEC Δ/24	MJESEC $\pi_\leftmoon$	MJESEC r
h	min s	s	′	h min	min	′	′
00	− 5 19.9	.4	15.8	$T_{\overline{m}}$ 13 16	2.2	61.3	16.7
12	− 5 15.1	$T_{\overline{m}_\odot}$ 12 h 5.3 min		Starost .9 d	Faza ●		

PLANETE Pl.	$T_{\overline{m}}$	π	360−α	Vel.	Pl.	$T_{\overline{m}}$	π	360−α	Vel.
	h min	′	°			h min	′	°	
♀	14 56	.2	177	−4.2	♃	2 55	.0	357	−2.6
♂	15 9	.1	173	1.5	♄	14 51	.0	177	1.1

UT	SUNCE $S_\odot$	SUNCE $\delta_\odot$	PROLJ. TAČKA S_Υ	VENERA S_φ	VENERA δ_φ	MARS S_σ	MARS δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	178 42.4	15 3.8	320 20.0	136 8.2	− 2 44.6	132 50.2	− 2 53.9
2	208 42.6	15 2.3	350 24.9	166 8.7	− 2 47.1	162 52.2	− 2 55.2
4	238 42.8	15 .8	20 29.8	196 9.2	− 2 49.5	192 54.3	− 2 56.4
6	268 43.0	14 59.3	50 34.8	226 9.7	− 2 52.0	222 56.4	− 2 57.7
8	298 43.2	14 57.8	80 39.7	256 10.2	− 2 54.4	252 58.4	− 2 59.0
10	328 43.4	14 56.3	110 44.6	286 10.7	− 2 56.9	283 .5	− 3 .3
12	358 43.6	14 54.8	140 49.5	316 11.2	− 2 59.3	313 2.6	− 3 1.6
14	28 43.8	14 53.3	170 54.5	346 11.7	− 3 1.7	343 4.6	− 3 2.9
16	58 44.0	14 51.8	200 59.4	16 12.2	− 3 4.2	13 6.7	− 3 4.2
18	88 44.3	14 50.2	231 4.3	46 12.7	− 3 6.6	43 8.8	− 3 5.5
20	118 44.5	14 48.7	261 9.3	76 13.2	− 3 9.1	73 10.8	− 3 6.8
22	148 44.7	14 47.2	291 14.2	106 13.7	− 3 11.5	103 12.9	− 3 8.1
Δ	1	−8		2	−12	10	−6

UT	MJESEC $S_\leftmoon$	MJESEC Δ	MJESEC $\delta_\leftmoon$	MJESEC Δ	JUPITER S_4	JUPITER δ_4	SATURN S_η	SATURN δ_η
h	° ′		° ′		° ′	° ′	° ′	° ′
0	155 12.4	93	1 17.5	−159	317 11.7	− 0 15.5	137 41.1	1 15.0
2	184 9.0	94	0 45.8	−159	347 17.0	− 0 15.7	167 45.6	1 14.8
4	213 5.7	94	0 14.0	−158	17 22.2	− 0 15.8	197 50.0	1 14.6
6	242 2.5	94 − 0	17.6	−158	47 27.4	− 0 16.0	227 54.5	1 14.4
8	270 59.4	95 − 0	49.3	−158	77 32.6	− 0 16.1	257 58.9	1 14.2
10	299 56.4	95 − 1	20.9	−157	107 37.8	− 0 16.3	288 3.4	1 14.0
12	328 53.4	96 − 1	52.4	−157	137 43.0	− 0 16.4	318 7.9	1 13.8
14	357 50.5	96 − 2	23.8	−156	167 48.2	− 0 16.6	348 12.3	1 13.5
16	26 47.7	96 − 2	55.1	−156	197 53.4	− 0 16.7	18 16.8	1 13.3
18	55 44.9	96 − 3	26.2	−155	227 58.7	− 0 16.9	48 21.3	1 13.1
20	84 42.1	96 − 3	57.3	−154	258 3.9	− 0 17.0	78 25.7	1 12.9
22	113 39.4	97 − 4	28.2	−154	288 9.1	− 0 17.2	108 30.2	1 12.7
Δ					26	−1	22	−1

φ	SUNCE IZLAZ	SUNCE ZALAZ	TRAJANJE SUMRAKA GRAĐ.	TRAJANJE SUMRAKA ASTR.	MJESEC IZLAZ	MJESEC Δ/24	MJESEC ZALAZ	MJESEC Δ/24
N	h min	h min	h min	h min	h min	min	h min	min
60	4 7	20 2	0 53	: ::	8 4	4.2	19 52	.3
55	4 29	19 40	0 43	3 1	8 2	3.8	19 57	.6
50	4 45	19 24	0 36	2 18	8 1	3.5	20 1	.9
45	4 58	19 11	0 32	1 56	8 0	3.3	20 4	1.1
40	5 9	19 1	0 29	1 43	7 60	3.1	20 7	1.3
35	5 18	18 52	0 27	1 33	7 59	3.0	20 9	1.4
30	5 26	18 44	0 25	1 27	7 59	2.8	20 11	1.5
20	5 39	18 31	0 23	1 18	7 58	2.6	20 15	1.8
10	5 51	18 19	0 22	1 13	7 57	2.4	20 18	2.0
0	6 2	18 8	0 21	1 11	7 57	2.2	20 21	2.2
10	6 12	17 58	0 22	1 12	7 56	2.0	20 24	2.4
20	6 24	17 47	0 23	1 15	7 55	1.8	20 27	2.6
30	6 37	17 34	0 25	1 21	7 55	1.5	20 31	2.8
35	6 44	17 27	0 26	1 26	7 54	1.4	20 33	2.9
40	6 52	17 18	0 28	1 32	7 54	1.2	20 35	3.1
45	7 2	17 9	0 31	1 40	7 54	1.1	20 38	3.3
50	7 14	16 57	0 34	1 50	7 53	.9	20 41	3.5
55	7 28	16 42	0 39	2 4	7 53	.6	20 45	3.8
60	7 48	16 23	0 45	2 23	7 52	.3	20 50	4.1
S								

SUNCE UT	SUNCE e = Tp − UT	SUNCE Δ/24	SUNCE r	MJESEC Prolaz	MJESEC Δ/24	MJESEC $\pi_\leftmoon$	MJESEC r
h	min s	s	′	h min	min	′	′
00	− 5 10.3	.4	15.8	$T_{\overline{m}}$ 14 9	2.2	61.0	16.6
12	− 5 5.3	$T_{\overline{m}_\odot}$ 12 h 5.1 min		Starost 1.9 d	Faza ●		

PLANETE Pl.	$T_{\overline{m}}$	π	360−α	Vel.	Pl.	$T_{\overline{m}}$	π	360−α	Vel.
	h min	′	°			h min	′	°	
♀	14 55	.2	176	−4.2	♃	2 51	.0	357	−2.6
♂	15 8	.1	172	1.5	♄	14 47	.0	177	1.1

UT	SUNCE $S_\odot$	SUNCE $\delta_\odot$	PROLJ. TAČKA S_Υ	VENERA S_φ	VENERA δ_φ	MARS S_σ	MARS δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	178 44.9	14 45.7	321 19.1	136 14.2	− 3 14.0	133 15.0	− 3 9.4
2	208 45.1	14 44.2	351 24.0	166 14.7	− 3 16.4	163 17.0	− 3 10.7
4	238 45.3	14 42.7	21 29.0	196 15.2	− 3 18.8	193 19.1	− 3 12.0
6	268 45.6	14 41.1	51 33.9	226 15.7	− 3 21.3	223 21.2	− 3 13.3
8	298 45.8	14 39.6	81 38.8	256 16.2	− 3 23.7	253 23.2	− 3 14.6
10	328 46.0	14 38.1	111 43.7	286 16.7	− 3 26.2	283 25.3	− 3 15.9
12	358 46.2	14 36.6	141 48.7	316 17.3	− 3 28.6	313 27.4	− 3 17.2
14	28 46.4	14 35.0	171 53.6	346 17.8	− 3 31.0	343 29.4	− 3 18.4
16	58 46.7	14 33.5	201 58.5	16 18.3	− 3 33.5	13 31.5	− 3 19.7
18	88 46.9	14 32.0	232 3.5	46 18.8	− 3 35.9	43 33.5	− 3 21.0
20	118 47.1	14 30.5	262 8.4	76 19.4	− 3 38.4	73 35.6	− 3 22.3
22	148 47.4	14 28.9	292 13.3	106 19.9	− 3 40.8	103 37.6	− 3 23.6
Δ	1	−8		3	−12	10	−6

UT	MJESEC $S_\leftmoon$	MJESEC Δ	MJESEC $\delta_\leftmoon$	MJESEC Δ	JUPITER S_4	JUPITER δ_4	SATURN S_η	SATURN δ_η
h	° ′		° ′		° ′	° ′	° ′	° ′
0	142 36.7	97	− 4 58.9	−153	318 14.3	− 0 17.3	138 34.7	1 12.5
2	171 34.1	97	− 5 29.5	−152	348 19.5	− 0 17.5	168 39.1	1 12.3
4	200 31.4	97	− 5 59.9	−151	18 24.8	− 0 17.6	198 43.6	1 12.1
6	229 28.8	97	− 6 30.0	−150	48 30.0	− 0 17.8	228 48.1	1 11.9
8	258 26.2	97	− 7 .0	−149	78 35.2	− 0 17.9	258 52.5	1 11.6
10	287 23.5	97	− 7 29.8	−148	108 40.4	− 0 18.1	288 57.0	1 11.4
12	316 20.9	97	− 7 59.3	−146	138 45.7	− 0 18.2	319 1.4	1 11.2
14	345 18.2	97	− 8 28.5	−145	168 50.9	− 0 18.4	349 5.9	1 11.0
16	14 15.5	96	− 8 57.5	−144	198 56.1	− 0 18.5	19 10.4	1 10.8
18	43 12.8	96	− 9 26.3	−142	229 1.3	− 0 18.7	49 14.8	1 10.6
20	72 10.0	96	− 9 54.7	−141	259 6.6	− 0 18.8	79 19.3	1 10.4
22	101 7.2	96	−10 22.9	−139	289 11.8	− 0 19.0	109 23.7	1 10.2
Δ					26	−1	22	−1

φ	SUNCE IZLAZ	SUNCE ZALAZ	TRAJANJE SUMRAKA GRAĐ.	TRAJANJE SUMRAKA ASTR.	MJESEC IZLAZ	MJESEC Δ/24	MJESEC ZALAZ	MJESEC Δ/24
N	h min	h min	h min	h min	h min	min	h min	min
60	4 9	19 59	0 52	: ::	9 44	4.1	19 59	.4
55	4 30	19 38	0 42	2 57	9 33	3.7	20 12	.7
50	4 46	19 22	0 36	2 17	9 26	3.5	20 22	1.0
45	4 59	19 10	0 32	1 56	9 20	3.2	20 31	1.2
40	5 9	18 60	0 29	1 42	9 14	3.1	20 37	1.4
35	5 18	18 51	0 27	1 33	9 10	2.9	20 43	1.5
30	5 26	18 43	0 25	1 26	9 6	2.8	20 49	1.6
20	5 39	18 30	0 23	1 18	8 60	2.5	20 58	1.8
10	5 51	18 19	0 22	1 13	8 54	2.4	21 6	2.0
0	6 2	18 8	0 21	1 11	8 49	2.2	21 13	2.2
10	6 12	17 58	0 22	1 12	8 43	2.0	21 21	2.4
20	6 23	17 47	0 23	1 15	8 38	1.8	21 29	2.5
30	6 36	17 34	0 25	1 21	8 32	1.6	21 38	2.8
35	6 43	17 27	0 26	1 26	8 28	1.4	21 43	2.9
40	6 51	17 19	0 28	1 32	8 24	1.3	21 49	3.0
45	7 1	17 10	0 31	1 39	8 19	1.1	21 56	3.2
50	7 12	16 58	0 34	1 50	8 14	.9	22 5	3.4
55	7 26	16 44	0 39	2 4	8 7	.7	22 16	3.7
60	7 45	16 26	0 45	2 23	7 59	.3	22 29	4.1
S								

SUNCE UT	SUNCE $e = T_p - UT$	SUNCE Δ/24	SUNCE r	MJESEC Prolaz	MJESEC Δ/24	MJESEC $\pi_\leftmoon$	MJESEC r
h	min s	s	′	h min	min	′	′
00	− 5 .2	.4	15.8	$T_{\overline{m}}$ 15 1	2.2	60.5	16.5
12	− 4 54.8	$T_{\overline{m}_\odot}$ 12 h 4.9 min		Starost 2.9 d	Faza ●		

PLANETE

Pl.	$T_{\overline{m}}$	π	360−α	Vel.	Pl.	$T_{\overline{m}}$	π	360−α	Vel.
	h min	′	°			h min	′	°	
♀	14 55	.2	175	−4.2	♃	2 47	.0	357	−2.6
♂	15 6	.1	172	1.5	♄	14 43	.0	177	1.1

UT	SUNCE $S_\odot$	SUNCE $\delta_\odot$	PROLJ. TAČKA S_Υ	VENERA S_φ	VENERA δ_φ	MARS S_σ	MARS δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	178 47.6	14 27.4	322 18.2	136 20.4	− 3 43.2	133 39.7	− 3 24.9
2	208 47.8	14 25.9	352 23.2	166 21.0	− 3 45.7	163 41.8	− 3 26.2
4	238 48.0	14 24.3	22 28.1	196 21.5	− 3 48.1	193 43.8	− 3 27.5
6	268 48.3	14 22.8	52 33.0	226 22.0	− 3 50.5	223 45.9	− 3 28.8
8	298 48.5	14 21.2	82 38.0	256 22.6	− 3 53.0	253 47.9	− 3 30.1
10	328 48.7	14 19.7	112 42.9	286 23.1	− 3 55.4	283 50.0	− 3 31.4
12	358 49.0	14 18.1	142 47.8	316 23.7	− 3 57.8	313 52.0	− 3 32.7
14	28 49.2	14 16.6	172 52.7	346 24.2	− 4 .2	343 54.1	− 3 34.0
16	58 49.4	14 15.1	202 57.7	16 24.8	− 4 2.7	13 56.1	− 3 35.3
18	88 49.7	14 13.5	233 2.6	46 25.3	− 4 5.1	43 58.2	− 3 36.6
20	118 49.9	14 12.0	263 7.5	76 25.9	− 4 7.5	74 .2	− 3 37.9
22	148 50.2	14 10.4	293 12.5	106 26.4	− 4 10.0	104 2.3	− 3 39.2
Δ	1	−8		3	−12	10	−6

UT	MJESEC $S_\leftmoon$	MJESEC Δ	MJESEC $\delta_\leftmoon$	MJESEC Δ	JUPITER S_4	JUPITER δ_4	SATURN S_η	SATURN δ_η
h	° ′		° ′		° ′	° ′	° ′	° ′
0	130 4.4	96	−10 50.7	−138	319 17.0	− 0 19.2	139 28.2	1 9.9
2	159 1.5	95	−11 18.3	−136	349 22.3	− 0 19.3	169 32.7	1 9.7
4	187 58.5	95	−11 45.5	−134	19 27.5	− 0 19.5	199 37.1	1 9.5
6	216 55.5	95	−12 12.4	−133	49 32.8	− 0 19.6	229 41.6	1 9.3
8	245 52.5	94	−12 39.0	−131	79 38.0	− 0 19.8	259 46.0	1 9.1
10	274 49.3	94	−13 5.2	−129	109 43.2	− 0 19.9	289 50.5	1 8.9
12	303 46.1	94	−13 31.0	−127	139 48.5	− 0 20.1	319 54.9	1 8.7
14	332 42.8	93	−13 56.5	−125	169 53.7	− 0 20.3	349 59.4	1 8.4
16	1 39.4	93	−14 21.5	−123	199 59.0	− 0 20.4	20 3.9	1 8.2
18	30 36.0	92	−14 46.2	−121	230 4.2	− 0 20.6	50 8.3	1 8.0
20	59 32.5	92	−15 10.5	−119	260 9.5	− 0 20.7	80 12.8	1 7.8
22	88 28.8	91	−15 34.4	−117	290 14.7	− 0 20.9	110 17.2	1 7.6
Δ					26	−1	22	−1

φ	SUNCE IZLAZ	SUNCE ZALAZ	TRAJANJE SUMRAKA GRAĐ.	TRAJANJE SUMRAKA ASTR.	MJESEC IZLAZ	MJESEC Δ/24	MJESEC ZALAZ	MJESEC Δ/24
N	h min	h min	h min	h min	h min	min	h min	min
60	4 11	19 56	0 52	: ::	11 22	4.1	20 8	.5
55	4 32	19 36	0 42	2 54	11 3	3.6	20 30	.9
50	4 48	19 21	0 36	2 15	10 49	3.4	20 46	1.2
45	5 0	19 8	0 32	1 55	10 37	3.2	20 59	1.4
40	5 10	18 58	0 29	1 42	10 28	3.0	21 10	1.5
35	5 19	18 50	0 27	1 33	10 20	2.9	21 19	1.6
30	5 27	18 42	0 25	1 26	10 13	2.7	21 27	1.7
20	5 40	18 30	0 23	1 17	10 1	2.5	21 42	1.9
10	5 51	18 18	0 22	1 13	9 50	2.4	21 54	2.1
0	6 1	18 8	0 21	1 11	9 41	2.2	22 6	2.2
10	6 12	17 58	0 22	1 12	9 31	2.0	22 17	2.4
20	6 23	17 47	0 23	1 15	9 21	1.9	22 30	2.5
30	6 35	17 35	0 25	1 21	9 9	1.7	22 44	2.7
35	6 42	17 28	0 26	1 26	9 3	1.6	22 53	2.8
40	6 50	17 20	0 28	1 32	8 55	1.4	23 2	2.9
45	6 59	17 11	0 31	1 39	8 47	1.3	23 13	3.1
50	7 10	16 60	0 34	1 50	8 36	1.1	23 27	3.3
55	7 24	16 46	0 38	2 3	8 23	.8	23 44	3.6
60	7 42	16 28	0 45	2 23	8 7	.4	. . .	.0
S								

SUNCE UT	SUNCE $e = T_p - UT$	SUNCE Δ/24	SUNCE r	MJESEC Prolaz	MJESEC Δ/24	MJESEC $\pi_\leftmoon$	MJESEC r
h	min s	s	′	h min	min	′	′
00	− 4 49.5	.5	15.8	$T_{\overline{m}}$ 15 53	2.2	59.8	16.3
12	− 4 43.8	$T_{\overline{m}_\odot}$ 12 h 4.7 min		Starost 3.9 d	Faza ●		

PLANETE

Pl.	$T_{\overline{m}}$	π	360−α	Vel.	Pl.	$T_{\overline{m}}$	π	360−α	Vel.
	h min	′	°			h min	′	°	
♀	14 54	.2	174	−4.2	♃	2 42	.0	357	−2.6
♂	15 4	.1	171	1.5	♄	14 40	.0	177	1.1

UT	SUNCE		PROLJ. TAČKA	VENERA		MARS	
	$S_\odot$	$\delta_\odot$	S_Υ	S_φ	δ_φ	S_σ	δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	178 50.4	14 8.8	323 17.4	136 27.0	− 4 12.4	134 4.3	− 3 40.5
2	208 50.6	14 7.3	353 22.3	166 27.5	− 4 14.8	164 6.4	− 3 41.8
4	238 50.9	14 5.7	23 27.2	196 28.1	− 4 17.2	194 8.4	− 3 43.0
6	268 51.1	14 4.2	53 32.2	226 28.6	− 4 19.7	224 10.5	− 3 44.3
8	298 51.4	14 2.6	83 37.1	256 29.2	− 4 22.1	254 12.5	− 3 45.6
10	328 51.6	14 1.1	113 42.0	286 29.8	− 4 24.5	284 14.6	− 3 46.9
12	358 51.9	13 59.5	143 47.0	316 30.3	− 4 26.9	314 16.6	− 3 48.2
14	28 52.1	13 57.9	173 51.9	346 30.9	− 4 29.4	344 18.7	− 3 49.5
16	58 52.4	13 56.4	203 56.8	16 31.5	− 4 31.8	14 20.7	− 3 50.8
18	88 52.6	13 54.8	234 1.7	46 32.1	− 4 34.2	44 22.8	− 3 52.1
20	118 52.9	13 53.2	264 6.7	76 32.6	− 4 36.6	74 24.8	− 3 53.4
22	148 53.1	13 51.7	294 11.6	106 33.2	− 4 39.0	104 26.8	− 3 54.7
Δ	1	−8		3	−12	10	−6

UT	MJESEC				JUPITER		SATURN	
	$S_\leftmoon$	Δ	$\delta_\leftmoon$	Δ	S_4	δ_4	S_η	δ_η
h	° ′		° ′		° ′	° ′	° ′	° ′
0	117 25.1	91	−15 57.9	−115	320 19.9	− 0 21.1	140 21.7	1 7.4
2	146 21.3	91	−16 20.9	−113	350 25.2	− 0 21.2	170 26.1	1 7.2
4	175 17.4	90	−16 43.6	−111	20 30.4	− 0 21.4	200 30.6	1 6.9
6	204 13.5	90	−17 5.7	−109	50 35.7	− 0 21.5	230 35.1	1 6.7
8	233 9.4	89	−17 27.5	−106	80 40.9	− 0 21.7	260 39.5	1 6.5
10	262 5.2	89	−17 48.8	−104	110 46.2	− 0 21.9	290 44.0	1 6.3
12	291 .9	88	−18 9.6	−102	140 51.5	− 0 22.0	320 48.4	1 6.1
14	319 56.6	88	−18 29.9	−99	170 56.7	− 0 22.2	350 52.9	1 5.9
16	348 52.1	87	−18 49.8	−97	201 2.0	− 0 22.4	20 57.3	1 5.7
18	17 47.6	87	−19 9.2	−95	231 7.2	− 0 22.5	51 1.8	1 5.4
20	46 42.9	86	−19 28.2	−92	261 12.5	− 0 22.7	81 6.2	1 5.2
22	75 38.2	86	−19 46.6	−90	291 17.7	− 0 22.9	111 10.7	1 5.0
Δ					26	−1	22	−1

φ	SUNCE		TRAJANJE SUMRAKA		MJESEC			
	IZLAZ	ZALAZ	GRAĐ.	ASTR.	IZLAZ	Δ/24	ZALAZ	Δ/24
N	h min	h min	h min	h min	h min	min	h min	min
60	4 14	19 54	0 51	: ::	12 60	3.9	20 20	.8
55	4 34	19 34	0 42	2 51	12 31	3.5	20 51	1.2
50	4 49	19 19	0 36	2 14	12 10	3.2	21 14	1.4
45	5 1	19 7	0 32	1 54	11 53	3.0	21 31	1.6
40	5 11	18 57	0 29	1 42	11 40	2.9	21 46	1.7
35	5 20	18 49	0 27	1 32	11 28	2.8	21 58	1.8
30	5 27	18 41	0 25	1 26	11 19	2.7	22 9	1.9
20	5 40	18 29	0 23	1 17	11 2	2.5	22 28	2.0
10	5 51	18 18	0 22	1 13	10 47	2.4	22 44	2.2
0	6 1	18 8	0 21	1 11	10 33	2.2	22 59	2.3
10	6 11	17 58	0 22	1 11	10 20	2.1	23 14	2.4
20	6 22	17 47	0 23	1 15	10 6	2.0	23 30	2.5
30	6 34	17 36	0 25	1 21	9 49	1.8	23 49	2.6
35	6 41	17 29	0 26	1 25	9 40	1.7	. . .	.0
40	6 49	17 21	0 28	1 31	9 29	1.6	. . .	.0
45	6 58	17 12	0 30	1 39	9 17	1.5	. . .	.0
50	7 8	17 1	0 34	1 49	9 2	1.3	. . .	.0
55	7 22	16 48	0 38	2 3	8 43	1.0	. . .	.0
60	7 40	16 30	0 45	2 22	8 17	.6	0 9	4.0
S								

SUNCE				MJESEC			
UT	$e = T_p - UT$	Δ/24	r	Prolaz	Δ/24	$\pi_\leftmoon$	r
h	min s	s	′	h min	min	′	′
00	− 4 38.2	.5	15.8	$T_{\overline{m}}$ 16 46	2.2	58.9	16.1
12	− 4 32.3	$T_{\overline{m}_\odot}$ 12 h	4.5 min	Starost 4.9 d	Faza ◐		

PLANETE

Pl.	$T_{\overline{m}}$	π	360−α	Vel.	Pl.	$T_{\overline{m}}$	π	360−α	Vel.
	h min	′	°			h min	′	°	
♀	14 54	.2	173	−4.2	♃	2 38	.0	357	−2.6
♂	15 3	.1	171	1.5	♄	14 36	.0	177	1.1

UT	SUNCE		PROLJ. TAČKA	VENERA		MARS	
	$S_\odot$	$\delta_\odot$	S_Υ	S_φ	δ_φ	S_σ	δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	178 53.4	13 50.1	324 16.5	136 33.8	− 4 41.4	134 28.9	− 3 56.0
2	208 53.6	13 48.5	354 21.5	166 34.4	− 4 43.9	164 30.9	− 3 57.3
4	238 53.9	13 46.9	24 26.4	196 35.0	− 4 46.3	194 33.0	− 3 58.6
6	268 54.1	13 45.4	54 31.3	226 35.6	− 4 48.7	224 35.0	− 3 59.9
8	298 54.4	13 43.8	84 36.2	256 36.2	− 4 51.1	254 37.0	− 4 1.2
10	328 54.6	13 42.2	114 41.2	286 36.8	− 4 53.5	284 39.1	− 4 2.5
12	358 54.9	13 40.6	144 46.1	316 37.4	− 4 55.9	314 41.1	− 4 3.8
14	28 55.1	13 39.0	174 51.0	346 37.9	− 4 58.3	344 43.2	− 4 5.1
16	58 55.4	13 37.4	204 56.0	16 38.5	− 5 .7	14 45.2	− 4 6.4
18	88 55.7	13 35.9	235 .9	46 39.2	− 5 3.2	44 47.2	− 4 7.7
20	118 55.9	13 34.3	265 5.8	76 39.8	− 5 5.6	74 49.3	− 4 9.0
22	148 56.2	13 32.7	295 10.7	106 40.4	− 5 8.0	104 51.3	− 4 10.2
Δ	1	−8		3	−12	10	−6

UT	MJESEC				JUPITER		SATURN	
	$S_\leftmoon$	Δ	$\delta_\leftmoon$	Δ	S_4	δ_4	S_η	δ_η
h	° ′		° ′		° ′	° ′	° ′	° ′
0	104 33.4	86	−20 4.5	−87	321 23.0	− 0 23.0	141 15.1	1 4.8
2	133 28.5	85	−20 21.9	−85	351 28.3	− 0 23.2	171 19.6	1 4.6
4	162 23.5	85	−20 38.9	−82	21 33.5	− 0 23.4	201 24.0	1 4.4
6	191 18.5	84	−20 55.3	−80	51 38.8	− 0 23.5	231 28.5	1 4.1
8	220 13.3	84	−21 11.2	−77	81 44.1	− 0 23.7	261 32.9	1 3.9
10	249 8.1	84	−21 26.6	−74	111 49.3	− 0 23.9	291 37.4	1 3.7
12	278 2.8	83	−21 41.4	−72	141 54.6	− 0 24.0	321 41.8	1 3.5
14	306 57.5	83	−21 55.7	−69	171 59.9	− 0 24.2	351 46.3	1 3.3
16	335 52.1	83	−22 9.5	−66	202 5.1	− 0 24.4	21 50.7	1 3.1
18	4 46.6	82	−22 22.8	−64	232 10.4	− 0 24.6	51 55.2	1 2.8
20	33 41.1	82	−22 35.5	−61	262 15.7	− 0 24.7	81 59.6	1 2.6
22	62 35.6	82	−22 47.7	−58	292 20.9	− 0 24.9	112 4.1	1 2.4
Δ					26	−1	22	−1

φ	SUNCE		TRAJANJE SUMRAKA		MJESEC			
	IZLAZ	ZALAZ	GRAĐ.	ASTR.	IZLAZ	Δ/24	ZALAZ	Δ/24
N	h min	h min	h min	h min	h min	min	h min	min
60	4 16	19 51	0 51	: ::	14 32	3.4	20 39	1.3
55	4 36	19 31	0 41	2 48	13 53	3.1	21 20	1.6
50	4 51	19 17	0 36	2 13	13 26	2.9	21 48	1.8
45	5 3	19 5	0 32	1 54	13 6	2.8	22 10	1.9
40	5 12	18 56	0 29	1 41	12 49	2.7	22 27	2.0
35	5 21	18 48	0 27	1 32	12 35	2.6	22 42	2.0
30	5 28	18 40	0 25	1 26	12 23	2.5	22 54	2.1
20	5 40	18 28	0 23	1 17	12 2	2.4	23 16	2.1
10	5 51	18 18	0 22	1 12	11 44	2.4	23 35	2.2
0	6 1	18 8	0 21	1 11	11 27	2.3	23 53	2.3
10	6 11	17 58	0 22	1 11	11 11	2.2	. . .	.0
20	6 21	17 48	0 23	1 15	10 53	2.1	. . .	.0
30	6 33	17 36	0 25	1 21	10 33	2.0	. . .	.0
35	6 40	17 30	0 26	1 25	10 21	1.9	0 0	2.7
40	6 47	17 22	0 28	1 31	10 8	1.8	0 13	2.8
45	6 56	17 13	0 30	1 39	9 52	1.7	0 28	2.9
50	7 7	17 3	0 34	1 49	9 32	1.6	0 47	3.1
55	7 20	16 50	0 38	2 3	9 7	1.4	1 10	3.3
60	7 37	16 33	0 45	2 22	8 33	1.0	1 44	3.7
S								

SUNCE				MJESEC			
UT	$e = T_p - UT$	Δ/24	r	Prolaz	Δ/24	$\pi_\leftmoon$	r
h	min s	s	′	h min	min	′	′
00	− 4 26.4	.5	15.8	$T_{\overline{m}}$ 17 40	2.3	58.1	15.8
12	− 4 20.2	$T_{\overline{m}_\odot}$ 12 h	4.3 min	Starost 5.9 d	Faza ◐		

PLANETE

Pl.	$T_{\overline{m}}$	π	360−α	Vel.	Pl.	$T_{\overline{m}}$	π	360−α	Vel.
	h min	′	°			h min	′	°	
♀	14 53	.2	172	−4.2	♃	2 34	.0	357	−2.7
♂	15 1	.1	170	1.5	♄	14 33	.0	177	1.1

UT	SUNCE $S_\odot$	SUNCE $\delta_\odot$	PROLJ. TAČKA S_Υ	VENERA S_φ	VENERA δ_φ	MARS S_σ	MARS δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	178 56.4	13 31.1	325 15.7	136 41.0	− 5 10.4	134 53.3	− 4 11.5
2	208 56.7	13 29.5	355 20.6	166 41.6	− 5 12.8	164 55.4	− 4 12.8
4	238 57.0	13 27.9	25 25.5	196 42.2	− 5 15.2	194 57.4	− 4 14.1
6	268 57.2	13 26.3	55 30.4	226 42.8	− 5 17.6	224 59.4	− 4 15.4
8	298 57.5	13 24.7	85 35.4	256 43.4	− 5 20.0	255 1.5	− 4 16.7
10	328 57.8	13 23.1	115 40.3	286 44.0	− 5 22.4	285 3.5	− 4 18.0
12	358 58.0	13 21.5	145 45.2	316 44.7	− 5 24.8	315 5.5	− 4 19.3
14	28 58.3	13 19.9	175 50.2	346 45.3	− 5 27.2	345 7.6	− 4 20.6
16	58 58.6	13 18.3	205 55.1	16 45.9	− 5 29.6	15 9.6	− 4 21.9
18	88 58.9	13 16.7	236 .0	46 46.5	− 5 32.0	45 11.6	− 4 23.2
20	118 59.1	13 15.1	266 4.9	76 47.2	− 5 34.4	75 13.6	− 4 24.5
22	148 59.4	13 13.5	296 9.9	106 47.8	− 5 36.8	105 15.7	− 4 25.8
Δ	1	−8		3	−12	10	−6

UT	MJESEC $S_\leftmoon$	MJESEC Δ	MJESEC $\delta_\leftmoon$	MJESEC Δ	JUPITER $S_\jupiter$	JUPITER $\delta_\jupiter$	SATURN $S_\saturn$	SATURN $\delta_\saturn$
h	° ′		° ′		° ′	° ′	° ′	° ′
0	91 30.0	82	−22 59.3	−55	322 26.2	− 0 25.1	142 8.5	1 2.2
2	120 24.4	82	−23 10.4	−53	352 31.5	− 0 25.2	172 13.0	1 2.0
4	149 18.8	82	−23 20.9	−50	22 36.8	− 0 25.4	202 17.4	1 1.8
6	178 13.1	82	−23 30.9	−47	52 42.1	− 0 25.6	232 21.9	1 1.5
8	207 7.4	82	−23 40.3	−44	82 47.3	− 0 25.8	262 26.3	1 1.3
10	236 1.8	82	−23 49.2	−42	112 52.6	− 0 25.9	292 30.8	1 1.1
12	264 56.1	82	−23 57.5	−39	142 57.9	− 0 26.1	322 35.2	1 .9
14	293 50.4	82	−24 5.3	−36	173 3.2	− 0 26.3	352 39.7	1 .7
16	322 44.8	82	−24 12.5	−33	203 8.5	− 0 26.5	22 44.1	1 .4
18	351 39.2	82	−24 19.1	−31	233 13.7	− 0 26.6	52 48.5	1 .2
20	20 33.6	82	−24 25.2	−28	263 19.0	− 0 26.8	82 53.0	1 .0
22	49 28.0	83	−24 30.8	−25	293 24.3	− 0 27.0	112 57.4	0 59.8
Δ					26	−1	22	−1

φ	SUNCE IZLAZ	SUNCE ZALAZ	TRAJANJE SUMRAKA GRAĐ.	TRAJANJE SUMRAKA ASTR.	MJESEC IZLAZ	MJESEC Δ/24	MJESEC ZALAZ	MJESEC Δ/24
N	h min	h min	h min	h min	h min	min	h min	min
60	4 19	19 48	0 50	: ::	15 55	2.7	21 10	2.0
55	4 38	19 29	0 41	2 46	15 8	2.6	21 58	2.1
50	4 52	19 15	0 36	2 12	14 36	2.5	22 30	2.1
45	5 4	19 4	0 32	1 53	14 12	2.5	22 54	2.2
40	5 13	18 54	0 29	1 41	13 53	2.4	23 14	2.2
35	5 21	18 46	0 27	1 32	13 37	2.4	23 30	2.2
30	5 28	18 39	0 25	1 25	13 24	2.4	23 44	2.2
20	5 41	18 27	0 23	1 17	13 0	2.3	. . .	.0
10	5 51	18 17	0 22	1 12	12 40	2.3	. . .	.0
0	6 1	18 8	0 21	1 11	12 22	2.3	. . .	.0
10	6 10	17 58	0 22	1 11	12 3	2.2	0 11	2.3
20	6 20	17 48	0 23	1 14	11 43	2.2	0 30	2.4
30	6 32	17 37	0 25	1 21	11 20	2.1	0 52	2.5
35	6 38	17 30	0 26	1 25	11 7	2.1	1 5	2.5
40	6 46	17 23	0 28	1 31	10 51	2.1	1 20	2.6
45	6 54	17 14	0 30	1 39	10 33	2.0	1 38	2.6
50	7 5	17 4	0 34	1 49	10 10	2.0	2 0	2.7
55	7 18	16 52	0 38	2 3	9 40	1.8	2 29	2.8
60	7 34	16 35	0 44	2 22	8 57	1.6	3 12	3.1
S								

SUNCE UT	SUNCE $e = T_p - UT$	SUNCE Δ/24	SUNCE r	MJESEC Prolaz	MJESEC Δ/24	MJESEC $\pi_\leftmoon$	MJESEC r
h	min s	s	′	h min	min	′	′
00	− 4 14.0	.5	15.8	$T_{\overline{m}}$ 18 35	2.2	57.2	15.6
12	− 4 7.6	$T_{\overline{m}_\odot}$ 12 h	4.1 min	Starost 6.9 d	Faza ◐		

PLANETE

Pl.	$T_{\overline{m}}$	π	360−α	Vel.	Pl.	$T_{\overline{m}}$	π	360−α	Vel.
	h min	′	°			h min	′	°	
♀	14 53	.2	171	−4.2	♃	2 30	.0	357	−2.7
♂	14 59	.1	170	1.5	♄	14 29	.0	177	1.1

UT	SUNCE $S_\odot$	SUNCE $\delta_\odot$	PROLJ. TAČKA S_Υ	VENERA S_φ	VENERA δ_φ	MARS S_σ	MARS δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	178 59.7	13 11.9	326 14.8	136 48.4	− 5 39.2	135 17.7	− 4 27.1
2	208 59.9	13 10.3	356 19.7	166 49.1	− 5 41.6	165 19.7	− 4 28.4
4	239 .2	13 8.7	26 24.7	196 49.7	− 5 44.0	195 21.8	− 4 29.7
6	269 .5	13 7.1	56 29.6	226 50.4	− 5 46.4	225 23.8	− 4 31.0
8	299 .8	13 5.5	86 34.5	256 51.0	− 5 48.8	255 25.8	− 4 32.3
10	329 1.1	13 3.8	116 39.4	286 51.7	− 5 51.2	285 27.8	− 4 33.6
12	359 1.3	13 2.2	146 44.4	316 52.3	− 5 53.5	315 29.9	− 4 34.9
14	29 1.6	13 .6	176 49.3	346 53.0	− 5 55.9	345 31.9	− 4 36.1
16	59 1.9	12 59.0	206 54.2	16 53.6	− 5 58.3	15 33.9	− 4 37.4
18	89 2.2	12 57.4	236 59.2	46 54.3	− 6 .7	45 35.9	− 4 38.7
20	119 2.5	12 55.7	267 4.1	76 54.9	− 6 3.1	75 37.9	− 4 40.0
22	149 2.7	12 54.1	297 9.0	106 55.6	− 6 5.5	105 40.0	− 4 41.3
Δ	1	−8		3	−12	10	−6

UT	MJESEC $S_\leftmoon$	MJESEC Δ	MJESEC $\delta_\leftmoon$	MJESEC Δ	JUPITER $S_\jupiter$	JUPITER $\delta_\jupiter$	SATURN $S_\saturn$	SATURN $\delta_\saturn$
h	° ′		° ′		° ′	° ′	° ′	° ′
0	78 22.5	83	−24 35.7	−22	323 29.6	− 0 27.2	143 1.9	0 59.6
2	107 17.1	83	−24 40.2	−19	353 34.9	− 0 27.3	173 6.3	0 59.3
4	136 11.7	83	−24 44.0	−17	23 40.2	− 0 27.5	203 10.8	0 59.1
6	165 6.4	84	−24 47.4	−14	53 45.5	− 0 27.7	233 15.2	0 58.9
8	194 1.2	84	−24 50.1	−11	83 50.8	− 0 27.9	263 19.7	0 58.7
10	222 56.1	85	−24 52.4	−8	113 56.0	− 0 28.1	293 24.1	0 58.5
12	251 51.0	85	−24 54.0	−6	144 1.3	− 0 28.2	323 28.5	0 58.3
14	280 46.1	86	−24 55.2	−3	174 6.6	− 0 28.4	353 33.0	0 58.0
16	309 41.3	87	−24 55.8	0	204 11.9	− 0 28.6	23 37.4	0 57.8
18	338 36.6	87	−24 55.8	2	234 17.2	− 0 28.8	53 41.9	0 57.6
20	7 32.0	88	−24 55.3	5	264 22.5	− 0 29.0	83 46.3	0 57.4
22	36 27.6	89	−24 54.3	8	294 27.8	− 0 29.1	113 50.7	0 57.2
Δ					26	−1	22	−1

φ	SUNCE IZLAZ	SUNCE ZALAZ	TRAJANJE SUMRAKA GRAĐ.	TRAJANJE SUMRAKA ASTR.	MJESEC IZLAZ	MJESEC Δ/24	MJESEC ZALAZ	MJESEC Δ/24
N	h min	h min	h min	h min	h min	min	h min	min
60	4 21	19 45	0 50	: ::	16 60	1.8	21 58	2.7
55	4 40	19 27	0 41	2 43	16 9	2.0	22 49	2.6
50	4 54	19 13	0 35	2 11	15 36	2.0	23 22	2.5
45	5 5	19 2	0 32	1 53	15 11	2.1	23 47	2.4
40	5 14	18 53	0 29	1 40	14 51	2.1	. . .	.0
35	5 22	18 45	0 27	1 32	14 35	2.1	. . .	.0
30	5 29	18 38	0 25	1 25	14 21	2.1	. . .	.0
20	5 41	18 27	0 23	1 17	13 56	2.2	0 8	2.2
10	5 51	18 17	0 22	1 12	13 35	2.2	0 28	2.2
0	6 1	18 7	0 21	1 11	13 16	2.2	0 48	2.2
10	6 10	17 58	0 22	1 11	12 56	2.2	1 7	2.3
20	6 20	17 48	0 23	1 14	12 36	2.2	1 28	2.3
30	6 31	17 37	0 25	1 21	12 11	2.3	1 51	2.3
35	6 37	17 31	0 26	1 25	11 57	2.3	2 5	2.3
40	6 44	17 24	0 28	1 31	11 41	2.3	2 22	2.3
45	6 53	17 16	0 30	1 39	11 21	2.3	2 41	2.3
50	7 3	17 6	0 34	1 49	10 57	2.3	3 5	2.3
55	7 15	16 53	0 38	2 2	10 24	2.3	3 38	2.3
60	7 32	16 37	0 44	2 21	9 36	2.4	4 26	2.3
S								

SUNCE UT	SUNCE $e = T_p - UT$	SUNCE Δ/24	SUNCE r	MJESEC Prolaz	MJESEC Δ/24	MJESEC $\pi_\leftmoon$	MJESEC r
h	min s	s	′	h min	min	′	′
00	− 4 1.1	.6	15.8	$T_{\overline{m}}$ 19 29	2.2	56.5	15.4
12	− 3 54.4	$T_{\overline{m}_\odot}$ 12 h	3.9 min	Starost 7.9 d	Faza ◐		

PLANETE

Pl.	$T_{\overline{m}}$	π	360−α	Vel.	Pl.	$T_{\overline{m}}$	π	360−α	Vel.
	h min	′	°			h min	′	°	
♀	14 52	.2	171	−4.2	♃	2 26	.0	357	−2.7
♂	14 58	.1	169	1.5	♄	14 26	.0	177	1.1

UT	SUNCE $S_\odot$	SUNCE $\delta_\odot$	PROLJ. TAČKA S_Υ	VENERA S_φ	VENERA δ_φ	MARS S_σ	MARS δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	179 3.0	12 52.5	327 13.9	136 56.3	− 6 7.9	135 42.0	− 4 42.6
2	209 3.3	12 50.9	357 18.9	166 56.9	− 6 10.2	165 44.0	− 4 43.9
4	239 3.6	12 49.2	27 23.8	196 57.6	− 6 12.6	195 46.0	− 4 45.2
6	269 3.9	12 47.6	57 28.7	226 58.3	− 6 15.0	225 48.0	− 4 46.5
8	299 4.2	12 46.0	87 33.7	256 58.9	− 6 17.4	255 50.0	− 4 47.8
10	329 4.5	12 44.4	117 38.6	286 59.6	− 6 19.8	285 52.1	− 4 49.1
12	359 4.7	12 42.7	147 43.5	317 .3	− 6 22.1	315 54.1	− 4 50.4
14	29 5.0	12 41.1	177 48.4	347 1.0	− 6 24.5	345 56.1	− 4 51.7
16	59 5.3	12 39.4	207 53.4	17 1.6	− 6 26.9	15 58.1	− 4 53.0
18	89 5.6	12 37.8	237 58.3	47 2.3	− 6 29.3	46 .1	− 4 54.3
20	119 5.9	12 36.2	268 3.2	77 3.0	− 6 31.6	76 2.1	− 4 55.6
22	149 6.2	12 34.5	298 8.2	107 3.7	− 6 34.0	106 4.1	− 4 56.9
Δ	1	−8		3	−12	10	−6

UT	MJESEC $S_\leftmoon$	MJESEC Δ	MJESEC $\delta_\leftmoon$	MJESEC Δ	JUPITER $S_\jupiter$	JUPITER $\delta_\jupiter$	SATURN $S_\saturn$	SATURN $\delta_\saturn$
h	° ′		° ′		° ′	° ′	° ′	° ′
0	65 23.3	89	−24 52.7	10	324 33.1	− 0 29.3	143 55.2	0 56.9
2	94 19.2	90	−24 50.7	13	354 38.4	− 0 29.5	173 59.6	0 56.7
4	123 15.3	91	−24 48.0	16	24 43.7	− 0 29.7	204 4.1	0 56.5
6	152 11.5	92	−24 44.9	18	54 49.0	− 0 29.9	234 8.5	0 56.3
8	181 7.8	93	−24 41.3	21	84 54.3	− 0 30.1	264 12.9	0 56.1
10	210 4.4	94	−24 37.1	23	114 59.6	− 0 30.2	294 17.4	0 55.8
12	239 1.1	95	−24 32.5	26	145 4.9	− 0 30.4	324 21.8	0 55.6
14	267 58.1	96	−24 27.3	28	175 10.3	− 0 30.6	354 26.3	0 55.4
16	296 55.2	97	−24 21.7	31	205 15.6	− 0 30.8	24 30.7	0 55.2
18	325 52.6	98	−24 15.5	33	235 20.9	− 0 31.0	54 35.1	0 55.0
20	354 50.1	99	−24 8.9	36	265 26.2	− 0 31.2	84 39.6	0 54.7
22	23 47.9	100	−24 1.8	38	295 31.5	− 0 31.4	114 44.0	0 54.5
Δ					27	−1	22	−1

φ	SUNCE IZLAZ	SUNCE ZALAZ	TRAJANJE SUMRAKA GRAĐ.	TRAJANJE SUMRAKA ASTR.	MJESEC IZLAZ	MJESEC Δ/24	MJESEC ZALAZ	MJESEC Δ/24
N	h min	h min	h min	h min	h min	min	h min	min
60	4 23	19 42	0 49	: ::	17 43	1.1	23 4	3.2
55	4 42	19 24	0 41	2 41	16 56	1.4	23 50	2.9
50	4 55	19 11	0 35	2 10	16 25	1.6	.. ..	.0
45	5 6	19 0	0 31	1 52	16 1	1.7	.. ..	.0
40	5 15	18 51	0 29	1 40	15 42	1.8	0 6	2.4
35	5 23	18 44	0 27	1 31	15 26	1.8	0 23	2.3
30	5 30	18 37	0 25	1 25	15 12	1.9	0 37	2.3
20	5 41	18 26	0 23	1 17	14 48	2.0	1 1	2.3
10	5 51	18 16	0 22	1 12	14 28	2.1	1 22	2.2
0	6 0	18 7	0 21	1 10	14 9	2.1	1 42	2.2
10	6 9	17 58	0 21	1 11	13 50	2.2	2 1	2.1
20	6 19	17 49	0 23	1 14	13 29	2.3	2 22	2.1
30	6 30	17 38	0 24	1 20	13 6	2.3	2 46	2.0
35	6 36	17 32	0 26	1 25	12 52	2.4	2 60	2.0
40	6 43	17 25	0 28	1 31	12 36	2.4	3 16	1.9
45	6 51	17 17	0 30	1 39	12 17	2.5	3 35	1.9
50	7 1	17 7	0 33	1 49	11 53	2.6	3 60	1.8
55	7 13	16 55	0 38	2 2	11 21	2.7	4 32	1.7
60	7 29	16 39	0 44	2 21	10 33	3.0	5 20	1.4
S								

SUNCE UT	SUNCE $e = T_p - UT$	SUNCE Δ/24	SUNCE r	MJESEC Prolaz	MJESEC Δ/24	MJESEC $\pi_\leftmoon$	MJESEC r
h	min s	s	′	h min	min	′	′
00	− 3 47.7	.6	15.8	$T_{\overline{m}}$ 20 21	2.1	55.8	15.2
12	− 3 40.7	$T_{\overline{m}_\odot}$ 12 h	3.7 min	Starost 8.9 d	Faza ◐		

PLANETE

Pl.	$T_{\overline{m}}$	π	360−α	Vel.	Pl.	$T_{\overline{m}}$	π	360−α	Vel.
	h min	′	°			h min	′	°	
♀	14 52	.2	170	−4.2	♃	2 21	.0	357	−2.7
♂	14 56	.1	168	1.5	♄	14 22	.0	177	1.1

UT	SUNCE $S_\odot$	SUNCE $\delta_\odot$	PROLJ. TAČKA S_Υ	VENERA S_φ	VENERA δ_φ	MARS S_σ	MARS δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	179 6.5	12 32.9	328 13.1	137 4.4	− 6 36.4	136 6.1	− 4 58.2
2	209 6.8	12 31.2	358 18.0	167 5.1	− 6 38.7	166 8.2	− 4 59.4
4	239 7.1	12 29.6	28 22.9	197 5.8	− 6 41.1	196 10.2	− 5 .7
6	269 7.4	12 28.0	58 27.9	227 6.5	− 6 43.5	226 12.2	− 5 2.0
8	299 7.7	12 26.3	88 32.8	257 7.2	− 6 45.8	256 14.2	− 5 3.3
10	329 8.0	12 24.7	118 37.7	287 7.9	− 6 48.2	286 16.2	− 5 4.6
12	359 8.3	12 23.0	148 42.6	317 8.6	− 6 50.6	316 18.2	− 5 5.9
14	29 8.6	12 21.4	178 47.6	347 9.3	− 6 52.9	346 20.2	− 5 7.2
16	59 8.9	12 19.7	208 52.5	17 10.0	− 6 55.3	16 22.2	− 5 8.5
18	89 9.2	12 18.1	238 57.4	47 10.7	− 6 57.7	46 24.2	− 5 9.8
20	119 9.5	12 16.4	269 2.4	77 11.4	− 7 .0	76 26.2	− 5 11.1
22	149 9.8	12 14.7	299 7.3	107 12.1	− 7 2.4	106 28.2	− 5 12.4
Δ	2	−8		4	−12	10	−6

UT	MJESEC $S_\leftmoon$	MJESEC Δ	MJESEC $\delta_\leftmoon$	MJESEC Δ	JUPITER $S_\jupiter$	JUPITER $\delta_\jupiter$	SATURN $S_\saturn$	SATURN $\delta_\saturn$
h	° ′		° ′		° ′	° ′	° ′	° ′
0	52 45.9	101	−23 54.2	40	325 36.8	− 0 31.6	144 48.5	0 54.3
2	81 44.1	102	−23 46.1	43	355 42.1	− 0 31.7	174 52.9	0 54.1
4	110 42.5	103	−23 37.6	45	25 47.4	− 0 31.9	204 57.3	0 53.8
6	139 41.2	105	−23 28.6	47	55 52.7	− 0 32.1	235 1.8	0 53.6
8	168 40.1	106	−23 19.2	49	85 58.1	− 0 32.3	265 6.2	0 53.4
10	197 39.3	107	−23 9.3	52	116 3.4	− 0 32.5	295 10.6	0 53.2
12	226 38.7	108	−22 59.0	54	146 8.7	− 0 32.7	325 15.1	0 53.0
14	255 38.4	110	−22 48.3	56	176 14.0	− 0 32.9	355 19.5	0 52.7
16	284 38.3	111	−22 37.1	58	206 19.3	− 0 33.1	25 23.9	0 52.5
18	313 38.4	112	−22 25.5	60	236 24.7	− 0 33.3	55 28.4	0 52.3
20	342 38.9	113	−22 13.5	62	266 30.0	− 0 33.4	85 32.8	0 52.1
22	11 39.5	115	−22 1.1	64	296 35.3	− 0 33.6	115 37.2	0 51.8
Δ					27	−1	22	−1

φ	SUNCE IZLAZ	SUNCE ZALAZ	TRAJANJE SUMRAKA GRAĐ.	TRAJANJE SUMRAKA ASTR.	MJESEC IZLAZ	MJESEC Δ/24	MJESEC ZALAZ	MJESEC Δ/24
N	h min	h min	h min	h min	h min	min	h min	min
60	4 26	19 39	0 49	: ::	18 9	.7	.. ..	.0
55	4 43	19 22	0 40	2 39	17 30	1.0	.. ..	.0
50	4 57	19 9	0 35	2 9	17 3	1.2	0 22	2.7
45	5 7	18 59	0 31	1 51	16 42	1.4	0 45	2.6
40	5 16	18 50	0 29	1 39	16 25	1.5	1 3	2.5
35	5 24	18 43	0 26	1 31	16 10	1.6	1 19	2.4
30	5 30	18 36	0 25	1 25	15 58	1.7	1 33	2.4
20	5 41	18 25	0 23	1 16	15 36	1.8	1 56	2.2
10	5 51	18 16	0 22	1 12	15 17	1.9	2 15	2.2
0	6 0	18 7	0 21	1 10	14 60	2.0	2 34	2.1
10	6 9	17 58	0 21	1 11	14 42	2.1	2 52	2.0
20	6 18	17 49	0 22	1 14	14 24	2.2	3 12	1.9
30	6 29	17 38	0 24	1 20	14 2	2.3	3 34	1.8
35	6 35	17 32	0 26	1 25	13 49	2.4	3 48	1.7
40	6 42	17 26	0 28	1 31	13 34	2.5	4 3	1.6
45	6 50	17 18	0 30	1 39	13 17	2.6	4 21	1.5
50	6 59	17 9	0 33	1 49	12 55	2.8	4 43	1.4
55	7 11	16 57	0 38	2 2	12 26	3.0	5 13	1.2
60	7 26	16 42	0 44	2 21	11 45	3.3	5 55	.9
S								

SUNCE UT	SUNCE $e = T_p - UT$	SUNCE Δ/24	SUNCE r	MJESEC Prolaz	MJESEC Δ/24	MJESEC $\pi_\leftmoon$	MJESEC r
h	min s	s	′	h min	min	′	′
00	− 3 33.8	.6	15.8	$T_{\overline{m}}$ 21 12	2.0	55.2	15.0
12	− 3 26.6	$T_{\overline{m}_\odot}$ 12 h	3.4 min	Starost 9.9 d	Faza ◐		

PLANETE

Pl.	$T_{\overline{m}}$	π	360−α	Vel.	Pl.	$T_{\overline{m}}$	π	360−α	Vel.
	h min	′	°			h min	′	°	
♀	14 51	.2	169	−4.2	♃	2 17	.0	357	−2.7
♂	14 55	.1	168	1.5	♄	14 19	.0	177	1.1

UT	SUNCE $S_\odot$	SUNCE $\delta_\odot$	PROLJ. TAČKA S_Υ	VENERA S_φ	VENERA δ_φ	MARS S_σ	MARS δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	179 10.1	12 13.1	329 12.2	137 12.9	- 7 4.7	136 30.2	- 5 13.7
2	209 10.4	12 11.4	359 17.1	167 13.6	- 7 7.1	166 32.2	- 5 15.0
4	239 10.7	12 9.8	29 22.1	197 14.3	- 7 9.4	196 34.2	- 5 16.3
6	269 11.0	12 8.1	59 27.0	227 15.0	- 7 11.8	226 36.2	- 5 17.6
8	299 11.3	12 6.4	89 31.9	257 15.8	- 7 14.2	256 38.2	- 5 18.9
10	329 11.6	12 4.8	119 36.9	287 16.5	- 7 16.5	286 40.2	- 5 20.1
12	359 12.0	12 3.1	149 41.8	317 17.2	- 7 18.9	316 42.2	- 5 21.4
14	29 12.3	12 1.4	179 46.7	347 18.0	- 7 21.2	346 44.2	- 5 22.7
16	59 12.6	11 59.8	209 51.6	17 18.7	- 7 23.5	16 46.2	- 5 24.0
18	89 12.9	11 58.1	239 56.6	47 19.4	- 7 25.9	46 48.2	- 5 25.3
20	119 13.2	11 56.4	270 1.5	77 20.2	- 7 28.2	76 50.2	- 5 26.6
22	149 13.5	11 54.8	300 6.4	107 20.9	- 7 30.6	106 52.2	- 5 27.9
Δ	2	-8		4	-12	10	-6

UT	MJESEC $S_\leftmoon$	MJESEC Δ	MJESEC $\delta_\leftmoon$	MJESEC Δ	JUPITER $S_\jupiter$	JUPITER $\delta_\jupiter$	SATURN $S_\saturn$	SATURN $\delta_\saturn$
h	° ′		° ′		° ′	° ′	° ′	° ′
0	40 40.5	116	-21 48.3	66	326 40.6	- 0 33.8	145 41.7	0 51.6
2	69 41.7	117	-21 35.0	68	356 46.0	- 0 34.0	175 46.1	0 51.4
4	98 43.1	119	-21 21.4	70	26 51.3	- 0 34.2	205 50.5	0 51.2
6	127 44.8	120	-21 7.4	72	56 56.6	- 0 34.4	235 55.0	0 51.0
8	156 46.8	121	-20 53.1	74	87 1.9	- 0 34.6	265 59.4	0 50.7
10	185 49.0	123	-20 38.4	75	117 7.3	- 0 34.8	296 3.8	0 50.5
12	214 51.5	124	-20 23.3	77	147 12.6	- 0 35.0	326 8.3	0 50.3
14	243 54.3	125	-20 7.8	79	177 17.9	- 0 35.2	356 12.7	0 50.1
16	272 57.3	126	-19 52.0	81	207 23.3	- 0 35.4	26 17.1	0 49.8
18	302 .6	128	-19 35.9	82	237 28.6	- 0 35.6	56 21.6	0 49.6
20	331 4.1	129	-19 19.5	84	267 33.9	- 0 35.8	86 26.0	0 49.4
22	0 7.9	130	-19 2.7	86	297 39.3	- 0 36.0	116 30.4	0 49.2
Δ					27	-1	22	-1

φ	SUNCE IZLAZ	SUNCE ZALAZ	TRAJANJE SUMRAKA GRAĐ.	TRAJANJE SUMRAKA ASTR.	MJESEC IZLAZ	MJESEC Δ/24	MJESEC ZALAZ	MJESEC Δ/24
N	h min	h min	h min	h min	h min	min	h min	min
60	4 28	19 36	0 48	4 7	18 25	.4	0 22	3.4
55	4 45	19 20	0 40	2 37	17 55	.8	1 0	3.0
50	4 58	19 7	0 35	2 8	17 33	1.0	1 27	2.8
45	5 9	18 57	0 31	1 51	17 15	1.2	1 47	2.7
40	5 17	18 49	0 28	1 39	17 1	1.3	2 3	2.5
35	5 24	18 41	0 26	1 31	16 48	1.4	2 17	2.4
30	5 31	18 35	0 25	1 24	16 38	1.5	2 29	2.3
20	5 42	18 24	0 23	1 16	16 19	1.6	2 49	2.2
10	5 51	18 15	0 22	1 12	16 3	1.8	3 7	2.1
0	5 60	18 7	0 21	1 10	15 48	1.9	3 24	2.0
10	6 8	17 58	0 21	1 11	15 33	2.0	3 40	1.8
20	6 18	17 49	0 22	1 14	15 17	2.2	3 57	1.7
30	6 28	17 39	0 24	1 20	14 58	2.3	4 17	1.6
35	6 34	17 33	0 26	1 25	14 47	2.4	4 29	1.5
40	6 40	17 27	0 28	1 31	14 35	2.5	4 42	1.4
45	6 48	17 19	0 30	1 38	14 20	2.7	4 58	1.3
50	6 57	17 10	0 33	1 48	14 2	2.8	5 17	1.1
55	7 8	16 59	0 38	2 2	13 38	3.0	5 42	.9
60	7 23	16 44	0 44	2 20	13 5	3.4	6 16	.6
S								

SUNCE UT	SUNCE $e = T_p - UT$	SUNCE Δ/24	SUNCE r	MJESEC Prolaz	MJESEC Δ/24	MJESEC $\pi_\leftmoon$	MJESEC r
h	min s	s	′	h min	min	′	′
00	- 3 19.4	.6	15.8	$T_{\overline{m}}$ 21 59	1.9	54.8	14.9
12	- 3 11.9	$T_{\overline{m}_\odot}$ 12 h 3.2 min		Starost 10.9 d	Faza ◐		

PLANETE

Pl.	$T_{\overline{m}}$	π	360−α	Vel.	Pl.	$T_{\overline{m}}$	π	360−α	Vel.
	h min	′	°			h min	′	°	
♀	14 51	.2	168	-4.2	♃	2 13	.0	357	-2.7
♂	14 53	.1	167	1.5	♄	14 15	.0	176	1.1

UT	SUNCE $S_\odot$	SUNCE $\delta_\odot$	PROLJ. TAČKA S_Υ	VENERA S_φ	VENERA δ_φ	MARS S_σ	MARS δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	179 13.8	11 53.1	330 11.4	137 21.7	- 7 32.9	136 54.2	- 5 29.2
2	209 14.1	11 51.4	0 16.3	167 22.4	- 7 35.3	166 56.2	- 5 30.5
4	239 14.5	11 49.7	30 21.2	197 23.2	- 7 37.6	196 58.2	- 5 31.8
6	269 14.8	11 48.1	60 26.1	227 23.9	- 7 39.9	227 .2	- 5 33.1
8	299 15.1	11 46.4	90 31.1	257 24.7	- 7 42.3	257 2.2	- 5 34.4
10	329 15.4	11 44.7	120 36.0	287 25.5	- 7 44.6	287 4.2	- 5 35.7
12	359 15.7	11 43.0	150 40.9	317 26.2	- 7 47.0	317 6.2	- 5 36.9
14	29 16.1	11 41.3	180 45.9	347 27.0	- 7 49.3	347 8.2	- 5 38.2
16	59 16.4	11 39.7	210 50.8	17 27.8	- 7 51.6	17 10.1	- 5 39.5
18	89 16.7	11 38.0	240 55.7	47 28.5	- 7 53.9	47 12.1	- 5 40.8
20	119 17.0	11 36.3	271 .6	77 29.3	- 7 56.3	77 14.1	- 5 42.1
22	149 17.3	11 34.6	301 5.6	107 30.1	- 7 58.6	107 16.1	- 5 43.4
Δ	2	-8		4	-12	10	-6

UT	MJESEC $S_\leftmoon$	MJESEC Δ	MJESEC $\delta_\leftmoon$	MJESEC Δ	JUPITER $S_\jupiter$	JUPITER $\delta_\jupiter$	SATURN $S_\saturn$	SATURN $\delta_\saturn$
h	° ′		° ′		° ′	° ′	° ′	° ′
0	29 12.0	132	-18 45.6	87	327 44.6	- 0 36.2	146 34.9	0 48.9
2	58 16.3	133	-18 28.1	89	357 49.9	- 0 36.4	176 39.3	0 48.7
4	87 20.9	134	-18 10.4	90	27 55.3	- 0 36.6	206 43.7	0 48.5
6	116 25.7	135	-17 52.4	92	58 .6	- 0 36.8	236 48.2	0 48.3
8	145 30.7	136	-17 34.1	93	88 6.0	- 0 37.0	266 52.6	0 48.1
10	174 36.0	138	-17 15.5	94	118 11.3	- 0 37.2	296 57.0	0 47.8
12	203 41.5	139	-16 56.6	96	148 16.6	- 0 37.4	327 1.4	0 47.6
14	232 47.3	140	-16 37.4	97	178 22.0	- 0 37.6	357 5.9	0 47.4
16	261 53.3	141	-16 18.0	98	208 27.3	- 0 37.8	27 10.3	0 47.2
18	290 59.5	142	-15 58.3	100	238 32.7	- 0 38.0	57 14.7	0 46.9
20	320 6.0	143	-15 38.4	101	268 38.0	- 0 38.2	87 19.2	0 46.7
22	349 12.7	144	-15 18.2	102	298 43.4	- 0 38.4	117 23.6	0 46.5
Δ					27	-1	22	-1

φ	SUNCE IZLAZ	SUNCE ZALAZ	TRAJANJE SUMRAKA GRAĐ.	TRAJANJE SUMRAKA ASTR.	MJESEC IZLAZ	MJESEC Δ/24	MJESEC ZALAZ	MJESEC Δ/24
N	h min	h min	h min	h min	h min	min	h min	min
60	4 31	19 34	0 48	3 49	18 36	.3	1 44	3.4
55	4 47	19 17	0 40	2 35	18 13	.6	2 13	3.1
50	4 60	19 5	0 35	2 7	17 56	.8	2 34	2.8
45	5 10	18 55	0 31	1 50	17 43	1.0	2 50	2.6
40	5 18	18 47	0 28	1 39	17 32	1.1	3 4	2.5
35	5 25	18 40	0 26	1 30	17 22	1.2	3 15	2.4
30	5 31	18 34	0 25	1 24	17 13	1.3	3 25	2.3
20	5 42	18 24	0 23	1 16	16 59	1.5	3 42	2.1
10	5 51	18 15	0 21	1 12	16 46	1.7	3 57	2.0
0	5 60	18 6	0 21	1 10	16 34	1.8	4 11	1.9
10	6 8	17 58	0 21	1 11	16 22	1.9	4 24	1.7
20	6 17	17 49	0 22	1 14	16 9	2.1	4 39	1.6
30	6 27	17 40	0 24	1 20	15 54	2.3	4 55	1.4
35	6 32	17 34	0 26	1 25	15 45	2.4	5 5	1.3
40	6 39	17 28	0 28	1 31	15 35	2.5	5 16	1.2
45	6 46	17 20	0 30	1 38	15 23	2.6	5 28	1.1
50	6 55	17 11	0 33	1 48	15 9	2.8	5 44	.9
55	7 6	17 1	0 37	2 2	14 51	3.0	6 3	.7
60	7 20	16 46	0 43	2 20	14 27	3.4	6 30	.4
S								

SUNCE UT	SUNCE $e = T_p - UT$	SUNCE Δ/24	SUNCE r	MJESEC Prolaz	MJESEC Δ/24	MJESEC $\pi_\leftmoon$	MJESEC r
h	min s	s	′	h min	min	′	′
00	- 3 4.5	.6	15.8	$T_{\overline{m}}$ 22 44	1.8	54.4	14.8
12	- 2 56.8	$T_{\overline{m}_\odot}$ 12 h 3.0 min		Starost 11.9 d	Faza ◐		

PLANETE

Pl.	$T_{\overline{m}}$	π	360−α	Vel.	Pl.	$T_{\overline{m}}$	π	360−α	Vel.
	h min	′	°			h min	′	°	
♀	14 50	.2	167	-4.2	♃	2 9	.0	358	-2.7
♂	14 51	.1	167	1.5	♄	14 12	.0	176	1.1

UT	SUNCE $S_\odot$	SUNCE $\delta_\odot$	PROLJ. TAČKA S_Υ	VENERA S_φ	VENERA δ_φ	MARS S_σ	MARS δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	179 17.7	11 32.9	331 10.5	137 30.9	− 8 .9	137 18.1	− 5 44.7
2	209 18.0	11 31.2	1 15.4	167 31.6	− 8 3.3	167 20.1	− 5 46.0
4	239 18.3	11 29.5	31 20.4	197 32.4	− 8 5.6	197 22.1	− 5 47.3
6	269 18.7	11 27.8	61 25.3	227 33.2	− 8 7.9	227 24.0	− 5 48.6
8	299 19.0	11 26.1	91 30.2	257 34.0	− 8 10.2	257 26.0	− 5 49.9
10	329 19.3	11 24.4	121 35.1	287 34.8	− 8 12.5	287 28.0	− 5 51.2
12	359 19.6	11 22.8	151 40.1	317 35.6	− 8 14.9	317 30.0	− 5 52.4
14	29 20.0	11 21.1	181 45.0	347 36.4	− 8 17.2	347 32.0	− 5 53.7
16	59 20.3	11 19.4	211 49.9	17 37.2	− 8 19.5	17 34.0	− 5 55.0
18	89 20.6	11 17.7	241 54.9	47 38.0	− 8 21.8	47 35.9	− 5 56.3
20	119 21.0	11 16.0	271 59.8	77 38.8	− 8 24.1	77 37.9	− 5 57.6
22	149 21.3	11 14.3	302 4.7	107 39.6	− 8 26.4	107 39.9	− 5 58.9
Δ	2	−8		4	−12	10	−6

UT	MJESEC $S_\leftmoon$	MJESEC Δ	MJESEC $\delta_\leftmoon$	MJESEC Δ	JUPITER $S_\jupiter$	JUPITER $\delta_\jupiter$	SATURN $S_\saturn$	SATURN $\delta_\saturn$
h	° ′		° ′		° ′	° ′	° ′	° ′
0	18 19.6	146	−14 57.8	103	328 48.7	− 0 38.6	147 28.0	0 46.3
2	47 26.7	147	−14 37.2	104	358 54.1	− 0 38.8	177 32.4	0 46.0
4	76 34.0	148	−14 16.3	105	28 59.4	− 0 39.0	207 36.9	0 45.8
6	105 41.5	149	−13 55.2	106	59 4.8	− 0 39.2	237 41.3	0 45.6
8	134 49.3	150	−13 33.9	108	89 10.1	− 0 39.4	267 45.7	0 45.4
10	163 57.2	151	−13 12.4	109	119 15.5	− 0 39.6	297 50.1	0 45.1
12	193 5.3	152	−12 50.7	109	149 20.8	− 0 39.8	327 54.6	0 44.9
14	222 13.6	152	−12 28.8	110	179 26.2	− 0 40.0	357 59.0	0 44.7
16	251 22.1	153	−12 6.7	111	209 31.5	− 0 40.2	28 3.4	0 44.5
18	280 30.7	154	−11 44.5	112	239 36.9	− 0 40.4	58 7.8	0 44.2
20	309 39.6	155	−11 22.0	113	269 42.3	− 0 40.6	88 12.3	0 44.0
22	338 48.6	156	−10 59.4	114	299 47.6	− 0 40.8	118 16.7	0 43.8
Δ					27	−1	22	−1

φ	SUNCE IZLAZ	SUNCE ZALAZ	TRAJANJE SUMRAKA GRAĐ.	TRAJANJE SUMRAKA ASTR.	MJESEC IZLAZ	MJESEC Δ/24	MJESEC ZALAZ	MJESEC Δ/24
N	h min	h min	h min	h min	h min	min	h min	min
60	4 33	19 31	0 48	3 39	18 43	.2	3 6	3.3
55	4 49	19 15	0 40	2 33	18 28	.5	3 26	3.0
50	5 1	19 3	0 35	2 6	18 16	.7	3 42	2.8
45	5 11	18 54	0 31	1 50	18 6	.9	3 54	2.6
40	5 19	18 46	0 28	1 38	17 59	1.0	4 4	2.5
35	5 26	18 39	0 26	1 30	17 52	1.1	4 13	2.4
30	5 32	18 33	0 25	1 24	17 46	1.2	4 20	2.2
20	5 42	18 23	0 23	1 16	17 35	1.4	4 33	2.1
10	5 51	18 14	0 21	1 12	17 26	1.6	4 44	1.9
0	5 59	18 6	0 21	1 10	17 17	1.7	4 55	1.8
10	6 7	17 58	0 21	1 11	17 8	1.9	5 5	1.6
20	6 16	17 50	0 22	1 14	16 59	2.0	5 16	1.5
30	6 26	17 40	0 24	1 20	16 48	2.2	5 29	1.3
35	6 31	17 35	0 26	1 25	16 42	2.3	5 36	1.2
40	6 37	17 29	0 28	1 31	16 35	2.5	5 45	1.1
45	6 45	17 21	0 30	1 38	16 27	2.6	5 54	.9
50	6 53	17 13	0 33	1 48	16 17	2.8	6 6	.8
55	7 4	17 2	0 37	2 2	16 4	3.0	6 20	.6
60	7 18	16 49	0 43	2 20	15 47	3.3	6 38	.3
S								

SUNCE UT	SUNCE $e = T_p - UT$	SUNCE Δ/24	SUNCE r	MJESEC Prolaz	MJESEC Δ/24	MJESEC $\pi_\leftmoon$	MJESEC r
h	min s	s	′	h min	min	′	′
00	− 2 49.1	.7	15.8	$T_{\overline{m}}$ 23 27	1.7	54.2	14.8
12	− 2 41.2	$T_{\overline{m}_\odot}$ 12 h 2.7 min		Starost 12.9 d	Faza ○		

PLANETE

Pl.	$T_{\overline{m}}$	π	360−α	Vel.	Pl.	$T_{\overline{m}}$	π	360−α	Vel.
	h min	′	°			h min	′	°	
♀	14 50	.2	166	−4.2	♃	2 4	.0	358	−2.7
♂	14 50	.1	166	1.5	♄	14 8	.0	176	1.1

UT	SUNCE $S_\odot$	SUNCE $\delta_\odot$	PROLJ. TAČKA S_Υ	VENERA S_φ	VENERA δ_φ	MARS S_σ	MARS δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	179 21.6	11 12.5	332 9.6	137 40.4	− 8 28.7	137 41.9	− 6 .2
2	209 22.0	11 10.8	2 14.6	167 41.2	− 8 31.1	167 43.9	− 6 1.5
4	239 22.3	11 9.1	32 19.5	197 42.0	− 8 33.4	197 45.8	− 6 2.8
6	269 22.6	11 7.4	62 24.4	227 42.8	− 8 35.7	227 47.8	− 6 4.1
8	299 23.0	11 5.7	92 29.3	257 43.7	− 8 38.0	257 49.8	− 6 5.4
10	329 23.3	11 4.0	122 34.3	287 44.5	− 8 40.3	287 51.8	− 6 6.6
12	359 23.6	11 2.3	152 39.2	317 45.3	− 8 42.6	317 53.7	− 6 7.9
14	29 24.0	11 .6	182 44.1	347 46.1	− 8 44.9	347 55.7	− 6 9.2
16	59 24.3	10 58.9	212 49.1	17 47.0	− 8 47.2	17 57.7	− 6 10.5
18	89 24.7	10 57.2	242 54.0	47 47.8	− 8 49.5	47 59.6	− 6 11.8
20	119 25.0	10 55.4	272 58.9	77 48.6	− 8 51.8	78 1.6	− 6 13.1
22	149 25.3	10 53.7	303 3.8	107 49.5	− 8 54.1	108 3.6	− 6 14.4
Δ	2	−9		4	−12	10	−6

UT	MJESEC $S_\leftmoon$	MJESEC Δ	MJESEC $\delta_\leftmoon$	MJESEC Δ	JUPITER $S_\jupiter$	JUPITER $\delta_\jupiter$	SATURN $S_\saturn$	SATURN $\delta_\saturn$
h	° ′		° ′		° ′	° ′	° ′	° ′
0	7 57.7	157	−10 36.7	115	329 53.0	− 0 41.0	148 21.1	0 43.6
2	37 7.0	157	−10 13.8	115	359 58.3	− 0 41.2	178 25.5	0 43.3
4	66 16.5	158	− 9 50.7	116	30 3.7	− 0 41.4	208 30.0	0 43.1
6	95 26.1	159	− 9 27.5	117	60 9.1	− 0 41.6	238 34.4	0 42.9
8	124 35.8	159	− 9 4.1	117	90 14.4	− 0 41.9	268 38.8	0 42.6
10	153 45.7	160	− 8 40.6	118	120 19.8	− 0 42.1	298 43.2	0 42.4
12	182 55.7	161	− 8 17.0	119	150 25.2	− 0 42.3	328 47.7	0 42.2
14	212 5.8	161	− 7 53.3	119	180 30.5	− 0 42.5	358 52.1	0 42.0
16	241 16.1	162	− 7 29.5	120	210 35.9	− 0 42.7	28 56.5	0 41.7
18	270 26.4	162	− 7 5.5	120	240 41.3	− 0 42.9	59 .9	0 41.5
20	299 36.8	163	− 6 41.5	121	270 46.6	− 0 43.1	89 5.3	0 41.3
22	328 47.4	163	− 6 17.3	121	300 52.0	− 0 43.3	119 9.8	0 41.1
Δ					27	−1	22	−1

φ	SUNCE IZLAZ	SUNCE ZALAZ	TRAJANJE SUMRAKA GRAĐ.	TRAJANJE SUMRAKA ASTR.	MJESEC IZLAZ	MJESEC Δ/24	MJESEC ZALAZ	MJESEC Δ/24
N	h min	h min	h min	h min	h min	min	h min	min
60	4 35	19 28	0 47	3 31	18 49	.2	4 26	3.3
55	4 51	19 13	0 40	2 32	18 40	.5	4 39	3.0
50	5 3	19 1	0 35	2 5	18 33	.7	4 49	2.8
45	5 12	18 52	0 31	1 49	18 28	.8	4 57	2.6
40	5 20	18 44	0 28	1 38	18 23	1.0	5 3	2.4
35	5 27	18 38	0 26	1 30	18 19	1.1	5 9	2.3
30	5 32	18 32	0 25	1 24	18 15	1.2	5 14	2.2
20	5 42	18 22	0 23	1 16	18 9	1.4	5 23	2.0
10	5 51	18 14	0 21	1 12	18 4	1.5	5 30	1.9
0	5 59	18 6	0 21	1 10	17 59	1.7	5 37	1.7
10	6 7	17 58	0 21	1 11	17 53	1.8	5 44	1.6
20	6 15	17 50	0 22	1 14	17 48	2.0	5 52	1.4
30	6 25	17 41	0 24	1 20	17 41	2.2	5 60	1.2
35	6 30	17 35	0 26	1 25	17 38	2.3	6 5	1.1
40	6 36	17 29	0 28	1 31	17 34	2.4	6 10	1.0
45	6 43	17 23	0 30	1 38	17 29	2.6	6 16	.8
50	6 51	17 14	0 33	1 48	17 23	2.7	6 24	.7
55	7 1	17 4	0 37	2 1	17 16	3.0	6 33	.5
60	7 15	16 51	0 43	2 20	17 6	3.2	6 45	.2
S								

SUNCE UT	SUNCE $e = T_p - UT$	SUNCE Δ/24	SUNCE r	MJESEC Prolaz	MJESEC Δ/24	MJESEC $\pi_\leftmoon$	MJESEC r
h	min s	s	′	h min	min	′	′
00	− 2 33.3	.7	15.8	$T_{\overline{m}}$	1.0	54.0	14.7
12	− 2 25.2	$T_{\overline{m}_\odot}$ 12 h 2.4 min		Starost 13.9 d	Faza ○		

PLANETE

Pl.	$T_{\overline{m}}$	π	360−α	Vel.	Pl.	$T_{\overline{m}}$	π	360−α	Vel.
	h min	′	°			h min	′	°	
♀	14 49	.2	166	−4.2	♃	2 0	.0	358	−2.7
♂	14 48	.1	166	1.5	♄	14 5	.0	176	1.1

UT	SUNCE $S_\odot$	SUNCE $\delta_\odot$	PROLJ. TAČKA S_Υ	VENERA S_φ	VENERA δ_φ	MARS S_σ	MARS δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	179 25.7	10 52.0	333 8.8	137 50.3	− 8 56.4	138 5.6	− 6 15.7
2	209 26.0	10 50.3	3 13.7	167 51.2	− 8 58.7	168 7.5	− 6 17.0
4	239 26.4	10 48.6	33 18.6	197 52.0	− 9 .9	198 9.5	− 6 18.3
6	269 26.7	10 46.8	63 23.6	227 52.9	− 9 3.2	228 11.5	− 6 19.5
8	299 27.1	10 45.1	93 28.5	257 53.7	− 9 5.5	258 13.4	− 6 20.8
10	329 27.4	10 43.4	123 33.4	287 54.6	− 9 7.8	288 15.4	− 6 22.1
12	359 27.8	10 41.7	153 38.3	317 55.4	− 9 10.1	318 17.4	− 6 23.4
14	29 28.1	10 39.9	183 43.3	347 56.3	− 9 12.4	348 19.3	− 6 24.7
16	59 28.5	10 38.2	213 48.2	17 57.1	− 9 14.7	18 21.3	− 6 26.0
18	89 28.8	10 36.5	243 53.1	47 58.0	− 9 16.9	48 23.3	− 6 27.3
20	119 29.2	10 34.8	273 58.1	77 58.9	− 9 19.2	78 25.2	− 6 28.6
22	149 29.5	10 33.0	304 3.0	107 59.8	− 9 21.5	108 27.2	− 6 29.9
Δ	2	−9		4	−11	10	−6

UT	MJESEC $S_\leftmoon$	MJESEC Δ	MJESEC $\delta_\leftmoon$	MJESEC Δ	JUPITER $S_\jupiter$	JUPITER $\delta_\jupiter$	SATURN $S_\saturn$	SATURN $\delta_\saturn$
h	° ′		° ′		° ′	° ′	° ′	° ′
0	357 58.0	164	− 5 53.1	122	330 57.4	− 0 43.5	149 14.2	0 40.8
2	27 8.7	164	− 5 28.8	122	1 2.7	− 0 43.7	179 18.6	0 40.6
4	56 19.5	164	− 5 4.4	122	31 8.1	− 0 44.0	209 23.0	0 40.4
6	85 30.4	165	− 4 39.9	123	61 13.5	− 0 44.2	239 27.5	0 40.2
8	114 41.3	165	− 4 15.4	123	91 18.9	− 0 44.4	269 31.9	0 39.9
10	143 52.3	165	− 3 50.8	123	121 24.2	− 0 44.6	299 36.3	0 39.7
12	173 3.3	165	− 3 26.1	123	151 29.6	− 0 44.8	329 40.7	0 39.5
14	202 14.4	166	− 3 1.4	124	181 35.0	− 0 45.0	359 45.1	0 39.2
16	231 25.5	166	− 2 36.7	124	211 40.4	− 0 45.2	29 49.6	0 39.0
18	260 36.6	166	− 2 11.9	124	241 45.7	− 0 45.5	59 54.0	0 38.8
20	289 47.8	166	− 1 47.1	124	271 51.1	− 0 45.7	89 58.4	0 38.6
22	318 59.0	166	− 1 22.2	124	301 56.5	− 0 45.9	120 2.8	0 38.3
Δ					27	−1	22	−1

φ	SUNCE IZLAZ	SUNCE ZALAZ	TRAJANJE SUMRAKA GRAĐ.	TRAJANJE SUMRAKA ASTR.	MJESEC IZLAZ	MJESEC Δ/24	MJESEC ZALAZ	MJESEC Δ/24
N	h min	h min	h min	h min	h min	min	h min	min
60	4 38	19 25	0 47	3 25	18 53	.2	5 44	3.2
55	4 53	19 10	0 39	2 30	18 51	.4	5 50	3.0
50	5 4	18 59	0 34	2 4	18 49	.6	5 55	2.7
45	5 13	18 50	0 31	1 48	18 47	.8	5 59	2.6
40	5 21	18 43	0 28	1 38	18 46	.9	6 2	2.4
35	5 27	18 36	0 26	1 30	18 45	1.1	6 5	2.3
30	5 33	18 31	0 25	1 24	18 44	1.2	6 7	2.2
20	5 43	18 21	0 23	1 16	18 42	1.4	6 11	2.0
10	5 51	18 13	0 21	1 11	18 40	1.5	6 15	1.8
0	5 59	18 5	0 21	1 10	18 39	1.7	6 18	1.7
10	6 6	17 58	0 21	1 11	18 37	1.8	6 21	1.5
20	6 14	17 50	0 22	1 14	18 36	2.0	6 25	1.4
30	6 24	17 41	0 24	1 20	18 34	2.2	6 29	1.2
35	6 29	17 36	0 26	1 25	18 33	2.3	6 31	1.1
40	6 34	17 30	0 28	1 30	18 32	2.4	6 34	.9
45	6 41	17 24	0 30	1 38	18 30	2.6	6 37	.8
50	6 49	17 16	0 33	1 48	18 29	2.7	6 40	.6
55	6 59	17 6	0 37	2 1	18 27	3.0	6 45	.4
60	7 12	16 53	0 43	2 20	18 24	3.2	6 50	.2
S								

SUNCE UT	SUNCE $e = T_p - UT$	SUNCE Δ/24	SUNCE r	MJESEC Prolaz	MJESEC Δ/24	MJESEC $\pi_\leftmoon$	MJESEC r
h	min s	s	′	h min	min	′	′
00	− 2 17.1	.7	15.8	$T_{\overline{m}}$ 0 8	1.7	54.0	14.7
12	− 2 8.7	$T_{\overline{m}_\odot}$ 12 h 2.1 min		Starost 14.9 d	Faza ○		

PLANETE

Pl.	$T_{\overline{m}}$	π	360−α	Vel.	Pl.	$T_{\overline{m}}$	π	360−α	Vel.
	h min	′	°			h min	′	°	
♀	14 48	.2	165	−4.3	♃	1 56	.0	358	−2.7
♂	14 47	.1	165	1.5	♄	14 1	.0	176	1.1

UT	SUNCE $S_\odot$	SUNCE $\delta_\odot$	PROLJ. TAČKA S_Υ	VENERA S_φ	VENERA δ_φ	MARS S_σ	MARS δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	179 29.9	10 31.3	334 7.9	138 .6	− 9 23.8	138 29.1	− 6 31.1
2	209 30.2	10 29.6	4 12.8	168 1.5	− 9 26.0	168 31.1	− 6 32.4
4	239 30.6	10 27.8	34 17.8	198 2.4	− 9 28.3	198 33.1	− 6 33.7
6	269 30.9	10 26.1	64 22.7	228 3.3	− 9 30.6	228 35.0	− 6 35.0
8	299 31.3	10 24.4	94 27.6	258 4.1	− 9 32.8	258 37.0	− 6 36.3
10	329 31.6	10 22.6	124 32.6	288 5.0	− 9 35.1	288 38.9	− 6 37.6
12	359 32.0	10 20.9	154 37.5	318 5.9	− 9 37.4	318 40.9	− 6 38.9
14	29 32.3	10 19.1	184 42.4	348 6.8	− 9 39.6	348 42.8	− 6 40.2
16	59 32.7	10 17.4	214 47.3	18 7.7	− 9 41.9	18 44.8	− 6 41.4
18	89 33.0	10 15.6	244 52.3	48 8.6	− 9 44.2	48 46.8	− 6 42.7
20	119 33.4	10 13.9	274 57.2	78 9.5	− 9 46.4	78 48.7	− 6 44.0
22	149 33.8	10 12.2	305 2.1	108 10.4	− 9 48.7	108 50.7	− 6 45.3
Δ	2	−9		4	−11	10	−6

UT	MJESEC $S_\leftmoon$	MJESEC Δ	MJESEC $\delta_\leftmoon$	MJESEC Δ	JUPITER $S_\jupiter$	JUPITER $\delta_\jupiter$	SATURN $S_\saturn$	SATURN $\delta_\saturn$
h	° ′		° ′		° ′	° ′	° ′	° ′
0	348 10.2	166	− 0 57.4	124	332 1.9	− 0 46.1	150 7.2	0 38.1
2	17 21.4	166	− 0 32.5	124	2 7.3	− 0 46.3	180 11.6	0 37.9
4	46 32.6	166	− 0 7.6	124	32 12.7	− 0 46.5	210 16.1	0 37.7
6	75 43.8	166	0 17.3	124	62 18.0	− 0 46.7	240 20.5	0 37.4
8	104 55.0	166	0 42.2	124	92 23.4	− 0 47.0	270 24.9	0 37.2
10	134 6.1	166	1 7.1	124	122 28.8	− 0 47.2	300 29.3	0 37.0
12	163 17.3	165	1 31.9	124	152 34.2	− 0 47.4	330 33.7	0 36.7
14	192 28.4	165	1 56.8	124	182 39.6	− 0 47.6	0 38.1	0 36.5
16	221 39.4	165	2 21.6	124	212 45.0	− 0 47.8	30 42.6	0 36.3
18	250 50.4	165	2 46.4	124	242 50.4	− 0 48.0	60 47.0	0 36.1
20	280 1.4	164	3 11.2	124	272 55.8	− 0 48.3	90 51.4	0 35.8
22	309 12.3	164	3 36.0	123	303 1.2	− 0 48.5	120 55.8	0 35.6
Δ					27	−1	22	−1

φ	SUNCE IZLAZ	SUNCE ZALAZ	TRAJANJE SUMRAKA GRAĐ.	TRAJANJE SUMRAKA ASTR.	MJESEC IZLAZ	MJESEC Δ/24	MJESEC ZALAZ	MJESEC Δ/24
N	h min	h min	h min	h min	h min	min	h min	min
60	4 40	19 22	0 47	3 20	18 58	.2	7 2	3.2
55	4 55	19 8	0 39	2 28	19 2	.5	7 1	3.0
50	5 6	18 57	0 34	2 4	19 5	.7	7 1	2.7
45	5 15	18 48	0 31	1 48	19 7	.8	7 0	2.6
40	5 22	18 41	0 28	1 37	19 9	1.0	6 60	2.4
35	5 28	18 35	0 26	1 29	19 10	1.1	6 60	2.3
30	5 34	18 30	0 25	1 23	19 12	1.2	6 59	2.2
20	5 43	18 21	0 22	1 16	19 15	1.4	6 59	2.0
10	5 51	18 13	0 21	1 11	19 17	1.5	6 59	1.8
0	5 59	18 5	0 21	1 10	19 19	1.7	6 58	1.7
10	6 6	17 58	0 21	1 11	19 21	1.9	6 58	1.5
20	6 14	17 50	0 22	1 14	19 24	2.0	6 58	1.4
30	6 22	17 42	0 24	1 20	19 26	2.2	6 57	1.2
35	6 27	17 37	0 26	1 24	19 28	2.3	6 57	1.1
40	6 33	17 31	0 27	1 30	19 30	2.4	6 57	1.0
45	6 39	17 25	0 30	1 38	19 32	2.6	6 56	.8
50	6 47	17 17	0 33	1 48	19 34	2.8	6 56	.7
55	6 57	17 8	0 37	2 1	19 38	3.0	6 55	.5
60	7 9	16 56	0 43	2 20	19 42	3.3	6 55	.2
S								

SUNCE UT	SUNCE $e = T_p - UT$	SUNCE Δ/24	SUNCE r	MJESEC Prolaz	MJESEC Δ/24	MJESEC $\pi_\leftmoon$	MJESEC r
h	min s	s	′	h min	min	′	′
00	− 2 .4	.7	15.9	$T_{\overline{m}}$ 0 49	1.7	54.0	14.7
12	− 1 51.9	$T_{\overline{m}_\odot}$ 12 h 1.9 min		Starost 15.9 d	Faza ○		

PLANETE

Pl.	$T_{\overline{m}}$	π	360−α	Vel.	Pl.	$T_{\overline{m}}$	π	360−α	Vel.
	h min	′	°			h min	′	°	
♀	14 48	.2	164	−4.3	♃	1 52	.0	358	−2.7
♂	14 45	.1	164	1.5	♄	13 57	.0	176	1.1

UT	SUNCE $S_\odot$	SUNCE $\delta_\odot$	PROLJ. TAČKA S_Υ	VENERA S_φ	VENERA δ_φ	MARS S_σ	MARS δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	179 34.1	10 10.4	335 7.1	138 11.3	- 9 50.9	138 52.6	- 6 46.6
2	209 34.5	10 8.7	5 12.0	168 12.2	- 9 53.2	168 54.6	- 6 47.9
4	239 34.8	10 6.9	35 16.9	198 13.2	- 9 55.4	198 56.5	- 6 49.2
6	269 35.2	10 5.2	65 21.8	228 14.1	- 9 57.7	228 58.5	- 6 50.4
8	299 35.6	10 3.4	95 26.8	258 15.0	- 9 59.9	259 .4	- 6 51.7
10	329 35.9	10 1.7	125 31.7	288 15.9	-10 2.2	289 2.4	- 6 53.0
12	359 36.3	9 59.9	155 36.6	318 16.8	-10 4.4	319 4.3	- 6 54.3
14	29 36.6	9 58.2	185 41.5	348 17.8	-10 6.7	349 6.3	- 6 55.6
16	59 37.0	9 56.4	215 46.5	18 18.7	-10 8.9	19 8.2	- 6 56.9
18	89 37.4	9 54.6	245 51.4	48 19.6	-10 11.2	49 10.1	- 6 58.2
20	119 37.7	9 52.9	275 56.3	78 20.6	-10 13.4	79 12.1	- 6 59.4
22	149 38.1	9 51.1	306 1.3	108 21.5	-10 15.7	109 14.0	- 7 .7
Δ	2	-9		5	-11	10	-6

UT	MJESEC $S_\leftmoon$	MJESEC Δ	MJESEC $\delta_\leftmoon$	MJESEC Δ	JUPITER S_4	JUPITER δ_4	SATURN S_η	SATURN δ_η
h	° ′		° ′		° ′	° ′	° ′	° ′
0	338 23.1	164	4 .6	123	333 6.5	- 0 48.7	151 .2	0 35.4
2	7 33.8	163	4 25.3	123	3 11.9	- 0 48.9	181 4.6	0 35.1
4	36 44.5	163	4 49.9	123	33 17.3	- 0 49.1	211 9.1	0 34.9
6	65 55.1	162	5 14.4	122	63 22.7	- 0 49.4	241 13.5	0 34.7
8	95 5.6	162	5 38.8	122	93 28.1	- 0 49.6	271 17.9	0 34.5
10	124 15.9	161	6 3.2	121	123 33.5	- 0 49.8	301 22.3	0 34.2
12	153 26.2	161	6 27.5	121	153 38.9	- 0 50.0	331 26.7	0 34.0
14	182 36.3	160	6 51.7	121	183 44.3	- 0 50.3	1 31.1	0 33.8
16	211 46.4	159	7 15.8	120	213 49.7	- 0 50.5	31 35.5	0 33.5
18	240 56.3	159	7 39.8	120	243 55.1	- 0 50.7	61 39.9	0 33.3
20	270 6.0	158	8 3.8	119	274 .5	- 0 50.9	91 44.4	0 33.1
22	299 15.6	157	8 27.6	118	304 5.9	- 0 51.1	121 48.8	0 32.8
Δ					27	-1	22	-1

φ	SUNCE IZLAZ	SUNCE ZALAZ	TRAJANJE SUMRAKA GRAĐ.	TRAJANJE SUMRAKA ASTR.	MJESEC IZLAZ	MJESEC Δ/24	MJESEC ZALAZ	MJESEC Δ/24
N	h min	h min	h min	h min	h min	min	h min	min
60	4 43	19 19	0 46	3 15	19 3	.3	8 19	3.3
55	4 57	19 5	0 39	2 27	19 13	.5	8 12	3.0
50	5 7	18 55	0 34	2 3	19 21	.7	8 6	2.8
45	5 16	18 47	0 31	1 47	19 27	.9	8 2	2.6
40	5 23	18 40	0 28	1 37	19 32	1.1	7 58	2.5
35	5 29	18 34	0 26	1 29	19 37	1.2	7 55	2.3
30	5 34	18 29	0 25	1 23	19 41	1.3	7 52	2.2
20	5 43	18 20	0 22	1 15	19 48	1.5	7 47	2.0
10	5 51	18 12	0 21	1 11	19 54	1.6	7 43	1.9
0	5 58	18 5	0 21	1 10	19 60	1.8	7 39	1.7
10	6 5	17 58	0 21	1 11	20 6	1.9	7 35	1.6
20	6 13	17 51	0 22	1 14	20 12	2.1	7 30	1.4
30	6 21	17 42	0 24	1 20	20 19	2.3	7 25	1.2
35	6 26	17 38	0 26	1 24	20 24	2.4	7 23	1.1
40	6 31	17 32	0 27	1 30	20 28	2.5	7 20	1.0
45	6 38	17 26	0 30	1 38	20 34	2.6	7 16	.9
50	6 45	17 19	0 33	1 48	20 41	2.8	7 12	.7
55	6 54	17 10	0 37	2 1	20 49	3.0	7 6	.5
60	7 6	16 58	0 43	2 19	20 60	3.3	6 59	.2
S								

SUNCE UT	SUNCE $e = T_p - UT$	SUNCE Δ/24	SUNCE r	MJESEC Prolaz	MJESEC Δ/24	MJESEC $\pi_\leftmoon$	MJESEC r
h	min s	s	′	h min	min	′	′
00	- 1 43.3	.7	15.9	$T_{\overline{m}}$ 1 29	1.7	54.1	14.7
12	- 1 34.6	$T_{\overline{m}_\odot}$ 12 h	1.6 min	Starost 16.9 d	Faza ❍		

PLANETE

Pl.	$T_{\overline{m}}$	π	360−α	Vel.	Pl.	$T_{\overline{m}}$	π	360−α	Vel.
	h min	′	°			h min	′	°	
♀	14 47	.2	163	-4.3	♃	1 47	.0	358	-2.7
♂	14 44	.1	164	1.5	♄	13 54	.0	176	1.1

UT	SUNCE $S_\odot$	SUNCE $\delta_\odot$	PROLJ. TAČKA S_Υ	VENERA S_φ	VENERA δ_φ	MARS S_σ	MARS δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	179 38.5	9 49.4	336 6.2	138 22.5	-10 17.9	139 16.0	- 7 2.0
2	209 38.8	9 47.6	6 11.1	168 23.4	-10 20.1	169 17.9	- 7 3.3
4	239 39.2	9 45.8	36 16.0	198 24.3	-10 22.4	199 19.9	- 7 4.6
6	269 39.6	9 44.1	66 21.0	228 25.3	-10 24.6	229 21.8	- 7 5.9
8	299 39.9	9 42.3	96 25.9	258 26.3	-10 26.8	259 23.7	- 7 7.2
10	329 40.3	9 40.6	126 30.8	288 27.2	-10 29.0	289 25.7	- 7 8.4
12	359 40.7	9 38.8	156 35.8	318 28.2	-10 31.3	319 27.6	- 7 9.7
14	29 41.1	9 37.0	186 40.7	348 29.1	-10 33.5	349 29.6	- 7 11.0
16	59 41.4	9 35.3	216 45.6	18 30.1	-10 35.7	19 31.5	- 7 12.3
18	89 41.8	9 33.5	246 50.5	48 31.1	-10 37.9	49 33.4	- 7 13.6
20	119 42.2	9 31.7	276 55.5	78 32.0	-10 40.2	79 35.4	- 7 14.9
22	149 42.5	9 29.9	307 .4	108 33.0	-10 42.4	109 37.3	- 7 16.1
Δ	2	-9		5	-11	10	-6

UT	MJESEC $S_\leftmoon$	MJESEC Δ	MJESEC $\delta_\leftmoon$	MJESEC Δ	JUPITER S_4	JUPITER δ_4	SATURN S_η	SATURN δ_η
h	° ′		° ′		° ′	° ′	° ′	° ′
0	328 25.1	157	8 51.3	118	334 11.3	- 0 51.4	151 53.2	0 32.6
2	357 34.4	156	9 14.8	117	4 16.7	- 0 51.6	181 57.6	0 32.4
4	26 43.5	155	9 38.3	117	34 22.1	- 0 51.8	212 2.0	0 32.2
6	55 52.5	154	10 1.6	116	64 27.5	- 0 52.0	242 6.4	0 31.9
8	85 1.3	153	10 24.7	115	94 32.9	- 0 52.3	272 10.8	0 31.7
10	114 9.9	152	10 47.8	114	124 38.4	- 0 52.5	302 15.2	0 31.5
12	143 18.3	151	11 10.6	114	154 43.8	- 0 52.7	332 19.7	0 31.2
14	172 26.6	150	11 33.3	113	184 49.2	- 0 52.9	2 24.1	0 31.0
16	201 34.6	149	11 55.9	112	214 54.6	- 0 53.2	32 28.5	0 30.8
18	230 42.4	148	12 18.3	111	244 60.0	- 0 53.4	62 32.9	0 30.5
20	259 50.0	147	12 40.5	110	275 5.4	- 0 53.6	92 37.3	0 30.3
22	288 57.4	146	13 2.5	109	305 10.8	- 0 53.8	122 41.7	0 30.1
Δ					27	-1	22	-1

φ	SUNCE IZLAZ	SUNCE ZALAZ	TRAJANJE SUMRAKA GRAĐ.	TRAJANJE SUMRAKA ASTR.	MJESEC IZLAZ	MJESEC Δ/24	MJESEC ZALAZ	MJESEC Δ/24
N	h min	h min	h min	h min	h min	min	h min	min
60	4 45	19 16	0 46	3 11	19 9	.4	9 39	3.4
55	4 58	19 3	0 39	2 25	19 26	.7	9 24	3.1
50	5 9	18 53	0 34	2 2	19 39	.9	9 13	2.8
45	5 17	18 45	0 31	1 47	19 49	1.0	9 4	2.7
40	5 24	18 38	0 28	1 36	19 58	1.2	8 57	2.5
35	5 30	18 32	0 26	1 29	20 5	1.3	8 51	2.4
30	5 35	18 27	0 24	1 23	20 11	1.4	8 45	2.3
20	5 43	18 19	0 22	1 15	20 23	1.6	8 36	2.1
10	5 51	18 11	0 21	1 11	20 33	1.7	8 28	2.0
0	5 58	18 5	0 21	1 10	20 42	1.9	8 20	1.8
10	6 5	17 58	0 21	1 10	20 52	2.0	8 12	1.7
20	6 12	17 51	0 22	1 14	21 2	2.2	8 4	1.5
30	6 20	17 43	0 24	1 20	21 14	2.3	7 55	1.3
35	6 25	17 38	0 26	1 24	21 20	2.4	7 50	1.2
40	6 30	17 33	0 27	1 30	21 28	2.5	7 44	1.1
45	6 36	17 27	0 30	1 38	21 37	2.7	7 37	1.0
50	6 43	17 20	0 33	1 48	21 48	2.9	7 28	.8
55	6 52	17 12	0 37	2 1	22 2	3.1	7 18	.6
60	7 3	17 0	0 43	2 19	22 20	3.4	7 5	.3
S								

SUNCE UT	SUNCE $e = T_p - UT$	SUNCE Δ/24	SUNCE r	MJESEC Prolaz	MJESEC Δ/24	MJESEC $\pi_\leftmoon$	MJESEC r
h	min s	s	′	h min	min	′	′
00	- 1 25.9	.7	15.9	$T_{\overline{m}}$ 2 10	1.8	54.3	14.8
12	- 1 17.0	$T_{\overline{m}_\odot}$ 12 h	1.3 min	Starost 17.9 d	Faza ❍		

PLANETE

Pl.	$T_{\overline{m}}$	π	360−α	Vel.	Pl.	$T_{\overline{m}}$	π	360−α	Vel.
	h min	′	°			h min	′	°	
♀	14 46	.2	162	-4.3	♃	1 43	.0	358	-2.7
♂	14 42	.1	163	1.5	♄	13 50	.0	176	1.1

UT	SUNCE		PROLJ. TAČKA	VENERA		MARS	
	$S_\odot$	$\delta_\odot$	S_Υ	S_φ	δ_φ	S_σ	δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	179 42.9	9 28.2	337 5.3	138 34.0	-10 44.6	139 39.2	- 7 17.4
2	209 43.3	9 26.4	7 10.3	168 35.0	-10 46.8	169 41.2	- 7 18.7
4	239 43.7	9 24.6	37 15.2	198 36.0	-10 49.0	199 43.1	- 7 20.0
6	269 44.0	9 22.8	67 20.1	228 36.9	-10 51.2	229 45.0	- 7 21.3
8	299 44.4	9 21.1	97 25.0	258 37.9	-10 53.4	259 47.0	- 7 22.6
10	329 44.8	9 19.3	127 30.0	288 38.9	-10 55.6	289 48.9	- 7 23.8
12	359 45.2	9 17.5	157 34.9	318 39.9	-10 57.8	319 50.8	- 7 25.1
14	29 45.6	9 15.7	187 39.8	348 40.9	-11 .1	349 52.7	- 7 26.4
16	59 45.9	9 14.0	217 44.8	18 41.9	-11 2.3	19 54.7	- 7 27.7
18	89 46.3	9 12.2	247 49.7	48 42.9	-11 4.5	49 56.6	- 7 29.0
20	119 46.7	9 10.4	277 54.6	78 44.0	-11 6.7	79 58.5	- 7 30.2
22	149 47.1	9 8.6	307 59.5	108 45.0	-11 8.8	110 .5	- 7 31.5
Δ	2	-9		5	-11	10	-6

UT	MJESEC				JUPITER		SATURN	
	$S_\leftmoon$	Δ	$\delta_\leftmoon$	Δ	S_4	δ_4	S_η	δ_η
h	° ′		° ′		° ′	° ′	° ′	° ′
0	318 4.5	145	13 24.3	108	335 16.2	- 0 54.1	152 46.1	0 29.9
2	347 11.4	143	13 45.9	107	5 21.6	- 0 54.3	182 50.5	0 29.6
4	16 18.1	142	14 7.3	106	35 27.1	- 0 54.5	212 54.9	0 29.4
6	45 24.5	141	14 28.5	105	65 32.5	- 0 54.8	242 59.3	0 29.2
8	74 30.7	140	14 49.5	104	95 37.9	- 0 55.0	273 3.7	0 28.9
10	103 36.6	138	15 10.2	103	125 43.3	- 0 55.2	303 8.2	0 28.7
12	132 42.3	137	15 30.8	101	155 48.7	- 0 55.4	333 12.6	0 28.5
14	161 47.7	136	15 51.0	100	185 54.1	- 0 55.7	3 17.0	0 28.2
16	190 52.8	134	16 11.1	99	215 59.6	- 0 55.9	33 21.4	0 28.0
18	219 57.6	133	16 30.9	98	246 5.0	- 0 56.1	63 25.8	0 27.8
20	249 2.2	131	16 50.4	96	276 10.4	- 0 56.4	93 30.2	0 27.5
22	278 6.4	130	17 9.6	95	306 15.8	- 0 56.6	123 34.6	0 27.3
Δ					27	-1	22	-1

φ	SUNCE		TRAJANJE SUMRAKA		MJESEC			
	IZLAZ	ZALAZ	GRAĐ.	ASTR.	IZLAZ	Δ/24	ZALAZ	Δ/24
N	h min	h min	h min	h min	h min	min	h min	min
60	4 47	19 13	0 46	3 7	19 18	.5	10 60	3.5
55	5 0	19 0	0 39	2 24	19 42	.9	10 38	3.1
50	5 10	18 51	0 34	2 1	19 60	1.1	10 21	2.9
45	5 18	18 43	0 30	1 47	20 14	1.3	10 8	2.7
40	5 25	18 37	0 28	1 36	20 26	1.4	9 58	2.6
35	5 30	18 31	0 26	1 29	20 36	1.5	9 48	2.5
30	5 35	18 26	0 24	1 23	20 45	1.6	9 40	2.4
20	5 44	18 18	0 22	1 15	21 1	1.7	9 27	2.2
10	5 51	18 11	0 21	1 11	21 14	1.9	9 15	2.1
0	5 58	18 4	0 21	1 10	21 27	2.0	9 3	1.9
10	6 4	17 58	0 21	1 10	21 40	2.1	8 52	1.8
20	6 11	17 51	0 22	1 14	21 54	2.2	8 40	1.6
30	6 19	17 43	0 24	1 20	22 9	2.4	8 27	1.5
35	6 23	17 39	0 26	1 24	22 19	2.5	8 19	1.4
40	6 28	17 34	0 27	1 30	22 29	2.6	8 10	1.3
45	6 34	17 28	0 30	1 38	22 42	2.7	8 0	1.1
50	6 41	17 22	0 33	1 48	22 57	2.9	7 48	1.0
55	6 50	17 13	0 37	2 1	23 17	3.1	7 32	.7
60	7 0	17 3	0 42	2 19	23 43	3.5	7 12	.4
S								

UT	SUNCE			MJESEC			
	$e = T_p - UT$	Δ/24	r	Prolaz	Δ/24	$\pi_\leftmoon$	r
h	min s	s	′	h min	min	′	′
00	- 1 8.1	.8	15.9	$T_{\overline{m}}$ 2 53	1.9	54.6	14.9
12	- 0 59.0	$T_{\overline{m}_\odot}$ 12 h	1.0 min	Starost 18.9 d	Faza ◑		

PLANETE

Pl.	$T_{\overline{m}}$	π	360−α	Vel.	Pl.	$T_{\overline{m}}$	π	360−α	Vel.
	h min	′	°			h min	′	°	
♀	14 45	.2	161	-4.3	♃	1 39	.0	358	-2.7
♂	14 40	.1	163	1.5	♄	13 47	.0	176	1.1

UT	SUNCE		PROLJ. TAČKA	VENERA		MARS	
	$S_\odot$	$\delta_\odot$	S_Υ	S_φ	δ_φ	S_σ	δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	179 47.5	9 6.8	338 4.5	138 46.0	-11 11.0	140 2.4	- 7 32.8
2	209 47.8	9 5.0	8 9.4	168 47.0	-11 13.2	170 4.3	- 7 34.1
4	239 48.2	9 3.2	38 14.3	198 48.0	-11 15.4	200 6.2	- 7 35.4
6	269 48.6	9 1.5	68 19.3	228 49.0	-11 17.6	230 8.1	- 7 36.6
8	299 49.0	8 59.7	98 24.2	258 50.1	-11 19.8	260 10.1	- 7 37.9
10	329 49.4	8 57.9	128 29.1	288 51.1	-11 22.0	290 12.0	- 7 39.2
12	359 49.8	8 56.1	158 34.0	318 52.1	-11 24.2	320 13.9	- 7 40.5
14	29 50.1	8 54.3	188 39.0	348 53.2	-11 26.4	350 15.8	- 7 41.8
16	59 50.5	8 52.5	218 43.9	18 54.2	-11 28.5	20 17.7	- 7 43.0
18	89 50.9	8 50.7	248 48.8	48 55.3	-11 30.7	50 19.7	- 7 44.3
20	119 51.3	8 48.9	278 53.8	78 56.3	-11 32.9	80 21.6	- 7 45.6
22	149 51.7	8 47.1	308 58.7	108 57.4	-11 35.1	110 23.5	- 7 46.9
Δ	2	-9		5	-11	10	-6

UT	MJESEC				JUPITER		SATURN	
	$S_\leftmoon$	Δ	$\delta_\leftmoon$	Δ	S_4	δ_4	S_η	δ_η
h	° ′		° ′		° ′	° ′	° ′	° ′
0	307 10.4	128	17 28.6	93	336 21.3	- 0 56.8	153 39.0	0 27.1
2	336 14.1	127	17 47.3	92	6 26.7	- 0 57.1	183 43.4	0 26.8
4	5 17.5	125	18 5.7	90	36 32.1	- 0 57.3	213 47.8	0 26.6
6	34 20.5	124	18 23.7	89	66 37.5	- 0 57.5	243 52.2	0 26.4
8	63 23.3	122	18 41.5	87	96 43.0	- 0 57.8	273 56.6	0 26.1
10	92 25.7	121	18 59.0	86	126 48.4	- 0 58.0	304 1.0	0 25.9
12	121 27.9	119	19 16.1	84	156 53.8	- 0 58.2	334 5.4	0 25.7
14	150 29.7	117	19 32.9	82	186 59.2	- 0 58.5	4 9.8	0 25.5
16	179 31.2	116	19 49.4	81	217 4.7	- 0 58.7	34 14.3	0 25.2
18	208 32.3	114	20 5.5	79	247 10.1	- 0 58.9	64 18.7	0 25.0
20	237 33.2	113	20 21.3	77	277 15.5	- 0 59.2	94 23.1	0 24.8
22	266 33.7	111	20 36.7	75	307 21.0	- 0 59.4	124 27.5	0 24.5
Δ					27	-1	22	-1

φ	SUNCE		TRAJANJE SUMRAKA		MJESEC			
	IZLAZ	ZALAZ	GRAĐ.	ASTR.	IZLAZ	Δ/24	ZALAZ	Δ/24
N	h min	h min	h min	h min	h min	min	h min	min
60	4 50	19 10	0 45	3 3	19 30	.8	12 23	3.5
55	5 2	18 58	0 38	2 23	20 3	1.2	11 53	3.1
50	5 12	18 49	0 34	2 1	20 26	1.4	11 31	2.9
45	5 19	18 41	0 30	1 46	20 44	1.5	11 13	2.7
40	5 26	18 35	0 28	1 36	20 59	1.7	10 59	2.6
35	5 31	18 30	0 26	1 28	21 12	1.7	10 47	2.5
30	5 36	18 25	0 24	1 23	21 23	1.8	10 37	2.4
20	5 44	18 17	0 22	1 15	21 42	1.9	10 19	2.3
10	5 51	18 10	0 21	1 11	21 59	2.0	10 4	2.2
0	5 57	18 4	0 21	1 10	22 15	2.1	9 50	2.1
10	6 4	17 58	0 21	1 10	22 30	2.2	9 35	1.9
20	6 10	17 51	0 22	1 14	22 47	2.3	9 20	1.8
30	6 18	17 44	0 24	1 20	23 7	2.4	9 2	1.7
35	6 22	17 40	0 26	1 24	23 18	2.5	8 52	1.6
40	6 27	17 35	0 27	1 30	23 32	2.6	8 41	1.5
45	6 32	17 30	0 30	1 38	23 47	2.7	8 27	1.4
50	6 39	17 23	0 33	1 48	. . .	.0	8 11	1.2
55	6 47	17 15	0 37	2 1	. . .	.0	7 50	1.0
60	6 58	17 5	0 42	2 19	. . .	.0	7 22	.6
S								

UT	SUNCE			MJESEC			
	$e = T_p - UT$	Δ/24	r	Prolaz	Δ/24	$\pi_\leftmoon$	r
h	min s	s	′	h min	min	′	′
00	- 0 50.0	.8	15.9	$T_{\overline{m}}$ 3 38	2.0	55.1	15.0
12	- 0 40.8	$T_{\overline{m}_\odot}$ 12 h	.7 min	Starost 19.9 d	Faza ◑		

PLANETE

Pl.	$T_{\overline{m}}$	π	360−α	Vel.	Pl.	$T_{\overline{m}}$	π	360−α	Vel.
	h min	′	°			h min	′	°	
♀	14 44	.2	161	-4.3	♃	1 34	.0	358	-2.7
♂	14 39	.1	162	1.5	♄	13 43	.0	176	1.1

UT	SUNCE $S_\odot$	SUNCE $\delta_\odot$	PROLJ. TAČKA S_Υ	VENERA S_φ	VENERA δ_φ	MARS S_σ	MARS δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	179 52.1	8 45.3	339 3.6	138 58.4	-11 37.2	140 25.4	- 7 48.2
2	209 52.5	8 43.5	9 8.5	168 59.5	-11 39.4	170 27.3	- 7 49.4
4	239 52.8	8 41.7	39 13.5	199 .5	-11 41.6	200 29.2	- 7 50.7
6	269 53.2	8 39.9	69 18.4	229 1.6	-11 43.7	230 31.2	- 7 52.0
8	299 53.6	8 38.1	99 23.3	259 2.7	-11 45.9	260 33.1	- 7 53.3
10	329 54.0	8 36.3	129 28.2	289 3.7	-11 48.1	290 35.0	- 7 54.6
12	359 54.4	8 34.5	159 33.2	319 4.8	-11 50.2	320 36.9	- 7 55.8
14	29 54.8	8 32.7	189 38.1	349 5.9	-11 52.4	350 38.8	- 7 57.1
16	59 55.2	8 30.9	219 43.0	19 7.0	-11 54.5	20 40.7	- 7 58.4
18	89 55.6	8 29.1	249 48.0	49 8.1	-11 56.7	50 42.6	- 7 59.7
20	119 56.0	8 27.3	279 52.9	79 9.2	-11 58.8	80 44.5	- 8 .9
22	149 56.4	8 25.5	309 57.8	109 10.2	-12 1.0	110 46.4	- 8 2.2
Δ	2	-9		5	-11	10	-6

UT	MJESEC $S_\leftmoon$	MJESEC Δ	MJESEC $\delta_\leftmoon$	MJESEC Δ	JUPITER S_4	JUPITER δ_4	SATURN S_η	SATURN δ_η
h	° ′		° ′		° ′	° ′	° ′	° ′
0	295 33.8	109	20 51.7	73	337 26.4	- 0 59.6	154 31.9	0 24.3
2	324 33.7	108	21 6.3	71	7 31.8	- 0 59.9	184 36.3	0 24.1
4	353 33.2	106	21 20.6	69	37 37.3	- 1 .1	214 40.7	0 23.8
6	22 32.4	104	21 34.4	67	67 42.7	- 1 .3	244 45.1	0 23.6
8	51 31.2	103	21 47.9	65	97 48.1	- 1 .6	274 49.5	0 23.4
10	80 29.7	101	22 .9	63	127 53.6	- 1 .8	304 53.9	0 23.1
12	109 27.9	99	22 13.5	61	157 59.0	- 1 1.0	334 58.3	0 22.9
14	138 25.7	98	22 25.7	59	188 4.4	- 1 1.3	5 2.7	0 22.7
16	167 23.3	96	22 37.4	56	218 9.9	- 1 1.5	35 7.1	0 22.4
18	196 20.4	94	22 48.7	54	248 15.3	- 1 1.8	65 11.5	0 22.2
20	225 17.3	93	22 59.6	52	278 20.8	- 1 2.0	95 15.9	0 22.0
22	254 13.8	91	23 9.9	50	308 26.2	- 1 2.2	125 20.3	0 21.7
Δ					27	-1	22	-1

φ	SUNCE IZLAZ	SUNCE ZALAZ	TRAJANJE SUMRAKA GRAĐ.	TRAJANJE SUMRAKA ASTR.	MJESEC IZLAZ	MJESEC Δ/24	MJESEC ZALAZ	MJESEC Δ/24
N	h min	h min	h min	h min	h min	min	h min	min
60	4 52	19 7	0 45	3 0	19 51	1.4	13 47	3.2
55	5 4	18 55	0 38	2 21	20 31	1.7	13 7	2.9
50	5 13	18 47	0 34	1 60	20 60	1.8	12 40	2.8
45	5 21	18 39	0 30	1 46	21 21	1.9	12 19	2.7
40	5 27	18 33	0 28	1 36	21 39	2.0	12 2	2.6
35	5 32	18 28	0 26	1 28	21 54	2.0	11 48	2.5
30	5 36	18 24	0 24	1 22	22 7	2.1	11 35	2.5
20	5 44	18 16	0 22	1 15	22 29	2.2	11 14	2.4
10	5 51	18 10	0 21	1 11	22 48	2.2	10 56	2.3
0	5 57	18 4	0 21	1 9	23 6	2.3	10 39	2.2
10	6 3	17 58	0 21	1 10	23 24	2.3	10 22	2.1
20	6 10	17 51	0 22	1 13	23 43	2.4	10 4	2.0
30	6 17	17 44	0 24	1 20	. . .	.0	9 43	1.9
35	6 21	17 40	0 25	1 24	. . .	.0	9 31	1.9
40	6 25	17 36	0 27	1 30	. . .	.0	9 17	1.8
45	6 31	17 31	0 30	1 38	. . .	.0	9 0	1.7
50	6 37	17 25	0 33	1 48	0 7	2.8	8 40	1.6
55	6 45	17 17	0 37	2 1	0 32	3.0	8 14	1.4
60	6 55	17 7	0 42	2 19	1 8	3.4	7 37	1.1
S								

SUNCE UT	SUNCE $e = T_p - UT$	SUNCE Δ/24	SUNCE r	MJESEC Prolaz	MJESEC Δ/24	MJESEC $\pi_\leftmoon$	MJESEC r
h	min s	s	′	h min	min	′	′
00	- 0 31.5	.8	15.9	$T_{\overline{m}}$ 4 27	2.2	55.7	15.2
12	- 0 22.1	$T_{\overline{m}_\odot}$ 12 h .4 min		Starost 20.9 d	Faza ◑		

PLANETE

Pl.	$T_{\overline{m}}$	π	360−α	Vel.	Pl.	$T_{\overline{m}}$	π	360−α	Vel.
	h min	′	°			h min	′	°	
♀	14 44	.2	160	-4.3	♃	1 30	.0	358	-2.7
♂	14 37	.1	161	1.5	♄	13 40	.0	175	1.1

UT	SUNCE $S_\odot$	SUNCE $\delta_\odot$	PROLJ. TAČKA S_Υ	VENERA S_φ	VENERA δ_φ	MARS S_σ	MARS δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	179 56.8	8 23.7	340 2.7	139 11.3	-12 3.1	140 48.3	- 8 3.5
2	209 57.2	8 21.9	10 7.7	169 12.4	-12 5.3	170 50.2	- 8 4.8
4	239 57.5	8 20.1	40 12.6	199 13.5	-12 7.4	200 52.1	- 8 6.1
6	269 57.9	8 18.2	70 17.5	229 14.6	-12 9.6	230 54.0	- 8 7.3
8	299 58.3	8 16.4	100 22.5	259 15.8	-12 11.7	260 55.9	- 8 8.6
10	329 58.7	8 14.6	130 27.4	289 16.9	-12 13.9	290 57.8	- 8 9.9
12	359 59.1	8 12.8	160 32.3	319 18.0	-12 16.0	320 59.7	- 8 11.2
14	29 59.5	8 11.0	190 37.2	349 19.1	-12 18.1	351 1.6	- 8 12.4
16	59 59.9	8 9.2	220 42.2	19 20.2	-12 20.3	21 3.5	- 8 13.7
18	90 .3	8 7.4	250 47.1	49 21.3	-12 22.4	51 5.4	- 8 15.0
20	120 .7	8 5.5	280 52.0	79 22.5	-12 24.5	81 7.3	- 8 16.3
22	150 1.1	8 3.7	310 57.0	109 23.6	-12 26.6	111 9.2	- 8 17.5
Δ	2	-9		6	-11	10	-6

UT	MJESEC $S_\leftmoon$	MJESEC Δ	MJESEC $\delta_\leftmoon$	MJESEC Δ	JUPITER S_4	JUPITER δ_4	SATURN S_η	SATURN δ_η
h	° ′		° ′		° ′	° ′	° ′	° ′
0	283 10.0	89	23 19.8	47	338 31.6	- 1 2.5	155 24.7	0 21.5
2	312 5.9	88	23 29.3	45	8 37.1	- 1 2.7	185 29.1	0 21.3
4	341 1.5	86	23 38.2	42	38 42.5	- 1 2.9	215 33.5	0 21.0
6	9 56.8	85	23 46.6	40	68 48.0	- 1 3.2	245 37.9	0 20.8
8	38 51.7	83	23 54.5	37	98 53.4	- 1 3.4	275 42.3	0 20.6
10	67 46.4	82	24 2.0	34	128 58.9	- 1 3.7	305 46.7	0 20.3
12	96 40.7	80	24 8.8	32	159 4.3	- 1 3.9	335 51.1	0 20.1
14	125 34.8	79	24 15.2	29	189 9.8	- 1 4.1	5 55.5	0 19.9
16	154 28.6	78	24 21.0	26	219 15.2	- 1 4.4	35 59.9	0 19.6
18	183 22.1	76	24 26.3	24	249 20.7	- 1 4.6	66 4.3	0 19.4
20	212 15.3	75	24 31.1	21	279 26.1	- 1 4.9	96 8.7	0 19.2
22	241 8.3	74	24 35.3	18	309 31.6	- 1 5.1	126 13.1	0 18.9
Δ					27	-1	22	-1

φ	SUNCE IZLAZ	SUNCE ZALAZ	TRAJANJE SUMRAKA GRAĐ.	TRAJANJE SUMRAKA ASTR.	MJESEC IZLAZ	MJESEC Δ/24	MJESEC ZALAZ	MJESEC Δ/24
N	h min	h min	h min	h min	h min	min	h min	min
60	4 54	19 4	0 45	2 57	20 25	2.3	15 4	2.6
55	5 6	18 53	0 38	2 20	21 12	2.3	14 17	2.5
50	5 15	18 44	0 34	1 59	21 44	2.4	13 46	2.5
45	5 22	18 38	0 30	1 45	22 8	2.4	13 22	2.5
40	5 28	18 32	0 28	1 35	22 27	2.4	13 4	2.4
35	5 33	18 27	0 26	1 28	22 43	2.4	12 48	2.4
30	5 37	18 23	0 24	1 22	22 57	2.4	12 34	2.4
20	5 44	18 15	0 22	1 15	23 21	2.4	12 11	2.4
10	5 51	18 9	0 21	1 11	23 41	2.4	11 51	2.4
0	5 57	18 3	0 21	1 9	. . .	.0	11 32	2.3
10	6 3	17 58	0 21	1 10	. . .	.0	11 13	2.3
20	6 9	17 52	0 22	1 13	. . .	.0	10 53	2.3
30	6 16	17 45	0 24	1 20	0 6	2.4	10 30	2.2
35	6 19	17 41	0 25	1 24	0 19	2.5	10 16	2.2
40	6 24	17 37	0 27	1 30	0 34	2.5	10 0	2.2
45	6 29	17 32	0 30	1 38	0 53	2.6	9 42	2.1
50	6 35	17 26	0 33	1 48	1 15	2.7	9 18	2.1
55	6 42	17 19	0 37	2 1	1 46	2.8	8 48	2.0
60	6 52	17 10	0 42	2 19	2 30	3.0	8 2	1.8
S								

SUNCE UT	SUNCE $e = T_p - UT$	SUNCE Δ/24	SUNCE r	MJESEC Prolaz	MJESEC Δ/24	MJESEC $\pi_\leftmoon$	MJESEC r
h	min s	s	′	h min	min	′	′
00	- 0 12.8	.8	15.9	$T_{\overline{m}}$ 5 19	2.3	56.4	15.4
12	- 0 3.3	$T_{\overline{m}_\odot}$ 12 h .1 min		Starost 21.9 d	Faza ◑		

PLANETE

Pl.	$T_{\overline{m}}$	π	360−α	Vel.	Pl.	$T_{\overline{m}}$	π	360−α	Vel.
	h min	′	°			h min	′	°	
♀	14 43	.2	159	-4.3	♃	1 26	.0	358	-2.7
♂	14 36	.1	161	1.5	♄	13 36	.0	175	1.1

UT	SUNCE $S_\odot$	SUNCE $\delta_\odot$	PROLJ. TAČKA S_Υ	VENERA S_φ	VENERA δ_φ	MARS S_σ	MARS δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	180 1.5	8 1.9	341 1.9	139 24.7	-12 28.8	141 11.1	- 8 18.8
2	210 1.9	8 .1	11 6.8	169 25.9	-12 30.9	171 13.0	- 8 20.1
4	240 2.3	7 58.3	41 11.7	199 27.0	-12 33.0	201 14.9	- 8 21.4
6	270 2.7	7 56.4	71 16.7	229 28.2	-12 35.1	231 16.8	- 8 22.6
8	300 3.1	7 54.6	101 21.6	259 29.3	-12 37.3	261 18.7	- 8 23.9
10	330 3.5	7 52.8	131 26.5	289 30.5	-12 39.4	291 20.6	- 8 25.2
12	0 3.9	7 51.0	161 31.5	319 31.6	-12 41.5	321 22.5	- 8 26.5
14	30 4.3	7 49.1	191 36.4	349 32.8	-12 43.6	351 24.4	- 8 27.7
16	60 4.7	7 47.3	221 41.3	19 34.0	-12 45.7	21 26.3	- 8 29.0
18	90 5.1	7 45.5	251 46.2	49 35.1	-12 47.8	51 28.2	- 8 30.3
20	120 5.5	7 43.6	281 51.2	79 36.3	-12 49.9	81 30.0	- 8 31.5
22	150 5.9	7 41.8	311 56.1	109 37.5	-12 52.0	111 31.9	- 8 32.8
Δ	2	-9		6	-11	9	-6

UT	MJESEC $S_\leftmoon$	MJESEC Δ	MJESEC $\delta_\leftmoon$	MJESEC Δ	JUPITER S_4	JUPITER δ_4	SATURN S_η	SATURN δ_η
h	° ′		° ′		° ′	° ′	° ′	° ′
0	270 1.0	72	24 38.9	15	339 37.0	- 1 5.4	156 17.5	0 18.7
2	298 53.5	71	24 41.9	12	9 42.5	- 1 5.6	186 21.9	0 18.5
4	327 45.7	70	24 44.4	10	39 47.9	- 1 5.8	216 26.3	0 18.2
6	356 37.7	69	24 46.3	7	69 53.4	- 1 6.1	246 30.7	0 18.0
8	25 29.5	68	24 47.6	4	99 58.8	- 1 6.3	276 35.1	0 17.7
10	54 21.0	67	24 48.4	1	130 4.3	- 1 6.6	306 39.5	0 17.5
12	83 12.4	66	24 48.5	-2	160 9.7	- 1 6.8	336 43.9	0 17.3
14	112 3.6	65	24 48.0	-5	190 15.2	- 1 7.1	6 48.3	0 17.0
16	140 54.5	64	24 46.9	-8	220 20.6	- 1 7.3	36 52.7	0 16.8
18	169 45.4	63	24 45.2	-11	250 26.1	- 1 7.5	66 57.1	0 16.6
20	198 36.0	63	24 42.9	-15	280 31.6	- 1 7.8	97 1.5	0 16.3
22	227 26.5	62	24 40.0	-18	310 37.0	- 1 8.0	127 5.9	0 16.1
Δ					27	-1	22	-1

φ	SUNCE IZLAZ	SUNCE ZALAZ	TRAJANJE SUMRAKA GRAĐ.	TRAJANJE SUMRAKA ASTR.	MJESEC IZLAZ	MJESEC Δ/24	MJESEC ZALAZ	MJESEC Δ/24
N	h min	h min	h min	h min	h min	min	h min	min
60	4 57	19 1	0 45	2 55	21 19	3.3	16 7	1.8
55	5 8	18 50	0 38	2 19	22 8	3.0	15 19	2.0
50	5 16	18 42	0 33	1 58	22 40	2.9	14 46	2.1
45	5 23	18 36	0 30	1 45	23 4	2.8	14 22	2.2
40	5 28	18 30	0 28	1 35	23 24	2.7	14 2	2.2
35	5 33	18 26	0 26	1 28	23 40	2.7	13 46	2.3
30	5 37	18 22	0 24	1 22	23 54	2.6	13 32	2.3
20	5 45	18 15	0 22	1 15	. . .	.0	13 8	2.3
10	5 51	18 9	0 21	1 11	. . .	.0	12 47	2.4
0	5 56	18 3	0 21	1 9	0 1	2.4	12 28	2.4
10	6 2	17 58	0 21	1 10	0 20	2.4	12 8	2.4
20	6 8	17 52	0 22	1 13	0 41	2.4	11 47	2.5
30	6 14	17 45	0 24	1 20	1 5	2.4	11 23	2.5
35	6 18	17 42	0 25	1 24	1 19	2.4	11 9	2.5
40	6 22	17 38	0 27	1 30	1 35	2.4	10 53	2.6
45	6 27	17 33	0 30	1 38	1 55	2.3	10 33	2.6
50	6 33	17 28	0 33	1 48	2 19	2.3	10 8	2.6
55	6 40	17 21	0 37	2 1	2 52	2.3	9 35	2.7
60	6 49	17 12	0 42	2 19	3 42	2.2	8 45	2.8
S								

SUNCE UT	SUNCE $e = T_p - UT$	SUNCE Δ/24	SUNCE r	MJESEC Prolaz	MJESEC Δ/24	MJESEC $\pi_\leftmoon$	MJESEC r
h	min s	s	′	h min	min	′	′
00	0 6.2	.8	15.9	$T_{\overline{m}}$ 6 14	2.4	57.2	15.6
12	0 15.9	$T_{\overline{m}_\odot}$ 11 h 59.7 min		Starost 22.9 d	Faza ◑		

PLANETE

Pl.	$T_{\overline{m}}$	π	360−α	Vel.	Pl.	$T_{\overline{m}}$	π	360−α	Vel.
	h min	′	°			h min	′	°	
♀	14 42	.3	158	-4.3	♃	1 21	.0	359	-2.7
♂	14 34	.1	160	1.5	♄	13 33	.0	175	1.1

UT	SUNCE $S_\odot$	SUNCE $\delta_\odot$	PROLJ. TAČKA S_Υ	VENERA S_φ	VENERA δ_φ	MARS S_σ	MARS δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	180 6.3	7 40.0	342 1.0	139 38.7	-12 54.1	141 33.8	- 8 34.1
2	210 6.7	7 38.2	12 6.0	169 39.9	-12 56.2	171 35.7	- 8 35.4
4	240 7.2	7 36.3	42 10.9	199 41.0	-12 58.3	201 37.6	- 8 36.6
6	270 7.6	7 34.5	72 15.8	229 42.2	-13 .4	231 39.5	- 8 37.9
8	300 8.0	7 32.7	102 20.7	259 43.4	-13 2.5	261 41.4	- 8 39.2
10	330 8.4	7 30.8	132 25.7	289 44.6	-13 4.6	291 43.2	- 8 40.4
12	0 8.8	7 29.0	162 30.6	319 45.8	-13 6.7	321 45.1	- 8 41.7
14	30 9.2	7 27.1	192 35.5	349 47.0	-13 8.7	351 47.0	- 8 43.0
16	60 9.6	7 25.3	222 40.4	19 48.2	-13 10.8	21 48.9	- 8 44.3
18	90 10.0	7 23.5	252 45.4	49 49.5	-13 12.9	51 50.8	- 8 45.5
20	120 10.4	7 21.6	282 50.3	79 50.7	-13 15.0	81 52.6	- 8 46.8
22	150 10.8	7 19.8	312 55.2	109 51.9	-13 17.1	111 54.5	- 8 48.1
Δ	2	-9		6	-10	9	-6

UT	MJESEC $S_\leftmoon$	MJESEC Δ	MJESEC $\delta_\leftmoon$	MJESEC Δ	JUPITER S_4	JUPITER δ_4	SATURN S_η	SATURN δ_η
h	° ′		° ′		° ′	° ′	° ′	° ′
0	256 16.9	61	24 36.5	-21	340 42.5	- 1 8.3	157 10.3	0 15.9
2	285 7.2	61	24 32.3	-24	10 47.9	- 1 8.5	187 14.7	0 15.6
4	313 57.3	60	24 27.5	-27	40 53.4	- 1 8.8	217 19.1	0 15.4
6	342 47.3	60	24 22.1	-30	70 58.9	- 1 9.0	247 23.5	0 15.2
8	11 37.3	59	24 16.0	-33	101 4.3	- 1 9.3	277 27.9	0 14.9
10	40 27.1	59	24 9.4	-37	131 9.8	- 1 9.5	307 32.2	0 14.7
12	69 16.9	59	24 2.1	-40	161 15.2	- 1 9.7	337 36.6	0 14.5
14	98 6.6	58	23 54.1	-43	191 20.7	- 1 10.0	7 41.0	0 14.2
16	126 56.3	58	23 45.5	-46	221 26.2	- 1 10.2	37 45.4	0 14.0
18	155 46.0	58	23 36.3	-49	251 31.6	- 1 10.5	67 49.8	0 13.7
20	184 35.6	58	23 26.5	-52	281 37.1	- 1 10.7	97 54.2	0 13.5
22	213 25.2	58	23 16.0	-55	311 42.6	- 1 11.0	127 58.6	0 13.3
Δ					27	-1	22	-1

φ	SUNCE IZLAZ	SUNCE ZALAZ	TRAJANJE SUMRAKA GRAĐ.	TRAJANJE SUMRAKA ASTR.	MJESEC IZLAZ	MJESEC Δ/24	MJESEC ZALAZ	MJESEC Δ/24
N	h min	h min	h min	h min	h min	min	h min	min
60	4 59	18 58	0 44	2 52	22 38	3.9	16 50	1.1
55	5 10	18 48	0 38	2 18	23 20	3.5	16 7	1.5
50	5 18	18 40	0 33	1 58	23 49	3.3	15 37	1.7
45	5 24	18 34	0 30	1 44	. . .	.0	15 14	1.9
40	5 29	18 29	0 28	1 35	. . .	.0	14 56	2.0
35	5 34	18 24	0 26	1 27	. . .	.0	14 41	2.1
30	5 38	18 20	0 24	1 22	. . .	.0	14 27	2.1
20	5 45	18 14	0 22	1 15	0 18	2.6	14 4	2.2
10	5 51	18 8	0 21	1 11	0 38	2.5	13 44	2.3
0	5 56	18 3	0 21	1 9	0 58	2.4	13 26	2.4
10	6 1	17 58	0 21	1 10	1 17	2.4	13 7	2.5
20	6 7	17 52	0 22	1 13	1 38	2.3	12 47	2.6
30	6 13	17 46	0 24	1 20	2 1	2.2	12 23	2.7
35	6 17	17 43	0 25	1 24	2 15	2.2	12 10	2.8
40	6 21	17 39	0 27	1 30	2 32	2.1	11 54	2.9
45	6 25	17 34	0 29	1 38	2 51	2.0	11 35	3.0
50	6 31	17 29	0 32	1 48	3 15	1.9	11 11	3.1
55	6 37	17 23	0 36	2 1	3 47	1.7	10 39	3.3
60	6 46	17 14	0 42	2 19	4 35	1.4	9 52	3.7
S								

SUNCE UT	SUNCE $e = T_p - UT$	SUNCE Δ/24	SUNCE r	MJESEC Prolaz	MJESEC Δ/24	MJESEC $\pi_\leftmoon$	MJESEC r
h	min s	s	′	h min	min	′	′
00	0 25.6	.8	15.9	$T_{\overline{m}}$ 7 12	2.4	58.1	15.8
12	0 35.3	$T_{\overline{m}_\odot}$ 11 h 59.4 min		Starost 23.9 d	Faza ◑		

PLANETE

Pl.	$T_{\overline{m}}$	π	360−α	Vel.	Pl.	$T_{\overline{m}}$	π	360−α	Vel.
	h min	′	°			h min	′	°	
♀	14 41	.3	158	-4.3	♃	1 17	.0	359	-2.7
♂	14 33	.1	160	1.5	♄	13 29	.0	175	1.1

UT	SUNCE $S_\odot$	$\delta_\odot$	PROLJ. TAČKA S_Υ	VENERA S_φ	δ_φ	MARS S_σ	δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	180 11.2	7 18.0	343 .2	139 53.1	-13 19.1	141 56.4	- 8 49.3
2	210 11.6	7 16.1	13 5.1	169 54.4	-13 21.2	171 58.3	- 8 50.6
4	240 12.1	7 14.3	43 10.0	199 55.6	-13 23.3	202 .1	- 8 51.9
6	270 12.5	7 12.4	73 14.9	229 56.8	-13 25.3	232 2.0	- 8 53.1
8	300 12.9	7 10.6	103 19.9	259 58.1	-13 27.4	262 3.9	- 8 54.4
10	330 13.3	7 8.7	133 24.8	289 59.3	-13 29.5	292 5.8	- 8 55.7
12	0 13.7	7 6.9	163 29.7	320 .6	-13 31.5	322 7.6	- 8 56.9
14	30 14.1	7 5.0	193 34.7	350 1.8	-13 33.6	352 9.5	- 8 58.2
16	60 14.5	7 3.2	223 39.6	20 3.1	-13 35.6	22 11.4	- 8 59.5
18	90 14.9	7 1.3	253 44.5	50 4.3	-13 37.7	52 13.2	- 9 .7
20	120 15.4	6 59.5	283 49.4	80 5.6	-13 39.7	82 15.1	- 9 2.0
22	150 15.8	6 57.6	313 54.4	110 6.9	-13 41.8	112 17.0	- 9 3.3
Δ	2	-9		6	-10	9	-6

UT	MJESEC $S_\leftmoon$	Δ	$\delta_\leftmoon$	Δ	JUPITER S_4	δ_4	SATURN S_η	δ_η
h	° ′		° ′		° ′	° ′	° ′	° ′
0	242 14.8	58	23 5.0	-59	341 48.0	- 1 11.2	158 3.0	0 13.0
2	271 4.5	58	22 53.2	-62	11 53.5	- 1 11.5	188 7.4	0 12.8
4	299 54.1	58	22 40.9	-65	41 59.0	- 1 11.7	218 11.8	0 12.6
6	328 43.8	59	22 27.9	-68	72 4.4	- 1 12.0	248 16.2	0 12.3
8	357 33.5	59	22 14.4	-71	102 9.9	- 1 12.2	278 20.6	0 12.1
10	26 23.3	59	22 .2	-74	132 15.4	- 1 12.5	308 25.0	0 11.9
12	55 13.1	59	21 45.4	-77	162 20.9	- 1 12.7	338 29.4	0 11.6
14	84 3.0	60	21 30.0	-80	192 26.3	- 1 13.0	8 33.8	0 11.4
16	112 52.9	60	21 14.0	-83	222 31.8	- 1 13.2	38 38.2	0 11.2
18	141 43.0	61	20 57.4	-86	252 37.3	- 1 13.5	68 42.5	0 10.9
20	170 33.1	61	20 40.2	-89	282 42.8	- 1 13.7	98 46.9	0 10.7
22	199 23.4	62	20 22.5	-92	312 48.2	- 1 14.0	128 51.3	0 10.4
Δ					27	-1	22	-1

φ	SUNCE IZLAZ	ZALAZ	TRAJANJE SUMRAKA GRAĐ.	ASTR.	MJESEC IZLAZ	Δ/24	ZALAZ	Δ/24
N	h min	h min	h min	h min	h min	min	h min	min
60	5 2	18 55	0 44	2 50	. . .	.0	17 17	.7
55	5 12	18 45	0 38	2 17	. . .	.0	16 43	1.1
50	5 19	18 38	0 33	1 57	. . .	.0	16 18	1.4
45	5 25	18 32	0 30	1 44	0 12	3.1	15 59	1.6
40	5 30	18 27	0 28	1 34	0 29	3.0	15 43	1.7
35	5 35	18 23	0 26	1 27	0 44	2.9	15 30	1.8
30	5 39	18 19	0 24	1 22	0 57	2.8	15 18	1.9
20	5 45	18 13	0 22	1 14	1 19	2.7	14 58	2.1
10	5 51	18 7	0 21	1 11	1 38	2.5	14 41	2.3
0	5 56	18 2	0 21	1 9	1 56	2.4	14 24	2.4
10	6 1	17 57	0 21	1 10	2 14	2.3	14 8	2.5
20	6 6	17 52	0 22	1 13	2 33	2.2	13 50	2.7
30	6 12	17 47	0 24	1 20	2 55	2.0	13 29	2.9
35	6 15	17 43	0 25	1 24	3 8	1.9	13 17	3.0
40	6 19	17 40	0 27	1 30	3 22	1.8	13 3	3.1
45	6 23	17 35	0 29	1 38	3 40	1.7	12 46	3.2
50	6 29	17 30	0 32	1 48	4 1	1.5	12 26	3.4
55	6 35	17 24	0 36	2 1	4 29	1.3	11 59	3.7
60	6 43	17 16	0 42	2 19	5 9	.9	11 20	4.2
S								

SUNCE UT	e = Tp − UT	Δ/24	r	MJESEC Prolaz		Δ/24	$\pi_\leftmoon$	r
h	min s	s	′		h min	min	′	′
00	0 45.1	.8	15.9	$T_{\overline{m}}$	8 10	2.4	59.0	16.1
12	0 55.0	$T_{\overline{m}_\odot}$	11 h 59.1 min	Starost 24.9 d		Faza ◑		

PLANETE

Pl.	$T_{\overline{m}}$	π	360−α	Vel.	Pl.	$T_{\overline{m}}$	π	360−α	Vel.
	h min	′	°			h min	′	°	
♀	14 40	.3	157	-4.3	♃	1 13	.0	359	-2.7
♂	14 31	.1	159	1.5	♄	13 26	.0	175	1.1

UT	SUNCE $S_\odot$	$\delta_\odot$	PROLJ. TAČKA S_Υ	VENERA S_φ	δ_φ	MARS S_σ	δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	180 16.2	6 55.8	343 59.3	140 8.1	-13 43.8	142 18.8	- 9 4.5
2	210 16.6	6 53.9	14 4.2	170 9.4	-13 45.9	172 20.7	- 9 5.8
4	240 17.0	6 52.1	44 9.2	200 10.7	-13 47.9	202 22.6	- 9 7.1
6	270 17.4	6 50.2	74 14.1	230 12.0	-13 50.0	232 24.4	- 9 8.3
8	300 17.8	6 48.4	104 19.0	260 13.3	-13 52.0	262 26.3	- 9 9.6
10	330 18.3	6 46.5	134 23.9	290 14.6	-13 54.0	292 28.2	- 9 10.9
12	0 18.7	6 44.7	164 28.9	320 15.9	-13 56.1	322 30.0	- 9 12.1
14	30 19.1	6 42.8	194 33.8	350 17.2	-13 58.1	352 31.9	- 9 13.4
16	60 19.5	6 41.0	224 38.7	20 18.5	-14 .1	22 33.7	- 9 14.7
18	90 19.9	6 39.1	254 43.7	50 19.8	-14 2.2	52 35.6	- 9 15.9
20	120 20.3	6 37.2	284 48.6	80 21.1	-14 4.2	82 37.4	- 9 17.2
22	150 20.8	6 35.4	314 53.5	110 22.4	-14 6.2	112 39.3	- 9 18.5
Δ	2	-9		6	-10	9	-6

UT	MJESEC $S_\leftmoon$	Δ	$\delta_\leftmoon$	Δ	JUPITER S_4	δ_4	SATURN S_η	δ_η
h	° ′		° ′		° ′	° ′	° ′	° ′
0	228 13.7	62	20 4.2	-94	342 53.7	- 1 14.2	158 55.7	0 10.2
2	257 4.2	63	19 45.3	-97	12 59.2	- 1 14.5	189 .1	0 10.0
4	285 54.7	64	19 25.8	-100	43 4.7	- 1 14.7	219 4.5	0 9.7
6	314 45.4	64	19 5.8	-103	73 10.1	- 1 15.0	249 8.9	0 9.5
8	343 36.3	65	18 45.3	-105	103 15.6	- 1 15.2	279 13.3	0 9.3
10	12 27.2	66	18 24.2	-108	133 21.1	- 1 15.5	309 17.7	0 9.0
12	41 18.3	66	18 2.7	-110	163 26.6	- 1 15.7	339 22.1	0 8.8
14	70 9.6	67	17 40.5	-113	193 32.0	- 1 16.0	9 26.5	0 8.6
16	99 1.0	68	17 17.9	-115	223 37.5	- 1 16.2	39 30.8	0 8.3
18	127 52.5	68	16 54.8	-118	253 43.0	- 1 16.5	69 35.2	0 8.1
20	156 44.2	69	16 31.3	-120	283 48.5	- 1 16.7	99 39.6	0 7.8
22	185 36.1	70	16 7.2	-123	313 54.0	- 1 17.0	129 44.0	0 7.6
Δ					27	-1	22	-1

φ	SUNCE IZLAZ	ZALAZ	TRAJANJE SUMRAKA GRAĐ.	ASTR.	MJESEC IZLAZ	Δ/24	ZALAZ	Δ/24
N	h min	h min	h min	h min	h min	min	h min	min
60	5 4	18 52	0 44	2 48	0 13	4.3	17 34	.5
55	5 13	18 43	0 38	2 16	0 46	3.8	17 9	.8
50	5 21	18 36	0 33	1 57	1 9	3.5	16 51	1.1
45	5 26	18 30	0 30	1 44	1 27	3.3	16 36	1.3
40	5 31	18 26	0 28	1 34	1 42	3.2	16 24	1.5
35	5 35	18 22	0 26	1 27	1 54	3.0	16 14	1.6
30	5 39	18 18	0 24	1 22	2 5	2.9	16 5	1.8
20	5 45	18 12	0 22	1 14	2 23	2.7	15 49	2.0
10	5 51	18 7	0 21	1 10	2 40	2.5	15 35	2.2
0	5 55	18 2	0 21	1 9	2 55	2.4	15 22	2.3
10	6 0	17 57	0 21	1 10	3 9	2.2	15 9	2.5
20	6 5	17 53	0 22	1 13	3 25	2.0	14 54	2.7
30	6 11	17 47	0 24	1 19	3 44	1.9	14 38	2.9
35	6 14	17 44	0 25	1 24	3 54	1.7	14 28	3.0
40	6 18	17 41	0 27	1 30	4 6	1.6	14 17	3.2
45	6 22	17 37	0 29	1 38	4 21	1.4	14 4	3.4
50	6 26	17 32	0 32	1 48	4 38	1.2	13 48	3.6
55	6 32	17 26	0 36	2 1	4 60	1.0	13 28	3.9
60	6 40	17 19	0 42	2 19	5 30	.6	12 60	4.3
S								

SUNCE UT	e = Tp − UT	Δ/24	r	MJESEC Prolaz		Δ/24	$\pi_\leftmoon$	r
h	min s	s	′		h min	min	′	′
00	1 4.9	.8	15.9	$T_{\overline{m}}$	9 8	2.4	59.9	16.3
12	1 14.9	$T_{\overline{m}_\odot}$	11 h 58.8 min	Starost 25.9 d		Faza ◑		

PLANETE

Pl.	$T_{\overline{m}}$	π	360−α	Vel.	Pl.	$T_{\overline{m}}$	π	360−α	Vel.
	h min	′	°			h min	′	°	
♀	14 39	.3	156	-4.3	♃	1 8	.0	359	-2.7
♂	14 30	.1	158	1.5	♄	13 22	.0	175	1.1

UT	SUNCE $S_\odot$	SUNCE $\delta_\odot$	PROLJ. TAČKA S_Υ	VENERA S_φ	VENERA δ_φ	MARS S_σ	MARS δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	180 21.2	6 33.5	344 58.4	140 23.7	-14 8.2	142 41.2	- 9 19.7
2	210 21.6	6 31.7	15 3.4	170 25.1	-14 10.2	172 43.0	- 9 21.0
4	240 22.0	6 29.8	45 8.3	200 26.4	-14 12.3	202 44.9	- 9 22.2
6	270 22.4	6 27.9	75 13.2	230 27.7	-14 14.3	232 46.7	- 9 23.5
8	300 22.9	6 26.1	105 18.2	260 29.1	-14 16.3	262 48.6	- 9 24.8
10	330 23.3	6 24.2	135 23.1	290 30.4	-14 18.3	292 50.4	- 9 26.0
12	0 23.7	6 22.4	165 28.0	320 31.7	-14 20.3	322 52.3	- 9 27.3
14	30 24.1	6 20.5	195 32.9	350 33.1	-14 22.3	352 54.1	- 9 28.5
16	60 24.5	6 18.6	225 37.9	20 34.5	-14 24.3	22 56.0	- 9 29.8
18	90 25.0	6 16.8	255 42.8	50 35.8	-14 26.3	52 57.8	- 9 31.1
20	120 25.4	6 14.9	285 47.7	80 37.2	-14 28.3	82 59.7	- 9 32.3
22	150 25.8	6 13.0	315 52.7	110 38.6	-14 30.3	113 1.5	- 9 33.6
Δ	2	-9		7	-10	9	-6

UT	MJESEC $S_\leftmoon$	MJESEC Δ	MJESEC $\delta_\leftmoon$	MJESEC Δ	JUPITER S_4	JUPITER δ_4	SATURN S_η	SATURN δ_η
h	° ′		° ′		° ′	° ′	° ′	° ′
0	214 28.1	71	15 42.7	-125	343 59.5	- 1 17.2	159 48.4	0 7.4
2	243 20.2	72	15 17.7	-127	14 4.9	- 1 17.5	189 52.8	0 7.1
4	272 12.5	72	14 52.3	-129	44 10.4	- 1 17.7	219 57.2	0 6.9
6	301 5.0	73	14 26.5	-131	74 15.9	- 1 18.0	250 1.6	0 6.7
8	329 57.6	74	14 .3	-133	104 21.4	- 1 18.3	280 6.0	0 6.4
10	358 50.4	75	13 33.7	-135	134 26.9	- 1 18.5	310 10.4	0 6.2
12	27 43.3	75	13 6.7	-137	164 32.4	- 1 18.8	340 14.7	0 5.9
14	56 36.4	76	12 39.3	-139	194 37.9	- 1 19.0	10 19.1	0 5.7
16	85 29.7	77	12 11.5	-140	224 43.3	- 1 19.3	40 23.5	0 5.5
18	114 23.1	78	11 43.4	-142	254 48.8	- 1 19.5	70 27.9	0 5.2
20	143 16.6	78	11 15.0	-144	284 54.3	- 1 19.8	100 32.3	0 5.0
22	172 10.3	79	10 46.2	-145	314 59.8	- 1 20.0	130 36.7	0 4.8
Δ					27	-1	22	-1

φ	SUNCE IZLAZ	SUNCE ZALAZ	TRAJANJE SUMRAKA GRAĐ.	TRAJANJE SUMRAKA ASTR.	MJESEC IZLAZ	MJESEC Δ/24	MJESEC ZALAZ	MJESEC Δ/24
N	h min	h min	h min	h min	h min	min	h min	min
60	5 6	18 49	0 44	2 46	1 55	4.3	17 45	.4
55	5 15	18 40	0 37	2 15	2 17	3.9	17 30	.7
50	5 22	18 34	0 33	1 56	2 34	3.6	17 18	1.0
45	5 28	18 28	0 30	1 43	2 47	3.4	17 8	1.2
40	5 32	18 24	0 27	1 34	2 58	3.2	17 0	1.4
35	5 36	18 20	0 26	1 27	3 7	3.1	16 53	1.5
30	5 40	18 17	0 24	1 21	3 15	2.9	16 47	1.6
20	5 45	18 11	0 22	1 14	3 28	2.7	16 36	1.9
10	5 51	18 6	0 21	1 10	3 40	2.5	16 27	2.1
0	5 55	18 2	0 21	1 9	3 52	2.3	16 18	2.3
10	5 60	17 57	0 21	1 10	4 3	2.1	16 9	2.5
20	6 4	17 53	0 22	1 13	4 15	1.9	15 59	2.7
30	6 10	17 48	0 24	1 19	4 28	1.7	15 48	2.9
35	6 13	17 45	0 25	1 24	4 36	1.6	15 41	3.1
40	6 16	17 42	0 27	1 30	4 45	1.4	15 34	3.2
45	6 20	17 38	0 29	1 38	4 55	1.2	15 25	3.4
50	6 24	17 33	0 32	1 48	5 8	1.0	15 15	3.6
55	6 30	17 28	0 36	2 1	5 23	.8	15 1	3.9
60	6 37	17 21	0 42	2 20	5 43	.4	14 43	4.3
S								

SUNCE UT	SUNCE $e = T_p - UT$	SUNCE Δ/24	SUNCE r	MJESEC Prolaz	MJESEC Δ/24	MJESEC $\pi_\leftmoon$	MJESEC r
h	min s	s	′	h min	min	′	′
00	1 24.9	.8	15.9	$T_{\overline{m}}$ 10 5	2.3	60.6	16.5
12	1 35.0	$T_{\overline{m}_\odot}$ 11 h 58.4 min		Starost 26.9 d	Faza ●		

PLANETE

Pl.	$T_{\overline{m}}$	π	360−α	Vel.	Pl.	$T_{\overline{m}}$	π	360−α	Vel.
	h min	′	°			h min	′	°	
♀	14 38	.3	155	-4.4	♃	1 4	.0	359	-2.8
♂	14 28	.1	158	1.5	♄	13 19	.0	175	1.1

UT	SUNCE $S_\odot$	SUNCE $\delta_\odot$	PROLJ. TAČKA S_Υ	VENERA S_φ	VENERA δ_φ	MARS S_σ	MARS δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	180 26.2	6 11.1	345 57.6	140 39.9	-14 32.3	143 3.4	- 9 34.8
2	210 26.7	6 9.3	16 2.5	170 41.3	-14 34.2	173 5.2	- 9 36.1
4	240 27.1	6 7.4	46 7.4	200 42.7	-14 36.2	203 7.0	- 9 37.4
6	270 27.5	6 5.5	76 12.4	230 44.1	-14 38.2	233 8.9	- 9 38.6
8	300 27.9	6 3.7	106 17.3	260 45.5	-14 40.2	263 10.7	- 9 39.9
10	330 28.4	6 1.8	136 22.2	290 46.9	-14 42.2	293 12.6	- 9 41.1
12	0 28.8	5 59.9	166 27.1	320 48.3	-14 44.1	323 14.4	- 9 42.4
14	30 29.2	5 58.0	196 32.1	350 49.7	-14 46.1	353 16.3	- 9 43.7
16	60 29.6	5 56.2	226 37.0	20 51.1	-14 48.1	23 18.1	- 9 44.9
18	90 30.1	5 54.3	256 41.9	50 52.5	-14 50.1	53 19.9	- 9 46.2
20	120 30.5	5 52.4	286 46.9	80 53.9	-14 52.0	83 21.8	- 9 47.4
22	150 30.9	5 50.5	316 51.8	110 55.3	-14 54.0	113 23.6	- 9 48.7
Δ	2	-9		7	-10	9	-6

UT	MJESEC $S_\leftmoon$	MJESEC Δ	MJESEC $\delta_\leftmoon$	MJESEC Δ	JUPITER S_4	JUPITER δ_4	SATURN S_η	SATURN δ_η
h	° ′		° ′		° ′	° ′	° ′	° ′
0	201 4.1	80	10 17.2	-147	345 5.3	- 1 20.3	160 41.1	0 4.5
2	229 58.1	81	9 47.9	-148	15 10.8	- 1 20.6	190 45.5	0 4.3
4	258 52.2	81	9 18.3	-149	45 16.3	- 1 20.8	220 49.8	0 4.0
6	287 46.4	82	8 48.4	-151	75 21.8	- 1 21.1	250 54.2	0 3.8
8	316 40.8	82	8 18.3	-152	105 27.3	- 1 21.3	280 58.6	0 3.6
10	345 35.3	83	7 47.9	-153	135 32.8	- 1 21.6	311 3.0	0 3.3
12	14 29.9	84	7 17.4	-154	165 38.2	- 1 21.8	341 7.4	0 3.1
14	43 24.6	84	6 46.6	-155	195 43.7	- 1 22.1	11 11.8	0 2.9
16	72 19.4	85	6 15.6	-156	225 49.2	- 1 22.3	41 16.2	0 2.6
18	101 14.3	85	5 44.5	-156	255 54.7	- 1 22.6	71 20.5	0 2.4
20	130 9.3	86	5 13.3	-157	286 .2	- 1 22.9	101 24.9	0 2.1
22	159 4.5	86	4 41.9	-158	316 5.7	- 1 23.1	131 29.3	0 1.9
Δ					27	-1	22	-1

φ	SUNCE IZLAZ	SUNCE ZALAZ	TRAJANJE SUMRAKA GRAĐ.	TRAJANJE SUMRAKA ASTR.	MJESEC IZLAZ	MJESEC Δ/24	MJESEC ZALAZ	MJESEC Δ/24
N	h min	h min	h min	h min	h min	min	h min	min
60	5 9	18 46	0 43	2 44	3 39	4.3	17 53	.3
55	5 17	18 38	0 37	2 14	3 51	3.9	17 46	.6
50	5 24	18 32	0 33	1 56	4 1	3.6	17 41	.9
45	5 29	18 26	0 30	1 43	4 8	3.4	17 37	1.1
40	5 33	18 22	0 27	1 34	4 15	3.2	17 33	1.3
35	5 37	18 19	0 26	1 27	4 20	3.1	17 30	1.4
30	5 40	18 16	0 24	1 21	4 25	2.9	17 27	1.6
20	5 46	18 10	0 22	1 14	4 33	2.7	17 22	1.8
10	5 50	18 6	0 21	1 10	4 40	2.5	17 17	2.0
0	5 55	18 1	0 21	1 9	4 47	2.3	17 13	2.2
10	5 59	17 57	0 21	1 10	4 54	2.1	17 8	2.4
20	6 3	17 53	0 22	1 13	5 1	1.8	17 3	2.7
30	6 8	17 48	0 24	1 19	5 9	1.6	16 58	2.9
35	6 11	17 45	0 25	1 24	5 14	1.5	16 55	3.0
40	6 14	17 42	0 27	1 30	5 19	1.3	16 51	3.2
45	6 18	17 39	0 29	1 38	5 25	1.1	16 47	3.4
50	6 22	17 35	0 32	1 48	5 32	.9	16 42	3.6
55	6 27	17 30	0 36	2 1	5 41	.7	16 35	3.9
60	6 34	17 23	0 42	2 20	5 53	.3	16 27	4.3
S								

SUNCE UT	SUNCE $e = T_p - UT$	SUNCE Δ/24	SUNCE r	MJESEC Prolaz	MJESEC Δ/24	MJESEC $\pi_\leftmoon$	MJESEC r
h	min s	s	′	h min	min	′	′
00	1 45.1	.9	15.9	$T_{\overline{m}}$ 10 60	2.2	61.2	16.7
12	1 55.4	$T_{\overline{m}_\odot}$ 11 h 58.1 min		Starost 27.9 d	Faza ●		

PLANETE

Pl.	$T_{\overline{m}}$	π	360−α	Vel.	Pl.	$T_{\overline{m}}$	π	360−α	Vel.
	h min	′	°			h min	′	°	
♀	14 37	.3	155	-4.4	♃	0 59	.0	359	-2.8
♂	14 27	.1	157	1.5	♄	13 15	.0	175	1.1

UT	SUNCE $S_\odot$	SUNCE $\delta_\odot$	PROLJ. TAČKA S_Υ	VENERA S_φ	VENERA δ_φ	MARS S_σ	MARS δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	180 31.3	5 48.7	346 56.7	140 56.8	-14 55.9	143 25.4	- 9 49.9
2	210 31.8	5 46.8	17 1.6	170 58.2	-14 57.9	173 27.3	- 9 51.2
4	240 32.2	5 44.9	47 6.6	200 59.6	-14 59.8	203 29.1	- 9 52.5
6	270 32.6	5 43.0	77 11.5	231 1.1	-15 1.8	233 30.9	- 9 53.7
8	300 33.1	5 41.2	107 16.4	261 2.5	-15 3.7	263 32.8	- 9 55.0
10	330 33.5	5 39.3	137 21.4	291 4.0	-15 5.7	293 34.6	- 9 56.2
12	0 33.9	5 37.4	167 26.3	321 5.4	-15 7.6	323 36.4	- 9 57.5
14	30 34.3	5 35.5	197 31.2	351 6.9	-15 9.6	353 38.3	- 9 58.7
16	60 34.8	5 33.6	227 36.1	21 8.4	-15 11.5	23 40.1	- 9 60.0
18	90 35.2	5 31.7	257 41.1	51 9.8	-15 13.5	53 41.9	-10 1.2
20	120 35.6	5 29.9	287 46.0	81 11.3	-15 15.4	83 43.7	-10 2.5
22	150 36.1	5 28.0	317 50.9	111 12.8	-15 17.3	113 45.6	-10 3.7
Δ	2	-9		7	-10	9	-6

UT	MJESEC $S_\leftmoon$	MJESEC Δ	MJESEC $\delta_\leftmoon$	MJESEC Δ	JUPITER S_4	JUPITER δ_4	SATURN S_η	SATURN δ_η
h	° ′		° ′		° ′	° ′	° ′	° ′
0	187 59.7	86	4 10.3	-158	346 11.2	- 1 23.4	161 33.7	0 1.7
2	216 54.9	87	3 38.7	-159	16 16.7	- 1 23.6	191 38.1	0 1.4
4	245 50.3	87	3 7.0	-159	46 22.2	- 1 23.9	221 42.5	0 1.2
6	274 45.7	87	2 35.2	-159	76 27.7	- 1 24.2	251 46.9	0 .9
8	303 41.2	88	2 3.3	-160	106 33.2	- 1 24.4	281 51.2	0 .7
10	332 36.7	88	1 31.4	-160	136 38.7	- 1 24.7	311 55.6	0 .5
12	1 32.3	88	0 59.5	-160	166 44.2	- 1 24.9	342 .0	0 .2
14	30 27.9	88	0 27.5	-160	196 49.7	- 1 25.2	12 4.4	- 0 .0
16	59 23.6	88	- 0 4.4	-160	226 55.2	- 1 25.4	42 8.8	- 0 .2
18	88 19.3	89	- 0 36.3	-159	257 .7	- 1 25.7	72 13.2	- 0 .5
20	117 15.0	89	- 1 8.2	-159	287 6.2	- 1 26.0	102 17.5	- 0 .7
22	146 10.8	89	- 1 40.1	-159	317 11.7	- 1 26.2	132 21.9	- 0 1.0
Δ					27	-1	22	-1

φ	SUNCE IZLAZ	SUNCE ZALAZ	TRAJANJE SUMRAKA GRAĐ.	TRAJANJE SUMRAKA ASTR.	MJESEC IZLAZ	MJESEC Δ/24	MJESEC ZALAZ	MJESEC Δ/24
N	h min	h min	h min	h min	h min	min	h min	min
60	5 11	18 43	0 43	2 42	5 22	4.3	18 1	.3
55	5 19	18 35	0 37	2 13	5 26	3.9	18 2	.6
50	5 25	18 29	0 33	1 55	5 28	3.6	18 3	.9
45	5 30	18 25	0 30	1 42	5 30	3.4	18 3	1.1
40	5 34	18 21	0 27	1 33	5 32	3.2	18 4	1.3
35	5 38	18 17	0 26	1 26	5 33	3.0	18 4	1.4
30	5 41	18 14	0 24	1 21	5 35	2.9	18 5	1.6
20	5 46	18 9	0 22	1 14	5 37	2.6	18 5	1.8
10	5 50	18 5	0 21	1 10	5 39	2.4	18 6	2.0
0	5 54	18 1	0 21	1 9	5 41	2.2	18 6	2.2
10	5 58	17 57	0 21	1 10	5 43	2.0	18 7	2.4
20	6 3	17 53	0 22	1 13	5 45	1.8	18 7	2.6
30	6 7	17 49	0 24	1 19	5 47	1.6	18 8	2.9
35	6 10	17 46	0 25	1 24	5 49	1.4	18 8	3.0
40	6 13	17 43	0 27	1 30	5 50	1.3	18 8	3.2
45	6 16	17 40	0 29	1 38	5 52	1.1	18 8	3.4
50	6 20	17 36	0 32	1 48	5 54	.9	18 9	3.6
55	6 25	17 32	0 36	2 1	5 57	.6	18 9	3.9
60	6 31	17 26	0 42	2 20	6 1	.3	18 10	4.3
S								

SUNCE UT	SUNCE $e = T_p - UT$	SUNCE Δ/24	SUNCE r	MJESEC Prolaz	MJESEC Δ/24	MJESEC $\pi_\leftmoon$	MJESEC r
h	min s	s	′	h min	min	′	′
00	2 5.5	.9	15.9	$T_{\overline{m}}$ 11 54	2.2	61.4	16.7
12	2 15.9	$T_{\overline{m}_\odot}$ 11 h 57.7 min		Starost 28.9 d	Faza ●		

PLANETE

Pl.	$T_{\overline{m}}$	π	360−α	Vel.	Pl.	$T_{\overline{m}}$	π	360−α	Vel.
	h min	′	°			h min	′	°	
♀	14 36	.3	154	-4.4	♃	0 55	.0	359	-2.8
♂	14 25	.1	156	1.5	♄	13 12	.0	175	1.1

UT	SUNCE $S_\odot$	SUNCE $\delta_\odot$	PROLJ. TAČKA S_Υ	VENERA S_φ	VENERA δ_φ	MARS S_σ	MARS δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	180 36.5	5 26.1	347 55.9	141 14.3	-15 19.2	143 47.4	-10 5.0
2	210 36.9	5 24.2	18 .8	171 15.8	-15 21.2	173 49.2	-10 6.2
4	240 37.4	5 22.3	48 5.7	201 17.3	-15 23.1	203 51.0	-10 7.5
6	270 37.8	5 20.4	78 10.6	231 18.8	-15 25.0	233 52.8	-10 8.7
8	300 38.2	5 18.5	108 15.6	261 20.3	-15 26.9	263 54.7	-10 10.0
10	330 38.6	5 16.7	138 20.5	291 21.8	-15 28.8	293 56.5	-10 11.3
12	0 39.1	5 14.8	168 25.4	321 23.3	-15 30.8	323 58.3	-10 12.5
14	30 39.5	5 12.9	198 30.4	351 24.8	-15 32.7	354 .1	-10 13.8
16	60 39.9	5 11.0	228 35.3	21 26.3	-15 34.6	24 1.9	-10 15.0
18	90 40.4	5 9.1	258 40.2	51 27.9	-15 36.5	54 3.8	-10 16.3
20	120 40.8	5 7.2	288 45.1	81 29.4	-15 38.4	84 5.6	-10 17.5
22	150 41.2	5 5.3	318 50.1	111 30.9	-15 40.3	114 7.4	-10 18.7
Δ	2	-9		8	-10	9	-6

UT	MJESEC $S_\leftmoon$	MJESEC Δ	MJESEC $\delta_\leftmoon$	MJESEC Δ	JUPITER S_4	JUPITER δ_4	SATURN S_η	SATURN δ_η
h	° ′		° ′		° ′	° ′	° ′	° ′
0	175 6.5	89	- 2 11.9	-158	347 17.2	- 1 26.5	162 26.3	- 0 1.2
2	204 2.3	89	- 2 43.5	-158	17 22.7	- 1 26.7	192 30.7	- 0 1.4
4	232 58.0	89	- 3 15.1	-157	47 28.2	- 1 27.0	222 35.1	- 0 1.7
6	261 53.8	89	- 3 46.6	-157	77 33.7	- 1 27.3	252 39.5	- 0 1.9
8	290 49.5	89	- 4 18.0	-156	107 39.2	- 1 27.5	282 43.8	- 0 2.2
10	319 45.2	88	- 4 49.2	-155	137 44.7	- 1 27.8	312 48.2	- 0 2.4
12	348 40.9	88	- 5 20.3	-155	167 50.2	- 1 28.0	342 52.6	- 0 2.6
14	17 36.6	88	- 5 51.2	-154	197 55.7	- 1 28.3	12 57.0	- 0 2.9
16	46 32.2	88	- 6 21.9	-153	228 1.2	- 1 28.6	43 1.4	- 0 3.1
18	75 27.8	88	- 6 52.4	-152	258 6.8	- 1 28.8	73 5.8	- 0 3.4
20	104 23.4	87	- 7 22.7	-150	288 12.3	- 1 29.1	103 10.1	- 0 3.6
22	133 18.9	87	- 7 52.8	-149	318 17.8	- 1 29.4	133 14.5	- 0 3.8
Δ					28	-1	22	-1

φ	SUNCE IZLAZ	SUNCE ZALAZ	TRAJANJE SUMRAKA GRAĐ.	TRAJANJE SUMRAKA ASTR.	MJESEC IZLAZ	MJESEC Δ/24	MJESEC ZALAZ	MJESEC Δ/24
N	h min	h min	h min	h min	h min	min	h min	min
60	5 13	18 40	0 43	2 41	7 5	4.2	18 8	.4
55	5 21	18 33	0 37	2 12	6 59	3.9	18 17	.7
50	5 27	18 27	0 33	1 55	6 55	3.6	18 24	1.0
45	5 31	18 23	0 30	1 42	6 51	3.4	18 30	1.2
40	5 35	18 19	0 27	1 33	6 49	3.2	18 35	1.4
35	5 38	18 16	0 26	1 26	6 46	3.0	18 39	1.5
30	5 41	18 13	0 24	1 21	6 44	2.9	18 42	1.6
20	5 46	18 8	0 22	1 14	6 40	2.6	18 49	1.9
10	5 50	18 4	0 21	1 10	6 37	2.4	18 54	2.1
0	5 54	18 1	0 21	1 9	6 34	2.2	18 60	2.2
10	5 58	17 57	0 21	1 10	6 31	2.0	19 5	2.4
20	6 2	17 53	0 22	1 13	6 29	1.8	19 10	2.6
30	6 6	17 49	0 24	1 19	6 25	1.6	19 17	2.9
35	6 8	17 47	0 25	1 24	6 23	1.5	19 20	3.0
40	6 11	17 44	0 27	1 30	6 21	1.3	19 25	3.2
45	6 14	17 41	0 29	1 38	6 19	1.1	19 29	3.3
50	6 18	17 38	0 32	1 48	6 16	.9	19 35	3.6
55	6 22	17 34	0 36	2 1	6 12	.7	19 42	3.8
60	6 28	17 28	0 42	2 20	6 8	.3	19 52	4.2
S								

SUNCE UT	SUNCE $e = T_p - UT$	SUNCE Δ/24	SUNCE r	MJESEC Prolaz	MJESEC Δ/24	MJESEC $\pi_\leftmoon$	MJESEC r
h	min s	s	′	h min	min	′	′
00	2 26.1	.9	15.9	$T_{\overline{m}}$ 12 47	2.2	61.3	16.7
12	2 36.5	$T_{\overline{m}_\odot}$ 11 h 57.4 min		Starost .6 d	Faza ●		

PLANETE

Pl.	$T_{\overline{m}}$	π	360−α	Vel.	Pl.	$T_{\overline{m}}$	π	360−α	Vel.
	h min	′	°			h min	′	°	
♀	14 34	.3	153	-4.4	♃	0 51	.0	359	-2.8
♂	14 24	.1	156	1.5	♄	13 8	.0	174	1.1

UT	SUNCE $S_\odot$	$\delta_\odot$	PROLJ. TAČKA S_Υ	VENERA S_φ	δ_φ	MARS S_σ	δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	180 41.7	5 3.4	348 55.0	141 32.5	-15 42.2	144 9.2	-10 20.0
2	210 42.1	5 1.5	18 59.9	171 34.0	-15 44.1	174 11.0	-10 21.2
4	240 42.5	4 59.6	49 4.9	201 35.6	-15 46.0	204 12.8	-10 22.5
6	270 43.0	4 57.7	79 9.8	231 37.1	-15 47.8	234 14.6	-10 23.7
8	300 43.4	4 55.8	109 14.7	261 38.7	-15 49.7	264 16.4	-10 25.0
10	330 43.9	4 54.0	139 19.6	291 40.3	-15 51.6	294 18.3	-10 26.2
12	0 44.3	4 52.1	169 24.6	321 41.9	-15 53.5	324 20.1	-10 27.5
14	30 44.7	4 50.2	199 29.5	351 43.4	-15 55.4	354 21.9	-10 28.7
16	60 45.2	4 48.3	229 34.4	21 45.0	-15 57.2	24 23.7	-10 30.0
18	90 45.6	4 46.4	259 39.3	51 46.6	-15 59.1	54 25.5	-10 31.2
20	120 46.0	4 44.5	289 44.3	81 48.2	-16 1.0	84 27.3	-10 32.5
22	150 46.5	4 42.6	319 49.2	111 49.8	-16 2.8	114 29.1	-10 33.7
Δ	2	-9		8	-9	9	-6

UT	MJESEC $S_\leftmoon$	Δ	$\delta_\leftmoon$	Δ	JUPITER S_4	δ_4	SATURN S_η	δ_η
h	° ′		° ′		° ′	° ′	° ′	° ′
0	162 14.3	87	-8 22.7	-148	348 23.3	-1 29.6	163 18.9	-0 4.1
2	191 9.7	87	-8 52.2	-147	18 28.8	-1 29.9	193 23.3	-0 4.3
4	220 5.0	86	-9 21.6	-145	48 34.3	-1 30.1	223 27.7	-0 4.5
6	249 .2	86	-9 50.6	-144	78 39.8	-1 30.4	253 32.0	-0 4.8
8	277 55.4	85	-10 19.3	-142	108 45.3	-1 30.7	283 36.4	-0 5.0
10	306 50.4	85	-10 47.8	-141	138 50.8	-1 30.9	313 40.8	-0 5.3
12	335 45.5	85	-11 15.9	-139	168 56.3	-1 31.2	343 45.2	-0 5.5
14	4 40.4	84	-11 43.7	-137	199 1.8	-1 31.4	13 49.6	-0 5.7
16	33 35.2	84	-12 11.1	-135	229 7.4	-1 31.7	43 53.9	-0 6.0
18	62 29.9	83	-12 38.2	-134	259 12.9	-1 32.0	73 58.3	-0 6.2
20	91 24.6	83	-13 4.9	-132	289 18.4	-1 32.2	104 2.7	-0 6.5
22	120 19.2	82	-13 31.3	-130	319 23.9	-1 32.5	134 7.1	-0 6.7
Δ					28	-1	22	-1

φ	SUNCE IZLAZ	ZALAZ	TRAJANJE SUMRAKA GRAĐ.	ASTR.	MJESEC IZLAZ	Δ/24	ZALAZ	Δ/24
N	h min	h min	h min	h min	h min	min	h min	min
60	5 16	18 37	0 43	2 39	8 47	4.2	18 17	.5
55	5 23	18 30	0 37	2 12	8 32	3.8	18 34	.9
50	5 28	18 25	0 33	1 54	8 21	3.5	18 48	1.1
45	5 32	18 21	0 30	1 42	8 12	3.3	18 58	1.3
40	5 36	18 17	0 27	1 33	8 5	3.1	19 7	1.5
35	5 39	18 14	0 25	1 26	7 58	3.0	19 15	1.6
30	5 42	18 12	0 24	1 21	7 53	2.8	19 22	1.7
20	5 46	18 7	0 22	1 14	7 44	2.6	19 33	1.9
10	5 50	18 4	0 21	1 10	7 35	2.4	19 44	2.1
0	5 54	18 0	0 21	1 9	7 28	2.3	19 53	2.3
10	5 57	17 57	0 21	1 10	7 20	2.1	20 3	2.4
20	6 1	17 54	0 22	1 13	7 12	1.9	20 14	2.6
30	6 5	17 50	0 24	1 19	7 4	1.7	20 25	2.8
35	6 7	17 48	0 25	1 24	6 58	1.6	20 32	3.0
40	6 9	17 45	0 27	1 30	6 53	1.4	20 40	3.1
45	6 12	17 43	0 29	1 38	6 46	1.2	20 50	3.3
50	6 16	17 39	0 32	1 48	6 38	1.0	21 1	3.5
55	6 20	17 35	0 36	2 1	6 28	.8	21 15	3.8
60	6 25	17 30	0 42	2 20	6 16	.4	21 33	4.2
S								

SUNCE UT	e = Tp − UT	Δ/24	r	MJESEC Prolaz		Δ/24	$\pi_\leftmoon$	r
h	min s	s	′		h min	min	′	′
00	2 46.9	.9	15.9	$T_{\overline{m}}$	13 41	2.2	60.8	16.6
12	2 57.4	$T_{\overline{m}_\odot}$	11 h 57.0 min	Starost	1.6 d	Faza	●	

PLANETE

Pl.	$T_{\overline{m}}$	π	360−α	Vel.	Pl.	$T_{\overline{m}}$	π	360−α	Vel.
	h min	′	°			h min	′	°	
♀	14 33	.3	153	-4.4	♃	0 46	.0	359	-2.8
♂	14 23	.1	155	1.5	♄	13 5	.0	174	1.1

UT	SUNCE $S_\odot$	$\delta_\odot$	PROLJ. TAČKA S_Υ	VENERA S_φ	δ_φ	MARS S_σ	δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	180 46.9	4 40.7	349 54.1	141 51.4	-16 4.7	144 30.9	-10 35.0
2	210 47.3	4 38.8	19 59.1	171 53.0	-16 6.6	174 32.7	-10 36.2
4	240 47.8	4 36.9	50 4.0	201 54.7	-16 8.4	204 34.5	-10 37.4
6	270 48.2	4 35.0	80 8.9	231 56.3	-16 10.3	234 36.3	-10 38.7
8	300 48.7	4 33.1	110 13.8	261 57.9	-16 12.1	264 38.1	-10 39.9
10	330 49.1	4 31.2	140 18.8	291 59.5	-16 14.0	294 39.9	-10 41.2
12	0 49.5	4 29.3	170 23.7	322 1.2	-16 15.8	324 41.7	-10 42.4
14	30 50.0	4 27.4	200 28.6	352 2.8	-16 17.7	354 43.5	-10 43.7
16	60 50.4	4 25.5	230 33.6	22 4.5	-16 19.5	24 45.3	-10 44.9
18	90 50.8	4 23.6	260 38.5	52 6.1	-16 21.3	54 47.1	-10 46.1
20	120 51.3	4 21.7	290 43.4	82 7.8	-16 23.2	84 48.9	-10 47.4
22	150 51.7	4 19.7	320 48.3	112 9.5	-16 25.0	114 50.7	-10 48.6
Δ	2	-10		8	-9	9	-6

UT	MJESEC $S_\leftmoon$	Δ	$\delta_\leftmoon$	Δ	JUPITER S_4	δ_4	SATURN S_η	δ_η
h	° ′		° ′		° ′	° ′	° ′	° ′
0	149 13.6	82	-13 57.2	-128	349 29.4	-1 32.8	164 11.5	-0 6.9
2	178 8.0	81	-14 22.8	-126	19 34.9	-1 33.0	194 15.8	-0 7.2
4	207 2.2	81	-14 47.9	-124	49 40.4	-1 33.3	224 20.2	-0 7.4
6	235 56.4	80	-15 12.6	-121	79 45.9	-1 33.6	254 24.6	-0 7.7
8	264 50.5	80	-15 36.9	-119	109 51.5	-1 33.8	284 29.0	-0 7.9
10	293 44.4	79	-16 .8	-117	139 57.0	-1 34.1	314 33.4	-0 8.1
12	322 38.3	79	-16 24.2	-115	170 2.5	-1 34.3	344 37.7	-0 8.4
14	351 32.1	78	-16 47.1	-112	200 8.0	-1 34.6	14 42.1	-0 8.6
16	20 25.7	78	-17 9.6	-110	230 13.5	-1 34.9	44 46.5	-0 8.9
18	49 19.3	77	-17 31.6	-108	260 19.0	-1 35.1	74 50.9	-0 9.1
20	78 12.8	77	-17 53.1	-105	290 24.6	-1 35.4	104 55.2	-0 9.3
22	107 6.1	76	-18 14.1	-103	320 30.1	-1 35.7	134 59.6	-0 9.6
Δ					28	-1	22	-1

φ	SUNCE IZLAZ	ZALAZ	TRAJANJE SUMRAKA GRAĐ.	ASTR.	MJESEC IZLAZ	Δ/24	ZALAZ	Δ/24
N	h min	h min	h min	h min	h min	min	h min	min
60	5 18	18 34	0 43	2 37	10 28	4.1	18 28	.7
55	5 25	18 28	0 37	2 11	10 3	3.7	18 55	1.1
50	5 30	18 23	0 33	1 54	9 45	3.4	19 14	1.4
45	5 34	18 19	0 30	1 41	9 31	3.2	19 30	1.5
40	5 37	18 16	0 27	1 33	9 20	3.0	19 43	1.7
35	5 40	18 13	0 25	1 26	9 10	2.9	19 54	1.8
30	5 42	18 11	0 24	1 21	9 1	2.8	20 3	1.9
20	5 47	18 7	0 22	1 14	8 47	2.6	20 20	2.1
10	5 50	18 3	0 21	1 10	8 34	2.5	20 35	2.2
0	5 53	17 60	0 21	1 9	8 22	2.3	20 48	2.3
10	5 57	17 57	0 21	1 10	8 10	2.2	21 2	2.5
20	5 60	17 54	0 22	1 13	7 58	2.0	21 17	2.6
30	6 4	17 50	0 24	1 19	7 44	1.8	21 33	2.8
35	6 6	17 48	0 25	1 24	7 36	1.7	21 43	2.8
40	6 8	17 46	0 27	1 30	7 27	1.6	21 55	3.0
45	6 10	17 44	0 29	1 38	7 16	1.4	22 8	3.1
50	6 13	17 41	0 32	1 48	7 3	1.2	22 24	3.3
55	6 17	17 37	0 36	2 2	6 47	1.0	22 45	3.5
60	6 22	17 33	0 42	2 21	6 26	.6	23 13	3.9
S								

SUNCE UT	e = Tp − UT	Δ/24	r	MJESEC Prolaz		Δ/24	$\pi_\leftmoon$	r
h	min s	s	′		h min	min	′	′
00	3 7.8	.9	15.9	$T_{\overline{m}}$	14 35	2.3	60.1	16.4
12	3 18.3	$T_{\overline{m}_\odot}$	11 h 56.7 min	Starost	2.6 d	Faza	●	

PLANETE

Pl.	$T_{\overline{m}}$	π	360−α	Vel.	Pl.	$T_{\overline{m}}$	π	360−α	Vel.
	h min	′	°			h min	′	°	
♀	14 32	.3	152	-4.4	♃	0 42	.0	360	-2.8
♂	14 21	.1	155	1.5	♄	13 1	.0	174	1.1

UT	SUNCE $S_\odot$	SUNCE $\delta_\odot$	PROLJ. TAČKA S_Υ	VENERA S_φ	VENERA δ_φ	MARS S_σ	MARS δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	180 52.2	4 17.8	350 53.3	142 11.1	-16 26.8	144 52.5	-10 49.9
2	210 52.6	4 15.9	20 58.2	172 12.8	-16 28.7	174 54.2	-10 51.1
4	240 53.0	4 14.0	51 3.1	202 14.5	-16 30.5	204 56.0	-10 52.3
6	270 53.5	4 12.1	81 8.1	232 16.2	-16 32.3	234 57.8	-10 53.6
8	300 53.9	4 10.2	111 13.0	262 17.9	-16 34.1	264 59.6	-10 54.8
10	330 54.4	4 8.3	141 17.9	292 19.6	-16 35.9	295 1.4	-10 56.1
12	0 54.8	4 6.4	171 22.8	322 21.3	-16 37.7	325 3.2	-10 57.3
14	30 55.2	4 4.5	201 27.8	352 23.0	-16 39.5	355 5.0	-10 58.5
16	60 55.7	4 2.6	231 32.7	22 24.8	-16 41.3	25 6.8	-10 59.8
18	90 56.1	4 .7	261 37.6	52 26.5	-16 43.1	55 8.5	-11 1.0
20	120 56.6	3 58.8	291 42.6	82 28.2	-16 44.9	85 10.3	-11 2.2
22	150 57.0	3 56.8	321 47.5	112 30.0	-16 46.7	115 12.1	-11 3.5
Δ	2	-10		9	-9	9	-6

UT	MJESEC $S_\leftmoon$	MJESEC Δ	MJESEC $\delta_\leftmoon$	MJESEC Δ	JUPITER S_4	JUPITER δ_4	SATURN S_η	SATURN δ_η
h	° ′		° ′		° ′	° ′	° ′	° ′
0	135 59.4	76	-18 34.6	-100	350 35.6	- 1 35.9	165 4.0	- 0 9.8
2	164 52.6	76	-18 54.6	-97	20 41.1	- 1 36.2	195 8.4	- 0 10.1
4	193 45.8	75	-19 14.1	-95	50 46.6	- 1 36.5	225 12.8	- 0 10.3
6	222 38.8	75	-19 33.1	-92	80 52.1	- 1 36.7	255 17.1	- 0 10.5
8	251 31.8	74	-19 51.5	-90	110 57.7	- 1 37.0	285 21.5	- 0 10.8
10	280 24.7	74	-20 9.4	-87	141 3.2	- 1 37.3	315 25.9	- 0 11.0
12	309 17.5	74	-20 26.8	-84	171 8.7	- 1 37.5	345 30.3	- 0 11.3
14	338 10.2	74	-20 43.6	-81	201 14.2	- 1 37.8	15 34.6	- 0 11.5
16	7 2.9	73	-20 59.9	-79	231 19.7	- 1 38.0	45 39.0	- 0 11.7
18	35 55.6	73	-21 15.6	-76	261 25.3	- 1 38.3	75 43.4	- 0 12.0
20	64 48.2	73	-21 30.8	-73	291 30.8	- 1 38.6	105 47.8	- 0 12.2
22	93 40.7	73	-21 45.4	-70	321 36.3	- 1 38.8	135 52.2	- 0 12.5
Δ					28	-1	22	-1

φ	SUNCE IZLAZ	SUNCE ZALAZ	TRAJANJE SUMRAKA GRAĐ.	TRAJANJE SUMRAKA ASTR.	MJESEC IZLAZ	MJESEC Δ/24	MJESEC ZALAZ	MJESEC Δ/24
N	h min	h min	h min	h min	h min	min	h min	min
60	5 20	18 31	0 43	2 36	12 6	3.7	18 45	1.1
55	5 26	18 25	0 37	2 10	11 31	3.3	19 21	1.5
50	5 31	18 21	0 33	1 53	11 7	3.1	19 47	1.7
45	5 35	18 17	0 30	1 41	10 48	3.0	20 7	1.8
40	5 38	18 14	0 27	1 32	10 33	2.9	20 23	1.9
35	5 41	18 12	0 25	1 26	10 20	2.8	20 37	2.0
30	5 43	18 9	0 24	1 21	10 8	2.7	20 49	2.1
20	5 47	18 6	0 22	1 14	9 49	2.6	21 9	2.2
10	5 50	18 2	0 21	1 10	9 33	2.4	21 27	2.3
0	5 53	17 60	0 21	1 9	9 17	2.3	21 44	2.3
10	5 56	17 57	0 21	1 10	9 2	2.2	22 1	2.4
20	5 59	17 54	0 22	1 13	8 46	2.1	22 19	2.5
30	6 2	17 51	0 24	1 19	8 27	2.0	22 39	2.6
35	6 4	17 49	0 25	1 24	8 17	1.9	22 52	2.7
40	6 6	17 47	0 27	1 30	8 4	1.8	23 6	2.7
45	6 9	17 45	0 29	1 38	7 50	1.7	23 22	2.8
50	6 11	17 42	0 32	1 48	7 32	1.5	23 43	2.9
55	6 15	17 39	0 36	2 2	7 10	1.3	. . .	.0
60	6 19	17 35	0 41	2 21	6 40	.9	. . .	.0
S								

SUNCE UT	SUNCE $e = T_p - UT$	SUNCE Δ/24	SUNCE r	MJESEC Prolaz	MJESEC Δ/24	MJESEC $\pi_\leftmoon$	MJESEC r
h	min s	s	′	h min	min	′	′
00	3 28.8	.9	15.9	$T_{\overline{m}}$ 15 31	2.3	59.3	16.1
12	3 39.4	$T_{\overline{m}_\odot}$ 11 h 56.3 min		Starost 3.6 d	Faza ◑		

PLANETE

Pl.	$T_{\overline{m}}$	π	360−α	Vel.	Pl.	$T_{\overline{m}}$	π	360−α	Vel.
	h min	′	°			h min	′	°	
♀	14 30	.3	151	-4.4	♃	0 38	.0	360	-2.8
♂	14 20	.1	154	1.5	♄	12 58	.0	174	1.1

UT	SUNCE $S_\odot$	SUNCE $\delta_\odot$	PROLJ. TAČKA S_Υ	VENERA S_φ	VENERA δ_φ	MARS S_σ	MARS δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	180 57.4	3 54.9	351 52.4	142 31.7	-16 48.5	145 13.9	-11 4.7
2	210 57.9	3 53.0	21 57.3	172 33.4	-16 50.3	175 15.7	-11 5.9
4	240 58.3	3 51.1	52 2.3	202 35.2	-16 52.1	205 17.4	-11 7.2
6	270 58.8	3 49.2	82 7.2	232 37.0	-16 53.9	235 19.2	-11 8.4
8	300 59.2	3 47.3	112 12.1	262 38.7	-16 55.7	265 21.0	-11 9.6
10	330 59.7	3 45.4	142 17.1	292 40.5	-16 57.4	295 22.8	-11 10.9
12	1 .1	3 43.5	172 22.0	322 42.3	-16 59.2	325 24.5	-11 12.1
14	31 .5	3 41.5	202 26.9	352 44.1	-17 1.0	355 26.3	-11 13.3
16	61 1.0	3 39.6	232 31.8	22 45.9	-17 2.7	25 28.1	-11 14.6
18	91 1.4	3 37.7	262 36.8	52 47.7	-17 4.5	55 29.9	-11 15.8
20	121 1.9	3 35.8	292 41.7	82 49.5	-17 6.3	85 31.6	-11 17.0
22	151 2.3	3 33.9	322 46.6	112 51.3	-17 8.0	115 33.4	-11 18.3
Δ	2	-10		9	-9	9	-6

UT	MJESEC $S_\leftmoon$	MJESEC Δ	MJESEC $\delta_\leftmoon$	MJESEC Δ	JUPITER S_4	JUPITER δ_4	SATURN S_η	SATURN δ_η
h	° ′		° ′		° ′	° ′	° ′	° ′
0	122 33.3	73	-21 59.4	-67	351 41.8	- 1 39.1	165 56.5	- 0 12.7
2	151 25.8	72	-22 12.9	-64	21 47.4	- 1 39.4	196 .9	- 0 12.9
4	180 18.3	72	-22 25.8	-62	51 52.9	- 1 39.6	226 5.3	- 0 13.2
6	209 10.7	72	-22 38.1	-59	81 58.4	- 1 39.9	256 9.7	- 0 13.4
8	238 3.2	72	-22 49.8	-56	112 3.9	- 1 40.2	286 14.0	- 0 13.7
10	266 55.7	72	-23 1.0	-53	142 9.5	- 1 40.4	316 18.4	- 0 13.9
12	295 48.1	73	-23 11.6	-50	172 15.0	- 1 40.7	346 22.8	- 0 14.2
14	324 40.6	73	-23 21.6	-47	202 20.5	- 1 41.0	16 27.2	- 0 14.4
16	353 33.2	73	-23 31.0	-44	232 26.0	- 1 41.2	46 31.5	- 0 14.6
18	22 25.7	73	-23 39.8	-41	262 31.6	- 1 41.5	76 35.9	- 0 14.9
20	51 18.4	73	-23 48.0	-38	292 37.1	- 1 41.8	106 40.3	- 0 15.1
22	80 11.0	74	-23 55.7	-35	322 42.6	- 1 42.0	136 44.7	- 0 15.4
Δ					28	-1	22	-1

φ	SUNCE IZLAZ	SUNCE ZALAZ	TRAJANJE SUMRAKA GRAĐ.	TRAJANJE SUMRAKA ASTR.	MJESEC IZLAZ	MJESEC Δ/24	MJESEC ZALAZ	MJESEC Δ/24
N	h min	h min	h min	h min	h min	min	h min	min
60	5 23	18 28	0 42	2 35	13 35	3.1	19 12	1.8
55	5 28	18 23	0 37	2 9	12 52	2.8	19 57	2.0
50	5 33	18 18	0 33	1 53	12 22	2.7	20 28	2.1
45	5 36	18 15	0 30	1 41	11 59	2.6	20 51	2.1
40	5 39	18 12	0 27	1 32	11 41	2.6	21 9	2.2
35	5 41	18 10	0 25	1 26	11 26	2.5	21 25	2.2
30	5 43	18 8	0 24	1 21	11 13	2.5	21 38	2.2
20	5 47	18 5	0 22	1 14	10 51	2.4	22 1	2.3
10	5 50	18 2	0 21	1 10	10 31	2.4	22 21	2.3
0	5 53	17 59	0 21	1 9	10 13	2.3	22 40	2.3
10	5 55	17 57	0 21	1 10	9 56	2.3	22 59	2.3
20	5 58	17 54	0 22	1 13	9 37	2.2	23 19	2.4
30	6 1	17 51	0 24	1 19	9 15	2.1	23 42	2.4
35	6 3	17 50	0 25	1 24	9 2	2.1	23 56	2.4
40	6 5	17 48	0 27	1 30	8 47	2.0	. . .	.0
45	6 7	17 46	0 29	1 38	8 30	2.0	. . .	.0
50	6 9	17 44	0 32	1 48	8 9	1.9	. . .	.0
55	6 12	17 41	0 36	2 2	7 41	1.7	0 10	3.1
60	6 16	17 37	0 41	2 21	7 1	1.4	0 49	3.4
S								

SUNCE UT	SUNCE $e = T_p - UT$	SUNCE Δ/24	SUNCE r	MJESEC Prolaz	MJESEC Δ/24	MJESEC $\pi_\leftmoon$	MJESEC r
h	min s	s	′	h min	min	′	′
00	3 50.0	.9	15.9	$T_{\overline{m}}$ 16 27	2.3	58.3	15.9
12	4 .6	$T_{\overline{m}_\odot}$ 11 h 56.0 min		Starost 4.6 d	Faza ◑		

PLANETE

Pl.	$T_{\overline{m}}$	π	360−α	Vel.	Pl.	$T_{\overline{m}}$	π	360−α	Vel.
	h min	′	°			h min	′	°	
♀	14 29	.3	151	-4.4	♃	0 33	.0	360	-2.8
♂	14 18	.1	153	1.5	♄	12 54	.0	174	1.1

UT	SUNCE $S_\odot$	$\delta_\odot$	PROLJ. TAČKA S_Υ	VENERA S_φ	δ_φ	MARS S_σ	δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	181 2.8	3 32.0	352 51.6	142 53.1	-17 9.8	145 35.2	-11 19.5
2	211 3.2	3 30.0	22 56.5	172 54.9	-17 11.5	175 37.0	-11 20.7
4	241 3.6	3 28.1	53 1.4	202 56.8	-17 13.3	205 38.7	-11 22.0
6	271 4.1	3 26.2	83 6.3	232 58.6	-17 15.0	235 40.5	-11 23.2
8	301 4.5	3 24.3	113 11.3	263 .4	-17 16.8	265 42.3	-11 24.4
10	331 5.0	3 22.4	143 16.2	293 2.3	-17 18.5	295 44.0	-11 25.7
12	1 5.4	3 20.5	173 21.1	323 4.1	-17 20.2	325 45.8	-11 26.9
14	31 5.9	3 18.5	203 26.0	353 6.0	-17 22.0	355 47.5	-11 28.1
16	61 6.3	3 16.6	233 31.0	23 7.9	-17 23.7	25 49.3	-11 29.3
18	91 6.8	3 14.7	263 35.9	53 9.8	-17 25.4	55 51.1	-11 30.6
20	121 7.2	3 12.8	293 40.8	83 11.6	-17 27.1	85 52.8	-11 31.8
22	151 7.6	3 10.9	323 45.8	113 13.5	-17 28.9	115 54.6	-11 33.0
Δ	2	-10		9	-9	9	-6

UT	MJESEC $S_\leftmoon$	Δ	$\delta_\leftmoon$	Δ	JUPITER S_4	δ_4	SATURN S_η	δ_η
h	° ′		° ′		° ′	° ′	° ′	° ′
0	109 3.7	74	-24 2.8	-32	352 48.1	- 1 42.3	166 49.0	- 0 15.6
2	137 56.5	74	-24 9.3	-30	22 53.7	- 1 42.6	196 53.4	- 0 15.8
4	166 49.4	75	-24 15.2	-27	52 59.2	- 1 42.8	226 57.8	- 0 16.1
6	195 42.4	75	-24 20.5	-24	83 4.7	- 1 43.1	257 2.2	- 0 16.3
8	224 35.4	76	-24 25.3	-21	113 10.2	- 1 43.4	287 6.5	- 0 16.6
10	253 28.6	76	-24 29.4	-18	143 15.8	- 1 43.6	317 10.9	- 0 16.8
12	282 21.9	77	-24 33.0	-15	170 36.3	- 1 43.9	347 15.3	- 0 17.0
14	311 15.3	78	-24 36.1	-12	203 26.8	- 1 44.2	17 19.7	- 0 17.3
16	340 8.9	78	-24 38.5	-9	233 32.3	- 1 44.4	47 24.0	- 0 17.5
18	9 2.5	79	-24 40.4	-7	263 37.9	- 1 44.7	77 28.4	- 0 17.8
20	37 56.4	80	-24 41.7	-4	293 43.4	- 1 45.0	107 32.8	- 0 18.0
22	66 50.4	81	-24 42.5	-1	323 48.9	- 1 45.2	137 37.1	- 0 18.2
Δ					28	-1	22	-1

φ	SUNCE IZLAZ	ZALAZ	TRAJANJE SUMRAKA GRAĐ.	ASTR.	MJESEC IZLAZ	Δ/24	ZALAZ	Δ/24
N	h min	h min	h min	h min	h min	min	h min	min
60	5 25	18 25	0 42	2 34	14 49	2.1	19 55	2.5
55	5 30	18 20	0 37	2 9	13 60	2.2	20 44	2.5
50	5 34	18 16	0 33	1 52	13 27	2.2	21 17	2.4
45	5 37	18 13	0 29	1 41	13 3	2.2	21 41	2.4
40	5 40	18 11	0 27	1 32	12 43	2.3	22 1	2.4
35	5 42	18 9	0 25	1 25	12 27	2.3	22 17	2.3
30	5 44	18 7	0 24	1 20	12 13	2.3	22 31	2.3
20	5 47	18 4	0 22	1 14	11 49	2.3	22 55	2.3
10	5 50	18 1	0 21	1 10	11 28	2.3	23 16	2.3
0	5 52	17 59	0 21	1 9	11 9	2.3	23 36	2.2
10	5 55	17 57	0 21	1 10	10 50	2.3	23 55	2.2
20	5 57	17 54	0 22	1 13	10 30	2.3	. . .	.0
30	5 60	17 52	0 24	1 19	10 6	2.3	. . .	.0
35	6 1	17 51	0 25	1 24	9 52	2.3	. . .	.0
40	6 3	17 49	0 27	1 30	9 36	2.3	0 11	2.4
45	6 5	17 47	0 29	1 38	9 17	2.2	0 30	2.5
50	6 7	17 45	0 32	1 48	8 53	2.2	0 54	2.5
55	6 10	17 43	0 36	2 2	8 22	2.2	1 25	2.5
60	6 13	17 40	0 41	2 22	7 35	2.1	2 11	2.6
S								

SUNCE UT	e = Tp − UT	Δ/24	r	MJESEC Prolaz		Δ/24	$\pi_\leftmoon$	r
h	min s	s	′		h min	min	′	′
00	4 11.2	.9	15.9	$T_{\overline{m}}$	17 22	2.3	57.4	15.6
12	4 21.9	$T_{\overline{m}_\odot}$	11 h 55.6 min	Starost	5.6 d	Faza	◐	

PLANETE

Pl.	$T_{\overline{m}}$	π	360−α	Vel.	Pl.	$T_{\overline{m}}$	π	360−α	Vel.
	h min	′	°			h min	′	°	
♀	14 28	.3	150	-4.4	♃	0 29	.0	360	-2.8
♂	14 17	.1	153	1.5	♄	12 51	.0	174	1.1

UT	SUNCE $S_\odot$	$\delta_\odot$	PROLJ. TAČKA S_Υ	VENERA S_φ	δ_φ	MARS S_σ	δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	181 8.1	3 8.9	353 50.7	143 15.4	-17 30.6	145 56.4	-11 34.2
2	211 8.5	3 7.0	23 55.6	173 17.3	-17 32.3	175 58.1	-11 35.5
4	241 9.0	3 5.1	54 .5	203 19.2	-17 34.0	205 59.9	-11 36.7
6	271 9.4	3 3.2	84 5.5	233 21.1	-17 35.7	236 1.6	-11 37.9
8	301 9.9	3 1.2	114 10.4	263 23.1	-17 37.4	266 3.4	-11 39.1
10	331 10.3	2 59.3	144 15.3	293 25.0	-17 39.1	296 5.1	-11 40.4
12	1 10.8	2 57.4	174 20.3	323 26.9	-17 40.8	326 6.9	-11 41.6
14	31 11.2	2 55.5	204 25.2	353 28.9	-17 42.5	356 8.6	-11 42.8
16	61 11.7	2 53.5	234 30.1	23 30.8	-17 44.2	26 10.4	-11 44.0
18	91 12.1	2 51.6	264 35.0	53 32.8	-17 45.9	56 12.1	-11 45.3
20	121 12.5	2 49.7	294 40.0	83 34.7	-17 47.6	86 13.9	-11 46.5
22	151 13.0	2 47.8	324 44.9	113 36.7	-17 49.2	116 15.6	-11 47.7
Δ	2	-10		10	-8	9	-6

UT	MJESEC $S_\leftmoon$	Δ	$\delta_\leftmoon$	Δ	JUPITER S_4	δ_4	SATURN S_η	δ_η
h	° ′		° ′		° ′	° ′	° ′	° ′
0	95 44.5	82	-24 42.7	2	353 54.5	- 1 45.5	167 41.5	- 0 18.5
2	124 38.9	83	-24 42.4	4	23 60.0	- 1 45.8	197 45.9	- 0 18.7
4	153 33.4	84	-24 41.5	7	54 5.5	- 1 46.0	227 50.3	- 0 19.0
6	182 28.1	85	-24 40.1	10	84 11.1	- 1 46.3	257 54.6	- 0 19.2
8	211 23.0	86	-24 38.1	12	114 16.6	- 1 46.6	287 59.0	- 0 19.5
10	240 18.1	87	-24 35.6	15	144 22.1	- 1 46.8	318 3.4	- 0 19.7
12	269 13.4	88	-24 32.6	18	174 27.6	- 1 47.1	348 7.8	- 0 19.9
14	298 9.0	89	-24 29.0	20	204 33.2	- 1 47.4	18 12.1	- 0 20.2
16	327 4.7	90	-24 24.9	23	234 38.7	- 1 47.7	48 16.5	- 0 20.4
18	356 .7	91	-24 20.4	25	264 44.2	- 1 47.9	78 20.9	- 0 20.7
20	24 56.9	92	-24 15.3	28	294 49.8	- 1 48.2	108 25.2	- 0 20.9
22	53 53.4	94	-24 9.7	30	324 55.3	- 1 48.5	138 29.6	- 0 21.1
Δ					28	-1	22	-1

φ	SUNCE IZLAZ	ZALAZ	TRAJANJE SUMRAKA GRAĐ.	ASTR.	MJESEC IZLAZ	Δ/24	ZALAZ	Δ/24
N	h min	h min	h min	h min	h min	min	h min	min
60	5 27	18 22	0 42	2 32	15 40	1.3	20 56	3.1
55	5 32	18 17	0 37	2 8	14 52	1.6	21 43	2.8
50	5 36	18 14	0 32	1 52	14 20	1.8	22 15	2.7
45	5 38	18 11	0 29	1 40	13 56	1.8	22 39	2.6
40	5 41	18 9	0 27	1 32	13 37	1.9	22 57	2.5
35	5 43	18 7	0 25	1 25	13 21	2.0	23 13	2.4
30	5 44	18 6	0 24	1 20	13 7	2.0	23 27	2.4
20	5 47	18 3	0 22	1 14	12 43	2.1	23 50	2.3
10	5 50	18 1	0 21	1 10	12 23	2.1	. . .	.0
0	5 52	17 59	0 21	1 9	12 4	2.2	. . .	.0
10	5 54	17 57	0 21	1 10	11 45	2.2	. . .	.0
20	5 56	17 55	0 22	1 13	11 24	2.3	0 16	2.2
30	5 59	17 52	0 24	1 19	11 0	2.3	0 39	2.1
35	5 60	17 51	0 25	1 24	10 46	2.4	0 54	2.1
40	6 1	17 50	0 27	1 30	10 30	2.4	1 10	2.1
45	6 3	17 48	0 29	1 38	10 11	2.5	1 29	2.0
50	6 5	17 47	0 32	1 48	9 47	2.5	1 53	2.0
55	6 7	17 45	0 36	2 2	9 15	2.6	2 25	1.9
60	6 10	17 42	0 41	2 22	8 27	2.8	3 14	1.7
S								

SUNCE UT	e = Tp − UT	Δ/24	r	MJESEC Prolaz		Δ/24	$\pi_\leftmoon$	r
h	min s	s	′		h min	min	′	′
00	4 32.6	.9	15.9	$T_{\overline{m}}$	18 17	2.1	56.5	15.4
12	4 43.3	$T_{\overline{m}_\odot}$	11 h 55.3 min	Starost	6.6 d	Faza	◐	

PLANETE

Pl.	$T_{\overline{m}}$	π	360−α	Vel.	Pl.	$T_{\overline{m}}$	π	360−α	Vel.
	h min	′	°			h min	′	°	
♀	14 26	.3	149	-4.4	♃	0 24	.0	0	-2.8
♂	14 15	.1	152	1.5	♄	12 47	.0	174	1.1

UT	SUNCE $S_\odot$	SUNCE $\delta_\odot$	PROLJ. TAČKA S_Υ	VENERA S_φ	VENERA δ_φ	MARS S_σ	MARS δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	181 13.4	2 45.8	354 49.8	143 38.7	-17 50.9	146 17.4	-11 48.9
2	211 13.9	2 43.9	24 54.8	173 40.7	-17 52.6	176 19.1	-11 50.1
4	241 14.3	2 42.0	54 59.7	203 42.7	-17 54.2	206 20.9	-11 51.4
6	271 14.8	2 40.1	85 4.6	233 44.7	-17 55.9	236 22.6	-11 52.6
8	301 15.2	2 38.1	115 9.5	263 46.7	-17 57.6	266 24.4	-11 53.8
10	331 15.7	2 36.2	145 14.5	293 48.7	-17 59.2	296 26.1	-11 55.0
12	1 16.1	2 34.3	175 19.4	323 50.7	-18 .9	326 27.9	-11 56.2
14	31 16.6	2 32.3	205 24.3	353 52.7	-18 2.5	356 29.6	-11 57.5
16	61 17.0	2 30.4	235 29.3	23 54.8	-18 4.2	26 31.3	-11 58.7
18	91 17.5	2 28.5	265 34.2	53 56.8	-18 5.8	56 33.1	-11 59.9
20	121 17.9	2 26.6	295 39.1	83 58.8	-18 7.5	86 34.8	-12 1.1
22	151 18.3	2 24.6	325 44.0	114 .9	-18 9.1	116 36.6	-12 2.3
Δ	2	-10		10	-8	9	-6

UT	MJESEC $S_\leftmoon$	MJESEC Δ	MJESEC $\delta_\leftmoon$	MJESEC Δ	JUPITER S_4	JUPITER δ_4	SATURN S_η	SATURN δ_η
h	° ′		° ′		° ′	° ′	° ′	° ′
0	82 50.1	95	-24 3.6	33	355 .8	- 1 48.7	168 34.0	- 0 21.4
2	111 47.1	96	-23 57.0	35	25 6.4	- 1 49.0	198 38.4	- 0 21.6
4	140 44.3	97	-23 50.0	38	55 11.9	- 1 49.3	228 42.7	- 0 21.9
6	169 41.8	99	-23 42.4	40	85 17.4	- 1 49.5	258 47.1	- 0 22.1
8	198 39.5	100	-23 34.4	42	115 23.0	- 1 49.8	288 51.5	- 0 22.4
10	227 37.5	101	-23 25.9	45	145 28.5	- 1 50.1	318 55.8	- 0 22.6
12	256 35.8	103	-23 17.0	47	175 34.0	- 1 50.3	349 .2	- 0 22.8
14	285 34.3	104	-23 7.6	49	205 39.6	- 1 50.6	19 4.6	- 0 23.1
16	314 33.2	105	-22 57.8	51	235 45.1	- 1 50.9	49 9.0	- 0 23.3
18	343 32.3	107	-22 47.6	53	265 50.6	- 1 51.1	79 13.3	- 0 23.6
20	12 31.6	108	-22 36.9	56	295 56.2	- 1 51.4	109 17.7	- 0 23.8
22	41 31.3	110	-22 25.8	58	326 1.7	- 1 51.7	139 22.1	- 0 24.0
Δ					28	-1	22	-1

φ	SUNCE IZLAZ	SUNCE ZALAZ	TRAJANJE SUMRAKA GRAĐ.	TRAJANJE SUMRAKA ASTR.	MJESEC IZLAZ	MJESEC Δ/24	MJESEC ZALAZ	MJESEC Δ/24
N	h min	h min	h min	h min	h min	min	h min	min
60	5 30	18 19	0 42	2 31	16 12	.8	22 10	3.4
55	5 34	18 15	0 36	2 7	15 31	1.2	22 51	3.0
50	5 37	18 12	0 32	1 52	15 3	1.4	23 19	2.8
45	5 40	18 9	0 29	1 40	14 41	1.5	23 40	2.6
40	5 42	18 8	0 27	1 32	14 23	1.6	23 57	2.5
35	5 43	18 6	0 25	1 25	14 8	1.7	.. ..	.0
30	5 45	18 4	0 24	1 20	13 55	1.8	.. ..	.0
20	5 48	18 2	0 22	1 13	13 33	1.9	.. ..	.0
10	5 50	17 60	0 21	1 10	13 14	2.0	0 10	2.2
0	5 52	17 58	0 21	1 9	12 56	2.1	0 29	2.1
10	5 54	17 56	0 21	1 10	12 38	2.1	0 48	2.1
20	5 55	17 55	0 22	1 13	12 19	2.2	1 8	2.0
30	5 57	17 53	0 24	1 20	11 57	2.4	1 31	1.9
35	5 58	17 52	0 25	1 24	11 43	2.4	1 44	1.8
40	5 60	17 51	0 27	1 30	11 28	2.5	1 60	1.8
45	6 1	17 50	0 29	1 38	11 10	2.6	2 18	1.7
50	6 3	17 48	0 32	1 49	10 48	2.7	2 41	1.6
55	6 4	17 46	0 36	2 3	10 18	2.9	3 11	1.4
60	6 7	17 44	0 41	2 23	9 35	3.2	3 55	1.1
S								

SUNCE UT	SUNCE $e = T_p - UT$	SUNCE Δ/24	SUNCE r	MJESEC Prolaz	MJESEC Δ/24	MJESEC $\pi_\leftmoon$	MJESEC r
h	min s	s	′	h min	min	′	′
00	4 53.9	.9	15.9	$T_{\overline{m}}$ 19 8	2.0	55.7	15.2
12	5 4.7	$T_{\overline{m}_\odot}$ 11 h 54.9 min		Starost 7.6 d	Faza ◐		

PLANETE

Pl.	$T_{\overline{m}}$	π	360−α	Vel.	Pl.	$T_{\overline{m}}$	π	360−α	Vel.
	h min	′	°			h min	′	°	
♀	14 24	.3	149	-4.4	♃	0 20	.0	0	-2.8
♂	14 14	.1	151	1.5	♄	12 44	.0	174	1.1

UT	SUNCE $S_\odot$	SUNCE $\delta_\odot$	PROLJ. TAČKA S_Υ	VENERA S_φ	VENERA δ_φ	MARS S_σ	MARS δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	181 18.8	2 22.7	355 49.0	144 3.0	-18 10.7	146 38.3	-12 3.5
2	211 19.2	2 20.8	25 53.9	174 5.0	-18 12.4	176 40.0	-12 4.8
4	241 19.7	2 18.8	55 58.8	204 7.1	-18 14.0	206 41.8	-12 6.0
6	271 20.1	2 16.9	86 3.8	234 9.2	-18 15.6	236 43.5	-12 7.2
8	301 20.6	2 15.0	116 8.7	264 11.3	-18 17.2	266 45.2	-12 8.4
10	331 21.0	2 13.0	146 13.6	294 13.4	-18 18.9	296 47.0	-12 9.6
12	1 21.5	2 11.1	176 18.5	324 15.5	-18 20.5	326 48.7	-12 10.8
14	31 21.9	2 9.2	206 23.5	354 17.6	-18 22.1	356 50.4	-12 12.0
16	61 22.4	2 7.2	236 28.4	24 19.7	-18 23.7	26 52.1	-12 13.3
18	91 22.8	2 5.3	266 33.3	54 21.9	-18 25.3	56 53.9	-12 14.5
20	121 23.3	2 3.4	296 38.3	84 24.0	-18 26.9	86 55.6	-12 15.7
22	151 23.7	2 1.4	326 43.2	114 26.1	-18 28.5	116 57.3	-12 16.9
Δ	2	-10		11	-8	9	-6

UT	MJESEC $S_\leftmoon$	MJESEC Δ	MJESEC $\delta_\leftmoon$	MJESEC Δ	JUPITER S_4	JUPITER δ_4	SATURN S_η	SATURN δ_η
h	° ′		° ′		° ′	° ′	° ′	° ′
0	70 31.2	111	-22 14.2	60	356 7.2	- 1 51.9	169 26.4	- 0 24.3
2	99 31.5	113	-22 2.3	62	26 12.8	- 1 52.2	199 30.8	- 0 24.5
4	128 32.0	114	-21 50.0	64	56 18.3	- 1 52.5	229 35.2	- 0 24.8
6	157 32.8	115	-21 37.2	66	86 23.8	- 1 52.7	259 39.6	- 0 25.0
8	186 33.8	117	-21 24.1	68	116 29.4	- 1 53.0	289 43.9	- 0 25.3
10	215 35.2	118	-21 10.6	69	146 34.9	- 1 53.3	319 48.3	- 0 25.5
12	244 36.8	120	-20 56.7	71	176 40.5	- 1 53.6	349 52.7	- 0 25.7
14	273 38.8	121	-20 42.5	73	206 46.0	- 1 53.8	19 57.0	- 0 26.0
16	302 41.0	122	-20 27.9	75	236 51.5	- 1 54.1	50 1.4	- 0 26.2
18	331 43.4	124	-20 12.9	77	266 57.1	- 1 54.4	80 5.8	- 0 26.5
20	0 46.2	125	-19 57.6	78	297 2.6	- 1 54.6	110 10.1	- 0 26.7
22	29 49.2	127	-19 42.0	80	327 8.1	- 1 54.9	140 14.5	- 0 26.9
Δ					28	-1	22	-1

φ	SUNCE IZLAZ	SUNCE ZALAZ	TRAJANJE SUMRAKA GRAĐ.	TRAJANJE SUMRAKA ASTR.	MJESEC IZLAZ	MJESEC Δ/24	MJESEC ZALAZ	MJESEC Δ/24
N	h min	h min	h min	h min	h min	min	h min	min
60	5 32	18 16	0 42	2 30	16 32	.5	23 31	3.4
55	5 36	18 12	0 36	2 7	15 59	.9	.. ..	.0
50	5 39	18 10	0 32	1 51	15 35	1.1	.. ..	.0
45	5 41	18 8	0 29	1 40	15 17	1.2	.. ..	.0
40	5 43	18 6	0 27	1 31	15 1	1.4	.. ..	.0
35	5 44	18 4	0 25	1 25	14 49	1.5	0 11	2.4
30	5 46	18 3	0 24	1 20	14 37	1.5	0 24	2.3
20	5 48	18 1	0 22	1 13	14 18	1.7	0 45	2.2
10	5 50	17 59	0 21	1 10	14 1	1.8	1 3	2.1
0	5 51	17 58	0 21	1 9	13 45	1.9	1 20	2.0
10	5 53	17 56	0 21	1 10	13 30	2.1	1 37	1.9
20	5 54	17 55	0 22	1 13	13 13	2.2	1 55	1.8
30	5 56	17 54	0 24	1 20	12 53	2.3	2 16	1.6
35	5 57	17 53	0 25	1 24	12 42	2.4	2 28	1.6
40	5 58	17 52	0 27	1 30	12 28	2.5	2 42	1.5
45	5 59	17 51	0 29	1 38	12 13	2.6	2 58	1.4
50	6 0	17 50	0 32	1 49	11 53	2.8	3 18	1.2
55	6 2	17 48	0 36	2 3	11 28	3.0	3 44	1.0
60	6 4	17 47	0 41	2 23	10 53	3.4	4 21	.7
S								

SUNCE UT	SUNCE $e = T_p - UT$	SUNCE Δ/24	SUNCE r	MJESEC Prolaz	MJESEC Δ/24	MJESEC $\pi_\leftmoon$	MJESEC r
h	min s	s	′	h min	min	′	′
00	5 15.4	.9	15.9	$T_{\overline{m}}$ 19 57	1.9	55.1	15.0
12	5 26.1	$T_{\overline{m}_\odot}$ 11 h 54.6 min		Starost 8.6 d	Faza ◐		

PLANETE

Pl.	$T_{\overline{m}}$	π	360−α	Vel.	Pl.	$T_{\overline{m}}$	π	360−α	Vel.
	h min	′	°			h min	′	°	
♀	14 23	.3	148	-4.4	♃	0 15	.0	0	-2.8
♂	14 13	.1	151	1.5	♄	12 40	.0	174	1.1

UT	SUNCE $S_\odot$	$\delta_\odot$	PROLJ. TAČKA S_Υ	VENERA S_φ	δ_φ	MARS S_σ	δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	181 24.2	1 59.5	356 48.1	144 28.3	-18 30.1	146 59.1	-12 18.1
2	211 24.6	1 57.6	26 53.0	174 30.4	-18 31.7	177 .8	-12 19.3
4	241 25.1	1 55.6	56 58.0	204 32.6	-18 33.2	207 2.5	-12 20.5
6	271 25.5	1 53.7	87 2.9	234 34.8	-18 34.8	237 4.2	-12 21.7
8	301 25.9	1 51.8	117 7.8	264 37.0	-18 36.4	267 5.9	-12 22.9
10	331 26.4	1 49.8	147 12.7	294 39.2	-18 38.0	297 7.7	-12 24.1
12	1 26.8	1 47.9	177 17.7	324 41.4	-18 39.5	327 9.4	-12 25.3
14	31 27.3	1 46.0	207 22.6	354 43.6	-18 41.1	357 11.1	-12 26.6
16	61 27.7	1 44.0	237 27.5	24 45.8	-18 42.7	27 12.8	-12 27.8
18	91 28.2	1 42.1	267 32.5	54 48.0	-18 44.2	57 14.5	-12 29.0
20	121 28.6	1 40.2	297 37.4	84 50.2	-18 45.8	87 16.3	-12 30.2
22	151 29.1	1 38.2	327 42.3	114 52.5	-18 47.3	117 18.0	-12 31.4
Δ	2	-10		11	-8	9	-6

UT	MJESEC $S_\leftmoon$	Δ	$\delta_\leftmoon$	Δ	JUPITER $S_\jupiter$	$\delta_\jupiter$	SATURN $S_\saturn$	$\delta_\saturn$
h	° ′		° ′		° ′	° ′	° ′	° ′
0	58 52.5	128	-19 26.0	82	357 13.7	- 1 55.2	170 18.9	- 0 27.2
2	87 56.1	129	-19 9.7	83	27 19.2	- 1 55.4	200 23.3	- 0 27.4
4	117 .0	131	-18 53.0	85	57 24.7	- 1 55.7	230 27.6	- 0 27.7
6	146 4.1	132	-18 36.1	86	87 30.3	- 1 56.0	260 32.0	- 0 27.9
8	175 8.4	133	-18 18.9	88	117 35.8	- 1 56.2	290 36.4	- 0 28.2
10	204 13.1	134	-18 1.3	89	147 41.4	- 1 56.5	320 40.7	- 0 28.4
12	233 18.0	136	-17 43.5	91	177 46.9	- 1 56.8	350 45.1	- 0 28.6
14	262 23.1	137	-17 25.4	92	207 52.4	- 1 57.0	20 49.5	- 0 28.9
16	291 28.5	138	-17 6.9	93	237 58.0	- 1 57.3	50 53.8	- 0 29.1
18	320 34.1	139	-16 48.3	95	268 3.5	- 1 57.6	80 58.2	- 0 29.4
20	349 40.0	141	-16 29.3	96	298 9.0	- 1 57.9	111 2.6	- 0 29.6
22	18 46.1	142	-16 10.1	97	328 14.6	- 1 58.1	141 6.9	- 0 29.8
Δ					28	-1	22	-1

φ	SUNCE IZLAZ	ZALAZ	TRAJANJE SUMRAKA GRAĐ.	ASTR.	MJESEC IZLAZ	Δ/24	ZALAZ	Δ/24
N	h min	h min	h min	h min	h min	min	h min	min
60	5 34	18 13	0 42	2 29	16 44	.4	.. ..	.0
55	5 38	18 10	0 36	2 6	16 19	.7	0 3	3.0
50	5 40	18 7	0 32	1 51	16 1	.9	0 26	2.8
45	5 42	18 6	0 29	1 40	15 46	1.0	0 43	2.6
40	5 44	18 4	0 27	1 31	15 34	1.2	0 57	2.5
35	5 45	18 3	0 25	1 25	15 24	1.3	1 10	2.4
30	5 46	18 2	0 24	1 20	15 14	1.4	1 20	2.3
20	5 48	18 0	0 22	1 13	14 59	1.6	1 38	2.1
10	5 50	17 59	0 21	1 10	14 45	1.7	1 54	2.0
0	5 51	17 57	0 21	1 9	14 32	1.8	2 8	1.9
10	5 52	17 56	0 21	1 10	14 19	2.0	2 23	1.8
20	5 54	17 55	0 22	1 13	14 5	2.1	2 38	1.6
30	5 55	17 54	0 24	1 20	13 49	2.3	2 55	1.5
35	5 56	17 53	0 25	1 24	13 39	2.4	3 6	1.4
40	5 56	17 53	0 27	1 30	13 29	2.5	3 17	1.3
45	5 57	17 52	0 29	1 38	13 16	2.6	3 31	1.1
50	5 58	17 51	0 32	1 49	13 1	2.8	3 47	1.0
55	5 59	17 50	0 36	2 3	12 41	3.0	4 8	.8
60	6 1	17 49	0 41	2 24	12 14	3.4	4 37	.4
S								

SUNCE UT	e = Tp − UT	Δ/24	r	MJESEC Prolaz	Δ/24	$\pi_\leftmoon$	r
h	min s	s	′	h min	min	′	′
00	5 36.8	.9	15.9	$T_{\overline{m}}$ 20 43	1.8	54.6	14.9
12	5 47.6	$T_{\overline{m}_\odot}$ 11 h 54.2 min		Starost 9.6 d	Faza ◐		

PLANETE

Pl.	$T_{\overline{m}}$	π	360−α	Vel.	Pl.	$T_{\overline{m}}$	π	360−α	Vel.
	h min	′	°			h min	′	°	
♀	14 21	.3	148	-4.4	♃	0 11	.0	0	-2.8
♂	14 11	.1	150	1.5	♄	12 37	.0	174	1.1

UT	SUNCE $S_\odot$	$\delta_\odot$	PROLJ. TAČKA S_Υ	VENERA S_φ	δ_φ	MARS S_σ	δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	181 29.5	1 36.3	357 47.2	144 54.7	-18 48.9	147 19.7	-12 32.6
2	211 30.0	1 34.3	27 52.2	174 57.0	-18 50.4	177 21.4	-12 33.8
4	241 30.4	1 32.4	57 57.1	204 59.2	-18 52.0	207 23.1	-12 35.0
6	271 30.9	1 30.5	88 2.0	235 1.5	-18 53.5	237 24.8	-12 36.2
8	301 31.3	1 28.5	118 7.0	265 3.8	-18 55.0	267 26.5	-12 37.4
10	331 31.8	1 26.6	148 11.9	295 6.1	-18 56.6	297 28.2	-12 38.6
12	1 32.2	1 24.7	178 16.8	325 8.4	-18 58.1	327 30.0	-12 39.8
14	31 32.6	1 22.7	208 21.7	355 10.7	-18 59.6	357 31.7	-12 41.0
16	61 33.1	1 20.8	238 26.7	25 13.0	-19 1.1	27 33.4	-12 42.2
18	91 33.5	1 18.8	268 31.6	55 15.3	-19 2.6	57 35.1	-12 43.4
20	121 34.0	1 16.9	298 36.5	85 17.6	-19 4.1	87 36.8	-12 44.6
22	151 34.4	1 15.0	328 41.5	115 20.0	-19 5.6	117 38.5	-12 45.8
Δ	2	-10		11	-8	9	-6

UT	MJESEC $S_\leftmoon$	Δ	$\delta_\leftmoon$	Δ	JUPITER $S_\jupiter$	$\delta_\jupiter$	SATURN $S_\saturn$	$\delta_\saturn$
h	° ′		° ′		° ′	° ′	° ′	° ′
0	47 52.5	143	-15 50.7	99	358 20.1	- 1 58.4	171 11.3	- 0 30.1
2	76 59.0	144	-15 31.0	100	28 25.7	- 1 58.7	201 15.7	- 0 30.3
4	106 5.8	145	-15 11.0	101	58 31.2	- 1 58.9	231 20.0	- 0 30.6
6	135 12.9	146	-14 50.8	102	88 36.7	- 1 59.2	261 24.4	- 0 30.8
8	164 20.1	147	-14 30.4	103	118 42.3	- 1 59.5	291 28.8	- 0 31.1
10	193 27.5	148	-14 9.8	104	148 47.8	- 1 59.7	321 33.1	- 0 31.3
12	222 35.2	149	-13 49.0	105	178 53.4	- 2 .0	351 37.5	- 0 31.5
14	251 43.0	150	-13 27.9	106	208 58.9	- 2 .3	21 41.9	- 0 31.8
16	280 51.0	151	-13 6.7	107	239 4.4	- 2 .5	51 46.3	- 0 32.0
18	309 59.2	152	-12 45.2	108	269 10.0	- 2 .8	81 50.6	- 0 32.3
20	339 7.6	153	-12 23.6	109	299 15.5	- 2 1.1	111 55.0	- 0 32.5
22	8 16.2	154	-12 1.7	110	329 21.0	- 2 1.3	141 59.4	- 0 32.8
Δ					28	-1	22	-1

φ	SUNCE IZLAZ	ZALAZ	TRAJANJE SUMRAKA GRAĐ.	ASTR.	MJESEC IZLAZ	Δ/24	ZALAZ	Δ/24
N	h min	h min	h min	h min	h min	min	h min	min
60	5 37	18 10	0 42	2 28	16 53	.3	0 53	3.3
55	5 39	18 7	0 36	2 6	16 35	.5	1 16	3.0
50	5 42	18 5	0 32	1 51	16 22	.8	1 33	2.8
45	5 43	18 4	0 29	1 39	16 11	.9	1 47	2.6
40	5 45	18 3	0 27	1 31	16 2	1.1	1 58	2.5
35	5 46	18 2	0 25	1 25	15 54	1.2	2 7	2.4
30	5 47	18 1	0 24	1 20	15 48	1.3	2 15	2.3
20	5 48	17 59	0 22	1 13	15 36	1.4	2 29	2.1
10	5 49	17 58	0 21	1 10	15 25	1.6	2 42	1.9
0	5 51	17 57	0 21	1 9	15 16	1.7	2 53	1.8
10	5 52	17 56	0 21	1 10	15 6	1.9	3 5	1.6
20	5 53	17 55	0 22	1 13	14 55	2.0	3 17	1.5
30	5 54	17 55	0 24	1 20	14 43	2.2	3 31	1.3
35	5 54	17 54	0 25	1 24	14 36	2.3	3 39	1.2
40	5 55	17 54	0 27	1 31	14 28	2.5	3 48	1.1
45	5 55	17 53	0 29	1 39	14 19	2.6	3 58	1.0
50	5 56	17 53	0 32	1 49	14 8	2.8	4 11	.8
55	5 57	17 52	0 36	2 4	13 53	3.0	4 27	.6
60	5 58	17 51	0 42	2 24	13 35	3.3	4 47	.3
S								

SUNCE UT	e = Tp − UT	Δ/24	r	MJESEC Prolaz	Δ/24	$\pi_\leftmoon$	r
h	min s	s	′	h min	min	′	′
00	5 58.3	.9	15.9	$T_{\overline{m}}$ 21 26	1.7	54.3	14.8
12	6 9.0	$T_{\overline{m}_\odot}$ 11 h 53.9 min		Starost 10.6 d	Faza ◐		

PLANETE

Pl.	$T_{\overline{m}}$	π	360−α	Vel.	Pl.	$T_{\overline{m}}$	π	360−α	Vel.
	h min	′	°			h min	′	°	
♀	14 19	.3	147	-4.4	♃	0 7	.0	1	-2.8
♂	14 10	.1	150	1.5	♄	12 33	.0	173	1.1

20. SEPTEMBAR 2010. PONEDJELJAK

UT	SUNCE $S_\odot$	SUNCE $\delta_\odot$	PROLJ. TAČKA S_Υ	VENERA S_φ	VENERA δ_φ	MARS S_σ	MARS δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	181 34.9	1 13.0	358 46.4	145 22.3	-19 7.1	147 40.2	-12 47.0
2	211 35.3	1 11.1	28 51.3	175 24.6	-19 8.6	177 41.9	-12 48.2
4	241 35.8	1 9.1	58 56.2	205 27.0	-19 10.1	207 43.6	-12 49.4
6	271 36.2	1 7.2	89 1.2	235 29.4	-19 11.6	237 45.3	-12 50.6
8	301 36.7	1 5.3	119 6.1	265 31.8	-19 13.1	267 47.0	-12 51.8
10	331 37.1	1 3.3	149 11.0	295 34.1	-19 14.6	297 48.7	-12 53.0
12	1 37.6	1 1.4	179 16.0	325 36.5	-19 16.1	327 50.4	-12 54.2
14	31 38.0	0 59.4	209 20.9	355 38.9	-19 17.5	357 52.1	-12 55.4
16	61 38.4	0 57.5	239 25.8	25 41.4	-19 19.0	27 53.8	-12 56.6
18	91 38.9	0 55.6	269 30.7	55 43.8	-19 20.5	57 55.5	-12 57.8
20	121 39.3	0 53.6	299 35.7	85 46.2	-19 21.9	87 57.2	-12 59.0
22	151 39.8	0 51.7	329 40.6	115 48.6	-19 23.4	117 58.8	-13 .1
Δ	2	-10		12	-7	8	-6

UT	MJESEC $S_\leftmoon$	MJESEC Δ	MJESEC $\delta_\leftmoon$	MJESEC Δ	JUPITER S_4	JUPITER δ_4	SATURN S_η	SATURN δ_η
h	° ′		° ′		° ′	° ′	° ′	° ′
0	37 24.9	155	-11 39.7	111	359 26.6	- 2 1.6	172 3.7	- 0 33.0
2	66 33.8	155	-11 17.5	112	29 32.1	- 2 1.9	202 8.1	- 0 33.2
4	95 42.9	156	-10 55.2	113	59 37.7	- 2 2.1	232 12.5	- 0 33.5
6	124 52.1	157	-10 32.7	113	89 43.2	- 2 2.4	262 16.8	- 0 33.7
8	154 1.5	158	-10 10.0	114	119 48.7	- 2 2.7	292 21.2	- 0 34.0
10	183 11.0	158	- 9 47.2	115	149 54.3	- 2 3.0	322 25.6	- 0 34.2
12	212 20.6	159	- 9 24.2	116	179 59.8	- 2 3.2	352 29.9	- 0 34.4
14	241 30.4	159	- 9 1.1	116	210 5.4	- 2 3.5	22 34.3	- 0 34.7
16	270 40.3	160	- 8 37.8	117	240 10.9	- 2 3.8	52 38.7	- 0 34.9
18	299 50.3	161	- 8 14.5	117	270 16.4	- 2 4.0	82 43.0	- 0 35.2
20	329 .4	161	- 7 51.0	118	300 22.0	- 2 4.3	112 47.4	- 0 35.4
22	358 10.6	162	- 7 27.4	119	330 27.5	- 2 4.6	142 51.8	- 0 35.7
Δ					28	-1	22	-1

φ	SUNCE IZLAZ	SUNCE ZALAZ	TRAJANJE SUMRAKA GRAĐ.	TRAJANJE SUMRAKA ASTR.	MJESEC IZLAZ	MJESEC Δ/24	MJESEC ZALAZ	MJESEC Δ/24
N	h min	h min	h min	h min	h min	min	h min	min
60	5 39	18 6	0 42	2 27	16 59	.2	2 13	3.3
55	5 41	18 5	0 36	2 5	16 48	.5	2 28	3.0
50	5 43	18 3	0 32	1 50	16 40	.7	2 40	2.8
45	5 44	18 2	0 29	1 39	16 33	.8	2 49	2.6
40	5 45	18 1	0 27	1 31	16 27	1.0	2 57	2.4
35	5 46	18 0	0 25	1 25	16 23	1.1	3 4	2.3
30	5 47	17 59	0 24	1 20	16 18	1.2	3 9	2.2
20	5 48	17 58	0 22	1 13	16 11	1.4	3 19	2.0
10	5 49	17 57	0 21	1 10	16 4	1.5	3 28	1.9
0	5 50	17 57	0 21	1 9	15 58	1.7	3 36	1.7
10	5 51	17 56	0 21	1 10	15 51	1.8	3 44	1.6
20	5 52	17 56	0 22	1 13	15 45	2.0	3 53	1.4
30	5 52	17 55	0 24	1 20	15 37	2.2	4 2	1.2
35	5 53	17 55	0 25	1 24	15 32	2.3	4 8	1.1
40	5 53	17 55	0 27	1 31	15 27	2.4	4 14	1.0
45	5 53	17 54	0 29	1 39	15 21	2.6	4 22	.9
50	5 54	17 54	0 32	1 49	15 14	2.7	4 30	.7
55	5 54	17 54	0 36	2 4	15 5	3.0	4 41	.5
60	5 55	17 54	0 42	2 25	14 54	3.2	4 55	.2
S								

SUNCE UT	SUNCE $e = T_p - UT$	SUNCE Δ/24	SUNCE r	MJESEC Prolaz	MJESEC Δ/24	MJESEC $\pi_\leftmoon$	MJESEC r
h	min s	s	′	h min	min	′	′
00	6 19.7	.9	16.0	$T_{\overline{m}}$ 22 7	1.7	54.1	14.7
12	6 30.4	$T_{\overline{m}_\odot}$ 11 h 53.5 min		Starost 11.6 d	Faza ◐		

PLANETE

Pl.	$T_{\overline{m}}$	π	360−α	Vel.	Pl.	$T_{\overline{m}}$	π	360−α	Vel.
	h min	′	°			h min	′	°	
♀	14 17	.3	147	-4.4	♃	0 2	.0	1	-2.8
♂	14 9	.1	149	1.5	♄	12 30	.0	173	1.1

21. SEPTEMBAR UTORAK

UT	SUNCE $S_\odot$	SUNCE $\delta_\odot$	PROLJ. TAČKA S_Υ	VENERA S_φ	VENERA δ_φ	MARS S_σ	MARS δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	181 40.2	0 49.7	359 45.5	145 51.1	-19 24.8	148 .5	-13 1.3
2	211 40.7	0 47.8	29 50.5	175 53.5	-19 26.3	178 2.2	-13 2.5
4	241 41.1	0 45.8	59 55.4	205 56.0	-19 27.7	208 3.9	-13 3.7
6	271 41.6	0 43.9	90 .3	235 58.5	-19 29.2	238 5.6	-13 4.9
8	301 42.0	0 42.0	120 5.2	266 1.0	-19 30.6	268 7.3	-13 6.1
10	331 42.4	0 40.0	150 10.2	296 3.5	-19 32.0	298 9.0	-13 7.3
12	1 42.9	0 38.1	180 15.1	326 6.0	-19 33.5	328 10.7	-13 8.5
14	31 43.3	0 36.1	210 20.0	356 8.5	-19 34.9	358 12.3	-13 9.7
16	61 43.8	0 34.2	240 24.9	26 11.0	-19 36.3	28 14.0	-13 10.9
18	91 44.2	0 32.2	270 29.9	56 13.5	-19 37.7	58 15.7	-13 12.0
20	121 44.7	0 30.3	300 34.8	86 16.1	-19 39.1	88 17.4	-13 13.2
22	151 45.1	0 28.4	330 39.7	116 18.6	-19 40.5	118 19.1	-13 14.4
Δ	2	-10		13	-7	8	-6

UT	MJESEC $S_\leftmoon$	MJESEC Δ	MJESEC $\delta_\leftmoon$	MJESEC Δ	JUPITER S_4	JUPITER δ_4	SATURN S_η	SATURN δ_η
h	° ′		° ′		° ′	° ′	° ′	° ′
0	27 20.9	162	- 7 3.7	119	0 33.1	- 2 4.8	172 56.1	- 0 35.9
2	56 31.3	162	- 6 39.9	120	30 38.6	- 2 5.1	203 .5	- 0 36.1
4	85 41.8	163	- 6 15.9	120	60 44.1	- 2 5.4	233 4.9	- 0 36.4
6	114 52.4	163	- 5 51.9	120	90 49.7	- 2 5.6	263 9.2	- 0 36.6
8	144 3.0	164	- 5 27.8	121	120 55.2	- 2 5.9	293 13.6	- 0 36.9
10	173 13.7	164	- 5 3.6	121	151 .8	- 2 6.2	323 17.9	- 0 37.1
12	202 24.5	164	- 4 39.4	122	181 6.3	- 2 6.4	353 22.3	- 0 37.4
14	231 35.3	164	- 4 15.1	122	211 11.8	- 2 6.7	23 26.7	- 0 37.6
16	260 46.2	165	- 3 50.7	122	241 17.4	- 2 7.0	53 31.0	- 0 37.8
18	289 57.1	165	- 3 26.2	123	271 22.9	- 2 7.2	83 35.4	- 0 38.1
20	319 8.0	165	- 3 1.7	123	301 28.5	- 2 7.5	113 39.8	- 0 38.3
22	348 19.0	165	- 2 37.1	123	331 34.0	- 2 7.8	143 44.1	- 0 38.6
Δ					28	-1	22	-1

φ	SUNCE IZLAZ	SUNCE ZALAZ	TRAJANJE SUMRAKA GRAĐ.	TRAJANJE SUMRAKA ASTR.	MJESEC IZLAZ	MJESEC Δ/24	MJESEC ZALAZ	MJESEC Δ/24
N	h min	h min	h min	h min	h min	min	h min	min
60	5 41	18 3	0 42	2 27	17 4	.2	3 31	3.2
55	5 43	18 2	0 36	2 5	16 60	.5	3 40	2.9
50	5 45	18 1	0 32	1 50	16 56	.7	3 46	2.7
45	5 46	17 60	0 29	1 39	16 54	.8	3 51	2.6
40	5 46	17 59	0 27	1 31	16 51	1.0	3 55	2.4
35	5 47	17 59	0 25	1 25	16 49	1.1	3 59	2.3
30	5 48	17 58	0 24	1 20	16 47	1.2	4 2	2.2
20	5 49	17 57	0 22	1 13	16 44	1.4	4 8	2.0
10	5 49	17 57	0 21	1 10	16 41	1.5	4 13	1.8
0	5 50	17 56	0 21	1 9	16 38	1.7	4 17	1.7
10	5 50	17 56	0 21	1 10	16 36	1.8	4 22	1.5
20	5 51	17 56	0 22	1 13	16 33	2.0	4 27	1.4
30	5 51	17 56	0 24	1 20	16 29	2.2	4 32	1.2
35	5 51	17 56	0 25	1 25	16 28	2.3	4 35	1.1
40	5 51	17 56	0 27	1 31	16 25	2.4	4 39	1.0
45	5 51	17 56	0 29	1 39	16 23	2.6	4 43	.8
50	5 52	17 56	0 32	1 50	16 20	2.7	4 47	.7
55	5 52	17 56	0 36	2 4	16 16	2.9	4 53	.5
60	5 52	17 56	0 42	2 25	16 11	3.2	5 1	.2
S								

SUNCE UT	SUNCE $e = T_p - UT$	SUNCE Δ/24	SUNCE r	MJESEC Prolaz	MJESEC Δ/24	MJESEC $\pi_\leftmoon$	MJESEC r
h	min s	s	′	h min	min	′	′
00	6 41.1	.9	16.0	$T_{\overline{m}}$ 22 48	1.7	54.0	14.7
12	6 51.8	$T_{\overline{m}_\odot}$ 11 h 53.1 min		Starost 12.6 d	Faza ○		

PLANETE

Pl.	$T_{\overline{m}}$	π	360−α	Vel.	Pl.	$T_{\overline{m}}$	π	360−α	Vel.
	h min	′	°			h min	′	°	
♀	14 15	.3	146	-4.4	♃	23 53	.0	1	-2.8
♂	14 7	.1	148	1.5	♄	12 26	.0	173	1.1

UT	SUNCE $S_\odot$	SUNCE $\delta_\odot$	PROLJ. TAČKA S_Υ	VENERA S_φ	VENERA δ_φ	MARS S_σ	MARS δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	181 45.6	0 26.4	0 44.7	146 21.2	-19 41.9	148 20.7	-13 15.6
2	211 46.0	0 24.5	30 49.6	176 23.7	-19 43.3	178 22.4	-13 16.8
4	241 46.4	0 22.5	60 54.5	206 26.3	-19 44.7	208 24.1	-13 18.0
6	271 46.9	0 20.6	90 59.4	236 28.9	-19 46.1	238 25.8	-13 19.2
8	301 47.3	0 18.6	121 4.4	266 31.5	-19 47.5	268 27.5	-13 20.3
10	331 47.8	0 16.7	151 9.3	296 34.1	-19 48.9	298 29.1	-13 21.5
12	1 48.2	0 14.7	181 14.2	326 36.7	-19 50.3	328 30.8	-13 22.7
14	31 48.7	0 12.8	211 19.2	356 39.3	-19 51.7	358 32.5	-13 23.9
16	61 49.1	0 10.9	241 24.1	26 41.9	-19 53.0	28 34.1	-13 25.1
18	91 49.5	0 8.9	271 29.0	56 44.6	-19 54.4	58 35.8	-13 26.3
20	121 50.0	0 7.0	301 33.9	86 47.2	-19 55.7	88 37.5	-13 27.4
22	151 50.4	0 5.0	331 38.9	116 49.9	-19 57.1	118 39.1	-13 28.6
Δ	2	-10		13	-7	8	-6

UT	MJESEC $S_\leftmoon$	MJESEC Δ	MJESEC $\delta_\leftmoon$	MJESEC Δ	JUPITER S_4	JUPITER δ_4	SATURN S_η	SATURN δ_η
h	° ′		° ′		° ′	° ′	° ′	° ′
0	17 30.0	165	- 2 12.5	123	1 39.5	- 2 8.0	173 48.5	- 0 38.8
2	46 41.0	165	- 1 47.9	123	31 45.1	- 2 8.3	203 52.9	- 0 39.0
4	75 52.0	165	- 1 23.2	124	61 50.6	- 2 8.6	233 57.2	- 0 39.3
6	105 3.0	165	- 0 58.5	124	91 56.2	- 2 8.8	264 1.6	- 0 39.5
8	134 14.0	165	- 0 33.8	124	122 1.7	- 2 9.1	294 6.0	- 0 39.8
10	163 25.0	165	- 0 9.0	124	152 7.2	- 2 9.4	324 10.3	- 0 40.0
12	192 36.0	165	0 15.7	124	182 12.8	- 2 9.6	354 14.7	- 0 40.3
14	221 46.9	165	0 40.5	124	212 18.3	- 2 9.9	24 19.1	- 0 40.5
16	250 57.8	164	1 5.2	124	242 23.9	- 2 10.2	54 23.4	- 0 40.7
18	280 8.7	164	1 30.0	124	272 29.4	- 2 10.4	84 27.8	- 0 41.0
20	309 19.5	164	1 54.7	124	302 35.0	- 2 10.7	114 32.2	- 0 41.2
22	338 30.3	164	2 19.4	123	332 40.5	- 2 11.0	144 36.5	- 0 41.5
Δ					28	-1	22	-1

φ	SUNCE IZLAZ	SUNCE ZALAZ	TRAJANJE SUMRAKA GRAĐ.	TRAJANJE SUMRAKA ASTR.	MJESEC IZLAZ	MJESEC Δ/24	MJESEC ZALAZ	MJESEC Δ/24
N	h min	h min	h min	h min	h min	min	h min	min
60	5 44	18 0	0 42	2 26	17 9	.2	4 49	3.2
55	5 45	17 59	0 36	2 4	17 11	.5	4 51	3.0
50	5 46	17 59	0 32	1 50	17 12	.7	4 52	2.7
45	5 47	17 58	0 29	1 39	17 13	.8	4 53	2.6
40	5 47	17 58	0 27	1 31	17 14	1.0	4 54	2.4
35	5 48	17 57	0 25	1 25	17 15	1.1	4 54	2.3
30	5 48	17 57	0 24	1 20	17 15	1.2	4 55	2.2
20	5 49	17 56	0 22	1 13	17 17	1.4	4 56	2.0
10	5 49	17 56	0 21	1 10	17 18	1.5	4 57	1.8
0	5 50	17 56	0 21	1 9	17 19	1.7	4 58	1.7
10	5 50	17 56	0 21	1 10	17 20	1.9	4 59	1.5
20	5 50	17 56	0 22	1 13	17 21	2.0	4 60	1.4
30	5 50	17 56	0 24	1 20	17 22	2.2	5 1	1.2
35	5 50	17 56	0 25	1 25	17 23	2.3	5 1	1.1
40	5 50	17 57	0 27	1 31	17 23	2.4	5 2	1.0
45	5 50	17 57	0 29	1 39	17 24	2.6	5 3	.8
50	5 49	17 57	0 32	1 50	17 26	2.8	5 3	.7
55	5 49	17 58	0 36	2 5	17 27	3.0	5 5	.5
60	5 49	17 58	0 42	2 26	17 29	3.3	5 6	.2
S								

SUNCE UT	SUNCE $e = T_p - UT$	SUNCE Δ/24	SUNCE r	MJESEC Prolaz	MJESEC Δ/24	MJESEC $\pi_\leftmoon$	MJESEC r
h	min s	s	′	h min	min	′	′
00	7 2.4	.9	16.0	$T_{\overline{m}}$ 23 28	1.7	54.0	14.7
12	7 13.0	$T_{\overline{m}_\odot}$ 11 h 52.8 min		Starost 13.6 d	Faza ○		

PLANETE Pl.	$T_{\overline{m}}$	π	360−α	Vel.	Pl.	$T_{\overline{m}}$	π	360−α	Vel.
	h min	′	°			h min	′	°	
♀	14 13	.3	146	-4.4	♃	23 49	.0	1	-2.8
♂	14 6	.1	148	1.5	♄	12 23	.0	173	1.1

UT	SUNCE $S_\odot$	SUNCE $\delta_\odot$	PROLJ. TAČKA S_Υ	VENERA S_φ	VENERA δ_φ	MARS S_σ	MARS δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	181 50.9	0 3.1	1 43.8	146 52.5	-19 58.5	148 40.8	-13 29.8
2	211 51.3	0 1.1	31 48.7	176 55.2	-19 59.8	178 42.5	-13 31.0
4	241 51.7	- 0 .8	61 53.7	206 57.9	-20 1.1	208 44.1	-13 32.2
6	271 52.2	- 0 2.8	91 58.6	237 .6	-20 2.5	238 45.8	-13 33.3
8	301 52.6	- 0 4.7	122 3.5	267 3.3	-20 3.8	268 47.5	-13 34.5
10	331 53.1	- 0 6.6	152 8.4	297 6.0	-20 5.2	298 49.1	-13 35.7
12	1 53.5	- 0 8.6	182 13.4	327 8.8	-20 6.5	328 50.8	-13 36.9
14	31 53.9	- 0 10.5	212 18.3	357 11.5	-20 7.8	358 52.5	-13 38.0
16	61 54.4	- 0 12.5	242 23.2	27 14.2	-20 9.1	28 54.1	-13 39.2
18	91 54.8	- 0 14.4	272 28.2	57 17.0	-20 10.4	58 55.8	-13 40.4
20	121 55.3	- 0 16.4	302 33.1	87 19.8	-20 11.7	88 57.4	-13 41.6
22	151 55.7	- 0 18.3	332 38.0	117 22.5	-20 13.0	118 59.1	-13 42.7
Δ	2	-10		14	-7	8	-6

UT	MJESEC $S_\leftmoon$	MJESEC Δ	MJESEC $\delta_\leftmoon$	MJESEC Δ	JUPITER S_4	JUPITER δ_4	SATURN S_η	SATURN δ_η
h	° ′		° ′		° ′	° ′	° ′	° ′
0	7 41.0	163	2 44.1	123	2 46.0	- 2 11.2	174 40.9	- 0 41.7
2	36 51.7	163	3 8.8	123	32 51.6	- 2 11.5	204 45.3	- 0 42.0
4	66 2.3	163	3 33.4	123	62 57.1	- 2 11.8	234 49.6	- 0 42.2
6	95 12.8	162	3 58.0	123	93 2.6	- 2 12.0	264 54.0	- 0 42.4
8	124 23.2	162	4 22.5	122	123 8.2	- 2 12.3	294 58.3	- 0 42.7
10	153 33.5	161	4 47.0	122	153 13.7	- 2 12.6	325 2.7	- 0 42.9
12	182 43.7	161	5 11.4	122	183 19.3	- 2 12.8	355 7.1	- 0 43.2
14	211 53.9	160	5 35.8	121	213 24.8	- 2 13.1	25 11.4	- 0 43.4
16	241 3.9	160	6 .0	121	243 30.3	- 2 13.4	55 15.8	- 0 43.7
18	270 13.8	159	6 24.2	121	273 35.9	- 2 13.6	85 20.2	- 0 43.9
20	299 23.6	158	6 48.4	120	303 41.4	- 2 13.9	115 24.5	- 0 44.1
22	328 33.2	158	7 12.4	120	333 47.0	- 2 14.2	145 28.9	- 0 44.4
Δ					28	-1	22	-1

φ	SUNCE IZLAZ	SUNCE ZALAZ	TRAJANJE SUMRAKA GRAĐ.	TRAJANJE SUMRAKA ASTR.	MJESEC IZLAZ	MJESEC Δ/24	MJESEC ZALAZ	MJESEC Δ/24
N	h min	h min	h min	h min	h min	min	h min	min
60	5 46	17 57	0 41	2 25	17 15	.3	6 7	3.3
55	5 47	17 57	0 36	2 4	17 22	.5	6 1	3.0
50	5 48	17 56	0 32	1 49	17 28	.7	5 58	2.8
45	5 48	17 56	0 29	1 39	17 33	.9	5 54	2.6
40	5 48	17 56	0 27	1 31	17 38	1.0	5 52	2.5
35	5 49	17 56	0 25	1 24	17 41	1.2	5 49	2.3
30	5 49	17 56	0 24	1 20	17 44	1.3	5 47	2.2
20	5 49	17 56	0 22	1 13	17 50	1.4	5 44	2.0
10	5 49	17 56	0 21	1 10	17 55	1.6	5 41	1.9
0	5 49	17 56	0 21	1 9	17 59	1.8	5 38	1.7
10	5 49	17 56	0 21	1 10	18 4	1.9	5 35	1.6
20	5 49	17 56	0 22	1 13	18 9	2.1	5 32	1.4
30	5 49	17 57	0 24	1 20	18 15	2.2	5 29	1.2
35	5 48	17 57	0 25	1 25	18 18	2.4	5 27	1.1
40	5 48	17 57	0 27	1 31	18 22	2.5	5 25	1.0
45	5 48	17 58	0 29	1 39	18 26	2.6	5 22	.9
50	5 47	17 59	0 32	1 50	18 32	2.8	5 19	.7
55	5 46	17 60	0 36	2 5	18 38	3.0	5 16	.5
60	5 46	18 1	0 42	2 27	18 47	3.3	5 11	.2
S								

SUNCE UT	SUNCE $e = T_p - UT$	SUNCE Δ/24	SUNCE r	MJESEC Prolaz	MJESEC Δ/24	MJESEC $\pi_\leftmoon$	MJESEC r
h	min s	s	′	h min	min	′	′
00	7 23.6	.9	16.0	$T_{\overline{m}}$	1.0	54.1	14.7
12	7 34.2	$T_{\overline{m}_\odot}$ 11 h 52.4 min		Starost 14.6 d	Faza ○		

PLANETE Pl.	$T_{\overline{m}}$	π	360−α	Vel.	Pl.	$T_{\overline{m}}$	π	360−α	Vel.
	h min	′	°			h min	′	°	
♀	14 11	.3	145	-4.5	♃	23 45	.0	1	-2.8
♂	14 5	.1	147	1.5	♄	12 19	.0	173	1.1

UT	SUNCE $S_\odot$	SUNCE $\delta_\odot$	PROLJ. TAČKA S_Υ	VENERA S_φ	VENERA δ_φ	MARS S_σ	MARS δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	181 56.1	- 0 20.3	2 42.9	147 25.3	-20 14.3	149 .7	-13 43.9
2	211 56.6	- 0 22.2	32 47.9	177 28.1	-20 15.6	179 2.4	-13 45.1
4	241 57.0	- 0 24.2	62 52.8	207 30.9	-20 16.9	209 4.0	-13 46.2
6	271 57.5	- 0 26.1	92 57.7	237 33.7	-20 18.2	239 5.7	-13 47.4
8	301 57.9	- 0 28.1	123 2.7	267 36.6	-20 19.5	269 7.4	-13 48.6
10	331 58.3	- 0 30.0	153 7.6	297 39.4	-20 20.8	299 9.0	-13 49.8
12	1 58.8	- 0 31.9	183 12.5	327 42.2	-20 22.0	329 10.6	-13 50.9
14	31 59.2	- 0 33.9	213 17.4	357 45.1	-20 23.3	359 12.3	-13 52.1
16	61 59.6	- 0 35.8	243 22.4	27 48.0	-20 24.6	29 13.9	-13 53.3
18	92 .1	- 0 37.8	273 27.3	57 50.8	-20 25.8	59 15.6	-13 54.4
20	122 .5	- 0 39.7	303 32.2	87 53.7	-20 27.1	89 17.2	-13 55.6
22	152 .9	- 0 41.7	333 37.2	117 56.6	-20 28.3	119 18.9	-13 56.8
Δ	2	-10		14	-6	8	-6

UT	MJESEC $S_\leftmoon$	MJESEC Δ	MJESEC $\delta_\leftmoon$	MJESEC Δ	JUPITER $S_\jupiter$	JUPITER $\delta_\jupiter$	SATURN $S_\saturn$	SATURN $\delta_\saturn$
h	° ′		° ′		° ′	° ′	° ′	° ′
0	357 42.8	157	7 36.3	119	3 52.5	- 2 14.4	175 33.3	- 0 44.6
2	26 52.1	156	8 .1	119	33 58.0	- 2 14.7	205 37.6	- 0 44.9
4	56 1.4	155	8 23.9	118	64 3.6	- 2 15.0	235 42.0	- 0 45.1
6	85 10.5	155	8 47.5	117	94 9.1	- 2 15.2	265 46.3	- 0 45.3
8	114 19.4	154	9 10.9	117	124 14.7	- 2 15.5	295 50.7	- 0 45.6
10	143 28.1	153	9 34.3	116	154 20.2	- 2 15.8	325 55.1	- 0 45.8
12	172 36.7	152	9 57.5	115	184 25.7	- 2 16.0	355 59.4	- 0 46.1
14	201 45.1	151	10 20.6	115	214 31.3	- 2 16.3	26 3.8	- 0 46.3
16	230 53.3	150	10 43.5	114	244 36.8	- 2 16.6	56 8.2	- 0 46.6
18	260 1.4	149	11 6.3	113	274 42.4	- 2 16.8	86 12.5	- 0 46.8
20	289 9.2	148	11 28.9	112	304 47.9	- 2 17.1	116 16.9	- 0 47.0
22	318 16.9	147	11 51.3	111	334 53.4	- 2 17.4	146 21.3	- 0 47.3
Δ					28	-1	22	-1

φ	SUNCE IZLAZ	SUNCE ZALAZ	TRAJANJE SUMRAKA GRAĐ.	TRAJANJE SUMRAKA ASTR.	MJESEC IZLAZ	MJESEC Δ/24	MJESEC ZALAZ	MJESEC Δ/24
N	h min	h min	h min	h min	h min	min	h min	min
60	5 49	17 54	0 41	2 25	17 21	.3	7 25	3.4
55	5 49	17 54	0 36	2 4	17 35	.6	7 13	3.1
50	5 49	17 54	0 32	1 49	17 46	.8	7 4	2.8
45	5 49	17 54	0 29	1 39	17 55	1.0	6 57	2.6
40	5 49	17 54	0 27	1 31	18 2	1.2	6 51	2.5
35	5 49	17 54	0 25	1 24	18 9	1.3	6 45	2.4
30	5 49	17 54	0 24	1 20	18 15	1.4	6 41	2.3
20	5 49	17 55	0 22	1 13	18 25	1.5	6 33	2.1
10	5 49	17 55	0 21	1 10	18 33	1.7	6 26	1.9
0	5 49	17 55	0 21	1 9	18 41	1.8	6 19	1.8
10	5 48	17 56	0 21	1 10	18 50	2.0	6 13	1.6
20	5 48	17 56	0 22	1 13	18 59	2.1	6 6	1.5
30	5 47	17 57	0 24	1 20	19 9	2.3	5 58	1.3
35	5 47	17 58	0 25	1 25	19 15	2.4	5 54	1.2
40	5 46	17 58	0 27	1 31	19 22	2.5	5 49	1.1
45	5 46	17 59	0 29	1 39	19 29	2.7	5 43	.9
50	5 45	18 0	0 32	1 50	19 39	2.9	5 36	.8
55	5 44	18 1	0 36	2 6	19 51	3.1	5 27	.6
60	5 43	18 3	0 42	2 28	20 7	3.4	5 16	.3
S								

SUNCE UT	SUNCE $e = T_p - UT$	SUNCE Δ/24	SUNCE r	MJESEC Prolaz	MJESEC Δ/24	MJESEC $\pi_\leftmoon$	MJESEC r
h	min s	s	′	h min	min	′	′
00	7 44.7	.9	16.0	$T_{\overline{m}}$ 0 9	1.8	54.3	14.8
12	7 55.2	$T_{\overline{m}_\odot}$ 11 h 52.1 min		Starost 15.6 d	Faza ○		

PLANETE Pl.	$T_{\overline{m}}$	π	360−α	Vel.	Pl.	$T_{\overline{m}}$	π	360−α	Vel.
	h min	′	°			h min	′	°	
♀	14 9	.3	145	-4.5	♃	23 40	.0	1	-2.8
♂	14 3	.1	146	1.5	♄	12 16	.0	173	1.1

UT	SUNCE $S_\odot$	SUNCE $\delta_\odot$	PROLJ. TAČKA S_Υ	VENERA S_φ	VENERA δ_φ	MARS S_σ	MARS δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	182 1.4	- 0 43.6	3 42.1	147 59.5	-20 29.6	149 20.5	-13 57.9
2	212 1.8	- 0 45.6	33 47.0	178 2.5	-20 30.8	179 22.2	-13 59.1
4	242 2.3	- 0 47.5	63 51.9	208 5.4	-20 32.0	209 23.8	-14 .3
6	272 2.7	- 0 49.5	93 56.9	238 8.3	-20 33.3	239 25.4	-14 1.4
8	302 3.1	- 0 51.4	124 1.8	268 11.3	-20 34.5	269 27.1	-14 2.6
10	332 3.6	- 0 53.4	154 6.7	298 14.2	-20 35.7	299 28.7	-14 3.8
12	2 4.0	- 0 55.3	184 11.6	328 17.2	-20 36.9	329 30.4	-14 4.9
14	32 4.4	- 0 57.3	214 16.6	358 20.2	-20 38.1	359 32.0	-14 6.1
16	62 4.9	- 0 59.2	244 21.5	28 23.2	-20 39.4	29 33.6	-14 7.2
18	92 5.3	- 1 1.2	274 26.4	58 26.2	-20 40.6	59 35.3	-14 8.4
20	122 5.7	- 1 3.1	304 31.4	88 29.2	-20 41.7	89 36.9	-14 9.6
22	152 6.2	- 1 5.0	334 36.3	118 32.2	-20 42.9	119 38.5	-14 10.7
Δ	2	-10		15	-6	8	-6

UT	MJESEC $S_\leftmoon$	MJESEC Δ	MJESEC $\delta_\leftmoon$	MJESEC Δ	JUPITER $S_\jupiter$	JUPITER $\delta_\jupiter$	SATURN $S_\saturn$	SATURN $\delta_\saturn$
h	° ′		° ′		° ′	° ′	° ′	° ′
0	347 24.3	146	12 13.6	110	4 59.0	- 2 17.6	176 25.6	- 0 47.5
2	16 31.5	145	12 35.7	109	35 4.5	- 2 17.9	206 30.0	- 0 47.8
4	45 38.5	144	12 57.6	108	65 10.0	- 2 18.1	236 34.3	- 0 48.0
6	74 45.3	143	13 19.3	107	95 15.6	- 2 18.4	266 38.7	- 0 48.3
8	103 51.9	142	13 40.8	106	125 21.1	- 2 18.7	296 43.1	- 0 48.5
10	132 58.2	140	14 2.0	105	155 26.7	- 2 18.9	326 47.4	- 0 48.7
12	162 4.3	139	14 23.1	104	185 32.2	- 2 19.2	356 51.8	- 0 49.0
14	191 10.2	138	14 44.0	103	215 37.7	- 2 19.5	26 56.2	- 0 49.2
16	220 15.8	137	15 4.6	102	245 43.3	- 2 19.7	57 .5	- 0 49.5
18	249 21.2	136	15 24.9	101	275 48.8	- 2 20.0	87 4.9	- 0 49.7
20	278 26.3	134	15 45.0	99	305 54.3	- 2 20.3	117 9.2	- 0 49.9
22	307 31.1	133	16 4.9	98	335 59.9	- 2 20.5	147 13.6	- 0 50.2
Δ					28	-1	22	-1

φ	SUNCE IZLAZ	SUNCE ZALAZ	TRAJANJE SUMRAKA GRAĐ.	TRAJANJE SUMRAKA ASTR.	MJESEC IZLAZ	MJESEC Δ/24	MJESEC ZALAZ	MJESEC Δ/24
N	h min	h min	h min	h min	h min	min	h min	min
60	5 51	17 51	0 41	2 24	17 29	.5	8 46	3.4
55	5 51	17 52	0 36	2 3	17 50	.8	8 27	3.1
50	5 51	17 52	0 32	1 49	18 7	1.0	8 12	2.9
45	5 50	17 52	0 29	1 38	18 19	1.2	8 0	2.7
40	5 50	17 53	0 27	1 30	18 30	1.3	7 51	2.6
35	5 50	17 53	0 25	1 24	18 39	1.4	7 43	2.4
30	5 50	17 53	0 24	1 20	18 47	1.5	7 36	2.3
20	5 49	17 54	0 22	1 13	19 2	1.7	7 23	2.2
10	5 49	17 54	0 21	1 10	19 14	1.8	7 12	2.0
0	5 48	17 55	0 21	1 9	19 26	1.9	7 2	1.9
10	5 48	17 56	0 21	1 10	19 37	2.1	6 52	1.8
20	5 47	17 57	0 22	1 13	19 50	2.2	6 42	1.6
30	5 46	17 58	0 24	1 20	20 4	2.4	6 30	1.4
35	5 45	17 59	0 25	1 25	20 13	2.5	6 23	1.3
40	5 45	17 59	0 27	1 31	20 22	2.6	6 15	1.2
45	5 44	18 0	0 29	1 40	20 34	2.7	6 6	1.1
50	5 43	18 2	0 32	1 51	20 48	2.9	5 55	.9
55	5 41	18 3	0 36	2 6	21 5	3.1	5 41	.7
60	5 39	18 5	0 42	2 28	21 29	3.5	5 23	.4
S								

SUNCE UT	SUNCE $e = T_p - UT$	SUNCE Δ/24	SUNCE r	MJESEC Prolaz	MJESEC Δ/24	MJESEC $\pi_\leftmoon$	MJESEC r
h	min s	s	′	h min	min	′	′
00	8 5.7	.9	16.0	$T_{\overline{m}}$ 0 52	1.9	54.6	14.9
12	8 16.1	$T_{\overline{m}_\odot}$ 11 h 51.7 min		Starost 16.6 d	Faza ○		

PLANETE Pl.	$T_{\overline{m}}$	π	360−α	Vel.	Pl.	$T_{\overline{m}}$	π	360−α	Vel.
	h min	′	°			h min	′	°	
♀	14 7	.4	144	-4.5	♃	23 36	.0	1	-2.8
♂	14 2	.1	146	1.5	♄	12 13	.0	173	1.1

UT	SUNCE $S_\odot$	SUNCE $\delta_\odot$	PROLJ. TAČKA S_Υ	VENERA S_φ	VENERA δ_φ	MARS S_σ	MARS δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	182 6.6	- 1 7.0	4 41.2	148 35.3	-20 44.1	149 40.2	-14 11.9
2	212 7.0	- 1 8.9	34 46.1	178 38.3	-20 45.3	179 41.8	-14 13.0
4	242 7.4	- 1 10.9	64 51.1	208 41.4	-20 46.5	209 43.4	-14 14.2
6	272 7.9	- 1 12.8	94 56.0	238 44.4	-20 47.7	239 45.0	-14 15.4
8	302 8.3	- 1 14.8	125 .9	268 47.5	-20 48.8	269 46.7	-14 16.5
10	332 8.7	- 1 16.7	155 5.9	298 50.6	-20 50.0	299 48.3	-14 17.7
12	2 9.2	- 1 18.7	185 10.8	328 53.7	-20 51.1	329 49.9	-14 18.8
14	32 9.6	- 1 20.6	215 15.7	358 56.8	-20 52.3	359 51.5	-14 20.0
16	62 10.0	- 1 22.6	245 20.6	28 60.0	-20 53.4	29 53.2	-14 21.1
18	92 10.5	- 1 24.5	275 25.6	59 3.1	-20 54.6	59 54.8	-14 22.3
20	122 10.9	- 1 26.5	305 30.5	89 6.2	-20 55.7	89 56.4	-14 23.4
22	152 11.3	- 1 28.4	335 35.4	119 9.4	-20 56.9	119 58.0	-14 24.6
Δ	2	-10		16	-6	8	-6

UT	MJESEC $S_\leftmoon$	MJESEC Δ	MJESEC $\delta_\leftmoon$	MJESEC Δ	JUPITER $S_\jupiter$	JUPITER $\delta_\jupiter$	SATURN $S_\saturn$	SATURN $\delta_\saturn$
h	° ′		° ′		° ′	° ′	° ′	° ′
0	336 35.7	132	16 24.5	97	6 5.4	- 2 20.8	177 18.0	- 0 50.4
2	5 40.1	130	16 43.8	95	36 11.0	- 2 21.0	207 22.3	- 0 50.7
4	34 44.1	129	17 2.9	94	66 16.5	- 2 21.3	237 26.7	- 0 50.9
6	63 47.9	128	17 21.7	92	96 22.0	- 2 21.6	267 31.1	- 0 51.2
8	92 51.4	126	17 40.1	91	126 27.6	- 2 21.8	297 35.4	- 0 51.4
10	121 54.7	125	17 58.3	89	156 33.1	- 2 22.1	327 39.8	- 0 51.6
12	150 57.6	123	18 16.2	88	186 38.6	- 2 22.4	357 44.1	- 0 51.9
14	180 .3	122	18 33.8	86	216 44.2	- 2 22.6	27 48.5	- 0 52.1
16	209 2.7	121	18 51.0	85	246 49.7	- 2 22.9	57 52.9	- 0 52.4
18	238 4.8	119	19 7.9	83	276 55.2	- 2 23.1	87 57.2	- 0 52.6
20	267 6.6	118	19 24.5	81	307 .8	- 2 23.4	118 1.6	- 0 52.9
22	296 8.1	116	19 40.7	79	337 6.3	- 2 23.7	148 6.0	- 0 53.1
Δ					28	-1	22	-1

φ	SUNCE IZLAZ	SUNCE ZALAZ	TRAJANJE SUMRAKA GRAĐ.	TRAJANJE SUMRAKA ASTR.	MJESEC IZLAZ	MJESEC Δ/24	MJESEC ZALAZ	MJESEC Δ/24
N	h min	h min	h min	h min	h min	min	h min	min
60	5 53	17 48	0 41	2 23	17 41	.7	10 9	3.5
55	5 53	17 49	0 36	2 3	18 10	1.1	9 41	3.1
50	5 52	17 50	0 32	1 49	18 31	1.3	9 21	2.9
45	5 52	17 50	0 29	1 38	18 48	1.4	9 5	2.7
40	5 51	17 51	0 27	1 30	19 2	1.6	8 52	2.6
35	5 51	17 51	0 25	1 24	19 14	1.7	8 41	2.5
30	5 50	17 52	0 24	1 20	19 24	1.7	8 32	2.4
20	5 50	17 53	0 22	1 13	19 42	1.9	8 15	2.3
10	5 49	17 54	0 21	1 10	19 58	2.0	8 1	2.1
0	5 48	17 55	0 21	1 9	20 12	2.1	7 48	2.0
10	5 47	17 56	0 21	1 10	20 27	2.2	7 35	1.9
20	5 46	17 57	0 22	1 13	20 43	2.3	7 20	1.8
30	5 45	17 58	0 24	1 20	21 1	2.4	7 4	1.6
35	5 44	17 59	0 25	1 25	21 12	2.5	6 55	1.5
40	5 43	18 0	0 27	1 31	21 24	2.6	6 44	1.4
45	5 42	18 2	0 29	1 40	21 39	2.7	6 32	1.3
50	5 41	18 3	0 32	1 51	21 57	2.8	6 17	1.1
55	5 39	18 5	0 36	2 6	22 20	3.1	5 58	.9
60	5 36	18 8	0 42	2 29	22 52	3.4	5 33	.6
S								

SUNCE UT	SUNCE $e = T_p - UT$	SUNCE Δ/24	SUNCE r	MJESEC Prolaz	MJESEC Δ/24	MJESEC $\pi_\leftmoon$	MJESEC r
h	min s	s	′	h min	min	′	′
00	8 26.5	.9	16.0	$T_{\overline{m}}$ 1 37	2.0	54.9	15.0
12	8 36.9	$T_{\overline{m}_\odot}$ 11 h 51.4 min		Starost 17.6 d	Faza ◑		

PLANETE Pl.	$T_{\overline{m}}$	π	360−α	Vel.	Pl.	$T_{\overline{m}}$	π	360−α	Vel.
	h min	′	°			h min	′	°	
♀	14 4	.4	144	-4.5	♃	23 31	.0	1	-2.8
♂	14 1	.1	145	1.5	♄	12 9	.0	173	1.1

UT	SUNCE $S_\odot$	SUNCE $\delta_\odot$	PROLJ. TAČKA S_Υ	VENERA S_φ	VENERA δ_φ	MARS S_σ	MARS δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	182 11.7	- 1 30.4	5 40.4	149 12.6	-20 58.0	149 59.6	-14 25.7
2	212 12.2	- 1 32.3	35 45.3	179 15.7	-20 59.1	180 1.3	-14 26.9
4	242 12.6	- 1 34.2	65 50.2	209 18.9	-21 .2	210 2.9	-14 28.0
6	272 13.0	- 1 36.2	95 55.1	239 22.1	-21 1.3	240 4.5	-14 29.2
8	302 13.4	- 1 38.1	126 .1	269 25.4	-21 2.4	270 6.1	-14 30.3
10	332 13.9	- 1 40.1	156 5.0	299 28.6	-21 3.5	300 7.7	-14 31.5
12	2 14.3	- 1 42.0	186 9.9	329 31.8	-21 4.6	330 9.3	-14 32.6
14	32 14.7	- 1 44.0	216 14.9	359 35.1	-21 5.7	0 10.9	-14 33.8
16	62 15.1	- 1 45.9	246 19.8	29 38.3	-21 6.8	30 12.5	-14 34.9
18	92 15.6	- 1 47.9	276 24.7	59 41.6	-21 7.9	60 14.2	-14 36.1
20	122 16.0	- 1 49.8	306 29.6	89 44.9	-21 9.0	90 15.8	-14 37.2
22	152 16.4	- 1 51.8	336 34.6	119 48.2	-21 10.0	120 17.4	-14 38.4
Δ	2	-10		16	-5	8	-6

UT	MJESEC $S_\leftmoon$	MJESEC Δ	MJESEC $\delta_\leftmoon$	MJESEC Δ	JUPITER $S_\jupiter$	JUPITER $\delta_\jupiter$	SATURN $S_\saturn$	SATURN $\delta_\saturn$
h	° ′		° ′		° ′	° ′	° ′	° ′
0	325 9.4	115	19 56.5	78	7 11.8	- 2 23.9	178 10.3	- 0 53.3
2	354 10.3	113	20 12.0	76	37 17.4	- 2 24.2	208 14.7	- 0 53.6
4	23 11.0	112	20 27.2	74	67 22.9	- 2 24.5	238 19.0	- 0 53.8
6	52 11.3	110	20 41.9	72	97 28.4	- 2 24.7	268 23.4	- 0 54.1
8	81 11.4	109	20 56.3	70	127 34.0	- 2 25.0	298 27.8	- 0 54.3
10	110 11.2	107	21 10.3	68	157 39.5	- 2 25.2	328 32.1	- 0 54.5
12	139 10.6	106	21 23.8	66	187 45.0	- 2 25.5	358 36.5	- 0 54.8
14	168 9.8	105	21 37.0	64	217 50.6	- 2 25.8	28 40.8	- 0 55.0
16	197 8.7	103	21 49.8	62	247 56.1	- 2 26.0	58 45.2	- 0 55.3
18	226 7.4	102	22 2.1	60	278 1.6	- 2 26.3	88 49.6	- 0 55.5
20	255 5.7	100	22 14.0	57	308 7.2	- 2 26.5	118 53.9	- 0 55.8
22	284 3.7	99	22 25.5	55	338 12.7	- 2 26.8	148 58.3	- 0 56.0
Δ					28	-1	22	-1

φ	SUNCE IZLAZ	SUNCE ZALAZ	TRAJANJE SUMRAKA GRAĐ.	TRAJANJE SUMRAKA ASTR.	MJESEC IZLAZ	MJESEC Δ/24	MJESEC ZALAZ	MJESEC Δ/24
N	h min	h min	h min	h min	h min	min	h min	min
60	5 56	17 45	0 41	2 23	17 59	1.2	11 32	3.3
55	5 54	17 47	0 36	2 3	18 36	1.5	10 55	3.0
50	5 54	17 48	0 32	1 49	19 2	1.7	10 30	2.8
45	5 53	17 49	0 29	1 38	19 23	1.8	10 10	2.7
40	5 52	17 49	0 27	1 30	19 39	1.9	9 54	2.6
35	5 52	17 50	0 25	1 24	19 53	1.9	9 41	2.5
30	5 51	17 51	0 24	1 19	20 6	2.0	9 29	2.4
20	5 50	17 52	0 22	1 13	20 27	2.1	9 9	2.3
10	5 49	17 53	0 21	1 10	20 45	2.1	8 52	2.2
0	5 48	17 54	0 21	1 9	21 2	2.2	8 36	2.1
10	5 47	17 56	0 21	1 10	21 19	2.3	8 20	2.1
20	5 45	17 57	0 22	1 13	21 38	2.3	8 3	2.0
30	5 44	17 59	0 24	1 20	21 59	2.4	7 43	1.8
35	5 43	18 0	0 25	1 25	22 12	2.5	7 32	1.8
40	5 41	18 1	0 27	1 32	22 26	2.5	7 19	1.7
45	5 40	18 3	0 29	1 40	22 44	2.6	7 3	1.6
50	5 38	18 5	0 32	1 51	23 5	2.7	6 44	1.5
55	5 36	18 7	0 36	2 7	23 33	2.8	6 20	1.3
60	5 33	18 10	0 42	2 30	. . .	.0	5 47	.9
S								

SUNCE UT	SUNCE $e = T_p - UT$	SUNCE Δ/24	SUNCE r	MJESEC Prolaz	MJESEC Δ/24	MJESEC $\pi_\leftmoon$	MJESEC r
h	min s	s	′	h min	min	′	′
00	8 47.1	.9	16.0	$T_{\overline{m}}$ 2 24	2.1	55.3	15.1
12	8 57.4	$T_{\overline{m}_\odot}$ 11 h 51.0 min		Starost 18.6 d	Faza ◑		

PLANETE Pl.	$T_{\overline{m}}$	π	360−α	Vel.	Pl.	$T_{\overline{m}}$	π	360−α	Vel.
	h min	′	°			h min	′	°	
♀	14 2	.4	144	-4.5	♃	23 27	.0	2	-2.8
♂	13 59	.1	144	1.5	♄	12 6	.0	172	1.1

UT	SUNCE $S_\odot$	SUNCE $\delta_\odot$	PROLJ. TAČKA S_Υ	VENERA S_φ	VENERA δ_φ	MARS S_σ	MARS δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	182 16.8	− 1 53.7	6 39.5	149 51.5	−21 11.1	150 19.0	−14 39.5
2	212 17.3	− 1 55.6	36 44.4	179 54.8	−21 12.2	180 20.6	−14 40.7
4	242 17.7	− 1 57.6	66 49.4	209 58.1	−21 13.2	210 22.2	−14 41.8
6	272 18.1	− 1 59.5	96 54.3	240 1.5	−21 14.3	240 23.8	−14 42.9
8	302 18.5	− 2 1.5	126 59.2	270 4.8	−21 15.3	270 25.4	−14 44.1
10	332 19.0	− 2 3.4	157 4.1	300 8.2	−21 16.4	300 27.0	−14 45.2
12	2 19.4	− 2 5.4	187 9.1	330 11.6	−21 17.4	330 28.6	−14 46.4
14	32 19.8	− 2 7.3	217 14.0	0 15.0	−21 18.4	0 30.2	−14 47.5
16	62 20.2	− 2 9.3	247 18.9	30 18.4	−21 19.4	30 31.8	−14 48.6
18	92 20.6	− 2 11.2	277 23.8	60 21.8	−21 20.5	60 33.4	−14 49.8
20	122 21.1	− 2 13.2	307 28.8	90 25.2	−21 21.5	90 35.0	−14 50.9
22	152 21.5	− 2 15.1	337 33.7	120 28.7	−21 22.5	120 36.6	−14 52.0
Δ	2	−10		17	−5	8	−6

UT	MJESEC $S_\leftmoon$	MJESEC Δ	MJESEC $\delta_\leftmoon$	MJESEC Δ	JUPITER S_4	JUPITER δ_4	SATURN S_η	SATURN δ_η
h	° ′		° ′		° ′	° ′	° ′	° ′
0	313 1.5	97	22 36.5	53	8 18.2	− 2 27.1	179 2.7	− 0 56.2
2	341 59.0	96	22 47.0	51	38 23.8	− 2 27.3	209 7.0	− 0 56.5
4	10 56.2	95	22 57.1	48	68 29.3	− 2 27.6	239 11.4	− 0 56.7
6	39 53.2	93	23 6.8	46	98 34.8	− 2 27.8	269 15.7	− 0 57.0
8	68 49.9	92	23 15.9	43	128 40.4	− 2 28.1	299 20.1	− 0 57.2
10	97 46.3	91	23 24.6	41	158 45.9	− 2 28.3	329 24.5	− 0 57.4
12	126 42.4	90	23 32.8	39	188 51.4	− 2 28.6	359 28.8	− 0 57.7
14	155 38.4	88	23 40.5	36	218 57.0	− 2 28.9	29 33.2	− 0 57.9
16	184 34.0	87	23 47.7	34	249 2.5	− 2 29.1	59 37.5	− 0 58.2
18	213 29.5	86	23 54.4	31	279 8.0	− 2 29.4	89 41.9	− 0 58.4
20	242 24.7	85	24 .6	28	309 13.5	− 2 29.6	119 46.3	− 0 58.7
22	271 19.6	84	24 6.3	26	339 19.1	− 2 29.9	149 50.6	− 0 58.9
Δ					28	−1	22	−1

φ	SUNCE IZLAZ	SUNCE ZALAZ	TRAJANJE SUMRAKA GRAĐ.	TRAJANJE SUMRAKA ASTR.	MJESEC IZLAZ	MJESEC Δ/24	MJESEC ZALAZ	MJESEC Δ/24
N	h min	h min	h min	h min	h min	min	h min	min
60	5 58	17 42	0 41	2 22	18 28	1.9	12 50	2.8
55	5 56	17 44	0 36	2 2	19 12	2.1	12 6	2.6
50	5 55	17 45	0 32	1 48	19 42	2.1	11 36	2.5
45	5 54	17 47	0 29	1 38	20 5	2.2	11 14	2.5
40	5 53	17 48	0 27	1 30	20 24	2.2	10 56	2.4
35	5 52	17 49	0 25	1 24	20 40	2.2	10 40	2.4
30	5 52	17 49	0 24	1 19	20 53	2.2	10 27	2.4
20	5 50	17 51	0 22	1 13	21 16	2.3	10 5	2.3
10	5 49	17 52	0 21	1 10	21 36	2.3	9 45	2.3
0	5 47	17 54	0 21	1 9	21 55	2.3	9 27	2.2
10	5 46	17 56	0 21	1 10	22 14	2.3	9 9	2.2
20	5 44	17 57	0 22	1 14	22 34	2.3	8 50	2.2
30	5 42	17 60	0 24	1 20	22 57	2.3	8 27	2.1
35	5 41	18 1	0 25	1 25	23 11	2.4	8 14	2.1
40	5 40	18 2	0 27	1 32	23 27	2.4	7 59	2.0
45	5 38	18 4	0 29	1 40	23 46	2.4	7 42	2.0
50	5 36	18 6	0 32	1 52	. . .	.0	7 19	1.9
55	5 34	18 9	0 37	2 8	. . .	.0	6 50	1.8
60	5 30	18 12	0 42	2 31	0 15	3.1	6 9	1.5
S								

SUNCE UT	SUNCE $e = T_p - UT$	SUNCE Δ/24	SUNCE r	MJESEC Prolaz	MJESEC Δ/24	MJESEC $\pi_\leftmoon$	MJESEC r
h	min s	s	′	h min	min	′	′
00	9 7.6	.8	16.0	$T_{\overline{m}}$ 3 15	2.2	55.9	15.2
12	9 17.7	$T_{\overline{m}_\odot}$ 11 h 50.7 min		Starost 19.6 d	Faza ◑		

PLANETE

Pl.	$T_{\overline{m}}$	π	360−α	Vel.	Pl.	$T_{\overline{m}}$	π	360−α	Vel.
	h min	′	°			h min	′	°	
♀	13 59	.4	143	−4.5	♃	23 22	.0	2	−2.8
♂	13 58	.1	144	1.5	♄	12 2	.0	172	1.1

UT	SUNCE $S_\odot$	SUNCE $\delta_\odot$	PROLJ. TAČKA S_Υ	VENERA S_φ	VENERA δ_φ	MARS S_σ	MARS δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	182 21.9	− 2 17.0	7 38.6	150 32.1	−21 23.5	150 38.2	−14 53.2
2	212 22.3	− 2 19.0	37 43.6	180 35.6	−21 24.5	180 39.7	−14 54.3
4	242 22.7	− 2 20.9	67 48.5	210 39.1	−21 25.5	210 41.3	−14 55.5
6	272 23.1	− 2 22.9	97 53.4	240 42.5	−21 26.4	240 42.9	−14 56.6
8	302 23.6	− 2 24.8	127 58.3	270 46.0	−21 27.4	270 44.5	−14 57.7
10	332 24.0	− 2 26.8	158 3.3	300 49.6	−21 28.4	300 46.1	−14 58.9
12	2 24.4	− 2 28.7	188 8.2	330 53.1	−21 29.4	330 47.7	−14 60.0
14	32 24.8	− 2 30.6	218 13.1	0 56.6	−21 30.3	0 49.3	−15 1.1
16	62 25.2	− 2 32.6	248 18.1	31 .2	−21 31.3	30 50.9	−15 2.3
18	92 25.6	− 2 34.5	278 23.0	61 3.7	−21 32.2	60 52.4	−15 3.4
20	122 26.0	− 2 36.5	308 27.9	91 7.3	−21 33.2	90 54.0	−15 4.5
22	152 26.5	− 2 38.4	338 32.8	121 10.9	−21 34.1	120 55.6	−15 5.6
Δ	2	−10		18	−5	8	−6

UT	MJESEC $S_\leftmoon$	MJESEC Δ	MJESEC $\delta_\leftmoon$	MJESEC Δ	JUPITER S_4	JUPITER δ_4	SATURN S_η	SATURN δ_η
h	° ′		° ′		° ′	° ′	° ′	° ′
0	300 14.4	83	24 11.4	23	9 24.6	− 2 30.2	179 55.0	− 0 59.1
2	329 8.9	82	24 16.0	20	39 30.1	− 2 30.4	209 59.3	− 0 59.4
4	358 3.2	81	24 20.1	18	69 35.7	− 2 30.7	240 3.7	− 0 59.6
6	26 57.4	80	24 23.6	15	99 41.2	− 2 30.9	270 8.1	− 0 59.9
8	55 51.3	79	24 26.6	12	129 46.7	− 2 31.2	300 12.4	− 1 .1
10	84 45.1	78	24 29.1	9	159 52.2	− 2 31.4	330 16.8	− 1 .3
12	113 38.7	77	24 31.0	7	189 57.8	− 2 31.7	0 21.2	− 1 .6
14	142 32.1	76	24 32.3	4	220 3.3	− 2 32.0	30 25.5	− 1 .8
16	171 25.3	76	24 33.1	1	250 8.8	− 2 32.2	60 29.9	− 1 1.1
18	200 18.5	75	24 33.3	−2	280 14.4	− 2 32.5	90 34.2	− 1 1.3
20	229 11.4	74	24 32.9	−5	310 19.9	− 2 32.7	120 38.6	− 1 1.6
22	258 4.3	74	24 32.0	−8	340 25.4	− 2 33.0	150 43.0	− 1 1.8
Δ					28	−1	22	−1

φ	SUNCE IZLAZ	SUNCE ZALAZ	TRAJANJE SUMRAKA GRAĐ.	TRAJANJE SUMRAKA ASTR.	MJESEC IZLAZ	MJESEC Δ/24	MJESEC ZALAZ	MJESEC Δ/24
N	h min	h min	h min	h min	h min	min	h min	min
60	6 0	17 39	0 41	2 22	19 14	2.8	13 57	2.0
55	5 58	17 41	0 36	2 2	20 2	2.7	13 9	2.1
50	5 57	17 43	0 32	1 48	20 34	2.6	12 38	2.2
45	5 55	17 45	0 29	1 38	20 58	2.6	12 14	2.2
40	5 54	17 46	0 27	1 30	21 17	2.5	11 54	2.3
35	5 53	17 47	0 25	1 24	21 33	2.5	11 38	2.3
30	5 52	17 48	0 24	1 19	21 47	2.5	11 25	2.3
20	5 50	17 50	0 22	1 13	22 10	2.4	11 1	2.3
10	5 49	17 52	0 21	1 10	22 31	2.4	10 40	2.3
0	5 47	17 54	0 21	1 9	22 50	2.3	10 21	2.3
10	5 45	17 55	0 21	1 10	23 9	2.3	10 2	2.3
20	5 43	17 58	0 22	1 14	23 30	2.3	9 42	2.3
30	5 41	18 0	0 24	1 20	23 54	2.2	9 18	2.4
35	5 40	18 2	0 25	1 25	. . .	.0	9 4	2.4
40	5 38	18 3	0 27	1 32	. . .	.0	8 48	2.4
45	5 36	18 5	0 29	1 40	. . .	.0	8 29	2.4
50	5 34	18 8	0 33	1 52	0 10	2.4	8 5	2.4
55	5 31	18 11	0 37	2 8	0 42	2.4	7 33	2.4
60	5 27	18 15	0 42	2 32	1 29	2.4	6 45	2.4
S								

SUNCE UT	SUNCE $e = T_p - UT$	SUNCE Δ/24	SUNCE r	MJESEC Prolaz	MJESEC Δ/24	MJESEC $\pi_\leftmoon$	MJESEC r
h	min s	s	′	h min	min	′	′
00	9 27.7	.8	16.0	$T_{\overline{m}}$ 4 8	2.3	56.5	15.4
12	9 37.7	$T_{\overline{m}_\odot}$ 11 h 50.4 min		Starost 20.6 d	Faza ◑		

PLANETE

Pl.	$T_{\overline{m}}$	π	360−α	Vel.	Pl.	$T_{\overline{m}}$	π	360−α	Vel.
	h min	′	°			h min	′	°	
♀	13 56	.4	143	−4.5	♃	23 18	.0	2	−2.8
♂	13 57	.1	143	1.5	♄	11 59	.0	172	1.1

UT	SUNCE		PROLJ. TAČKA	VENERA		MARS	
	$S_\odot$	$\delta_\odot$	S_Υ	S_φ	δ_φ	S_σ	δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	182 26.9	- 2 40.4	8 37.8	151 14.5	-21 35.1	150 57.2	-15 6.8
2	212 27.3	- 2 42.3	38 42.7	181 18.1	-21 36.0	180 58.8	-15 7.9
4	242 27.7	- 2 44.2	68 47.6	211 21.7	-21 36.9	211 .3	-15 9.0
6	272 28.1	- 2 46.2	98 52.6	241 25.4	-21 37.8	241 1.9	-15 10.2
8	302 28.5	- 2 48.1	128 57.5	271 29.0	-21 38.7	271 3.5	-15 11.3
10	332 28.9	- 2 50.1	159 2.4	301 32.7	-21 39.6	301 5.1	-15 12.4
12	2 29.3	- 2 52.0	189 7.3	331 36.4	-21 40.5	331 6.6	-15 13.5
14	32 29.7	- 2 54.0	219 12.3	1 40.0	-21 41.4	1 8.2	-15 14.7
16	62 30.1	- 2 55.9	249 17.2	31 43.8	-21 42.3	31 9.8	-15 15.8
18	92 30.6	- 2 57.8	279 22.1	61 47.5	-21 43.2	61 11.4	-15 16.9
20	122 31.0	- 2 59.8	309 27.1	91 51.2	-21 44.1	91 12.9	-15 18.0
22	152 31.4	- 3 1.7	339 32.0	121 54.9	-21 45.0	121 14.5	-15 19.1
Δ	2	-10		18	-4	8	-6

UT	MJESEC				JUPITER		SATURN	
	$S_\leftmoon$	Δ	$\delta_\leftmoon$	Δ	S_4	δ_4	S_η	δ_η
h	° ′		° ′		° ′	° ′	° ′	° ′
0	286 57.0	73	24 30.5	-10	10 30.9	- 2 33.2	180 47.3	- 1 2.0
2	315 49.6	73	24 28.4	-13	40 36.5	- 2 33.5	210 51.7	- 1 2.3
4	344 42.1	72	24 25.7	-16	70 42.0	- 2 33.7	240 56.0	- 1 2.5
6	13 34.6	72	24 22.5	-19	100 47.5	- 2 34.0	271 .4	- 1 2.8
8	42 26.9	71	24 18.6	-22	130 53.0	- 2 34.3	301 4.8	- 1 3.0
10	71 19.2	71	24 14.2	-25	160 58.6	- 2 34.5	331 9.1	- 1 3.2
12	100 11.4	71	24 9.2	-28	191 4.1	- 2 34.8	1 13.5	- 1 3.5
14	129 3.5	71	24 3.6	-31	221 9.6	- 2 35.0	31 17.8	- 1 3.7
16	157 55.6	70	23 57.5	-34	251 15.1	- 2 35.3	61 22.2	- 1 4.0
18	186 47.7	70	23 50.7	-37	281 20.7	- 2 35.5	91 26.6	- 1 4.2
20	215 39.8	70	23 43.3	-40	311 26.2	- 2 35.8	121 30.9	- 1 4.5
22	244 31.8	70	23 35.4	-43	341 31.7	- 2 36.0	151 35.3	- 1 4.7
Δ					28	-1	22	-1

φ	SUNCE		TRAJANJE SUMRAKA		MJESEC			
	IZLAZ	ZALAZ	GRAĐ.	ASTR.	IZLAZ	Δ/24	ZALAZ	Δ/24
N	h min	h min	h min	h min	h min	min	h min	min
60	6 3	17 36	0 41	2 21	20 22	3.6	14 46	1.3
55	6 0	17 39	0 36	2 2	21 6	3.2	14 1	1.6
50	5 58	17 41	0 32	1 48	21 36	3.0	13 30	1.8
45	5 56	17 43	0 29	1 38	21 59	2.9	13 7	1.9
40	5 55	17 44	0 27	1 30	22 17	2.8	12 49	2.0
35	5 54	17 46	0 25	1 24	22 33	2.7	12 33	2.1
30	5 53	17 47	0 24	1 19	22 46	2.7	12 19	2.1
20	5 51	17 49	0 22	1 13	23 9	2.5	11 56	2.2
10	5 49	17 51	0 21	1 10	23 28	2.4	11 36	2.3
0	5 47	17 53	0 21	1 9	23 46	2.3	11 17	2.4
10	5 45	17 55	0 21	1 10	. . .	.0	10 58	2.4
20	5 43	17 58	0 22	1 14	. . .	.0	10 38	2.5
30	5 40	18 1	0 24	1 20	. . .	.0	10 14	2.6
35	5 38	18 2	0 25	1 25	0 8	2.2	10 1	2.6
40	5 36	18 4	0 27	1 32	0 24	2.1	9 45	2.7
45	5 34	18 7	0 30	1 41	0 43	2.1	9 25	2.7
50	5 32	18 9	0 33	1 52	1 7	2.0	9 1	2.8
55	5 28	18 13	0 37	2 9	1 39	1.9	8 30	3.0
60	5 24	18 17	0 42	2 34	2 28	1.7	7 42	3.2
S								

UT	SUNCE			MJESEC			
	$e = T_p - UT$	Δ/24	r	Prolaz	Δ/24	$\pi_\leftmoon$	r
h	min s	s	′	h min	min	′	′
00	9 47.6	.8	16.0	$T_{\overline{m}}$ 5 4	2.3	57.1	15.6
12	9 57.5	$T_{\overline{m}_\odot}$ 11 h 50.0 min		Starost 21.6 d	Faza ◑		

PLANETE

Pl.	$T_{\overline{m}}$	π	360−α	Vel.	Pl.	$T_{\overline{m}}$	π	360−α	Vel.
	h min	′	°			h min	′	°	
♀	13 53	.4	143	-4.5	♃	23 14	.0	2	-2.8
♂	13 55	.1	142	1.5	♄	11 55	.0	172	1.1

UT	SUNCE		PROLJ. TAČKA	VENERA		MARS	
	$S_\odot$	$\delta_\odot$	S_Υ	S_φ	δ_φ	S_σ	δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	182 31.8	- 3 3.7	9 36.9	151 58.7	-21 45.8	151 16.1	-15 20.3
2	212 32.2	- 3 5.6	39 41.8	182 2.5	-21 46.7	181 17.6	-15 21.4
4	242 32.6	- 3 7.5	69 46.8	212 6.2	-21 47.5	211 19.2	-15 22.5
6	272 33.0	- 3 9.5	99 51.7	242 10.0	-21 48.4	241 20.8	-15 23.6
8	302 33.4	- 3 11.4	129 56.6	272 13.8	-21 49.2	271 22.3	-15 24.7
10	332 33.8	- 3 13.4	160 1.6	302 17.7	-21 50.1	301 23.9	-15 25.9
12	2 34.2	- 3 15.3	190 6.5	332 21.5	-21 50.9	331 25.4	-15 27.0
14	32 34.6	- 3 17.2	220 11.4	2 25.3	-21 51.7	1 27.0	-15 28.1
16	62 35.0	- 3 19.2	250 16.3	32 29.2	-21 52.5	31 28.6	-15 29.2
18	92 35.4	- 3 21.1	280 21.3	62 33.1	-21 53.3	61 30.1	-15 30.3
20	122 35.8	- 3 23.1	310 26.2	92 36.9	-21 54.1	91 31.7	-15 31.4
22	152 36.2	- 3 25.0	340 31.1	122 40.8	-21 54.9	121 33.2	-15 32.5
Δ	2	-10		19	-4	8	-6

UT	MJESEC				JUPITER		SATURN	
	$S_\leftmoon$	Δ	$\delta_\leftmoon$	Δ	S_4	δ_4	S_η	δ_η
h	° ′		° ′		° ′	° ′	° ′	° ′
0	273 23.8	70	23 26.9	-45	11 37.2	- 2 36.3	181 39.6	- 1 4.9
2	302 15.8	70	23 17.8	-48	41 42.7	- 2 36.5	211 44.0	- 1 5.2
4	331 7.9	70	23 8.1	-51	71 48.3	- 2 36.8	241 48.4	- 1 5.4
6	359 59.9	70	22 57.8	-54	101 53.8	- 2 37.0	271 52.7	- 1 5.7
8	28 52.0	71	22 47.0	-57	131 59.3	- 2 37.3	301 57.1	- 1 5.9
10	57 44.1	71	22 35.6	-60	162 4.8	- 2 37.5	332 1.4	- 1 6.1
12	86 36.3	71	22 23.6	-63	192 10.3	- 2 37.8	2 5.8	- 1 6.4
14	115 28.5	71	22 11.0	-66	222 15.9	- 2 38.0	32 10.2	- 1 6.6
16	144 20.8	72	21 57.9	-68	252 21.4	- 2 38.3	62 14.5	- 1 6.9
18	173 13.1	72	21 44.2	-71	282 26.9	- 2 38.6	92 18.9	- 1 7.1
20	202 5.5	72	21 30.0	-74	312 32.4	- 2 38.8	122 23.2	- 1 7.3
22	230 58.0	73	21 15.2	-77	342 37.9	- 2 39.1	152 27.6	- 1 7.6
Δ					28	-1	22	-1

φ	SUNCE		TRAJANJE SUMRAKA		MJESEC			
	IZLAZ	ZALAZ	GRAĐ.	ASTR.	IZLAZ	Δ/24	ZALAZ	Δ/24
N	h min	h min	h min	h min	h min	min	h min	min
60	6 5	17 33	0 41	2 21	21 47	4.0	15 17	.8
55	6 2	17 36	0 36	2 2	22 23	3.6	14 40	1.2
50	5 60	17 39	0 32	1 48	22 49	3.3	14 14	1.5
45	5 58	17 41	0 29	1 38	23 9	3.1	13 53	1.6
40	5 56	17 43	0 27	1 30	23 25	3.0	13 37	1.7
35	5 55	17 44	0 25	1 24	23 38	2.9	13 23	1.9
30	5 53	17 46	0 24	1 19	23 50	2.8	13 10	1.9
20	5 51	17 48	0 22	1 13	. . .	.0	12 49	2.1
10	5 49	17 51	0 21	1 10	. . .	.0	12 31	2.2
0	5 46	17 53	0 21	1 9	. . .	.0	12 14	2.3
10	5 44	17 55	0 21	1 10	0 5	2.3	11 56	2.4
20	5 42	17 58	0 22	1 14	0 24	2.2	11 38	2.6
30	5 39	18 1	0 24	1 21	0 47	2.0	11 16	2.7
35	5 37	18 3	0 25	1 26	0 60	2.0	11 3	2.8
40	5 35	18 5	0 27	1 32	1 15	1.9	10 49	2.9
45	5 32	18 8	0 30	1 41	1 33	1.8	10 31	3.0
50	5 30	18 11	0 33	1 53	1 55	1.6	10 10	3.2
55	5 26	18 15	0 37	2 9	2 25	1.4	9 41	3.4
60	5 21	18 20	0 43	2 35	3 7	1.0	8 60	3.8
S								

UT	SUNCE			MJESEC			
	$e = T_p - UT$	Δ/24	r	Prolaz	Δ/24	$\pi_\leftmoon$	r
h	min s	s	′	h min	min	′	′
00	10 7.3	.8	16.0	$T_{\overline{m}}$ 6 0	2.3	57.9	15.8
12	10 17.0	$T_{\overline{m}_\odot}$ 11 h 49.7 min		Starost 22.6 d	Faza ◑		

PLANETE

Pl.	$T_{\overline{m}}$	π	360−α	Vel.	Pl.	$T_{\overline{m}}$	π	360−α	Vel.
	h min	′	°			h min	′	°	
♀	13 50	.4	142	-4.5	♃	23 9	.0	2	-2.8
♂	13 54	.1	142	1.5	♄	11 52	.0	172	1.1

UT	SUNCE $S_\odot$	SUNCE $\delta_\odot$	PROLJ. TAČKA S_Υ	VENERA S_φ	VENERA δ_φ	MARS S_σ	MARS δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	182 36.6	- 3 26.9	10 36.1	152 44.8	-21 55.7	151 34.8	-15 33.6
2	212 37.0	- 3 28.9	40 41.0	182 48.7	-21 56.5	181 36.3	-15 34.8
4	242 37.4	- 3 30.8	70 45.9	212 52.6	-21 57.3	211 37.9	-15 35.9
6	272 37.8	- 3 32.7	100 50.8	242 56.6	-21 58.1	241 39.4	-15 37.0
8	302 38.2	- 3 34.7	130 55.8	273 .5	-21 58.8	271 41.0	-15 38.1
10	332 38.6	- 3 36.6	161 .7	303 4.5	-21 59.6	301 42.5	-15 39.2
12	2 39.0	- 3 38.5	191 5.6	333 8.5	-22 .4	331 44.1	-15 40.3
14	32 39.4	- 3 40.5	221 10.5	3 12.5	-22 1.1	1 45.6	-15 41.4
16	62 39.8	- 3 42.4	251 15.5	33 16.5	-22 1.9	31 47.2	-15 42.5
18	92 40.2	- 3 44.4	281 20.4	63 20.6	-22 2.6	61 48.7	-15 43.6
20	122 40.6	- 3 46.3	311 25.3	93 24.6	-22 3.3	91 50.3	-15 44.7
22	152 41.0	- 3 48.2	341 30.3	123 28.7	-22 4.0	121 51.8	-15 45.8
Δ	2	-10		20	-4	8	-6

UT	MJESEC $S_\leftmoon$	MJESEC Δ	MJESEC $\delta_\leftmoon$	MJESEC Δ	JUPITER S_4	JUPITER δ_4	SATURN S_η	SATURN δ_η
h	° ′		° ′		° ′	° ′	° ′	° ′
0	259 50.5	73	20 59.8	-79	12 43.5	- 2 39.3	182 32.0	- 1 7.8
2	288 43.2	74	20 43.9	-82	42 49.0	- 2 39.6	212 36.3	- 1 8.1
4	317 35.9	74	20 27.5	-85	72 54.5	- 2 39.8	242 40.7	- 1 8.3
6	346 28.8	75	20 10.5	-87	103 .0	- 2 40.1	272 45.1	- 1 8.6
8	15 21.7	75	19 53.0	-90	133 5.5	- 2 40.3	302 49.4	- 1 8.8
10	44 14.8	76	19 35.0	-93	163 11.0	- 2 40.6	332 53.8	- 1 9.0
12	73 7.9	76	19 16.5	-95	193 16.6	- 2 40.8	2 58.1	- 1 9.3
14	102 1.2	77	18 57.4	-98	223 22.1	- 2 41.0	33 2.5	- 1 9.5
16	130 54.6	78	18 37.9	-100	253 27.6	- 2 41.3	63 6.9	- 1 9.8
18	159 48.1	78	18 17.9	-103	283 33.1	- 2 41.5	93 11.2	- 1 10.0
20	188 41.7	79	17 57.3	-105	313 38.6	- 2 41.8	123 15.6	- 1 10.2
22	217 35.4	79	17 36.3	-107	343 44.1	- 2 42.0	153 19.9	- 1 10.5
Δ		28		-1			22	-1

φ	SUNCE IZLAZ	SUNCE ZALAZ	TRAJANJE SUMRAKA GRAĐ.	TRAJANJE SUMRAKA ASTR.	MJESEC IZLAZ	MJESEC Δ/24	MJESEC ZALAZ	MJESEC Δ/24
N	h min	h min	h min	h min	h min	min	h min	min
60	6 7	17 30	0 41	2 21	23 22	4.1	15 37	.6
55	6 4	17 34	0 36	2 1	23 49	3.7	15 9	.9
50	6 1	17 37	0 32	1 48	. . .	.0	14 49	1.2
45	5 59	17 39	0 29	1 38	. . .	.0	14 32	1.4
40	5 57	17 41	0 27	1 30	. . .	.0	14 19	1.5
35	5 55	17 43	0 25	1 24	. . .	.0	14 7	1.7
30	5 54	17 45	0 24	1 19	. . .	.0	13 57	1.8
20	5 51	17 47	0 22	1 13	0 10	2.6	13 39	2.0
10	5 49	17 50	0 21	1 10	0 27	2.4	13 24	2.1
0	5 46	17 53	0 21	1 9	0 43	2.3	13 9	2.3
10	5 44	17 55	0 21	1 10	0 59	2.2	12 55	2.4
20	5 41	17 58	0 22	1 14	1 16	2.0	12 39	2.6
30	5 37	18 2	0 24	1 21	1 36	1.9	12 21	2.8
35	5 35	18 4	0 25	1 26	1 47	1.8	12 10	2.9
40	5 33	18 6	0 27	1 32	2 0	1.6	11 58	3.0
45	5 31	18 9	0 30	1 41	2 16	1.5	11 44	3.2
50	5 27	18 12	0 33	1 53	2 34	1.3	11 26	3.4
55	5 23	18 17	0 37	2 10	2 59	1.1	11 3	3.7
60	5 18	18 22	0 43	2 36	3 32	.7	10 31	4.1
S								

SUNCE UT	SUNCE $e = T_p - UT$	SUNCE Δ/24	SUNCE r	MJESEC Prolaz	MJESEC Δ/24	MJESEC $\pi_\leftmoon$	MJESEC r
h	min s	s	′	h min	min	′	′
00	10 26.6	.8	16.0	$T_{\overline{m}}$ 6 56	2.3	58.7	16.0
12	10 36.1	$T_{\overline{m}_\odot}$ 11 h 49.4 min		Starost 23.6 d	Faza ◑		

PLANETE

Pl.	$T_{\overline{m}}$	π	360−α	Vel.	Pl.	$T_{\overline{m}}$	π	360−α	Vel.
	h min	′	°			h min	′	°	
♀	13 47	.4	142	-4.5	♃	23 5	.0	2	-2.8
♂	13 53	.1	141	1.5	♄	11 48	.0	172	1.1

UT	SUNCE $S_\odot$	SUNCE $\delta_\odot$	PROLJ. TAČKA S_Υ	VENERA S_φ	VENERA δ_φ	MARS S_σ	MARS δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	182 41.4	- 3 50.2	11 35.2	153 32.8	-22 4.8	151 53.3	-15 46.9
2	212 41.8	- 3 52.1	41 40.1	183 36.9	-22 5.5	181 54.9	-15 48.0
4	242 42.1	- 3 54.0	71 45.0	213 41.0	-22 6.2	211 56.4	-15 49.1
6	272 42.5	- 3 56.0	101 50.0	243 45.1	-22 6.9	241 58.0	-15 50.2
8	302 42.9	- 3 57.9	131 54.9	273 49.2	-22 7.6	271 59.5	-15 51.3
10	332 43.3	- 3 59.8	161 59.8	303 53.4	-22 8.3	302 1.0	-15 52.4
12	2 43.7	- 4 1.8	192 4.8	333 57.5	-22 8.9	332 2.6	-15 53.5
14	32 44.1	- 4 3.7	222 9.7	4 1.7	-22 9.6	2 4.1	-15 54.6
16	62 44.5	- 4 5.6	252 14.6	34 5.9	-22 10.3	32 5.6	-15 55.7
18	92 44.9	- 4 7.6	282 19.5	64 10.1	-22 10.9	62 7.2	-15 56.8
20	122 45.3	- 4 9.5	312 24.5	94 14.3	-22 11.6	92 8.7	-15 57.9
22	152 45.6	- 4 11.4	342 29.4	124 18.5	-22 12.2	122 10.2	-15 59.0
Δ	2	-10		21	-3	8	-5

UT	MJESEC $S_\leftmoon$	MJESEC Δ	MJESEC $\delta_\leftmoon$	MJESEC Δ	JUPITER S_4	JUPITER δ_4	SATURN S_η	SATURN δ_η
h	° ′		° ′		° ′	° ′	° ′	° ′
0	246 29.3	80	17 14.9	-110	13 49.6	- 2 42.3	183 24.3	- 1 10.7
2	275 23.3	81	16 52.9	-112	43 55.1	- 2 42.5	213 28.7	- 1 11.0
4	304 17.4	81	16 30.6	-114	74 .7	- 2 42.8	243 33.0	- 1 11.2
6	333 11.6	82	16 7.7	-116	104 6.2	- 2 43.0	273 37.4	- 1 11.4
8	2 6.0	82	15 44.5	-118	134 11.7	- 2 43.3	303 41.7	- 1 11.7
10	31 .5	83	15 20.8	-121	164 17.2	- 2 43.5	333 46.1	- 1 11.9
12	59 55.1	84	14 56.7	-123	194 22.7	- 2 43.8	3 50.5	- 1 12.2
14	88 49.8	84	14 32.2	-125	224 28.2	- 2 44.0	33 54.8	- 1 12.4
16	117 44.7	85	14 7.3	-126	254 33.7	- 2 44.3	63 59.2	- 1 12.6
18	146 39.6	85	13 42.0	-128	284 39.2	- 2 44.5	94 3.5	- 1 12.9
20	175 34.7	86	13 16.3	-130	314 44.7	- 2 44.8	124 7.9	- 1 13.1
22	204 29.9	86	12 50.3	-132	344 50.3	- 2 45.0	154 12.3	- 1 13.4
Δ		28		-1			22	-1

φ	SUNCE IZLAZ	SUNCE ZALAZ	TRAJANJE SUMRAKA GRAĐ.	TRAJANJE SUMRAKA ASTR.	MJESEC IZLAZ	MJESEC Δ/24	MJESEC ZALAZ	MJESEC Δ/24
N	h min	h min	h min	h min	h min	min	h min	min
60	6 10	17 27	0 41	2 20	. . .	.0	15 51	.4
55	6 6	17 31	0 36	2 1	. . .	.0	15 32	.8
50	6 3	17 35	0 32	1 48	0 9	3.5	15 17	1.0
45	6 0	17 37	0 29	1 38	0 24	3.2	15 5	1.2
40	5 58	17 40	0 27	1 30	0 36	3.1	14 55	1.4
35	5 56	17 42	0 25	1 24	0 47	2.9	14 47	1.5
30	5 54	17 43	0 24	1 19	0 56	2.8	14 39	1.6
20	5 51	17 47	0 22	1 13	1 12	2.6	14 26	1.9
10	5 49	17 49	0 21	1 10	1 25	2.4	14 15	2.1
0	5 46	17 52	0 21	1 9	1 38	2.3	14 4	2.2
10	5 43	17 55	0 21	1 10	1 51	2.1	13 53	2.4
20	5 40	17 59	0 22	1 14	2 5	1.9	13 42	2.6
30	5 36	18 2	0 24	1 21	2 20	1.7	13 28	2.8
35	5 34	18 5	0 25	1 26	2 29	1.6	13 20	3.0
40	5 32	18 7	0 27	1 33	2 39	1.5	13 11	3.1
45	5 29	18 10	0 30	1 42	2 51	1.3	13 1	3.3
50	5 25	18 14	0 33	1 54	3 6	1.1	12 48	3.5
55	5 21	18 19	0 37	2 11	3 24	.8	12 31	3.8
60	5 15	18 24	0 43	2 37	3 48	.5	12 9	4.2
S								

SUNCE UT	SUNCE $e = T_p - UT$	SUNCE Δ/24	SUNCE r	MJESEC Prolaz	MJESEC Δ/24	MJESEC $\pi_\leftmoon$	MJESEC r
h	min s	s	′	h min	min	′	′
00	10 45.6	.8	16.0	$T_{\overline{m}}$ 7 51	2.3	59.4	16.2
12	10 55.0	$T_{\overline{m}_\odot}$ 11 h 49.1 min		Starost 24.6 d	Faza ◑		

PLANETE

Pl.	$T_{\overline{m}}$	π	360−α	Vel.	Pl.	$T_{\overline{m}}$	π	360−α	Vel.
	h min	′	°			h min	′	°	
♀	13 44	.4	142	-4.4	♃	23 0	.0	2	-2.8
♂	13 52	.1	140	1.5	♄	11 45	.0	172	1.1

UT	SUNCE		PROLJ. TAČKA	VENERA		MARS	
	$S_\odot$	$\delta_\odot$	S_Υ	S_φ	δ_φ	S_σ	δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	182 46.0	− 4 13.3	12 34.3	154 22.8	−22 12.9	152 11.7	−16 .1
2	212 46.4	− 4 15.3	42 39.3	184 27.0	−22 13.5	182 13.3	−16 1.2
4	242 46.8	− 4 17.2	72 44.2	214 31.3	−22 14.1	212 14.8	−16 2.3
6	272 47.2	− 4 19.1	102 49.1	244 35.6	−22 14.7	242 16.3	−16 3.4
8	302 47.6	− 4 21.1	132 54.0	274 39.9	−22 15.4	272 17.8	−16 4.5
10	332 48.0	− 4 23.0	162 59.0	304 44.2	−22 16.0	302 19.4	−16 5.6
12	2 48.3	− 4 24.9	193 3.9	334 48.5	−22 16.6	332 20.9	−16 6.7
14	32 48.7	− 4 26.8	223 8.8	4 52.9	−22 17.2	2 22.4	−16 7.8
16	62 49.1	− 4 28.8	253 13.8	34 57.2	−22 17.7	32 23.9	−16 8.9
18	92 49.5	− 4 30.7	283 18.7	65 1.6	−22 18.3	62 25.4	−16 9.9
20	122 49.9	− 4 32.6	313 23.6	95 6.0	−22 18.9	92 27.0	−16 11.0
22	152 50.2	− 4 34.6	343 28.5	125 10.4	−22 19.5	122 28.5	−16 12.1
Δ	2	−10		22	−3	8	−5

UT	MJESEC				JUPITER		SATURN	
	$S_\leftmoon$	Δ	$\delta_\leftmoon$	Δ	S_4	δ_4	S_η	δ_η
h	° ′		° ′		° ′	° ′	° ′	° ′
0	233 25.2	87	12 23.9	−134	14 55.8	− 2 45.2	184 16.6	− 1 13.6
2	262 20.6	88	11 57.1	−135	45 1.3	− 2 45.5	214 21.0	− 1 13.8
4	291 16.1	88	11 30.1	−137	75 6.8	− 2 45.7	244 25.3	− 1 14.1
6	320 11.7	89	11 2.7	−138	105 12.3	− 2 46.0	274 29.7	− 1 14.3
8	349 7.4	89	10 35.0	−140	135 17.8	− 2 46.2	304 34.1	− 1 14.6
10	18 3.2	89	10 7.0	−141	165 23.3	− 2 46.5	334 38.4	− 1 14.8
12	46 59.1	90	9 38.7	−143	195 28.8	− 2 46.7	4 42.8	− 1 15.0
14	75 55.1	90	9 10.1	−144	225 34.3	− 2 47.0	34 47.1	− 1 15.3
16	104 51.1	91	8 41.3	−145	255 39.8	− 2 47.2	64 51.5	− 1 15.5
18	133 47.2	91	8 12.3	−146	285 45.3	− 2 47.4	94 55.9	− 1 15.8
20	162 43.4	91	7 43.0	−148	315 50.8	− 2 47.7	125 .2	− 1 16.0
22	191 39.6	91	7 13.4	−149	345 56.3	− 2 47.9	155 4.6	− 1 16.2
Δ					28	−1	22	−1

φ	SUNCE		TRAJANJE SUMRAKA		MJESEC			
	IZLAZ	ZALAZ	GRAĐ.	ASTR.	IZLAZ	Δ/24	ZALAZ	Δ/24
N	h min	h min	h min	h min	h min	min	h min	min
60	6 12	17 24	0 41	2 20	1 3	4.2	16 0	.3
55	6 8	17 29	0 36	2 1	1 19	3.8	15 50	.7
50	6 4	17 32	0 32	1 48	1 32	3.5	15 41	.9
45	6 1	17 35	0 29	1 37	1 42	3.3	15 34	1.1
40	5 59	17 38	0 27	1 30	1 50	3.1	15 28	1.3
35	5 57	17 40	0 25	1 24	1 57	3.0	15 23	1.4
30	5 55	17 42	0 24	1 19	2 4	2.8	15 19	1.6
20	5 52	17 46	0 22	1 13	2 14	2.6	15 11	1.8
10	5 49	17 49	0 21	1 10	2 24	2.4	15 4	2.0
0	5 46	17 52	0 21	1 9	2 32	2.2	14 58	2.2
10	5 42	17 55	0 21	1 10	2 41	2.0	14 51	2.4
20	5 39	17 59	0 22	1 14	2 51	1.8	14 44	2.6
30	5 35	18 3	0 24	1 21	3 1	1.6	14 36	2.8
35	5 33	18 5	0 25	1 26	3 7	1.5	14 31	3.0
40	5 30	18 8	0 27	1 33	3 14	1.3	14 26	3.1
45	5 27	18 12	0 30	1 42	3 22	1.2	14 19	3.3
50	5 23	18 16	0 33	1 54	3 32	1.0	14 12	3.5
55	5 18	18 20	0 37	2 12	3 44	.7	14 2	3.8
60	5 12	18 27	0 43	2 39	3 59	.4	13 49	4.2
S								

SUNCE				MJESEC			
UT	e = Tp − UT	Δ/24	r	Prolaz	Δ/24	$\pi_\leftmoon$	r
h	min s	s	′	h min	min	′	′
00	11 4.3	.8	16.0	$T_{\overline{m}}$ 8 45	2.2	60.1	16.4
12	11 13.5	$T_{\overline{m}_\odot}$ 11 h 48.8 min		Starost 25.6 d	Faza ●		

PLANETE								
Pl.	$T_{\overline{m}}$	π	360 − α	Vel.	Pl.	$T_{\overline{m}}$	π	360 − α	Vel.
	h min	′	°			h min	′	°	
♀	13 41	.4	142	−4.4	♃	22 56	.0	2	−2.8
♂	13 51	.1	140	1.5	♄	11 41	.0	172	1.1

UT	SUNCE		PROLJ. TAČKA	VENERA		MARS	
	$S_\odot$	$\delta_\odot$	S_Υ	S_φ	δ_φ	S_σ	δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	182 50.6	− 4 36.5	13 33.5	155 14.8	−22 20.0	152 30.0	−16 13.2
2	212 51.0	− 4 38.4	43 38.4	185 19.3	−22 20.6	182 31.5	−16 14.3
4	242 51.4	− 4 40.3	73 43.3	215 23.7	−22 21.1	212 33.0	−16 15.4
6	272 51.7	− 4 42.3	103 48.3	245 28.2	−22 21.6	242 34.5	−16 16.4
8	302 52.1	− 4 44.2	133 53.2	275 32.6	−22 22.2	272 36.0	−16 17.5
10	332 52.5	− 4 46.1	163 58.1	305 37.1	−22 22.7	302 37.5	−16 18.6
12	2 52.9	− 4 48.0	194 3.0	335 41.6	−22 23.2	332 39.1	−16 19.7
14	32 53.2	− 4 50.0	224 8.0	5 46.2	−22 23.7	2 40.6	−16 20.8
16	62 53.6	− 4 51.9	254 12.9	35 50.7	−22 24.2	32 42.1	−16 21.9
18	92 54.0	− 4 53.8	284 17.8	65 55.2	−22 24.7	62 43.6	−16 22.9
20	122 54.4	− 4 55.7	314 22.7	95 59.8	−22 25.2	92 45.1	−16 24.0
22	152 54.7	− 4 57.6	344 27.7	126 4.4	−22 25.7	122 46.6	−16 25.1
Δ	2	−10		23	−3	8	−5

UT	MJESEC				JUPITER		SATURN	
	$S_\leftmoon$	Δ	$\delta_\leftmoon$	Δ	S_4	δ_4	S_η	δ_η
h	° ′		° ′		° ′	° ′	° ′	° ′
0	220 35.9	92	6 43.7	−150	16 1.8	− 2 48.2	185 8.9	− 1 16.5
2	249 32.3	92	6 13.8	−151	46 7.3	− 2 48.4	215 13.3	− 1 16.7
4	278 28.7	92	5 43.7	−151	76 12.8	− 2 48.6	245 17.7	− 1 17.0
6	307 25.1	92	5 13.4	−152	106 18.3	− 2 48.9	275 22.0	− 1 17.2
8	336 21.6	92	4 42.9	−153	136 23.8	− 2 49.1	305 26.4	− 1 17.4
10	5 18.0	93	4 12.3	−154	166 29.3	− 2 49.4	335 30.7	− 1 17.7
12	34 14.5	93	3 41.6	−154	196 34.8	− 2 49.6	5 35.1	− 1 17.9
14	63 11.1	93	3 10.8	−155	226 40.3	− 2 49.8	35 39.5	− 1 18.2
16	92 7.6	93	2 39.9	−155	256 45.8	− 2 50.1	65 43.8	− 1 18.4
18	121 4.1	93	2 8.8	−155	286 51.3	− 2 50.3	95 48.2	− 1 18.6
20	150 .6	93	1 37.8	−156	316 56.8	− 2 50.6	125 52.6	− 1 18.9
22	178 57.1	92	1 6.6	−156	347 2.3	− 2 50.8	155 56.9	− 1 19.1
Δ					27	−1	22	−1

φ	SUNCE		TRAJANJE SUMRAKA		MJESEC			
	IZLAZ	ZALAZ	GRAĐ.	ASTR.	IZLAZ	Δ/24	ZALAZ	Δ/24
N	h min	h min	h min	h min	h min	min	h min	min
60	6 15	17 21	0 41	2 20	2 43	4.2	16 8	.3
55	6 10	17 26	0 36	2 1	2 51	3.8	16 5	.6
50	6 6	17 30	0 32	1 47	2 56	3.5	16 3	.9
45	6 3	17 34	0 29	1 37	3 1	3.3	16 1	1.1
40	6 0	17 36	0 27	1 30	3 5	3.1	15 60	1.3
35	5 58	17 39	0 25	1 24	3 8	3.0	15 58	1.4
30	5 56	17 41	0 24	1 19	3 11	2.8	15 57	1.6
20	5 52	17 45	0 22	1 13	3 17	2.6	15 54	1.8
10	5 48	17 48	0 21	1 10	3 21	2.4	15 52	2.0
0	5 45	17 52	0 21	1 9	3 26	2.2	15 50	2.2
10	5 42	17 55	0 21	1 10	3 30	2.0	15 48	2.4
20	5 38	17 59	0 22	1 14	3 34	1.8	15 46	2.6
30	5 34	18 4	0 24	1 21	3 40	1.6	15 44	2.9
35	5 31	18 6	0 26	1 26	3 43	1.4	15 42	3.0
40	5 28	18 9	0 27	1 33	3 46	1.3	15 41	3.1
45	5 25	18 13	0 30	1 42	3 50	1.1	15 39	3.3
50	5 21	18 17	0 33	1 55	3 55	.9	15 36	3.6
55	5 16	18 22	0 37	2 12	4 1	.6	15 33	3.8
60	5 9	18 29	0 43	2 41	4 8	.3	15 29	4.2
S								

SUNCE				MJESEC			
UT	e = Tp − UT	Δ/24	r	Prolaz	Δ/24	$\pi_\leftmoon$	r
h	min s	s	′	h min	min	′	′
00	11 22.7	.7	16.0	$T_{\overline{m}}$ 9 38	2.2	60.6	16.5
12	11 31.6	$T_{\overline{m}_\odot}$ 11 h 48.5 min		Starost 26.6 d	Faza ●		

PLANETE								
Pl.	$T_{\overline{m}}$	π	360 − α	Vel.	Pl.	$T_{\overline{m}}$	π	360 − α	Vel.
	h min	′	°			h min	′	°	
♀	13 37	.4	142	−4.4	♃	22 52	.0	2	−2.8
♂	13 49	.1	139	1.5	♄	11 38	.0	172	1.1

UT	SUNCE $S_\odot$	SUNCE $\delta_\odot$	PROLJ. TAČKA S_Υ	VENERA S_φ	VENERA δ_φ	MARS S_σ	MARS δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	182 55.1	- 4 59.6	14 32.6	156 9.0	-22 26.2	152 48.1	-16 26.2
2	212 55.5	- 5 1.5	44 37.5	186 13.6	-22 26.6	182 49.6	-16 27.2
4	242 55.8	- 5 3.4	74 42.5	216 18.2	-22 27.1	212 51.1	-16 28.3
6	272 56.2	- 5 5.3	104 47.4	246 22.9	-22 27.5	242 52.6	-16 29.4
8	302 56.6	- 5 7.2	134 52.3	276 27.5	-22 28.0	272 54.1	-16 30.5
10	332 56.9	- 5 9.2	164 57.2	306 32.2	-22 28.4	302 55.6	-16 31.5
12	2 57.3	- 5 11.1	195 2.2	336 36.9	-22 28.8	332 57.1	-16 32.6
14	32 57.7	- 5 13.0	225 7.1	6 41.6	-22 29.3	2 58.6	-16 33.7
16	62 58.0	- 5 14.9	255 12.0	36 46.3	-22 29.7	33 .0	-16 34.7
18	92 58.4	- 5 16.8	285 17.0	66 51.0	-22 30.1	63 1.5	-16 35.8
20	122 58.8	- 5 18.8	315 21.9	96 55.7	-22 30.5	93 3.0	-16 36.9
22	152 59.1	- 5 20.7	345 26.8	127 .5	-22 30.9	123 4.5	-16 37.9
Δ	2	-10		23	-2	7	-5

UT	MJESEC $S_\leftmoon$	MJESEC Δ	MJESEC $\delta_\leftmoon$	MJESEC Δ	JUPITER S_4	JUPITER δ_4	SATURN S_η	SATURN δ_η
h	° ′		° ′		° ′	° ′	° ′	° ′
0	207 53.6	92	0 35.4	-156	17 7.8	- 2 51.0	186 1.3	- 1 19.4
2	236 50.1	92	0 4.2	-156	47 13.3	- 2 51.3	216 5.6	- 1 19.6
4	265 46.5	92	- 0 27.1	-156	77 18.8	- 2 51.5	246 10.0	- 1 19.8
6	294 42.9	92	- 0 58.3	-156	107 24.3	- 2 51.8	276 14.4	- 1 20.1
8	323 39.2	91	- 1 29.5	-156	137 29.8	- 2 52.0	306 18.7	- 1 20.3
10	352 35.5	91	- 2 .7	-156	167 35.3	- 2 52.2	336 23.1	- 1 20.6
12	21 31.7	91	- 2 31.9	-156	197 40.8	- 2 52.5	6 27.4	- 1 20.8
14	50 27.9	90	- 3 3.0	-155	227 46.3	- 2 52.7	36 31.8	- 1 21.0
16	79 24.0	90	- 3 34.0	-155	257 51.7	- 2 52.9	66 36.2	- 1 21.3
18	108 20.0	90	- 4 5.0	-154	287 57.2	- 2 53.2	96 40.5	- 1 21.5
20	137 15.9	89	- 4 35.8	-154	318 2.7	- 2 53.4	126 44.9	- 1 21.7
22	166 11.7	89	- 5 6.5	-153	348 8.2	- 2 53.6	156 49.2	- 1 22.0
Δ					27	-1	22	-1

φ	SUNCE IZLAZ	SUNCE ZALAZ	TRAJANJE SUMRAKA GRAĐ.	TRAJANJE SUMRAKA ASTR.	MJESEC IZLAZ	MJESEC Δ/24	MJESEC ZALAZ	MJESEC Δ/24
N	h min	h min	h min	h min	h min	min	h min	min
60	6 17	17 18	0 41	2 19	4 23	4.2	16 16	.3
55	6 12	17 24	0 36	2 1	4 22	3.9	16 21	.7
50	6 7	17 28	0 32	1 47	4 22	3.6	16 25	.9
45	6 4	17 32	0 29	1 37	4 21	3.3	16 28	1.1
40	6 1	17 35	0 27	1 30	4 20	3.2	16 30	1.3
35	5 58	17 37	0 25	1 24	4 20	3.0	16 32	1.5
30	5 56	17 40	0 24	1 19	4 20	2.9	16 34	1.6
20	5 52	17 44	0 22	1 13	4 19	2.6	16 38	1.8
10	5 48	17 48	0 21	1 10	4 19	2.4	16 40	2.0
0	5 45	17 51	0 21	1 9	4 18	2.2	16 43	2.2
10	5 41	17 55	0 21	1 10	4 18	2.0	16 46	2.4
20	5 37	17 59	0 22	1 14	4 18	1.8	16 49	2.6
30	5 33	18 4	0 24	1 21	4 17	1.6	16 52	2.9
35	5 30	18 7	0 26	1 26	4 17	1.4	16 54	3.0
40	5 27	18 10	0 27	1 33	4 17	1.3	16 56	3.2
45	5 23	18 14	0 30	1 43	4 17	1.1	16 59	3.4
50	5 19	18 19	0 33	1 55	4 16	.9	17 2	3.6
55	5 13	18 24	0 37	2 13	4 16	.7	17 5	3.9
60	5 6	18 32	0 43	2 42	4 16	.3	17 10	4.2
S								

SUNCE UT	SUNCE $e = T_p - UT$	SUNCE Δ/24	SUNCE r	MJESEC Prolaz	MJESEC Δ/24	MJESEC $\pi_\leftmoon$	MJESEC r
h	min s	s	′	h min	min	′	′
00	11 40.6	.7	16.0	$T_{\overline{m}}$ 10 31	2.2	60.9	16.6
12	11 49.4	$T_{\overline{m}_\odot}$ 11 h 48.2 min		Starost 27.6 d	Faza ●		

PLANETE

Pl.	$T_{\overline{m}}$	π	360−α	Vel.	Pl.	$T_{\overline{m}}$	π	360−α	Vel.
	h min	′	°			h min	′	°	
♀	13 33	.4	142	-4.4	♃	22 47	.0	3	-2.8
♂	13 48	.1	138	1.5	♄	11 34	.0	171	1.1

UT	SUNCE $S_\odot$	SUNCE $\delta_\odot$	PROLJ. TAČKA S_Υ	VENERA S_φ	VENERA δ_φ	MARS S_σ	MARS δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	182 59.5	- 5 22.6	15 31.7	157 5.3	-22 31.2	153 6.0	-16 39.0
2	212 59.9	- 5 24.5	45 36.7	187 10.1	-22 31.6	183 7.5	-16 40.1
4	243 .2	- 5 26.4	75 41.6	217 14.9	-22 32.0	213 9.0	-16 41.1
6	273 .6	- 5 28.3	105 46.5	247 19.7	-22 32.4	243 10.5	-16 42.2
8	303 .9	- 5 30.2	135 51.5	277 24.5	-22 32.7	273 11.9	-16 43.3
10	333 1.3	- 5 32.2	165 56.4	307 29.4	-22 33.1	303 13.4	-16 44.3
12	3 1.7	- 5 34.1	196 1.3	337 34.2	-22 33.4	333 14.9	-16 45.4
14	33 2.0	- 5 36.0	226 6.2	7 39.1	-22 33.7	3 16.4	-16 46.5
16	63 2.4	- 5 37.9	256 11.2	37 44.0	-22 34.0	33 17.9	-16 47.5
18	93 2.7	- 5 39.8	286 16.1	67 48.9	-22 34.4	63 19.3	-16 48.6
20	123 3.1	- 5 41.7	316 21.0	97 53.9	-22 34.7	93 20.8	-16 49.6
22	153 3.4	- 5 43.6	346 26.0	127 58.8	-22 35.0	123 22.3	-16 50.7
Δ	2	-10		24	-2	7	-5

UT	MJESEC $S_\leftmoon$	MJESEC Δ	MJESEC $\delta_\leftmoon$	MJESEC Δ	JUPITER S_4	JUPITER δ_4	SATURN S_η	SATURN δ_η
h	° ′		° ′		° ′	° ′	° ′	° ′
0	195 7.5	88	- 5 37.1	-152	18 13.7	- 2 53.9	186 53.6	- 1 22.2
2	224 3.1	88	- 6 7.6	-151	48 19.2	- 2 54.1	216 58.0	- 1 22.5
4	252 58.7	87	- 6 37.8	-151	78 24.7	- 2 54.4	247 2.3	- 1 22.7
6	281 54.1	87	- 7 7.9	-150	108 30.2	- 2 54.6	277 6.7	- 1 22.9
8	310 49.4	86	- 7 37.9	-149	138 35.7	- 2 54.8	307 11.0	- 1 23.2
10	339 44.6	85	- 8 7.6	-147	168 41.1	- 2 55.1	337 15.4	- 1 23.4
12	8 39.7	85	- 8 37.1	-146	198 46.6	- 2 55.3	7 19.8	- 1 23.7
14	37 34.6	84	- 9 6.3	-145	228 52.1	- 2 55.5	37 24.1	- 1 23.9
16	66 29.4	83	- 9 35.3	-144	258 57.6	- 2 55.7	67 28.5	- 1 24.1
18	95 24.1	83	-10 4.1	-142	289 3.1	- 2 56.0	97 32.9	- 1 24.4
20	124 18.6	82	-10 32.5	-141	319 8.6	- 2 56.2	127 37.2	- 1 24.6
22	153 13.0	81	-11 .7	-139	349 14.1	- 2 56.4	157 41.6	- 1 24.8
Δ					27	-1	22	-1

φ	SUNCE IZLAZ	SUNCE ZALAZ	TRAJANJE SUMRAKA GRAĐ.	TRAJANJE SUMRAKA ASTR.	MJESEC IZLAZ	MJESEC Δ/24	MJESEC ZALAZ	MJESEC Δ/24
N	h min	h min	h min	h min	h min	min	h min	min
60	6 19	17 15	0 41	2 19	6 5	4.3	16 24	.4
55	6 14	17 21	0 36	2 1	5 55	3.9	16 37	.8
50	6 9	17 26	0 32	1 47	5 47	3.6	16 47	1.1
45	6 5	17 30	0 29	1 37	5 41	3.4	16 55	1.3
40	6 2	17 33	0 27	1 30	5 36	3.2	17 2	1.4
35	5 59	17 36	0 25	1 24	5 32	3.0	17 8	1.6
30	5 57	17 39	0 24	1 19	5 28	2.9	17 13	1.7
20	5 52	17 43	0 22	1 13	5 22	2.7	17 22	1.9
10	5 48	17 47	0 21	1 10	5 16	2.4	17 29	2.1
0	5 45	17 51	0 21	1 9	5 11	2.3	17 37	2.3
10	5 41	17 55	0 21	1 10	5 6	2.1	17 44	2.5
20	5 36	17 60	0 22	1 14	5 1	1.9	17 52	2.7
30	5 31	18 5	0 24	1 21	4 55	1.7	18 1	2.9
35	5 29	18 8	0 26	1 27	4 52	1.5	18 6	3.0
40	5 25	18 11	0 27	1 34	4 48	1.4	18 12	3.2
45	5 21	18 15	0 30	1 43	4 43	1.2	18 19	3.3
50	5 17	18 20	0 33	1 56	4 38	1.0	18 28	3.6
55	5 11	18 26	0 37	2 14	4 32	.7	18 38	3.8
60	5 3	18 34	0 44	2 44	4 24	.4	18 52	4.2
S								

SUNCE UT	SUNCE $e = T_p - UT$	SUNCE Δ/24	SUNCE r	MJESEC Prolaz	MJESEC Δ/24	MJESEC $\pi_\leftmoon$	MJESEC r
h	min s	s	′	h min	min	′	′
00	11 58.2	.7	16.0	$T_{\overline{m}}$ 11 24	2.3	61.0	16.6
12	12 6.8	$T_{\overline{m}_\odot}$ 11 h 47.9 min		Starost 28.6 d	Faza ●		

PLANETE

Pl.	$T_{\overline{m}}$	π	360−α	Vel.	Pl.	$T_{\overline{m}}$	π	360−α	Vel.
	h min	′	°			h min	′	°	
♀	13 29	.4	142	-4.4	♃	22 43	.0	3	-2.8
♂	13 47	.1	138	1.5	♄	11 31	.0	171	1.1

UT	SUNCE $S_\odot$	SUNCE $\delta_\odot$	PROLJ. TAČKA S_Υ	VENERA S_φ	VENERA δ_φ	MARS S_σ	MARS δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	183 3.8	- 5 45.5	16 30.9	158 3.8	-22 35.3	153 23.8	-16 51.7
2	213 4.1	- 5 47.4	46 35.8	188 8.7	-22 35.6	183 25.2	-16 52.8
4	243 4.5	- 5 49.4	76 40.7	218 13.7	-22 35.8	213 26.7	-16 53.9
6	273 4.8	- 5 51.3	106 45.7	248 18.7	-22 36.1	243 28.2	-16 54.9
8	303 5.2	- 5 53.2	136 50.6	278 23.8	-22 36.4	273 29.6	-16 56.0
10	333 5.5	- 5 55.1	166 55.5	308 28.8	-22 36.6	303 31.1	-16 57.0
12	3 5.9	- 5 57.0	197 .5	338 33.8	-22 36.9	333 32.6	-16 58.1
14	33 6.2	- 5 58.9	227 5.4	8 38.9	-22 37.1	3 34.0	-16 59.1
16	63 6.6	- 6 .8	257 10.3	38 44.0	-22 37.3	33 35.5	-17 .2
18	93 6.9	- 6 2.7	287 15.2	68 49.1	-22 37.5	63 37.0	-17 1.2
20	123 7.3	- 6 4.6	317 20.2	98 54.2	-22 37.8	93 38.4	-17 2.3
22	153 7.6	- 6 6.5	347 25.1	128 59.3	-22 38.0	123 39.9	-17 3.3
Δ	2	-10		25	-1	7	-5

UT	MJESEC $S_\leftmoon$	MJESEC Δ	MJESEC $\delta_\leftmoon$	MJESEC Δ	JUPITER $S_\jupiter$	JUPITER $\delta_\jupiter$	SATURN $S_\saturn$	SATURN $\delta_\saturn$
h	° ′		° ′		° ′	° ′	° ′	° ′
0	182 7.2	80	-11 28.6	-138	19 19.5	- 2 56.7	187 45.9	- 1 25.1
2	211 1.3	80	-11 56.1	-136	49 25.0	- 2 56.9	217 50.3	- 1 25.3
4	239 55.2	79	-12 23.3	-134	79 30.5	- 2 57.1	247 54.7	- 1 25.6
6	268 49.0	78	-12 50.2	-133	109 36.0	- 2 57.4	277 59.0	- 1 25.8
8	297 42.6	77	-13 16.7	-131	139 41.5	- 2 57.6	308 3.4	- 1 26.0
10	326 36.1	77	-13 42.9	-129	169 46.9	- 2 57.8	338 7.7	- 1 26.3
12	355 29.4	76	-14 8.6	-127	199 52.4	- 2 58.1	8 12.1	- 1 26.5
14	24 22.6	75	-14 34.0	-125	229 57.9	- 2 58.3	38 16.5	- 1 26.8
16	53 15.6	74	-14 58.9	-123	260 3.4	- 2 58.5	68 20.8	- 1 27.0
18	82 8.4	73	-15 23.5	-121	290 8.8	- 2 58.7	98 25.2	- 1 27.2
20	111 1.1	73	-15 47.6	-118	320 14.3	- 2 59.0	128 29.6	- 1 27.5
22	139 53.7	72	-16 11.2	-116	350 19.8	- 2 59.2	158 33.9	- 1 27.7
Δ					27	-1	22	-1

φ	SUNCE IZLAZ	SUNCE ZALAZ	TRAJANJE SUMRAKA GRAĐ.	TRAJANJE SUMRAKA ASTR.	MJESEC IZLAZ	MJESEC Δ/24	MJESEC ZALAZ	MJESEC Δ/24
N	h min	h min	h min	h min	h min	min	h min	min
60	6 22	17 12	0 42	2 19	7 47	4.2	16 35	.6
55	6 15	17 19	0 36	2 1	7 27	3.8	16 56	1.0
50	6 11	17 24	0 32	1 47	7 13	3.5	17 13	1.3
45	6 6	17 28	0 29	1 37	7 2	3.3	17 26	1.5
40	6 3	17 32	0 27	1 30	6 52	3.1	17 36	1.6
35	6 0	17 35	0 25	1 24	6 44	3.0	17 46	1.8
30	5 57	17 37	0 24	1 19	6 38	2.9	17 54	1.9
20	5 53	17 42	0 22	1 13	6 26	2.7	18 8	2.1
10	5 48	17 47	0 21	1 10	6 15	2.5	18 20	2.2
0	5 44	17 51	0 21	1 9	6 6	2.3	18 32	2.4
10	5 40	17 55	0 21	1 10	5 56	2.2	18 44	2.5
20	5 36	17 60	0 22	1 14	5 46	2.0	18 56	2.7
30	5 30	18 5	0 24	1 21	5 35	1.8	19 10	2.9
35	5 27	18 9	0 26	1 27	5 28	1.7	19 19	3.0
40	5 24	18 12	0 28	1 34	5 21	1.5	19 28	3.1
45	5 19	18 17	0 30	1 43	5 12	1.4	19 39	3.3
50	5 14	18 22	0 33	1 56	5 2	1.2	19 53	3.5
55	5 8	18 28	0 38	2 15	4 49	.9	20 10	3.7
60	5 0	18 37	0 44	2 46	4 33	.5	20 33	4.1
S								

SUNCE UT	SUNCE $e = T_p - UT$	SUNCE Δ/24	SUNCE r	MJESEC Prolaz	MJESEC Δ/24	MJESEC $\pi_\leftmoon$	MJESEC r
h	min s	s	′	h min	min	′	′
00	12 15.3	.7	16.0	$T_{\overline{m}}$ 12 19	2.3	60.7	16.5
12	12 23.7	$T_{\overline{m}_\odot}$ 11 h 47.6 min		Starost .2 d	Faza ●		

PLANETE

Pl.	$T_{\overline{m}}$	π	360−α	Vel.	Pl.	$T_{\overline{m}}$	π	360−α	Vel.
	h min	′	°			h min	′	°	
♀	13 25	.4	142	-4.4	♃	22 39	.0	3	-2.7
♂	13 46	.1	137	1.5	♄	11 27	.0	171	1.1

UT	SUNCE $S_\odot$	SUNCE $\delta_\odot$	PROLJ. TAČKA S_Υ	VENERA S_φ	VENERA δ_φ	MARS S_σ	MARS δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	183 8.0	- 6 8.4	17 30.0	159 4.5	-22 38.2	153 41.4	-17 4.4
2	213 8.3	- 6 10.3	47 35.0	189 9.6	-22 38.3	183 42.8	-17 5.4
4	243 8.7	- 6 12.2	77 39.9	219 14.8	-22 38.5	213 44.3	-17 6.5
6	273 9.0	- 6 14.1	107 44.8	249 20.0	-22 38.7	243 45.7	-17 7.5
8	303 9.3	- 6 16.0	137 49.7	279 25.2	-22 38.9	273 47.2	-17 8.5
10	333 9.7	- 6 17.9	167 54.7	309 30.4	-22 39.0	303 48.6	-17 9.6
12	3 10.0	- 6 19.8	197 59.6	339 35.7	-22 39.2	333 50.1	-17 10.6
14	33 10.4	- 6 21.7	228 4.5	9 40.9	-22 39.3	3 51.6	-17 11.7
16	63 10.7	- 6 23.6	258 9.4	39 46.2	-22 39.4	33 53.0	-17 12.7
18	93 11.0	- 6 25.5	288 14.4	69 51.5	-22 39.6	63 54.5	-17 13.7
20	123 11.4	- 6 27.4	318 19.3	99 56.8	-22 39.7	93 55.9	-17 14.8
22	153 11.7	- 6 29.3	348 24.2	130 2.1	-22 39.8	123 57.4	-17 15.8
Δ	2	-9		26	-1	7	-5

UT	MJESEC $S_\leftmoon$	MJESEC Δ	MJESEC $\delta_\leftmoon$	MJESEC Δ	JUPITER $S_\jupiter$	JUPITER $\delta_\jupiter$	SATURN $S_\saturn$	SATURN $\delta_\saturn$
h	° ′		° ′		° ′	° ′	° ′	° ′
0	168 46.1	71	-16 34.4	-114	20 25.3	- 2 59.4	188 38.3	- 1 27.9
2	197 38.3	71	-16 57.2	-111	50 30.7	- 2 59.7	218 42.6	- 1 28.2
4	226 30.4	70	-17 19.4	-109	80 36.2	- 2 59.9	248 47.0	- 1 28.4
6	255 22.4	69	-17 41.2	-106	110 41.7	- 3 .1	278 51.4	- 1 28.7
8	284 14.2	68	-18 2.5	-104	140 47.2	- 3 .3	308 55.7	- 1 28.9
10	313 5.9	68	-18 23.3	-101	170 52.6	- 3 .6	339 .1	- 1 29.1
12	341 57.4	67	-18 43.5	-99	200 58.1	- 3 .8	9 4.4	- 1 29.4
14	10 48.9	67	-19 3.3	-96	231 3.6	- 3 1.0	39 8.8	- 1 29.6
16	39 40.2	66	-19 22.5	-93	261 9.0	- 3 1.2	69 13.2	- 1 29.8
18	68 31.4	65	-19 41.1	-91	291 14.5	- 3 1.5	99 17.5	- 1 30.1
20	97 22.5	65	-19 59.2	-88	321 20.0	- 3 1.7	129 21.9	- 1 30.3
22	126 13.5	65	-20 16.8	-85	351 25.5	- 3 1.9	159 26.3	- 1 30.6
Δ					27	-1	22	-1

φ	SUNCE IZLAZ	SUNCE ZALAZ	TRAJANJE SUMRAKA GRAĐ.	TRAJANJE SUMRAKA ASTR.	MJESEC IZLAZ	MJESEC Δ/24	MJESEC ZALAZ	MJESEC Δ/24
N	h min	h min	h min	h min	h min	min	h min	min
60	6 24	17 9	0 42	2 19	9 28	4.0	16 50	1.0
55	6 17	17 16	0 36	2 1	8 59	3.6	17 21	1.3
50	6 12	17 22	0 32	1 47	8 38	3.3	17 43	1.6
45	6 8	17 26	0 29	1 37	8 21	3.2	18 1	1.7
40	6 4	17 30	0 27	1 30	8 8	3.0	18 15	1.9
35	6 1	17 33	0 25	1 24	7 57	2.9	18 28	2.0
30	5 58	17 36	0 24	1 19	7 47	2.8	18 39	2.0
20	5 53	17 41	0 22	1 13	7 30	2.7	18 57	2.2
10	5 48	17 46	0 21	1 10	7 15	2.5	19 13	2.3
0	5 44	17 51	0 21	1 9	7 2	2.4	19 29	2.4
10	5 40	17 55	0 21	1 10	6 48	2.3	19 44	2.5
20	5 35	18 0	0 22	1 14	6 34	2.1	20 0	2.6
30	5 29	18 6	0 24	1 22	6 17	2.0	20 19	2.8
35	5 26	18 9	0 26	1 27	6 8	1.9	20 30	2.8
40	5 22	18 13	0 28	1 34	5 57	1.7	20 43	2.9
45	5 18	18 18	0 30	1 44	5 45	1.6	20 58	3.0
50	5 12	18 23	0 33	1 57	5 30	1.4	21 16	3.2
55	5 6	18 30	0 38	2 16	5 11	1.2	21 40	3.4
60	4 57	18 39	0 44	2 48	4 46	.8	22 13	3.8
S								

SUNCE UT	SUNCE $e = T_p - UT$	SUNCE Δ/24	SUNCE r	MJESEC Prolaz	MJESEC Δ/24	MJESEC $\pi_\leftmoon$	MJESEC r
h	min s	s	′	h min	min	′	′
00	12 32.1	.7	16.0	$T_{\overline{m}}$ 13 15	2.4	60.1	16.4
12	12 40.2	$T_{\overline{m}_\odot}$ 11 h 47.3 min		Starost 1.2 d	Faza ●		

PLANETE

Pl.	$T_{\overline{m}}$	π	360−α	Vel.	Pl.	$T_{\overline{m}}$	π	360−α	Vel.
	h min	′	°			h min	′	°	
♀	13 21	.4	142	-4.4	♃	22 34	.0	3	-2.7
♂	13 45	.1	136	1.5	♄	11 24	.0	171	1.1

UT	SUNCE $S_\odot$	SUNCE $\delta_\odot$	PROLJ. TAČKA S_Υ	VENERA S_φ	VENERA δ_φ	MARS S_σ	MARS δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	183 12.0	- 6 31.2	18 29.2	160 7.5	-22 39.9	153 58.8	-17 16.9
2	213 12.4	- 6 33.1	48 34.1	190 12.8	-22 40.0	184 .2	-17 17.9
4	243 12.7	- 6 35.0	78 39.0	220 18.2	-22 40.0	214 1.7	-17 18.9
6	273 13.0	- 6 36.9	108 43.9	250 23.6	-22 40.1	244 3.1	-17 20.0
8	303 13.4	- 6 38.8	138 48.9	280 28.9	-22 40.2	274 4.6	-17 21.0
10	333 13.7	- 6 40.7	168 53.8	310 34.4	-22 40.2	304 6.0	-17 22.0
12	3 14.0	- 6 42.6	198 58.7	340 39.8	-22 40.3	334 7.5	-17 23.1
14	33 14.4	- 6 44.5	229 3.7	10 45.2	-22 40.3	4 8.9	-17 24.1
16	63 14.7	- 6 46.4	259 8.6	40 50.7	-22 40.4	34 10.3	-17 25.1
18	93 15.0	- 6 48.2	289 13.5	70 56.2	-22 40.4	64 11.8	-17 26.2
20	123 15.4	- 6 50.1	319 18.4	101 1.7	-22 40.4	94 13.2	-17 27.2
22	153 15.7	- 6 52.0	349 23.4	131 7.2	-22 40.4	124 14.6	-17 28.2
Δ	2	-9		27	0	7	-5

UT	MJESEC $S_\leftmoon$	MJESEC Δ	MJESEC $\delta_\leftmoon$	MJESEC Δ	JUPITER S_4	JUPITER δ_4	SATURN S_η	SATURN δ_η
h	° ′		° ′		° ′	° ′	° ′	° ′
0	155 4.4	64	-20 33.8	-82	21 30.9	- 3 2.1	189 30.6	- 1 30.8
2	183 55.2	64	-20 50.2	-79	51 36.4	- 3 2.3	219 35.0	- 1 31.0
4	212 45.9	63	-21 6.1	-76	81 41.9	- 3 2.6	249 39.3	- 1 31.3
6	241 36.6	63	-21 21.4	-73	111 47.3	- 3 2.8	279 43.7	- 1 31.5
8	270 27.2	63	-21 36.0	-71	141 52.8	- 3 3.0	309 48.1	- 1 31.7
10	299 17.8	63	-21 50.2	-68	171 58.2	- 3 3.2	339 52.4	- 1 32.0
12	328 8.3	62	-22 3.7	-65	202 3.7	- 3 3.5	9 56.8	- 1 32.2
14	356 58.8	62	-22 16.6	-62	232 9.2	- 3 3.7	40 1.2	- 1 32.4
16	25 49.3	62	-22 28.9	-59	262 14.6	- 3 3.9	70 5.5	- 1 32.7
18	54 39.7	62	-22 40.6	-56	292 20.1	- 3 4.1	100 9.9	- 1 32.9
20	83 30.2	62	-22 51.7	-52	322 25.6	- 3 4.3	130 14.2	- 1 33.2
22	112 20.6	62	-23 2.2	-49	352 31.0	- 3 4.6	160 18.6	- 1 33.4
Δ					27	-1	22	-1

φ	SUNCE IZLAZ	SUNCE ZALAZ	TRAJANJE SUMRAKA GRAĐ.	TRAJANJE SUMRAKA ASTR.	MJESEC IZLAZ	MJESEC Δ/24	MJESEC ZALAZ	MJESEC Δ/24
N	h min	h min	h min	h min	h min	min	h min	min
60	6 27	17 6	0 42	2 19	11 4	3.5	17 13	1.5
55	6 19	17 14	0 36	2 0	10 25	3.2	17 53	1.8
50	6 14	17 20	0 32	1 47	9 58	3.0	18 21	2.0
45	6 9	17 24	0 29	1 37	9 37	2.9	18 43	2.1
40	6 5	17 28	0 27	1 30	9 20	2.8	19 0	2.1
35	6 2	17 32	0 25	1 24	9 6	2.7	19 15	2.2
30	5 59	17 35	0 24	1 19	8 54	2.7	19 28	2.2
20	5 53	17 41	0 22	1 13	8 33	2.6	19 50	2.3
10	5 48	17 46	0 21	1 10	8 15	2.5	20 9	2.3
0	5 44	17 50	0 21	1 9	7 59	2.4	20 26	2.4
10	5 39	17 55	0 21	1 11	7 42	2.3	20 44	2.5
20	5 34	18 1	0 22	1 14	7 25	2.2	21 3	2.5
30	5 28	18 7	0 24	1 22	7 4	2.1	21 25	2.6
35	5 24	18 10	0 26	1 27	6 53	2.1	21 38	2.6
40	5 20	18 14	0 28	1 34	6 39	2.0	21 53	2.6
45	5 16	18 19	0 30	1 44	6 23	1.9	22 11	2.7
50	5 10	18 25	0 33	1 57	6 4	1.8	22 33	2.8
55	5 3	18 32	0 38	2 17	5 39	1.6	23 2	2.9
60	4 54	18 42	0 44	2 50	5 4	1.2	23 44	3.1
S								

SUNCE UT	SUNCE $e = T_p - UT$	SUNCE Δ/24	SUNCE r	MJESEC Prolaz	MJESEC Δ/24	MJESEC $\pi_\leftmoon$	MJESEC r
h	min s	s	′	h min	min	′	′
00	12 48.4	.7	16.0	$T_{\overline{m}}$ 14 13	2.4	59.4	16.2
12	12 56.3	$T_{\overline{m}_\odot}$ 11 h 47.1 min		Starost 2.2 d	Faza ●		

PLANETE Pl.	$T_{\overline{m}}$	π	360−α	Vel.	Pl.	$T_{\overline{m}}$	π	360−α	Vel.
	h min	′	°			h min	′	°	
♀	13 17	.5	142	-4.4	♃	22 30	.0	3	-2.7
♂	13 43	.1	135	1.5	♄	11 20	.0	171	1.0

UT	SUNCE $S_\odot$	SUNCE $\delta_\odot$	PROLJ. TAČKA S_Υ	VENERA S_φ	VENERA δ_φ	MARS S_σ	MARS δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	183 16.0	- 6 53.9	19 28.3	161 12.7	-22 40.4	154 16.1	-17 29.2
2	213 16.3	- 6 55.8	49 33.2	191 18.2	-22 40.4	184 17.5	-17 30.3
4	243 16.7	- 6 57.7	79 38.2	221 23.8	-22 40.4	214 18.9	-17 31.3
6	273 17.0	- 6 59.6	109 43.1	251 29.4	-22 40.3	244 20.4	-17 32.3
8	303 17.3	- 7 1.5	139 48.0	281 35.0	-22 40.3	274 21.8	-17 33.3
10	333 17.6	- 7 3.3	169 52.9	311 40.6	-22 40.2	304 23.2	-17 34.3
12	3 17.9	- 7 5.2	199 57.9	341 46.2	-22 40.2	334 24.7	-17 35.4
14	33 18.3	- 7 7.1	230 2.8	11 51.8	-22 40.1	4 26.1	-17 36.4
16	63 18.6	- 7 9.0	260 7.7	41 57.5	-22 40.0	34 27.5	-17 37.4
18	93 18.9	- 7 10.9	290 12.7	72 3.1	-22 40.0	64 28.9	-17 38.4
20	123 19.2	- 7 12.8	320 17.6	102 8.8	-22 39.9	94 30.3	-17 39.4
22	153 19.5	- 7 14.6	350 22.5	132 14.5	-22 39.8	124 31.8	-17 40.5
Δ	2	-9		28	0	7	-5

UT	MJESEC $S_\leftmoon$	MJESEC Δ	MJESEC $\delta_\leftmoon$	MJESEC Δ	JUPITER S_4	JUPITER δ_4	SATURN S_η	SATURN δ_η
h	° ′		° ′		° ′	° ′	° ′	° ′
0	141 11.1	63	-23 12.0	-46	22 36.5	- 3 4.8	190 23.0	- 1 33.6
2	170 1.6	63	-23 21.3	-43	52 41.9	- 3 5.0	220 27.3	- 1 33.9
4	198 52.2	63	-23 30.0	-40	82 47.4	- 3 5.2	250 31.7	- 1 34.1
6	227 42.8	63	-23 38.0	-37	112 52.8	- 3 5.4	280 36.1	- 1 34.3
8	256 33.4	64	-23 45.4	-34	142 58.3	- 3 5.6	310 40.4	- 1 34.6
10	285 24.2	64	-23 52.3	-31	173 3.8	- 3 5.9	340 44.8	- 1 34.8
12	314 15.0	65	-23 58.5	-28	203 9.2	- 3 6.1	10 49.2	- 1 35.0
14	343 5.9	65	-24 4.1	-25	233 14.7	- 3 6.3	40 53.5	- 1 35.3
16	11 57.0	66	-24 9.0	-22	263 20.1	- 3 6.5	70 57.9	- 1 35.5
18	40 48.1	66	-24 13.4	-19	293 25.6	- 3 6.7	101 2.2	- 1 35.8
20	69 39.4	67	-24 17.2	-16	323 31.0	- 3 6.9	131 6.6	- 1 36.0
22	98 30.9	68	-24 20.4	-13	353 36.5	- 3 7.2	161 11.0	- 1 36.2
Δ					27	-1	22	-1

φ	SUNCE IZLAZ	SUNCE ZALAZ	TRAJANJE SUMRAKA GRAĐ.	TRAJANJE SUMRAKA ASTR.	MJESEC IZLAZ	MJESEC Δ/24	MJESEC ZALAZ	MJESEC Δ/24
N	h min	h min	h min	h min	h min	min	h min	min
60	6 29	17 3	0 42	2 19	12 28	2.6	17 50	2.3
55	6 21	17 11	0 36	2 0	11 41	2.5	18 37	2.3
50	6 15	17 18	0 32	1 47	11 10	2.5	19 8	2.3
45	6 10	17 23	0 29	1 37	10 46	2.5	19 32	2.3
40	6 6	17 27	0 27	1 30	10 28	2.5	19 51	2.3
35	6 2	17 31	0 25	1 24	10 12	2.5	20 7	2.3
30	5 59	17 34	0 24	1 19	9 58	2.4	20 21	2.3
20	5 54	17 40	0 22	1 13	9 35	2.4	20 45	2.3
10	5 48	17 45	0 21	1 10	9 15	2.4	21 5	2.3
0	5 44	17 50	0 21	1 9	8 57	2.4	21 24	2.3
10	5 39	17 55	0 21	1 11	8 38	2.3	21 43	2.3
20	5 33	18 1	0 22	1 15	8 18	2.3	22 3	2.3
30	5 27	18 7	0 24	1 22	7 55	2.3	22 27	2.3
35	5 23	18 11	0 26	1 27	7 42	2.3	22 41	2.3
40	5 19	18 15	0 28	1 35	7 27	2.2	22 57	2.3
45	5 14	18 21	0 30	1 44	7 9	2.2	23 16	2.3
50	5 8	18 27	0 33	1 58	6 46	2.1	23 39	2.3
55	5 1	18 34	0 38	2 18	6 16	2.1	. . .	.0
60	4 51	18 44	0 44	2 52	5 33	1.9	. . .	.0
S								

SUNCE UT	SUNCE $e = T_p - UT$	SUNCE Δ/24	SUNCE r	MJESEC Prolaz	MJESEC Δ/24	MJESEC $\pi_\leftmoon$	MJESEC r
h	min s	s	′	h min	min	′	′
00	13 4.2	.6	16.0	$T_{\overline{m}}$ 15 10	2.4	58.5	15.9
12	13 11.9	$T_{\overline{m}_\odot}$ 11 h 46.8 min		Starost 3.2 d	Faza ●		

PLANETE Pl.	$T_{\overline{m}}$	π	360−α	Vel.	Pl.	$T_{\overline{m}}$	π	360−α	Vel.
	h min	′	°			h min	′	°	
♀	13 13	.5	142	-4.4	♃	22 25	.0	3	-2.7
♂	13 42	.1	135	1.5	♄	11 17	.0	171	1.0

UT	SUNCE $S_\odot$	SUNCE $\delta_\odot$	PROLJ. TAČKA S_Υ	VENERA S_φ	VENERA δ_φ	MARS S_σ	MARS δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	183 19.8	- 7 16.5	20 27.4	162 20.2	-22 39.6	154 33.2	-17 41.5
2	213 20.2	- 7 18.4	50 32.4	192 26.0	-22 39.5	184 34.6	-17 42.5
4	243 20.5	- 7 20.3	80 37.3	222 31.7	-22 39.4	214 36.0	-17 43.5
6	273 20.8	- 7 22.2	110 42.2	252 37.5	-22 39.3	244 37.4	-17 44.5
8	303 21.1	- 7 24.0	140 47.2	282 43.2	-22 39.1	274 38.9	-17 45.5
10	333 21.4	- 7 25.9	170 52.1	312 49.0	-22 39.0	304 40.3	-17 46.5
12	3 21.7	- 7 27.8	200 57.0	342 54.8	-22 38.8	334 41.7	-17 47.5
14	33 22.0	- 7 29.7	231 1.9	13 .7	-22 38.6	4 43.1	-17 48.6
16	63 22.3	- 7 31.5	261 6.9	43 6.5	-22 38.4	34 44.5	-17 49.6
18	93 22.7	- 7 33.4	291 11.8	73 12.4	-22 38.2	64 45.9	-17 50.6
20	123 23.0	- 7 35.3	321 16.7	103 18.2	-22 38.0	94 47.3	-17 51.6
22	153 23.3	- 7 37.2	351 21.6	133 24.1	-22 37.8	124 48.7	-17 52.6
Δ	2	-9		29	1	7	-5

UT	MJESEC $S_\leftmoon$	MJESEC Δ	MJESEC $\delta_\leftmoon$	MJESEC Δ	JUPITER $S_\jupiter$	JUPITER $\delta_\jupiter$	SATURN $S_\saturn$	SATURN $\delta_\saturn$
h	° ′		° ′		° ′	° ′	° ′	° ′
0	127 22.4	69	-24 22.9	-10	23 41.9	- 3 7.4	191 15.3	- 1 36.5
2	156 14.2	70	-24 24.9	-7	53 47.4	- 3 7.6	221 19.7	- 1 36.7
4	185 6.1	71	-24 26.3	-4	83 52.8	- 3 7.8	251 24.1	- 1 36.9
6	213 58.2	72	-24 27.1	-1	113 58.3	- 3 8.0	281 28.4	- 1 37.2
8	242 50.5	73	-24 27.3	2	144 3.7	- 3 8.2	311 32.8	- 1 37.4
10	271 43.0	74	-24 27.0	5	174 9.2	- 3 8.4	341 37.2	- 1 37.6
12	300 35.8	75	-24 26.1	7	204 14.6	- 3 8.7	11 41.5	- 1 37.9
14	329 28.7	76	-24 24.6	10	234 20.0	- 3 8.9	41 45.9	- 1 38.1
16	358 21.9	77	-24 22.5	13	264 25.5	- 3 9.1	71 50.2	- 1 38.3
18	27 15.3	78	-24 19.9	16	294 30.9	- 3 9.3	101 54.6	- 1 38.6
20	56 9.0	80	-24 16.7	18	324 36.4	- 3 9.5	131 59.0	- 1 38.8
22	85 2.9	81	-24 13.0	21	354 41.8	- 3 9.7	162 3.3	- 1 39.1
Δ					27	-1	22	-1

φ	SUNCE IZLAZ	SUNCE ZALAZ	TRAJANJE SUMRAKA GRAĐ.	TRAJANJE SUMRAKA ASTR.	MJESEC IZLAZ	MJESEC Δ/24	MJESEC ZALAZ	MJESEC Δ/24
N	h min	h min	h min	h min	h min	min	h min	min
60	6 32	17 0	0 42	2 19	13 30	1.7	18 45	3.0
55	6 23	17 9	0 36	2 0	12 42	1.9	19 33	2.8
50	6 17	17 15	0 32	1 47	12 10	2.0	20 4	2.6
45	6 12	17 21	0 29	1 37	11 46	2.1	20 28	2.6
40	6 7	17 25	0 27	1 30	11 27	2.1	20 47	2.5
35	6 3	17 29	0 25	1 24	11 11	2.1	21 3	2.4
30	5 60	17 33	0 24	1 19	10 57	2.2	21 17	2.4
20	5 54	17 39	0 22	1 13	10 33	2.2	21 41	2.3
10	5 48	17 45	0 21	1 10	10 13	2.2	22 1	2.3
0	5 43	17 50	0 21	1 9	9 53	2.3	22 20	2.2
10	5 38	17 55	0 21	1 11	9 34	2.3	22 39	2.2
20	5 32	18 1	0 22	1 15	9 14	2.3	22 59	2.1
30	5 26	18 8	0 24	1 22	8 50	2.4	23 22	2.0
35	5 22	18 12	0 26	1 28	8 36	2.4	23 36	2.0
40	5 17	18 16	0 28	1 35	8 20	2.4	23 51	1.9
45	5 12	18 22	0 30	1 45	8 1	2.5	. . .	.0
50	5 6	18 28	0 34	1 59	7 38	2.5	. . .	.0
55	4 58	18 36	0 38	2 19	7 6	2.6	0 11	2.2
60	4 48	18 47	0 45	2 55	6 19	2.7	0 58	2.1
S								

SUNCE UT	SUNCE $e = T_p - UT$	SUNCE Δ/24	SUNCE r	MJESEC Prolaz	MJESEC Δ/24	MJESEC $\pi_\leftmoon$	MJESEC r
h	min s	s	′	h min	min	′	′
00	13 19.6	.6	16.0	$T_{\overline{m}}$ 16 7	2.2	57.5	15.7
12	13 27.0	$T_{\overline{m}_\odot}$ 11 h 46.6 min		Starost 4.2 d	Faza ◑		

PLANETE Pl.	$T_{\overline{m}}$	π	360−α	Vel.	Pl.	$T_{\overline{m}}$	π	360−α	Vel.
	h min	′	°			h min	′	°	
♀	13 8	.5	142	-4.4	♃	22 21	.0	3	-2.7
♂	13 41	.1	134	1.5	♄	11 13	.0	171	1.0

UT	SUNCE $S_\odot$	SUNCE $\delta_\odot$	PROLJ. TAČKA S_Υ	VENERA S_φ	VENERA δ_φ	MARS S_σ	MARS δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	183 23.6	- 7 39.0	21 26.6	163 30.0	-22 37.6	154 50.1	-17 53.6
2	213 23.9	- 7 40.9	51 31.5	193 35.9	-22 37.4	184 51.5	-17 54.6
4	243 24.2	- 7 42.8	81 36.4	223 41.9	-22 37.1	214 53.0	-17 55.6
6	273 24.5	- 7 44.7	111 41.4	253 47.8	-22 36.9	244 54.4	-17 56.6
8	303 24.8	- 7 46.5	141 46.3	283 53.8	-22 36.6	274 55.8	-17 57.6
10	333 25.1	- 7 48.4	171 51.2	313 59.8	-22 36.4	304 57.2	-17 58.6
12	3 25.4	- 7 50.3	201 56.1	344 5.8	-22 36.1	334 58.6	-17 59.6
14	33 25.7	- 7 52.1	232 1.1	14 11.8	-22 35.8	4 60.0	-18 .6
16	63 26.0	- 7 54.0	262 6.0	44 17.8	-22 35.5	35 1.4	-18 1.6
18	93 26.3	- 7 55.9	292 10.9	74 23.9	-22 35.2	65 2.8	-18 2.6
20	123 26.6	- 7 57.7	322 15.9	104 29.9	-22 34.9	95 4.1	-18 3.6
22	153 26.9	- 7 59.6	352 20.8	134 36.0	-22 34.6	125 5.5	-18 4.6
Δ	1	-9		30	1	7	-5

UT	MJESEC $S_\leftmoon$	MJESEC Δ	MJESEC $\delta_\leftmoon$	MJESEC Δ	JUPITER $S_\jupiter$	JUPITER $\delta_\jupiter$	SATURN $S_\saturn$	SATURN $\delta_\saturn$
h	° ′		° ′		° ′	° ′	° ′	° ′
0	113 57.1	82	-24 8.8	24	24 47.3	- 3 9.9	192 7.7	- 1 39.3
2	142 51.5	84	-24 4.0	26	54 52.7	- 3 10.1	222 12.1	- 1 39.5
4	171 46.2	85	-23 58.7	29	84 58.1	- 3 10.3	252 16.4	- 1 39.8
6	200 41.3	86	-23 52.9	32	115 3.6	- 3 10.5	282 20.8	- 1 40.0
8	229 36.5	88	-23 46.6	34	145 9.0	- 3 10.8	312 25.2	- 1 40.2
10	258 32.1	89	-23 39.8	37	175 14.4	- 3 11.0	342 29.5	- 1 40.5
12	287 28.0	91	-23 32.5	39	205 19.9	- 3 11.2	12 33.9	- 1 40.7
14	316 24.2	92	-23 24.7	41	235 25.3	- 3 11.4	42 38.3	- 1 40.9
16	345 20.7	94	-23 16.4	44	265 30.8	- 3 11.6	72 42.6	- 1 41.2
18	14 17.5	96	-23 7.6	46	295 36.2	- 3 11.8	102 47.0	- 1 41.4
20	43 14.7	97	-22 58.4	48	325 41.6	- 3 12.0	132 51.4	- 1 41.6
22	72 12.1	99	-22 48.7	51	355 47.1	- 3 12.2	162 55.7	- 1 41.9
Δ					27	-1	22	-1

φ	SUNCE IZLAZ	SUNCE ZALAZ	TRAJANJE SUMRAKA GRAĐ.	TRAJANJE SUMRAKA ASTR.	MJESEC IZLAZ	MJESEC Δ/24	MJESEC ZALAZ	MJESEC Δ/24
N	h min	h min	h min	h min	h min	min	h min	min
60	6 34	16 57	0 42	2 19	14 11	1.0	19 56	3.3
55	6 25	17 6	0 36	2 0	13 27	1.3	20 39	3.0
50	6 18	17 13	0 32	1 47	12 58	1.5	21 8	2.8
45	6 13	17 19	0 29	1 37	12 35	1.7	21 30	2.7
40	6 8	17 24	0 27	1 30	12 17	1.7	21 47	2.5
35	6 4	17 28	0 25	1 24	12 2	1.8	22 2	2.5
30	6 0	17 32	0 24	1 19	11 49	1.9	22 15	2.4
20	5 54	17 38	0 22	1 13	11 26	2.0	22 37	2.3
10	5 48	17 44	0 21	1 10	11 6	2.1	22 56	2.2
0	5 43	17 50	0 21	1 9	10 48	2.1	23 13	2.1
10	5 37	17 55	0 21	1 11	10 30	2.2	23 31	2.0
20	5 31	18 1	0 22	1 15	10 10	2.3	23 49	1.9
30	5 24	18 9	0 24	1 22	9 47	2.4	. . .	.0
35	5 20	18 13	0 26	1 28	9 34	2.5	. . .	.0
40	5 16	18 18	0 28	1 35	9 19	2.5	. . .	.0
45	5 10	18 23	0 30	1 45	9 0	2.6	0 10	1.9
50	5 4	18 30	0 34	1 59	8 37	2.7	0 34	1.8
55	4 56	18 38	0 38	2 20	8 7	2.9	1 4	1.6
60	4 45	18 49	0 45	2 58	7 22	3.2	1 49	1.3
S								

SUNCE UT	SUNCE $e = T_p - UT$	SUNCE Δ/24	SUNCE r	MJESEC Prolaz	MJESEC Δ/24	MJESEC $\pi_\leftmoon$	MJESEC r
h	min s	s	′	h min	min	′	′
00	13 34.5	.6	16.1	$T_{\overline{m}}$ 17 1	2.1	56.6	15.4
12	13 41.7	$T_{\overline{m}_\odot}$ 11 h 46.3 min		Starost 5.2 d	Faza ◑		

PLANETE Pl.	$T_{\overline{m}}$	π	360−α	Vel.	Pl.	$T_{\overline{m}}$	π	360−α	Vel.
	h min	′	°			h min	′	°	
♀	13 3	.5	142	-4.3	♃	22 17	.0	3	-2.7
♂	13 40	.1	133	1.5	♄	11 10	.0	171	1.0

UT	SUNCE $S_\odot$	SUNCE $\delta_\odot$	PROLJ. TAČKA S_Υ	VENERA S_φ	VENERA δ_φ	MARS S_σ	MARS δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	183 27.2	- 8 1.4	22 25.7	164 42.1	-22 34.2	155 6.9	-18 5.6
2	213 27.5	- 8 3.3	52 30.6	194 48.2	-22 33.9	185 8.3	-18 6.6
4	243 27.8	- 8 5.2	82 35.6	224 54.3	-22 33.6	215 9.7	-18 7.6
6	273 28.0	- 8 7.0	112 40.5	255 .4	-22 33.2	245 11.1	-18 8.5
8	303 28.3	- 8 8.9	142 45.4	285 6.6	-22 32.8	275 12.5	-18 9.5
10	333 28.6	- 8 10.7	172 50.4	315 12.8	-22 32.4	305 13.9	-18 10.5
12	3 28.9	- 8 12.6	202 55.3	345 18.9	-22 32.1	335 15.3	-18 11.5
14	33 29.2	- 8 14.5	233 .2	15 25.1	-22 31.7	5 16.7	-18 12.5
16	63 29.5	- 8 16.3	263 5.1	45 31.4	-22 31.2	35 18.0	-18 13.5
18	93 29.8	- 8 18.2	293 10.1	75 37.6	-22 30.8	65 19.4	-18 14.5
20	123 30.1	- 8 20.0	323 15.0	105 43.8	-22 30.4	95 20.8	-18 15.4
22	153 30.4	- 8 21.9	353 19.9	135 50.1	-22 30.0	125 22.2	-18 16.4
Δ	1	-9		31	2	7	-5

UT	MJESEC $S_\leftmoon$	MJESEC Δ	MJESEC $\delta_\leftmoon$	MJESEC Δ	JUPITER S_4	JUPITER δ_4	SATURN S_η	SATURN δ_η
h	° ′		° ′		° ′	° ′	° ′	° ′
0	101 9.8	100	-22 38.6	53	25 52.5	- 3 12.4	193 .1	- 1 42.1
2	130 7.9	102	-22 28.0	55	55 57.9	- 3 12.6	223 4.5	- 1 42.3
4	159 6.3	104	-22 17.1	57	86 3.3	- 3 12.8	253 8.8	- 1 42.6
6	188 5.0	105	-22 5.6	59	116 8.8	- 3 13.0	283 13.2	- 1 42.8
8	217 4.1	107	-21 53.8	61	146 14.2	- 3 13.2	313 17.6	- 1 43.0
10	246 3.5	108	-21 41.5	63	176 19.6	- 3 13.4	343 21.9	- 1 43.3
12	275 3.2	110	-21 28.9	65	206 25.1	- 3 13.6	13 26.3	- 1 43.5
14	304 3.2	112	-21 15.8	67	236 30.5	- 3 13.8	43 30.6	- 1 43.7
16	333 3.5	113	-21 2.4	69	266 35.9	- 3 14.0	73 35.0	- 1 44.0
18	2 4.2	115	-20 48.6	71	296 41.3	- 3 14.2	103 39.4	- 1 44.2
20	31 5.2	117	-20 34.4	73	326 46.8	- 3 14.4	133 43.7	- 1 44.4
22	60 6.5	118	-20 19.9	74	356 52.2	- 3 14.6	163 48.1	- 1 44.7
Δ					27	-1	22	-1

φ	SUNCE IZLAZ	SUNCE ZALAZ	TRAJANJE SUMRAKA GRAĐ.	TRAJANJE SUMRAKA ASTR.	MJESEC IZLAZ	MJESEC Δ/24	MJESEC ZALAZ	MJESEC Δ/24
N	h min	h min	h min	h min	h min	min	h min	min
60	6 36	16 55	0 42	2 19	14 35	.6	21 16	3.4
55	6 27	17 4	0 37	2 0	13 60	1.0	21 50	3.1
50	6 20	17 11	0 33	1 47	13 35	1.2	22 14	2.8
45	6 14	17 17	0 30	1 37	13 15	1.3	22 33	2.7
40	6 9	17 22	0 27	1 30	12 59	1.5	22 48	2.5
35	6 5	17 27	0 25	1 24	12 46	1.6	23 1	2.4
30	6 1	17 31	0 24	1 20	12 34	1.6	23 12	2.3
20	5 54	17 37	0 22	1 13	12 14	1.8	23 31	2.2
10	5 48	17 44	0 21	1 10	11 56	1.9	23 48	2.1
0	5 43	17 49	0 21	1 9	11 40	2.0	.. ..	.0
10	5 37	17 55	0 21	1 11	11 23	2.1	.. ..	.0
20	5 31	18 2	0 22	1 15	11 5	2.2	.. ..	.0
30	5 23	18 9	0 24	1 22	10 45	2.4	0 11	1.8
35	5 19	18 14	0 26	1 28	10 33	2.4	0 23	1.7
40	5 14	18 19	0 28	1 36	10 19	2.5	0 38	1.6
45	5 9	18 24	0 30	1 46	10 3	2.7	0 55	1.5
50	5 2	18 31	0 34	1 60	9 43	2.8	1 16	1.4
55	4 53	18 40	0 38	2 22	9 16	3.0	1 43	1.2
60	4 42	18 52	0 45	3 1	8 39	3.4	2 22	.8
S								

SUNCE UT	SUNCE $e = T_p - UT$	SUNCE Δ/24	SUNCE r	MJESEC Prolaz	MJESEC Δ/24	MJESEC $\pi_\leftmoon$	MJESEC r
h	min s	s	′	h min	min	′	′
00	13 48.9	.6	16.1	$T_{\overline{m}}$ 17 51	2.0	55.8	15.2
12	13 55.8	$T_{\overline{m}_\odot}$ 11 h 46.1 min		Starost 6.2 d	Faza ◐		

PLANETE

Pl.	$T_{\overline{m}}$	π	360−α	Vel.	Pl.	$T_{\overline{m}}$	π	360−α	Vel.
	h min	′	°			h min	′	°	
♀	12 59	.5	142	-4.3	♃	22 12	.0	3	-2.7
♂	13 39	.1	133	1.5	♄	11 6	.0	171	1.0

UT	SUNCE $S_\odot$	SUNCE $\delta_\odot$	PROLJ. TAČKA S_Υ	VENERA S_φ	VENERA δ_φ	MARS S_σ	MARS δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	183 30.6	- 8 23.7	23 24.9	165 56.4	-22 29.5	155 23.6	-18 17.4
2	213 30.9	- 8 25.6	53 29.8	196 2.6	-22 29.1	185 24.9	-18 18.4
4	243 31.2	- 8 27.4	83 34.7	226 8.9	-22 28.6	215 26.3	-18 19.4
6	273 31.5	- 8 29.3	113 39.6	256 15.3	-22 28.1	245 27.7	-18 20.3
8	303 31.8	- 8 31.1	143 44.6	286 21.6	-22 27.6	275 29.1	-18 21.3
10	333 32.0	- 8 33.0	173 49.5	316 27.9	-22 27.1	305 30.4	-18 22.3
12	3 32.3	- 8 34.8	203 54.4	346 34.3	-22 26.6	335 31.8	-18 23.3
14	33 32.6	- 8 36.7	233 59.4	16 40.7	-22 26.1	5 33.2	-18 24.3
16	63 32.9	- 8 38.5	264 4.3	46 47.1	-22 25.6	35 34.6	-18 25.2
18	93 33.2	- 8 40.4	294 9.2	76 53.5	-22 25.1	65 35.9	-18 26.2
20	123 33.4	- 8 42.2	324 14.1	106 59.9	-22 24.5	95 37.3	-18 27.2
22	153 33.7	- 8 44.1	354 19.1	137 6.3	-22 24.0	125 38.7	-18 28.1
Δ	1	-9		32	3	7	-5

UT	MJESEC $S_\leftmoon$	MJESEC Δ	MJESEC $\delta_\leftmoon$	MJESEC Δ	JUPITER S_4	JUPITER δ_4	SATURN S_η	SATURN δ_η
h	° ′		° ′		° ′	° ′	° ′	° ′
0	89 8.1	120	-20 5.0	76	26 57.6	- 3 14.8	193 52.5	- 1 44.9
2	118 10.0	121	-19 49.7	78	57 3.0	- 3 15.0	223 56.8	- 1 45.1
4	147 12.3	123	-19 34.1	80	87 8.4	- 3 15.2	254 1.2	- 1 45.4
6	176 14.9	124	-19 18.2	81	117 13.9	- 3 15.4	284 5.6	- 1 45.6
8	205 17.7	126	-19 2.0	83	147 19.3	- 3 15.6	314 9.9	- 1 45.8
10	234 20.9	127	-18 45.4	84	177 24.7	- 3 15.8	344 14.3	- 1 46.1
12	263 24.4	129	-18 28.6	86	207 30.1	- 3 16.0	14 18.7	- 1 46.3
14	292 28.1	130	-18 11.4	87	237 35.5	- 3 16.2	44 23.1	- 1 46.5
16	321 32.2	132	-17 53.9	89	267 40.9	- 3 16.4	74 27.4	- 1 46.8
18	350 36.5	133	-17 36.2	90	297 46.4	- 3 16.6	104 31.8	- 1 47.0
20	19 41.1	135	-17 18.1	92	327 51.8	- 3 16.8	134 36.2	- 1 47.2
22	48 46.0	136	-16 59.8	93	357 57.2	- 3 17.0	164 40.5	- 1 47.5
Δ					27	-1	22	-1

φ	SUNCE IZLAZ	SUNCE ZALAZ	TRAJANJE SUMRAKA GRAĐ.	TRAJANJE SUMRAKA ASTR.	MJESEC IZLAZ	MJESEC Δ/24	MJESEC ZALAZ	MJESEC Δ/24
N	h min	h min	h min	h min	h min	min	h min	min
60	6 39	16 52	0 42	2 19	14 50	.4	22 38	3.4
55	6 29	17 2	0 37	2 0	14 23	.7	23 3	3.0
50	6 22	17 9	0 33	1 47	14 3	1.0	23 22	2.8
45	6 15	17 16	0 30	1 37	13 47	1.1	23 37	2.6
40	6 10	17 21	0 27	1 30	13 34	1.2	23 49	2.5
35	6 6	17 25	0 25	1 24	13 23	1.4	23 60	2.4
30	6 2	17 30	0 24	1 20	13 13	1.4	.. ..	.0
20	5 55	17 37	0 22	1 13	12 56	1.6	.. ..	.0
10	5 49	17 43	0 21	1 10	12 42	1.7	.. ..	.0
0	5 43	17 49	0 21	1 9	12 28	1.9	0 3	1.9
10	5 36	17 55	0 21	1 11	12 14	2.0	0 18	1.8
20	5 30	18 2	0 22	1 15	11 59	2.1	0 35	1.7
30	5 22	18 10	0 24	1 23	11 42	2.3	0 53	1.5
35	5 18	18 14	0 26	1 28	11 32	2.4	1 4	1.5
40	5 13	18 20	0 28	1 36	11 20	2.5	1 16	1.4
45	5 7	18 26	0 30	1 46	11 7	2.6	1 31	1.2
50	4 60	18 33	0 34	2 1	10 50	2.8	1 48	1.1
55	4 51	18 42	0 39	2 23	10 29	3.0	2 11	.9
60	4 39	18 54	0 45	3 4	9 60	3.4	2 42	.5
S								

SUNCE UT	SUNCE $e = T_p - UT$	SUNCE Δ/24	SUNCE r	MJESEC Prolaz	MJESEC Δ/24	MJESEC $\pi_\leftmoon$	MJESEC r
h	min s	s	′	h min	min	′	′
00	14 2.7	.6	16.1	$T_{\overline{m}}$ 18 39	1.8	55.2	15.0
12	14 9.4	$T_{\overline{m}_\odot}$ 11 h 45.8 min		Starost 7.2 d	Faza ◐		

PLANETE

Pl.	$T_{\overline{m}}$	π	360−α	Vel.	Pl.	$T_{\overline{m}}$	π	360−α	Vel.
	h min	′	°			h min	′	°	
♀	12 54	.5	143	-4.3	♃	22 8	.0	4	-2.7
♂	13 38	.1	132	1.5	♄	11 3	.0	170	1.0

UT	SUNCE $S_\odot$	SUNCE $\delta_\odot$	PROLJ. TAČKA S_Υ	VENERA S_φ	VENERA δ_φ	MARS S_σ	MARS δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	183 34.0	- 8 45.9	24 24.0	167 12.8	-22 23.4	155 40.0	-18 29.1
2	213 34.2	- 8 47.8	54 28.9	197 19.3	-22 22.8	185 41.4	-18 30.1
4	243 34.5	- 8 49.6	84 33.9	227 25.7	-22 22.2	215 42.8	-18 31.1
6	273 34.8	- 8 51.4	114 38.8	257 32.2	-22 21.7	245 44.1	-18 32.0
8	303 35.1	- 8 53.3	144 43.7	287 38.7	-22 21.0	275 45.5	-18 33.0
10	333 35.3	- 8 55.1	174 48.6	317 45.3	-22 20.4	305 46.8	-18 33.9
12	3 35.6	- 8 56.9	204 53.6	347 51.8	-22 19.8	335 48.2	-18 34.9
14	33 35.9	- 8 58.8	234 58.5	17 58.4	-22 19.2	5 49.6	-18 35.9
16	63 36.1	- 9 .6	265 3.4	48 4.9	-22 18.5	35 50.9	-18 36.8
18	93 36.4	- 9 2.5	295 8.3	78 11.5	-22 17.9	65 52.3	-18 37.8
20	123 36.6	- 9 4.3	325 13.3	108 18.1	-22 17.2	95 53.6	-18 38.8
22	153 36.9	- 9 6.1	355 18.2	138 24.7	-22 16.6	125 55.0	-18 39.7
Δ	1	-9		33	3	7	-5

UT	MJESEC $S_\leftmoon$	MJESEC Δ	MJESEC $\delta_\leftmoon$	MJESEC Δ	JUPITER $S_\jupiter$	JUPITER $\delta_\jupiter$	SATURN $S_\saturn$	SATURN $\delta_\saturn$
h	° ′		° ′		° ′	° ′	° ′	° ′
0	77 51.2	137	-16 41.2	94	28 2.6	- 3 17.2	194 44.9	- 1 47.7
2	106 56.7	139	-16 22.4	95	58 8.0	- 3 17.4	224 49.3	- 1 47.9
4	136 2.4	140	-16 3.3	97	88 13.4	- 3 17.6	254 53.6	- 1 48.2
6	165 8.3	141	-15 44.0	98	118 18.8	- 3 17.8	284 58.0	- 1 48.4
8	194 14.5	142	-15 24.4	99	148 24.2	- 3 18.0	315 2.4	- 1 48.6
10	223 21.0	144	-15 4.6	100	178 29.6	- 3 18.2	345 6.7	- 1 48.9
12	252 27.7	145	-14 44.5	101	208 35.0	- 3 18.4	15 11.1	- 1 49.1
14	281 34.6	146	-14 24.3	102	238 40.4	- 3 18.6	45 15.5	- 1 49.3
16	310 41.8	147	-14 3.8	103	268 45.8	- 3 18.8	75 19.8	- 1 49.6
18	339 49.2	148	-13 43.1	104	298 51.3	- 3 18.9	105 24.2	- 1 49.8
20	8 56.8	149	-13 22.2	105	328 56.7	- 3 19.1	135 28.6	- 1 50.0
22	38 4.6	150	-13 1.1	106	359 2.1	- 3 19.3	165 32.9	- 1 50.3
Δ					27	-1	22	-1

φ	SUNCE IZLAZ	SUNCE ZALAZ	TRAJANJE SUMRAKA GRAĐ.	TRAJANJE SUMRAKA ASTR.	MJESEC IZLAZ	MJESEC Δ/24	MJESEC ZALAZ	MJESEC Δ/24
N	h min	h min	h min	h min	h min	min	h min	min
60	6 41	16 49	0 42	2 19	15 0	.3	23 58	3.3
55	6 31	16 59	0 37	2 1	14 41	.6	. . .	.0
50	6 23	17 7	0 33	1 47	14 26	.8	. . .	.0
45	6 17	17 14	0 30	1 38	14 14	1.0	. . .	.0
40	6 11	17 19	0 27	1 30	14 4	1.1	. . .	.0
35	6 7	17 24	0 25	1 24	13 56	1.2	. . .	.0
30	6 2	17 28	0 24	1 20	13 48	1.3	0 9	2.3
20	5 55	17 36	0 22	1 14	13 35	1.5	0 24	2.1
10	5 49	17 43	0 21	1 10	13 23	1.6	0 37	2.0
0	5 42	17 49	0 21	1 10	13 13	1.8	0 50	1.8
10	5 36	17 55	0 21	1 11	13 2	1.9	1 2	1.7
20	5 29	18 2	0 22	1 15	12 50	2.1	1 15	1.5
30	5 21	18 11	0 24	1 23	12 37	2.2	1 30	1.4
35	5 17	18 15	0 26	1 29	12 29	2.3	1 39	1.3
40	5 11	18 21	0 28	1 36	12 20	2.5	1 49	1.2
45	5 5	18 27	0 31	1 47	12 10	2.6	2 0	1.0
50	4 58	18 35	0 34	2 1	11 58	2.8	2 14	.9
55	4 48	18 44	0 39	2 24	11 42	3.0	2 31	.7
60	4 36	18 57	0 46	3 7	11 21	3.3	2 54	.4
S								

SUNCE UT	SUNCE $e = T_p - UT$	SUNCE Δ/24	SUNCE r	MJESEC Prolaz	MJESEC Δ/24	MJESEC $\pi_\leftmoon$	MJESEC r
h	min s	s	′	h min	min	′	′
00	14 16.1	.5	16.1	$T_{\overline{m}}$ 19 23	1.8	54.7	14.9
12	14 22.5	$T_{\overline{m}_\odot}$ 11 h 45.6 min		Starost 8.2 d	Faza ◐		

PLANETE Pl.	$T_{\overline{m}}$	π	360−α	Vel.	Pl.	$T_{\overline{m}}$	π	360−α	Vel.
	h min	′	°			h min	′	°	
♀	12 48	.5	143	-4.3	♃	22 4	.0	4	-2.7
♂	13 37	.1	131	1.5	♄	10 59	.0	170	1.0

UT	SUNCE $S_\odot$	SUNCE $\delta_\odot$	PROLJ. TAČKA S_Υ	VENERA S_φ	VENERA δ_φ	MARS S_σ	MARS δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	183 37.2	- 9 8.0	25 23.1	168 31.3	-22 15.9	155 56.3	-18 40.7
2	213 37.4	- 9 9.8	55 28.1	198 38.0	-22 15.2	185 57.7	-18 41.6
4	243 37.7	- 9 11.6	85 33.0	228 44.6	-22 14.5	215 59.0	-18 42.6
6	273 37.9	- 9 13.4	115 37.9	258 51.3	-22 13.8	246 .4	-18 43.5
8	303 38.2	- 9 15.3	145 42.8	288 57.9	-22 13.0	276 1.7	-18 44.5
10	333 38.5	- 9 17.1	175 47.8	319 4.6	-22 12.3	306 3.1	-18 45.5
12	3 38.7	- 9 18.9	205 52.7	349 11.3	-22 11.6	336 4.4	-18 46.4
14	33 39.0	- 9 20.8	235 57.6	19 18.1	-22 10.8	6 5.8	-18 47.4
16	63 39.2	- 9 22.6	266 2.6	49 24.8	-22 10.1	36 7.1	-18 48.3
18	93 39.5	- 9 24.4	296 7.5	79 31.5	-22 9.3	66 8.5	-18 49.3
20	123 39.7	- 9 26.2	326 12.4	109 38.3	-22 8.5	96 9.8	-18 50.2
22	153 40.0	- 9 28.0	356 17.3	139 45.1	-22 7.7	126 11.1	-18 51.1
Δ	1	-9		34	4	7	-5

UT	MJESEC $S_\leftmoon$	MJESEC Δ	MJESEC $\delta_\leftmoon$	MJESEC Δ	JUPITER $S_\jupiter$	JUPITER $\delta_\jupiter$	SATURN $S_\saturn$	SATURN $\delta_\saturn$
h	° ′		° ′		° ′	° ′	° ′	° ′
0	67 12.6	151	-12 39.8	107	29 7.5	- 3 19.5	195 37.3	- 1 50.5
2	96 20.9	152	-12 18.3	108	59 12.9	- 3 19.7	225 41.7	- 1 50.7
4	125 29.3	153	-11 56.7	109	89 18.3	- 3 19.9	255 46.0	- 1 51.0
6	154 37.8	154	-11 34.9	110	119 23.7	- 3 20.1	285 50.4	- 1 51.2
8	183 46.6	155	-11 12.9	111	149 29.1	- 3 20.3	315 54.8	- 1 51.4
10	212 55.6	156	-10 50.7	112	179 34.4	- 3 20.5	345 59.2	- 1 51.6
12	242 4.7	156	-10 28.4	112	209 39.8	- 3 20.7	16 3.5	- 1 51.9
14	271 13.9	157	-10 5.9	113	239 45.2	- 3 20.8	46 7.9	- 1 52.1
16	300 23.3	158	- 9 43.3	114	269 50.6	- 3 21.0	76 12.3	- 1 52.3
18	329 32.9	158	- 9 20.6	114	299 56.0	- 3 21.2	106 16.6	- 1 52.6
20	358 42.6	159	- 8 57.7	115	330 1.4	- 3 21.4	136 21.0	- 1 52.8
22	27 52.4	160	- 8 34.7	116	0 6.8	- 3 21.6	166 25.4	- 1 53.0
Δ					27	-1	22	-1

φ	SUNCE IZLAZ	SUNCE ZALAZ	TRAJANJE SUMRAKA GRAĐ.	TRAJANJE SUMRAKA ASTR.	MJESEC IZLAZ	MJESEC Δ/24	MJESEC ZALAZ	MJESEC Δ/24
N	h min	h min	h min	h min	h min	min	h min	min
60	6 44	16 46	0 42	2 19	15 8	.2	. . .	.0
55	6 33	16 57	0 37	2 1	14 55	.5	0 17	3.0
50	6 25	17 5	0 33	1 47	14 45	.7	0 30	2.8
45	6 18	17 12	0 30	1 38	14 37	.9	0 40	2.6
40	6 12	17 18	0 27	1 30	14 30	1.0	0 49	2.4
35	6 7	17 23	0 26	1 24	14 25	1.1	0 57	2.3
30	6 3	17 27	0 24	1 20	14 20	1.2	1 3	2.2
20	5 55	17 35	0 22	1 14	14 11	1.4	1 14	2.0
10	5 49	17 42	0 21	1 10	14 3	1.6	1 24	1.9
0	5 42	17 49	0 21	1 10	13 55	1.7	1 33	1.7
10	5 35	17 55	0 21	1 11	13 48	1.9	1 43	1.6
20	5 28	18 3	0 22	1 15	13 40	2.0	1 52	1.4
30	5 20	18 11	0 25	1 23	13 31	2.2	2 3	1.3
35	5 15	18 16	0 26	1 29	13 26	2.3	2 10	1.2
40	5 10	18 22	0 28	1 37	13 20	2.4	2 17	1.1
45	5 3	18 28	0 31	1 47	13 13	2.6	2 25	.9
50	4 56	18 36	0 34	2 2	13 4	2.7	2 35	.8
55	4 46	18 46	0 39	2 26	12 54	3.0	2 47	.6
60	4 33	18 59	0 46	3 11	12 40	3.2	3 3	.3
S								

SUNCE UT	SUNCE $e = T_p - UT$	SUNCE Δ/24	SUNCE r	MJESEC Prolaz	MJESEC Δ/24	MJESEC $\pi_\leftmoon$	MJESEC r
h	min s	s	′	h min	min	′	′
00	14 28.9	.5	16.1	$T_{\overline{m}}$ 20 5	1.7	54.3	14.8
12	14 35.0	$T_{\overline{m}_\odot}$ 11 h 45.4 min		Starost 9.2 d	Faza ◐		

PLANETE Pl.	$T_{\overline{m}}$	π	360−α	Vel.	Pl.	$T_{\overline{m}}$	π	360−α	Vel.
	h min	′	°			h min	′	°	
♀	12 43	.5	143	-4.2	♃	21 60	.0	4	-2.7
♂	13 36	.1	131	1.5	♄	10 56	.0	170	1.0

UT	SUNCE $S_\odot$	SUNCE $\delta_\odot$	PROLJ. TAČKA S_Υ	VENERA S_φ	VENERA δ_φ	MARS S_σ	MARS δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	183 40.2	- 9 29.9	26 22.3	169 51.8	-22 6.9	156 12.5	-18 52.1
2	213 40.5	- 9 31.7	56 27.2	199 58.6	-22 6.1	186 13.8	-18 53.0
4	243 40.7	- 9 33.5	86 32.1	230 5.5	-22 5.3	216 15.2	-18 54.0
6	273 41.0	- 9 35.3	116 37.1	260 12.3	-22 4.4	246 16.5	-18 54.9
8	303 41.2	- 9 37.1	146 42.0	290 19.1	-22 3.6	276 17.8	-18 55.9
10	333 41.5	- 9 39.0	176 46.9	320 26.0	-22 2.8	306 19.2	-18 56.8
12	3 41.7	- 9 40.8	206 51.8	350 32.8	-22 1.9	336 20.5	-18 57.7
14	33 41.9	- 9 42.6	236 56.8	20 39.7	-22 1.0	6 21.8	-18 58.7
16	63 42.2	- 9 44.4	267 1.7	50 46.6	-22 .1	36 23.2	-18 59.6
18	93 42.4	- 9 46.2	297 6.6	80 53.5	-21 59.3	66 24.5	-19 .6
20	123 42.7	- 9 48.0	327 11.6	111 .4	-21 58.3	96 25.8	-19 1.5
22	153 42.9	- 9 49.8	357 16.5	141 7.3	-21 57.4	126 27.1	-19 2.4
Δ	1	-9		34	4	7	-5

UT	MJESEC $S_\leftmoon$	MJESEC Δ	MJESEC $\delta_\leftmoon$	MJESEC Δ	JUPITER S_4	JUPITER δ_4	SATURN S_η	SATURN δ_η
h	° ′		° ′		° ′	° ′	° ′	° ′
0	57 2.3	160	- 8 11.6	116	30 12.2	- 3 21.8	196 29.7	- 1 53.3
2	86 12.4	161	- 7 48.3	117	60 17.6	- 3 22.0	226 34.1	- 1 53.5
4	115 22.6	161	- 7 24.9	117	90 23.0	- 3 22.1	256 38.5	- 1 53.7
6	144 32.8	162	- 7 1.4	118	120 28.4	- 3 22.3	286 42.9	- 1 54.0
8	173 43.2	162	- 6 37.9	118	150 33.7	- 3 22.5	316 47.2	- 1 54.2
10	202 53.6	163	- 6 14.2	119	180 39.1	- 3 22.7	346 51.6	- 1 54.4
12	232 4.2	163	- 5 50.4	119	210 44.5	- 3 22.9	16 56.0	- 1 54.6
14	261 14.8	163	- 5 26.5	120	240 49.9	- 3 23.1	47 .3	- 1 54.9
16	290 25.4	164	- 5 2.6	120	270 55.3	- 3 23.2	77 4.7	- 1 55.1
18	319 36.2	164	- 4 38.6	120	301 .7	- 3 23.4	107 9.1	- 1 55.3
20	348 47.0	164	- 4 14.5	121	331 6.0	- 3 23.6	137 13.5	- 1 55.6
22	17 57.8	164	- 3 50.3	121	1 11.4	- 3 23.8	167 17.8	- 1 55.8
Δ					27	-1	22	-1

φ	SUNCE IZLAZ	SUNCE ZALAZ	TRAJANJE SUMRAKA GRAĐ.	TRAJANJE SUMRAKA ASTR.	MJESEC IZLAZ	MJESEC Δ/24	MJESEC ZALAZ	MJESEC Δ/24
N	h min	h min	h min	h min	h min	min	h min	min
60	6 46	16 43	0 42	2 19	15 14	.2	1 18	3.2
55	6 35	16 54	0 37	2 1	15 7	.5	1 28	2.9
50	6 26	17 3	0 33	1 48	15 2	.7	1 36	2.7
45	6 19	17 10	0 30	1 38	14 58	.8	1 43	2.6
40	6 13	17 16	0 27	1 30	14 55	1.0	1 48	2.4
35	6 8	17 22	0 26	1 24	14 52	1.1	1 52	2.3
30	6 4	17 26	0 24	1 20	14 49	1.2	1 57	2.2
20	5 56	17 34	0 22	1 14	14 44	1.4	2 3	2.0
10	5 49	17 42	0 21	1 10	14 40	1.5	2 10	1.8
0	5 42	17 49	0 21	1 10	14 36	1.7	2 15	1.7
10	5 35	17 56	0 21	1 11	14 32	1.8	2 21	1.5
20	5 28	18 3	0 22	1 15	14 28	2.0	2 27	1.4
30	5 19	18 12	0 25	1 23	14 24	2.2	2 34	1.2
35	5 14	18 17	0 26	1 29	14 21	2.3	2 38	1.1
40	5 8	18 23	0 28	1 37	14 18	2.4	2 42	1.0
45	5 2	18 30	0 31	1 48	14 14	2.6	2 47	.9
50	4 54	18 38	0 34	2 3	14 10	2.7	2 53	.7
55	4 43	18 48	0 39	2 27	14 5	2.9	3 0	.5
60	4 30	19 2	0 46	3 16	13 58	3.2	3 10	.2
S								

SUNCE UT	SUNCE $e = T_p - UT$	SUNCE Δ/24	SUNCE r	MJESEC Prolaz	MJESEC Δ/24	MJESEC $\pi_\leftmoon$	MJESEC r
h	min s	s	′	h min	min	′	′
00	14 41.1	.5	16.1	$T_{\overline{m}}$ 20 46	1.7	54.1	14.7
12	14 46.9	$T_{\overline{m}_\odot}$ 11 h 45.2 min		Starost 10.2 d	Faza ◐		

PLANETE Pl.	$T_{\overline{m}}$	π	360−α	Vel.	Pl.	$T_{\overline{m}}$	π	360−α	Vel.
	h min	′	°			h min	′	°	
♀	12 38	.5	143	-4.2	♃	21 55	.0	4	-2.7
♂	13 35	.1	130	1.5	♄	10 52	.0	170	1.0

UT	SUNCE $S_\odot$	SUNCE $\delta_\odot$	PROLJ. TAČKA S_Υ	VENERA S_φ	VENERA δ_φ	MARS S_σ	MARS δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	183 43.1	- 9 51.6	27 21.4	171 14.3	-21 56.5	156 28.5	-19 3.4
2	213 43.4	- 9 53.5	57 26.3	201 21.2	-21 55.6	186 29.8	-19 4.3
4	243 43.6	- 9 55.3	87 31.3	231 28.2	-21 54.6	216 31.1	-19 5.2
6	273 43.8	- 9 57.1	117 36.2	261 35.1	-21 53.7	246 32.4	-19 6.2
8	303 44.1	- 9 58.9	147 41.1	291 42.1	-21 52.7	276 33.8	-19 7.1
10	333 44.3	-10 .7	177 46.1	321 49.1	-21 51.8	306 35.1	-19 8.0
12	3 44.5	-10 2.5	207 51.0	351 56.1	-21 50.8	336 36.4	-19 8.9
14	33 44.8	-10 4.3	237 55.9	22 3.2	-21 49.8	6 37.7	-19 9.9
16	63 45.0	-10 6.1	268 .8	52 10.2	-21 48.8	36 39.0	-19 10.8
18	93 45.2	-10 7.9	298 5.8	82 17.2	-21 47.8	66 40.3	-19 11.7
20	123 45.4	-10 9.7	328 10.7	112 24.3	-21 46.8	96 41.7	-19 12.6
22	153 45.7	-10 11.5	358 15.6	142 31.4	-21 45.7	126 43.0	-19 13.6
Δ	1	-9		35	5	7	-5

UT	MJESEC $S_\leftmoon$	MJESEC Δ	MJESEC $\delta_\leftmoon$	MJESEC Δ	JUPITER S_4	JUPITER δ_4	SATURN S_η	SATURN δ_η
h	° ′		° ′		° ′	° ′	° ′	° ′
0	47 8.6	164	- 3 26.1	121	31 16.8	- 3 24.0	197 22.2	- 1 56.0
2	76 19.5	165	- 3 1.8	122	61 22.2	- 3 24.1	227 26.6	- 1 56.3
4	105 30.4	165	- 2 37.5	122	91 27.6	- 3 24.3	257 30.9	- 1 56.5
6	134 41.4	165	- 2 13.1	122	121 32.9	- 3 24.5	287 35.3	- 1 56.7
8	163 52.3	165	- 1 48.7	122	151 38.3	- 3 24.7	317 39.7	- 1 56.9
10	193 3.3	165	- 1 24.3	122	181 43.7	- 3 24.9	347 44.1	- 1 57.2
12	222 14.2	165	- 0 59.8	123	211 49.1	- 3 25.0	17 48.4	- 1 57.4
14	251 25.1	165	- 0 35.3	123	241 54.4	- 3 25.2	47 52.8	- 1 57.6
16	280 36.0	164	- 0 10.7	123	271 59.8	- 3 25.4	77 57.2	- 1 57.9
18	309 46.9	164	0 13.8	123	302 5.2	- 3 25.6	108 1.5	- 1 58.1
20	338 57.7	164	0 38.3	123	332 10.5	- 3 25.7	138 5.9	- 1 58.3
22	8 8.5	164	1 2.9	123	2 15.9	- 3 25.9	168 10.3	- 1 58.5
Δ					27	-1	22	-1

φ	SUNCE IZLAZ	SUNCE ZALAZ	TRAJANJE SUMRAKA GRAĐ.	TRAJANJE SUMRAKA ASTR.	MJESEC IZLAZ	MJESEC Δ/24	MJESEC ZALAZ	MJESEC Δ/24
N	h min	h min	h min	h min	h min	min	h min	min
60	6 49	16 40	0 43	2 19	15 19	.2	2 35	3.2
55	6 37	16 52	0 37	2 1	15 19	.5	2 39	2.9
50	6 28	17 1	0 33	1 48	15 18	.7	2 42	2.7
45	6 21	17 9	0 30	1 38	15 18	.8	2 44	2.6
40	6 14	17 15	0 27	1 30	15 18	1.0	2 46	2.4
35	6 9	17 20	0 26	1 24	15 18	1.1	2 48	2.3
30	6 4	17 25	0 24	1 20	15 18	1.2	2 49	2.2
20	5 56	17 34	0 22	1 14	15 17	1.4	2 52	2.0
10	5 49	17 41	0 21	1 11	15 17	1.5	2 54	1.8
0	5 42	17 48	0 21	1 10	15 17	1.7	2 56	1.7
10	5 35	17 56	0 21	1 11	15 17	1.8	2 58	1.5
20	5 27	18 4	0 23	1 16	15 16	2.0	3 0	1.4
30	5 18	18 13	0 25	1 23	15 16	2.2	3 3	1.2
35	5 13	18 18	0 26	1 29	15 16	2.3	3 4	1.1
40	5 7	18 24	0 28	1 37	15 16	2.4	3 6	1.0
45	4 60	18 31	0 31	1 48	15 16	2.6	3 7	.8
50	4 51	18 40	0 34	2 4	15 15	2.7	3 10	.7
55	4 41	18 50	0 39	2 29	15 15	3.0	3 12	.5
60	4 27	19 4	0 47	3 20	15 15	3.2	3 16	.2
S								

SUNCE UT	SUNCE $e = T_p - UT$	SUNCE Δ/24	SUNCE r	MJESEC Prolaz	MJESEC Δ/24	MJESEC $\pi_\leftmoon$	MJESEC r
h	min s	s	′	h min	min	′	′
00	14 52.7	.5	16.1	$T_{\overline{m}}$ 21 27	1.7	54.1	14.7
12	14 58.2	$T_{\overline{m}_\odot}$ 11 h 45.0 min		Starost 11.2 d	Faza ◐		

PLANETE Pl.	$T_{\overline{m}}$	π	360−α	Vel.	Pl.	$T_{\overline{m}}$	π	360−α	Vel.
	h min	′	°			h min	′	°	
♀	12 32	.5	144	-4.2	♃	21 51	.0	4	-2.7
♂	13 34	.1	129	1.5	♄	10 49	.0	170	1.0

UT	SUNCE $S_\odot$	SUNCE $\delta_\odot$	PROLJ. TAČKA S_Υ	VENERA S_φ	VENERA δ_φ	MARS S_σ	MARS δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	183 45.9	-10 13.3	28 20.5	172 38.4	-21 44.7	156 44.3	-19 14.5
2	213 46.1	-10 15.1	58 25.5	202 45.5	-21 43.6	186 45.6	-19 15.4
4	243 46.3	-10 16.9	88 30.4	232 52.6	-21 42.6	216 46.9	-19 16.3
6	273 46.6	-10 18.7	118 35.3	262 59.7	-21 41.5	246 48.2	-19 17.2
8	303 46.8	-10 20.5	148 40.3	293 6.9	-21 40.4	276 49.5	-19 18.2
10	333 47.0	-10 22.2	178 45.2	323 14.0	-21 39.3	306 50.8	-19 19.1
12	3 47.2	-10 24.0	208 50.1	353 21.1	-21 38.2	336 52.1	-19 20.0
14	33 47.4	-10 25.8	238 55.0	23 28.3	-21 37.1	6 53.4	-19 20.9
16	63 47.6	-10 27.6	269 .0	53 35.5	-21 36.0	36 54.7	-19 21.8
18	93 47.9	-10 29.4	299 4.9	83 42.6	-21 34.9	66 56.0	-19 22.7
20	123 48.1	-10 31.2	329 9.8	113 49.8	-21 33.8	96 57.3	-19 23.6
22	153 48.3	-10 33.0	359 14.8	143 57.0	-21 32.6	126 58.6	-19 24.5
Δ	1	-9		36	6	7	-5

UT	MJESEC $S_\leftmoon$	MJESEC Δ	MJESEC $\delta_\leftmoon$	MJESEC Δ	JUPITER S_4	JUPITER δ_4	SATURN S_η	SATURN δ_η
h	° ′		° ′		° ′	° ′	° ′	° ′
0	37 19.3	164	1 27.4	123	32 21.3	- 3 26.1	198 14.7	- 1 58.8
2	66 30.0	163	1 52.0	123	62 26.6	- 3 26.3	228 19.0	- 1 59.0
4	95 40.6	163	2 16.5	123	92 32.0	- 3 26.4	258 23.4	- 1 59.2
6	124 51.2	162	2 41.0	122	122 37.4	- 3 26.6	288 27.8	- 1 59.5
8	154 1.7	162	3 5.5	122	152 42.7	- 3 26.8	318 32.2	- 1 59.7
10	183 12.1	162	3 30.0	122	182 48.1	- 3 26.9	348 36.5	- 1 59.9
12	212 22.4	161	3 54.4	122	212 53.5	- 3 27.1	18 40.9	- 2 .1
14	241 32.7	161	4 18.8	122	242 58.8	- 3 27.3	48 45.3	- 2 .4
16	270 42.8	160	4 43.1	121	273 4.2	- 3 27.5	78 49.7	- 2 .6
18	299 52.8	159	5 7.4	121	303 9.5	- 3 27.6	108 54.0	- 2 .8
20	329 2.7	159	5 31.6	121	333 14.9	- 3 27.8	138 58.4	- 2 1.1
22	358 12.5	158	5 55.8	120	3 20.3	- 3 28.0	169 2.8	- 2 1.3
Δ					27	-1	22	-1

φ	SUNCE IZLAZ	SUNCE ZALAZ	TRAJANJE SUMRAKA GRAĐ.	TRAJANJE SUMRAKA ASTR.	MJESEC IZLAZ	MJESEC Δ/24	MJESEC ZALAZ	MJESEC Δ/24
N	h min	h min	h min	h min	h min	min	h min	min
60	6 51	16 37	0 43	2 19	15 25	.3	3 52	3.3
55	6 39	16 50	0 37	2 1	15 30	.5	3 49	3.0
50	6 30	16 59	0 33	1 48	15 35	.7	3 47	2.8
45	6 22	17 7	0 30	1 38	15 38	.9	3 45	2.6
40	6 16	17 14	0 27	1 30	15 41	1.0	3 44	2.4
35	6 10	17 19	0 26	1 24	15 44	1.1	3 43	2.3
30	6 5	17 24	0 24	1 20	15 46	1.3	3 42	2.2
20	5 56	17 33	0 22	1 14	15 50	1.4	3 40	2.0
10	5 49	17 41	0 21	1 11	15 54	1.6	3 38	1.9
0	5 42	17 48	0 21	1 10	15 57	1.7	3 36	1.7
10	5 34	17 56	0 21	1 11	16 1	1.9	3 35	1.6
20	5 26	18 4	0 23	1 16	16 5	2.1	3 33	1.4
30	5 17	18 13	0 25	1 24	16 9	2.2	3 31	1.2
35	5 11	18 19	0 26	1 30	16 11	2.3	3 30	1.1
40	5 5	18 25	0 28	1 38	16 14	2.5	3 29	1.0
45	4 58	18 32	0 31	1 49	16 17	2.6	3 27	.9
50	4 49	18 41	0 34	2 5	16 21	2.8	3 26	.7
55	4 39	18 52	0 40	2 30	16 26	3.0	3 24	.5
60	4 24	19 7	0 47	3 26	16 32	3.3	3 21	.2
S								

SUNCE UT	SUNCE $e = T_p - UT$	SUNCE Δ/24	SUNCE r	MJESEC Prolaz	MJESEC Δ/24	MJESEC $\pi_\leftmoon$	MJESEC r
h	min s	s	′	h min	min	′	′
00	15 3.8	.4	16.1	$T_{\overline{m}}$ 22 7	1.8	54.2	14.8
12	15 9.0	$T_{\overline{m}_\odot}$ 11 h 44.9 min		Starost 12.2 d	Faza ○		

PLANETE

Pl.	$T_{\overline{m}}$	π	360−α	Vel.	Pl.	$T_{\overline{m}}$	π	360−α	Vel.
	h min	′	°			h min	′	°	
♀	12 26	.5	144	-4.2	♃	21 47	.0	4	-2.7
♂	13 32	.1	128	1.5	♄	10 45	.0	170	1.0

UT	SUNCE $S_\odot$	SUNCE $\delta_\odot$	PROLJ. TAČKA S_Υ	VENERA S_φ	VENERA δ_φ	MARS S_σ	MARS δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	183 48.5	-10 34.8	29 19.7	174 4.2	-21 31.5	156 59.9	-19 25.4
2	213 48.7	-10 36.5	59 24.6	204 11.4	-21 30.3	187 1.2	-19 26.4
4	243 48.9	-10 38.3	89 29.5	234 18.7	-21 29.1	217 2.5	-19 27.3
6	273 49.1	-10 40.1	119 34.5	264 25.9	-21 27.9	247 3.8	-19 28.2
8	303 49.3	-10 41.9	149 39.4	294 33.1	-21 26.7	277 5.1	-19 29.1
10	333 49.5	-10 43.7	179 44.3	324 40.4	-21 25.5	307 6.4	-19 30.0
12	3 49.7	-10 45.4	209 49.3	354 47.7	-21 24.3	337 7.7	-19 30.9
14	33 49.9	-10 47.2	239 54.2	24 54.9	-21 23.1	7 9.0	-19 31.8
16	63 50.1	-10 49.0	269 59.1	55 2.2	-21 21.8	37 10.3	-19 32.7
18	93 50.3	-10 50.8	300 4.0	85 9.5	-21 20.6	67 11.6	-19 33.6
20	123 50.5	-10 52.5	330 9.0	115 16.8	-21 19.4	97 12.9	-19 34.5
22	153 50.7	-10 54.3	0 13.9	145 24.1	-21 18.1	127 14.1	-19 35.4
Δ	1	-9		36	6	6	-5

UT	MJESEC $S_\leftmoon$	MJESEC Δ	MJESEC $\delta_\leftmoon$	MJESEC Δ	JUPITER S_4	JUPITER δ_4	SATURN S_η	SATURN δ_η
h	° ′		° ′		° ′	° ′	° ′	° ′
0	27 22.1	158	6 19.8	120	33 25.6	- 3 28.1	199 7.2	- 2 1.5
2	56 31.6	157	6 43.9	120	63 31.0	- 3 28.3	229 11.5	- 2 1.7
4	85 41.0	156	7 7.8	119	93 36.3	- 3 28.5	259 15.9	- 2 2.0
6	114 50.2	155	7 31.6	119	123 41.7	- 3 28.6	289 20.3	- 2 2.2
8	143 59.3	154	7 55.4	118	153 47.0	- 3 28.8	319 24.7	- 2 2.4
10	173 8.2	154	8 19.0	118	183 52.4	- 3 29.0	349 29.0	- 2 2.7
12	202 16.9	153	8 42.5	117	213 57.7	- 3 29.1	19 33.4	- 2 2.9
14	231 25.4	152	9 5.9	116	244 3.1	- 3 29.3	49 37.8	- 2 3.1
16	260 33.8	151	9 29.2	116	274 8.4	- 3 29.5	79 42.2	- 2 3.3
18	289 42.0	150	9 52.4	115	304 13.8	- 3 29.6	109 46.5	- 2 3.6
20	318 50.0	149	10 15.4	114	334 19.1	- 3 29.8	139 50.9	- 2 3.8
22	347 57.8	148	10 38.3	114	4 24.5	- 3 30.0	169 55.3	- 2 4.0
Δ					27	-1	22	-1

φ	SUNCE IZLAZ	SUNCE ZALAZ	TRAJANJE SUMRAKA GRAĐ.	TRAJANJE SUMRAKA ASTR.	MJESEC IZLAZ	MJESEC Δ/24	MJESEC ZALAZ	MJESEC Δ/24
N	h min	h min	h min	h min	h min	min	h min	min
60	6 54	16 34	0 43	2 19	15 31	.3	5 10	3.3
55	6 41	16 47	0 37	2 1	15 43	.6	5 1	3.0
50	6 31	16 57	0 33	1 48	15 52	.8	4 53	2.8
45	6 23	17 5	0 30	1 38	15 60	1.0	4 48	2.6
40	6 17	17 12	0 27	1 30	16 6	1.1	4 43	2.5
35	6 11	17 18	0 26	1 24	16 12	1.2	4 38	2.4
30	6 6	17 23	0 24	1 20	16 16	1.3	4 35	2.3
20	5 57	17 32	0 22	1 14	16 25	1.5	4 28	2.1
10	5 49	17 40	0 21	1 11	16 32	1.7	4 23	1.9
0	5 41	17 48	0 21	1 10	16 39	1.8	4 17	1.8
10	5 34	17 56	0 21	1 12	16 46	2.0	4 12	1.6
20	5 25	18 4	0 23	1 16	16 54	2.1	4 7	1.5
30	5 16	18 14	0 25	1 24	17 3	2.3	4 0	1.3
35	5 10	18 20	0 26	1 30	17 8	2.4	3 57	1.2
40	5 4	18 26	0 28	1 38	17 13	2.5	3 53	1.1
45	4 56	18 34	0 31	1 49	17 20	2.7	3 48	.9
50	4 47	18 43	0 35	2 6	17 28	2.9	3 42	.8
55	4 36	18 54	0 40	2 32	17 38	3.1	3 35	.6
60	4 22	19 10	0 47	3 33	17 52	3.4	3 27	.3
S								

SUNCE UT	SUNCE $e = T_p - UT$	SUNCE Δ/24	SUNCE r	MJESEC Prolaz	MJESEC Δ/24	MJESEC $\pi_\leftmoon$	MJESEC r
h	min s	s	′	h min	min	′	′
00	15 14.2	.4	16.1	$T_{\overline{m}}$ 22 50	1.8	54.4	14.8
12	15 19.0	$T_{\overline{m}_\odot}$ 11 h 44.7 min		Starost 13.2 d	Faza ○		

PLANETE

Pl.	$T_{\overline{m}}$	π	360−α	Vel.	Pl.	$T_{\overline{m}}$	π	360−α	Vel.
	h min	′	°			h min	′	°	
♀	12 21	.5	145	-4.1	♃	21 42	.0	4	-2.7
♂	13 31	.1	128	1.5	♄	10 42	.0	170	1.0

UT	SUNCE $S_\odot$	SUNCE $\delta_\odot$	PROLJ. TAČKA S_Υ	VENERA S_φ	VENERA δ_φ	MARS S_σ	MARS δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	183 50.9	-10 56.1	30 18.8	175 31.4	-21 16.8	157 15.4	-19 36.3
2	213 51.1	-10 57.9	60 23.8	205 38.8	-21 15.5	187 16.7	-19 37.1
4	243 51.3	-10 59.6	90 28.7	235 46.1	-21 14.2	217 18.0	-19 38.0
6	273 51.5	-11 1.4	120 33.6	265 53.5	-21 12.9	247 19.3	-19 38.9
8	303 51.7	-11 3.2	150 38.5	296 .8	-21 11.6	277 20.6	-19 39.8
10	333 51.9	-11 4.9	180 43.5	326 8.2	-21 10.3	307 21.8	-19 40.7
12	3 52.1	-11 6.7	210 48.4	356 15.5	-21 9.0	337 23.1	-19 41.6
14	33 52.3	-11 8.5	240 53.3	26 22.9	-21 7.7	7 24.4	-19 42.5
16	63 52.5	-11 10.2	270 58.3	56 30.3	-21 6.3	37 25.7	-19 43.4
18	93 52.6	-11 12.0	301 3.2	86 37.7	-21 5.0	67 26.9	-19 44.3
20	123 52.8	-11 13.7	331 8.1	116 45.1	-21 3.6	97 28.2	-19 45.1
22	153 53.0	-11 15.5	1 13.0	146 52.5	-21 2.2	127 29.5	-19 46.0
Δ	1	-9		37	7	6	-4

UT	MJESEC $S_\leftmoon$	MJESEC Δ	MJESEC $\delta_\leftmoon$	MJESEC Δ	JUPITER S_4	JUPITER δ_4	SATURN S_η	SATURN δ_η
h	° ′		° ′		° ′	° ′	° ′	° ′
0	17 5.4	147	11 1.0	113	34 29.8	- 3 30.1	199 59.7	- 2 4.2
2	46 12.8	146	11 23.6	112	64 35.1	- 3 30.3	230 4.0	- 2 4.5
4	75 19.9	145	11 46.0	111	94 40.5	- 3 30.5	260 8.4	- 2 4.7
6	104 26.9	144	12 8.2	110	124 45.8	- 3 30.6	290 12.8	- 2 4.9
8	133 33.6	142	12 30.3	109	154 51.2	- 3 30.8	320 17.2	- 2 5.1
10	162 40.1	141	12 52.1	108	184 56.5	- 3 30.9	350 21.5	- 2 5.4
12	191 46.3	140	13 13.8	107	215 1.8	- 3 31.1	20 25.9	- 2 5.6
14	220 52.3	139	13 35.3	106	245 7.2	- 3 31.3	50 30.3	- 2 5.8
16	249 58.1	138	13 56.5	105	275 12.5	- 3 31.4	80 34.7	- 2 6.1
18	279 3.6	136	14 17.6	104	305 17.9	- 3 31.6	110 39.1	- 2 6.3
20	308 8.9	135	14 38.4	103	335 23.2	- 3 31.7	140 43.4	- 2 6.5
22	337 13.9	134	14 59.0	102	5 28.5	- 3 31.9	170 47.8	- 2 6.7
Δ					27	-1	22	-1

φ	SUNCE IZLAZ	SUNCE ZALAZ	TRAJANJE SUMRAKA GRAĐ.	TRAJANJE SUMRAKA ASTR.	MJESEC IZLAZ	MJESEC Δ/24	MJESEC ZALAZ	MJESEC Δ/24
N	h min	h min	h min	h min	h min	min	h min	min
60	6 56	16 32	0 43	2 19	15 39	.5	6 31	3.4
55	6 43	16 45	0 37	2 1	15 58	.8	6 14	3.1
50	6 33	16 55	0 33	1 48	16 12	1.0	6 1	2.9
45	6 25	17 4	0 30	1 38	16 24	1.2	5 51	2.7
40	6 18	17 11	0 28	1 30	16 33	1.3	5 43	2.6
35	6 12	17 17	0 26	1 25	16 41	1.4	5 35	2.4
30	6 6	17 22	0 24	1 20	16 49	1.5	5 29	2.3
20	5 57	17 32	0 22	1 14	17 1	1.7	5 18	2.2
10	5 49	17 40	0 21	1 11	17 13	1.8	5 9	2.0
0	5 41	17 48	0 21	1 10	17 23	1.9	5 0	1.9
10	5 33	17 56	0 21	1 12	17 34	2.1	4 51	1.7
20	5 25	18 5	0 23	1 16	17 45	2.2	4 42	1.6
30	5 15	18 15	0 25	1 24	17 58	2.4	4 31	1.4
35	5 9	18 21	0 26	1 30	18 6	2.5	4 25	1.3
40	5 2	18 27	0 28	1 38	18 14	2.6	4 18	1.2
45	4 55	18 35	0 31	1 50	18 24	2.7	4 10	1.1
50	4 46	18 45	0 35	2 6	18 37	2.9	4 1	.9
55	4 34	18 56	0 40	2 34	18 52	3.1	3 49	.7
60	4 19	19 12	0 48	3 41	19 13	3.5	3 33	.4
S								

SUNCE UT	SUNCE $e = T_p - UT$	SUNCE Δ/24	SUNCE r	MJESEC Prolaz	MJESEC Δ/24	MJESEC $\pi_\leftmoon$	MJESEC r
h	min s	s	′	h min	min	′	′
00	15 23.9	.4	16.1	$T_{\overline{m}}$ 23 34	2.0	54.7	14.9
12	15 28.5	$T_{\overline{m}_\odot}$ 11 h 44.5 min		Starost 14.2 d	Faza ○		

PLANETE

Pl.	$T_{\overline{m}}$	π	360−α	Vel.	Pl.	$T_{\overline{m}}$	π	360−α	Vel.
	h min	′	°			h min	′	°	
♀	12 15	.5	145	-4.1	♃	21 38	.0	4	-2.7
♂	13 30	.1	127	1.5	♄	10 38	.0	170	1.0

UT	SUNCE $S_\odot$	SUNCE $\delta_\odot$	PROLJ. TAČKA S_Υ	VENERA S_φ	VENERA δ_φ	MARS S_σ	MARS δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	183 53.2	-11 17.2	31 18.0	176 59.9	-21 .8	157 30.8	-19 46.9
2	213 53.4	-11 19.0	61 22.9	207 7.4	-20 59.4	187 32.0	-19 47.8
4	243 53.6	-11 20.8	91 27.8	237 14.8	-20 58.0	217 33.3	-19 48.7
6	273 53.7	-11 22.5	121 32.8	267 22.2	-20 56.6	247 34.6	-19 49.5
8	303 53.9	-11 24.3	151 37.7	297 29.7	-20 55.2	277 35.8	-19 50.4
10	333 54.1	-11 26.0	181 42.6	327 37.1	-20 53.8	307 37.1	-19 51.3
12	3 54.3	-11 27.8	211 47.5	357 44.6	-20 52.3	337 38.4	-19 52.2
14	33 54.4	-11 29.5	241 52.5	27 52.1	-20 50.9	7 39.6	-19 53.0
16	63 54.6	-11 31.3	271 57.4	57 59.5	-20 49.4	37 40.9	-19 53.9
18	93 54.8	-11 33.0	302 2.3	88 7.0	-20 48.0	67 42.2	-19 54.8
20	123 55.0	-11 34.8	332 7.2	118 14.5	-20 46.5	97 43.4	-19 55.7
22	153 55.1	-11 36.5	2 12.2	148 22.0	-20 45.0	127 44.7	-19 56.5
Δ	1	-9		37	7	6	-4

UT	MJESEC $S_\leftmoon$	MJESEC Δ	MJESEC $\delta_\leftmoon$	MJESEC Δ	JUPITER S_4	JUPITER δ_4	SATURN S_η	SATURN δ_η
h	° ′		° ′		° ′	° ′	° ′	° ′
0	6 18.6	132	15 19.4	101	35 33.8	- 3 32.1	200 52.2	- 2 7.0
2	35 23.1	131	15 39.5	99	65 39.2	- 3 32.2	230 56.6	- 2 7.2
4	64 27.3	130	15 59.3	98	95 44.5	- 3 32.4	261 .9	- 2 7.4
6	93 31.2	128	16 18.9	97	125 49.8	- 3 32.5	291 5.3	- 2 7.6
8	122 34.8	127	16 38.2	95	155 55.2	- 3 32.7	321 9.7	- 2 7.9
10	151 38.2	125	16 57.3	94	186 .5	- 3 32.8	351 14.1	- 2 8.1
12	180 41.3	124	17 16.0	92	216 5.8	- 3 33.0	21 18.5	- 2 8.3
14	209 44.1	123	17 34.5	91	246 11.1	- 3 33.1	51 22.8	- 2 8.5
16	238 46.6	121	17 52.6	89	276 16.5	- 3 33.3	81 27.2	- 2 8.8
18	267 48.9	120	18 10.5	88	306 21.8	- 3 33.4	111 31.6	- 2 9.0
20	296 50.8	118	18 28.0	86	336 27.1	- 3 33.6	141 36.0	- 2 9.2
22	325 52.4	117	18 45.2	84	6 32.4	- 3 33.8	171 40.3	- 2 9.4
Δ					27	-1	22	-1

φ	SUNCE IZLAZ	SUNCE ZALAZ	TRAJANJE SUMRAKA GRAĐ.	TRAJANJE SUMRAKA ASTR.	MJESEC IZLAZ	MJESEC Δ/24	MJESEC ZALAZ	MJESEC Δ/24
N	h min	h min	h min	h min	h min	min	h min	min
60	6 59	16 29	0 43	2 20	15 50	.7	7 53	3.5
55	6 45	16 43	0 37	2 1	16 16	1.0	7 28	3.1
50	6 35	16 53	0 33	1 48	16 36	1.2	7 10	2.9
45	6 26	17 2	0 30	1 38	16 51	1.4	6 56	2.7
40	6 19	17 9	0 28	1 31	17 4	1.5	6 44	2.6
35	6 13	17 16	0 26	1 25	17 15	1.6	6 34	2.5
30	6 7	17 21	0 24	1 20	17 25	1.7	6 25	2.4
20	5 58	17 31	0 22	1 14	17 41	1.8	6 10	2.3
10	5 49	17 40	0 21	1 11	17 56	1.9	5 57	2.1
0	5 41	17 48	0 21	1 10	18 9	2.1	5 45	2.0
10	5 33	17 56	0 21	1 12	18 23	2.2	5 33	1.9
20	5 24	18 5	0 23	1 16	18 38	2.3	5 20	1.7
30	5 14	18 15	0 25	1 24	18 55	2.4	5 5	1.6
35	5 8	18 21	0 26	1 30	19 5	2.5	4 57	1.5
40	5 1	18 28	0 28	1 39	19 16	2.6	4 47	1.4
45	4 53	18 36	0 31	1 50	19 30	2.7	4 36	1.3
50	4 44	18 46	0 35	2 7	19 46	2.9	4 22	1.1
55	4 32	18 59	0 40	2 36	20 8	3.1	4 5	.9
60	4 16	19 15	0 48	3 53	20 37	3.5	3 42	.5
S								

SUNCE UT	SUNCE $e = T_p - UT$	SUNCE Δ/24	SUNCE r	MJESEC Prolaz	MJESEC Δ/24	MJESEC $\pi_\leftmoon$	MJESEC r
h	min s	s	′	h min	min	′	′
00	15 33.0	.4	16.1	$T_{\overline{m}}$	1.0	55.0	15.0
12	15 37.2	$T_{\overline{m}_\odot}$ 11 h 44.4 min		Starost 15.2 d	Faza ○		

PLANETE

Pl.	$T_{\overline{m}}$	π	360−α	Vel.	Pl.	$T_{\overline{m}}$	π	360−α	Vel.
	h min	′	°			h min	′	°	
♀	12 9	.5	146	-4.1	♃	21 34	.0	4	-2.7
♂	13 29	.1	126	1.4	♄	10 35	.0	170	1.0

UT	SUNCE		PROLJ. TAČKA	VENERA		MARS	
	$S_\odot$	$\delta_\odot$	S_Υ	S_φ	δ_φ	S_σ	δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	183 55.3	-11 38.2	32 17.1	178 29.5	-20 43.5	157 45.9	-19 57.4
2	213 55.5	-11 40.0	62 22.0	208 37.0	-20 42.0	187 47.2	-19 58.3
4	243 55.6	-11 41.7	92 27.0	238 44.5	-20 40.5	217 48.4	-19 59.1
6	273 55.8	-11 43.5	122 31.9	268 52.0	-20 39.0	247 49.7	-19 60.0
8	303 56.0	-11 45.2	152 36.8	298 59.5	-20 37.5	277 50.9	-20 .8
10	333 56.1	-11 46.9	182 41.7	329 7.0	-20 36.0	307 52.2	-20 1.7
12	3 56.3	-11 48.7	212 46.7	359 14.6	-20 34.4	337 53.5	-20 2.6
14	33 56.4	-11 50.4	242 51.6	29 22.1	-20 32.9	7 54.7	-20 3.4
16	63 56.6	-11 52.1	272 56.5	59 29.7	-20 31.3	37 55.9	-20 4.3
18	93 56.8	-11 53.9	303 1.5	89 37.2	-20 29.8	67 57.2	-20 5.1
20	123 56.9	-11 55.6	333 6.4	119 44.7	-20 28.2	97 58.4	-20 6.0
22	153 57.1	-11 57.3	3 11.3	149 52.3	-20 26.6	127 59.7	-20 6.9
Δ	1	-9		38	8	6	-4

UT	MJESEC				JUPITER		SATURN	
	$S_\leftmoon$	Δ	$\delta_\leftmoon$	Δ	S_4	δ_4	S_η	δ_η
h	° ′		° ′		° ′	° ′	° ′	° ′
0	354 53.8	115	19 2.0	83	36 37.7	- 3 33.9	201 44.7	- 2 9.7
2	23 54.9	114	19 18.5	81	66 43.1	- 3 34.1	231 49.1	- 2 9.9
4	52 55.6	112	19 34.7	79	96 48.4	- 3 34.2	261 53.5	- 2 10.1
6	81 56.1	111	19 50.5	77	126 53.7	- 3 34.4	291 57.9	- 2 10.3
8	110 56.3	109	20 5.9	75	156 59.0	- 3 34.5	322 2.2	- 2 10.6
10	139 56.2	108	20 20.9	73	187 4.3	- 3 34.7	352 6.6	- 2 10.8
12	168 55.8	107	20 35.6	71	217 9.6	- 3 34.8	22 11.0	- 2 11.0
14	197 55.1	105	20 49.9	69	247 15.0	- 3 35.0	52 15.4	- 2 11.2
16	226 54.1	104	21 3.7	67	277 20.3	- 3 35.1	82 19.8	- 2 11.4
18	255 52.9	102	21 17.2	65	307 25.6	- 3 35.2	112 24.2	- 2 11.7
20	284 51.3	101	21 30.2	63	337 30.9	- 3 35.4	142 28.5	- 2 11.9
22	313 49.5	99	21 42.8	61	7 36.2	- 3 35.5	172 32.9	- 2 12.1
Δ					27	-1	22	-1

φ	SUNCE		TRAJANJE SUMRAKA		MJESEC			
	IZLAZ	ZALAZ	GRAĐ.	ASTR.	IZLAZ	Δ/24	ZALAZ	Δ/24
N	h min	h min	h min	h min	h min	min	h min	min
60	7 1	16 26	0 43	2 20	16 6	1.1	9 17	3.4
55	6 47	16 41	0 37	2 1	16 41	1.4	8 44	3.0
50	6 36	16 52	0 33	1 48	17 5	1.6	8 20	2.8
45	6 27	17 1	0 30	1 38	17 25	1.7	8 2	2.7
40	6 20	17 8	0 28	1 31	17 40	1.8	7 47	2.6
35	6 14	17 15	0 26	1 25	17 54	1.9	7 34	2.5
30	6 8	17 20	0 24	1 20	18 5	1.9	7 23	2.4
20	5 58	17 30	0 22	1 14	18 25	2.0	7 4	2.3
10	5 49	17 39	0 21	1 11	18 43	2.1	6 48	2.2
0	5 41	17 48	0 21	1 10	18 59	2.2	6 33	2.1
10	5 32	17 56	0 22	1 12	19 15	2.3	6 18	2.0
20	5 23	18 5	0 23	1 16	19 33	2.3	6 2	1.9
30	5 13	18 16	0 25	1 25	19 53	2.4	5 43	1.8
35	5 7	18 22	0 26	1 31	20 5	2.5	5 32	1.7
40	4 60	18 29	0 29	1 39	20 19	2.6	5 20	1.6
45	4 52	18 38	0 31	1 51	20 36	2.7	5 6	1.5
50	4 42	18 48	0 35	2 8	20 56	2.8	4 48	1.4
55	4 29	19 1	0 40	2 38	21 22	2.9	4 26	1.2
60	4 13	19 17	0 49	4 18	22 0	3.2	3 55	.8
S								

SUNCE				MJESEC			
UT	$e = T_p - UT$	Δ/24	r	Prolaz	Δ/24	$\pi_\leftmoon$	r
h	min s	s	′	h min	min	′	′
00	15 41.4	.3	16.1	$T_{\overline{m}}$ 0 21	2.1	55.4	15.1
12	15 45.2	$T_{\overline{m}_\odot}$ 11 h 44.2 min		Starost 16.2 d	Faza ❍		

PLANETE

Pl.	$T_{\overline{m}}$	π	360−α	Vel.	Pl.	$T_{\overline{m}}$	π	360−α	Vel.
	h min	′	°			h min	′	°	
♀	12 3	.5	146	-4.0	♃	21 30	.0	4	-2.7
♂	13 28	.1	125	1.4	♄	10 31	.0	169	1.0

UT	SUNCE		PROLJ. TAČKA	VENERA		MARS	
	$S_\odot$	$\delta_\odot$	S_Υ	S_φ	δ_φ	S_σ	δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	183 57.2	-11 59.1	33 16.2	179 59.9	-20 25.0	158 .9	-20 7.7
2	213 57.4	-12 .8	63 21.2	210 7.4	-20 23.4	188 2.2	-20 8.6
4	243 57.5	-12 2.5	93 26.1	240 15.0	-20 21.8	218 3.4	-20 9.4
6	273 57.7	-12 4.2	123 31.0	270 22.6	-20 20.2	248 4.7	-20 10.3
8	303 57.8	-12 6.0	153 36.0	300 30.1	-20 18.6	278 5.9	-20 11.1
10	333 58.0	-12 7.7	183 40.9	330 37.7	-20 17.0	308 7.1	-20 12.0
12	3 58.1	-12 9.4	213 45.8	0 45.3	-20 15.3	338 8.4	-20 12.8
14	33 58.3	-12 11.1	243 50.7	30 52.9	-20 13.7	8 9.6	-20 13.7
16	63 58.4	-12 12.8	273 55.7	61 .5	-20 12.0	38 10.8	-20 14.5
18	93 58.6	-12 14.6	304 .6	91 8.1	-20 10.4	68 12.1	-20 15.3
20	123 58.7	-12 16.3	334 5.5	121 15.7	-20 8.7	98 13.3	-20 16.2
22	153 58.8	-12 18.0	4 10.5	151 23.3	-20 7.0	128 14.5	-20 17.0
Δ	1	-9		38	8	6	-4

UT	MJESEC				JUPITER		SATURN	
	$S_\leftmoon$	Δ	$\delta_\leftmoon$	Δ	S_4	δ_4	S_η	δ_η
h	° ′		° ′		° ′	° ′	° ′	° ′
0	342 47.4	98	21 55.0	59	37 41.5	- 3 35.7	202 37.3	- 2 12.3
2	11 45.0	97	22 6.7	56	67 46.8	- 3 35.8	232 41.7	- 2 12.6
4	40 42.4	95	22 18.0	54	97 52.1	- 3 36.0	262 46.1	- 2 12.8
6	69 39.4	94	22 28.9	52	127 57.4	- 3 36.1	292 50.4	- 2 13.0
8	98 36.3	93	22 39.2	50	158 2.7	- 3 36.3	322 54.8	- 2 13.2
10	127 32.8	92	22 49.1	47	188 8.0	- 3 36.4	352 59.2	- 2 13.5
12	156 29.2	90	22 58.6	45	218 13.3	- 3 36.5	23 3.6	- 2 13.7
14	185 25.2	89	23 7.5	42	248 18.6	- 3 36.7	53 8.0	- 2 13.9
16	214 21.1	88	23 16.0	40	278 23.9	- 3 36.8	83 12.4	- 2 14.1
18	243 16.7	87	23 23.9	37	308 29.2	- 3 37.0	113 16.7	- 2 14.3
20	272 12.1	86	23 31.4	35	338 34.5	- 3 37.1	143 21.1	- 2 14.6
22	301 7.2	85	23 38.3	32	8 39.8	- 3 37.3	173 25.5	- 2 14.8
Δ					26	-1	22	-1

φ	SUNCE		TRAJANJE SUMRAKA		MJESEC			
	IZLAZ	ZALAZ	GRAĐ.	ASTR.	IZLAZ	Δ/24	ZALAZ	Δ/24
N	h min	h min	h min	h min	h min	min	h min	min
60	7 4	16 23	0 44	2 20	16 32	1.7	10 37	3.0
55	6 49	16 38	0 38	2 2	17 14	1.9	9 56	2.8
50	6 38	16 50	0 33	1 48	17 43	2.0	9 28	2.6
45	6 29	16 59	0 30	1 38	18 5	2.1	9 6	2.6
40	6 21	17 7	0 28	1 31	18 23	2.1	8 49	2.5
35	6 14	17 13	0 26	1 25	18 38	2.1	8 34	2.5
30	6 9	17 19	0 24	1 20	18 51	2.2	8 22	2.4
20	5 58	17 30	0 22	1 14	19 14	2.2	8 0	2.3
10	5 49	17 39	0 21	1 11	19 33	2.2	7 41	2.3
0	5 41	17 48	0 21	1 10	19 51	2.3	7 24	2.2
10	5 32	17 56	0 22	1 12	20 10	2.3	7 6	2.2
20	5 23	18 6	0 23	1 16	20 29	2.3	6 48	2.1
30	5 12	18 17	0 25	1 25	20 52	2.4	6 26	2.0
35	5 6	18 23	0 26	1 31	21 5	2.4	6 14	2.0
40	4 58	18 31	0 29	1 40	21 21	2.4	5 59	1.9
45	4 50	18 39	0 31	1 52	21 39	2.5	5 42	1.9
50	4 40	18 50	0 35	2 9	22 2	2.5	5 21	1.8
55	4 27	19 3	0 41	2 40	22 33	2.5	4 54	1.6
60	4 10	19 20	0 49	: ::	23 18	2.7	4 15	1.3
S								

SUNCE				MJESEC			
UT	$e = T_p - UT$	Δ/24	r	Prolaz	Δ/24	$\pi_\leftmoon$	r
h	min s	s	′	h min	min	′	′
00	15 49.1	.3	16.1	$T_{\overline{m}}$ 1 11	2.2	55.9	15.2
12	15 52.6	$T_{\overline{m}_\odot}$ 11 h 44.1 min		Starost 17.2 d	Faza ❍		

PLANETE

Pl.	$T_{\overline{m}}$	π	360−α	Vel.	Pl.	$T_{\overline{m}}$	π	360−α	Vel.
	h min	′	°			h min	′	°	
♀	11 57	.5	147	-4.0	♃	21 25	.0	4	-2.7
♂	13 27	.1	125	1.4	♄	10 28	.0	169	1.0

UT	SUNCE $S_\odot$	SUNCE $\delta_\odot$	PROLJ. TAČKA S_Υ	VENERA S_φ	VENERA δ_φ	MARS S_σ	MARS δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	183 59.0	-12 19.7	34 15.4	181 30.9	-20 5.3	158 15.8	-20 17.9
2	213 59.1	-12 21.4	64 20.3	211 38.5	-20 3.6	188 17.0	-20 18.7
4	243 59.2	-12 23.1	94 25.2	241 46.1	-20 2.0	218 18.2	-20 19.5
6	273 59.4	-12 24.8	124 30.2	271 53.7	-20 .2	248 19.5	-20 20.4
8	303 59.5	-12 26.5	154 35.1	302 1.3	-19 58.5	278 20.7	-20 21.2
10	333 59.6	-12 28.2	184 40.0	332 8.9	-19 56.8	308 21.9	-20 22.0
12	3 59.8	-12 29.9	214 45.0	2 16.5	-19 55.1	338 23.1	-20 22.9
14	33 59.9	-12 31.6	244 49.9	32 24.1	-19 53.4	8 24.4	-20 23.7
16	64 .0	-12 33.3	274 54.8	62 31.8	-19 51.6	38 25.6	-20 24.5
18	94 .2	-12 35.0	304 59.7	92 39.4	-19 49.9	68 26.8	-20 25.4
20	124 .3	-12 36.7	335 4.7	122 47.0	-19 48.1	98 28.0	-20 26.2
22	154 .4	-12 38.4	5 9.6	152 54.6	-19 46.4	128 29.2	-20 27.0
Δ	1	-9		38	9	6	-4

UT	MJESEC $S_\leftmoon$	MJESEC Δ	MJESEC $\delta_\leftmoon$	MJESEC Δ	JUPITER S_4	JUPITER δ_4	SATURN S_η	SATURN δ_η
h	° ′		° ′		° ′	° ′	° ′	° ′
0	330 2.2	84	23 44.7	30	38 45.1	- 3 37.4	203 29.9	- 2 15.0
2	358 56.9	83	23 50.6	27	68 50.4	- 3 37.5	233 34.3	- 2 15.2
4	27 51.5	82	23 56.0	24	98 55.7	- 3 37.7	263 38.7	- 2 15.5
6	56 45.8	81	24 .9	22	129 1.0	- 3 37.8	293 43.0	- 2 15.7
8	85 40.0	80	24 5.2	19	159 6.2	- 3 37.9	323 47.4	- 2 15.9
10	114 34.1	79	24 9.0	16	189 11.5	- 3 38.1	353 51.8	- 2 16.1
12	143 27.9	79	24 12.2	13	219 16.8	- 3 38.2	23 56.2	- 2 16.3
14	172 21.7	78	24 14.9	11	249 22.1	- 3 38.4	54 .6	- 2 16.6
16	201 15.2	77	24 17.0	8	279 27.4	- 3 38.5	84 5.0	- 2 16.8
18	230 8.7	77	24 18.6	5	309 32.7	- 3 38.6	114 9.3	- 2 17.0
20	259 2.0	76	24 19.6	2	339 38.0	- 3 38.8	144 13.7	- 2 17.2
22	287 55.2	76	24 20.1	0	9 43.2	- 3 38.9	174 18.1	- 2 17.5
Δ					26	-1	22	-1

φ	SUNCE IZLAZ	SUNCE ZALAZ	TRAJANJE SUMRAKA GRAĐ.	TRAJANJE SUMRAKA ASTR.	MJESEC IZLAZ	MJESEC Δ/24	MJESEC ZALAZ	MJESEC Δ/24
N	h min	h min	h min	h min	h min	min	h min	min
60	7 6	16 21	0 44	2 20	17 14	2.6	11 49	2.3
55	6 51	16 36	0 38	2 2	17 60	2.5	11 2	2.3
50	6 39	16 48	0 33	1 48	18 31	2.5	10 31	2.3
45	6 30	16 57	0 30	1 38	18 55	2.4	10 8	2.3
40	6 22	17 5	0 28	1 31	19 14	2.4	9 49	2.3
35	6 15	17 12	0 26	1 25	19 30	2.4	9 33	2.3
30	6 9	17 18	0 24	1 20	19 43	2.4	9 20	2.3
20	5 59	17 29	0 22	1 14	20 7	2.4	8 56	2.3
10	5 49	17 38	0 21	1 11	20 27	2.3	8 36	2.3
0	5 41	17 47	0 21	1 10	20 46	2.3	8 17	2.3
10	5 32	17 56	0 22	1 12	21 5	2.3	7 59	2.3
20	5 22	18 6	0 23	1 17	21 25	2.3	7 39	2.3
30	5 11	18 18	0 25	1 25	21 49	2.2	7 15	2.3
35	5 4	18 24	0 27	1 31	22 3	2.2	7 2	2.3
40	4 57	18 32	0 29	1 40	22 19	2.2	6 46	2.3
45	4 48	18 41	0 31	1 52	22 38	2.2	6 27	2.3
50	4 38	18 51	0 35	2 10	23 2	2.1	6 4	2.2
55	4 25	19 5	0 41	2 42	23 34	2.0	5 33	2.2
60	4 7	19 23	0 49	: ::	.. ..	.0	4 47	2.1
S								

SUNCE UT	SUNCE $e = T_p - UT$	SUNCE Δ/24	SUNCE r	MJESEC Prolaz	MJESEC Δ/24	MJESEC $\pi_\leftmoon$	MJESEC r
h	min s	s	′	h min	min	′	′
00	15 56.1	.3	16.1	$T_{\overline{m}}$ 2 4	2.3	56.4	15.4
12	15 59.2	$T_{\overline{m}_\odot}$ 11 h 44.0 min		Starost 18.2 d	Faza ◑		

PLANETE

Pl.	$T_{\overline{m}}$	π	360−α	Vel.	Pl.	$T_{\overline{m}}$	π	360−α	Vel.
	h min	′	°			h min	′	°	
♀	11 51	.5	147	-4.0	♃	21 21	.0	4	-2.7
♂	13 26	.1	124	1.4	♄	10 24	.0	169	1.0

UT	SUNCE $S_\odot$	SUNCE $\delta_\odot$	PROLJ. TAČKA S_Υ	VENERA S_φ	VENERA δ_φ	MARS S_σ	MARS δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	184 .5	-12 40.1	35 14.5	183 2.3	-19 44.6	158 30.4	-20 27.9
2	214 .7	-12 41.8	65 19.4	213 9.9	-19 42.8	188 31.7	-20 28.7
4	244 .8	-12 43.5	95 24.4	243 17.5	-19 41.0	218 32.9	-20 29.5
6	274 .9	-12 45.2	125 29.3	273 25.1	-19 39.3	248 34.1	-20 30.3
8	304 1.0	-12 46.9	155 34.2	303 32.8	-19 37.5	278 35.3	-20 31.1
10	334 1.1	-12 48.6	185 39.2	333 40.4	-19 35.7	308 36.5	-20 32.0
12	4 1.2	-12 50.3	215 44.1	3 48.0	-19 33.9	338 37.7	-20 32.8
14	34 1.4	-12 52.0	245 49.0	33 55.7	-19 32.0	8 38.9	-20 33.6
16	64 1.5	-12 53.7	275 53.9	64 3.3	-19 30.2	38 40.1	-20 34.4
18	94 1.6	-12 55.4	305 58.9	94 10.9	-19 28.4	68 41.3	-20 35.2
20	124 1.7	-12 57.0	336 3.8	124 18.5	-19 26.6	98 42.6	-20 36.0
22	154 1.8	-12 58.7	6 8.7	154 26.2	-19 24.7	128 43.8	-20 36.9
Δ	1	-8		38	9	6	-4

UT	MJESEC $S_\leftmoon$	MJESEC Δ	MJESEC $\delta_\leftmoon$	MJESEC Δ	JUPITER S_4	JUPITER δ_4	SATURN S_η	SATURN δ_η
h	° ′		° ′		° ′	° ′	° ′	° ′
0	316 48.3	75	24 20.0	-3	39 48.5	- 3 39.0	204 22.5	- 2 17.7
2	345 41.4	75	24 19.3	-6	69 53.8	- 3 39.2	234 26.9	- 2 17.9
4	14 34.3	74	24 18.1	-9	99 59.1	- 3 39.3	264 31.3	- 2 18.1
6	43 27.2	74	24 16.3	-12	130 4.4	- 3 39.4	294 35.7	- 2 18.3
8	72 20.0	74	24 13.9	-15	160 9.6	- 3 39.6	324 40.0	- 2 18.6
10	101 12.8	74	24 11.0	-18	190 14.9	- 3 39.7	354 44.4	- 2 18.8
12	130 5.5	74	24 7.4	-20	220 20.2	- 3 39.8	24 48.8	- 2 19.0
14	158 58.2	73	24 3.4	-23	250 25.4	- 3 39.9	54 53.2	- 2 19.2
16	187 50.9	73	23 58.7	-26	280 30.7	- 3 40.1	84 57.6	- 2 19.4
18	216 43.6	73	23 53.5	-29	310 36.0	- 3 40.2	115 2.0	- 2 19.7
20	245 36.3	73	23 47.7	-32	340 41.3	- 3 40.3	145 6.4	- 2 19.9
22	274 29.0	74	23 41.3	-35	10 46.5	- 3 40.5	175 10.7	- 2 20.1
Δ					26	-1	22	-1

φ	SUNCE IZLAZ	SUNCE ZALAZ	TRAJANJE SUMRAKA GRAĐ.	TRAJANJE SUMRAKA ASTR.	MJESEC IZLAZ	MJESEC Δ/24	MJESEC ZALAZ	MJESEC Δ/24
N	h min	h min	h min	h min	h min	min	h min	min
60	7 9	16 18	0 44	2 21	18 15	3.3	12 43	1.5
55	6 53	16 34	0 38	2 2	18 60	3.0	11 57	1.8
50	6 41	16 46	0 33	1 49	19 30	2.9	11 27	1.9
45	6 31	16 56	0 30	1 39	19 53	2.8	11 3	2.0
40	6 23	17 4	0 28	1 31	20 12	2.7	10 45	2.1
35	6 16	17 11	0 26	1 25	20 27	2.6	10 29	2.1
30	6 10	17 17	0 24	1 20	20 41	2.6	10 15	2.2
20	5 59	17 28	0 23	1 14	21 4	2.5	9 52	2.2
10	5 50	17 38	0 21	1 11	21 23	2.4	9 32	2.3
0	5 41	17 47	0 21	1 11	21 42	2.3	9 13	2.3
10	5 31	17 57	0 22	1 12	22 0	2.2	8 54	2.4
20	5 21	18 7	0 23	1 17	22 20	2.2	8 34	2.4
30	5 10	18 18	0 25	1 25	22 43	2.1	8 10	2.5
35	5 3	18 25	0 27	1 32	22 56	2.0	7 56	2.5
40	4 56	18 33	0 29	1 40	23 12	1.9	7 40	2.6
45	4 47	18 42	0 32	1 53	23 30	1.8	7 21	2.6
50	4 36	18 53	0 36	2 11	23 53	1.7	6 57	2.7
55	4 22	19 7	0 41	2 45	.. ..	.0	6 26	2.8
60	4 4	19 25	0 50	: ::	0 22	1.9	5 38	3.0
S								

SUNCE UT	SUNCE $e = T_p - UT$	SUNCE Δ/24	SUNCE r	MJESEC Prolaz	MJESEC Δ/24	MJESEC $\pi_\leftmoon$	MJESEC r
h	min s	s	′	h min	min	′	′
00	16 2.3	.2	16.1	$T_{\overline{m}}$ 2 59	2.3	56.9	15.5
12	16 5.1	$T_{\overline{m}_\odot}$ 11 h 43.9 min		Starost 19.2 d	Faza ◑		

PLANETE

Pl.	$T_{\overline{m}}$	π	360−α	Vel.	Pl.	$T_{\overline{m}}$	π	360−α	Vel.
	h min	′	°			h min	′	°	
♀	11 45	.5	148	-3.9	♃	21 17	.0	5	-2.7
♂	13 25	.1	123	1.4	♄	10 21	.0	169	1.0

UT	SUNCE		PROLJ. TAČKA	VENERA		MARS	
	$S_\odot$	$\delta_\odot$	S_Υ	S_φ	δ_φ	S_σ	δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	184 1.9	-13 .4	36 13.7	184 33.8	-19 22.9	158 45.0	-20 37.7
2	214 2.0	-13 2.1	66 18.6	214 41.4	-19 21.0	188 46.2	-20 38.5
4	244 2.1	-13 3.8	96 23.5	244 49.1	-19 19.2	218 47.4	-20 39.3
6	274 2.2	-13 5.4	126 28.4	274 56.7	-19 17.3	248 48.6	-20 40.1
8	304 2.3	-13 7.1	156 33.4	305 4.3	-19 15.5	278 49.8	-20 40.9
10	334 2.4	-13 8.8	186 38.3	335 11.9	-19 13.6	308 51.0	-20 41.7
12	4 2.5	-13 10.5	216 43.2	5 19.6	-19 11.7	338 52.2	-20 42.5
14	34 2.6	-13 12.1	246 48.2	35 27.2	-19 9.8	8 53.4	-20 43.3
16	64 2.7	-13 13.8	276 53.1	65 34.8	-19 7.9	38 54.5	-20 44.1
18	94 2.8	-13 15.5	306 58.0	95 42.4	-19 6.0	68 55.7	-20 44.9
20	124 2.9	-13 17.1	337 2.9	125 50.0	-19 4.1	98 56.9	-20 45.7
22	154 3.0	-13 18.8	7 7.9	155 57.6	-19 2.2	128 58.1	-20 46.5
Δ	0	-8		38	9	6	-4

UT	MJESEC				JUPITER		SATURN	
	$S_\leftmoon$	Δ	$\delta_\leftmoon$	Δ	S_4	δ_4	S_η	δ_η
h	° ′		° ′		° ′	° ′	° ′	° ′
0	303 21.7	74	23 34.3	-38	40 51.8	- 3 40.6	205 15.1	- 2 20.3
2	332 14.4	74	23 26.8	-40	70 57.1	- 3 40.7	235 19.5	- 2 20.5
4	1 7.2	74	23 18.8	-43	101 2.3	- 3 40.8	265 23.9	- 2 20.8
6	30 .0	74	23 10.1	-46	131 7.6	- 3 41.0	295 28.3	- 2 21.0
8	58 52.9	75	23 .9	-49	161 12.9	- 3 41.1	325 32.7	- 2 21.2
10	87 45.9	75	22 51.2	-52	191 18.1	- 3 41.2	355 37.1	- 2 21.4
12	116 38.9	76	22 40.9	-54	221 23.4	- 3 41.3	25 41.5	- 2 21.6
14	145 32.0	76	22 30.0	-57	251 28.6	- 3 41.5	55 45.9	- 2 21.9
16	174 25.2	76	22 18.6	-60	281 33.9	- 3 41.6	85 50.2	- 2 22.1
18	203 18.5	77	22 6.7	-62	311 39.1	- 3 41.7	115 54.6	- 2 22.3
20	232 11.9	77	21 54.2	-65	341 44.4	- 3 41.8	145 59.0	- 2 22.5
22	261 5.4	78	21 41.2	-68	11 49.7	- 3 42.0	176 3.4	- 2 22.7
Δ					26	-1	22	-1

φ	SUNCE		TRAJANJE SUMRAKA		MJESEC			
	IZLAZ	ZALAZ	GRAĐ.	ASTR.	IZLAZ	Δ/24	ZALAZ	Δ/24
N	h min	h min	h min	h min	h min	min	h min	min
60	7 12	16 15	0 44	2 21	19 35	3.8	13 19	1.0
55	6 55	16 32	0 38	2 2	20 13	3.4	12 40	1.3
50	6 43	16 44	0 34	1 49	20 40	3.2	12 12	1.5
45	6 33	16 54	0 30	1 39	20 60	3.0	11 51	1.7
40	6 24	17 3	0 28	1 31	21 16	2.9	11 34	1.8
35	6 17	17 10	0 26	1 25	21 30	2.8	11 19	1.9
30	6 11	17 17	0 25	1 21	21 42	2.7	11 7	2.0
20	5 60	17 28	0 23	1 14	22 3	2.5	10 45	2.1
10	5 50	17 38	0 22	1 11	22 21	2.4	10 26	2.2
0	5 40	17 47	0 21	1 11	22 38	2.3	10 9	2.3
10	5 31	17 57	0 22	1 12	22 54	2.1	9 51	2.4
20	5 21	18 7	0 23	1 17	23 12	2.0	9 32	2.5
30	5 9	18 19	0 25	1 25	23 32	1.9	9 10	2.6
35	5 2	18 26	0 27	1 32	23 44	1.8	8 57	2.7
40	4 54	18 34	0 29	1 41	23 58	1.7	8 42	2.8
45	4 45	18 43	0 32	1 53	.. ..	.0	8 24	2.9
50	4 34	18 55	0 36	2 13	.. ..	.0	8 2	3.0
55	4 20	19 9	0 41	2 47	0 23	1.5	7 33	3.2
60	4 2	19 28	0 50	: ::	1 6	1.2	6 50	3.6
S								

SUNCE				MJESEC			
UT	$e = T_p - UT$	Δ/24	r	Prolaz	Δ/24	$\pi_\leftmoon$	r
h	min s	s	′	h min	min	′	′
00	16 7.8	.2	16.1	$T_{\overline{m}}$ 3 55	2.3	57.4	15.6
12	16 10.2	$T_{\overline{m}_\odot}$ 11 h 43.8 min		Starost 20.2 d	Faza ◑		

PLANETE									
Pl.	$T_{\overline{m}}$	π	360−α	Vel.	Pl.	$T_{\overline{m}}$	π	360−α	Vel.
	h min	′	°			h min	′	°	
♀	11 39	.5	148	-3.9	♃	21 13	.0	5	-2.6
♂	13 24	.1	123	1.4	♄	10 17	.0	169	1.0

UT	SUNCE		PROLJ. TAČKA	VENERA		MARS	
	$S_\odot$	$\delta_\odot$	S_Υ	S_φ	δ_φ	S_σ	δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	184 3.1	-13 20.5	37 12.8	186 5.3	-19 .3	158 59.3	-20 47.3
2	214 3.2	-13 22.1	67 17.7	216 12.9	-18 58.4	189 .5	-20 48.1
4	244 3.3	-13 23.8	97 22.7	246 20.5	-18 56.5	219 1.7	-20 48.9
6	274 3.3	-13 25.4	127 27.6	276 28.1	-18 54.6	249 2.9	-20 49.7
8	304 3.4	-13 27.1	157 32.5	306 35.7	-18 52.6	279 4.1	-20 50.5
10	334 3.5	-13 28.7	187 37.4	336 43.3	-18 50.7	309 5.2	-20 51.3
12	4 3.6	-13 30.4	217 42.4	6 50.9	-18 48.8	339 6.4	-20 52.1
14	34 3.7	-13 32.1	247 47.3	36 58.5	-18 46.8	9 7.6	-20 52.8
16	64 3.8	-13 33.7	277 52.2	67 6.1	-18 44.9	39 8.8	-20 53.6
18	94 3.8	-13 35.4	307 57.2	97 13.6	-18 42.9	69 10.0	-20 54.4
20	124 3.9	-13 37.0	338 2.1	127 21.2	-18 41.0	99 11.1	-20 55.2
22	154 4.0	-13 38.7	8 7.0	157 28.8	-18 39.0	129 12.3	-20 56.0
Δ	0	-8		38	10	6	-4

UT	MJESEC				JUPITER		SATURN	
	$S_\leftmoon$	Δ	$\delta_\leftmoon$	Δ	S_4	δ_4	S_η	δ_η
h	° ′		° ′		° ′	° ′	° ′	° ′
0	289 59.0	79	21 27.6	-70	41 54.9	- 3 42.1	206 7.8	- 2 22.9
2	318 52.7	79	21 13.5	-73	72 .2	- 3 42.2	236 12.2	- 2 23.2
4	347 46.6	80	20 58.9	-75	102 5.4	- 3 42.3	266 16.6	- 2 23.4
6	16 40.6	81	20 43.8	-78	132 10.7	- 3 42.4	296 21.0	- 2 23.6
8	45 34.7	81	20 28.2	-81	162 15.9	- 3 42.6	326 25.4	- 2 23.8
10	74 29.0	82	20 12.1	-83	192 21.2	- 3 42.7	356 29.7	- 2 24.0
12	103 23.4	83	19 55.5	-85	222 26.4	- 3 42.8	26 34.1	- 2 24.3
14	132 17.9	83	19 38.4	-88	252 31.6	- 3 42.9	56 38.5	- 2 24.5
16	161 12.6	84	19 20.8	-90	282 36.9	- 3 43.0	86 42.9	- 2 24.7
18	190 7.4	85	19 2.8	-93	312 42.1	- 3 43.1	116 47.3	- 2 24.9
20	219 2.4	86	18 44.3	-95	342 47.4	- 3 43.3	146 51.7	- 2 25.1
22	247 57.6	86	18 25.3	-97	12 52.6	- 3 43.4	176 56.1	- 2 25.3
Δ					26	-1	22	-1

φ	SUNCE		TRAJANJE SUMRAKA		MJESEC			
	IZLAZ	ZALAZ	GRAĐ.	ASTR.	IZLAZ	Δ/24	ZALAZ	Δ/24
N	h min	h min	h min	h min	h min	min	h min	min
60	7 14	16 12	0 44	2 21	21 5	3.9	13 42	.6
55	6 57	16 29	0 38	2 3	21 34	3.6	13 11	1.0
50	6 44	16 42	0 34	1 49	21 55	3.3	12 49	1.2
45	6 34	16 53	0 30	1 39	22 12	3.1	12 31	1.4
40	6 25	17 2	0 28	1 31	22 25	2.9	12 17	1.6
35	6 18	17 9	0 26	1 25	22 37	2.8	12 5	1.7
30	6 11	17 16	0 25	1 21	22 46	2.7	11 54	1.8
20	6 0	17 27	0 23	1 14	23 3	2.5	11 35	2.0
10	5 50	17 37	0 22	1 11	23 18	2.4	11 19	2.1
0	5 40	17 47	0 21	1 11	23 32	2.2	11 4	2.2
10	5 31	17 57	0 22	1 12	23 46	2.1	10 48	2.4
20	5 20	18 8	0 23	1 17	.. ..	.0	10 32	2.5
30	5 8	18 20	0 25	1 26	.. ..	.0	10 13	2.7
35	5 1	18 27	0 27	1 32	.. ..	.0	10 2	2.8
40	4 53	18 35	0 29	1 41	.. ..	.0	9 49	2.9
45	4 44	18 45	0 32	1 54	0 14	1.5	9 34	3.1
50	4 32	18 56	0 36	2 14	0 34	1.4	9 15	3.2
55	4 18	19 11	0 42	2 50	0 59	1.1	8 50	3.5
60	3 59	19 31	0 51	: ::	1 35	.8	8 16	3.9
S								

SUNCE				MJESEC			
UT	$e = T_p - UT$	Δ/24	r	Prolaz	Δ/24	$\pi_\leftmoon$	r
h	min s	s	′	h min	min	′	′
00	16 12.5	.2	16.1	$T_{\overline{m}}$ 4 51	2.3	58.0	15.8
12	16 14.5	$T_{\overline{m}_\odot}$ 11 h 43.8 min		Starost 21.2 d	Faza ◑		

PLANETE									
Pl.	$T_{\overline{m}}$	π	360−α	Vel.	Pl.	$T_{\overline{m}}$	π	360−α	Vel.
	h min	′	°			h min	′	°	
♀	11 33	.5	149	-3.9	♃	21 9	.0	5	-2.6
♂	13 24	.1	122	1.4	♄	10 14	.0	169	1.0

UT	SUNCE $S_\odot$	SUNCE $\delta_\odot$	PROLJ. TAČKA S_Υ	VENERA S_φ	VENERA δ_φ	MARS S_σ	MARS δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	184 4.1	-13 40.3	38 11.9	187 36.4	-18 37.0	159 13.5	-20 56.8
2	214 4.1	-13 41.9	68 16.9	217 44.0	-18 35.1	189 14.7	-20 57.5
4	244 4.2	-13 43.6	98 21.8	247 51.5	-18 33.1	219 15.9	-20 58.3
6	274 4.3	-13 45.2	128 26.7	277 59.1	-18 31.1	249 17.0	-20 59.1
8	304 4.4	-13 46.9	158 31.7	308 6.6	-18 29.2	279 18.2	-20 59.9
10	334 4.4	-13 48.5	188 36.6	338 14.2	-18 27.2	309 19.4	-21 .6
12	4 4.5	-13 50.1	218 41.5	8 21.8	-18 25.2	339 20.5	-21 1.4
14	34 4.6	-13 51.8	248 46.4	38 29.3	-18 23.2	9 21.7	-21 2.2
16	64 4.6	-13 53.4	278 51.4	68 36.8	-18 21.2	39 22.9	-21 3.0
18	94 4.7	-13 55.0	308 56.3	98 44.4	-18 19.2	69 24.0	-21 3.7
20	124 4.7	-13 56.7	339 1.2	128 51.9	-18 17.2	99 25.2	-21 4.5
22	154 4.8	-13 58.3	9 6.1	158 59.4	-18 15.2	129 26.4	-21 5.3
Δ	0	-8		38	10	6	-4

UT	MJESEC $S_\leftmoon$	MJESEC Δ	MJESEC $\delta_\leftmoon$	MJESEC Δ	JUPITER S_4	JUPITER δ_4	SATURN S_η	SATURN δ_η
h	° ′		° ′		° ′	° ′	° ′	° ′
0	276 52.9	87	18 5.8	-99	42 57.9	- 3 43.5	207 .5	- 2 25.6
2	305 48.3	88	17 46.0	-102	73 3.1	- 3 43.6	237 4.9	- 2 25.8
4	334 43.9	89	17 25.7	-104	103 8.3	- 3 43.7	267 9.3	- 2 26.0
6	3 39.7	90	17 4.9	-106	133 13.6	- 3 43.8	297 13.7	- 2 26.2
8	32 35.6	90	16 43.7	-108	163 18.8	- 3 43.9	327 18.1	- 2 26.4
10	61 31.7	91	16 22.2	-110	193 24.0	- 3 44.1	357 22.4	- 2 26.6
12	90 27.9	92	16 .2	-112	223 29.3	- 3 44.2	27 26.8	- 2 26.9
14	119 24.3	93	15 37.8	-114	253 34.5	- 3 44.3	57 31.2	- 2 27.1
16	148 20.8	93	15 15.0	-116	283 39.7	- 3 44.4	87 35.6	- 2 27.3
18	177 17.4	94	14 51.9	-118	313 45.0	- 3 44.5	117 40.0	- 2 27.5
20	206 14.3	95	14 28.3	-119	343 50.2	- 3 44.6	147 44.4	- 2 27.7
22	235 11.2	95	14 4.5	-121	13 55.4	- 3 44.7	177 48.8	- 2 27.9
Δ					26	-1	22	-1

φ	SUNCE IZLAZ	SUNCE ZALAZ	TRAJANJE SUMRAKA GRAĐ.	TRAJANJE SUMRAKA ASTR.	MJESEC IZLAZ	MJESEC Δ/24	MJESEC ZALAZ	MJESEC Δ/24
N	h min	h min	h min	h min	h min	min	h min	min
60	7 17	16 10	0 45	2 22	22 40	4.0	13 57	.4
55	6 59	16 27	0 38	2 3	22 59	3.6	13 35	.8
50	6 46	16 41	0 34	1 49	23 14	3.4	13 19	1.0
45	6 35	16 51	0 30	1 39	23 26	3.2	13 5	1.2
40	6 27	17 0	0 28	1 31	23 36	3.0	12 54	1.4
35	6 19	17 8	0 26	1 25	23 44	2.8	12 45	1.5
30	6 12	17 15	0 25	1 21	23 51	2.7	12 37	1.6
20	6 0	17 27	0 23	1 15	. . .	.0	12 22	1.8
10	5 50	17 37	0 22	1 11	. . .	.0	12 9	2.0
0	5 40	17 47	0 21	1 11	. . .	.0	11 57	2.2
10	5 30	17 57	0 22	1 13	. . .	.0	11 45	2.3
20	5 20	18 8	0 23	1 17	0 0	1.9	11 32	2.5
30	5 7	18 21	0 25	1 26	0 17	1.7	11 17	2.7
35	5 0	18 28	0 27	1 33	0 27	1.6	11 9	2.8
40	4 52	18 36	0 29	1 42	0 38	1.5	10 59	3.0
45	4 42	18 46	0 32	1 55	0 51	1.3	10 47	3.1
50	4 30	18 58	0 36	2 15	1 7	1.1	10 33	3.3
55	4 16	19 13	0 42	2 53	1 27	.9	10 14	3.6
60	3 56	19 33	0 51	: ::	1 53	.5	9 50	4.0
S								

SUNCE UT	SUNCE $e = T_p - UT$	SUNCE Δ/24	SUNCE r	MJESEC Prolaz	MJESEC Δ/24	MJESEC $\pi_\leftmoon$	MJESEC r
h	min s	s	′	h min	min	′	′
00	16 16.5	.1	16.1	$T_{\overline{m}}$ 5 45	2.2	58.5	15.9
12	16 18.0	$T_{\overline{m}_\odot}$ 11 h 43.7 min		Starost 22.2 d	Faza ◑		

PLANETE

Pl.	$T_{\overline{m}}$	π	360−α	Vel.	Pl.	$T_{\overline{m}}$	π	360−α	Vel.
	h min	′	°			h min	′	°	
♀	11 27	.5	149	-3.9	♃	21 4	.0	5	-2.6
♂	13 23	.1	121	1.4	♄	10 10	.0	169	1.0

UT	SUNCE $S_\odot$	SUNCE $\delta_\odot$	PROLJ. TAČKA S_Υ	VENERA S_φ	VENERA δ_φ	MARS S_σ	MARS δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	184 4.9	-13 59.9	39 11.1	189 7.0	-18 13.2	159 27.5	-21 6.0
2	214 4.9	-14 1.6	69 16.0	219 14.5	-18 11.2	189 28.7	-21 6.8
4	244 5.0	-14 3.2	99 20.9	249 22.0	-18 9.2	219 29.8	-21 7.6
6	274 5.0	-14 4.8	129 25.9	279 29.5	-18 7.1	249 31.0	-21 8.3
8	304 5.1	-14 6.4	159 30.8	309 37.0	-18 5.1	279 32.2	-21 9.1
10	334 5.1	-14 8.0	189 35.7	339 44.5	-18 3.1	309 33.3	-21 9.8
12	4 5.2	-14 9.7	219 40.6	9 52.0	-18 1.1	339 34.5	-21 10.6
14	34 5.2	-14 11.3	249 45.6	39 59.4	-17 59.0	9 35.6	-21 11.4
16	64 5.3	-14 12.9	279 50.5	70 6.9	-17 57.0	39 36.8	-21 12.1
18	94 5.3	-14 14.5	309 55.4	100 14.4	-17 55.0	69 37.9	-21 12.9
20	124 5.4	-14 16.1	340 .4	130 21.8	-17 52.9	99 39.1	-21 13.6
22	154 5.4	-14 17.7	10 5.3	160 29.3	-17 50.9	129 40.2	-21 14.4
Δ	0	-8		37	10	6	-4

UT	MJESEC $S_\leftmoon$	MJESEC Δ	MJESEC $\delta_\leftmoon$	MJESEC Δ	JUPITER S_4	JUPITER δ_4	SATURN S_η	SATURN δ_η
h	° ′		° ′		° ′	° ′	° ′	° ′
0	264 8.3	96	13 40.2	-123	44 .6	- 3 44.8	207 53.2	- 2 28.2
2	293 5.5	97	13 15.6	-125	74 5.9	- 3 44.9	237 57.6	- 2 28.4
4	322 2.9	97	12 50.7	-126	104 11.1	- 3 45.0	268 2.0	- 2 28.6
6	351 .3	98	12 25.5	-128	134 16.3	- 3 45.1	298 6.4	- 2 28.8
8	19 57.9	99	11 59.9	-129	164 21.5	- 3 45.2	328 10.8	- 2 29.0
10	48 55.6	99	11 34.1	-131	194 26.7	- 3 45.4	358 15.2	- 2 29.2
12	77 53.5	100	11 7.9	-132	224 32.0	- 3 45.5	28 19.6	- 2 29.4
14	106 51.4	100	10 41.5	-134	254 37.2	- 3 45.6	58 24.0	- 2 29.7
16	135 49.4	101	10 14.8	-135	284 42.4	- 3 45.7	88 28.4	- 2 29.9
18	164 47.5	101	9 47.8	-136	314 47.6	- 3 45.8	118 32.8	- 2 30.1
20	193 45.8	101	9 20.6	-137	344 52.8	- 3 45.9	148 37.2	- 2 30.3
22	222 44.1	102	8 53.1	-139	14 58.0	- 3 46.0	178 41.6	- 2 30.5
Δ					26	-1	22	-1

φ	SUNCE IZLAZ	SUNCE ZALAZ	TRAJANJE SUMRAKA GRAĐ.	TRAJANJE SUMRAKA ASTR.	MJESEC IZLAZ	MJESEC Δ/24	MJESEC ZALAZ	MJESEC Δ/24
N	h min	h min	h min	h min	h min	min	h min	min
60	7 19	16 7	0 45	2 22	. . .	.0	14 8	.4
55	7 1	16 25	0 38	2 3	. . .	.0	13 54	.7
50	6 48	16 39	0 34	1 49	. . .	.0	13 43	.9
45	6 37	16 50	0 31	1 39	. . .	.0	13 35	1.1
40	6 28	16 59	0 28	1 31	. . .	.0	13 28	1.3
35	6 20	17 7	0 26	1 25	. . .	.0	13 21	1.4
30	6 13	17 14	0 25	1 21	. . .	.0	13 16	1.5
20	6 1	17 26	0 23	1 15	0 4	2.5	13 6	1.8
10	5 50	17 37	0 22	1 12	0 15	2.3	12 58	1.9
0	5 40	17 47	0 21	1 11	0 25	2.1	12 50	2.1
10	5 30	17 57	0 22	1 13	0 35	2.0	12 41	2.3
20	5 19	18 9	0 23	1 17	0 46	1.8	12 33	2.5
30	5 6	18 21	0 25	1 26	0 58	1.6	12 23	2.7
35	4 59	18 29	0 27	1 33	1 5	1.5	12 17	2.8
40	4 51	18 37	0 29	1 42	1 13	1.3	12 10	3.0
45	4 41	18 48	0 32	1 56	1 22	1.2	12 2	3.2
50	4 29	18 60	0 36	2 16	1 34	1.0	11 53	3.4
55	4 13	19 15	0 42	2 56	1 48	.7	11 41	3.6
60	3 53	19 36	0 52	: ::	2 6	.4	11 25	4.0
S								

SUNCE UT	SUNCE $e = T_p - UT$	SUNCE Δ/24	SUNCE r	MJESEC Prolaz	MJESEC Δ/24	MJESEC $\pi_\leftmoon$	MJESEC r
h	min s	s	′	h min	min	′	′
00	16 19.6	.1	16.1	$T_{\overline{m}}$ 6 37	2.1	59.0	16.1
12	16 20.8	$T_{\overline{m}_\odot}$ 11 h 43.7 min		Starost 23.2 d	Faza ◑		

PLANETE

Pl.	$T_{\overline{m}}$	π	360−α	Vel.	Pl.	$T_{\overline{m}}$	π	360−α	Vel.
	h min	′	°			h min	′	°	
♀	11 21	.5	150	-3.9	♃	21 0	.0	5	-2.6
♂	13 22	.1	120	1.4	♄	10 7	.0	169	1.0

1. NOVEMBAR 2010. PONEDJELJAK

UT	SUNCE $S_\odot$	SUNCE $\delta_\odot$	PROLJ. TAČKA S_Υ	VENERA S_φ	VENERA δ_φ	MARS S_σ	MARS δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	184 5.4	-14 19.3	40 10.2	190 36.7	-17 48.9	159 41.4	-21 15.1
2	214 5.5	-14 20.9	70 15.1	220 44.2	-17 46.8	189 42.5	-21 15.9
4	244 5.5	-14 22.5	100 20.1	250 51.6	-17 44.8	219 43.7	-21 16.6
6	274 5.6	-14 24.2	130 25.0	280 59.1	-17 42.7	249 44.8	-21 17.4
8	304 5.6	-14 25.8	160 29.9	311 6.5	-17 40.7	279 46.0	-21 18.1
10	334 5.6	-14 27.4	190 34.9	341 13.9	-17 38.6	309 47.1	-21 18.9
12	4 5.7	-14 29.0	220 39.8	11 21.3	-17 36.6	339 48.3	-21 19.6
14	34 5.7	-14 30.6	250 44.7	41 28.7	-17 34.5	9 49.4	-21 20.3
16	64 5.7	-14 32.1	280 49.6	71 36.1	-17 32.5	39 50.5	-21 21.1
18	94 5.7	-14 33.7	310 54.6	101 43.5	-17 30.4	69 51.7	-21 21.8
20	124 5.8	-14 35.3	340 59.5	131 50.8	-17 28.3	99 52.8	-21 22.6
22	154 5.8	-14 36.9	11 4.4	161 58.2	-17 26.3	129 54.0	-21 23.3
Δ	0	-8		37	10	6	-4

UT	MJESEC $S_\leftmoon$	MJESEC Δ	MJESEC $\delta_\leftmoon$	MJESEC Δ	JUPITER S_4	JUPITER δ_4	SATURN S_η	SATURN δ_η
h	° ′		° ′		° ′	° ′	° ′	° ′
0	251 42.4	102	8 25.4	-140	45 3.2	- 3 46.1	208 46.0	- 2 30.7
2	280 40.9	103	7 57.5	-141	75 8.5	- 3 46.2	238 50.3	- 2 30.9
4	309 39.4	103	7 29.3	-142	105 13.7	- 3 46.3	268 54.7	- 2 31.2
6	338 37.9	103	7 1.0	-143	135 18.9	- 3 46.4	298 59.1	- 2 31.4
8	7 36.6	103	6 32.5	-144	165 24.1	- 3 46.5	329 3.5	- 2 31.6
10	36 35.2	103	6 3.8	-144	195 29.3	- 3 46.6	359 7.9	- 2 31.8
12	65 33.9	104	5 34.9	-145	225 34.5	- 3 46.7	29 12.3	- 2 32.0
14	94 32.6	104	5 5.8	-146	255 39.7	- 3 46.8	59 16.7	- 2 32.2
16	123 31.4	104	4 36.6	-147	285 44.9	- 3 46.9	89 21.1	- 2 32.4
18	152 30.1	104	4 7.3	-147	315 50.1	- 3 47.0	119 25.5	- 2 32.7
20	181 28.9	104	3 37.9	-148	345 55.3	- 3 47.1	149 29.9	- 2 32.9
22	210 27.7	104	3 8.3	-148	16 .5	- 3 47.2	179 34.3	- 2 33.1
Δ					26	0	22	-1

φ	SUNCE IZLAZ	SUNCE ZALAZ	TRAJANJE SUMRAKA GRAĐ.	TRAJANJE SUMRAKA ASTR.	MJESEC IZLAZ	MJESEC Δ/24	MJESEC ZALAZ	MJESEC Δ/24
N	h min	h min	h min	h min	h min	min	h min	min
60	7 22	16 5	0 45	2 23	0 17	4.0	14 16	.3
55	7 3	16 23	0 38	2 3	0 27	3.7	14 10	.6
50	6 49	16 37	0 34	1 50	0 36	3.4	14 5	.9
45	6 38	16 48	0 31	1 39	0 42	3.2	14 1	1.1
40	6 29	16 58	0 28	1 32	0 48	3.0	13 58	1.2
35	6 21	17 6	0 26	1 26	0 53	2.9	13 55	1.4
30	6 14	17 13	0 25	1 21	0 57	2.7	13 53	1.5
20	6 1	17 26	0 23	1 15	1 4	2.5	13 48	1.7
10	5 51	17 37	0 22	1 12	1 10	2.3	13 44	1.9
0	5 40	17 47	0 21	1 11	1 16	2.1	13 41	2.1
10	5 30	17 58	0 22	1 13	1 22	1.9	13 37	2.3
20	5 19	18 9	0 23	1 18	1 29	1.7	13 33	2.5
30	5 6	18 22	0 25	1 27	1 36	1.5	13 28	2.7
35	4 58	18 30	0 27	1 33	1 40	1.4	13 25	2.9
40	4 49	18 39	0 29	1 43	1 45	1.2	13 22	3.0
45	4 39	18 49	0 32	1 56	1 50	1.1	13 18	3.2
50	4 27	19 1	0 36	2 17	1 57	.9	13 14	3.4
55	4 11	19 17	0 43	2 60	2 5	.6	13 8	3.7
60	3 50	19 39	0 52	: ::	2 15	.3	13 1	4.0
S								

SUNCE UT	SUNCE $e = T_p - UT$	SUNCE Δ/24	SUNCE r	MJESEC Prolaz	MJESEC Δ/24	MJESEC $\pi_\leftmoon$	MJESEC r
h	min s	s	′	h min	min	′	′
00	16 21.9	.1	16.1	$T_{\overline{m}}$ 7 28	2.1	59.5	16.2
12	16 22.7	$T_{\overline{m}_\odot}$ 11 h 43.6 min		Starost 24.2 d	Faza ◑		

PLANETE

Pl.	$T_{\overline{m}}$	π	360−α	Vel.	Pl.	$T_{\overline{m}}$	π	360−α	Vel.
	h min	′	°			h min	′	°	
♀	11 15	.5	150	-3.9	♃	20 56	.0	5	-2.6
♂	13 21	.1	120	1.4	♄	10 3	.0	169	1.0

2. NOVEMBAR UTORAK

UT	SUNCE $S_\odot$	SUNCE $\delta_\odot$	PROLJ. TAČKA S_Υ	VENERA S_φ	VENERA δ_φ	MARS S_σ	MARS δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	184 5.8	-14 38.5	41 9.4	192 5.6	-17 24.2	159 55.1	-21 24.0
2	214 5.8	-14 40.1	71 14.3	222 12.9	-17 22.1	189 56.2	-21 24.8
4	244 5.9	-14 41.7	101 19.2	252 20.2	-17 20.1	219 57.4	-21 25.5
6	274 5.9	-14 43.3	131 24.1	282 27.6	-17 18.0	249 58.5	-21 26.2
8	304 5.9	-14 44.9	161 29.1	312 34.9	-17 16.0	279 59.6	-21 27.0
10	334 5.9	-14 46.4	191 34.0	342 42.2	-17 13.9	310 .8	-21 27.7
12	4 5.9	-14 48.0	221 38.9	12 49.5	-17 11.8	340 1.9	-21 28.4
14	34 6.0	-14 49.6	251 43.9	42 56.8	-17 9.8	10 3.0	-21 29.1
16	64 6.0	-14 51.2	281 48.8	73 4.1	-17 7.7	40 4.1	-21 29.9
18	94 6.0	-14 52.7	311 53.7	103 11.4	-17 5.6	70 5.3	-21 30.6
20	124 6.0	-14 54.3	341 58.6	133 18.7	-17 3.5	100 6.4	-21 31.3
22	154 6.0	-14 55.9	12 3.6	163 25.9	-17 1.5	130 7.5	-21 32.0
Δ	0	-8		37	10	6	-4

UT	MJESEC $S_\leftmoon$	MJESEC Δ	MJESEC $\delta_\leftmoon$	MJESEC Δ	JUPITER S_4	JUPITER δ_4	SATURN S_η	SATURN δ_η
h	° ′		° ′		° ′	° ′	° ′	° ′
0	239 26.4	104	2 38.7	-149	46 5.7	- 3 47.3	209 38.7	- 2 33.3
2	268 25.2	104	2 8.9	-149	76 10.9	- 3 47.4	239 43.1	- 2 33.5
4	297 23.9	103	1 39.1	-149	106 16.1	- 3 47.4	269 47.5	- 2 33.7
6	326 22.6	103	1 9.2	-150	136 21.3	- 3 47.5	299 51.9	- 2 33.9
8	355 21.3	103	0 39.3	-150	166 26.5	- 3 47.6	329 56.3	- 2 34.1
10	24 19.9	103	0 9.3	-150	196 31.6	- 3 47.7	0 .7	- 2 34.4
12	53 18.4	102	- 0 20.7	-150	226 36.8	- 3 47.8	30 5.1	- 2 34.6
14	82 16.9	102	- 0 50.7	-150	256 42.0	- 3 47.9	60 9.5	- 2 34.8
16	111 15.3	102	- 1 20.8	-150	286 47.2	- 3 48.0	90 13.9	- 2 35.0
18	140 13.7	101	- 1 50.8	-150	316 52.4	- 3 48.1	120 18.3	- 2 35.2
20	169 11.9	101	- 2 20.8	-150	346 57.6	- 3 48.2	150 22.7	- 2 35.4
22	198 10.1	100	- 2 50.7	-150	17 2.8	- 3 48.3	180 27.1	- 2 35.6
Δ					26	0	22	-1

φ	SUNCE IZLAZ	SUNCE ZALAZ	TRAJANJE SUMRAKA GRAĐ.	TRAJANJE SUMRAKA ASTR.	MJESEC IZLAZ	MJESEC Δ/24	MJESEC ZALAZ	MJESEC Δ/24
N	h min	h min	h min	h min	h min	min	h min	min
60	7 24	16 2	0 45	2 23	1 53	4.0	14 24	.3
55	7 5	16 21	0 39	2 4	1 55	3.7	14 25	.6
50	6 51	16 36	0 34	1 50	1 57	3.4	14 26	.9
45	6 40	16 47	0 31	1 39	1 59	3.2	14 27	1.1
40	6 30	16 57	0 28	1 32	2 0	3.0	14 28	1.3
35	6 22	17 5	0 26	1 26	2 1	2.9	14 28	1.4
30	6 14	17 12	0 25	1 21	2 2	2.8	14 29	1.5
20	6 2	17 25	0 23	1 15	2 4	2.5	14 30	1.8
10	5 51	17 36	0 22	1 12	2 6	2.3	14 31	2.0
0	5 40	17 47	0 21	1 11	2 7	2.1	14 31	2.1
10	5 29	17 58	0 22	1 13	2 9	1.9	14 32	2.3
20	5 18	18 9	0 23	1 18	2 10	1.7	14 33	2.5
30	5 5	18 23	0 25	1 27	2 12	1.5	14 34	2.8
35	4 57	18 31	0 27	1 34	2 14	1.4	14 34	2.9
40	4 48	18 40	0 29	1 43	2 15	1.2	14 35	3.1
45	4 38	18 50	0 32	1 57	2 16	1.1	14 35	3.2
50	4 25	19 3	0 37	2 19	2 18	.9	14 36	3.5
55	4 9	19 19	0 43	3 3	2 20	.6	14 37	3.7
60	3 48	19 41	0 53	: ::	2 23	.3	14 38	4.1
S								

SUNCE UT	SUNCE $e = T_p - UT$	SUNCE Δ/24	SUNCE r	MJESEC Prolaz	MJESEC Δ/24	MJESEC $\pi_\leftmoon$	MJESEC r
h	min s	s	′	h min	min	′	′
00	16 23.5	.0	16.1	$T_{\overline{m}}$ 8 19	2.1	59.9	16.3
12	16 23.8	$T_{\overline{m}_\odot}$ 11 h 43.6 min		Starost 25.2 d	Faza ◑		

PLANETE

Pl.	$T_{\overline{m}}$	π	360−α	Vel.	Pl.	$T_{\overline{m}}$	π	360−α	Vel.
	h min	′	°			h min	′	°	
♀	11 9	.5	151	-4.0	♃	20 52	.0	5	-2.6
♂	13 20	.1	119	1.4	♄	9 60	.0	168	1.0

UT	SUNCE $S_\odot$	$\delta_\odot$	PROLJ. TAČKA S_Υ	VENERA S_φ	δ_φ	MARS S_σ	δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	184 6.0	-14 57.5	42 8.5	193 33.2	-16 59.4	160 8.6	-21 32.7
2	214 6.0	-14 59.0	72 13.4	223 40.4	-16 57.3	190 9.8	-21 33.5
4	244 6.0	-15 .6	102 18.3	253 47.7	-16 55.3	220 10.9	-21 34.2
6	274 6.0	-15 2.2	132 23.3	283 54.9	-16 53.2	250 12.0	-21 34.9
8	304 6.0	-15 3.7	162 28.2	314 2.1	-16 51.1	280 13.1	-21 35.6
10	334 6.0	-15 5.3	192 33.1	344 9.3	-16 49.0	310 14.2	-21 36.3
12	4 6.0	-15 6.8	222 38.1	14 16.5	-16 47.0	340 15.3	-21 37.0
14	34 6.0	-15 8.4	252 43.0	44 23.7	-16 44.9	10 16.5	-21 37.7
16	64 6.0	-15 10.0	282 47.9	74 30.8	-16 42.8	40 17.6	-21 38.4
18	94 6.0	-15 11.5	312 52.8	104 38.0	-16 40.8	70 18.7	-21 39.2
20	124 6.0	-15 13.1	342 57.8	134 45.2	-16 38.7	100 19.8	-21 39.9
22	154 6.0	-15 14.6	13 2.7	164 52.3	-16 36.6	130 20.9	-21 40.6
Δ	0	-8		36	10	6	-4

UT	MJESEC $S_\leftmoon$	Δ	$\delta_\leftmoon$	Δ	JUPITER S_4	δ_4	SATURN S_η	δ_η
h	° ′		° ′		° ′	° ′	° ′	° ′
0	227 8.2	100	- 3 20.7	-149	47 7.9	- 3 48.4	210 31.5	- 2 35.8
2	256 6.1	99	- 3 50.5	-149	77 13.1	- 3 48.4	240 35.9	- 2 36.0
4	285 4.0	99	- 4 20.3	-148	107 18.3	- 3 48.5	270 40.3	- 2 36.3
6	314 1.7	98	- 4 50.0	-148	137 23.5	- 3 48.6	300 44.7	- 2 36.5
8	342 59.3	97	- 5 19.6	-147	167 28.7	- 3 48.7	330 49.1	- 2 36.7
10	11 56.8	97	- 5 49.1	-147	197 33.8	- 3 48.8	0 53.5	- 2 36.9
12	40 54.1	96	- 6 18.4	-146	227 39.0	- 3 48.9	30 58.0	- 2 37.1
14	69 51.3	95	- 6 47.7	-145	257 44.2	- 3 49.0	61 2.4	- 2 37.3
16	98 48.3	94	- 7 16.7	-145	287 49.4	- 3 49.0	91 6.8	- 2 37.5
18	127 45.2	94	- 7 45.6	-144	317 54.5	- 3 49.1	121 11.2	- 2 37.7
20	156 41.9	93	- 8 14.4	-143	347 59.7	- 3 49.2	151 15.6	- 2 37.9
22	185 38.4	92	- 8 42.9	-142	18 4.9	- 3 49.3	181 20.0	- 2 38.2
Δ					26	0	22	-1

φ	SUNCE IZLAZ	ZALAZ	TRAJANJE SUMRAKA GRAĐ.	ASTR.	MJESEC IZLAZ	Δ/24	ZALAZ	Δ/24
N	h min	h min	h min	h min	h min	min	h min	min
60	7 27	15 59	0 46	2 23	3 30	4.1	14 32	.4
55	7 7	16 19	0 39	2 4	3 24	3.7	14 41	.7
50	6 53	16 34	0 34	1 50	3 20	3.5	14 48	1.0
45	6 41	16 46	0 31	1 40	3 16	3.3	14 53	1.2
40	6 31	16 56	0 28	1 32	3 13	3.1	14 58	1.4
35	6 23	17 4	0 26	1 26	3 10	2.9	15 2	1.5
30	6 15	17 12	0 25	1 21	3 8	2.8	15 6	1.6
20	6 2	17 25	0 23	1 15	3 5	2.6	15 12	1.8
10	5 51	17 36	0 22	1 12	3 1	2.4	15 18	2.0
0	5 40	17 47	0 21	1 11	2 58	2.2	15 23	2.2
10	5 29	17 58	0 22	1 13	2 55	2.0	15 28	2.4
20	5 17	18 10	0 23	1 18	2 52	1.8	15 34	2.6
30	5 4	18 24	0 25	1 27	2 49	1.6	15 40	2.8
35	4 56	18 32	0 27	1 34	2 47	1.4	15 44	2.9
40	4 47	18 41	0 29	1 44	2 45	1.3	15 48	3.1
45	4 36	18 52	0 32	1 58	2 42	1.1	15 53	3.3
50	4 23	19 5	0 37	2 20	2 39	.9	15 59	3.5
55	4 7	19 22	0 43	3 8	2 35	.7	16 6	3.8
60	3 45	19 44	0 54	: ::	2 31	.4	16 15	4.1
S								

SUNCE UT	e = Tp − UT	Δ/24	r	MJESEC Prolaz		Δ/24	$\pi_\leftmoon$	r
h	min s	s	′		h min	min	′	′
00	16 24.2	.0	16.1	$T_{\overline{m}}$	9 10	2.2	60.1	16.4
12	16 24.1	$T_{\overline{m}_\odot}$	11 h 43.6 min	Starost 26.2 d		Faza ●		

PLANETE

Pl.	$T_{\overline{m}}$	π	360−α	Vel.	Pl.	$T_{\overline{m}}$	π	360−α	Vel.
	h min	′	°			h min	′	°	
♀	11 3	.5	151	-4.0	♃	20 48	.0	5	-2.6
♂	13 19	.1	118	1.4	♄	9 56	.0	168	1.0

UT	SUNCE $S_\odot$	$\delta_\odot$	PROLJ. TAČKA S_Υ	VENERA S_φ	δ_φ	MARS S_σ	δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	184 6.0	-15 16.2	43 7.6	194 59.4	-16 34.6	160 22.0	-21 41.3
2	214 6.0	-15 17.7	73 12.6	225 6.6	-16 32.5	190 23.1	-21 42.0
4	244 5.9	-15 19.2	103 17.5	255 13.7	-16 30.4	220 24.2	-21 42.7
6	274 5.9	-15 20.8	133 22.4	285 20.8	-16 28.4	250 25.3	-21 43.4
8	304 5.9	-15 22.3	163 27.3	315 27.8	-16 26.3	280 26.4	-21 44.1
10	334 5.9	-15 23.9	193 32.3	345 34.9	-16 24.2	310 27.6	-21 44.8
12	4 5.9	-15 25.4	223 37.2	15 42.0	-16 22.2	340 28.7	-21 45.4
14	34 5.9	-15 27.0	253 42.1	45 49.0	-16 20.1	10 29.8	-21 46.1
16	64 5.8	-15 28.5	283 47.1	75 56.1	-16 18.0	40 30.9	-21 46.8
18	94 5.8	-15 30.0	313 52.0	106 3.1	-16 16.0	70 32.0	-21 47.5
20	124 5.8	-15 31.6	343 56.9	136 10.1	-16 13.9	100 33.1	-21 48.2
22	154 5.8	-15 33.1	14 1.8	166 17.2	-16 11.9	130 34.2	-21 48.9
Δ	0	-8		35	10	6	-3

UT	MJESEC $S_\leftmoon$	Δ	$\delta_\leftmoon$	Δ	JUPITER S_4	δ_4	SATURN S_η	δ_η
h	° ′		° ′		° ′	° ′	° ′	° ′
0	214 34.8	91	- 9 11.2	-141	48 10.0	- 3 49.4	211 24.4	- 2 38.4
2	243 31.0	90	- 9 39.3	-139	78 15.2	- 3 49.5	241 28.8	- 2 38.6
4	272 27.0	89	-10 7.2	-138	108 20.4	- 3 49.5	271 33.2	- 2 38.8
6	301 22.8	88	-10 34.8	-137	138 25.5	- 3 49.6	301 37.6	- 2 39.0
8	330 18.4	87	-11 2.2	-136	168 30.7	- 3 49.7	331 42.0	- 2 39.2
10	359 13.8	86	-11 29.3	-134	198 35.8	- 3 49.8	1 46.4	- 2 39.4
12	28 9.0	85	-11 56.1	-133	228 41.0	- 3 49.9	31 50.8	- 2 39.6
14	57 4.0	84	-12 22.7	-131	258 46.2	- 3 49.9	61 55.2	- 2 39.8
16	85 58.8	83	-12 48.9	-129	288 51.3	- 3 50.0	91 59.6	- 2 40.0
18	114 53.4	82	-13 14.8	-128	318 56.5	- 3 50.1	122 4.0	- 2 40.2
20	143 47.8	81	-13 40.3	-126	349 1.6	- 3 50.2	152 8.4	- 2 40.5
22	172 42.0	80	-14 5.5	-124	19 6.8	- 3 50.2	182 12.8	- 2 40.7
Δ					26	0	22	-1

φ	SUNCE IZLAZ	ZALAZ	TRAJANJE SUMRAKA GRAĐ.	ASTR.	MJESEC IZLAZ	Δ/24	ZALAZ	Δ/24
N	h min	h min	h min	h min	h min	min	h min	min
60	7 30	15 57	0 46	2 24	5 8	4.2	14 41	.5
55	7 10	16 17	0 39	2 4	4 54	3.8	14 58	.9
50	6 54	16 32	0 34	1 50	4 43	3.5	15 11	1.2
45	6 42	16 44	0 31	1 40	4 34	3.3	15 22	1.4
40	6 32	16 54	0 28	1 32	4 27	3.1	15 30	1.5
35	6 24	17 3	0 26	1 26	4 21	3.0	15 38	1.7
30	6 16	17 11	0 25	1 21	4 15	2.8	15 45	1.8
20	6 3	17 24	0 23	1 15	4 6	2.6	15 56	2.0
10	5 51	17 36	0 22	1 12	3 58	2.4	16 6	2.1
0	5 40	17 47	0 21	1 11	3 51	2.3	16 16	2.3
10	5 29	17 58	0 22	1 13	3 43	2.1	16 26	2.5
20	5 17	18 10	0 23	1 18	3 35	1.9	16 36	2.6
30	5 3	18 25	0 25	1 27	3 26	1.7	16 48	2.8
35	4 55	18 33	0 27	1 34	3 21	1.6	16 54	3.0
40	4 46	18 42	0 29	1 44	3 16	1.4	17 2	3.1
45	4 35	18 53	0 33	1 59	3 9	1.3	17 11	3.3
50	4 22	19 7	0 37	2 22	3 1	1.1	17 22	3.5
55	4 5	19 24	0 43	3 12	2 52	.8	17 36	3.8
60	3 42	19 47	0 54	: ::	2 40	.5	17 55	4.2
S								

SUNCE UT	e = Tp − UT	Δ/24	r	MJESEC Prolaz		Δ/24	$\pi_\leftmoon$	r
h	min s	s	′		h min	min	′	′
00	16 24.1	.0	16.2	$T_{\overline{m}}$	10 3	2.3	60.2	16.4
12	16 23.6	$T_{\overline{m}_\odot}$	11 h 43.6 min	Starost 27.2 d		Faza ●		

PLANETE

Pl.	$T_{\overline{m}}$	π	360−α	Vel.	Pl.	$T_{\overline{m}}$	π	360−α	Vel.
	h min	′	°			h min	′	°	
♀	10 57	.5	152	-4.0	♃	20 44	.0	5	-2.6
♂	13 18	.1	117	1.4	♄	9 53	.0	168	1.0

UT	SUNCE $S_\odot$	$\delta_\odot$	PROLJ. TAČKA S_Υ	VENERA S_φ	δ_φ	MARS S_σ	δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	184 5.7	-15 34.6	44 6.8	196 24.2	-16 9.8	160 35.2	-21 49.6
2	214 5.7	-15 36.1	74 11.7	226 31.1	-16 7.8	190 36.3	-21 50.3
4	244 5.7	-15 37.7	104 16.6	256 38.1	-16 5.7	220 37.4	-21 51.0
6	274 5.6	-15 39.2	134 21.6	286 45.1	-16 3.7	250 38.5	-21 51.6
8	304 5.6	-15 40.7	164 26.5	316 52.0	-16 1.6	280 39.6	-21 52.3
10	334 5.6	-15 42.2	194 31.4	346 59.0	-15 59.6	310 40.7	-21 53.0
12	4 5.5	-15 43.7	224 36.3	17 5.9	-15 57.5	340 41.8	-21 53.7
14	34 5.5	-15 45.3	254 41.3	47 12.8	-15 55.5	10 42.9	-21 54.3
16	64 5.5	-15 46.8	284 46.2	77 19.7	-15 53.5	40 44.0	-21 55.0
18	94 5.4	-15 48.3	314 51.1	107 26.6	-15 51.4	70 45.1	-21 55.7
20	124 5.4	-15 49.8	344 56.1	137 33.5	-15 49.4	100 46.2	-21 56.4
22	154 5.3	-15 51.3	15 1.0	167 40.3	-15 47.4	130 47.2	-21 57.0
Δ	0	-8		35	10	5	-3

UT	MJESEC $S_\leftmoon$	Δ	$\delta_\leftmoon$	Δ	JUPITER S_4	δ_4	SATURN S_η	δ_η
h	° ′		° ′		° ′	° ′	° ′	° ′
0	201 36.0	79	-14 30.3	-122	49 11.9	- 3 50.3	212 17.2	- 2 40.9
2	230 29.7	78	-14 54.8	-120	79 17.1	- 3 50.4	242 21.7	- 2 41.1
4	259 23.3	77	-15 18.9	-118	109 22.2	- 3 50.5	272 26.1	- 2 41.3
6	288 16.6	76	-15 42.5	-116	139 27.4	- 3 50.5	302 30.5	- 2 41.5
8	317 9.7	75	-16 5.8	-114	169 32.5	- 3 50.6	332 34.9	- 2 41.7
10	346 2.6	73	-16 28.6	-112	199 37.7	- 3 50.7	2 39.3	- 2 41.9
12	14 55.3	72	-16 51.0	-110	229 42.8	- 3 50.8	32 43.7	- 2 42.1
14	43 47.8	71	-17 13.0	-107	259 48.0	- 3 50.8	62 48.1	- 2 42.3
16	72 40.1	70	-17 34.5	-105	289 53.1	- 3 50.9	92 52.5	- 2 42.5
18	101 32.2	69	-17 55.5	-103	319 58.3	- 3 51.0	122 56.9	- 2 42.7
20	130 24.0	68	-18 16.0	-100	350 3.4	- 3 51.0	153 1.3	- 2 42.9
22	159 15.7	68	-18 36.1	-98	20 8.5	- 3 51.1	183 5.7	- 2 43.1
Δ					26	0	22	-1

φ	SUNCE IZLAZ	ZALAZ	TRAJANJE SUMRAKA GRAĐ.	ASTR.	MJESEC IZLAZ	Δ/24	ZALAZ	Δ/24
N	h min	h min	h min	h min	h min	min	h min	min
60	7 32	15 54	0 46	2 24	6 48	4.1	14 54	.8
55	7 12	16 15	0 39	2 4	6 25	3.7	15 20	1.2
50	6 56	16 31	0 34	1 50	6 7	3.4	15 39	1.4
45	6 44	16 43	0 31	1 40	5 53	3.2	15 54	1.6
40	6 33	16 53	0 28	1 32	5 42	3.1	16 7	1.8
35	6 25	17 2	0 26	1 26	5 32	3.0	16 18	1.9
30	6 17	17 10	0 25	1 21	5 23	2.8	16 27	2.0
20	6 3	17 24	0 23	1 15	5 9	2.7	16 44	2.1
10	5 51	17 36	0 22	1 12	4 56	2.5	16 58	2.3
0	5 40	17 47	0 21	1 11	4 45	2.4	17 11	2.4
10	5 29	17 59	0 22	1 13	4 33	2.2	17 25	2.5
20	5 17	18 11	0 23	1 18	4 21	2.0	17 39	2.7
30	5 2	18 25	0 25	1 28	4 7	1.9	17 56	2.8
35	4 54	18 34	0 27	1 35	3 59	1.8	18 6	2.9
40	4 45	18 43	0 30	1 45	3 50	1.6	18 17	3.0
45	4 33	18 55	0 33	1 59	3 40	1.5	18 30	3.2
50	4 20	19 8	0 37	2 23	3 27	1.3	18 46	3.3
55	4 3	19 26	0 44	3 18	3 11	1.0	19 6	3.6
60	3 40	19 49	0 55	: ::	2 51	.6	19 34	4.0
S								

SUNCE UT	e = Tp − UT	Δ/24	r	MJESEC Prolaz		Δ/24	$\pi_\leftmoon$	r
h	min s	s	′		h min	min	′	′
00	16 23.1	-.1	16.2	$T_{\overline{m}}$	10 58	2.4	60.0	16.4
12	16 22.2	$T_{\overline{m}_\odot}$ 11 h 43.6 min		Starost 28.2 d		Faza ●		

PLANETE

Pl.	$T_{\overline{m}}$	π	360−α	Vel.	Pl.	$T_{\overline{m}}$	π	360−α	Vel.
	h min	′	°			h min	′	°	
♀	10 52	.5	152	-4.1	♃	20 40	.0	5	-2.6
♂	13 17	.1	116	1.4	♄	9 49	.0	168	1.0

UT	SUNCE $S_\odot$	$\delta_\odot$	PROLJ. TAČKA S_Υ	VENERA S_φ	δ_φ	MARS S_σ	δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	184 5.3	-15 52.8	45 5.9	197 47.2	-15 45.3	160 48.3	-21 57.7
2	214 5.2	-15 54.3	75 10.8	227 54.0	-15 43.3	190 49.4	-21 58.4
4	244 5.2	-15 55.8	105 15.8	258 .9	-15 41.3	220 50.5	-21 59.0
6	274 5.1	-15 57.3	135 20.7	288 7.7	-15 39.3	250 51.6	-21 59.7
8	304 5.1	-15 58.8	165 25.6	318 14.5	-15 37.2	280 52.6	-22 .4
10	334 5.0	-16 .3	195 30.6	348 21.3	-15 35.2	310 53.7	-22 1.0
12	4 5.0	-16 1.8	225 35.5	18 28.0	-15 33.2	340 54.8	-22 1.7
14	34 4.9	-16 3.3	255 40.4	48 34.8	-15 31.2	10 55.9	-22 2.4
16	64 4.9	-16 4.8	285 45.3	78 41.6	-15 29.2	40 56.9	-22 3.0
18	94 4.8	-16 6.3	315 50.3	108 48.3	-15 27.2	70 58.0	-22 3.7
20	124 4.8	-16 7.8	345 55.2	138 55.0	-15 25.2	100 59.1	-22 4.3
22	154 4.7	-16 9.2	16 .1	169 1.7	-15 23.2	131 .2	-22 5.0
Δ	0	-7		34	10	5	-3

UT	MJESEC $S_\leftmoon$	Δ	$\delta_\leftmoon$	Δ	JUPITER S_4	δ_4	SATURN S_η	δ_η
h	° ′		° ′		° ′	° ′	° ′	° ′
0	188 7.3	67	-18 55.7	-95	50 13.7	- 3 51.2	213 10.2	- 2 43.4
2	216 58.6	66	-19 14.7	-93	80 18.8	- 3 51.2	243 14.6	- 2 43.6
4	245 49.7	65	-19 33.2	-90	110 23.9	- 3 51.3	273 19.0	- 2 43.8
6	274 40.7	64	-19 51.2	-87	140 29.1	- 3 51.4	303 23.4	- 2 44.0
8	303 31.6	63	-20 8.7	-85	170 34.2	- 3 51.4	333 27.8	- 2 44.2
10	332 22.2	63	-20 25.6	-82	200 39.3	- 3 51.5	3 32.2	- 2 44.4
12	1 12.8	62	-20 41.9	-79	230 44.5	- 3 51.6	33 36.6	- 2 44.6
14	30 3.1	61	-20 57.7	-76	260 49.6	- 3 51.6	63 41.0	- 2 44.8
16	58 53.4	61	-21 12.9	-73	290 54.7	- 3 51.7	93 45.4	- 2 45.0
18	87 43.5	60	-21 27.6	-70	320 59.8	- 3 51.8	123 49.9	- 2 45.2
20	116 33.6	60	-21 41.7	-67	351 5.0	- 3 51.8	153 54.3	- 2 45.4
22	145 23.5	59	-21 55.1	-64	21 10.1	- 3 51.9	183 58.7	- 2 45.6
Δ					26	0	22	-1

φ	SUNCE IZLAZ	ZALAZ	TRAJANJE SUMRAKA GRAĐ.	ASTR.	MJESEC IZLAZ	Δ/24	ZALAZ	Δ/24
N	h min	h min	h min	h min	h min	min	h min	min
60	7 35	15 52	0 46	2 25	8 27	3.8	15 13	1.3
55	7 14	16 13	0 39	2 5	7 53	3.4	15 48	1.6
50	6 58	16 29	0 34	1 51	7 29	3.2	16 13	1.8
45	6 45	16 42	0 31	1 40	7 11	3.1	16 33	1.9
40	6 35	16 52	0 28	1 32	6 55	2.9	16 49	2.0
35	6 26	17 1	0 26	1 26	6 43	2.8	17 2	2.1
30	6 18	17 9	0 25	1 22	6 32	2.8	17 14	2.2
20	6 4	17 23	0 23	1 15	6 13	2.6	17 35	2.3
10	5 52	17 36	0 22	1 12	5 56	2.5	17 52	2.4
0	5 40	17 47	0 22	1 12	5 41	2.4	18 9	2.4
10	5 29	17 59	0 22	1 14	5 26	2.3	18 25	2.5
20	5 16	18 12	0 23	1 18	5 10	2.2	18 43	2.6
30	5 2	18 26	0 26	1 28	4 52	2.1	19 4	2.7
35	4 53	18 35	0 27	1 35	4 41	2.0	19 16	2.8
40	4 44	18 44	0 30	1 45	4 29	1.9	19 29	2.8
45	4 32	18 56	0 33	2 0	4 15	1.8	19 46	2.9
50	4 18	19 10	0 37	2 25	3 58	1.6	20 6	3.0
55	4 1	19 28	0 44	3 24	3 36	1.4	20 32	3.2
60	3 37	19 52	0 56	: ::	3 6	1.0	21 10	3.5
S								

SUNCE UT	e = Tp − UT	Δ/24	r	MJESEC Prolaz		Δ/24	$\pi_\leftmoon$	r
h	min s	s	′		h min	min	′	′
00	16 21.3	-.1	16.2	$T_{\overline{m}}$	11 55	2.4	59.6	16.2
12	16 20.0	$T_{\overline{m}_\odot}$ 11 h 43.7 min		Starost 29.2 d		Faza ●		

PLANETE

Pl.	$T_{\overline{m}}$	π	360−α	Vel.	Pl.	$T_{\overline{m}}$	π	360−α	Vel.
	h min	′	°			h min	′	°	
♀	10 46	.5	153	-4.1	♃	20 36	.0	5	-2.6
♂	13 16	.1	116	1.4	♄	9 46	.0	168	1.0

UT	SUNCE $S_\odot$	$\delta_\odot$	PROLJ. TAČKA S_Υ	VENERA S_φ	δ_φ	MARS S_σ	δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	184 4.6	-16 10.7	46 5.0	199 8.4	-15 21.2	161 1.2	-22 5.6
2	214 4.6	-16 12.2	76 10.0	229 15.1	-15 19.2	191 2.3	-22 6.3
4	244 4.5	-16 13.7	106 14.9	259 21.8	-15 17.2	221 3.4	-22 6.9
6	274 4.4	-16 15.2	136 19.8	289 28.4	-15 15.2	251 4.4	-22 7.6
8	304 4.4	-16 16.6	166 24.8	319 35.1	-15 13.3	281 5.5	-22 8.2
10	334 4.3	-16 18.1	196 29.7	349 41.7	-15 11.3	311 6.6	-22 8.9
12	4 4.2	-16 19.6	226 34.6	19 48.3	-15 9.3	341 7.6	-22 9.5
14	34 4.1	-16 21.1	256 39.5	49 54.9	-15 7.3	11 8.7	-22 10.2
16	64 4.1	-16 22.5	286 44.5	80 1.5	-15 5.4	41 9.8	-22 10.8
18	94 4.0	-16 24.0	316 49.4	110 8.1	-15 3.4	71 10.8	-22 11.4
20	124 3.9	-16 25.5	346 54.3	140 14.7	-15 1.5	101 11.9	-22 12.1
22	154 3.8	-16 26.9	16 59.3	170 21.2	-14 59.5	131 12.9	-22 12.7
Δ	0	-7		33	10	5	-3

UT	MJESEC $S_\leftmoon$	Δ	$\delta_\leftmoon$	Δ	JUPITER $S_\jupiter$	$\delta_\jupiter$	SATURN $S_\saturn$	$\delta_\saturn$
h	° ′		° ′		° ′	° ′	° ′	° ′
0	174 13.4	59	-22 8.0	-61	51 15.2	- 3 51.9	214 3.1	- 2 45.8
2	203 3.1	59	-22 20.3	-58	81 20.3	- 3 52.0	244 7.5	- 2 46.0
4	231 52.9	58	-22 32.0	-55	111 25.4	- 3 52.1	274 11.9	- 2 46.2
6	260 42.5	58	-22 43.0	-52	141 30.6	- 3 52.1	304 16.3	- 2 46.4
8	289 32.1	58	-22 53.5	-49	171 35.7	- 3 52.2	334 20.8	- 2 46.6
10	318 21.7	58	-23 3.3	-46	201 40.8	- 3 52.2	4 25.2	- 2 46.8
12	347 11.3	58	-23 12.6	-43	231 45.9	- 3 52.3	34 29.6	- 2 47.0
14	16 .9	58	-23 21.2	-40	261 51.0	- 3 52.4	64 34.0	- 2 47.3
16	44 50.4	58	-23 29.2	-37	291 56.1	- 3 52.4	94 38.4	- 2 47.5
18	73 40.0	58	-23 36.5	-34	322 1.2	- 3 52.5	124 42.8	- 2 47.7
20	102 29.7	58	-23 43.3	-31	352 6.4	- 3 52.5	154 47.2	- 2 47.9
22	131 19.4	59	-23 49.4	-28	22 11.5	- 3 52.6	184 51.7	- 2 48.1
Δ					26	0	22	-1

φ	SUNCE IZLAZ	ZALAZ	TRAJANJE SUMRAKA GRAĐ.	ASTR.	MJESEC IZLAZ	Δ/24	ZALAZ	Δ/24
N	h min	h min	h min	h min	h min	min	h min	min
60	7 37	15 49	0 47	2 25	9 58	3.1	15 43	2.0
55	7 16	16 11	0 39	2 5	9 15	2.9	16 27	2.1
50	6 59	16 27	0 35	1 51	8 46	2.8	16 57	2.2
45	6 46	16 40	0 31	1 40	8 24	2.7	17 19	2.3
40	6 36	16 51	0 28	1 32	8 6	2.7	17 38	2.3
35	6 27	17 1	0 26	1 26	7 51	2.6	17 53	2.3
30	6 18	17 9	0 25	1 22	7 38	2.6	18 6	2.3
20	6 4	17 23	0 23	1 15	7 16	2.5	18 29	2.4
10	5 52	17 35	0 22	1 12	6 57	2.5	18 49	2.4
0	5 40	17 47	0 22	1 12	6 39	2.4	19 7	2.4
10	5 28	17 59	0 22	1 14	6 22	2.4	19 26	2.4
20	5 16	18 12	0 23	1 19	6 3	2.3	19 46	2.5
30	5 1	18 27	0 26	1 28	5 41	2.3	20 8	2.5
35	4 52	18 36	0 27	1 35	5 29	2.2	20 22	2.5
40	4 42	18 46	0 30	1 46	5 14	2.2	20 37	2.5
45	4 31	18 57	0 33	2 1	4 57	2.1	20 56	2.5
50	4 17	19 12	0 38	2 26	4 36	2.0	21 19	2.5
55	3 59	19 30	0 44	3 32	4 9	1.9	21 49	2.6
60	3 35	19 55	0 56	: ::	3 30	1.6	22 34	2.6
S								

SUNCE UT	e = Tp − UT	Δ/24	r	MJESEC Prolaz		Δ/24	$\pi_\leftmoon$	r
h	min s	s	′		h min	min	′	′
00	16 18.7	-.1	16.2	$T_{\overline{m}}$	12 53	2.5	59.0	16.1
12	16 17.0	$T_{\overline{m}_\odot}$	11 h 43.7 min	Starost	.8 d	Faza	●	

PLANETE

Pl.	$T_{\overline{m}}$	π	360−α	Vel.	Pl.	$T_{\overline{m}}$	π	360−α	Vel.
	h min	′	°			h min	′	°	
♀	10 41	.5	153	-4.2	♃	20 31	.0	5	-2.6
♂	13 15	.1	115	1.4	♄	9 42	.0	168	1.0

UT	SUNCE $S_\odot$	$\delta_\odot$	PROLJ. TAČKA S_Υ	VENERA S_φ	δ_φ	MARS S_σ	δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	184 3.8	-16 28.4	47 4.2	200 27.7	-14 57.6	161 14.0	-22 13.3
2	214 3.7	-16 29.8	77 9.1	230 34.3	-14 55.6	191 15.1	-22 14.0
4	244 3.6	-16 31.3	107 14.0	260 40.8	-14 53.7	221 16.1	-22 14.6
6	274 3.5	-16 32.8	137 19.0	290 47.3	-14 51.7	251 17.2	-22 15.2
8	304 3.4	-16 34.2	167 23.9	320 53.7	-14 49.8	281 18.2	-22 15.9
10	334 3.3	-16 35.7	197 28.8	351 .2	-14 47.9	311 19.3	-22 16.5
12	4 3.3	-16 37.1	227 33.8	21 6.6	-14 45.9	341 20.3	-22 17.1
14	34 3.2	-16 38.6	257 38.7	51 13.1	-14 44.0	11 21.4	-22 17.8
16	64 3.1	-16 40.0	287 43.6	81 19.5	-14 42.1	41 22.4	-22 18.4
18	94 3.0	-16 41.5	317 48.5	111 25.9	-14 40.2	71 23.5	-22 19.0
20	124 2.9	-16 42.9	347 53.5	141 32.3	-14 38.3	101 24.5	-22 19.6
22	154 2.8	-16 44.3	17 58.4	171 38.7	-14 36.4	131 25.6	-22 20.2
Δ	0	-7		32	10	5	-3

UT	MJESEC $S_\leftmoon$	Δ	$\delta_\leftmoon$	Δ	JUPITER $S_\jupiter$	$\delta_\jupiter$	SATURN $S_\saturn$	$\delta_\saturn$
h	° ′		° ′		° ′	° ′	° ′	° ′
0	160 9.1	59	-23 54.9	-24	52 16.6	- 3 52.6	214 56.1	- 2 48.3
2	188 59.0	60	-23 59.8	-21	82 21.7	- 3 52.7	245 .5	- 2 48.5
4	217 48.9	60	-24 4.0	-18	112 26.8	- 3 52.7	275 4.9	- 2 48.7
6	246 38.9	61	-24 7.7	-15	142 31.9	- 3 52.8	305 9.3	- 2 48.9
8	275 29.1	61	-24 10.7	-12	172 37.0	- 3 52.9	335 13.7	- 2 49.1
10	304 19.4	62	-24 13.1	-9	202 42.1	- 3 52.9	5 18.2	- 2 49.3
12	333 9.8	63	-24 14.9	-6	232 47.2	- 3 53.0	35 22.6	- 2 49.5
14	2 .4	64	-24 16.1	-3	262 52.3	- 3 53.0	65 27.0	- 2 49.7
16	30 51.1	65	-24 16.6	0	292 57.4	- 3 53.1	95 31.4	- 2 49.9
18	59 42.0	66	-24 16.6	3	323 2.5	- 3 53.1	125 35.8	- 2 50.1
20	88 33.2	67	-24 16.0	6	353 7.6	- 3 53.2	155 40.3	- 2 50.3
22	117 24.5	68	-24 14.8	9	23 12.6	- 3 53.2	185 44.7	- 2 50.5
Δ					25	0	22	-1

φ	SUNCE IZLAZ	ZALAZ	TRAJANJE SUMRAKA GRAĐ.	ASTR.	MJESEC IZLAZ	Δ/24	ZALAZ	Δ/24
N	h min	h min	h min	h min	h min	min	h min	min
60	7 40	15 47	0 47	2 26	11 12	2.1	16 30	2.8
55	7 18	16 9	0 40	2 5	10 25	2.2	17 18	2.6
50	7 1	16 26	0 35	1 51	9 53	2.3	17 50	2.6
45	6 48	16 39	0 31	1 41	9 29	2.3	18 14	2.5
40	6 37	16 50	0 29	1 33	9 10	2.3	18 33	2.5
35	6 27	16 60	0 27	1 26	8 54	2.3	18 49	2.5
30	6 19	17 8	0 25	1 22	8 40	2.3	19 2	2.4
20	6 5	17 22	0 23	1 15	8 17	2.4	19 26	2.4
10	5 52	17 35	0 22	1 12	7 57	2.4	19 46	2.4
0	5 40	17 47	0 22	1 12	7 38	2.4	20 5	2.3
10	5 28	17 59	0 22	1 14	7 19	2.4	20 24	2.3
20	5 15	18 13	0 23	1 19	6 59	2.4	20 45	2.3
30	5 0	18 28	0 26	1 28	6 36	2.4	21 8	2.2
35	4 51	18 37	0 27	1 36	6 22	2.4	21 22	2.2
40	4 41	18 47	0 30	1 46	6 6	2.4	21 37	2.1
45	4 30	18 59	0 33	2 2	5 47	2.4	21 56	2.1
50	4 15	19 13	0 38	2 28	5 24	2.4	22 20	2.0
55	3 57	19 32	0 45	3 44	4 53	2.4	22 51	1.9
60	3 32	19 57	0 57	: ::	4 8	2.4	23 37	1.7
S								

SUNCE UT	e = Tp − UT	Δ/24	r	MJESEC Prolaz		Δ/24	$\pi_\leftmoon$	r
h	min s	s	′		h min	min	′	′
00	16 15.2	-.2	16.2	$T_{\overline{m}}$	13 52	2.3	58.3	15.9
12	16 13.1	$T_{\overline{m}_\odot}$	11 h 43.8 min	Starost	1.8 d	Faza	●	

PLANETE

Pl.	$T_{\overline{m}}$	π	360−α	Vel.	Pl.	$T_{\overline{m}}$	π	360−α	Vel.
	h min	′	°			h min	′	°	
♀	10 36	.5	153	-4.2	♃	20 27	.0	5	-2.6
♂	13 15	.1	114	1.4	♄	9 39	.0	168	1.0

UT	SUNCE $S_\odot$	SUNCE $\delta_\odot$	PROLJ. TAČKA S_Υ	VENERA S_φ	VENERA δ_φ	MARS S_σ	MARS δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	184 2.7	-16 45.8	48 3.3	201 45.0	-14 34.5	161 26.6	-22 20.9
2	214 2.6	-16 47.2	78 8.3	231 51.4	-14 32.6	191 27.7	-22 21.5
4	244 2.5	-16 48.6	108 13.2	261 57.7	-14 30.7	221 28.7	-22 22.1
6	274 2.4	-16 50.1	138 18.1	292 4.0	-14 28.9	251 29.7	-22 22.7
8	304 2.3	-16 51.5	168 23.0	322 10.3	-14 27.0	281 30.8	-22 23.3
10	334 2.2	-16 52.9	198 28.0	352 16.6	-14 25.1	311 31.8	-22 23.9
12	4 2.1	-16 54.4	228 32.9	22 22.9	-14 23.2	341 32.9	-22 24.5
14	34 2.0	-16 55.8	258 37.8	52 29.2	-14 21.4	11 33.9	-22 25.1
16	64 1.9	-16 57.2	288 42.8	82 35.4	-14 19.5	41 34.9	-22 25.7
18	94 1.7	-16 58.6	318 47.7	112 41.6	-14 17.7	71 36.0	-22 26.4
20	124 1.6	-17 .0	348 52.6	142 47.8	-14 15.8	101 37.0	-22 27.0
22	154 1.5	-17 1.5	18 57.5	172 54.0	-14 14.0	131 38.1	-22 27.6
Δ	-1	-7		31	9	5	-3

UT	MJESEC $S_\leftmoon$	MJESEC Δ	MJESEC $\delta_\leftmoon$	MJESEC Δ	JUPITER S_4	JUPITER δ_4	SATURN S_η	SATURN δ_η
h	° ′		° ′		° ′	° ′	° ′	° ′
0	146 16.0	69	-24 13.0	12	53 17.7	- 3 53.2	215 49.1	- 2 50.7
2	175 7.8	70	-24 10.6	15	83 22.8	- 3 53.3	245 53.5	- 2 50.9
4	203 59.8	71	-24 7.7	18	113 27.9	- 3 53.3	275 57.9	- 2 51.1
6	232 52.1	73	-24 4.1	20	143 33.0	- 3 53.4	306 2.4	- 2 51.3
8	261 44.6	74	-24 .1	23	173 38.1	- 3 53.4	336 6.8	- 2 51.5
10	290 37.4	75	-23 55.4	26	203 43.2	- 3 53.5	6 11.2	- 2 51.7
12	319 30.5	77	-23 50.3	29	233 48.3	- 3 53.5	36 15.6	- 2 51.9
14	348 23.8	78	-23 44.5	31	263 53.3	- 3 53.6	66 20.0	- 2 52.1
16	17 17.4	80	-23 38.3	34	293 58.4	- 3 53.6	96 24.5	- 2 52.3
18	46 11.4	81	-23 31.5	36	324 3.5	- 3 53.6	126 28.9	- 2 52.5
20	75 5.6	83	-23 24.2	39	354 8.6	- 3 53.7	156 33.3	- 2 52.7
22	104 .2	84	-23 16.4	42	24 13.7	- 3 53.7	186 37.7	- 2 52.9
Δ					25	0	22	-1

φ	SUNCE IZLAZ	SUNCE ZALAZ	TRAJANJE SUMRAKA GRAĐ.	TRAJANJE SUMRAKA ASTR.	MJESEC IZLAZ	MJESEC Δ/24	MJESEC ZALAZ	MJESEC Δ/24
N	h min	h min	h min	h min	h min	min	h min	min
60	7 42	15 45	0 47	2 26	12 4	1.3	17 37	3.3
55	7 20	16 7	0 40	2 6	11 18	1.6	18 21	3.0
50	7 3	16 24	0 35	1 51	10 48	1.8	18 51	2.8
45	6 49	16 38	0 31	1 41	10 25	1.9	19 14	2.7
40	6 38	16 49	0 29	1 33	10 6	1.9	19 33	2.6
35	6 28	16 59	0 27	1 27	9 50	2.0	19 48	2.5
30	6 20	17 7	0 25	1 22	9 37	2.1	20 1	2.5
20	6 5	17 22	0 23	1 16	9 14	2.1	20 24	2.4
10	5 53	17 35	0 22	1 12	8 54	2.2	20 43	2.3
0	5 40	17 47	0 22	1 12	8 35	2.3	21 1	2.2
10	5 28	17 60	0 22	1 14	8 16	2.3	21 19	2.1
20	5 15	18 13	0 23	1 19	7 56	2.4	21 39	2.0
30	4 60	18 29	0 26	1 29	7 33	2.5	22 1	1.9
35	4 51	18 38	0 28	1 36	7 19	2.5	22 14	1.9
40	4 40	18 48	0 30	1 47	7 4	2.6	22 29	1.8
45	4 28	19 0	0 33	2 3	6 45	2.6	22 46	1.7
50	4 14	19 15	0 38	2 29	6 22	2.7	23 8	1.6
55	3 55	19 34	0 45	: ::	5 51	2.8	23 37	1.4
60	3 29	20 0	0 58	: ::	5 5	3.1	. . .	.0
S								

SUNCE UT	SUNCE $e = T_p - UT$	SUNCE Δ/24	SUNCE r	MJESEC Prolaz	MJESEC Δ/24	MJESEC $\pi_\leftmoon$	MJESEC r
h	min s	s	′	h min	min	′	′
00	16 10.9	-.2	16.2	$T_{\overline{m}}$ 14 48	2.2	57.5	15.7
12	16 8.4	$T_{\overline{m}_\odot}$ 11 h 43.9 min		Starost 2.8 d	Faza ●		

PLANETE

Pl.	$T_{\overline{m}}$	π	360−α	Vel.	Pl.	$T_{\overline{m}}$	π	360−α	Vel.
	h min	′	°			h min	′	°	
♀	10 31	.5	154	-4.2	♃	20 23	.0	5	-2.6
♂	13 14	.1	113	1.4	♄	9 35	.0	168	1.0

UT	SUNCE $S_\odot$	SUNCE $\delta_\odot$	PROLJ. TAČKA S_Υ	VENERA S_φ	VENERA δ_φ	MARS S_σ	MARS δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	184 1.4	-17 2.9	49 2.5	203 .2	-14 12.2	161 39.1	-22 28.2
2	214 1.3	-17 4.3	79 7.4	233 6.4	-14 10.3	191 40.1	-22 28.8
4	244 1.2	-17 5.7	109 12.3	263 12.5	-14 8.5	221 41.2	-22 29.4
6	274 1.1	-17 7.1	139 17.2	293 18.7	-14 6.7	251 42.2	-22 30.0
8	304 .9	-17 8.5	169 22.2	323 24.8	-14 4.9	281 43.2	-22 30.5
10	334 .8	-17 9.9	199 27.1	353 30.9	-14 3.1	311 44.2	-22 31.1
12	4 .7	-17 11.3	229 32.0	23 37.0	-14 1.3	341 45.3	-22 31.7
14	34 .6	-17 12.7	259 37.0	53 43.1	-13 59.5	11 46.3	-22 32.3
16	64 .4	-17 14.1	289 41.9	83 49.2	-13 57.7	41 47.3	-22 32.9
18	94 .3	-17 15.5	319 46.8	113 55.2	-13 55.9	71 48.3	-22 33.5
20	124 .2	-17 16.9	349 51.7	144 1.2	-13 54.2	101 49.4	-22 34.1
22	154 .0	-17 18.3	19 56.7	174 7.3	-13 52.4	131 50.4	-22 34.7
Δ	-1	-7		30	9	5	-3

UT	MJESEC $S_\leftmoon$	MJESEC Δ	MJESEC $\delta_\leftmoon$	MJESEC Δ	JUPITER S_4	JUPITER δ_4	SATURN S_η	SATURN δ_η
h	° ′		° ′		° ′	° ′	° ′	° ′
0	132 55.1	86	-23 8.1	44	54 18.7	- 3 53.8	216 42.2	- 2 53.1
2	161 50.3	88	-22 59.3	46	84 23.8	- 3 53.8	246 46.6	- 2 53.3
4	190 45.8	89	-22 50.0	49	114 28.9	- 3 53.9	276 51.0	- 2 53.5
6	219 41.7	91	-22 40.3	51	144 33.9	- 3 53.9	306 55.4	- 2 53.7
8	248 37.9	93	-22 30.0	53	174 39.0	- 3 53.9	336 59.9	- 2 53.9
10	277 34.5	94	-22 19.4	56	204 44.1	- 3 54.0	7 4.3	- 2 54.1
12	306 31.4	96	-22 8.2	58	234 49.2	- 3 54.0	37 8.7	- 2 54.3
14	335 28.6	98	-21 56.7	60	264 54.2	- 3 54.0	67 13.1	- 2 54.5
16	4 26.2	100	-21 44.7	62	294 59.3	- 3 54.1	97 17.5	- 2 54.7
18	33 24.2	101	-21 32.2	64	325 4.3	- 3 54.1	127 22.0	- 2 54.9
20	62 22.5	103	-21 19.4	66	355 9.4	- 3 54.1	157 26.4	- 2 55.1
22	91 21.1	105	-21 6.1	68	25 14.5	- 3 54.2	187 30.8	- 2 55.3
Δ					25	0	22	-1

φ	SUNCE IZLAZ	SUNCE ZALAZ	TRAJANJE SUMRAKA GRAĐ.	TRAJANJE SUMRAKA ASTR.	MJESEC IZLAZ	MJESEC Δ/24	MJESEC ZALAZ	MJESEC Δ/24
N	h min	h min	h min	h min	h min	min	h min	min
60	7 45	15 42	0 47	2 27	12 35	.8	18 55	3.5
55	7 22	16 6	0 40	2 6	11 57	1.1	19 32	3.1
50	7 4	16 23	0 35	1 52	11 30	1.4	19 59	2.9
45	6 51	16 37	0 31	1 41	11 9	1.5	20 19	2.7
40	6 39	16 48	0 29	1 33	10 53	1.6	20 35	2.6
35	6 29	16 58	0 27	1 27	10 38	1.7	20 48	2.5
30	6 21	17 7	0 25	1 22	10 26	1.8	21 0	2.4
20	6 6	17 22	0 23	1 16	10 5	1.9	21 20	2.3
10	5 53	17 35	0 22	1 13	9 46	2.0	21 38	2.1
0	5 40	17 47	0 22	1 12	9 29	2.1	21 54	2.0
10	5 28	18 0	0 22	1 14	9 12	2.2	22 10	1.9
20	5 14	18 14	0 23	1 19	8 53	2.3	22 27	1.8
30	4 59	18 29	0 26	1 29	8 32	2.4	22 47	1.7
35	4 50	18 39	0 28	1 37	8 19	2.5	22 58	1.6
40	4 39	18 49	0 30	1 47	8 5	2.6	23 11	1.5
45	4 27	19 2	0 33	2 3	7 48	2.7	23 27	1.4
50	4 12	19 17	0 38	2 31	7 27	2.8	23 45	1.2
55	3 53	19 36	0 45	: ::	6 59	3.0	. . .	.0
60	3 27	20 3	0 58	: ::	6 18	3.4	0 18	1.1
S								

SUNCE UT	SUNCE $e = T_p - UT$	SUNCE Δ/24	SUNCE r	MJESEC Prolaz	MJESEC Δ/24	MJESEC $\pi_\leftmoon$	MJESEC r
h	min s	s	′	h min	min	′	′
00	16 5.8	-.2	16.2	$T_{\overline{m}}$ 15 42	2.0	56.6	15.4
12	16 2.8	$T_{\overline{m}_\odot}$ 11 h 44.0 min		Starost 3.8 d	Faza ●		

PLANETE

Pl.	$T_{\overline{m}}$	π	360−α	Vel.	Pl.	$T_{\overline{m}}$	π	360−α	Vel.
	h min	′	°			h min	′	°	
♀	10 26	.5	154	-4.3	♃	20 19	.0	5	-2.6
♂	13 13	.1	113	1.4	♄	9 32	.0	168	1.0

UT	SUNCE $S_\odot$	SUNCE $\delta_\odot$	PROLJ. TAČKA S_Υ	VENERA S_φ	VENERA δ_φ	MARS S_σ	MARS δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	183 59.9	-17 19.7	50 1.6	204 13.3	-13 50.6	161 51.4	-22 35.2
2	213 59.8	-17 21.1	80 6.5	234 19.2	-13 48.9	191 52.4	-22 35.8
4	243 59.6	-17 22.4	110 11.5	264 25.2	-13 47.1	221 53.5	-22 36.4
6	273 59.5	-17 23.8	140 16.4	294 31.2	-13 45.4	251 54.5	-22 37.0
8	303 59.4	-17 25.2	170 21.3	324 37.1	-13 43.6	281 55.5	-22 37.6
10	333 59.2	-17 26.6	200 26.2	354 43.0	-13 41.9	311 56.5	-22 38.1
12	3 59.1	-17 28.0	230 31.2	24 48.9	-13 40.2	341 57.5	-22 38.7
14	33 58.9	-17 29.3	260 36.1	54 54.8	-13 38.5	11 58.5	-22 39.3
16	63 58.8	-17 30.7	290 41.0	85 .7	-13 36.7	41 59.5	-22 39.9
18	93 58.7	-17 32.1	320 46.0	115 6.6	-13 35.0	72 .6	-22 40.4
20	123 58.5	-17 33.4	350 50.9	145 12.4	-13 33.3	102 1.6	-22 41.0
22	153 58.4	-17 34.8	20 55.8	175 18.3	-13 31.6	132 2.6	-22 41.6
Δ	-1	-7		30	9	5	-3

UT	MJESEC $S_\leftmoon$	MJESEC Δ	MJESEC $\delta_\leftmoon$	MJESEC Δ	JUPITER S_4	JUPITER δ_4	SATURN S_η	SATURN δ_η
h	° ′		° ′		° ′	° ′	° ′	° ′
0	120 20.1	107	-20 52.5	70	55 19.5	- 3 54.2	217 35.3	- 2 55.5
2	149 19.5	109	-20 38.5	72	85 24.6	- 3 54.2	247 39.7	- 2 55.7
4	178 19.2	110	-20 24.1	74	115 29.6	- 3 54.3	277 44.1	- 2 55.9
6	207 19.2	112	-20 9.3	76	145 34.7	- 3 54.3	307 48.5	- 2 56.1
8	236 19.6	114	-19 54.1	77	175 39.8	- 3 54.3	337 53.0	- 2 56.3
10	265 20.4	115	-19 38.6	79	205 44.8	- 3 54.4	7 57.4	- 2 56.5
12	294 21.5	117	-19 22.8	81	235 49.9	- 3 54.4	38 1.8	- 2 56.7
14	323 22.9	119	-19 6.6	82	265 54.9	- 3 54.4	68 6.2	- 2 56.9
16	352 24.7	121	-18 50.1	84	295 60.0	- 3 54.5	98 10.7	- 2 57.1
18	21 26.8	122	-18 33.3	86	326 5.0	- 3 54.5	128 15.1	- 2 57.3
20	50 29.3	124	-18 16.2	87	356 10.0	- 3 54.5	158 19.5	- 2 57.5
22	79 32.1	126	-17 58.7	89	26 15.1	- 3 54.5	188 24.0	- 2 57.7
Δ					25	0	22	-1

φ	SUNCE IZLAZ	SUNCE ZALAZ	TRAJANJE SUMRAKA GRAĐ.	TRAJANJE SUMRAKA ASTR.	MJESEC IZLAZ	MJESEC Δ/24	MJESEC ZALAZ	MJESEC Δ/24
N	h min	h min	h min	h min	h min	min	h min	min
60	7 47	15 40	0 48	2 27	12 54	.5	20 18	3.4
55	7 24	16 4	0 40	2 6	12 25	.8	20 47	3.1
50	7 6	16 22	0 35	1 52	12 3	1.1	21 8	2.9
45	6 52	16 36	0 31	1 41	11 45	1.2	21 24	2.7
40	6 40	16 47	0 29	1 33	11 31	1.4	21 37	2.5
35	6 30	16 57	0 27	1 27	11 19	1.5	21 48	2.4
30	6 22	17 6	0 25	1 22	11 9	1.5	21 58	2.3
20	6 6	17 21	0 23	1 16	10 50	1.7	22 15	2.2
10	5 53	17 35	0 22	1 13	10 35	1.8	22 29	2.0
0	5 41	17 48	0 22	1 12	10 20	2.0	22 43	1.9
10	5 28	18 0	0 22	1 14	10 5	2.1	22 56	1.8
20	5 14	18 14	0 23	1 19	9 49	2.2	23 10	1.6
30	4 58	18 30	0 26	1 29	9 30	2.4	23 27	1.5
35	4 49	18 40	0 28	1 37	9 20	2.5	23 36	1.4
40	4 38	18 50	0 30	1 48	9 7	2.6	23 47	1.3
45	4 26	19 3	0 34	2 4	8 53	2.7	23 59	1.1
50	4 11	19 19	0 38	2 33	8 35	2.9	. . .	.0
55	3 51	19 38	0 46	: ::	8 12	3.1	0 10	1.0
60	3 24	20 5	0 59	: ::	7 40	3.4	0 44	.7
S								

SUNCE UT	SUNCE $e = T_p - UT$	SUNCE Δ/24	SUNCE r	MJESEC Prolaz	MJESEC Δ/24	MJESEC $\pi_\leftmoon$	MJESEC r
h	min s	s	′	h min	min	′	′
00	15 59.8	-.3	16.2	$T_{\overline{m}}$ 16 31	2.0	55.9	15.2
12	15 56.4	$T_{\overline{m}_\odot}$ 11 h 44.1 min		Starost 4.8 d	Faza ◐		

PLANETE

Pl.	$T_{\overline{m}}$	π	360−α	Vel.	Pl.	$T_{\overline{m}}$	π	360−α	Vel.
	h min	′	°			h min	′	°	
♀	10 21	.5	154	-4.3	♃	20 15	.0	5	-2.6
♂	13 12	.1	112	1.4	♄	9 28	.0	168	.9

UT	SUNCE $S_\odot$	SUNCE $\delta_\odot$	PROLJ. TAČKA S_Υ	VENERA S_φ	VENERA δ_φ	MARS S_σ	MARS δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	183 58.2	-17 36.2	51 .7	205 24.1	-13 30.0	162 3.6	-22 42.1
2	213 58.1	-17 37.5	81 5.7	235 29.9	-13 28.3	192 4.6	-22 42.7
4	243 57.9	-17 38.9	111 10.6	265 35.7	-13 26.6	222 5.6	-22 43.2
6	273 57.8	-17 40.3	141 15.5	295 41.4	-13 24.9	252 6.6	-22 43.8
8	303 57.6	-17 41.6	171 20.5	325 47.2	-13 23.3	282 7.6	-22 44.4
10	333 57.4	-17 43.0	201 25.4	355 52.9	-13 21.6	312 8.6	-22 44.9
12	3 57.3	-17 44.3	231 30.3	25 58.6	-13 20.0	342 9.6	-22 45.5
14	33 57.1	-17 45.7	261 35.2	56 4.3	-13 18.3	12 10.6	-22 46.0
16	63 57.0	-17 47.0	291 40.2	86 10.0	-13 16.7	42 11.6	-22 46.6
18	93 56.8	-17 48.4	321 45.1	116 15.7	-13 15.1	72 12.6	-22 47.1
20	123 56.6	-17 49.7	351 50.0	146 21.4	-13 13.5	102 13.6	-22 47.7
22	153 56.5	-17 51.0	21 55.0	176 27.0	-13 11.8	132 14.6	-22 48.2
Δ	-1	-7		29	8	5	-3

UT	MJESEC $S_\leftmoon$	MJESEC Δ	MJESEC $\delta_\leftmoon$	MJESEC Δ	JUPITER S_4	JUPITER δ_4	SATURN S_η	SATURN δ_η
h	° ′		° ′		° ′	° ′	° ′	° ′
0	108 35.2	127	-17 41.0	90	56 20.1	- 3 54.6	218 28.4	- 2 57.9
2	137 38.6	129	-17 23.0	91	86 25.2	- 3 54.6	248 32.8	- 2 58.0
4	166 42.3	130	-17 4.7	93	116 30.2	- 3 54.6	278 37.3	- 2 58.2
6	195 46.4	132	-16 46.1	94	146 35.3	- 3 54.7	308 41.7	- 2 58.4
8	224 50.7	133	-16 27.3	95	176 40.3	- 3 54.7	338 46.1	- 2 58.6
10	253 55.4	135	-16 8.2	97	206 45.3	- 3 54.7	8 50.5	- 2 58.8
12	283 .3	136	-15 48.9	98	236 50.4	- 3 54.7	38 55.0	- 2 59.0
14	312 5.6	138	-15 29.3	99	266 55.4	- 3 54.7	68 59.4	- 2 59.2
16	341 11.1	139	-15 9.5	100	297 .4	- 3 54.8	99 3.8	- 2 59.4
18	10 16.9	140	-14 49.4	101	327 5.5	- 3 54.8	129 8.3	- 2 59.6
20	39 23.0	142	-14 29.2	102	357 10.5	- 3 54.8	159 12.7	- 2 59.8
22	68 29.3	143	-14 8.7	103	27 15.5	- 3 54.8	189 17.1	- 2 60.0
Δ					25	0	22	-1

φ	SUNCE IZLAZ	SUNCE ZALAZ	TRAJANJE SUMRAKA GRAĐ.	TRAJANJE SUMRAKA ASTR.	MJESEC IZLAZ	MJESEC Δ/24	MJESEC ZALAZ	MJESEC Δ/24
N	h min	h min	h min	h min	h min	min	h min	min
60	7 50	15 38	0 48	2 28	13 7	.4	21 40	3.3
55	7 26	16 2	0 40	2 7	12 45	.7	22 1	3.0
50	7 8	16 20	0 35	1 52	12 28	.9	22 16	2.8
45	6 53	16 35	0 31	1 41	12 15	1.0	22 28	2.6
40	6 41	16 46	0 29	1 33	12 4	1.2	22 38	2.5
35	6 31	16 57	0 27	1 27	11 54	1.3	22 47	2.4
30	6 22	17 6	0 25	1 22	11 46	1.4	22 54	2.3
20	6 7	17 21	0 23	1 16	11 31	1.5	23 7	2.1
10	5 53	17 35	0 22	1 13	11 19	1.7	23 18	1.9
0	5 41	17 48	0 22	1 12	11 7	1.8	23 28	1.8
10	5 28	18 1	0 22	1 14	10 55	2.0	23 39	1.6
20	5 14	18 15	0 23	1 20	10 42	2.1	23 49	1.5
30	4 58	18 31	0 26	1 29	10 27	2.3	. . .	.0
35	4 48	18 41	0 28	1 37	10 19	2.4	. . .	.0
40	4 37	18 52	0 30	1 48	10 9	2.5	. . .	.0
45	4 25	19 4	0 34	2 5	9 58	2.6	. . .	.0
50	4 9	19 20	0 39	2 35	9 44	2.8	0 15	1.0
55	3 49	19 40	0 46	: ::	9 26	3.0	0 34	.7
60	3 22	20 8	1 0	: ::	9 2	3.4	0 60	.4
S								

SUNCE UT	SUNCE $e = T_p - UT$	SUNCE Δ/24	SUNCE r	MJESEC Prolaz	MJESEC Δ/24	MJESEC $\pi_\leftmoon$	MJESEC r
h	min s	s	′	h min	min	′	′
00	15 53.0	-.3	16.2	$T_{\overline{m}}$ 17 18	1.8	55.2	15.0
12	15 49.2	$T_{\overline{m}_\odot}$ 11 h 44.2 min		Starost 5.8 d	Faza ◐		

PLANETE

Pl.	$T_{\overline{m}}$	π	360−α	Vel.	Pl.	$T_{\overline{m}}$	π	360−α	Vel.
	h min	′	°			h min	′	°	
♀	10 16	.5	154	-4.3	♃	20 11	.0	5	-2.5
♂	13 11	.1	111	1.4	♄	9 25	.0	167	.9

UT	SUNCE $S_\odot$	SUNCE $\delta_\odot$	PROLJ. TAČKA S_Υ	VENERA S_φ	VENERA δ_φ	MARS S_σ	MARS δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	183 56.3	-17 52.4	51 59.9	206 32.6	-13 10.2	162 15.6	-22 48.8
2	213 56.1	-17 53.7	82 4.8	236 38.3	-13 8.6	192 16.6	-22 49.3
4	243 56.0	-17 55.1	112 9.7	266 43.9	-13 7.0	222 17.6	-22 49.9
6	273 55.8	-17 56.4	142 14.7	296 49.4	-13 5.5	252 18.6	-22 50.4
8	303 55.6	-17 57.7	172 19.6	326 55.0	-13 3.9	282 19.6	-22 50.9
10	333 55.5	-17 59.0	202 24.5	357 .5	-13 2.3	312 20.6	-22 51.5
12	3 55.3	-18 .4	232 29.5	27 6.1	-13 .7	342 21.6	-22 52.0
14	33 55.1	-18 1.7	262 34.4	57 11.6	-12 59.2	12 22.6	-22 52.6
16	63 54.9	-18 3.0	292 39.3	87 17.1	-12 57.6	42 23.6	-22 53.1
18	93 54.7	-18 4.3	322 44.2	117 22.6	-12 56.1	72 24.6	-22 53.6
20	123 54.6	-18 5.6	352 49.2	147 28.1	-12 54.6	102 25.6	-22 54.2
22	153 54.4	-18 7.0	22 54.1	177 33.5	-12 53.0	132 26.6	-22 54.7
Δ	-1	-7		28	8	5	-3

UT	MJESEC $S_\leftmoon$	MJESEC Δ	MJESEC $\delta_\leftmoon$	MJESEC Δ	JUPITER S_4	JUPITER δ_4	SATURN S_η	SATURN δ_η
h	° ′		° ′		° ′	° ′	° ′	° ′
0	97 35.9	144	-13 48.0	104	57 20.6	- 3 54.9	219 21.6	- 3 .2
2	126 42.8	145	-13 27.1	105	87 25.6	- 3 54.9	249 26.0	- 3 .4
4	155 49.9	147	-13 6.1	106	117 30.6	- 3 54.9	279 30.4	- 3 .6
6	184 57.2	148	-12 44.8	107	147 35.6	- 3 54.9	309 34.9	- 3 .8
8	214 4.8	149	-12 23.3	108	177 40.7	- 3 54.9	339 39.3	- 3 1.0
10	243 12.6	150	-12 1.7	109	207 45.7	- 3 54.9	9 43.8	- 3 1.2
12	272 20.6	151	-11 39.9	110	237 50.7	- 3 55.0	39 48.2	- 3 1.4
14	301 28.8	152	-11 18.0	111	267 55.7	- 3 55.0	69 52.6	- 3 1.5
16	330 37.2	153	-10 55.9	111	298 .7	- 3 55.0	99 57.1	- 3 1.7
18	359 45.8	154	-10 33.6	112	328 5.8	- 3 55.0	130 1.5	- 3 1.9
20	28 54.6	155	-10 11.2	113	358 10.8	- 3 55.0	160 5.9	- 3 2.1
22	58 3.6	156	- 9 48.7	113	28 15.8	- 3 55.0	190 10.4	- 3 2.3
Δ					25	0	22	-1

φ	SUNCE IZLAZ	SUNCE ZALAZ	TRAJANJE SUMRAKA GRAĐ.	TRAJANJE SUMRAKA ASTR.	MJESEC IZLAZ	MJESEC Δ/24	MJESEC ZALAZ	MJESEC Δ/24
N	h min	h min	h min	h min	h min	min	h min	min
60	7 53	15 35	0 48	2 29	13 16	.3	22 60	3.2
55	7 28	16 0	0 40	2 7	13 1	.5	23 13	3.0
50	7 9	16 19	0 35	1 52	12 49	.8	23 23	2.7
45	6 55	16 33	0 32	1 42	12 39	.9	23 31	2.6
40	6 43	16 46	0 29	1 33	12 32	1.0	23 38	2.4
35	6 32	16 56	0 27	1 27	12 25	1.2	23 43	2.3
30	6 23	17 5	0 25	1 22	12 19	1.3	23 48	2.2
20	6 8	17 21	0 23	1 16	12 8	1.4	23 57	2.0
10	5 54	17 35	0 22	1 13	11 59	1.6	.. ..	.0
0	5 41	17 48	0 22	1 12	11 51	1.7	.. ..	.0
10	5 28	18 1	0 22	1 14	11 42	1.9	.. ..	.0
20	5 13	18 15	0 24	1 20	11 33	2.0	.. ..	.0
30	4 57	18 32	0 26	1 30	11 22	2.2	0 2	1.3
35	4 48	18 42	0 28	1 38	11 16	2.3	0 9	1.2
40	4 37	18 53	0 30	1 49	11 9	2.4	0 17	1.1
45	4 24	19 6	0 34	2 6	11 1	2.6	0 26	1.0
50	4 8	19 22	0 39	2 37	10 51	2.8	0 38	.8
55	3 47	19 43	0 47	: ::	10 39	3.0	0 52	.6
60	3 20	20 11	1 1	: ::	10 23	3.3	1 10	.3
S								

SUNCE UT	SUNCE $e = T_p - UT$	SUNCE Δ/24	SUNCE r	MJESEC Prolaz	MJESEC Δ/24	MJESEC $\pi_\leftmoon$	MJESEC r
h	min s	s	′	h min	min	′	′
00	15 45.4	-.4	16.2	$T_{\overline{m}}$ 18 1	1.7	54.7	14.9
12	15 41.2	$T_{\overline{m}_\odot}$ 11 h 44.3 min		Starost 6.8 d	Faza ◐		

PLANETE

Pl.	$T_{\overline{m}}$	π	360−α	Vel.	Pl.	$T_{\overline{m}}$	π	360−α	Vel.
	h min	′	°			h min	′	°	
♀	10 12	.5	155	-4.3	♃	20 7	.0	5	-2.5
♂	13 11	.1	110	1.4	♄	9 21	.0	167	.9

UT	SUNCE $S_\odot$	SUNCE $\delta_\odot$	PROLJ. TAČKA S_Υ	VENERA S_φ	VENERA δ_φ	MARS S_σ	MARS δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	183 54.2	-18 8.3	52 59.0	207 38.9	-12 51.5	162 27.5	-22 55.2
2	213 54.0	-18 9.6	83 3.9	237 44.4	-12 50.0	192 28.5	-22 55.7
4	243 53.8	-18 10.9	113 8.9	267 49.8	-12 48.5	222 29.5	-22 56.3
6	273 53.6	-18 12.2	143 13.8	297 55.2	-12 47.0	252 30.5	-22 56.8
8	303 53.4	-18 13.5	173 18.7	328 .5	-12 45.5	282 31.5	-22 57.3
10	333 53.3	-18 14.8	203 23.7	358 5.9	-12 44.0	312 32.5	-22 57.8
12	3 53.1	-18 16.1	233 28.6	28 11.2	-12 42.6	342 33.4	-22 58.3
14	33 52.9	-18 17.4	263 33.5	58 16.6	-12 41.1	12 34.4	-22 58.9
16	63 52.7	-18 18.7	293 38.4	88 21.9	-12 39.6	42 35.4	-22 59.4
18	93 52.5	-18 20.0	323 43.4	118 27.2	-12 38.2	72 36.4	-22 59.9
20	123 52.3	-18 21.3	353 48.3	148 32.5	-12 36.7	102 37.4	-23 .4
22	153 52.1	-18 22.6	23 53.2	178 37.7	-12 35.3	132 38.3	-23 .9
Δ	-1	-6		27	7	5	-3

UT	MJESEC $S_\leftmoon$	MJESEC Δ	MJESEC $\delta_\leftmoon$	MJESEC Δ	JUPITER S_4	JUPITER δ_4	SATURN S_η	SATURN δ_η
h	° ′		° ′		° ′	° ′	° ′	° ′
0	87 12.7	157	- 9 26.0	114	58 20.8	- 3 55.0	220 14.8	- 3 2.5
2	116 22.1	157	- 9 3.2	115	88 25.8	- 3 55.1	250 19.2	- 3 2.7
4	145 31.5	158	- 8 40.3	115	118 30.8	- 3 55.1	280 23.7	- 3 2.9
6	174 41.2	159	- 8 17.2	116	148 35.8	- 3 55.1	310 28.1	- 3 3.1
8	203 50.9	160	- 7 54.1	116	178 40.8	- 3 55.1	340 32.6	- 3 3.3
10	233 .8	160	- 7 30.8	117	208 45.8	- 3 55.1	10 37.0	- 3 3.5
12	262 10.9	161	- 7 7.4	117	238 50.8	- 3 55.1	40 41.4	- 3 3.7
14	291 21.0	161	- 6 44.0	118	268 55.8	- 3 55.1	70 45.9	- 3 3.8
16	320 31.3	162	- 6 20.4	118	299 .8	- 3 55.1	100 50.3	- 3 4.0
18	349 41.6	162	- 5 56.8	119	329 5.8	- 3 55.1	130 54.8	- 3 4.2
20	18 52.1	163	- 5 33.1	119	359 10.8	- 3 55.1	160 59.2	- 3 4.4
22	48 2.7	163	- 5 9.3	119	29 15.8	- 3 55.1	191 3.6	- 3 4.6
Δ					25	0	22	-1

φ	SUNCE IZLAZ	SUNCE ZALAZ	TRAJANJE SUMRAKA GRAĐ.	TRAJANJE SUMRAKA ASTR.	MJESEC IZLAZ	MJESEC Δ/24	MJESEC ZALAZ	MJESEC Δ/24
N	h min	h min	h min	h min	h min	min	h min	min
60	7 55	15 33	0 49	2 29	13 22	.2	.. ..	.0
55	7 30	15 59	0 41	2 8	13 14	.5	.. ..	.0
50	7 11	16 17	0 35	1 53	13 7	.7	.. ..	.0
45	6 56	16 32	0 32	1 42	13 1	.9	.. ..	.0
40	6 44	16 45	0 29	1 34	12 57	1.0	.. ..	.0
35	6 33	16 55	0 27	1 27	12 53	1.1	.. ..	.0
30	6 24	17 5	0 25	1 23	12 49	1.2	.. ..	.0
20	6 8	17 21	0 23	1 16	12 43	1.4	.. ..	.0
10	5 54	17 35	0 22	1 13	12 38	1.5	0 4	1.9
0	5 41	17 48	0 22	1 12	12 33	1.7	0 11	1.7
10	5 28	18 1	0 22	1 15	12 27	1.8	0 18	1.6
20	5 13	18 16	0 24	1 20	12 22	2.0	0 25	1.4
30	4 57	18 33	0 26	1 30	12 16	2.2	0 33	1.2
35	4 47	18 43	0 28	1 38	12 12	2.3	0 38	1.1
40	4 36	18 54	0 30	1 49	12 8	2.4	0 44	1.0
45	4 22	19 7	0 34	2 7	12 3	2.6	0 50	.9
50	4 6	19 24	0 39	2 39	11 57	2.7	0 57	.7
55	3 46	19 45	0 47	: ::	11 50	2.9	1 6	.5
60	3 17	20 14	1 2	: ::	11 41	3.2	1 18	.3
S								

SUNCE UT	SUNCE $e = T_p - UT$	SUNCE Δ/24	SUNCE r	MJESEC Prolaz	MJESEC Δ/24	MJESEC $\pi_\leftmoon$	MJESEC r
h	min s	s	′	h min	min	′	′
00	15 37.0	-.4	16.2	$T_{\overline{m}}$ 18 42	1.7	54.4	14.8
12	15 32.3	$T_{\overline{m}_\odot}$ 11 h 44.5 min		Starost 7.8 d	Faza ◐		

PLANETE

Pl.	$T_{\overline{m}}$	π	360−α	Vel.	Pl.	$T_{\overline{m}}$	π	360−α	Vel.
	h min	′	°			h min	′	°	
♀	10 8	.5	155	-4.4	♃	20 3	.0	5	-2.5
♂	13 10	.1	109	1.4	♄	9 18	.0	167	.9

UT	SUNCE $S_\odot$	SUNCE $\delta_\odot$	PROLJ. TAČKA S_Υ	VENERA S_φ	VENERA δ_φ	MARS S_σ	MARS δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	183 51.9	-18 23.8	53 58.2	208 43.0	-12 33.9	162 39.3	-23 1.4
2	213 51.7	-18 25.1	84 3.1	238 48.2	-12 32.4	192 40.3	-23 1.9
4	243 51.5	-18 26.4	114 8.0	268 53.4	-12 31.0	222 41.3	-23 2.4
6	273 51.3	-18 27.7	144 12.9	298 58.6	-12 29.6	252 42.2	-23 2.9
8	303 51.1	-18 29.0	174 17.9	329 3.8	-12 28.2	282 43.2	-23 3.4
10	333 50.8	-18 30.2	204 22.8	359 9.0	-12 26.8	312 44.2	-23 3.9
12	3 50.6	-18 31.5	234 27.7	29 14.1	-12 25.5	342 45.1	-23 4.4
14	33 50.4	-18 32.8	264 32.7	59 19.3	-12 24.1	12 46.1	-23 4.9
16	63 50.2	-18 34.0	294 37.6	89 24.4	-12 22.7	42 47.1	-23 5.4
18	93 50.0	-18 35.3	324 42.5	119 29.5	-12 21.3	72 48.1	-23 5.9
20	123 49.8	-18 36.6	354 47.4	149 34.6	-12 20.0	102 49.0	-23 6.4
22	153 49.6	-18 37.8	24 52.4	179 39.7	-12 18.7	132 50.0	-23 6.9
Δ	-1	-6		26	7	5	-2

UT	MJESEC $S_\leftmoon$	MJESEC Δ	MJESEC $\delta_\leftmoon$	MJESEC Δ	JUPITER S_4	JUPITER δ_4	SATURN S_η	SATURN δ_η
h	° ′		° ′		° ′	° ′	° ′	° ′
0	77 13.3	163	-4 45.4	120	59 20.8	-3 55.2	221 8.1	-3 4.8
2	106 24.0	164	-4 21.5	120	89 25.8	-3 55.2	251 12.5	-3 5.0
4	135 34.7	164	-3 57.5	120	119 30.8	-3 55.2	281 17.0	-3 5.2
6	164 45.6	164	-3 33.4	121	149 35.8	-3 55.2	311 21.4	-3 5.4
8	193 56.4	165	-3 9.3	121	179 40.8	-3 55.2	341 25.8	-3 5.6
10	223 7.3	165	-2 45.2	121	209 45.8	-3 55.2	11 30.3	-3 5.8
12	252 18.3	165	-2 21.0	121	239 50.8	-3 55.2	41 34.7	-3 5.9
14	281 29.2	165	-1 56.7	121	269 55.8	-3 55.2	71 39.2	-3 6.1
16	310 40.2	165	-1 32.5	121	300 .8	-3 55.2	101 43.6	-3 6.3
18	339 51.2	165	-1 8.2	122	330 5.7	-3 55.2	131 48.1	-3 6.5
20	9 2.2	165	-0 43.9	122	0 10.7	-3 55.2	161 52.5	-3 6.7
22	38 13.2	165	-0 19.5	122	30 15.7	-3 55.2	191 57.0	-3 6.9
Δ					25	0	22	-1

φ	SUNCE IZLAZ	SUNCE ZALAZ	TRAJANJE SUMRAKA GRAĐ.	TRAJANJE SUMRAKA ASTR.	MJESEC IZLAZ	MJESEC Δ/24	MJESEC ZALAZ	MJESEC Δ/24
N	h min	h min	h min	h min	h min	min	h min	min
60	7 58	15 31	0 49	2 30	13 28	.2	0 19	3.2
55	7 32	15 57	0 41	2 8	13 25	.5	0 25	2.9
50	7 13	16 16	0 36	1 53	13 23	.7	0 29	2.7
45	6 57	16 31	0 32	1 42	13 22	.8	0 33	2.5
40	6 45	16 44	0 29	1 34	13 20	1.0	0 36	2.4
35	6 34	16 55	0 27	1 27	13 19	1.1	0 39	2.3
30	6 25	17 4	0 25	1 23	13 18	1.2	0 41	2.2
20	6 9	17 20	0 23	1 16	13 16	1.4	0 45	2.0
10	5 55	17 35	0 22	1 13	13 15	1.5	0 49	1.8
0	5 41	17 48	0 22	1 13	13 13	1.7	0 52	1.7
10	5 28	18 2	0 22	1 15	13 12	1.8	0 56	1.5
20	5 13	18 17	0 24	1 20	13 10	2.0	0 59	1.4
30	4 56	18 34	0 26	1 30	13 8	2.2	1 3	1.2
35	4 46	18 44	0 28	1 38	13 7	2.3	1 5	1.1
40	4 35	18 55	0 31	1 50	13 6	2.4	1 8	1.0
45	4 21	19 9	0 34	2 8	13 5	2.6	1 11	.8
50	4 5	19 25	0 39	2 41	13 3	2.7	1 14	.7
55	3 44	19 47	0 47	: ::	13 1	2.9	1 19	.5
60	3 15	20 16	1 3	: ::	12 58	3.2	1 24	.2
S								

SUNCE UT	SUNCE $e = T_p - UT$	SUNCE Δ/24	SUNCE r	MJESEC Prolaz	MJESEC Δ/24	MJESEC $\pi_\leftmoon$	MJESEC r
h	min s	s	′	h min	min	′	′
00	15 27.7	-.4	16.2	$T_{\overline{m}}$ 19 23	1.7	54.2	14.8
12	15 22.6	$T_{\overline{m}_\odot}$ 11 h 44.6 min		Starost 8.8 d	Faza ◐		

PLANETE

Pl.	$T_{\overline{m}}$	π	360−α	Vel.	Pl.	$T_{\overline{m}}$	π	360−α	Vel.
	h min	′	°			h min	′	°	
♀	10 3	.5	155	-4.4	♃	19 59	.0	5	-2.5
♂	13 9	.1	109	1.4	♄	9 14	.0	167	.9

UT	SUNCE $S_\odot$	SUNCE $\delta_\odot$	PROLJ. TAČKA S_Υ	VENERA S_φ	VENERA δ_φ	MARS S_σ	MARS δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	183 49.3	-18 39.1	54 57.3	209 44.7	-12 17.3	162 50.9	-23 7.4
2	213 49.1	-18 40.3	85 2.2	239 49.8	-12 16.0	192 51.9	-23 7.9
4	243 48.9	-18 41.6	115 7.2	269 54.8	-12 14.7	222 52.9	-23 8.4
6	273 48.7	-18 42.9	145 12.1	299 59.8	-12 13.4	252 53.8	-23 8.9
8	303 48.5	-18 44.1	175 17.0	330 4.8	-12 12.0	282 54.8	-23 9.4
10	333 48.2	-18 45.3	205 21.9	0 9.8	-12 10.8	312 55.8	-23 9.8
12	3 48.0	-18 46.6	235 26.9	30 14.7	-12 9.5	342 56.7	-23 10.3
14	33 47.8	-18 47.8	265 31.8	60 19.7	-12 8.2	12 57.7	-23 10.8
16	63 47.6	-18 49.1	295 36.7	90 24.6	-12 6.9	42 58.6	-23 11.3
18	93 47.3	-18 50.3	325 41.7	120 29.5	-12 5.6	72 59.6	-23 11.8
20	123 47.1	-18 51.5	355 46.6	150 34.4	-12 4.4	103 .5	-23 12.2
22	153 46.9	-18 52.8	25 51.5	180 39.3	-12 3.1	133 1.5	-23 12.7
Δ	-1	-6		25	6	5	-2

UT	MJESEC $S_\leftmoon$	MJESEC Δ	MJESEC $\delta_\leftmoon$	MJESEC Δ	JUPITER S_4	JUPITER δ_4	SATURN S_η	SATURN δ_η
h	° ′		° ′		° ′	° ′	° ′	° ′
0	67 24.1	165	0 4.8	122	60 20.7	-3 55.2	222 1.4	-3 7.1
2	96 35.1	165	0 29.2	122	90 25.7	-3 55.2	252 5.8	-3 7.3
4	125 46.0	164	0 53.5	122	120 30.6	-3 55.2	282 10.3	-3 7.4
6	154 56.9	164	1 17.9	122	150 35.6	-3 55.2	312 14.7	-3 7.6
8	184 7.7	164	1 42.2	122	180 40.6	-3 55.2	342 19.2	-3 7.8
10	213 18.5	164	2 6.6	122	210 45.6	-3 55.2	12 23.6	-3 8.0
12	242 29.2	163	2 30.9	121	240 50.5	-3 55.2	42 28.1	-3 8.2
14	271 39.8	163	2 55.2	121	270 55.5	-3 55.2	72 32.5	-3 8.4
16	300 50.4	162	3 19.4	121	301 .5	-3 55.2	102 37.0	-3 8.6
18	330 .9	162	3 43.7	121	331 5.5	-3 55.1	132 41.4	-3 8.8
20	359 11.3	161	4 7.9	121	1 10.4	-3 55.1	162 45.9	-3 8.9
22	28 21.6	161	4 32.0	121	31 15.4	-3 55.1	192 50.3	-3 9.1
Δ					25	0	22	-1

φ	SUNCE IZLAZ	SUNCE ZALAZ	TRAJANJE SUMRAKA GRAĐ.	TRAJANJE SUMRAKA ASTR.	MJESEC IZLAZ	MJESEC Δ/24	MJESEC ZALAZ	MJESEC Δ/24
N	h min	h min	h min	h min	h min	min	h min	min
60	8 0	15 29	0 49	2 30	13 34	.3	1 35	3.2
55	7 34	15 55	0 41	2 8	13 37	.5	1 35	2.9
50	7 14	16 15	0 36	1 53	13 40	.7	1 34	2.7
45	6 59	16 30	0 32	1 42	13 42	.9	1 34	2.6
40	6 46	16 43	0 29	1 34	13 44	1.0	1 34	2.4
35	6 35	16 54	0 27	1 28	13 45	1.1	1 34	2.3
30	6 26	17 4	0 25	1 23	13 47	1.2	1 33	2.2
20	6 9	17 20	0 23	1 16	13 49	1.4	1 33	2.0
10	5 55	17 35	0 22	1 13	13 51	1.6	1 33	1.8
0	5 41	17 48	0 22	1 13	13 54	1.7	1 33	1.7
10	5 27	18 2	0 22	1 15	13 56	1.9	1 32	1.5
20	5 13	18 17	0 24	1 20	13 58	2.0	1 32	1.4
30	4 56	18 34	0 26	1 31	14 1	2.2	1 32	1.2
35	4 45	18 45	0 28	1 39	14 2	2.3	1 31	1.1
40	4 34	18 56	0 31	1 51	14 4	2.4	1 31	1.0
45	4 20	19 10	0 34	2 9	14 6	2.6	1 31	.8
50	4 4	19 27	0 39	2 43	14 8	2.8	1 31	.7
55	3 42	19 49	0 48	: ::	14 11	3.0	1 30	.5
60	3 12	20 19	1 4	: ::	14 15	3.3	1 30	.2
S								

SUNCE UT	SUNCE $e = T_p - UT$	SUNCE Δ/24	SUNCE r	MJESEC Prolaz	MJESEC Δ/24	MJESEC $\pi_\leftmoon$	MJESEC r
h	min s	s	′	h min	min	′	′
00	15 17.6	-.5	16.2	$T_{\overline{m}}$ 20 3	1.8	54.2	14.8
12	15 12.1	$T_{\overline{m}_\odot}$ 11 h 44.8 min		Starost 9.8 d	Faza ◐		

PLANETE

Pl.	$T_{\overline{m}}$	π	360−α	Vel.	Pl.	$T_{\overline{m}}$	π	360−α	Vel.
	h min	′	°			h min	′	°	
♀	9 59	.5	155	-4.4	♃	19 55	.0	5	-2.5
♂	13 8	.1	108	1.4	♄	9 11	.0	167	.9

UT	SUNCE $S_\odot$	SUNCE $\delta_\odot$	PROLJ. TAČKA S_Υ	VENERA S_φ	VENERA δ_φ	MARS S_σ	MARS δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	183 46.6	-18 54.0	55 56.4	210 44.2	-12 1.9	163 2.5	-23 13.2
2	213 46.4	-18 55.2	86 1.4	240 49.1	-12 .7	193 3.4	-23 13.6
4	243 46.1	-18 56.5	116 6.3	270 53.9	-11 59.4	223 4.4	-23 14.1
6	273 45.9	-18 57.7	146 11.2	300 58.7	-11 58.2	253 5.3	-23 14.6
8	303 45.7	-18 58.9	176 16.2	331 3.5	-11 57.0	283 6.3	-23 15.0
10	333 45.4	-19 .1	206 21.1	1 8.3	-11 55.8	313 7.2	-23 15.5
12	3 45.2	-19 1.3	236 26.0	31 13.1	-11 54.6	343 8.2	-23 16.0
14	33 44.9	-19 2.6	266 30.9	61 17.9	-11 53.4	13 9.1	-23 16.4
16	63 44.7	-19 3.8	296 35.9	91 22.6	-11 52.3	43 10.1	-23 16.9
18	93 44.4	-19 5.0	326 40.8	121 27.3	-11 51.1	73 11.0	-23 17.3
20	123 44.2	-19 6.2	356 45.7	151 32.1	-11 49.9	103 11.9	-23 17.8
22	153 43.9	-19 7.4	26 50.6	181 36.8	-11 48.8	133 12.9	-23 18.2
Δ	-1	-6		24	6	5	-2

UT	MJESEC $S_\leftmoon$	MJESEC Δ	MJESEC $\delta_\leftmoon$	MJESEC Δ	JUPITER S_4	JUPITER δ_4	SATURN S_η	SATURN δ_η
h	° ′		° ′		° ′	° ′	° ′	° ′
0	57 31.7	160	4 56.1	120	61 20.3	- 3 55.1	222 54.8	- 3 9.3
2	86 41.8	160	5 20.2	120	91 25.3	- 3 55.1	252 59.2	- 3 9.5
4	115 51.7	159	5 44.2	120	121 30.3	- 3 55.1	283 3.7	- 3 9.7
6	145 1.6	158	6 8.1	119	151 35.2	- 3 55.1	313 8.1	- 3 9.9
8	174 11.2	158	6 32.0	119	181 40.2	- 3 55.1	343 12.6	- 3 10.1
10	203 20.8	157	6 55.8	118	211 45.2	- 3 55.1	13 17.0	- 3 10.2
12	232 30.1	156	7 19.4	118	241 50.1	- 3 55.1	43 21.5	- 3 10.4
14	261 39.3	155	7 43.1	118	271 55.1	- 3 55.1	73 25.9	- 3 10.6
16	290 48.4	154	8 6.6	117	302 .0	- 3 55.0	103 30.4	- 3 10.8
18	319 57.3	153	8 30.0	117	332 5.0	- 3 55.0	133 34.8	- 3 11.0
20	349 6.0	153	8 53.3	116	2 9.9	- 3 55.0	163 39.3	- 3 11.2
22	18 14.5	152	9 16.5	115	32 14.9	- 3 55.0	193 43.7	- 3 11.4
Δ					25	0	22	-1

φ	SUNCE IZLAZ	SUNCE ZALAZ	TRAJANJE SUMRAKA GRAĐ.	TRAJANJE SUMRAKA ASTR.	MJESEC IZLAZ	MJESEC Δ/24	MJESEC ZALAZ	MJESEC Δ/24
N	h min	h min	h min	h min	h min	min	h min	min
60	8 3	15 27	0 50	2 31	13 40	.3	2 53	3.3
55	7 36	15 54	0 41	2 9	13 49	.6	2 46	3.0
50	7 16	16 14	0 36	1 53	13 57	.8	2 40	2.8
45	7 0	16 29	0 32	1 42	14 3	1.0	2 36	2.6
40	6 47	16 42	0 29	1 34	14 8	1.1	2 32	2.5
35	6 36	16 53	0 27	1 28	14 12	1.2	2 29	2.3
30	6 27	17 3	0 25	1 23	14 16	1.3	2 26	2.2
20	6 10	17 20	0 23	1 16	14 23	1.5	2 21	2.1
10	5 55	17 35	0 22	1 13	14 29	1.6	2 17	1.9
0	5 41	17 49	0 22	1 13	14 35	1.8	2 13	1.7
10	5 27	18 3	0 22	1 15	14 40	1.9	2 9	1.6
20	5 12	18 18	0 24	1 20	14 47	2.1	2 5	1.4
30	4 55	18 35	0 26	1 31	14 54	2.3	2 0	1.3
35	4 45	18 46	0 28	1 39	14 58	2.4	1 58	1.2
40	4 33	18 57	0 31	1 51	15 2	2.5	1 55	1.0
45	4 19	19 11	0 34	2 10	15 8	2.7	1 51	.9
50	4 2	19 29	0 40	2 45	15 14	2.8	1 47	.7
55	3 40	19 51	0 48	: ::	15 23	3.0	1 42	.5
60	3 10	20 21	1 5	: ::	15 33	3.4	1 35	.3
S								

SUNCE UT	SUNCE $e = T_p - UT$	SUNCE Δ/24	SUNCE r	MJESEC Prolaz	MJESEC Δ/24	MJESEC $\pi_\leftmoon$	MJESEC r
h	min s	s	′	h min	min	′	′
00	15 6.7	-.5	16.2	$T_{\overline{m}}$ 20 45	1.8	54.4	14.8
12	15 .8	$T_{\overline{m}_\odot}$ 11 h 45.0 min		Starost 10.8 d	Faza ◐		

PLANETE

Pl.	$T_{\overline{m}}$	π	360−α	Vel.	Pl.	$T_{\overline{m}}$	π	360−α	Vel.
	h min	′	°			h min	′	°	
♀	9 55	.5	155	-4.4	♃	19 51	.0	5	-2.5
♂	13 7	.1	107	1.4	♄	9 7	.0	167	.9

UT	SUNCE $S_\odot$	SUNCE $\delta_\odot$	PROLJ. TAČKA S_Υ	VENERA S_φ	VENERA δ_φ	MARS S_σ	MARS δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	183 43.7	-19 8.6	56 55.6	211 41.4	-11 47.6	163 13.8	-23 18.7
2	213 43.4	-19 9.8	87 .5	241 46.1	-11 46.5	193 14.8	-23 19.2
4	243 43.2	-19 11.0	117 5.4	271 50.8	-11 45.4	223 15.7	-23 19.6
6	273 42.9	-19 12.2	147 10.4	301 55.4	-11 44.3	253 16.7	-23 20.0
8	303 42.7	-19 13.4	177 15.3	332 .0	-11 43.1	283 17.6	-23 20.5
10	333 42.4	-19 14.6	207 20.2	2 4.6	-11 42.0	313 18.5	-23 20.9
12	3 42.1	-19 15.8	237 25.1	32 9.2	-11 40.9	343 19.5	-23 21.4
14	33 41.9	-19 16.9	267 30.1	62 13.8	-11 39.9	13 20.4	-23 21.8
16	63 41.6	-19 18.1	297 35.0	92 18.4	-11 38.8	43 21.3	-23 22.3
18	93 41.3	-19 19.3	327 39.9	122 22.9	-11 37.7	73 22.3	-23 22.7
20	123 41.1	-19 20.5	357 44.9	152 27.4	-11 36.6	103 23.2	-23 23.1
22	153 40.8	-19 21.7	27 49.8	182 32.0	-11 35.6	133 24.2	-23 23.6
Δ	-1	-6		23	5	5	-2

UT	MJESEC $S_\leftmoon$	MJESEC Δ	MJESEC $\delta_\leftmoon$	MJESEC Δ	JUPITER S_4	JUPITER δ_4	SATURN S_η	SATURN δ_η
h	° ′		° ′		° ′	° ′	° ′	° ′
0	47 22.8	151	9 39.6	115	62 19.8	- 3 55.0	223 48.2	- 3 11.5
2	76 30.9	149	10 2.5	114	92 24.8	- 3 55.0	253 52.6	- 3 11.7
4	105 38.8	148	10 25.3	113	122 29.7	- 3 55.0	283 57.1	- 3 11.9
6	134 46.5	147	10 48.0	113	152 34.7	- 3 54.9	314 1.5	- 3 12.1
8	163 53.9	146	11 10.5	112	182 39.6	- 3 54.9	344 6.0	- 3 12.3
10	193 1.2	145	11 32.9	111	212 44.5	- 3 54.9	14 10.4	- 3 12.5
12	222 8.2	144	11 55.1	110	242 49.5	- 3 54.9	44 14.9	- 3 12.6
14	251 14.9	143	12 17.2	109	272 54.4	- 3 54.9	74 19.3	- 3 12.8
16	280 21.4	141	12 39.0	108	302 59.4	- 3 54.8	104 23.8	- 3 13.0
18	309 27.7	140	13 .7	108	333 4.3	- 3 54.8	134 28.3	- 3 13.2
20	338 33.7	139	13 22.2	107	3 9.2	- 3 54.8	164 32.7	- 3 13.4
22	7 39.4	137	13 43.5	106	33 14.2	- 3 54.8	194 37.2	- 3 13.6
Δ					25	0	22	-1

φ	SUNCE IZLAZ	SUNCE ZALAZ	TRAJANJE SUMRAKA GRAĐ.	TRAJANJE SUMRAKA ASTR.	MJESEC IZLAZ	MJESEC Δ/24	MJESEC ZALAZ	MJESEC Δ/24
N	h min	h min	h min	h min	h min	min	h min	min
60	8 5	15 25	0 50	2 32	13 47	.4	4 12	3.4
55	7 38	15 52	0 41	2 9	14 3	.7	3 58	3.1
50	7 17	16 13	0 36	1 54	14 16	.9	3 47	2.9
45	7 1	16 29	0 32	1 43	14 26	1.1	3 38	2.7
40	6 48	16 42	0 29	1 34	14 34	1.2	3 31	2.5
35	6 37	16 53	0 27	1 28	14 41	1.3	3 25	2.4
30	6 27	17 3	0 25	1 23	14 48	1.4	3 20	2.3
20	6 10	17 20	0 23	1 17	14 59	1.6	3 11	2.1
10	5 56	17 35	0 22	1 13	15 8	1.8	3 3	2.0
0	5 42	17 49	0 22	1 13	15 18	1.9	2 55	1.8
10	5 27	18 3	0 22	1 15	15 27	2.0	2 48	1.7
20	5 12	18 18	0 24	1 21	15 37	2.2	2 40	1.5
30	4 55	18 36	0 26	1 31	15 48	2.4	2 31	1.4
35	4 44	18 47	0 28	1 40	15 55	2.5	2 26	1.3
40	4 32	18 59	0 31	1 52	16 3	2.6	2 20	1.1
45	4 18	19 13	0 35	2 11	16 11	2.7	2 13	1.0
50	4 1	19 30	0 40	2 48	16 22	2.9	2 5	.8
55	3 39	19 53	0 48	: ::	16 36	3.1	1 55	.6
60	3 8	20 24	1 6	: ::	16 54	3.5	1 42	.3
S								

SUNCE UT	SUNCE $e = T_p - UT$	SUNCE Δ/24	SUNCE r	MJESEC Prolaz	MJESEC Δ/24	MJESEC $\pi_\leftmoon$	MJESEC r
h	min s	s	′	h min	min	′	′
00	14 54.9	-.5	16.2	$T_{\overline{m}}$ 21 28	2.0	54.7	14.9
12	14 48.6	$T_{\overline{m}_\odot}$ 11 h 45.2 min		Starost 11.8 d	Faza ◐		

PLANETE

Pl.	$T_{\overline{m}}$	π	360−α	Vel.	Pl.	$T_{\overline{m}}$	π	360−α	Vel.
	h min	′	°			h min	′	°	
♀	9 52	.5	155	-4.4	♃	19 47	.0	5	-2.5
♂	13 7	.1	106	1.4	♄	9 3	.0	167	.9

UT	SUNCE $S_\odot$	SUNCE $\delta_\odot$	PROLJ. TAČKA S_Υ	VENERA S_φ	VENERA δ_φ	MARS S_σ	MARS δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	183 40.5	-19 22.8	57 54.7	212 36.5	-11 34.5	163 25.1	-23 24.0
2	213 40.3	-19 24.0	87 59.6	242 40.9	-11 33.5	193 26.0	-23 24.4
4	243 40.0	-19 25.2	118 4.6	272 45.4	-11 32.5	223 26.9	-23 24.9
6	273 39.7	-19 26.3	148 9.5	302 49.9	-11 31.5	253 27.9	-23 25.3
8	303 39.4	-19 27.5	178 14.4	332 54.3	-11 30.4	283 28.8	-23 25.7
10	333 39.2	-19 28.7	208 19.4	2 58.7	-11 29.4	313 29.7	-23 26.1
12	3 38.9	-19 29.8	238 24.3	33 3.1	-11 28.4	343 30.7	-23 26.6
14	33 38.6	-19 31.0	268 29.2	63 7.5	-11 27.5	13 31.6	-23 27.0
16	63 38.3	-19 32.1	298 34.1	93 11.9	-11 26.5	43 32.5	-23 27.4
18	93 38.0	-19 33.3	328 39.1	123 16.3	-11 25.5	73 33.4	-23 27.8
20	123 37.8	-19 34.4	358 44.0	153 20.6	-11 24.5	103 34.4	-23 28.2
22	153 37.5	-19 35.6	28 48.9	183 25.0	-11 23.6	133 35.3	-23 28.6
Δ	-1	-6		22	5	5	-2

UT	MJESEC $S_\leftmoon$	MJESEC Δ	MJESEC $\delta_\leftmoon$	MJESEC Δ	JUPITER S_4	JUPITER δ_4	SATURN S_η	SATURN δ_η
h	° ′		° ′		° ′	° ′	° ′	° ′
0	36 44.9	136	14 4.6	104	63 19.1	- 3 54.8	224 41.6	- 3 13.7
2	65 50.1	135	14 25.5	103	93 24.0	- 3 54.7	254 46.1	- 3 13.9
4	94 55.0	133	14 46.2	102	123 29.0	- 3 54.7	284 50.5	- 3 14.1
6	123 59.6	132	15 6.6	101	153 33.9	- 3 54.7	314 55.0	- 3 14.3
8	153 4.0	130	15 26.8	100	183 38.8	- 3 54.7	344 59.5	- 3 14.5
10	182 8.0	129	15 46.8	99	213 43.7	- 3 54.6	15 3.9	- 3 14.6
12	211 11.8	127	16 6.5	97	243 48.7	- 3 54.6	45 8.4	- 3 14.8
14	240 15.2	126	16 25.9	96	273 53.6	- 3 54.6	75 12.8	- 3 15.0
16	269 18.4	124	16 45.1	95	303 58.5	- 3 54.6	105 17.3	- 3 15.2
18	298 21.2	123	17 4.0	93	334 3.4	- 3 54.5	135 21.8	- 3 15.4
20	327 23.7	121	17 22.6	92	4 8.4	- 3 54.5	165 26.2	- 3 15.5
22	356 25.9	119	17 40.9	90	34 13.3	- 3 54.5	195 30.7	- 3 15.7
Δ					25	0	22	-1

φ	SUNCE IZLAZ	SUNCE ZALAZ	TRAJANJE SUMRAKA GRAĐ.	TRAJANJE SUMRAKA ASTR.	MJESEC IZLAZ	MJESEC Δ/24	MJESEC ZALAZ	MJESEC Δ/24
N	h min	h min	h min	h min	h min	min	h min	min
60	8 8	15 23	0 50	2 32	13 57	.6	5 33	3.5
55	7 39	15 51	0 42	2 9	14 20	.9	5 12	3.1
50	7 19	16 11	0 36	1 54	14 38	1.2	4 56	2.9
45	7 3	16 28	0 32	1 43	14 52	1.3	4 43	2.7
40	6 49	16 41	0 29	1 34	15 4	1.4	4 32	2.6
35	6 38	16 52	0 27	1 28	15 14	1.5	4 23	2.5
30	6 28	17 2	0 25	1 23	15 22	1.6	4 15	2.4
20	6 11	17 20	0 23	1 17	15 37	1.8	4 2	2.2
10	5 56	17 35	0 22	1 14	15 51	1.9	3 50	2.1
0	5 42	17 49	0 22	1 13	16 3	2.0	3 39	2.0
10	5 27	18 3	0 22	1 15	16 16	2.2	3 28	1.8
20	5 12	18 19	0 24	1 21	16 29	2.3	3 17	1.7
30	4 54	18 37	0 26	1 31	16 45	2.4	3 4	1.5
35	4 44	18 48	0 28	1 40	16 54	2.5	2 56	1.4
40	4 32	18 60	0 31	1 52	17 5	2.6	2 47	1.3
45	4 17	19 14	0 35	2 12	17 17	2.8	2 37	1.2
50	3 60	19 32	0 40	2 50	17 32	2.9	2 25	1.0
55	3 37	19 55	0 49	: ::	17 51	3.2	2 10	.8
60	3 6	20 27	1 7	: ::	18 17	3.5	1 50	.5
S								

SUNCE UT	SUNCE $e = T_p - UT$	SUNCE Δ/24	SUNCE r	MJESEC Prolaz	MJESEC Δ/24	MJESEC $\pi_\leftmoon$	MJESEC r
h	min s	s	′	h min	min	′	′
00	14 42.3	-.6	16.2	$T_{\overline{m}}$ 22 15	2.0	55.1	15.0
12	14 35.6	$T_{\overline{m}_\odot}$ 11 h 45.4 min		Starost 12.8 d	Faza ○		

PLANETE

Pl.	$T_{\overline{m}}$	π	360−α	Vel.	Pl.	$T_{\overline{m}}$	π	360−α	Vel.
	h min	′	°			h min	′	°	
♀	9 48	.5	155	-4.5	♃	19 43	.0	5	-2.5
♂	13 6	.1	105	1.4	♄	8 60	.0	167	.9

UT	SUNCE $S_\odot$	SUNCE $\delta_\odot$	PROLJ. TAČKA S_Υ	VENERA S_φ	VENERA δ_φ	MARS S_σ	MARS δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	183 37.2	-19 36.7	58 53.9	213 29.3	-11 22.6	163 36.2	-23 29.1
2	213 36.9	-19 37.9	88 58.8	243 33.6	-11 21.7	193 37.1	-23 29.5
4	243 36.6	-19 39.0	119 3.7	273 37.9	-11 20.8	223 38.1	-23 29.9
6	273 36.3	-19 40.1	149 8.6	303 42.2	-11 19.8	253 39.0	-23 30.3
8	303 36.0	-19 41.3	179 13.6	333 46.4	-11 18.9	283 39.9	-23 30.7
10	333 35.7	-19 42.4	209 18.5	3 50.7	-11 18.0	313 40.8	-23 31.1
12	3 35.4	-19 43.5	239 23.4	33 54.9	-11 17.1	343 41.7	-23 31.5
14	33 35.1	-19 44.7	269 28.4	63 59.1	-11 16.2	13 42.6	-23 31.9
16	63 34.8	-19 45.8	299 33.3	94 3.3	-11 15.4	43 43.6	-23 32.3
18	93 34.5	-19 46.9	329 38.2	124 7.5	-11 14.5	73 44.5	-23 32.7
20	123 34.2	-19 48.0	359 43.1	154 11.7	-11 13.6	103 45.4	-23 33.1
22	153 33.9	-19 49.1	29 48.1	184 15.8	-11 12.8	133 46.3	-23 33.5
Δ	-1	-6		21	4	5	-2

UT	MJESEC $S_\leftmoon$	MJESEC Δ	MJESEC $\delta_\leftmoon$	MJESEC Δ	JUPITER S_4	JUPITER δ_4	SATURN S_η	SATURN δ_η
h	° ′		° ′		° ′	° ′	° ′	° ′
0	25 27.8	118	17 58.9	89	64 18.2	- 3 54.5	225 35.1	- 3 15.9
2	54 29.4	116	18 16.6	87	94 23.1	- 3 54.4	255 39.6	- 3 16.1
4	83 30.6	115	18 34.0	85	124 28.0	- 3 54.4	285 44.1	- 3 16.3
6	112 31.6	113	18 51.1	84	154 32.9	- 3 54.4	315 48.5	- 3 16.4
8	141 32.2	111	19 7.8	82	184 37.8	- 3 54.3	345 53.0	- 3 16.6
10	170 32.5	110	19 24.1	80	214 42.8	- 3 54.3	15 57.5	- 3 16.8
12	199 32.4	108	19 40.1	78	244 47.7	- 3 54.3	46 1.9	- 3 17.0
14	228 32.1	107	19 55.8	76	274 52.6	- 3 54.2	76 6.4	- 3 17.2
16	257 31.4	105	20 11.1	74	304 57.5	- 3 54.2	106 10.8	- 3 17.3
18	286 30.4	103	20 25.9	72	335 2.4	- 3 54.2	136 15.3	- 3 17.5
20	315 29.0	102	20 40.4	70	5 7.3	- 3 54.1	166 19.8	- 3 17.7
22	344 27.4	100	20 54.5	68	35 12.2	- 3 54.1	196 24.2	- 3 17.9
Δ					25	0	22	-1

φ	SUNCE IZLAZ	SUNCE ZALAZ	TRAJANJE SUMRAKA GRAĐ.	TRAJANJE SUMRAKA ASTR.	MJESEC IZLAZ	MJESEC Δ/24	MJESEC ZALAZ	MJESEC Δ/24
N	h min	h min	h min	h min	h min	min	h min	min
60	8 10	15 21	0 51	2 33	14 11	.9	6 57	3.5
55	7 41	15 49	0 42	2 10	14 43	1.3	6 27	3.1
50	7 20	16 10	0 36	1 54	15 6	1.5	6 5	2.9
45	7 4	16 27	0 32	1 43	15 23	1.6	5 49	2.8
40	6 51	16 40	0 29	1 35	15 38	1.7	5 35	2.6
35	6 39	16 52	0 27	1 28	15 51	1.8	5 23	2.5
30	6 29	17 2	0 26	1 23	16 1	1.9	5 13	2.5
20	6 12	17 19	0 23	1 17	16 20	2.0	4 56	2.3
10	5 56	17 35	0 22	1 14	16 37	2.1	4 40	2.2
0	5 42	17 49	0 22	1 13	16 52	2.2	4 26	2.1
10	5 28	18 4	0 22	1 15	17 8	2.3	4 12	2.0
20	5 12	18 20	0 24	1 21	17 24	2.4	3 57	1.9
30	4 54	18 38	0 26	1 32	17 44	2.5	3 40	1.7
35	4 43	18 49	0 28	1 40	17 55	2.5	3 30	1.7
40	4 31	19 1	0 31	1 53	18 8	2.6	3 19	1.6
45	4 16	19 15	0 35	2 13	18 23	2.7	3 6	1.4
50	3 59	19 33	0 40	2 53	18 42	2.9	2 50	1.3
55	3 36	19 57	0 49	: ::	19 7	3.1	2 29	1.1
60	3 4	20 29	1 8	: ::	19 41	3.4	2 2	.7
S								

SUNCE UT	SUNCE $e = T_p - UT$	SUNCE Δ/24	SUNCE r	MJESEC Prolaz	MJESEC Δ/24	MJESEC $\pi_\leftmoon$	MJESEC r
h	min s	s	′	h min	min	′	′
00	14 28.9	-.6	16.2	$T_{\overline{m}}$ 23 4	2.2	55.6	15.1
12	14 21.8	$T_{\overline{m}_\odot}$ 11 h 45.6 min		Starost 13.8 d	Faza ○		

PLANETE

Pl.	$T_{\overline{m}}$	π	360−α	Vel.	Pl.	$T_{\overline{m}}$	π	360−α	Vel.
	h min	′	°			h min	′	°	
♀	9 45	.4	155	-4.5	♃	19 40	.0	5	-2.5
♂	13 5	.1	105	1.4	♄	8 56	.0	167	.9

UT	SUNCE $S_\odot$	SUNCE $\delta_\odot$	PROLJ. TAČKA S_Υ	VENERA S_φ	VENERA δ_φ	MARS S_σ	MARS δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	183 33.6	-19 50.3	59 53.0	214 20.0	-11 11.9	163 47.2	-23 33.9
2	213 33.3	-19 51.4	89 57.9	244 24.1	-11 11.1	193 48.1	-23 34.3
4	243 33.0	-19 52.5	120 2.8	274 28.2	-11 10.2	223 49.0	-23 34.7
6	273 32.7	-19 53.6	150 7.8	304 32.3	-11 9.4	253 49.9	-23 35.1
8	303 32.4	-19 54.7	180 12.7	334 36.4	-11 8.6	283 50.9	-23 35.4
10	333 32.1	-19 55.8	210 17.6	4 40.5	-11 7.8	313 51.8	-23 35.8
12	3 31.8	-19 56.9	240 22.6	34 44.5	-11 7.0	343 52.7	-23 36.2
14	33 31.5	-19 58.0	270 27.5	64 48.6	-11 6.2	13 53.6	-23 36.6
16	63 31.2	-19 59.1	300 32.4	94 52.6	-11 5.4	43 54.5	-23 37.0
18	93 30.8	-20 .2	330 37.3	124 56.6	-11 4.6	73 55.4	-23 37.3
20	123 30.5	-20 1.3	0 42.3	155 .6	-11 3.9	103 56.3	-23 37.7
22	153 30.2	-20 2.3	30 47.2	185 4.6	-11 3.1	133 57.2	-23 38.1
Δ	-2	-5		20	4	5	-2

UT	MJESEC $S_\leftmoon$	MJESEC Δ	MJESEC $\delta_\leftmoon$	MJESEC Δ	JUPITER S_4	JUPITER δ_4	SATURN S_η	SATURN δ_η
h	° ′		° ′		° ′	° ′	° ′	° ′
0	13 25.4	99	21 8.2	66	65 17.1	- 3 54.1	226 28.7	- 3 18.1
2	42 23.1	97	21 21.5	64	95 22.0	- 3 54.0	256 33.2	- 3 18.2
4	71 20.5	95	21 34.3	62	125 26.9	- 3 54.0	286 37.6	- 3 18.4
6	100 17.6	94	21 46.7	60	155 31.8	- 3 54.0	316 42.1	- 3 18.6
8	129 14.4	92	21 58.6	58	185 36.7	- 3 53.9	346 46.6	- 3 18.8
10	158 10.9	91	22 10.1	55	215 41.6	- 3 53.9	16 51.0	- 3 18.9
12	187 7.0	89	22 21.2	53	245 46.5	- 3 53.8	46 55.5	- 3 19.1
14	216 2.9	88	22 31.8	50	275 51.4	- 3 53.8	76 60.0	- 3 19.3
16	244 58.6	87	22 41.9	48	305 56.3	- 3 53.8	107 4.4	- 3 19.5
18	273 53.9	85	22 51.5	46	336 1.1	- 3 53.7	137 8.9	- 3 19.6
20	302 48.9	84	23 .6	43	6 6.0	- 3 53.7	167 13.4	- 3 19.8
22	331 43.7	83	23 9.2	41	36 10.9	- 3 53.6	197 17.8	- 3 20.0
Δ					24	0	22	-1

φ	SUNCE IZLAZ	SUNCE ZALAZ	TRAJANJE SUMRAKA GRAĐ.	TRAJANJE SUMRAKA ASTR.	MJESEC IZLAZ	MJESEC Δ/24	MJESEC ZALAZ	MJESEC Δ/24
N	h min	h min	h min	h min	h min	min	h min	min
60	8 12	15 19	0 51	2 33	14 34	1.5	8 20	3.2
55	7 43	15 48	0 42	2 10	15 13	1.8	7 42	2.9
50	7 22	16 9	0 36	1 55	15 41	1.9	7 15	2.8
45	7 5	16 26	0 32	1 43	16 2	2.0	6 55	2.7
40	6 52	16 40	0 29	1 35	16 19	2.0	6 38	2.6
35	6 40	16 51	0 27	1 28	16 34	2.1	6 24	2.5
30	6 30	17 2	0 26	1 23	16 46	2.1	6 12	2.5
20	6 12	17 19	0 23	1 17	17 8	2.2	5 51	2.4
10	5 57	17 35	0 22	1 14	17 27	2.2	5 34	2.3
0	5 42	17 49	0 22	1 13	17 44	2.3	5 17	2.2
10	5 28	18 4	0 22	1 16	18 2	2.3	5 0	2.2
20	5 12	18 20	0 24	1 21	18 21	2.4	4 42	2.1
30	4 53	18 39	0 26	1 32	18 43	2.5	4 22	2.0
35	4 43	18 50	0 28	1 41	18 56	2.5	4 10	1.9
40	4 30	19 2	0 31	1 53	19 11	2.5	3 56	1.9
45	4 16	19 17	0 35	2 13	19 29	2.6	3 40	1.8
50	3 58	19 35	0 41	2 56	19 51	2.6	3 20	1.7
55	3 34	19 59	0 50	: ::	20 20	2.7	2 55	1.5
60	3 2	20 32	1 9	: ::	21 3	2.9	2 19	1.2
S								

SUNCE UT	SUNCE $e = T_p - UT$	SUNCE Δ/24	SUNCE r	MJESEC Prolaz	MJESEC Δ/24	MJESEC $\pi_\leftmoon$	MJESEC r
h	min s	s	′	h min	min	′	′
00	14 14.7	-.6	16.2	$T_{\overline{m}}$ 23 57	2.3	56.1	15.3
12	14 7.2	$T_{\overline{m}_\odot}$ 11 h 45.9 min		Starost 14.8 d	Faza ○		

PLANETE

Pl.	$T_{\overline{m}}$	π	360−α	Vel.	Pl.	$T_{\overline{m}}$	π	360−α	Vel.
	h min	′	°			h min	′	°	
♀	9 41	.4	154	-4.5	♃	19 36	.0	5	-2.5
♂	13 4	.1	104	1.4	♄	8 53	.0	167	.9

UT	SUNCE $S_\odot$	SUNCE $\delta_\odot$	PROLJ. TAČKA S_Υ	VENERA S_φ	VENERA δ_φ	MARS S_σ	MARS δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	183 29.9	-20 3.4	60 52.1	215 8.6	-11 2.3	163 58.1	-23 38.5
2	213 29.6	-20 4.5	90 57.1	245 12.5	-11 1.6	193 59.0	-23 38.8
4	243 29.2	-20 5.6	121 2.0	275 16.5	-11 .9	223 59.9	-23 39.2
6	273 28.9	-20 6.7	151 6.9	305 20.4	-11 .1	254 .8	-23 39.6
8	303 28.6	-20 7.7	181 11.8	335 24.3	-10 59.4	284 1.7	-23 39.9
10	333 28.3	-20 8.8	211 16.8	5 28.2	-10 58.7	314 2.6	-23 40.3
12	3 27.9	-20 9.9	241 21.7	35 32.1	-10 58.0	344 3.5	-23 40.7
14	33 27.6	-20 11.0	271 26.6	65 36.0	-10 57.3	14 4.4	-23 41.0
16	63 27.3	-20 12.0	301 31.6	95 39.8	-10 56.6	44 5.3	-23 41.4
18	93 26.9	-20 13.1	331 36.5	125 43.7	-10 55.9	74 6.2	-23 41.8
20	123 26.6	-20 14.1	1 41.4	155 47.5	-10 55.3	104 7.1	-23 42.1
22	153 26.3	-20 15.2	31 46.3	185 51.3	-10 54.6	134 8.0	-23 42.5
Δ	-2	-5		19	3	4	-2

UT	MJESEC $S_\leftmoon$	MJESEC Δ	MJESEC $\delta_\leftmoon$	MJESEC Δ	JUPITER S_4	JUPITER δ_4	SATURN S_η	SATURN δ_η
h	° ′		° ′		° ′	° ′	° ′	° ′
0	0 38.3	81	23 17.3	38	66 15.8	- 3 53.6	227 22.3	- 3 20.2
2	29 32.6	80	23 24.9	35	96 20.7	- 3 53.6	257 26.8	- 3 20.4
4	58 26.6	79	23 32.0	33	126 25.6	- 3 53.5	287 31.3	- 3 20.5
6	87 20.4	78	23 38.5	30	156 30.4	- 3 53.5	317 35.7	- 3 20.7
8	116 14.0	77	23 44.5	27	186 35.3	- 3 53.4	347 40.2	- 3 20.9
10	145 7.4	76	23 50.0	25	216 40.2	- 3 53.4	17 44.7	- 3 21.1
12	174 .6	75	23 55.0	22	246 45.1	- 3 53.3	47 49.1	- 3 21.2
14	202 53.5	74	23 59.3	19	276 50.0	- 3 53.3	77 53.6	- 3 21.4
16	231 46.3	73	24 3.2	16	306 54.8	- 3 53.2	107 58.1	- 3 21.6
18	260 39.0	72	24 6.4	14	336 59.7	- 3 53.2	138 2.6	- 3 21.8
20	289 31.4	72	24 9.1	11	7 4.6	- 3 53.1	168 7.0	- 3 21.9
22	318 23.7	71	24 11.2	8	37 9.5	- 3 53.1	198 11.5	- 3 22.1
Δ					24	0	22	-1

φ	SUNCE IZLAZ	SUNCE ZALAZ	TRAJANJE SUMRAKA GRAĐ.	TRAJANJE SUMRAKA ASTR.	MJESEC IZLAZ	MJESEC Δ/24	MJESEC ZALAZ	MJESEC Δ/24
N	h min	h min	h min	h min	h min	min	h min	min
60	8 15	15 17	0 51	2 34	15 11	2.3	9 36	2.5
55	7 45	15 47	0 42	2 11	15 56	2.4	8 52	2.5
50	7 24	16 8	0 36	1 55	16 26	2.4	8 21	2.5
45	7 7	16 25	0 32	1 43	16 49	2.4	7 59	2.4
40	6 53	16 39	0 29	1 35	17 8	2.4	7 40	2.4
35	6 41	16 51	0 27	1 28	17 24	2.4	7 25	2.4
30	6 31	17 1	0 26	1 23	17 37	2.4	7 11	2.4
20	6 13	17 19	0 23	1 17	18 0	2.4	6 49	2.4
10	5 57	17 35	0 22	1 14	18 21	2.4	6 29	2.4
0	5 43	17 50	0 22	1 13	18 39	2.4	6 11	2.3
10	5 28	18 5	0 23	1 16	18 58	2.4	5 52	2.3
20	5 12	18 21	0 24	1 21	19 18	2.3	5 32	2.3
30	4 53	18 40	0 27	1 32	19 42	2.3	5 10	2.3
35	4 42	18 51	0 29	1 41	19 56	2.3	4 56	2.2
40	4 30	19 3	0 31	1 54	20 12	2.3	4 41	2.2
45	4 15	19 18	0 35	2 14	20 31	2.3	4 23	2.2
50	3 56	19 37	0 41	2 59	20 54	2.3	4 0	2.1
55	3 33	20 1	0 50	: ::	21 26	2.2	3 30	2.0
60	2 60	20 34	1 10	: ::	22 13	2.2	2 47	1.9
S								

SUNCE UT	SUNCE $e = T_p - UT$	SUNCE Δ/24	SUNCE r	MJESEC Prolaz	MJESEC Δ/24	MJESEC $\pi_\leftmoon$	MJESEC r
h	min s	s	′	h min	min	′	′
00	13 59.7	-.7	16.2	$T_{\overline{m}}$	1.0	56.6	15.4
12	13 51.8	$T_{\overline{m}_\odot}$ 11 h 46.1 min		Starost 15.8 d	Faza ○		

PLANETE

Pl.	$T_{\overline{m}}$	π	360−α	Vel.	Pl.	$T_{\overline{m}}$	π	360−α	Vel.
	h min	′	°			h min	′	°	
♀	9 38	.4	154	-4.5	♃	19 32	.0	5	-2.5
♂	13 4	.1	103	1.4	♄	8 49	.0	166	.9

UT	SUNCE $S_\odot$	SUNCE $\delta_\odot$	PROLJ. TAČKA S_Υ	VENERA S_φ	VENERA δ_φ	MARS S_σ	MARS δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	183 25.9	-20 16.2	61 51.3	215 55.1	-10 54.0	164 8.9	-23 42.8
2	213 25.6	-20 17.3	91 56.2	245 58.9	-10 53.3	194 9.8	-23 43.2
4	243 25.3	-20 18.3	122 1.1	276 2.7	-10 52.7	224 10.7	-23 43.5
6	273 24.9	-20 19.4	152 6.1	306 6.4	-10 52.0	254 11.6	-23 43.9
8	303 24.6	-20 20.4	182 11.0	336 10.2	-10 51.4	284 12.4	-23 44.2
10	333 24.2	-20 21.5	212 15.9	6 13.9	-10 50.8	314 13.3	-23 44.6
12	3 23.9	-20 22.5	242 20.8	36 17.6	-10 50.2	344 14.2	-23 44.9
14	33 23.5	-20 23.5	272 25.8	66 21.3	-10 49.6	14 15.1	-23 45.2
16	63 23.2	-20 24.6	302 30.7	96 25.0	-10 49.0	44 16.0	-23 45.6
18	93 22.8	-20 25.6	332 35.6	126 28.7	-10 48.4	74 16.9	-23 45.9
20	123 22.5	-20 26.6	2 40.6	156 32.4	-10 47.8	104 17.8	-23 46.3
22	153 22.1	-20 27.7	32 45.5	186 36.0	-10 47.3	134 18.6	-23 46.6
Δ	-2	-5		19	3	4	-2

UT	MJESEC $S_\leftmoon$	MJESEC Δ	MJESEC $\delta_\leftmoon$	MJESEC Δ	JUPITER S_4	JUPITER δ_4	SATURN S_η	SATURN δ_η
h	° ′		° ′		° ′	° ′	° ′	° ′
0	347 15.9	70	24 12.8	5	67 14.3	- 3 53.0	228 16.0	- 3 22.3
2	16 8.0	70	24 13.8	2	97 19.2	- 3 53.0	258 20.5	- 3 22.4
4	44 59.9	69	24 14.2	-1	127 24.1	- 3 52.9	288 24.9	- 3 22.6
6	73 51.7	69	24 14.0	-4	157 28.9	- 3 52.9	318 29.4	- 3 22.8
8	102 43.5	68	24 13.2	-7	187 33.8	- 3 52.8	348 33.9	- 3 23.0
10	131 35.1	68	24 11.9	-10	217 38.7	- 3 52.8	18 38.4	- 3 23.1
12	160 26.7	68	24 10.0	-13	247 43.5	- 3 52.7	48 42.8	- 3 23.3
14	189 18.3	68	24 7.4	-16	277 48.4	- 3 52.7	78 47.3	- 3 23.5
16	218 9.8	67	24 4.3	-18	307 53.2	- 3 52.6	108 51.8	- 3 23.7
18	247 1.3	67	24 .6	-21	337 58.1	- 3 52.6	138 56.3	- 3 23.8
20	275 52.7	67	23 56.3	-24	8 2.9	- 3 52.5	169 .7	- 3 24.0
22	304 44.2	67	23 51.4	-27	38 7.8	- 3 52.5	199 5.2	- 3 24.2
Δ					24	0	22	-1

φ	SUNCE IZLAZ	SUNCE ZALAZ	TRAJANJE SUMRAKA GRAĐ.	TRAJANJE SUMRAKA ASTR.	MJESEC IZLAZ	MJESEC Δ/24	MJESEC ZALAZ	MJESEC Δ/24
N	h min	h min	h min	h min	h min	min	h min	min
60	8 17	15 15	0 52	2 35	16 7	3.2	10 38	1.8
55	7 47	15 45	0 42	2 11	16 52	2.9	9 52	2.0
50	7 25	16 7	0 36	1 55	17 23	2.8	9 21	2.1
45	7 8	16 24	0 32	1 44	17 46	2.7	8 57	2.1
40	6 54	16 39	0 30	1 35	18 5	2.7	8 38	2.2
35	6 42	16 51	0 27	1 29	18 21	2.6	8 23	2.2
30	6 32	17 1	0 26	1 24	18 34	2.6	8 9	2.2
20	6 14	17 19	0 23	1 17	18 57	2.5	7 46	2.3
10	5 58	17 35	0 22	1 14	19 17	2.4	7 25	2.3
0	5 43	17 50	0 22	1 13	19 36	2.4	7 7	2.4
10	5 28	18 5	0 23	1 16	19 55	2.3	6 48	2.4
20	5 12	18 21	0 24	1 21	20 15	2.2	6 27	2.4
30	4 53	18 40	0 27	1 32	20 38	2.2	6 4	2.5
35	4 42	18 51	0 29	1 41	20 51	2.1	5 50	2.5
40	4 29	19 4	0 31	1 54	21 7	2.0	5 34	2.5
45	4 14	19 19	0 35	2 15	21 26	2.0	5 15	2.6
50	3 55	19 38	0 41	3 2	21 49	1.9	4 51	2.6
55	3 31	20 3	0 51	: ::	22 20	1.7	4 19	2.7
60	2 58	20 37	1 11	: ::	23 5	1.4	3 32	2.8
S								

SUNCE UT	SUNCE $e = T_p - UT$	SUNCE Δ/24	SUNCE r	MJESEC Prolaz	MJESEC Δ/24	MJESEC $\pi_\leftmoon$	MJESEC r
h	min s	s	′	h min	min	′	′
00	13 43.9	-.7	16.2	$T_{\overline{m}}$ 0 53	2.4	57.2	15.6
12	13 35.6	$T_{\overline{m}_\odot}$ 11 h 46.4 min		Starost 16.8 d	Faza ❍		

PLANETE

Pl.	$T_{\overline{m}}$	π	360−α	Vel.	Pl.	$T_{\overline{m}}$	π	360−α	Vel.
	h min	′	°			h min	′	°	
♀	9 35	.4	154	-4.5	♃	19 28	.0	5	-2.5
♂	13 3	.1	102	1.4	♄	8 46	.0	166	.9

UT	SUNCE $S_\odot$	SUNCE $\delta_\odot$	PROLJ. TAČKA S_Υ	VENERA S_φ	VENERA δ_φ	MARS S_σ	MARS δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	183 21.8	-20 28.7	62 50.4	216 39.6	-10 46.7	164 19.5	-23 46.9
2	213 21.4	-20 29.7	92 55.3	246 43.3	-10 46.2	194 20.4	-23 47.3
4	243 21.1	-20 30.7	123 .3	276 46.9	-10 45.6	224 21.3	-23 47.6
6	273 20.7	-20 31.7	153 5.2	306 50.5	-10 45.1	254 22.2	-23 47.9
8	303 20.4	-20 32.7	183 10.1	336 54.1	-10 44.5	284 23.1	-23 48.2
10	333 20.0	-20 33.8	213 15.1	6 57.6	-10 44.0	314 23.9	-23 48.6
12	3 19.6	-20 34.8	243 20.0	37 1.2	-10 43.5	344 24.8	-23 48.9
14	33 19.3	-20 35.8	273 24.9	67 4.7	-10 43.0	14 25.7	-23 49.2
16	63 18.9	-20 36.8	303 29.8	97 8.2	-10 42.5	44 26.6	-23 49.5
18	93 18.5	-20 37.8	333 34.8	127 11.8	-10 42.0	74 27.5	-23 49.8
20	123 18.2	-20 38.8	3 39.7	157 15.3	-10 41.5	104 28.3	-23 50.2
22	153 17.8	-20 39.8	33 44.6	187 18.8	-10 41.1	134 29.2	-23 50.5
Δ	-2	-5		18	3	4	-2

UT	MJESEC $S_\leftmoon$	MJESEC Δ	MJESEC $\delta_\leftmoon$	MJESEC Δ	JUPITER S_4	JUPITER δ_4	SATURN S_η	SATURN δ_η
h	° ′		° ′		° ′	° ′	° ′	° ′
0	333 35.7	67	23 46.0	-30	68 12.7	- 3 52.4	229 9.7	- 3 24.3
2	2 27.2	68	23 39.9	-33	98 17.5	- 3 52.3	259 14.2	- 3 24.5
4	31 18.7	68	23 33.3	-36	128 22.4	- 3 52.3	289 18.7	- 3 24.7
6	60 10.3	68	23 26.0	-39	158 27.2	- 3 52.2	319 23.1	- 3 24.9
8	89 1.9	68	23 18.2	-42	188 32.1	- 3 52.2	349 27.6	- 3 25.0
10	117 53.6	69	23 9.8	-45	218 36.9	- 3 52.1	19 32.1	- 3 25.2
12	146 45.3	69	23 .9	-48	248 41.7	- 3 52.1	49 36.6	- 3 25.4
14	175 37.2	70	22 51.4	-50	278 46.6	- 3 52.0	79 41.1	- 3 25.5
16	204 29.1	70	22 41.3	-53	308 51.4	- 3 51.9	109 45.5	- 3 25.7
18	233 21.2	71	22 30.6	-56	338 56.3	- 3 51.9	139 50.0	- 3 25.9
20	262 13.4	72	22 19.4	-59	9 1.1	- 3 51.8	169 54.5	- 3 26.0
22	291 5.7	72	22 7.6	-62	39 6.0	- 3 51.8	199 59.0	- 3 26.2
Δ					24	0	22	-1

φ	SUNCE IZLAZ	SUNCE ZALAZ	TRAJANJE SUMRAKA GRAĐ.	TRAJANJE SUMRAKA ASTR.	MJESEC IZLAZ	MJESEC Δ/24	MJESEC ZALAZ	MJESEC Δ/24
N	h min	h min	h min	h min	h min	min	h min	min
60	8 19	15 13	0 52	2 35	17 23	3.7	11 20	1.1
55	7 49	15 44	0 43	2 11	18 3	3.3	10 39	1.5
50	7 27	16 6	0 37	1 55	18 31	3.1	10 10	1.7
45	7 9	16 24	0 33	1 44	18 52	3.0	9 48	1.8
40	6 55	16 38	0 30	1 35	19 9	2.9	9 31	1.9
35	6 43	16 50	0 27	1 29	19 23	2.8	9 16	2.0
30	6 32	17 1	0 26	1 24	19 36	2.7	9 3	2.0
20	6 14	17 19	0 24	1 17	19 57	2.5	8 41	2.2
10	5 58	17 35	0 22	1 14	20 16	2.4	8 22	2.3
0	5 43	17 50	0 22	1 14	20 33	2.3	8 3	2.3
10	5 28	18 6	0 23	1 16	20 50	2.2	7 45	2.4
20	5 11	18 22	0 24	1 22	21 8	2.1	7 26	2.5
30	4 52	18 41	0 27	1 33	21 30	1.9	7 3	2.6
35	4 41	18 52	0 29	1 42	21 42	1.9	6 50	2.7
40	4 28	19 5	0 31	1 55	21 56	1.8	6 35	2.8
45	4 13	19 21	0 35	2 16	22 13	1.6	6 16	2.9
50	3 54	19 40	0 41	3 5	22 33	1.5	5 54	3.0
55	3 30	20 4	0 51	: ::	23 0	1.2	5 23	3.2
60	2 56	20 39	1 12	: ::	23 38	.9	4 39	3.5
S								

SUNCE UT	SUNCE $e = T_p - UT$	SUNCE Δ/24	SUNCE r	MJESEC Prolaz	MJESEC Δ/24	MJESEC $\pi_\leftmoon$	MJESEC r
h	min s	s	′	h min	min	′	′
00	13 27.3	-.7	16.2	$T_{\overline{m}}$ 1 50	2.3	57.7	15.7
12	13 18.6	$T_{\overline{m}_\odot}$ 11 h 46.7 min		Starost 17.8 d	Faza ❍		

PLANETE

Pl.	$T_{\overline{m}}$	π	360−α	Vel.	Pl.	$T_{\overline{m}}$	π	360−α	Vel.
	h min	′	°			h min	′	°	
♀	9 32	.4	154	-4.5	♃	19 24	.0	5	-2.5
♂	13 2	.1	101	1.3	♄	8 42	.0	166	.9

UT	SUNCE $S_\odot$	SUNCE $\delta_\odot$	PROLJ. TAČKA S_Υ	VENERA S_φ	VENERA δ_φ	MARS S_σ	MARS δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	183 17.4	-20 40.7	63 49.5	217 22.2	-10 40.6	164 30.1	-23 50.8
2	213 17.1	-20 41.7	93 54.5	247 25.7	-10 40.1	194 31.0	-23 51.1
4	243 16.7	-20 42.7	123 59.4	277 29.1	-10 39.7	224 31.8	-23 51.4
6	273 16.3	-20 43.7	154 4.3	307 32.6	-10 39.2	254 32.7	-23 51.7
8	303 16.0	-20 44.7	184 9.3	337 36.0	-10 38.8	284 33.6	-23 52.0
10	333 15.6	-20 45.7	214 14.2	7 39.4	-10 38.4	314 34.4	-23 52.3
12	3 15.2	-20 46.6	244 19.1	37 42.8	-10 37.9	344 35.3	-23 52.6
14	33 14.8	-20 47.6	274 24.0	67 46.2	-10 37.5	14 36.2	-23 52.9
16	63 14.4	-20 48.6	304 29.0	97 49.6	-10 37.1	44 37.0	-23 53.2
18	93 14.1	-20 49.5	334 33.9	127 52.9	-10 36.7	74 37.9	-23 53.5
20	123 13.7	-20 50.5	4 38.8	157 56.3	-10 36.3	104 38.8	-23 53.8
22	153 13.3	-20 51.5	34 43.8	187 59.6	-10 35.9	134 39.7	-23 54.1
Δ	-2	-5		17	2	4	-2

UT	MJESEC $S_\leftmoon$	MJESEC Δ	MJESEC $\delta_\leftmoon$	MJESEC Δ	JUPITER S_4	JUPITER δ_4	SATURN S_η	SATURN δ_η
h	° ′		° ′		° ′	° ′	° ′	° ′
0	319 58.1	73	21 55.3	-64	69 10.8	- 3 51.7	230 3.5	- 3 26.4
2	348 50.7	74	21 42.5	-67	99 15.6	- 3 51.6	260 8.0	- 3 26.6
4	17 43.4	74	21 29.1	-70	129 20.5	- 3 51.6	290 12.4	- 3 26.7
6	46 36.3	75	21 15.2	-72	159 25.3	- 3 51.5	320 16.9	- 3 26.9
8	75 29.3	76	21 .7	-75	189 30.1	- 3 51.4	350 21.4	- 3 27.1
10	104 22.6	77	20 45.8	-77	219 35.0	- 3 51.4	20 25.9	- 3 27.2
12	133 15.9	78	20 30.3	-80	249 39.8	- 3 51.3	50 30.4	- 3 27.4
14	162 9.5	79	20 14.3	-82	279 44.6	- 3 51.2	80 34.9	- 3 27.6
16	191 3.3	80	19 57.8	-85	309 49.5	- 3 51.2	110 39.4	- 3 27.7
18	219 57.2	81	19 40.9	-87	339 54.3	- 3 51.1	140 43.8	- 3 27.9
20	248 51.4	82	19 23.5	-89	9 59.1	- 3 51.0	170 48.3	- 3 28.1
22	277 45.7	83	19 5.6	-92	40 3.9	- 3 51.0	200 52.8	- 3 28.2
Δ					24	0	22	-1

φ	SUNCE IZLAZ	SUNCE ZALAZ	TRAJANJE SUMRAKA GRAĐ.	TRAJANJE SUMRAKA ASTR.	MJESEC IZLAZ	MJESEC Δ/24	MJESEC ZALAZ	MJESEC Δ/24
N	h min	h min	h min	h min	h min	min	h min	min
60	8 22	15 12	0 52	2 36	18 51	3.9	11 47	.7
55	7 51	15 43	0 43	2 12	19 23	3.5	11 14	1.1
50	7 28	16 5	0 37	1 56	19 46	3.3	10 50	1.3
45	7 11	16 23	0 33	1 44	20 3	3.1	10 32	1.5
40	6 56	16 38	0 30	1 35	20 17	2.9	10 16	1.6
35	6 44	16 50	0 27	1 29	20 30	2.8	10 3	1.7
30	6 33	17 1	0 26	1 24	20 40	2.7	9 52	1.8
20	6 15	17 19	0 24	1 17	20 58	2.5	9 33	2.0
10	5 59	17 35	0 22	1 14	21 14	2.4	9 16	2.1
0	5 43	17 51	0 22	1 14	21 28	2.2	8 60	2.3
10	5 28	18 6	0 23	1 16	21 43	2.1	8 44	2.4
20	5 11	18 23	0 24	1 22	21 58	1.9	8 26	2.5
30	4 52	18 42	0 27	1 33	22 16	1.7	8 6	2.7
35	4 41	18 53	0 29	1 42	22 26	1.6	7 55	2.8
40	4 28	19 6	0 32	1 55	22 38	1.5	7 41	2.9
45	4 13	19 22	0 35	2 17	22 52	1.4	7 25	3.0
50	3 54	19 41	0 41	3 8	23 9	1.2	7 5	3.2
55	3 29	20 6	0 51	: ::	23 30	.9	6 40	3.5
60	2 54	20 42	1 14	: ::	23 59	.6	6 3	3.9
S								

SUNCE UT	SUNCE $e = T_p - UT$	SUNCE Δ/24	SUNCE r	MJESEC Prolaz	MJESEC Δ/24	MJESEC $\pi_\leftmoon$	MJESEC r
h	min s	s	′	h min	min	′	′
00	13 10.0	-.8	16.2	$T_{\overline{m}}$ 2 46	2.3	58.1	15.8
12	13 .9	$T_{\overline{m}_\odot}$ 11 h 47.0 min		Starost 18.8 d	Faza ◑		

PLANETE

Pl.	$T_{\overline{m}}$	π	360−α	Vel.	Pl.	$T_{\overline{m}}$	π	360−α	Vel.
	h min	′	°			h min	′	°	
♀	9 29	.4	154	-4.5	♃	19 20	.0	5	-2.5
♂	13 2	.1	101	1.3	♄	8 38	.0	166	.9

UT	SUNCE $S_\odot$	SUNCE $\delta_\odot$	PROLJ. TAČKA S_Υ	VENERA S_φ	VENERA δ_φ	MARS S_σ	MARS δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	183 12.9	-20 52.4	64 48.7	218 2.9	-10 35.6	164 40.5	-23 54.4
2	213 12.5	-20 53.4	94 53.6	248 6.2	-10 35.2	194 41.4	-23 54.7
4	243 12.1	-20 54.3	124 58.5	278 9.5	-10 34.8	224 42.2	-23 55.0
6	273 11.7	-20 55.3	155 3.5	308 12.8	-10 34.5	254 43.1	-23 55.3
8	303 11.4	-20 56.2	185 8.4	338 16.1	-10 34.1	284 44.0	-23 55.5
10	333 11.0	-20 57.2	215 13.3	8 19.3	-10 33.8	314 44.8	-23 55.8
12	3 10.6	-20 58.1	245 18.3	38 22.6	-10 33.5	344 45.7	-23 56.1
14	33 10.2	-20 59.1	275 23.2	68 25.8	-10 33.1	14 46.6	-23 56.4
16	63 9.8	-21 .0	305 28.1	98 29.0	-10 32.8	44 47.4	-23 56.7
18	93 9.4	-21 .9	335 33.0	128 32.2	-10 32.5	74 48.3	-23 56.9
20	123 9.0	-21 1.9	5 38.0	158 35.4	-10 32.2	104 49.1	-23 57.2
22	153 8.6	-21 2.8	35 42.9	188 38.6	-10 31.9	134 50.0	-23 57.5
Δ	-2	-5		16	2	4	-1

UT	MJESEC $S_\leftmoon$	MJESEC Δ	MJESEC $\delta_\leftmoon$	MJESEC Δ	JUPITER S_4	JUPITER δ_4	SATURN S_η	SATURN δ_η
h	° ′		° ′		° ′	° ′	° ′	° ′
0	306 40.2	84	18 47.2	-94	70 8.8	- 3 50.9	230 57.3	- 3 28.4
2	335 35.0	85	18 28.4	-96	100 13.6	- 3 50.8	261 1.8	- 3 28.6
4	4 29.9	86	18 9.1	-98	130 18.4	- 3 50.7	291 6.3	- 3 28.7
6	33 25.0	87	17 49.4	-101	160 23.2	- 3 50.7	321 10.8	- 3 28.9
8	62 20.4	88	17 29.3	-103	190 28.0	- 3 50.6	351 15.3	- 3 29.1
10	91 15.9	89	17 8.7	-105	220 32.8	- 3 50.5	21 19.8	- 3 29.2
12	120 11.7	90	16 47.8	-107	250 37.7	- 3 50.5	51 24.2	- 3 29.4
14	149 7.7	91	16 26.4	-109	280 42.5	- 3 50.4	81 28.7	- 3 29.6
16	178 3.8	92	16 4.7	-111	310 47.3	- 3 50.3	111 33.2	- 3 29.7
18	207 .2	93	15 42.6	-112	340 52.1	- 3 50.2	141 37.7	- 3 29.9
20	235 56.8	94	15 20.1	-114	10 56.9	- 3 50.2	171 42.2	- 3 30.1
22	264 53.6	95	14 57.2	-116	41 1.7	- 3 50.1	201 46.7	- 3 30.2
Δ					24	0	22	-1

φ	SUNCE IZLAZ	SUNCE ZALAZ	TRAJANJE SUMRAKA GRAĐ.	TRAJANJE SUMRAKA ASTR.	MJESEC IZLAZ	MJESEC Δ/24	MJESEC ZALAZ	MJESEC Δ/24
N	h min	h min	h min	h min	h min	min	h min	min
60	8 24	15 10	0 53	2 37	20 25	3.9	12 4	.5
55	7 52	15 42	0 43	2 12	20 48	3.6	11 40	.8
50	7 30	16 5	0 37	1 56	21 4	3.3	11 22	1.1
45	7 12	16 22	0 33	1 44	21 17	3.1	11 7	1.3
40	6 57	16 37	0 30	1 35	21 28	2.9	10 56	1.4
35	6 45	16 49	0 27	1 29	21 37	2.8	10 45	1.6
30	6 34	17 0	0 26	1 24	21 45	2.7	10 36	1.7
20	6 15	17 19	0 24	1 17	21 59	2.5	10 21	1.9
10	5 59	17 35	0 22	1 14	22 11	2.3	10 7	2.0
0	5 44	17 51	0 22	1 14	22 22	2.1	9 54	2.2
10	5 28	18 7	0 23	1 16	22 33	2.0	9 41	2.3
20	5 11	18 23	0 24	1 22	22 45	1.8	9 27	2.5
30	4 52	18 43	0 27	1 33	22 58	1.6	9 11	2.7
35	4 41	18 54	0 29	1 42	23 6	1.5	9 2	2.8
40	4 27	19 8	0 32	1 56	23 15	1.3	8 51	2.9
45	4 12	19 23	0 36	2 18	23 25	1.2	8 38	3.1
50	3 53	19 43	0 42	3 12	23 37	1.0	8 23	3.3
55	3 27	20 8	0 52	: ::	23 52	.7	8 3	3.6
60	2 52	20 44	1 15	: ::	.. ..	.0	7 36	4.0
S								

SUNCE UT	SUNCE $e = T_p - UT$	SUNCE Δ/24	SUNCE r	MJESEC Prolaz	MJESEC Δ/24	MJESEC $\pi_\leftmoon$	MJESEC r
h	min s	s	′	h min	min	′	′
00	12 51.8	-.8	16.2	$T_{\overline{m}}$ 3 41	2.2	58.5	15.9
12	12 42.3	$T_{\overline{m}_\odot}$ 11 h 47.3 min		Starost 19.8 d	Faza ◑		

PLANETE

Pl.	$T_{\overline{m}}$	π	360−α	Vel.	Pl.	$T_{\overline{m}}$	π	360−α	Vel.
	h min	′	°			h min	′	°	
♀	9 27	.4	153	-4.5	♃	19 16	.0	5	-2.4
♂	13 1	.1	100	1.3	♄	8 35	.0	166	.9

UT	SUNCE				PROLJ. TAČKA	VENERA				MARS			
	$S_\odot$		$\delta_\odot$		S_Υ	S_φ		δ_φ		S_σ		δ_σ	
h	°	′	°	′	° ′	°	′	°	′	°	′	°	′
0	183	8.2	-21	3.7	65 47.8	218	41.8	-10	31.6	164	50.9	-23	57.8
2	213	7.8	-21	4.6	95 52.8	248	44.9	-10	31.4	194	51.7	-23	58.0
4	243	7.4	-21	5.6	125 57.7	278	48.1	-10	31.1	224	52.6	-23	58.3
6	273	7.0	-21	6.5	156 2.6	308	51.2	-10	30.8	254	53.4	-23	58.6
8	303	6.6	-21	7.4	186 7.5	338	54.3	-10	30.6	284	54.3	-23	58.8
10	333	6.2	-21	8.3	216 12.5	8	57.4	-10	30.3	314	55.1	-23	59.1
12	3	5.7	-21	9.2	246 17.4	39	.5	-10	30.1	344	56.0	-23	59.3
14	33	5.3	-21	10.1	276 22.3	69	3.6	-10	29.8	14	56.8	-23	59.6
16	63	4.9	-21	11.0	306 27.3	99	6.7	-10	29.6	44	57.7	-23	59.9
18	93	4.5	-21	11.9	336 32.2	129	9.8	-10	29.4	74	58.5	-24	.1
20	123	4.1	-21	12.8	6 37.1	159	12.8	-10	29.2	104	59.4	-24	.4
22	153	3.7	-21	13.7	36 42.0	189	15.8	-10	28.9	135	.2	-24	.6
Δ		-2		-5			15		1		4		-1

UT	MJESEC					JUPITER				SATURN			
	$S_\leftmoon$		Δ	$\delta_\leftmoon$	Δ	S_4		δ_4		S_η		δ_η	
h	°	′		°	′	°	′	°	′	°	′	°	′
0	293	50.5	96	14	34.0 -118	71	6.5	- 3	50.0	231	51.2	- 3	30.4
2	322	47.7	97	14	10.4 -119	101	11.3	- 3	49.9	261	55.7	- 3	30.5
4	351	45.1	98	13	46.6 -121	131	16.1	- 3	49.9	292	.2	- 3	30.7
6	20	42.6	99	13	22.3 -123	161	20.9	- 3	49.8	322	4.7	- 3	30.9
8	49	40.3	100	12	57.8 -124	191	25.7	- 3	49.7	352	9.2	- 3	31.0
10	78	38.3	100	12	33.0 -126	221	30.5	- 3	49.6	22	13.7	- 3	31.2
12	107	36.3	101	12	7.9 -127	251	35.3	- 3	49.5	52	18.2	- 3	31.4
14	136	34.6	102	11	42.5 -128	281	40.1	- 3	49.5	82	22.7	- 3	31.5
16	165	33.0	103	11	16.8 -130	311	44.9	- 3	49.4	112	27.1	- 3	31.7
18	194	31.6	104	10	50.9 -131	341	49.7	- 3	49.3	142	31.6	- 3	31.9
20	223	30.3	104	10	24.7 -132	11	54.5	- 3	49.2	172	36.1	- 3	32.0
22	252	29.2	105	9	58.3 -133	41	59.3	- 3	49.1	202	40.6	- 3	32.2
Δ							24		0		22		-1

φ	SUNCE		TRAJANJE SUMRAKA		MJESEC			
	IZLAZ	ZALAZ	GRAĐ.	ASTR.	IZLAZ	Δ/24	ZALAZ	Δ/24
N	h min	h min	h min	h min	h min	min	h min	min
60	8 26	15 9	0 53	2 37	21 60	3.9	12 16	.4
55	7 54	15 41	0 43	2 13	22 13	3.6	11 60	.7
50	7 31	16 4	0 37	1 56	22 24	3.3	11 48	.9
45	7 13	16 22	0 33	1 44	22 32	3.1	11 38	1.1
40	6 58	16 37	0 30	1 36	22 39	2.9	11 30	1.3
35	6 46	16 49	0 28	1 29	22 44	2.8	11 23	1.4
30	6 35	17 0	0 26	1 24	22 50	2.7	11 16	1.5
20	6 16	17 19	0 24	1 17	22 58	2.4	11 5	1.7
10	5 60	17 36	0 22	1 14	23 6	2.3	10 56	1.9
0	5 44	17 51	0 22	1 14	23 13	2.1	10 46	2.1
10	5 28	18 7	0 23	1 16	23 20	1.9	10 37	2.3
20	5 11	18 24	0 24	1 22	23 28	1.7	10 27	2.5
30	4 52	18 44	0 27	1 33	23 36	1.5	10 16	2.7
35	4 40	18 55	0 29	1 43	23 41	1.4	10 9	2.8
40	4 27	19 9	0 32	1 56	23 47	1.2	10 2	2.9
45	4 11	19 25	0 36	2 19	23 53	1.1	9 53	3.1
50	3 52	19 44	0 42	3 16	.. ..	.0	9 42	3.3
55	3 26	20 10	0 52	: ::	.. ..	.0	9 28	3.6
60	2 50	20 47	1 16	: ::	0 14	.4	9 11	3.9
S								

SUNCE				MJESEC				
UT	e = Tp − UT	Δ/24	r	Prolaz		Δ/24	$\pi_\leftmoon$	r
h	min s	s	′		h min	min	′	′
00	12 32.9	-.8	16.2	$T_{\overline{m}}$	4 34	2.1	58.8	16.0
12	12 23.1	$T_{\overline{m}_\odot}$	11 h 47.6 min	Starost 20.8 d		Faza ◑		

PLANETE									
Pl.	$T_{\overline{m}}$	π	360−α	Vel.	Pl.	$T_{\overline{m}}$	π	360−α	Vel.
	h min	′	°			h min	′	°	
♀	9 24	.4	153	-4.5	♃	19 12	.0	5	-2.4
♂	13 0	.1	99	1.3	♄	8 31	.0	166	.9

UT	SUNCE				PROLJ. TAČKA	VENERA				MARS			
	$S_\odot$		$\delta_\odot$		S_Υ	S_φ		δ_φ		S_σ		δ_σ	
h	°	′	°	′	° ′	°	′	°	′	°	′	°	′
0	183	3.3	-21	14.6	66 47.0	219	18.9	-10	28.7	165	1.1	-24	.9
2	213	2.9	-21	15.5	96 51.9	249	21.9	-10	28.5	195	1.9	-24	1.1
4	243	2.4	-21	16.4	126 56.8	279	24.9	-10	28.4	225	2.8	-24	1.4
6	273	2.0	-21	17.3	157 1.7	309	27.9	-10	28.2	255	3.6	-24	1.6
8	303	1.6	-21	18.1	187 6.7	339	30.8	-10	28.0	285	4.5	-24	1.9
10	333	1.2	-21	19.0	217 11.6	9	33.8	-10	27.8	315	5.3	-24	2.1
12	3	.7	-21	19.9	247 16.5	39	36.8	-10	27.7	345	6.2	-24	2.3
14	33	.3	-21	20.8	277 21.5	69	39.7	-10	27.5	15	7.0	-24	2.6
16	62	59.9	-21	21.6	307 26.4	99	42.6	-10	27.4	45	7.8	-24	2.8
18	92	59.5	-21	22.5	337 31.3	129	45.5	-10	27.2	75	8.7	-24	3.0
20	122	59.0	-21	23.4	7 36.2	159	48.4	-10	27.1	105	9.5	-24	3.3
22	152	58.6	-21	24.2	37 41.2	189	51.3	-10	27.0	135	10.4	-24	3.5
Δ		-2		-4			15		1		4		-1

UT	MJESEC					JUPITER				SATURN			
	$S_\leftmoon$		Δ	$\delta_\leftmoon$	Δ	S_4		δ_4		S_η		δ_η	
h	°	′		°	′	°	′	°	′	°	′	°	′
0	281	28.2	106	9	31.6 -134	72	4.1	- 3	49.0	232	45.1	- 3	32.3
2	310	27.4	106	9	4.7 -135	102	8.9	- 3	49.0	262	49.6	- 3	32.5
4	339	26.7	107	8	37.7 -136	132	13.7	- 3	48.9	292	54.1	- 3	32.7
6	8	26.1	108	8	10.4 -137	162	18.5	- 3	48.8	322	58.6	- 3	32.8
8	37	25.6	108	7	42.9 -138	192	23.3	- 3	48.7	353	3.1	- 3	33.0
10	66	25.2	109	7	15.2 -139	222	28.0	- 3	48.6	23	7.6	- 3	33.2
12	95	25.0	109	6	47.4 -140	252	32.8	- 3	48.5	53	12.1	- 3	33.3
14	124	24.8	110	6	19.4 -141	282	37.6	- 3	48.5	83	16.6	- 3	33.5
16	153	24.7	110	5	51.3 -141	312	42.4	- 3	48.4	113	21.1	- 3	33.6
18	182	24.7	110	5	23.0 -142	342	47.2	- 3	48.3	143	25.6	- 3	33.8
20	211	24.8	111	4	54.6 -143	12	51.9	- 3	48.2	173	30.1	- 3	34.0
22	240	24.9	111	4	26.1 -143	42	56.7	- 3	48.1	203	34.6	- 3	34.1
Δ							24		0		23		-1

φ	SUNCE		TRAJANJE SUMRAKA		MJESEC			
	IZLAZ	ZALAZ	GRAĐ.	ASTR.	IZLAZ	Δ/24	ZALAZ	Δ/24
N	h min	h min	h min	h min	h min	min	h min	min
60	8 28	15 7	0 53	2 38	23 34	3.9	12 25	.3
55	7 56	15 40	0 43	2 13	23 39	3.6	12 17	.6
50	7 32	16 3	0 37	1 56	23 43	3.3	12 10	.9
45	7 14	16 21	0 33	1 45	23 46	3.1	12 5	1.1
40	6 59	16 36	0 30	1 36	23 49	2.9	12 0	1.2
35	6 47	16 49	0 28	1 29	23 51	2.8	11 57	1.4
30	6 36	17 0	0 26	1 24	23 54	2.7	11 53	1.5
20	6 17	17 19	0 24	1 18	23 57	2.4	11 47	1.7
10	5 60	17 36	0 22	1 14	.. ..	.0	11 42	1.9
0	5 44	17 52	0 22	1 14	.. ..	.0	11 37	2.1
10	5 28	18 8	0 23	1 16	.. ..	.0	11 32	2.2
20	5 11	18 25	0 24	1 22	.. ..	.0	11 26	2.4
30	4 52	18 45	0 27	1 34	.. ..	.0	11 20	2.7
35	4 40	18 56	0 29	1 43	.. ..	.0	11 17	2.8
40	4 27	19 10	0 32	1 57	.. ..	.0	11 12	2.9
45	4 11	19 26	0 36	2 20	.. ..	.0	11 8	3.1
50	3 51	19 46	0 42	3 21	0 2	.9	11 2	3.3
55	3 25	20 12	0 53	: ::	0 11	.6	10 54	3.6
60	2 48	20 49	1 18	: ::	0 24	.3	10 45	3.9
S								

SUNCE				MJESEC				
UT	e = Tp − UT	Δ/24	r	Prolaz		Δ/24	$\pi_\leftmoon$	r
h	min s	s	′		h min	min	′	′
00	12 13.3	-.8	16.2	$T_{\overline{m}}$	5 25	2.1	59.0	16.1
12	12 3.0	$T_{\overline{m}_\odot}$	11 h 47.9 min	Starost 21.8 d		Faza ◑		

PLANETE									
Pl.	$T_{\overline{m}}$	π	360−α	Vel.	Pl.	$T_{\overline{m}}$	π	360−α	Vel.
	h min	′	°			h min	′	°	
♀	9 22	.4	153	-4.5	♃	19 9	.0	5	-2.4
♂	12 60	.1	98	1.3	♄	8 28	.0	166	.9

UT	SUNCE		PROLJ. TAČKA	VENERA		MARS	
	$S_\odot$	$\delta_\odot$	S_Υ	S_φ	δ_φ	S_σ	δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	182 58.2	-21 25.1	67 46.1	219 54.2	-10 26.9	165 11.2	-24 3.7
2	212 57.7	-21 26.0	97 51.0	249 57.1	-10 26.8	195 12.1	-24 4.0
4	242 57.3	-21 26.8	127 56.0	279 60.0	-10 26.6	225 12.9	-24 4.2
6	272 56.9	-21 27.7	158 .9	310 2.8	-10 26.6	255 13.7	-24 4.4
8	302 56.4	-21 28.5	188 5.8	340 5.6	-10 26.5	285 14.6	-24 4.6
10	332 56.0	-21 29.3	218 10.7	10 8.5	-10 26.4	315 15.4	-24 4.8
12	2 55.6	-21 30.2	248 15.7	40 11.3	-10 26.3	345 16.2	-24 5.1
14	32 55.1	-21 31.0	278 20.6	70 14.1	-10 26.2	15 17.1	-24 5.3
16	62 54.7	-21 31.9	308 25.5	100 16.9	-10 26.2	45 17.9	-24 5.5
18	92 54.2	-21 32.7	338 30.5	130 19.6	-10 26.1	75 18.7	-24 5.7
20	122 53.8	-21 33.5	8 35.4	160 22.4	-10 26.1	105 19.6	-24 5.9
22	152 53.3	-21 34.4	38 40.3	190 25.2	-10 26.0	135 20.4	-24 6.1
Δ	-2	-4		14	0	4	-1

UT	MJESEC				JUPITER		SATURN	
	$S_\leftmoon$	Δ	$\delta_\leftmoon$	Δ	S_4	δ_4	S_η	δ_η
h	° ′		° ′		° ′	° ′	° ′	° ′
0	269 25.1	111	3 57.5	-144	73 1.5	- 3 48.0	233 39.1	- 3 34.3
2	298 25.3	111	3 28.8	-144	103 6.3	- 3 47.9	263 43.6	- 3 34.4
4	327 25.5	111	3 .0	-144	133 11.0	- 3 47.8	293 48.1	- 3 34.6
6	356 25.8	112	2 31.1	-145	163 15.8	- 3 47.7	323 52.7	- 3 34.7
8	25 26.1	112	2 2.1	-145	193 20.6	- 3 47.6	353 57.2	- 3 34.9
10	54 26.5	112	1 33.1	-145	223 25.4	- 3 47.6	24 1.7	- 3 35.1
12	83 26.8	112	1 4.1	-145	253 30.1	- 3 47.5	54 6.2	- 3 35.2
14	112 27.1	112	0 35.0	-146	283 34.9	- 3 47.4	84 10.7	- 3 35.4
16	141 27.4	111	0 5.9	-146	313 39.7	- 3 47.3	114 15.2	- 3 35.5
18	170 27.7	111	- 0 23.2	-146	343 44.4	- 3 47.2	144 19.7	- 3 35.7
20	199 28.0	111	- 0 52.3	-146	13 49.2	- 3 47.1	174 24.2	- 3 35.9
22	228 28.2	111	- 1 21.4	-145	43 53.9	- 3 47.0	204 28.7	- 3 36.0
Δ					24	0	23	-1

φ	SUNCE		TRAJANJE SUMRAKA		MJESEC			
	IZLAZ	ZALAZ	GRAĐ.	ASTR.	IZLAZ	Δ/24	ZALAZ	Δ/24
N	h min	h min	h min	h min	h min	min	h min	min
60	8 31	15 6	0 54	2 38	. . .	.0	12 33	.3
55	7 58	15 39	0 43	2 13	. . .	.0	12 32	.6
50	7 34	16 2	0 37	1 57	. . .	.0	12 31	.9
45	7 15	16 21	0 33	1 45	. . .	.0	12 30	1.0
40	7 0	16 36	0 30	1 36	. . .	.0	12 30	1.2
35	6 48	16 49	0 28	1 29	. . .	.0	12 29	1.3
30	6 36	16 60	0 26	1 24	. . .	.0	12 29	1.5
20	6 17	17 19	0 24	1 18	. . .	.0	12 28	1.7
10	6 0	17 36	0 23	1 14	0 0	2.2	12 27	1.9
0	5 45	17 52	0 22	1 14	0 3	2.1	12 26	2.1
10	5 29	18 8	0 23	1 16	0 6	1.9	12 26	2.2
20	5 11	18 25	0 24	1 22	0 9	1.7	12 25	2.4
30	4 51	18 45	0 27	1 34	0 13	1.5	12 24	2.7
35	4 40	18 57	0 29	1 43	0 15	1.3	12 24	2.8
40	4 26	19 11	0 32	1 57	0 17	1.2	12 23	2.9
45	4 10	19 27	0 36	2 21	0 20	1.0	12 22	3.1
50	3 50	19 47	0 42	3 26	0 23	.8	12 21	3.3
55	3 24	20 13	0 53	: ::	0 27	.6	12 20	3.6
60	2 47	20 51	1 19	: ::	0 32	.3	12 19	3.9
S								

SUNCE				MJESEC			
UT	e = Tp − UT	Δ/24	r	Prolaz	Δ/24	$\pi_\leftmoon$	r
h	min s	s	′	h min	min	′	′
00	11 52.9	-.9	16.2	$T_{\overline{m}}$ 6 15	2.0	59.2	16.1
12	11 42.3	$T_{\overline{m}_\odot}$ 11 h 48.3 min		Starost 22.8 d		Faza ◑	

PLANETE								
Pl.	$T_{\overline{m}}$	π	360−α	Vel.	Pl.	$T_{\overline{m}}$	π	360−α	Vel.
	h min	′	°			h min	′	°	
♀	9 20	.4	152	-4.5	♃	19 5	.0	5	-2.4
♂	12 59	.1	97	1.3	♄	8 24	.0	166	.9

UT	SUNCE		PROLJ. TAČKA	VENERA		MARS	
	$S_\odot$	$\delta_\odot$	S_Υ	S_φ	δ_φ	S_σ	δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	182 52.9	-21 35.2	68 45.2	220 27.9	-10 26.0	165 21.2	-24 6.3
2	212 52.5	-21 36.0	98 50.2	250 30.7	-10 25.9	195 22.1	-24 6.5
4	242 52.0	-21 36.8	128 55.1	280 33.4	-10 25.9	225 22.9	-24 6.7
6	272 51.6	-21 37.6	159 .0	310 36.1	-10 25.9	255 23.7	-24 6.9
8	302 51.1	-21 38.5	189 5.0	340 38.8	-10 25.9	285 24.6	-24 7.1
10	332 50.6	-21 39.3	219 9.9	10 41.5	-10 25.9	315 25.4	-24 7.3
12	2 50.2	-21 40.1	249 14.8	40 44.2	-10 25.9	345 26.2	-24 7.5
14	32 49.7	-21 40.9	279 19.7	70 46.8	-10 25.9	15 27.1	-24 7.7
16	62 49.3	-21 41.7	309 24.7	100 49.5	-10 25.9	45 27.9	-24 7.9
18	92 48.8	-21 42.5	339 29.6	130 52.1	-10 25.9	75 28.7	-24 8.1
20	122 48.4	-21 43.3	9 34.5	160 54.8	-10 26.0	105 29.5	-24 8.3
22	152 47.9	-21 44.1	39 39.5	190 57.4	-10 26.0	135 30.4	-24 8.5
Δ	-2	-4		13	0	4	-1

UT	MJESEC				JUPITER		SATURN	
	$S_\leftmoon$	Δ	$\delta_\leftmoon$	Δ	S_4	δ_4	S_η	δ_η
h	° ′		° ′		° ′	° ′	° ′	° ′
0	257 28.4	111	- 1 50.5	-145	73 58.7	- 3 46.9	234 33.2	- 3 36.2
2	286 28.5	110	- 2 19.6	-145	104 3.5	- 3 46.8	264 37.7	- 3 36.3
4	315 28.6	110	- 2 48.6	-145	134 8.2	- 3 46.7	294 42.2	- 3 36.5
6	344 28.6	110	- 3 17.5	-144	164 13.0	- 3 46.6	324 46.7	- 3 36.6
8	13 28.5	109	- 3 46.4	-144	194 17.7	- 3 46.5	354 51.2	- 3 36.8
10	42 28.4	109	- 4 15.3	-144	224 22.5	- 3 46.4	24 55.8	- 3 37.0
12	71 28.1	108	- 4 44.0	-143	254 27.2	- 3 46.3	55 .3	- 3 37.1
14	100 27.7	108	- 5 12.6	-143	284 32.0	- 3 46.2	85 4.8	- 3 37.3
16	129 27.3	107	- 5 41.2	-142	314 36.7	- 3 46.1	115 9.3	- 3 37.4
18	158 26.7	106	- 6 9.6	-141	344 41.5	- 3 46.0	145 13.8	- 3 37.6
20	187 25.9	106	- 6 37.9	-141	14 46.2	- 3 45.9	175 18.3	- 3 37.7
22	216 25.1	105	- 7 6.0	-140	44 51.0	- 3 45.8	205 22.8	- 3 37.9
Δ					24	1	23	-1

φ	SUNCE		TRAJANJE SUMRAKA		MJESEC			
	IZLAZ	ZALAZ	GRAĐ.	ASTR.	IZLAZ	Δ/24	ZALAZ	Δ/24
N	h min	h min	h min	h min	h min	min	h min	min
60	8 33	15 4	0 54	2 39	1 9	3.9	12 40	.4
55	7 59	15 38	0 44	2 14	1 6	3.6	12 46	.7
50	7 35	16 2	0 37	1 57	1 3	3.3	12 51	.9
45	7 17	16 20	0 33	1 45	1 2	3.1	12 55	1.1
40	7 1	16 36	0 30	1 36	1 0	3.0	12 59	1.3
35	6 49	16 49	0 28	1 29	0 59	2.8	13 1	1.4
30	6 37	16 60	0 26	1 24	0 58	2.7	13 4	1.5
20	6 18	17 19	0 24	1 18	0 56	2.5	13 8	1.7
10	6 1	17 36	0 23	1 15	0 54	2.3	13 12	1.9
0	5 45	17 52	0 22	1 14	0 52	2.1	13 16	2.1
10	5 29	18 9	0 23	1 17	0 51	1.9	13 20	2.3
20	5 12	18 26	0 24	1 23	0 49	1.7	13 24	2.5
30	4 51	18 46	0 27	1 34	0 48	1.5	13 28	2.7
35	4 40	18 58	0 29	1 44	0 47	1.4	13 31	2.8
40	4 26	19 12	0 32	1 58	0 46	1.2	13 34	3.0
45	4 10	19 28	0 36	2 22	0 45	1.1	13 37	3.1
50	3 49	19 49	0 42	3 33	0 43	.9	13 41	3.4
55	3 23	20 15	0 53	: ::	0 41	.6	13 46	3.6
60	2 45	20 53	1 20	: ::	0 39	.3	13 53	4.0
S								

SUNCE				MJESEC			
UT	e = Tp − UT	Δ/24	r	Prolaz	Δ/24	$\pi_\leftmoon$	r
h	min s	s	′	h min	min	′	′
00	11 31.8	-.9	16.2	$T_{\overline{m}}$ 7 4	2.1	59.3	16.2
12	11 20.9	$T_{\overline{m}_\odot}$ 11 h 48.7 min		Starost 23.8 d		Faza ◑	

PLANETE								
Pl.	$T_{\overline{m}}$	π	360−α	Vel.	Pl.	$T_{\overline{m}}$	π	360−α	Vel.
	h min	′	°			h min	′	°	
♀	9 17	.4	152	-4.5	♃	19 1	.0	5	-2.4
♂	12 58	.1	97	1.3	♄	8 21	.0	166	.9

UT	SUNCE $S_\odot$	$\delta_\odot$	PROLJ. TAČKA S_Υ	VENERA S_φ	δ_φ	MARS S_σ	δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	182 47.4	-21 44.9	69 44.4	221 .0	-10 26.0	165 31.2	-24 8.7
2	212 47.0	-21 45.6	99 49.3	251 2.6	-10 26.1	195 32.0	-24 8.9
4	242 46.5	-21 46.4	129 54.2	281 5.2	-10 26.1	225 32.8	-24 9.1
6	272 46.1	-21 47.2	159 59.2	311 7.8	-10 26.2	255 33.7	-24 9.2
8	302 45.6	-21 48.0	190 4.1	341 10.4	-10 26.3	285 34.5	-24 9.4
10	332 45.1	-21 48.8	220 9.0	11 12.9	-10 26.3	315 35.3	-24 9.6
12	2 44.7	-21 49.5	250 14.0	41 15.5	-10 26.4	345 36.1	-24 9.8
14	32 44.2	-21 50.3	280 18.9	71 18.0	-10 26.5	15 36.9	-24 9.9
16	62 43.7	-21 51.1	310 23.8	101 20.5	-10 26.6	45 37.8	-24 10.1
18	92 43.3	-21 51.8	340 28.7	131 23.1	-10 26.7	75 38.6	-24 10.3
20	122 42.8	-21 52.6	10 33.7	161 25.6	-10 26.8	105 39.4	-24 10.4
22	152 42.3	-21 53.4	40 38.6	191 28.1	-10 26.9	135 40.2	-24 10.6
Δ	-2	-4		13	0	4	-1

UT	MJESEC $S_\leftmoon$	Δ	$\delta_\leftmoon$	Δ	JUPITER S_4	δ_4	SATURN S_5	δ_5
h	° ′		° ′		° ′	° ′	° ′	° ′
0	245 24.1	104	-7 34.0	-139	74 55.7	-3 45.7	235 27.3	-3 38.0
2	274 23.0	104	-8 1.8	-138	105 .5	-3 45.6	265 31.8	-3 38.2
4	303 21.7	103	-8 29.4	-137	135 5.2	-3 45.5	295 36.4	-3 38.3
6	332 20.2	102	-8 56.9	-136	165 10.0	-3 45.4	325 40.9	-3 38.5
8	1 18.6	101	-9 24.2	-135	195 14.7	-3 45.3	355 45.4	-3 38.7
10	30 16.8	100	-9 51.2	-134	225 19.4	-3 45.2	25 49.9	-3 38.8
12	59 14.8	99	-10 18.1	-133	255 24.2	-3 45.1	55 54.4	-3 39.0
14	88 12.7	98	-10 44.7	-132	285 28.9	-3 45.0	85 58.9	-3 39.1
16	117 10.3	97	-11 11.0	-131	315 33.6	-3 44.8	116 3.5	-3 39.3
18	146 7.8	96	-11 37.1	-129	345 38.4	-3 44.7	146 8.0	-3 39.4
20	175 5.1	95	-12 3.0	-128	15 43.1	-3 44.6	176 12.5	-3 39.6
22	204 2.1	94	-12 28.5	-126	45 47.8	-3 44.5	206 17.0	-3 39.7
Δ					24	1	23	-1

φ	SUNCE IZLAZ	ZALAZ	TRAJANJE SUMRAKA GRAĐ.	ASTR.	MJESEC IZLAZ	Δ/24	ZALAZ	Δ/24
N	h min	h min	h min	h min	h min	min	h min	min
60	8 35	15 3	0 54	2 39	2 43	4.0	12 49	.5
55	8 1	15 37	0 44	2 14	2 32	3.6	13 2	.8
50	7 37	16 1	0 37	1 57	2 24	3.4	13 13	1.0
45	7 18	16 20	0 33	1 45	2 17	3.2	13 22	1.2
40	7 2	16 35	0 30	1 36	2 11	3.0	13 29	1.4
35	6 49	16 48	0 28	1 30	2 6	2.9	13 35	1.5
30	6 38	16 60	0 26	1 24	2 2	2.7	13 41	1.7
20	6 19	17 19	0 24	1 18	1 55	2.5	13 50	1.9
10	6 1	17 37	0 23	1 15	1 48	2.3	13 59	2.0
0	5 45	17 53	0 22	1 14	1 42	2.2	14 7	2.2
10	5 29	18 9	0 23	1 17	1 37	2.0	14 15	2.4
20	5 12	18 27	0 24	1 23	1 31	1.8	14 23	2.5
30	4 51	18 47	0 27	1 34	1 24	1.6	14 33	2.7
35	4 39	18 59	0 29	1 44	1 20	1.5	14 39	2.9
40	4 26	19 13	0 32	1 58	1 15	1.3	14 45	3.0
45	4 9	19 29	0 36	2 23	1 10	1.2	14 53	3.2
50	3 49	19 50	0 43	3 42	1 4	1.0	15 2	3.4
55	3 22	20 17	0 54	: ::	0 57	.7	15 13	3.6
60	2 44	20 56	1 22	: ::	0 47	.4	15 28	4.0
S								

SUNCE UT	e = Tp − UT	Δ/24	r	MJESEC Prolaz	Δ/24	$\pi_\leftmoon$	r
h	min s	s	′	h min	min	′	′
00	11 10.0	-.9	16.2	$T_{\overline{m}}$ 7 55	2.2	59.3	16.2
12	10 58.7	$T_{\overline{m}_\odot}$ 11 h 49.0 min		Starost 24.8 d	Faza ◑		

PLANETE Pl.	$T_{\overline{m}}$	π	360−α	Vel.	Pl.	$T_{\overline{m}}$	π	360−α	Vel.
	h min	′	°			h min	′	°	
♀	9 15	.4	151	-4.5	♃	18 57	.0	5	-2.4
♂	12 58	.1	96	1.3	♄	8 17	.0	166	.9

UT	SUNCE $S_\odot$	$\delta_\odot$	PROLJ. TAČKA S_Υ	VENERA S_φ	δ_φ	MARS S_σ	δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	182 41.8	-21 54.1	70 43.5	221 30.6	-10 27.0	165 41.0	-24 10.8
2	212 41.4	-21 54.9	100 48.4	251 33.0	-10 27.1	195 41.9	-24 10.9
4	242 40.9	-21 55.6	130 53.4	281 35.5	-10 27.2	225 42.7	-24 11.1
6	272 40.4	-21 56.4	160 58.3	311 38.0	-10 27.4	255 43.5	-24 11.3
8	302 39.9	-21 57.1	191 3.2	341 40.4	-10 27.5	285 44.3	-24 11.4
10	332 39.4	-21 57.9	221 8.2	11 42.8	-10 27.7	315 45.1	-24 11.6
12	2 39.0	-21 58.6	251 13.1	41 45.3	-10 27.8	345 45.9	-24 11.7
14	32 38.5	-21 59.3	281 18.0	71 47.7	-10 28.0	15 46.7	-24 11.9
16	62 38.0	-22 .1	311 22.9	101 50.1	-10 28.1	45 47.6	-24 12.0
18	92 37.5	-22 .8	341 27.9	131 52.5	-10 28.3	75 48.4	-24 12.2
20	122 37.0	-22 1.5	11 32.8	161 54.9	-10 28.5	105 49.2	-24 12.3
22	152 36.5	-22 2.2	41 37.7	191 57.2	-10 28.7	135 50.0	-24 12.5
Δ	-2	-4		12	-1	4	-1

UT	MJESEC $S_\leftmoon$	Δ	$\delta_\leftmoon$	Δ	JUPITER S_4	δ_4	SATURN S_5	δ_5
h	° ′		° ′		° ′	° ′	° ′	° ′
0	232 59.0	93	-12 53.8	-125	75 52.6	-3 44.4	236 21.5	-3 39.9
2	261 55.6	92	-13 18.8	-123	105 57.3	-3 44.3	266 26.0	-3 40.0
4	290 52.0	91	-13 43.4	-122	136 2.0	-3 44.2	296 30.6	-3 40.2
6	319 48.2	90	-14 7.8	-120	166 6.7	-3 44.1	326 35.1	-3 40.3
8	348 44.2	89	-14 31.8	-118	196 11.5	-3 44.0	356 39.6	-3 40.5
10	17 39.9	88	-14 55.4	-117	226 16.2	-3 43.9	26 44.1	-3 40.6
12	46 35.5	87	-15 18.7	-115	256 20.9	-3 43.7	56 48.6	-3 40.8
14	75 30.8	85	-15 41.6	-113	286 25.6	-3 43.6	86 53.2	-3 40.9
16	104 25.8	84	-16 4.2	-111	316 30.4	-3 43.5	116 57.7	-3 41.1
18	133 20.7	83	-16 26.3	-109	346 35.1	-3 43.4	147 2.2	-3 41.2
20	162 15.3	82	-16 48.1	-107	16 39.8	-3 43.3	177 6.7	-3 41.4
22	191 9.7	81	-17 9.4	-105	46 44.5	-3 43.2	207 11.3	-3 41.5
Δ					24	1	23	-1

φ	SUNCE IZLAZ	ZALAZ	TRAJANJE SUMRAKA GRAĐ.	ASTR.	MJESEC IZLAZ	Δ/24	ZALAZ	Δ/24
N	h min	h min	h min	h min	h min	min	h min	min
60	8 37	15 2	0 54	2 40	4 20	4.0	12 59	.6
55	8 2	15 36	0 44	2 14	3 60	3.6	13 22	1.0
50	7 38	16 1	0 37	1 57	3 45	3.4	13 38	1.3
45	7 19	16 20	0 33	1 45	3 33	3.2	13 52	1.5
40	7 3	16 35	0 30	1 36	3 23	3.0	14 3	1.6
35	6 50	16 48	0 28	1 30	3 15	2.9	14 12	1.7
30	6 39	16 60	0 26	1 25	3 7	2.8	14 20	1.8
20	6 19	17 20	0 24	1 18	2 55	2.6	14 35	2.0
10	6 2	17 37	0 23	1 15	2 44	2.4	14 48	2.2
0	5 46	17 53	0 22	1 14	2 34	2.2	14 59	2.3
10	5 29	18 10	0 23	1 17	2 24	2.1	15 11	2.4
20	5 12	18 27	0 24	1 23	2 14	1.9	15 24	2.6
30	4 51	18 48	0 27	1 35	2 2	1.7	15 39	2.8
35	4 39	18 60	0 29	1 44	1 55	1.6	15 47	2.9
40	4 25	19 14	0 32	1 59	1 47	1.5	15 57	3.0
45	4 9	19 31	0 36	2 24	1 38	1.3	16 9	3.1
50	3 48	19 51	0 43	: ::	1 27	1.1	16 23	3.3
55	3 21	20 18	0 54	: ::	1 14	.9	16 40	3.6
60	2 42	20 58	1 23	: ::	0 57	.5	17 4	4.0
S								

SUNCE UT	e = Tp − UT	Δ/24	r	MJESEC Prolaz	Δ/24	$\pi_\leftmoon$	r
h	min s	s	′	h min	min	′	′
00	10 47.5	-1.0	16.2	$T_{\overline{m}}$ 8 47	2.2	59.3	16.1
12	10 35.9	$T_{\overline{m}_\odot}$ 11 h 49.4 min		Starost 25.8 d	Faza ◑		

PLANETE Pl.	$T_{\overline{m}}$	π	360−α	Vel.	Pl.	$T_{\overline{m}}$	π	360−α	Vel.
	h min	′	°			h min	′	°	
♀	9 13	.4	151	-4.5	♃	18 54	.0	5	-2.4
♂	12 57	.1	95	1.3	♄	8 13	.0	166	.9

3. DECEMBAR 2010. PETAK

UT	SUNCE $S_\odot$	SUNCE $\delta_\odot$	PROLJ. TAČKA S_Υ	VENERA S_φ	VENERA δ_φ	MARS S_σ	MARS δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	182 36.1	-22 3.0	71 42.7	221 59.6	-10 28.8	165 50.8	-24 12.6
2	212 35.6	-22 3.7	101 47.6	252 2.0	-10 29.0	195 51.6	-24 12.8
4	242 35.1	-22 4.4	131 52.5	282 4.3	-10 29.2	225 52.4	-24 12.9
6	272 34.6	-22 5.1	161 57.4	312 6.7	-10 29.4	255 53.2	-24 13.0
8	302 34.1	-22 5.8	192 2.4	342 9.0	-10 29.6	285 54.0	-24 13.2
10	332 33.6	-22 6.5	222 7.3	12 11.3	-10 29.9	315 54.8	-24 13.3
12	2 33.1	-22 7.2	252 12.2	42 13.6	-10 30.1	345 55.6	-24 13.4
14	32 32.6	-22 7.9	282 17.2	72 15.9	-10 30.3	15 56.5	-24 13.6
16	62 32.1	-22 8.6	312 22.1	102 18.2	-10 30.5	45 57.3	-24 13.7
18	92 31.6	-22 9.3	342 27.0	132 20.5	-10 30.8	75 58.1	-24 13.8
20	122 31.1	-22 10.0	12 31.9	162 22.7	-10 31.0	105 58.9	-24 13.9
22	152 30.6	-22 10.7	42 36.9	192 25.0	-10 31.3	135 59.7	-24 14.1
Δ	-2	-4		12	-1	4	-1

UT	MJESEC $S_\leftmoon$	MJESEC Δ	MJESEC $\delta_\leftmoon$	MJESEC Δ	JUPITER S_4	JUPITER δ_4	SATURN S_η	SATURN δ_η
h	° ′		° ′		° ′	° ′	° ′	° ′
0	220 3.8	80	-17 30.4	-102	76 49.2	- 3 43.0	237 15.8	- 3 41.7
2	248 57.8	79	-17 50.9	-100	106 53.9	- 3 42.9	267 20.3	- 3 41.8
4	277 51.5	77	-18 10.9	-98	136 58.6	- 3 42.8	297 24.8	- 3 42.0
6	306 45.0	76	-18 30.5	-96	167 3.4	- 3 42.7	327 29.3	- 3 42.1
8	335 38.2	75	-18 49.6	-93	197 8.1	- 3 42.6	357 33.9	- 3 42.3
10	4 31.3	74	-19 8.3	-91	227 12.8	- 3 42.5	27 38.4	- 3 42.4
12	33 24.1	73	-19 26.5	-88	257 17.5	- 3 42.3	57 42.9	- 3 42.6
14	62 16.8	72	-19 44.2	-86	287 22.2	- 3 42.2	87 47.5	- 3 42.7
16	91 9.2	71	-20 1.4	-83	317 26.9	- 3 42.1	117 52.0	- 3 42.9
18	120 1.4	70	-20 18.0	-81	347 31.6	- 3 42.0	147 56.5	- 3 43.0
20	148 53.5	69	-20 34.2	-78	17 36.3	- 3 41.9	178 1.0	- 3 43.2
22	177 45.3	68	-20 49.8	-76	47 41.0	- 3 41.7	208 5.6	- 3 43.3
Δ					24	1	23	-1

φ	SUNCE IZLAZ	SUNCE ZALAZ	TRAJANJE SUMRAKA GRAĐ.	TRAJANJE SUMRAKA ASTR.	MJESEC IZLAZ	MJESEC Δ/24	MJESEC ZALAZ	MJESEC Δ/24
N	h min	h min	h min	h min	h min	min	h min	min
60	8 39	15 1	0 55	2 41	5 56	3.9	13 15	1.0
55	8 4	15 35	0 44	2 15	5 27	3.5	13 46	1.4
50	7 39	16 0	0 38	1 57	5 5	3.2	14 9	1.6
45	7 20	16 19	0 33	1 45	4 49	3.1	14 26	1.8
40	7 4	16 35	0 30	1 36	4 35	2.9	14 41	1.9
35	6 51	16 48	0 28	1 30	4 24	2.8	14 53	2.0
30	6 40	16 60	0 26	1 25	4 14	2.7	15 4	2.0
20	6 20	17 20	0 24	1 18	3 57	2.6	15 23	2.2
10	6 2	17 37	0 23	1 15	3 42	2.5	15 39	2.3
0	5 46	17 53	0 22	1 14	3 28	2.3	15 55	2.4
10	5 30	18 10	0 23	1 17	3 14	2.2	16 10	2.5
20	5 12	18 28	0 24	1 23	2 60	2.1	16 26	2.6
30	4 51	18 49	0 27	1 35	2 43	1.9	16 45	2.7
35	4 39	19 1	0 29	1 45	2 34	1.8	16 56	2.8
40	4 25	19 15	0 32	1 59	2 23	1.7	17 9	2.9
45	4 8	19 32	0 36	2 25	2 10	1.6	17 24	3.0
50	3 48	19 53	0 43	: ::	1 55	1.4	17 42	3.1
55	3 20	20 20	0 54	: ::	1 36	1.2	18 6	3.3
60	2 41	20 60	1 25	: ::	1 10	.8	18 40	3.7
S								

SUNCE UT	SUNCE $e = T_p - UT$	SUNCE Δ/24	SUNCE r	MJESEC Prolaz	MJESEC Δ/24	MJESEC $\pi_\leftmoon$	MJESEC r
h	min s	s	′	h min	min	′	′
00	10 24.4	-1.0	16.2	$T_{\overline{m}}$ 9 41	2.4	59.1	16.1
12	10 12.5	$T_{\overline{m}_\odot}$ 11 h 49.8 min		Starost 26.8 d	Faza ●		

PLANETE

Pl.	$T_{\overline{m}}$	π	360−α	Vel.	Pl.	$T_{\overline{m}}$	π	360−α	Vel.
	h min	′	°			h min	′	°	
♀	9 11	.4	150	-4.5	♃	18 50	.0	5	-2.4
♂	12 56	.1	94	1.3	♄	8 10	.0	166	.9

4. DECEMBAR SUBOTA

UT	SUNCE $S_\odot$	SUNCE $\delta_\odot$	PROLJ. TAČKA S_Υ	VENERA S_φ	VENERA δ_φ	MARS S_σ	MARS δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	182 30.1	-22 11.4	72 41.8	222 27.2	-10 31.5	166 .5	-24 14.2
2	212 29.6	-22 12.1	102 46.7	252 29.5	-10 31.8	196 1.3	-24 14.3
4	242 29.1	-22 12.7	132 51.7	282 31.7	-10 32.1	226 2.1	-24 14.4
6	272 28.6	-22 13.4	162 56.6	312 33.9	-10 32.3	256 2.9	-24 14.5
8	302 28.1	-22 14.1	193 1.5	342 36.1	-10 32.6	286 3.7	-24 14.6
10	332 27.6	-22 14.8	223 6.4	12 38.3	-10 32.9	316 4.5	-24 14.8
12	2 27.1	-22 15.4	253 11.4	42 40.5	-10 33.2	346 5.3	-24 14.9
14	32 26.6	-22 16.1	283 16.3	72 42.7	-10 33.5	16 6.1	-24 15.0
16	62 26.1	-22 16.8	313 21.2	102 44.9	-10 33.8	46 6.9	-24 15.1
18	92 25.6	-22 17.4	343 26.2	132 47.0	-10 34.1	76 7.7	-24 15.2
20	122 25.1	-22 18.1	13 31.1	162 49.2	-10 34.4	106 8.5	-24 15.3
22	152 24.5	-22 18.7	43 36.0	192 51.3	-10 34.7	136 9.3	-24 15.4
Δ	-3	-3		11	-1	4	-1

UT	MJESEC $S_\leftmoon$	MJESEC Δ	MJESEC $\delta_\leftmoon$	MJESEC Δ	JUPITER S_4	JUPITER δ_4	SATURN S_η	SATURN δ_η
h	° ′		° ′		° ′	° ′	° ′	° ′
0	206 37.0	68	-21 4.9	-73	77 45.7	- 3 41.6	238 10.1	- 3 43.5
2	235 28.5	67	-21 19.5	-70	107 50.4	- 3 41.5	268 14.6	- 3 43.6
4	264 19.9	66	-21 33.5	-67	137 55.1	- 3 41.4	298 19.2	- 3 43.8
6	293 11.1	65	-21 47.0	-65	167 59.8	- 3 41.2	328 23.7	- 3 43.9
8	322 2.2	65	-21 59.9	-62	198 4.5	- 3 41.1	358 28.2	- 3 44.1
10	350 53.1	64	-22 12.2	-59	228 9.2	- 3 41.0	28 32.7	- 3 44.2
12	19 43.9	63	-22 24.0	-56	258 13.9	- 3 40.9	58 37.3	- 3 44.3
14	48 34.6	63	-22 35.1	-53	288 18.5	- 3 40.7	88 41.8	- 3 44.5
16	77 25.2	63	-22 45.7	-50	318 23.2	- 3 40.6	118 46.3	- 3 44.6
18	106 15.7	62	-22 55.7	-47	348 27.9	- 3 40.5	148 50.9	- 3 44.8
20	135 6.1	62	-23 5.2	-44	18 32.6	- 3 40.3	178 55.4	- 3 44.9
22	163 56.5	62	-23 14.0	-41	48 37.3	- 3 40.2	208 59.9	- 3 45.1
Δ					23	1	23	-1

φ	SUNCE IZLAZ	SUNCE ZALAZ	TRAJANJE SUMRAKA GRAĐ.	TRAJANJE SUMRAKA ASTR.	MJESEC IZLAZ	MJESEC Δ/24	MJESEC ZALAZ	MJESEC Δ/24
N	h min	h min	h min	h min	h min	min	h min	min
60	8 41	14 60	0 55	2 41	7 30	3.4	13 39	1.6
55	8 5	15 35	0 44	2 15	6 51	3.1	14 19	1.9
50	7 40	15 60	0 38	1 58	6 23	3.0	14 47	2.0
45	7 21	16 19	0 33	1 46	6 3	2.9	15 8	2.1
40	7 5	16 35	0 30	1 37	5 46	2.8	15 26	2.2
35	6 52	16 48	0 28	1 30	5 32	2.7	15 41	2.2
30	6 40	16 60	0 26	1 25	5 20	2.7	15 53	2.2
20	6 20	17 20	0 24	1 18	4 59	2.6	16 15	2.3
10	6 3	17 37	0 23	1 15	4 41	2.5	16 34	2.4
0	5 46	17 54	0 22	1 14	4 24	2.4	16 52	2.4
10	5 30	18 11	0 23	1 17	4 8	2.3	17 9	2.5
20	5 12	18 29	0 24	1 23	3 50	2.2	17 28	2.5
30	4 51	18 49	0 27	1 35	3 30	2.1	17 50	2.6
35	4 39	19 2	0 29	1 45	3 18	2.1	18 3	2.6
40	4 25	19 16	0 32	1 60	3 4	2.0	18 18	2.6
45	4 8	19 33	0 37	2 25	2 49	1.9	18 36	2.7
50	3 47	19 54	0 43	: ::	2 29	1.8	18 58	2.8
55	3 20	20 22	0 55	: ::	2 4	1.6	19 26	2.9
60	2 40	21 2	1 27	: ::	1 29	1.3	20 8	3.0
S								

SUNCE UT	SUNCE $e = T_p - UT$	SUNCE Δ/24	SUNCE r	MJESEC Prolaz	MJESEC Δ/24	MJESEC $\pi_\leftmoon$	MJESEC r
h	min s	s	′	h min	min	′	′
00	10 .6	-1.0	16.3	$T_{\overline{m}}$ 10 38	2.4	58.7	16.0
12	9 48.4	$T_{\overline{m}_\odot}$ 11 h 50.2 min		Starost 27.8 d	Faza ●		

PLANETE

Pl.	$T_{\overline{m}}$	π	360−α	Vel.	Pl.	$T_{\overline{m}}$	π	360−α	Vel.
	h min	′	°			h min	′	°	
♀	9 10	.4	150	-4.5	♃	18 46	.0	5	-2.4
♂	12 56	.1	93	1.3	♄	8 6	.0	165	.9

5. DECEMBAR 2010. NEDJELJA

UT	SUNCE $S_\odot$	SUNCE $\delta_\odot$	PROLJ. TAČKA S_Υ	VENERA S_φ	VENERA δ_φ	MARS S_σ	MARS δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	182 24.0	-22 19.4	73 40.9	222 53.5	-10 35.0	166 10.1	-24 15.5
2	212 23.5	-22 20.0	103 45.9	252 55.6	-10 35.4	196 10.9	-24 15.6
4	242 23.0	-22 20.7	133 50.8	282 57.7	-10 35.7	226 11.7	-24 15.7
6	272 22.5	-22 21.3	163 55.7	312 59.8	-10 36.0	256 12.5	-24 15.8
8	302 22.0	-22 21.9	194 .6	343 1.9	-10 36.4	286 13.3	-24 15.9
10	332 21.4	-22 22.6	224 5.6	13 4.0	-10 36.7	316 14.1	-24 16.0
12	2 20.9	-22 23.2	254 10.5	43 6.1	-10 37.1	346 14.9	-24 16.1
14	32 20.4	-22 23.8	284 15.4	73 8.2	-10 37.4	16 15.7	-24 16.1
16	62 19.9	-22 24.4	314 20.4	103 10.2	-10 37.8	46 16.4	-24 16.2
18	92 19.4	-22 25.1	344 25.3	133 12.3	-10 38.2	76 17.2	-24 16.3
20	122 18.8	-22 25.7	14 30.2	163 14.3	-10 38.5	106 18.0	-24 16.4
22	152 18.3	-22 26.3	44 35.1	193 16.3	-10 38.9	136 18.8	-24 16.5
Δ	-3	-3		10	-2	4	0

UT	MJESEC $S_\leftmoon$	MJESEC Δ	MJESEC $\delta_\leftmoon$	MJESEC Δ	JUPITER $S_\jupiter$	JUPITER $\delta_\jupiter$	SATURN $S_\saturn$	SATURN $\delta_\saturn$
h	° ′		° ′		° ′	° ′	° ′	° ′
0	192 46.8	61	-23 22.2	-38	78 42.0	- 3 40.1	239 4.5	- 3 45.2
2	221 37.1	61	-23 29.8	-35	108 46.7	- 3 40.0	269 9.0	- 3 45.4
4	250 27.3	61	-23 36.8	-32	138 51.3	- 3 39.8	299 13.5	- 3 45.5
6	279 17.5	61	-23 43.2	-29	168 56.0	- 3 39.7	329 18.1	- 3 45.6
8	308 7.8	61	-23 49.0	-26	199 .7	- 3 39.6	359 22.6	- 3 45.8
10	336 58.0	61	-23 54.2	-23	229 5.4	- 3 39.4	29 27.2	- 3 45.9
12	5 48.3	62	-23 58.8	-20	259 10.1	- 3 39.3	59 31.7	- 3 46.1
14	34 38.6	62	-24 2.8	-17	289 14.7	- 3 39.2	89 36.2	- 3 46.2
16	63 28.9	62	-24 6.1	-14	319 19.4	- 3 39.0	119 40.8	- 3 46.4
18	92 19.4	63	-24 8.9	-11	349 24.1	- 3 38.9	149 45.3	- 3 46.5
20	121 9.9	63	-24 11.0	-8	19 28.7	- 3 38.8	179 49.8	- 3 46.6
22	150 .5	64	-24 12.6	-5	49 33.4	- 3 38.6	209 54.4	- 3 46.8
Δ					23	1	23	-1

φ	SUNCE IZLAZ	SUNCE ZALAZ	TRAJANJE SUMRAKA GRAĐ.	TRAJANJE SUMRAKA ASTR.	MJESEC IZLAZ	MJESEC Δ/24	MJESEC ZALAZ	MJESEC Δ/24
N	h min	h min	h min	h min	h min	min	h min	min
60	8 42	14 59	0 55	2 42	8 51	2.6	14 18	2.4
55	8 7	15 34	0 44	2 15	8 5	2.5	15 4	2.4
50	7 42	15 59	0 38	1 58	7 34	2.5	15 35	2.4
45	7 22	16 19	0 33	1 46	7 11	2.5	15 59	2.4
40	7 6	16 35	0 30	1 37	6 52	2.5	16 18	2.4
35	6 53	16 48	0 28	1 30	6 37	2.5	16 34	2.4
30	6 41	16 60	0 26	1 25	6 23	2.5	16 47	2.4
20	6 21	17 20	0 24	1 18	6 0	2.4	17 11	2.4
10	6 3	17 38	0 23	1 15	5 40	2.4	17 31	2.4
0	5 47	17 54	0 22	1 15	5 22	2.4	17 50	2.4
10	5 30	18 11	0 23	1 17	5 4	2.4	18 9	2.4
20	5 12	18 29	0 24	1 23	4 44	2.4	18 29	2.4
30	4 51	18 50	0 27	1 35	4 21	2.3	18 52	2.3
35	4 39	19 3	0 29	1 45	4 8	2.3	19 6	2.3
40	4 25	19 17	0 32	2 0	3 53	2.3	19 21	2.3
45	4 8	19 34	0 37	2 26	3 35	2.3	19 40	2.3
50	3 47	19 55	0 43	: ::	3 12	2.2	20 4	2.3
55	3 19	20 23	0 55	: ::	2 43	2.1	20 35	2.2
60	2 38	21 4	1 28	: ::	2 0	2.0	21 21	2.1
S								

SUNCE UT	SUNCE $e = T_p - UT$	SUNCE Δ/24	SUNCE r	MJESEC Prolaz	MJESEC Δ/24	MJESEC $\pi_\leftmoon$	MJESEC r
h	min s	s	′	h min	min	′	′
00	9 36.3	-1.0	16.3	$T_{\overline{m}}$ 11 36	2.4	58.3	15.9
12	9 23.8	$T_{\overline{m}_\odot}$ 11 h 50.6 min		Starost 28.8 d		Faza ●	

PLANETE

Pl.	$T_{\overline{m}}$	π	360−α	Vel.	Pl.	$T_{\overline{m}}$	π	360−α	Vel.
	h min	′	°			h min	′	°	
♀	9 8	.3	149	-4.5	♃	18 42	.0	5	-2.4
♂	12 55	.1	92	1.3	♄	8 2	.0	165	.9

6. DECEMBAR PONEDJELJAK

UT	SUNCE $S_\odot$	SUNCE $\delta_\odot$	PROLJ. TAČKA S_Υ	VENERA S_φ	VENERA δ_φ	MARS S_σ	MARS δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	182 17.8	-22 26.9	74 40.1	223 18.4	-10 39.3	166 19.6	-24 16.5
2	212 17.3	-22 27.5	104 45.0	253 20.4	-10 39.7	196 20.4	-24 16.6
4	242 16.7	-22 28.1	134 49.9	283 22.4	-10 40.1	226 21.2	-24 16.7
6	272 16.2	-22 28.7	164 54.9	313 24.4	-10 40.5	256 22.0	-24 16.8
8	302 15.7	-22 29.3	194 59.8	343 26.4	-10 40.9	286 22.8	-24 16.8
10	332 15.2	-22 29.9	225 4.7	13 28.4	-10 41.3	316 23.6	-24 16.9
12	2 14.6	-22 30.5	255 9.6	43 30.3	-10 41.7	346 24.4	-24 17.0
14	32 14.1	-22 31.1	285 14.6	73 32.3	-10 42.1	16 25.1	-24 17.0
16	62 13.6	-22 31.7	315 19.5	103 34.3	-10 42.6	46 25.9	-24 17.1
18	92 13.0	-22 32.3	345 24.4	133 36.2	-10 43.0	76 26.7	-24 17.2
20	122 12.5	-22 32.9	15 29.4	163 38.1	-10 43.4	106 27.5	-24 17.2
22	152 12.0	-22 33.5	45 34.3	193 40.1	-10 43.9	136 28.3	-24 17.3
Δ	-3	-3		10	-2	4	0

UT	MJESEC $S_\leftmoon$	MJESEC Δ	MJESEC $\delta_\leftmoon$	MJESEC Δ	JUPITER $S_\jupiter$	JUPITER $\delta_\jupiter$	SATURN $S_\saturn$	SATURN $\delta_\saturn$
h	° ′		° ′		° ′	° ′	° ′	° ′
0	178 51.2	64	-24 13.5	-2	79 38.1	- 3 38.5	239 58.9	- 3 46.9
2	207 42.0	65	-24 13.8	1	109 42.8	- 3 38.4	270 3.5	- 3 47.1
4	236 32.9	66	-24 13.6	4	139 47.4	- 3 38.2	300 8.0	- 3 47.2
6	265 24.1	66	-24 12.7	7	169 52.1	- 3 38.1	330 12.5	- 3 47.4
8	294 15.3	67	-24 11.3	10	199 56.7	- 3 37.9	0 17.1	- 3 47.5
10	323 6.8	68	-24 9.2	13	230 1.4	- 3 37.8	30 21.6	- 3 47.6
12	351 58.4	69	-24 6.6	16	260 6.1	- 3 37.7	60 26.2	- 3 47.8
14	20 50.2	70	-24 3.4	19	290 10.7	- 3 37.5	90 30.7	- 3 47.9
16	49 42.2	71	-23 59.7	22	320 15.4	- 3 37.4	120 35.3	- 3 48.1
18	78 34.5	72	-23 55.3	24	350 20.0	- 3 37.2	150 39.8	- 3 48.2
20	107 27.0	74	-23 50.5	27	20 24.7	- 3 37.1	180 44.4	- 3 48.3
22	136 19.7	75	-23 45.0	30	50 29.4	- 3 37.0	210 48.9	- 3 48.5
Δ					23	1	23	-1

φ	SUNCE IZLAZ	SUNCE ZALAZ	TRAJANJE SUMRAKA GRAĐ.	TRAJANJE SUMRAKA ASTR.	MJESEC IZLAZ	MJESEC Δ/24	MJESEC ZALAZ	MJESEC Δ/24
N	h min	h min	h min	h min	h min	min	h min	min
60	8 44	14 58	0 56	2 42	9 53	1.7	15 16	3.1
55	8 8	15 34	0 44	2 15	9 6	1.9	16 2	2.9
50	7 43	15 59	0 38	1 58	8 35	2.0	16 33	2.7
45	7 23	16 19	0 33	1 46	8 11	2.1	16 57	2.7
40	7 7	16 35	0 30	1 37	7 52	2.1	17 16	2.6
35	6 54	16 48	0 28	1 30	7 36	2.2	17 31	2.5
30	6 42	16 60	0 26	1 25	7 22	2.2	17 45	2.5
20	6 22	17 20	0 24	1 18	6 59	2.3	18 8	2.4
10	6 4	17 38	0 23	1 15	6 39	2.3	18 28	2.3
0	5 47	17 55	0 22	1 15	6 20	2.3	18 47	2.3
10	5 31	18 12	0 23	1 17	6 1	2.4	19 5	2.2
20	5 12	18 30	0 24	1 23	5 41	2.4	19 25	2.1
30	4 51	18 51	0 27	1 35	5 17	2.5	19 48	2.1
35	4 39	19 3	0 29	1 45	5 4	2.5	20 2	2.0
40	4 25	19 18	0 32	2 0	4 48	2.5	20 17	2.0
45	4 8	19 35	0 37	2 27	4 29	2.5	20 35	1.9
50	3 46	19 56	0 43	: ::	4 5	2.6	20 58	1.8
55	3 18	20 25	0 56	: ::	3 34	2.7	21 28	1.6
60	2 37	21 6	1 30	: ::	2 48	2.8	22 12	1.3
S								

SUNCE UT	SUNCE $e = T_p - UT$	SUNCE Δ/24	SUNCE r	MJESEC Prolaz	MJESEC Δ/24	MJESEC $\pi_\leftmoon$	MJESEC r
h	min s	s	′	h min	min	′	′
00	9 11.4	-1.1	16.3	$T_{\overline{m}}$ 12 33	2.3	57.7	15.7
12	8 58.6	$T_{\overline{m}_\odot}$ 11 h 51.0 min		Starost .3 d		Faza ●	

PLANETE

Pl.	$T_{\overline{m}}$	π	360−α	Vel.	Pl.	$T_{\overline{m}}$	π	360−α	Vel.
	h min	′	°			h min	′	°	
♀	9 6	.3	149	-4.5	♃	18 39	.0	5	-2.4
♂	12 54	.1	92	1.3	♄	7 59	.0	165	.8

UT	SUNCE $S_\odot$	SUNCE $\delta_\odot$	PROLJ. TAČKA S_Υ	VENERA S_φ	VENERA δ_φ	MARS S_σ	MARS δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	182 11.4	-22 34.0	75 39.2	223 42.0	-10 44.3	166 29.1	-24 17.3
2	212 10.9	-22 34.6	105 44.1	253 43.9	-10 44.7	196 29.9	-24 17.4
4	242 10.4	-22 35.2	135 49.1	283 45.8	-10 45.2	226 30.7	-24 17.4
6	272 9.8	-22 35.7	165 54.0	313 47.7	-10 45.7	256 31.4	-24 17.5
8	302 9.3	-22 36.3	195 58.9	343 49.6	-10 46.1	286 32.2	-24 17.5
10	332 8.7	-22 36.9	226 3.9	13 51.5	-10 46.6	316 33.0	-24 17.6
12	2 8.2	-22 37.4	256 8.8	43 53.3	-10 47.1	346 33.8	-24 17.6
14	32 7.7	-22 38.0	286 13.7	73 55.2	-10 47.5	16 34.6	-24 17.7
16	62 7.1	-22 38.5	316 18.6	103 57.0	-10 48.0	46 35.4	-24 17.7
18	92 6.6	-22 39.1	346 23.6	133 58.9	-10 48.5	76 36.1	-24 17.7
20	122 6.0	-22 39.6	16 28.5	164 .7	-10 49.0	106 36.9	-24 17.8
22	152 5.5	-22 40.2	46 33.4	194 2.5	-10 49.5	136 37.7	-24 17.8
Δ	-3	-3		9	-2	4	0

UT	MJESEC $S_\leftmoon$	MJESEC Δ	MJESEC $\delta_\leftmoon$	MJESEC Δ	JUPITER S_4	JUPITER δ_4	SATURN S_η	SATURN δ_η
h	° ′		° ′		° ′	° ′	° ′	° ′
0	165 12.7	76	-23 39.0	33	80 34.0	- 3 36.8	240 53.4	- 3 48.6
2	194 5.9	78	-23 32.5	35	110 38.7	- 3 36.7	270 58.0	- 3 48.8
4	222 59.4	79	-23 25.5	38	140 43.3	- 3 36.5	301 2.5	- 3 48.9
6	251 53.2	80	-23 17.9	40	170 48.0	- 3 36.4	331 7.1	- 3 49.0
8	280 47.3	82	-23 9.8	43	200 52.6	- 3 36.2	1 11.6	- 3 49.2
10	309 41.6	83	-23 1.2	46	230 57.3	- 3 36.1	31 16.2	- 3 49.3
12	338 36.3	85	-22 52.1	48	261 1.9	- 3 36.0	61 20.7	- 3 49.4
14	7 31.2	86	-22 42.5	50	291 6.5	- 3 35.8	91 25.3	- 3 49.6
16	36 26.5	88	-22 32.4	53	321 11.2	- 3 35.7	121 29.8	- 3 49.7
18	65 22.1	90	-22 21.8	55	351 15.8	- 3 35.5	151 34.4	- 3 49.9
20	94 18.1	91	-22 10.8	57	21 20.5	- 3 35.4	181 38.9	- 3 50.0
22	123 14.3	93	-21 59.3	60	51 25.1	- 3 35.2	211 43.5	- 3 50.1
Δ					23	1	23	-1

φ	SUNCE IZLAZ	SUNCE ZALAZ	TRAJANJE SUMRAKA GRAĐ.	TRAJANJE SUMRAKA ASTR.	MJESEC IZLAZ	MJESEC Δ/24	MJESEC ZALAZ	MJESEC Δ/24
N	h min	h min	h min	h min	h min	min	h min	min
60	8 46	14 57	0 56	2 43	10 33	1.0	16 30	3.5
55	8 10	15 33	0 45	2 16	9 52	1.4	17 11	3.1
50	7 44	15 59	0 38	1 58	9 23	1.5	17 39	2.9
45	7 24	16 19	0 33	1 46	9 1	1.7	18 1	2.8
40	7 8	16 35	0 30	1 37	8 43	1.8	18 18	2.6
35	6 55	16 48	0 28	1 30	8 28	1.9	18 32	2.6
30	6 43	17 0	0 26	1 25	8 15	1.9	18 45	2.5
20	6 22	17 20	0 24	1 18	7 53	2.0	19 6	2.3
10	6 5	17 38	0 23	1 15	7 34	2.1	19 24	2.2
0	5 48	17 55	0 22	1 15	7 16	2.2	19 42	2.1
10	5 31	18 12	0 23	1 17	6 58	2.3	19 59	2.0
20	5 13	18 30	0 24	1 23	6 38	2.4	20 17	1.9
30	4 51	18 52	0 27	1 35	6 16	2.5	20 38	1.8
35	4 39	19 4	0 29	1 46	6 3	2.5	20 50	1.7
40	4 25	19 19	0 32	2 1	5 48	2.6	21 4	1.6
45	4 7	19 36	0 37	2 28	5 30	2.7	21 20	1.5
50	3 46	19 57	0 44	: ::	5 8	2.8	21 41	1.4
55	3 18	20 26	0 56	: ::	4 38	3.0	22 7	1.2
60	2 36	21 8	1 31	: ::	3 55	3.3	22 44	.8
S								

SUNCE UT	SUNCE $e = T_p - UT$	SUNCE Δ/24	SUNCE r	MJESEC Prolaz	MJESEC Δ/24	MJESEC $\pi_\leftmoon$	MJESEC r
h	min s	s	′	h min	min	′	′
00	8 45.9	-1.1	16.3	$T_{\overline{m}}$ 13 29	2.2	57.0	15.5
12	8 32.9	$T_{\overline{m}_\odot}$ 11 h 51.5 min		Starost 1.3 d	Faza ●		

PLANETE

Pl.	$T_{\overline{m}}$	π	360−α	Vel.	Pl.	$T_{\overline{m}}$	π	360−α	Vel.
	h min	′	°			h min	′	°	
♀	9 5	.3	148	-4.5	♃	18 35	.0	5	-2.4
♂	12 54	.1	91	1.3	♄	7 55	.0	165	.8

UT	SUNCE $S_\odot$	SUNCE $\delta_\odot$	PROLJ. TAČKA S_Υ	VENERA S_φ	VENERA δ_φ	MARS S_σ	MARS δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	182 4.9	-22 40.7	76 38.4	224 4.4	-10 50.0	166 38.5	-24 17.8
2	212 4.4	-22 41.2	106 43.3	254 6.2	-10 50.5	196 39.3	-24 17.9
4	242 3.9	-22 41.8	136 48.2	284 8.0	-10 51.0	226 40.0	-24 17.9
6	272 3.3	-22 42.3	166 53.1	314 9.8	-10 51.5	256 40.8	-24 17.9
8	302 2.8	-22 42.8	196 58.1	344 11.6	-10 52.1	286 41.6	-24 18.0
10	332 2.2	-22 43.4	227 3.0	14 13.3	-10 52.6	316 42.4	-24 18.0
12	2 1.7	-22 43.9	257 7.9	44 15.1	-10 53.1	346 43.2	-24 18.0
14	32 1.1	-22 44.4	287 12.9	74 16.9	-10 53.6	16 43.9	-24 18.0
16	62 .6	-22 44.9	317 17.8	104 18.6	-10 54.2	46 44.7	-24 18.0
18	92 .0	-22 45.4	347 22.7	134 20.4	-10 54.7	76 45.5	-24 18.1
20	121 59.4	-22 45.9	17 27.6	164 22.1	-10 55.3	106 46.3	-24 18.1
22	151 58.9	-22 46.4	47 32.6	194 23.8	-10 55.8	136 47.0	-24 18.1
Δ	-3	-3		9	-3	4	0

UT	MJESEC $S_\leftmoon$	MJESEC Δ	MJESEC $\delta_\leftmoon$	MJESEC Δ	JUPITER S_4	JUPITER δ_4	SATURN S_η	SATURN δ_η
h	° ′		° ′		° ′	° ′	° ′	° ′
0	152 10.9	95	-21 47.4	62	81 29.8	- 3 35.1	241 48.0	- 3 50.3
2	181 7.8	96	-21 35.0	64	111 34.4	- 3 34.9	271 52.6	- 3 50.4
4	210 5.1	98	-21 22.2	66	141 39.0	- 3 34.8	301 57.1	- 3 50.5
6	239 2.7	100	-21 9.0	68	171 43.7	- 3 34.6	332 1.7	- 3 50.7
8	268 .7	102	-20 55.3	70	201 48.3	- 3 34.5	2 6.2	- 3 50.8
10	296 59.0	103	-20 41.3	72	231 52.9	- 3 34.3	32 10.8	- 3 50.9
12	325 57.6	105	-20 26.8	74	261 57.6	- 3 34.2	62 15.4	- 3 51.1
14	354 56.6	107	-20 12.0	76	292 2.2	- 3 34.0	92 19.9	- 3 51.2
16	23 56.0	108	-19 56.8	78	322 6.8	- 3 33.9	122 24.5	- 3 51.4
18	52 55.7	110	-19 41.2	80	352 11.4	- 3 33.7	152 29.0	- 3 51.5
20	81 55.7	112	-19 25.3	81	22 16.1	- 3 33.6	182 33.6	- 3 51.6
22	110 56.1	114	-19 9.0	83	52 20.7	- 3 33.4	212 38.1	- 3 51.8
Δ					23	1	23	-1

φ	SUNCE IZLAZ	SUNCE ZALAZ	TRAJANJE SUMRAKA GRAĐ.	TRAJANJE SUMRAKA ASTR.	MJESEC IZLAZ	MJESEC Δ/24	MJESEC ZALAZ	MJESEC Δ/24
N	h min	h min	h min	h min	h min	min	h min	min
60	8 48	14 56	0 56	2 43	10 58	.6	17 53	3.5
55	8 11	15 33	0 45	2 16	10 24	1.0	18 26	3.1
50	7 45	15 58	0 38	1 58	9 60	1.2	18 49	2.9
45	7 25	16 18	0 34	1 46	9 41	1.4	19 7	2.7
40	7 9	16 35	0 30	1 37	9 26	1.5	19 21	2.6
35	6 55	16 48	0 28	1 30	9 13	1.6	19 33	2.5
30	6 43	17 0	0 26	1 25	9 1	1.7	19 44	2.4
20	6 23	17 21	0 24	1 18	8 42	1.8	20 2	2.2
10	6 5	17 39	0 23	1 15	8 25	1.9	20 18	2.1
0	5 48	17 56	0 22	1 15	8 9	2.1	20 33	2.0
10	5 31	18 13	0 23	1 17	7 53	2.2	20 48	1.9
20	5 13	18 31	0 24	1 23	7 36	2.3	21 3	1.7
30	4 52	18 52	0 27	1 36	7 16	2.4	21 21	1.6
35	4 39	19 5	0 29	1 46	7 4	2.5	21 31	1.5
40	4 25	19 20	0 33	2 1	6 51	2.6	21 43	1.4
45	4 7	19 37	0 37	2 29	6 35	2.8	21 57	1.2
50	3 46	19 59	0 44	: ::	6 16	2.9	22 13	1.1
55	3 17	20 27	0 56	: ::	5 50	3.1	22 35	.9
60	2 35	21 9	1 33	: ::	5 15	3.5	23 3	.5
S								

SUNCE UT	SUNCE $e = T_p - UT$	SUNCE Δ/24	SUNCE r	MJESEC Prolaz	MJESEC Δ/24	MJESEC $\pi_\leftmoon$	MJESEC r
h	min s	s	′	h min	min	′	′
00	8 20.0	-1.1	16.3	$T_{\overline{m}}$ 14 21	2.0	56.4	15.4
12	8 6.7	$T_{\overline{m}_\odot}$ 11 h 51.9 min		Starost 2.3 d	Faza ●		

PLANETE

Pl.	$T_{\overline{m}}$	π	360−α	Vel.	Pl.	$T_{\overline{m}}$	π	360−α	Vel.
	h min	′	°			h min	′	°	
♀	9 3	.3	147	-4.5	♃	18 31	.0	5	-2.4
♂	12 53	.1	90	1.3	♄	7 52	.0	165	.8

UT	SUNCE $S_\odot$	SUNCE $\delta_\odot$	PROLJ. TAČKA S_Υ	VENERA S_φ	VENERA δ_φ	MARS S_σ	MARS δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	181 58.3	-22 46.9	77 37.5	224 25.5	-10 56.4	166 47.8	-24 18.1
2	211 57.8	-22 47.4	107 42.4	254 27.3	-10 56.9	196 48.6	-24 18.1
4	241 57.2	-22 47.9	137 47.3	284 29.0	-10 57.5	226 49.4	-24 18.1
6	271 56.7	-22 48.4	167 52.3	314 30.7	-10 58.1	256 50.1	-24 18.1
8	301 56.1	-22 48.9	197 57.2	344 32.3	-10 58.6	286 50.9	-24 18.1
10	331 55.6	-22 49.4	228 2.1	14 34.0	-10 59.2	316 51.7	-24 18.1
12	1 55.0	-22 49.9	258 7.1	44 35.7	-10 59.8	346 52.5	-24 18.1
14	31 54.4	-22 50.4	288 12.0	74 37.4	-11 .4	16 53.2	-24 18.1
16	61 53.9	-22 50.8	318 16.9	104 39.0	-11 1.0	46 54.0	-24 18.1
18	91 53.3	-22 51.3	348 21.8	134 40.7	-11 1.6	76 54.8	-24 18.1
20	121 52.7	-22 51.8	18 26.8	164 42.3	-11 2.2	106 55.6	-24 18.1
22	151 52.2	-22 52.3	48 31.7	194 43.9	-11 2.8	136 56.3	-24 18.1
Δ	-3	-2		8	-3	4	0

UT	MJESEC $S_\leftmoon$	MJESEC Δ	MJESEC $\delta_\leftmoon$	MJESEC Δ	JUPITER S_4	JUPITER δ_4	SATURN S_η	SATURN δ_η
h	° ′		° ′		° ′	° ′	° ′	° ′
0	139 56.8	115	-18 52.4	85	82 25.3	- 3 33.2	242 42.7	- 3 51.9
2	168 57.9	117	-18 35.4	86	112 29.9	- 3 33.1	272 47.3	- 3 52.0
4	197 59.3	119	-18 18.1	88	142 34.6	- 3 32.9	302 51.8	- 3 52.2
6	227 1.1	120	-18 .5	89	172 39.2	- 3 32.8	332 56.4	- 3 52.3
8	256 3.1	122	-17 42.6	91	202 43.8	- 3 32.6	3 .9	- 3 52.4
10	285 5.6	124	-17 24.4	92	232 48.4	- 3 32.5	33 5.5	- 3 52.6
12	314 8.3	125	-17 6.0	94	262 53.0	- 3 32.3	63 10.1	- 3 52.7
14	343 11.4	127	-16 47.2	95	292 57.6	- 3 32.1	93 14.6	- 3 52.8
16	12 14.8	129	-16 28.2	96	323 2.3	- 3 32.0	123 19.2	- 3 53.0
18	41 18.5	130	-16 8.9	98	353 6.9	- 3 31.8	153 23.7	- 3 53.1
20	70 22.5	132	-15 49.3	99	23 11.5	- 3 31.7	183 28.3	- 3 53.2
22	99 26.9	133	-15 29.5	100	53 16.1	- 3 31.5	213 32.9	- 3 53.3
Δ					23	1	23	-1

φ	SUNCE IZLAZ	SUNCE ZALAZ	TRAJANJE SUMRAKA GRAĐ.	TRAJANJE SUMRAKA ASTR.	MJESEC IZLAZ	MJESEC Δ/24	MJESEC ZALAZ	MJESEC Δ/24
N	h min	h min	h min	h min	h min	min	h min	min
60	8 49	14 55	0 56	2 44	11 13	.4	19 17	3.4
55	8 12	15 32	0 45	2 16	10 48	.7	19 41	3.1
50	7 46	15 58	0 38	1 59	10 29	1.0	19 59	2.9
45	7 26	16 18	0 34	1 46	10 14	1.1	20 12	2.7
40	7 10	16 35	0 30	1 37	10 1	1.3	20 24	2.5
35	6 56	16 48	0 28	1 30	9 51	1.4	20 33	2.4
30	6 44	17 0	0 26	1 25	9 41	1.5	20 42	2.3
20	6 24	17 21	0 24	1 18	9 25	1.6	20 56	2.1
10	6 6	17 39	0 23	1 15	9 11	1.8	21 9	2.0
0	5 49	17 56	0 22	1 15	8 58	1.9	21 21	1.9
10	5 32	18 13	0 23	1 17	8 45	2.0	21 32	1.7
20	5 13	18 32	0 24	1 24	8 31	2.2	21 44	1.6
30	4 52	18 53	0 27	1 36	8 14	2.4	21 58	1.4
35	4 39	19 6	0 30	1 46	8 5	2.5	22 7	1.3
40	4 25	19 20	0 33	2 1	7 54	2.6	22 16	1.2
45	4 7	19 38	0 37	2 29	7 41	2.7	22 26	1.0
50	3 45	19 60	0 44	: ::	7 26	2.9	22 39	.9
55	3 17	20 29	0 56	: ::	7 6	3.1	22 55	.7
60	2 35	21 11	1 34	: ::	6 38	3.4	23 16	.4
S								

SUNCE UT	SUNCE $e = T_p - UT$	SUNCE Δ/24	SUNCE r	MJESEC Prolaz	MJESEC Δ/24	MJESEC $\pi_\leftmoon$	MJESEC r
h	min s	s	′	h min	min	′	′
00	7 53.5	-1.1	16.3	$T_{\overline{m}}$ 15 9	1.9	55.7	15.2
12	7 40.1	$T_{\overline{m}_\odot}$ 11 h 52.3 min		Starost 3.3 d	Faza ◑		

PLANETE

Pl.	$T_{\overline{m}}$	π	360−α	Vel.	Pl.	$T_{\overline{m}}$	π	360−α	Vel.
	h min	′	°			h min	′	°	
♀	9 2	.3	147	-4.5	♃	18 27	.0	5	-2.3
♂	12 52	.1	89	1.3	♄	7 48	.0	165	.8

UT	SUNCE $S_\odot$	SUNCE $\delta_\odot$	PROLJ. TAČKA S_Υ	VENERA S_φ	VENERA δ_φ	MARS S_σ	MARS δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	181 51.6	-22 52.7	78 36.6	224 45.6	-11 3.4	166 57.1	-24 18.1
2	211 51.1	-22 53.2	108 41.6	254 47.2	-11 4.0	196 57.9	-24 18.1
4	241 50.5	-22 53.6	138 46.5	284 48.8	-11 4.6	226 58.6	-24 18.1
6	271 49.9	-22 54.1	168 51.4	314 50.4	-11 5.2	256 59.4	-24 18.0
8	301 49.4	-22 54.6	198 56.3	344 52.0	-11 5.8	287 .2	-24 18.0
10	331 48.8	-22 55.0	229 1.3	14 53.6	-11 6.5	317 1.0	-24 18.0
12	1 48.2	-22 55.4	259 6.2	44 55.2	-11 7.1	347 1.7	-24 18.0
14	31 47.7	-22 55.9	289 11.1	74 56.7	-11 7.7	17 2.5	-24 18.0
16	61 47.1	-22 56.3	319 16.1	104 58.3	-11 8.4	47 3.3	-24 17.9
18	91 46.5	-22 56.8	349 21.0	134 59.9	-11 9.0	77 4.0	-24 17.9
20	121 45.9	-22 57.2	19 25.9	165 1.4	-11 9.7	107 4.8	-24 17.9
22	151 45.4	-22 57.6	49 30.8	195 2.9	-11 10.3	137 5.6	-24 17.8
Δ	-3	-2		8	-3	4	0

UT	MJESEC $S_\leftmoon$	MJESEC Δ	MJESEC $\delta_\leftmoon$	MJESEC Δ	JUPITER S_4	JUPITER δ_4	SATURN S_η	SATURN δ_η
h	° ′		° ′		° ′	° ′	° ′	° ′
0	128 31.5	135	-15 9.5	101	83 20.7	- 3 31.3	243 37.4	- 3 53.5
2	157 36.4	136	-14 49.2	102	113 25.3	- 3 31.2	273 42.0	- 3 53.6
4	186 41.7	138	-14 28.8	103	143 29.9	- 3 31.0	303 46.6	- 3 53.7
6	215 47.2	139	-14 8.1	105	173 34.5	- 3 30.9	333 51.1	- 3 53.9
8	244 53.0	140	-13 47.1	106	203 39.1	- 3 30.7	3 55.7	- 3 54.0
10	273 59.0	142	-13 26.0	106	233 43.7	- 3 30.5	34 .3	- 3 54.1
12	303 5.3	143	-13 4.7	107	263 48.3	- 3 30.4	64 4.8	- 3 54.3
14	332 11.9	144	-12 43.2	108	293 52.9	- 3 30.2	94 9.4	- 3 54.4
16	1 18.8	145	-12 21.6	109	323 57.5	- 3 30.0	124 14.0	- 3 54.5
18	30 25.9	147	-11 59.7	110	354 2.1	- 3 29.9	154 18.5	- 3 54.6
20	59 33.2	148	-11 37.7	111	24 6.7	- 3 29.7	184 23.1	- 3 54.8
22	88 40.8	149	-11 15.6	112	54 11.3	- 3 29.5	214 27.7	- 3 54.9
Δ					23	1	23	-1

φ	SUNCE IZLAZ	SUNCE ZALAZ	TRAJANJE SUMRAKA GRAĐ.	TRAJANJE SUMRAKA ASTR.	MJESEC IZLAZ	MJESEC Δ/24	MJESEC ZALAZ	MJESEC Δ/24
N	h min	h min	h min	h min	h min	min	h min	min
60	8 51	14 55	0 57	2 44	11 23	.3	20 39	3.3
55	8 13	15 32	0 45	2 16	11 5	.6	20 55	3.0
50	7 47	15 58	0 38	1 59	10 52	.8	21 7	2.8
45	7 27	16 18	0 34	1 46	10 41	1.0	21 17	2.6
40	7 11	16 35	0 30	1 37	10 31	1.1	21 25	2.5
35	6 57	16 49	0 28	1 30	10 24	1.2	21 32	2.3
30	6 45	17 1	0 26	1 25	10 17	1.3	21 38	2.2
20	6 24	17 21	0 24	1 18	10 5	1.5	21 48	2.1
10	6 6	17 39	0 23	1 15	9 54	1.7	21 57	1.9
0	5 49	17 57	0 22	1 15	9 44	1.8	22 5	1.8
10	5 32	18 14	0 23	1 17	9 34	1.9	22 13	1.6
20	5 13	18 32	0 24	1 24	9 23	2.1	22 22	1.5
30	4 52	18 54	0 27	1 36	9 11	2.3	22 32	1.3
35	4 39	19 7	0 30	1 46	9 4	2.4	22 38	1.2
40	4 25	19 21	0 33	2 2	8 56	2.5	22 44	1.1
45	4 7	19 39	0 37	2 30	8 46	2.6	22 51	.9
50	3 45	20 1	0 44	: ::	8 35	2.8	23 0	.8
55	3 16	20 30	0 57	: ::	8 20	3.0	23 11	.6
60	2 34	21 13	1 36	: ::	8 1	3.3	23 25	.3
S								

SUNCE UT	SUNCE $e = T_p - UT$	SUNCE Δ/24	SUNCE r	MJESEC Prolaz	MJESEC Δ/24	MJESEC $\pi_\leftmoon$	MJESEC r
h	min s	s	′	h min	min	′	′
00	7 26.7	-1.1	16.3	$T_{\overline{m}}$ 15 55	1.7	55.2	15.0
12	7 13.0	$T_{\overline{m}_\odot}$ 11 h 52.8 min		Starost 4.3 d	Faza ◑		

PLANETE

Pl.	$T_{\overline{m}}$	π	360−α	Vel.	Pl.	$T_{\overline{m}}$	π	360−α	Vel.
	h min	′	°			h min	′	°	
♀	9 0	.3	146	-4.5	♃	18 24	.0	5	-2.3
♂	12 52	.1	88	1.3	♄	7 44	.0	165	.8

UT	SUNCE $S_\odot$	SUNCE $\delta_\odot$	PROLJ. TAČKA S_Υ	VENERA S_φ	VENERA δ_φ	MARS S_σ	MARS δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	181 44.8	-22 58.1	79 35.8	225 4.5	-11 11.0	167 6.3	-24 17.8
2	211 44.2	-22 58.5	109 40.7	255 6.0	-11 11.6	197 7.1	-24 17.8
4	241 43.7	-22 58.9	139 45.6	285 7.5	-11 12.3	227 7.9	-24 17.7
6	271 43.1	-22 59.3	169 50.6	315 9.0	-11 13.0	257 8.6	-24 17.7
8	301 42.5	-22 59.7	199 55.5	345 10.5	-11 13.6	287 9.4	-24 17.7
10	331 41.9	-23 .1	230 .4	15 12.0	-11 14.3	317 10.2	-24 17.6
12	1 41.4	-23 .6	260 5.3	45 13.5	-11 15.0	347 10.9	-24 17.6
14	31 40.8	-23 1.0	290 10.3	75 15.0	-11 15.7	17 11.7	-24 17.5
16	61 40.2	-23 1.4	320 15.2	105 16.5	-11 16.4	47 12.5	-24 17.5
18	91 39.6	-23 1.8	350 20.1	135 17.9	-11 17.1	77 13.2	-24 17.4
20	121 39.1	-23 2.2	20 25.1	165 19.4	-11 17.7	107 14.0	-24 17.4
22	151 38.5	-23 2.5	50 30.0	195 20.9	-11 18.4	137 14.8	-24 17.3
Δ	-3	-2		7	-3	4	0

UT	MJESEC $S_\leftmoon$	MJESEC Δ	MJESEC $\delta_\leftmoon$	MJESEC Δ	JUPITER S_4	JUPITER δ_4	SATURN S_η	SATURN δ_η
h	° ′		° ′		° ′	° ′	° ′	° ′
0	117 48.6	150	-10 53.3	112	84 15.9	- 3 29.4	244 32.2	- 3 55.0
2	146 56.6	151	-10 30.8	113	114 20.5	- 3 29.2	274 36.8	- 3 55.2
4	176 4.8	152	-10 8.2	114	144 25.1	- 3 29.0	304 41.4	- 3 55.3
6	205 13.2	153	- 9 45.5	114	174 29.7	- 3 28.9	334 45.9	- 3 55.4
8	234 21.9	154	- 9 22.6	115	204 34.3	- 3 28.7	4 50.5	- 3 55.5
10	263 30.7	155	- 8 59.6	115	234 38.9	- 3 28.5	34 55.1	- 3 55.7
12	292 39.7	156	- 8 36.6	116	264 43.5	- 3 28.4	64 59.7	- 3 55.8
14	321 48.9	157	- 8 13.4	117	294 48.0	- 3 28.2	95 4.2	- 3 55.9
16	350 58.2	158	- 7 50.0	117	324 52.6	- 3 28.0	125 8.8	- 3 56.0
18	20 7.7	158	- 7 26.6	117	354 57.2	- 3 27.8	155 13.4	- 3 56.2
20	49 17.4	159	- 7 3.1	118	25 1.8	- 3 27.7	185 18.0	- 3 56.3
22	78 27.2	160	- 6 39.6	118	55 6.4	- 3 27.5	215 22.5	- 3 56.4
Δ					23	1	23	-1

φ	SUNCE IZLAZ	SUNCE ZALAZ	TRAJANJE SUMRAKA GRAĐ.	TRAJANJE SUMRAKA ASTR.	MJESEC IZLAZ	MJESEC Δ/24	MJESEC ZALAZ	MJESEC Δ/24
N	h min	h min	h min	h min	h min	min	h min	min
60	8 52	14 54	0 57	2 44	11 31	.3	21 58	3.2
55	8 15	15 32	0 45	2 17	11 20	.5	22 7	2.9
50	7 48	15 58	0 38	1 59	11 11	.7	22 14	2.7
45	7 28	16 18	0 34	1 46	11 4	.9	22 20	2.6
40	7 12	16 35	0 30	1 37	10 58	1.0	22 24	2.4
35	6 58	16 49	0 28	1 30	10 53	1.1	22 28	2.3
30	6 46	17 1	0 26	1 25	10 48	1.2	22 31	2.2
20	6 25	17 22	0 24	1 18	10 41	1.4	22 37	2.0
10	6 7	17 40	0 23	1 15	10 34	1.6	22 42	1.8
0	5 50	17 57	0 22	1 15	10 27	1.7	22 47	1.7
10	5 32	18 14	0 23	1 17	10 21	1.9	22 52	1.5
20	5 14	18 33	0 24	1 24	10 14	2.0	22 57	1.4
30	4 52	18 55	0 27	1 36	10 6	2.2	23 2	1.2
35	4 39	19 7	0 30	1 46	10 1	2.3	23 6	1.1
40	4 25	19 22	0 33	2 2	9 56	2.4	23 9	1.0
45	4 7	19 40	0 37	2 30	9 50	2.6	23 13	.9
50	3 45	20 2	0 44	: ::	9 42	2.8	23 18	.7
55	3 16	20 31	0 57	: ::	9 33	3.0	23 24	.5
60	2 33	21 14	1 38	: ::	9 21	3.2	23 32	.2
S								

SUNCE UT	SUNCE $e = T_p - UT$	SUNCE Δ/24	SUNCE r	MJESEC Prolaz	MJESEC Δ/24	MJESEC $\pi_\leftmoon$	MJESEC r
h	min s	s	′	h min	min	′	′
00	6 59.4	-1.2	16.3	$T_{\overline{m}}$ 16 37	1.7	54.7	14.9
12	6 45.6	$T_{\overline{m}_\odot}$ 11 h 53.2 min		Starost 5.3 d	Faza ◐		

PLANETE

Pl.	$T_{\overline{m}}$	π	360−α	Vel.	Pl.	$T_{\overline{m}}$	π	360−α	Vel.
	h min	′	°			h min	′	°	
♀	8 59	.3	145	-4.5	♃	18 20	.0	5	-2.3
♂	12 51	.1	88	1.3	♄	7 41	.0	165	.8

UT	SUNCE $S_\odot$	SUNCE $\delta_\odot$	PROLJ. TAČKA S_Υ	VENERA S_φ	VENERA δ_φ	MARS S_σ	MARS δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	181 37.9	-23 2.9	80 34.9	225 22.3	-11 19.1	167 15.5	-24 17.3
2	211 37.3	-23 3.3	110 39.8	255 23.7	-11 19.8	197 16.3	-24 17.2
4	241 36.7	-23 3.7	140 44.8	285 25.2	-11 20.6	227 17.0	-24 17.1
6	271 36.2	-23 4.1	170 49.7	315 26.6	-11 21.3	257 17.8	-24 17.1
8	301 35.6	-23 4.5	200 54.6	345 28.0	-11 22.0	287 18.6	-24 17.0
10	331 35.0	-23 4.8	230 59.5	15 29.4	-11 22.7	317 19.3	-24 16.9
12	1 34.4	-23 5.2	261 4.5	45 30.8	-11 23.4	347 20.1	-24 16.9
14	31 33.8	-23 5.6	291 9.4	75 32.2	-11 24.2	17 20.9	-24 16.8
16	61 33.2	-23 5.9	321 14.3	105 33.6	-11 24.9	47 21.6	-24 16.7
18	91 32.7	-23 6.3	351 19.3	135 35.0	-11 25.6	77 22.4	-24 16.7
20	121 32.1	-23 6.6	21 24.2	165 36.4	-11 26.4	107 23.1	-24 16.6
22	151 31.5	-23 7.0	51 29.1	195 37.7	-11 27.1	137 23.9	-24 16.5
Δ	-3	-2		7	-4	4	0

UT	MJESEC $S_\leftmoon$	MJESEC Δ	MJESEC $\delta_\leftmoon$	MJESEC Δ	JUPITER S_4	JUPITER δ_4	SATURN S_η	SATURN δ_η
h	° ′		° ′		° ′	° ′	° ′	° ′
0	107 37.1	160	- 6 15.9	119	85 11.0	- 3 27.3	245 27.1	- 3 56.5
2	136 47.2	161	- 5 52.2	119	115 15.5	- 3 27.1	275 31.7	- 3 56.7
4	165 57.4	162	- 5 28.4	119	145 20.1	- 3 27.0	305 36.3	- 3 56.8
6	195 7.7	162	- 5 4.5	120	175 24.7	- 3 26.8	335 40.8	- 3 56.9
8	224 18.1	163	- 4 40.6	120	205 29.3	- 3 26.6	5 45.4	- 3 57.0
10	253 28.6	163	- 4 16.6	120	235 33.8	- 3 26.4	35 50.0	- 3 57.2
12	282 39.2	163	- 3 52.5	120	265 38.4	- 3 26.3	65 54.6	- 3 57.3
14	311 49.9	164	- 3 28.4	121	295 43.0	- 3 26.1	95 59.2	- 3 57.4
16	341 .6	164	- 3 4.3	121	325 47.6	- 3 25.9	126 3.7	- 3 57.5
18	10 11.5	164	- 2 40.2	121	355 52.1	- 3 25.7	156 8.3	- 3 57.7
20	39 22.3	165	- 2 16.0	121	25 56.7	- 3 25.6	186 12.9	- 3 57.8
22	68 33.2	165	- 1 51.8	121	56 1.3	- 3 25.4	216 17.5	- 3 57.9
Δ					23	1	23	-1

φ	SUNCE IZLAZ	SUNCE ZALAZ	TRAJANJE SUMRAKA GRAĐ.	TRAJANJE SUMRAKA ASTR.	MJESEC IZLAZ	MJESEC Δ/24	MJESEC ZALAZ	MJESEC Δ/24
N	h min	h min	h min	h min	h min	min	h min	min
60	8 53	14 54	0 57	2 45	11 37	.2	23 16	3.2
55	8 16	15 32	0 45	2 17	11 32	.5	23 18	2.9
50	7 49	15 58	0 38	1 59	11 28	.7	23 20	2.7
45	7 29	16 18	0 34	1 47	11 25	.8	23 21	2.5
40	7 12	16 35	0 30	1 37	11 22	1.0	23 22	2.4
35	6 58	16 49	0 28	1 31	11 20	1.1	23 23	2.3
30	6 46	17 1	0 26	1 25	11 18	1.2	23 24	2.2
20	6 25	17 22	0 24	1 19	11 14	1.4	23 25	2.0
10	6 7	17 40	0 23	1 15	11 11	1.5	23 27	1.8
0	5 50	17 57	0 22	1 15	11 8	1.7	23 28	1.7
10	5 33	18 15	0 23	1 18	11 5	1.8	23 29	1.5
20	5 14	18 33	0 25	1 24	11 2	2.0	23 30	1.4
30	4 52	18 55	0 27	1 36	10 59	2.2	23 31	1.2
35	4 40	19 8	0 30	1 46	10 57	2.3	23 32	1.1
40	4 25	19 23	0 33	2 2	10 54	2.4	23 33	1.0
45	4 7	19 41	0 37	2 31	10 52	2.5	23 34	.8
50	3 45	20 3	0 44	: ::	10 48	2.7	23 35	.7
55	3 16	20 32	0 57	: ::	10 44	2.9	23 36	.5
60	2 33	21 16	1 39	: ::	10 39	3.2	23 38	.2
S								

SUNCE UT	SUNCE $e = T_p - UT$	SUNCE Δ/24	SUNCE r	MJESEC Prolaz	MJESEC Δ/24	MJESEC $\pi_\leftmoon$	MJESEC r
h	min s	s	′	h min	min	′	′
00	6 31.8	-1.2	16.3	$T_{\overline{m}}$ 17 18	1.7	54.4	14.8
12	6 17.7	$T_{\overline{m}_\odot}$ 11 h 53.7 min		Starost 6.3 d	Faza ◐		

PLANETE

Pl.	$T_{\overline{m}}$	π	360−α	Vel.	Pl.	$T_{\overline{m}}$	π	360−α	Vel.
	h min	′	°			h min	′	°	
♀	8 58	.3	145	-4.5	♃	18 16	.0	5	-2.3
♂	12 51	.1	87	1.3	♄	7 37	.0	165	.8

13. DECEMBAR 2010. PONEDJELJAK

UT	SUNCE $S_\odot$	SUNCE $\delta_\odot$	PROLJ. TAČKA S_Υ	VENERA S_φ	VENERA δ_φ	MARS S_σ	MARS δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	181 30.9	-23 7.4	81 34.0	225 39.1	-11 27.8	167 24.7	-24 16.4
2	211 30.3	-23 7.7	111 39.0	255 40.4	-11 28.6	197 25.4	-24 16.4
4	241 29.7	-23 8.0	141 43.9	285 41.8	-11 29.3	227 26.2	-24 16.3
6	271 29.1	-23 8.4	171 48.8	315 43.1	-11 30.1	257 26.9	-24 16.2
8	301 28.5	-23 8.7	201 53.8	345 44.4	-11 30.9	287 27.7	-24 16.1
10	331 28.0	-23 9.1	231 58.7	15 45.8	-11 31.6	317 28.5	-24 16.0
12	1 27.4	-23 9.4	262 3.6	45 47.1	-11 32.4	347 29.2	-24 15.9
14	31 26.8	-23 9.7	292 8.5	75 48.4	-11 33.2	17 30.0	-24 15.8
16	61 26.2	-23 10.0	322 13.5	105 49.7	-11 33.9	47 30.7	-24 15.7
18	91 25.6	-23 10.4	352 18.4	135 51.0	-11 34.7	77 31.5	-24 15.6
20	121 25.0	-23 10.7	22 23.3	165 52.3	-11 35.5	107 32.3	-24 15.6
22	151 24.4	-23 11.0	52 28.3	195 53.6	-11 36.3	137 33.0	-24 15.5
Δ	-3	-2		7	-4	4	0

UT	MJESEC $S_\leftmoon$	MJESEC Δ	MJESEC $\delta_\leftmoon$	MJESEC Δ	JUPITER S_4	JUPITER δ_4	SATURN S_η	SATURN δ_η
h	° ′		° ′		° ′	° ′	° ′	° ′
0	97 44.2	165	-1 27.5	121	86 5.8	-3 25.2	246 22.1	-3 58.0
2	126 55.2	165	-1 3.3	121	116 10.4	-3 25.0	276 26.6	-3 58.2
4	156 6.2	165	-0 39.0	121	146 15.0	-3 24.8	306 31.2	-3 58.3
6	185 17.2	165	-0 14.7	121	176 19.5	-3 24.7	336 35.8	-3 58.4
8	214 28.3	165	0 9.5	121	206 24.1	-3 24.5	6 40.4	-3 58.5
10	243 39.3	165	0 33.8	121	236 28.6	-3 24.3	36 45.0	-3 58.6
12	272 50.3	165	0 58.0	121	266 33.2	-3 24.1	66 49.6	-3 58.8
14	302 1.3	165	1 22.3	121	296 37.8	-3 23.9	96 54.1	-3 58.9
16	331 12.3	165	1 46.5	121	326 42.3	-3 23.7	126 58.7	-3 59.0
18	0 23.3	165	2 10.7	121	356 46.9	-3 23.6	157 3.3	-3 59.1
20	29 34.2	164	2 34.9	121	26 51.4	-3 23.4	187 7.9	-3 59.2
22	58 45.1	164	2 59.1	121	56 56.0	-3 23.2	217 12.5	-3 59.4
Δ					23	1	23	-1

φ	SUNCE IZLAZ	SUNCE ZALAZ	TRAJANJE SUMRAKA GRAĐ.	TRAJANJE SUMRAKA ASTR.	MJESEC IZLAZ	MJESEC Δ/24	MJESEC ZALAZ	MJESEC Δ/24
N	h min	h min	h min	h min	h min	min	h min	min
60	8 55	14 53	0 57	2 45	11 43	.2	. . .	.0
55	8 17	15 31	0 45	2 17	11 44	.5	. . .	.0
50	7 50	15 58	0 38	1 59	11 44	.7	. . .	.0
45	7 30	16 19	0 34	1 47	11 45	.8	. . .	.0
40	7 13	16 35	0 30	1 37	11 46	1.0	. . .	.0
35	6 59	16 49	0 28	1 31	11 46	1.1	. . .	.0
30	6 47	17 1	0 26	1 25	11 47	1.2	. . .	.0
20	6 26	17 22	0 24	1 19	11 47	1.4	. . .	.0
10	6 8	17 41	0 23	1 15	11 48	1.5	. . .	.0
0	5 50	17 58	0 22	1 15	11 49	1.7	. . .	.0
10	5 33	18 15	0 23	1 18	11 49	1.8	. . .	.0
20	5 14	18 34	0 25	1 24	11 50	2.0	. . .	.0
30	4 53	18 56	0 27	1 36	11 51	2.2	23 60	1.2
35	4 40	19 9	0 30	1 47	11 51	2.3	23 58	1.1
40	4 25	19 24	0 33	2 3	11 52	2.4	23 56	1.0
45	4 7	19 41	0 37	2 32	11 53	2.6	23 54	.9
50	3 45	20 4	0 44	: ::	11 54	2.7	23 51	.7
55	3 16	20 33	0 57	: ::	11 55	2.9	23 48	.5
60	2 32	21 17	1 40	: ::	11 56	3.2	23 44	.3
S								

SUNCE UT	SUNCE $e = T_p - UT$	SUNCE Δ/24	SUNCE r	MJESEC Prolaz	MJESEC Δ/24	MJESEC $\pi_\leftmoon$	MJESEC r
h	min s	s	′	h min	min	′	′
00	6 3.8	-1.2	16.3	$T_{\overline{m}}$ 17 58	1.7	54.2	14.8
12	5 49.6	$T_{\overline{m}_\odot}$ 11 h 54.2 min		Starost 7.3 d	Faza ◐		

PLANETE

Pl.	$T_{\overline{m}}$	π	360−α	Vel.	Pl.	$T_{\overline{m}}$	π	360−α	Vel.
	h min	′	°			h min	′	°	
♀	8 57	.3	144	-4.5	♃	18 13	.0	5	-2.3
♂	12 50	.1	86	1.3	♄	7 33	.0	165	.8

14. DECEMBAR UTORAK

UT	SUNCE $S_\odot$	SUNCE $\delta_\odot$	PROLJ. TAČKA S_Υ	VENERA S_φ	VENERA δ_φ	MARS S_σ	MARS δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	181 23.8	-23 11.3	82 33.2	225 54.8	-11 37.1	167 33.8	-24 15.4
2	211 23.2	-23 11.6	112 38.1	255 56.1	-11 37.8	197 34.5	-24 15.2
4	241 22.6	-23 11.9	142 43.0	285 57.4	-11 38.6	227 35.3	-24 15.1
6	271 22.0	-23 12.2	172 48.0	315 58.6	-11 39.4	257 36.0	-24 15.0
8	301 21.4	-23 12.5	202 52.9	345 59.9	-11 40.2	287 36.8	-24 14.9
10	331 20.8	-23 12.8	232 57.8	16 1.1	-11 41.0	317 37.6	-24 14.8
12	1 20.3	-23 13.1	263 2.8	46 2.3	-11 41.8	347 38.3	-24 14.7
14	31 19.7	-23 13.4	293 7.7	76 3.6	-11 42.7	17 39.1	-24 14.6
16	61 19.1	-23 13.7	323 12.6	106 4.8	-11 43.5	47 39.8	-24 14.5
18	91 18.5	-23 14.0	353 17.5	136 6.0	-11 44.3	77 40.6	-24 14.4
20	121 17.9	-23 14.3	23 22.5	166 7.2	-11 45.1	107 41.3	-24 14.2
22	151 17.3	-23 14.5	53 27.4	196 8.4	-11 45.9	137 42.1	-24 14.1
Δ	-3	-1		6	-4	4	1

UT	MJESEC $S_\leftmoon$	MJESEC Δ	MJESEC $\delta_\leftmoon$	MJESEC Δ	JUPITER S_4	JUPITER δ_4	SATURN S_η	SATURN δ_η
h	° ′		° ′		° ′	° ′	° ′	° ′
0	87 55.9	164	3 23.2	120	87 .5	-3 23.0	247 17.1	-3 59.5
2	117 6.6	163	3 47.2	120	117 5.1	-3 22.8	277 21.7	-3 59.6
4	146 17.3	163	4 11.3	120	147 9.6	-3 22.6	307 26.3	-3 59.7
6	175 27.9	162	4 35.2	120	177 14.2	-3 22.4	337 30.9	-3 59.8
8	204 38.3	162	4 59.2	119	207 18.7	-3 22.3	7 35.4	-3 60.0
10	233 48.7	161	5 23.0	119	237 23.3	-3 22.1	37 40.0	-4 .1
12	262 59.0	161	5 46.8	119	267 27.8	-3 21.9	67 44.6	-4 .2
14	292 9.2	160	6 10.5	118	297 32.4	-3 21.7	97 49.2	-4 .3
16	321 19.3	160	6 34.2	118	327 36.9	-3 21.5	127 53.8	-4 .4
18	350 29.2	159	6 57.7	117	357 41.4	-3 21.3	157 58.4	-4 .5
20	19 39.0	158	7 21.2	117	27 46.0	-3 21.1	188 3.0	-4 .7
22	48 48.6	157	7 44.6	116	57 50.5	-3 20.9	218 7.6	-4 .8
Δ					23	1	23	-1

φ	SUNCE IZLAZ	SUNCE ZALAZ	TRAJANJE SUMRAKA GRAĐ.	TRAJANJE SUMRAKA ASTR.	MJESEC IZLAZ	MJESEC Δ/24	MJESEC ZALAZ	MJESEC Δ/24
N	h min	h min	h min	h min	h min	min	h min	min
60	8 56	14 53	0 57	2 45	11 48	.3	0 33	3.2
55	8 18	15 31	0 45	2 17	11 55	.5	0 29	3.0
50	7 51	15 58	0 38	1 59	12 1	.7	0 25	2.7
45	7 30	16 19	0 34	1 47	12 5	.9	0 22	2.6
40	7 14	16 35	0 31	1 37	12 9	1.0	0 20	2.4
35	6 60	16 49	0 28	1 31	12 12	1.2	0 18	2.3
30	6 48	17 2	0 26	1 25	12 15	1.3	0 16	2.2
20	6 27	17 23	0 24	1 19	12 20	1.4	0 13	2.0
10	6 8	17 41	0 23	1 15	12 25	1.6	0 11	1.9
0	5 51	17 58	0 23	1 15	12 29	1.7	0 8	1.7
10	5 33	18 16	0 23	1 18	12 34	1.9	0 6	1.6
20	5 15	18 35	0 25	1 24	12 38	2.0	0 3	1.4
30	4 53	18 57	0 27	1 36	12 43	2.2	. . .	.0
35	4 40	19 9	0 30	1 47	12 46	2.3	. . .	.0
40	4 25	19 24	0 33	2 3	12 50	2.5	. . .	.0
45	4 7	19 42	0 37	2 32	12 54	2.6	. . .	.0
50	3 45	20 5	0 44	: ::	12 59	2.8	. . .	.0
55	3 15	20 34	0 58	: ::	13 5	3.0	. . .	.0
60	2 32	21 18	1 42	: ::	13 13	3.3	23 50	.3
S								

SUNCE UT	SUNCE $e = T_p - UT$	SUNCE Δ/24	SUNCE r	MJESEC Prolaz	MJESEC Δ/24	MJESEC $\pi_\leftmoon$	MJESEC r
h	min s	s	′	h min	min	′	′
00	5 35.5	-1.2	16.3	$T_{\overline{m}}$ 18 39	1.8	54.3	14.8
12	5 21.1	$T_{\overline{m}_\odot}$ 11 h 54.6 min		Starost 8.3 d	Faza ◐		

PLANETE

Pl.	$T_{\overline{m}}$	π	360−α	Vel.	Pl.	$T_{\overline{m}}$	π	360−α	Vel.
	h min	′	°			h min	′	°	
♀	8 56	.3	143	-4.5	♃	18 9	.0	4	-2.3
♂	12 49	.1	85	1.3	♄	7 30	.0	165	.8

UT	SUNCE $S_\odot$	SUNCE $\delta_\odot$	PROLJ. TAČKA S_Υ	VENERA S_φ	VENERA δ_φ	MARS S_σ	MARS δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	181 16.7	-23 14.8	83 32.3	226 9.6	-11 46.7	167 42.8	-24 14.0
2	211 16.1	-23 15.1	113 37.3	256 10.8	-11 47.6	197 43.6	-24 13.9
4	241 15.5	-23 15.4	143 42.2	286 12.0	-11 48.4	227 44.3	-24 13.7
6	271 14.9	-23 15.6	173 47.1	316 13.2	-11 49.2	257 45.1	-24 13.6
8	301 14.3	-23 15.9	203 52.0	346 14.3	-11 50.1	287 45.9	-24 13.5
10	331 13.7	-23 16.1	233 57.0	16 15.5	-11 50.9	317 46.6	-24 13.3
12	1 13.1	-23 16.4	264 1.9	46 16.6	-11 51.8	347 47.4	-24 13.2
14	31 12.5	-23 16.6	294 6.8	76 17.8	-11 52.6	17 48.1	-24 13.1
16	61 11.9	-23 16.9	324 11.8	106 18.9	-11 53.4	47 48.9	-24 12.9
18	91 11.3	-23 17.1	354 16.7	136 20.1	-11 54.3	77 49.6	-24 12.8
20	121 10.7	-23 17.4	24 21.6	166 21.2	-11 55.1	107 50.4	-24 12.7
22	151 10.1	-23 17.6	54 26.5	196 22.3	-11 56.0	137 51.1	-24 12.5
Δ	-3	-1		6	-4	4	1

UT	MJESEC $S_\leftmoon$	MJESEC Δ	MJESEC $\delta_\leftmoon$	MJESEC Δ	JUPITER S_4	JUPITER δ_4	SATURN S_η	SATURN δ_η
h	° ′		° ′		° ′	° ′	° ′	° ′
0	77 58.1	157	8 7.9	116	87 55.1	-3 20.7	248 12.2	-4 .9
2	107 7.4	156	8 31.1	115	117 59.6	-3 20.5	278 16.8	-4 1.0
4	136 16.6	155	8 54.1	115	148 4.1	-3 20.4	308 21.4	-4 1.1
6	165 25.6	154	9 17.1	114	178 8.7	-3 20.2	338 26.0	-4 1.2
8	194 34.4	153	9 39.9	114	208 13.2	-3 20.0	8 30.6	-4 1.4
10	223 43.0	152	10 2.7	113	238 17.7	-3 19.8	38 35.2	-4 1.5
12	252 51.4	151	10 25.2	112	268 22.3	-3 19.6	68 39.8	-4 1.6
14	281 59.6	150	10 47.7	112	298 26.8	-3 19.4	98 44.4	-4 1.7
16	311 7.5	149	11 10.0	111	328 31.3	-3 19.2	128 49.0	-4 1.8
18	340 15.3	148	11 32.1	110	358 35.8	-3 19.0	158 53.6	-4 1.9
20	9 22.8	146	11 54.1	109	28 40.4	-3 18.8	188 58.2	-4 2.0
22	38 30.1	145	12 16.0	108	58 44.9	-3 18.6	219 2.8	-4 2.2
Δ					23	1	23	-1

φ	SUNCE IZLAZ	SUNCE ZALAZ	TRAJANJE SUMRAKA GRAĐ.	TRAJANJE SUMRAKA ASTR.	MJESEC IZLAZ	MJESEC Δ/24	MJESEC ZALAZ	MJESEC Δ/24
N	h min	h min	h min	h min	h min	min	h min	min
60	8 57	14 53	0 57	2 45	11 55	.4	1 51	3.3
55	8 19	15 31	0 45	2 17	12 8	.6	1 39	3.0
50	7 52	15 58	0 38	1 59	12 19	.9	1 31	2.8
45	7 31	16 19	0 34	1 47	12 27	1.0	1 24	2.6
40	7 15	16 36	0 31	1 38	12 34	1.2	1 18	2.5
35	7 0	16 50	0 28	1 31	12 40	1.3	1 13	2.4
30	6 48	17 2	0 26	1 25	12 46	1.4	1 9	2.3
20	6 27	17 23	0 24	1 19	12 55	1.5	1 2	2.1
10	6 9	17 42	0 23	1 15	13 3	1.7	0 55	1.9
0	5 51	17 59	0 23	1 15	13 11	1.8	0 49	1.8
10	5 34	18 16	0 23	1 18	13 19	2.0	0 43	1.6
20	5 15	18 35	0 25	1 24	13 27	2.1	0 37	1.5
30	4 53	18 57	0 27	1 36	13 37	2.3	0 29	1.3
35	4 40	19 10	0 30	1 47	13 43	2.4	0 25	1.2
40	4 25	19 25	0 33	2 3	13 49	2.5	0 21	1.1
45	4 7	19 43	0 37	2 32	13 56	2.7	0 15	1.0
50	3 45	20 5	0 44	: ::	14 5	2.8	0 9	.8
55	3 15	20 35	0 58	: ::	14 17	3.1	0 1	.6
60	2 31	21 19	1 43	: ::	14 32	3.4	23 57	.4
S								

SUNCE UT	SUNCE $e = T_p - UT$	SUNCE Δ/24	SUNCE r	MJESEC Prolaz	MJESEC Δ/24	MJESEC $\pi_\leftmoon$	MJESEC r
h	min s	s	′	h min	min	′	′
00	5 6.9	-1.2	16.3	$T_{\overline{m}}$ 19 21	1.9	54.5	14.8
12	4 52.4	$T_{\overline{m}_\odot}$ 11 h 55.1 min		Starost 9.3 d	Faza ◐		

PLANETE

Pl.	$T_{\overline{m}}$	π	360−α	Vel.	Pl.	$T_{\overline{m}}$	π	360−α	Vel.
	h min	′	°			h min	′	°	
♀	8 55	.3	143	-4.5	♃	18 6	.0	4	-2.3
♂	12 49	.1	84	1.3	♄	7 26	.0	165	.8

UT	SUNCE $S_\odot$	SUNCE $\delta_\odot$	PROLJ. TAČKA S_Υ	VENERA S_φ	VENERA δ_φ	MARS S_σ	MARS δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	181 9.5	-23 17.8	84 31.5	226 23.4	-11 56.9	167 51.9	-24 12.4
2	211 8.9	-23 18.1	114 36.4	256 24.5	-11 57.7	197 52.6	-24 12.2
4	241 8.3	-23 18.3	144 41.3	286 25.7	-11 58.6	227 53.4	-24 12.1
6	271 7.6	-23 18.5	174 46.2	316 26.7	-11 59.5	257 54.1	-24 11.9
8	301 7.0	-23 18.8	204 51.2	346 27.8	-12 .3	287 54.9	-24 11.8
10	331 6.4	-23 19.0	234 56.1	16 28.9	-12 1.2	317 55.6	-24 11.6
12	1 5.8	-23 19.2	265 1.0	46 30.0	-12 2.1	347 56.4	-24 11.5
14	31 5.2	-23 19.4	295 6.0	76 31.1	-12 3.0	17 57.1	-24 11.3
16	61 4.6	-23 19.6	325 10.9	106 32.1	-12 3.8	47 57.9	-24 11.1
18	91 4.0	-23 19.8	355 15.8	136 33.2	-12 4.7	77 58.6	-24 11.0
20	121 3.4	-23 20.0	25 20.7	166 34.2	-12 5.6	107 59.4	-24 10.8
22	151 2.8	-23 20.2	55 25.7	196 35.3	-12 6.5	138 .1	-24 10.6
Δ	-3	-1		5	-4	4	1

UT	MJESEC $S_\leftmoon$	MJESEC Δ	MJESEC $\delta_\leftmoon$	MJESEC Δ	JUPITER S_4	JUPITER δ_4	SATURN S_η	SATURN δ_η
h	° ′		° ′		° ′	° ′	° ′	° ′
0	67 37.2	144	12 37.6	107	88 49.4	-3 18.4	249 7.4	-4 2.3
2	96 44.0	143	12 59.1	107	118 53.9	-3 18.2	279 12.0	-4 2.4
4	125 50.5	141	13 20.4	106	148 58.5	-3 18.0	309 16.6	-4 2.5
6	154 56.8	140	13 41.5	105	179 3.0	-3 17.8	339 21.2	-4 2.6
8	184 2.8	139	14 2.4	104	209 7.5	-3 17.6	9 25.8	-4 2.7
10	213 8.6	137	14 23.1	102	239 12.0	-3 17.4	39 30.4	-4 2.8
12	242 14.0	136	14 43.6	101	269 16.5	-3 17.2	69 35.0	-4 2.9
14	271 19.2	134	15 3.9	100	299 21.1	-3 17.0	99 39.6	-4 3.1
16	300 24.1	133	15 24.0	99	329 25.6	-3 16.8	129 44.2	-4 3.2
18	329 28.6	131	15 43.8	98	359 30.1	-3 16.6	159 48.8	-4 3.3
20	358 32.9	130	16 3.4	97	29 34.6	-3 16.4	189 53.4	-4 3.4
22	27 36.8	128	16 22.7	95	59 39.1	-3 16.2	219 58.0	-4 3.5
Δ					23	1	23	-1

φ	SUNCE IZLAZ	SUNCE ZALAZ	TRAJANJE SUMRAKA GRAĐ.	TRAJANJE SUMRAKA ASTR.	MJESEC IZLAZ	MJESEC Δ/24	MJESEC ZALAZ	MJESEC Δ/24
N	h min	h min	h min	h min	h min	min	h min	min
60	8 58	14 53	0 58	2 46	12 4	.5	3 10	3.4
55	8 20	15 32	0 45	2 17	12 24	.8	2 52	3.1
50	7 53	15 59	0 38	1 59	12 39	1.0	2 38	2.9
45	7 32	16 19	0 34	1 47	12 52	1.2	2 27	2.7
40	7 15	16 36	0 31	1 38	13 2	1.3	2 18	2.6
35	7 1	16 50	0 28	1 31	13 11	1.4	2 10	2.4
30	6 49	17 2	0 26	1 25	13 18	1.5	2 3	2.3
20	6 28	17 24	0 24	1 19	13 32	1.7	1 52	2.2
10	6 9	17 42	0 23	1 15	13 44	1.8	1 41	2.0
0	5 52	17 59	0 23	1 15	13 55	2.0	1 32	1.9
10	5 34	18 17	0 23	1 18	14 6	2.1	1 22	1.8
20	5 15	18 36	0 25	1 24	14 18	2.2	1 12	1.6
30	4 54	18 58	0 27	1 36	14 32	2.4	1 1	1.4
35	4 41	19 11	0 30	1 47	14 40	2.5	0 54	1.3
40	4 26	19 26	0 33	2 3	14 49	2.6	0 47	1.2
45	4 8	19 44	0 37	2 33	15 0	2.7	0 38	1.1
50	3 45	20 6	0 45	: ::	15 14	2.9	0 27	.9
55	3 15	20 36	0 58	: ::	15 30	3.1	0 15	.7
60	2 31	21 20	1 44	: ::	15 53	3.5	. . .	.0
S								

SUNCE UT	SUNCE $e = T_p - UT$	SUNCE Δ/24	SUNCE r	MJESEC Prolaz	MJESEC Δ/24	MJESEC $\pi_\leftmoon$	MJESEC r
h	min s	s	′	h min	min	′	′
00	4 38.0	-1.2	16.3	$T_{\overline{m}}$ 20 6	2.0	54.8	14.9
12	4 23.5	$T_{\overline{m}_\odot}$ 11 h 55.6 min		Starost 10.3 d	Faza ◐		

PLANETE

Pl.	$T_{\overline{m}}$	π	360−α	Vel.	Pl.	$T_{\overline{m}}$	π	360−α	Vel.
	h min	′	°			h min	′	°	
♀	8 54	.3	142	-4.5	♃	18 2	.0	4	-2.3
♂	12 48	.1	83	1.3	♄	7 22	.0	165	.8

17. DECEMBAR 2010. PETAK

UT	SUNCE $S_\odot$	SUNCE $\delta_\odot$	PROLJ. TAČKA S_Υ	VENERA S_φ	VENERA δ_φ	MARS S_σ	MARS δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	181 2.2	-23 20.4	85 30.6	226 36.3	-12 7.4	168 .9	-24 10.5
2	211 1.6	-23 20.6	115 35.5	256 37.4	-12 8.3	198 1.6	-24 10.3
4	241 1.0	-23 20.8	145 40.5	286 38.4	-12 9.2	228 2.4	-24 10.1
6	271 .4	-23 21.0	175 45.4	316 39.4	-12 10.1	258 3.1	-24 9.9
8	300 59.8	-23 21.2	205 50.3	346 40.4	-12 11.0	288 3.9	-24 9.8
10	330 59.2	-23 21.4	235 55.2	16 41.4	-12 11.9	318 4.6	-24 9.6
12	0 58.5	-23 21.5	266 .2	46 42.4	-12 12.8	348 5.4	-24 9.4
14	30 57.9	-23 21.7	296 5.1	76 43.4	-12 13.7	18 6.1	-24 9.2
16	60 57.3	-23 21.9	326 10.0	106 44.4	-12 14.6	48 6.9	-24 9.1
18	90 56.7	-23 22.0	356 15.0	136 45.4	-12 15.6	78 7.6	-24 8.9
20	120 56.1	-23 22.2	26 19.9	166 46.4	-12 16.5	108 8.4	-24 8.7
22	150 55.5	-23 22.4	56 24.8	196 47.4	-12 17.4	138 9.1	-24 8.5
Δ	-3	-1		5	-5	4	1

UT	MJESEC $S_\leftmoon$	MJESEC Δ	MJESEC $\delta_\leftmoon$	MJESEC Δ	JUPITER $S_\jupiter$	JUPITER $\delta_\jupiter$	SATURN $S_\saturn$	SATURN $\delta_\saturn$
h	° ′		° ′		° ′	° ′	° ′	° ′
0	56 40.5	127	16 41.7	94	89 43.6	-3 16.0	250 2.6	-4 3.6
2	85 43.8	125	17 .5	93	119 48.1	-3 15.8	280 7.2	-4 3.7
4	114 46.8	123	17 19.1	91	149 52.6	-3 15.6	310 11.8	-4 3.8
6	143 49.5	122	17 37.3	90	179 57.1	-3 15.4	340 16.5	-4 3.9
8	172 51.8	120	17 55.3	88	210 1.6	-3 15.2	10 21.1	-4 4.1
10	201 53.8	118	18 12.9	87	240 6.1	-3 15.0	40 25.7	-4 4.2
12	230 55.5	117	18 30.2	85	270 10.7	-3 14.8	70 30.3	-4 4.3
14	259 56.8	115	18 47.3	84	300 15.2	-3 14.6	100 34.9	-4 4.4
16	288 57.8	113	19 4.0	82	330 19.7	-3 14.4	130 39.5	-4 4.5
18	317 58.4	111	19 20.3	80	0 24.2	-3 14.1	160 44.1	-4 4.6
20	346 58.7	110	19 36.3	78	30 28.7	-3 13.9	190 48.7	-4 4.7
22	15 58.6	108	19 52.0	77	60 33.2	-3 13.7	220 53.4	-4 4.8
Δ					23	1	23	-1

φ	SUNCE IZLAZ	SUNCE ZALAZ	TRAJANJE SUMRAKA GRAĐ.	TRAJANJE SUMRAKA ASTR.	MJESEC IZLAZ	MJESEC Δ/24	MJESEC ZALAZ	MJESEC Δ/24
N	h min	h min	h min	h min	h min	min	h min	min
60	8 59	14 53	0 58	2 46	12 16	.8	4 33	3.5
55	8 20	15 32	0 46	2 18	12 44	1.1	4 6	3.1
50	7 53	15 59	0 38	1 59	13 4	1.3	3 47	2.9
45	7 33	16 19	0 34	1 47	13 20	1.5	3 32	2.7
40	7 16	16 36	0 31	1 38	13 34	1.6	3 19	2.6
35	7 2	16 50	0 28	1 31	13 45	1.7	3 9	2.5
30	6 49	17 3	0 26	1 26	13 55	1.8	2 60	2.4
20	6 28	17 24	0 24	1 19	14 13	1.9	2 44	2.3
10	6 10	17 42	0 23	1 15	14 28	2.0	2 30	2.1
0	5 52	17 60	0 23	1 15	14 42	2.1	2 17	2.0
10	5 35	18 17	0 23	1 18	14 56	2.2	2 4	1.9
20	5 16	18 36	0 25	1 24	15 12	2.3	1 51	1.8
30	4 54	18 58	0 27	1 37	15 30	2.5	1 35	1.6
35	4 41	19 11	0 30	1 47	15 40	2.5	1 26	1.5
40	4 26	19 26	0 33	2 3	15 52	2.6	1 16	1.4
45	4 8	19 44	0 37	2 33	16 6	2.8	1 4	1.3
50	3 45	20 7	0 45	: ::	16 23	2.9	0 50	1.2
55	3 16	20 37	0 58	: ::	16 46	3.1	0 32	.9
60	2 31	21 21	1 45	: ::	17 16	3.5	0 8	.6
S								

SUNCE UT	SUNCE $e = T_p - UT$	SUNCE Δ/24	SUNCE r	MJESEC Prolaz	MJESEC Δ/24	MJESEC $\pi_\leftmoon$	MJESEC r
h	min s	s	′	h min	min	′	′
00	4 9.0	-1.2	16.3	$T_{\overline{m}}$ 20 54	2.1	55.3	15.1
12	3 54.3	$T_{\overline{m}_\odot}$ 11 h 56.1 min		Starost 11.3 d	Faza ◐		

PLANETE

Pl.	$T_{\overline{m}}$	π	360−α	Vel.	Pl.	$T_{\overline{m}}$	π	360−α	Vel.
	h min	′	°			h min	′	°	
♀	8 53	.3	141	-4.5	♃	17 58	.0	4	-2.3
♂	12 48	.1	82	1.3	♄	7 19	.0	165	.8

18. DECEMBAR SUBOTA

UT	SUNCE $S_\odot$	SUNCE $\delta_\odot$	PROLJ. TAČKA S_Υ	VENERA S_φ	VENERA δ_φ	MARS S_σ	MARS δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	180 54.9	-23 22.5	86 29.7	226 48.3	-12 18.3	168 9.9	-24 8.3
2	210 54.3	-23 22.7	116 34.7	256 49.3	-12 19.3	198 10.6	-24 8.1
4	240 53.7	-23 22.8	146 39.6	286 50.2	-12 20.2	228 11.4	-24 7.9
6	270 53.0	-23 23.0	176 44.5	316 51.2	-12 21.1	258 12.1	-24 7.7
8	300 52.4	-23 23.1	206 49.5	346 52.1	-12 22.1	288 12.9	-24 7.5
10	330 51.8	-23 23.3	236 54.4	16 53.1	-12 23.0	318 13.6	-24 7.3
12	0 51.2	-23 23.4	266 59.3	46 54.0	-12 23.9	348 14.4	-24 7.1
14	30 50.6	-23 23.5	297 4.2	76 54.9	-12 24.9	18 15.1	-24 6.9
16	60 50.0	-23 23.7	327 9.2	106 55.8	-12 25.8	48 15.9	-24 6.7
18	90 49.4	-23 23.8	357 14.1	136 56.7	-12 26.8	78 16.6	-24 6.5
20	120 48.8	-23 23.9	27 19.0	166 57.6	-12 27.7	108 17.4	-24 6.3
22	150 48.1	-23 24.0	57 24.0	196 58.5	-12 28.7	138 18.1	-24 6.1
Δ	-3	-1		5	-5	4	1

UT	MJESEC $S_\leftmoon$	MJESEC Δ	MJESEC $\delta_\leftmoon$	MJESEC Δ	JUPITER $S_\jupiter$	JUPITER $\delta_\jupiter$	SATURN $S_\saturn$	SATURN $\delta_\saturn$
h	° ′		° ′		° ′	° ′	° ′	° ′
0	44 58.2	106	20 7.3	75	90 37.6	-3 13.5	250 58.0	-4 4.9
2	73 57.4	104	20 22.2	73	120 42.1	-3 13.3	281 2.6	-4 5.0
4	102 56.3	103	20 36.8	71	150 46.6	-3 13.1	311 7.2	-4 5.1
6	131 54.8	101	20 51.0	69	180 51.1	-3 12.9	341 11.8	-4 5.2
8	160 53.0	99	21 4.7	67	210 55.6	-3 12.7	11 16.4	-4 5.4
10	189 50.8	97	21 18.1	65	241 .1	-3 12.5	41 21.0	-4 5.5
12	218 48.3	96	21 31.0	63	271 4.6	-3 12.3	71 25.7	-4 5.6
14	247 45.4	94	21 43.5	60	301 9.1	-3 12.0	101 30.3	-4 5.7
16	276 42.2	92	21 55.6	58	331 13.6	-3 11.8	131 34.9	-4 5.8
18	305 38.6	90	22 7.2	56	1 18.1	-3 11.6	161 39.5	-4 5.9
20	334 34.7	89	22 18.4	54	31 22.6	-3 11.4	191 44.1	-4 6.0
22	3 30.5	87	22 29.1	51	61 27.0	-3 11.2	221 48.8	-4 6.1
Δ					22	1	23	-1

φ	SUNCE IZLAZ	SUNCE ZALAZ	TRAJANJE SUMRAKA GRAĐ.	TRAJANJE SUMRAKA ASTR.	MJESEC IZLAZ	MJESEC Δ/24	MJESEC ZALAZ	MJESEC Δ/24
N	h min	h min	h min	h min	h min	min	h min	min
60	8 60	14 53	0 58	2 46	12 34	1.2	5 56	3.3
55	8 21	15 32	0 46	2 18	13 10	1.5	5 21	3.0
50	7 54	15 59	0 38	1 60	13 36	1.7	4 57	2.8
45	7 33	16 20	0 34	1 47	13 56	1.8	4 38	2.7
40	7 17	16 37	0 31	1 38	14 12	1.9	4 22	2.6
35	7 2	16 51	0 28	1 31	14 26	2.0	4 9	2.5
30	6 50	17 3	0 26	1 26	14 37	2.0	3 58	2.5
20	6 29	17 24	0 24	1 19	14 58	2.1	3 38	2.4
10	6 10	17 43	0 23	1 15	15 16	2.2	3 22	2.3
0	5 53	18 0	0 23	1 15	15 33	2.3	3 6	2.2
10	5 35	18 18	0 23	1 18	15 50	2.3	2 50	2.1
20	5 16	18 37	0 25	1 24	16 8	2.4	2 34	2.0
30	4 54	18 59	0 27	1 37	16 29	2.5	2 15	1.9
35	4 41	19 12	0 30	1 47	16 41	2.5	2 3	1.8
40	4 26	19 27	0 33	2 3	16 55	2.6	1 51	1.7
45	4 8	19 45	0 37	2 33	17 12	2.7	1 36	1.6
50	3 46	20 8	0 45	: ::	17 33	2.8	1 17	1.5
55	3 16	20 38	0 58	: ::	18 0	2.9	0 54	1.3
60	2 31	21 22	1 46	: ::	18 40	3.2	0 22	.9
S								

SUNCE UT	SUNCE $e = T_p - UT$	SUNCE Δ/24	SUNCE r	MJESEC Prolaz	MJESEC Δ/24	MJESEC $\pi_\leftmoon$	MJESEC r
h	min s	s	′	h min	min	′	′
00	3 39.7	-1.2	16.3	$T_{\overline{m}}$ 21 45	2.3	56.0	15.2
12	3 25.0	$T_{\overline{m}_\odot}$ 11 h 56.6 min		Starost 12.3 d	Faza ○		

PLANETE

Pl.	$T_{\overline{m}}$	π	360−α	Vel.	Pl.	$T_{\overline{m}}$	π	360−α	Vel.
	h min	′	°			h min	′	°	
♀	8 53	.3	140	-4.5	♃	17 55	.0	4	-2.3
♂	12 47	.1	82	1.3	♄	7 15	.0	164	.8

UT	SUNCE $S_\odot$	SUNCE $\delta_\odot$	PROLJ. TAČKA S_Υ	VENERA S_φ	VENERA δ_φ	MARS S_σ	MARS δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	180 47.5	-23 24.2	87 28.9	226 59.4	-12 29.6	168 18.9	-24 5.9
2	210 46.9	-23 24.3	117 33.8	257 .3	-12 30.6	198 19.6	-24 5.6
4	240 46.3	-23 24.4	147 38.7	287 1.2	-12 31.5	228 20.4	-24 5.4
6	270 45.7	-23 24.5	177 43.7	317 2.1	-12 32.5	258 21.1	-24 5.2
8	300 45.1	-23 24.6	207 48.6	347 3.0	-12 33.4	288 21.8	-24 5.0
10	330 44.5	-23 24.7	237 53.5	17 3.8	-12 34.4	318 22.6	-24 4.8
12	0 43.8	-23 24.8	267 58.4	47 4.7	-12 35.4	348 23.3	-24 4.5
14	30 43.2	-23 24.9	298 3.4	77 5.5	-12 36.3	18 24.1	-24 4.3
16	60 42.6	-23 25.0	328 8.3	107 6.4	-12 37.3	48 24.8	-24 4.1
18	90 42.0	-23 25.1	358 13.2	137 7.2	-12 38.3	78 25.6	-24 3.8
20	120 41.4	-23 25.2	28 18.2	167 8.0	-12 39.3	108 26.3	-24 3.6
22	150 40.8	-23 25.3	58 23.1	197 8.9	-12 40.2	138 27.1	-24 3.4
Δ	-3	0		4	-5	4	1

UT	MJESEC $S_\leftmoon$	MJESEC Δ	MJESEC $\delta_\leftmoon$	MJESEC Δ	JUPITER $S_\jupiter$	JUPITER $\delta_\jupiter$	SATURN $S_\saturn$	SATURN $\delta_\saturn$
h	° ′		° ′		° ′	° ′	° ′	° ′
0	32 25.9	86	22 39.4	49	91 31.5	-3 11.0	251 53.4	-4 6.2
2	61 21.0	84	22 49.2	46	121 36.0	-3 10.8	281 58.0	-4 6.3
4	90 15.8	82	22 58.4	44	151 40.5	-3 10.5	312 2.6	-4 6.4
6	119 10.3	81	23 7.2	41	181 45.0	-3 10.3	342 7.2	-4 6.5
8	148 4.5	79	23 15.5	39	211 49.4	-3 10.1	12 11.9	-4 6.6
10	176 58.3	78	23 23.3	36	241 53.9	-3 9.9	42 16.5	-4 6.7
12	205 51.9	77	23 30.5	34	271 58.4	-3 9.7	72 21.1	-4 6.8
14	234 45.2	75	23 37.2	31	302 2.9	-3 9.5	102 25.7	-4 6.9
16	263 38.2	74	23 43.4	28	332 7.3	-3 9.2	132 30.4	-4 7.0
18	292 31.0	73	23 49.0	25	2 11.8	-3 9.0	162 35.0	-4 7.1
20	321 23.5	71	23 54.1	23	32 16.3	-3 8.8	192 39.6	-4 7.2
22	350 15.8	70	23 58.7	20	62 20.8	-3 8.6	222 44.2	-4 7.3
Δ					22	1	23	-1

φ	SUNCE IZLAZ	SUNCE ZALAZ	TRAJANJE SUMRAKA GRAĐ.	TRAJANJE SUMRAKA ASTR.	MJESEC IZLAZ	MJESEC Δ/24	MJESEC ZALAZ	MJESEC Δ/24
N	h min	h min	h min	h min	h min	min	h min	min
60	9 1	14 53	0 58	2 46	13 4	2.0	7 16	2.9
55	8 22	15 32	0 46	2 18	13 47	2.1	6 34	2.7
50	7 55	15 59	0 39	1 60	14 17	2.2	6 5	2.6
45	7 34	16 20	0 34	1 47	14 39	2.2	5 43	2.6
40	7 17	16 37	0 31	1 38	14 58	2.3	5 25	2.5
35	7 3	16 51	0 28	1 31	15 13	2.3	5 10	2.5
30	6 51	17 4	0 26	1 26	15 26	2.3	4 57	2.5
20	6 29	17 25	0 24	1 19	15 49	2.3	4 35	2.4
10	6 11	17 43	0 23	1 15	16 9	2.4	4 16	2.4
0	5 53	18 1	0 23	1 15	16 27	2.4	3 58	2.3
10	5 36	18 18	0 23	1 18	16 45	2.4	3 41	2.3
20	5 17	18 37	0 25	1 24	17 5	2.4	3 22	2.2
30	4 55	18 59	0 27	1 37	17 28	2.4	2 60	2.2
35	4 42	19 13	0 30	1 47	17 42	2.4	2 47	2.1
40	4 27	19 28	0 33	2 3	17 58	2.5	2 32	2.1
45	4 9	19 46	0 37	2 33	18 16	2.5	2 15	2.0
50	3 46	20 8	0 45	: ::	18 40	2.5	1 53	1.9
55	3 16	20 38	0 58	: ::	19 11	2.5	1 25	1.8
60	2 31	21 23	1 46	: ::	19 56	2.5	0 45	1.6
S								

SUNCE UT	SUNCE $e = T_p - UT$	SUNCE Δ/24	SUNCE r	MJESEC Prolaz	MJESEC Δ/24	MJESEC $\pi_\leftmoon$	MJESEC r
h	min s	s	′	h min	min	′	′
00	3 10.3	-1.2	16.3	$T_{\overline{m}}$ 22 40	2.4	56.6	15.4
12	2 55.5	$T_{\overline{m}_\odot}$ 11 h 57.1 min		Starost 13.3 d	Faza ○		

PLANETE Pl.	$T_{\overline{m}}$	π	360−α	Vel.	Pl.	$T_{\overline{m}}$	π	360−α	Vel.
	h min	′	°			h min	′	°	
♀	8 52	.3	140	-4.5	♃	17 51	.0	4	-2.3
♂	12 46	.1	81	1.3	♄	7 11	.0	164	.8

UT	SUNCE $S_\odot$	SUNCE $\delta_\odot$	PROLJ. TAČKA S_Υ	VENERA S_φ	VENERA δ_φ	MARS S_σ	MARS δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	180 40.1	-23 25.3	88 28.0	227 9.7	-12 41.2	168 27.8	-24 3.1
2	210 39.5	-23 25.4	118 32.9	257 10.5	-12 42.2	198 28.6	-24 2.9
4	240 38.9	-23 25.5	148 37.9	287 11.3	-12 43.2	228 29.3	-24 2.7
6	270 38.3	-23 25.6	178 42.8	317 12.1	-12 44.2	258 30.1	-24 2.4
8	300 37.7	-23 25.6	208 47.7	347 12.9	-12 45.2	288 30.8	-24 2.2
10	330 37.1	-23 25.7	238 52.7	17 13.7	-12 46.2	318 31.5	-24 1.9
12	0 36.4	-23 25.7	268 57.6	47 14.5	-12 47.1	348 32.3	-24 1.7
14	30 35.8	-23 25.8	299 2.5	77 15.3	-12 48.1	18 33.0	-24 1.4
16	60 35.2	-23 25.9	329 7.4	107 16.1	-12 49.1	48 33.8	-24 1.2
18	90 34.6	-23 25.9	359 12.4	137 16.8	-12 50.1	78 34.5	-24 .9
20	120 34.0	-23 25.9	29 17.3	167 17.6	-12 51.1	108 35.3	-24 .7
22	150 33.3	-23 26.0	59 22.2	197 18.4	-12 52.1	138 36.0	-24 .4
Δ	-3	0		4	-5	4	1

UT	MJESEC $S_\leftmoon$	MJESEC Δ	MJESEC $\delta_\leftmoon$	MJESEC Δ	JUPITER $S_\jupiter$	JUPITER $\delta_\jupiter$	SATURN $S_\saturn$	SATURN $\delta_\saturn$
h	° ′		° ′		° ′	° ′	° ′	° ′
0	19 7.8	69	24 2.6	17	92 25.2	-3 8.4	252 48.9	-4 7.4
2	47 59.6	68	24 6.0	14	122 29.7	-3 8.1	282 53.5	-4 7.5
4	76 51.2	67	24 8.8	11	152 34.2	-3 7.9	312 58.1	-4 7.6
6	105 42.6	66	24 11.1	8	182 38.6	-3 7.7	343 2.8	-4 7.7
8	134 33.8	65	24 12.7	5	212 43.1	-3 7.5	13 7.4	-4 7.8
10	163 24.8	64	24 13.8	2	242 47.6	-3 7.3	43 12.0	-4 7.9
12	192 15.7	64	24 14.3	-1	272 52.0	-3 7.0	73 16.7	-4 8.0
14	221 6.4	63	24 14.2	-4	302 56.5	-3 6.8	103 21.3	-4 8.1
16	249 56.9	62	24 13.4	-7	333 .9	-3 6.6	133 25.9	-4 8.2
18	278 47.4	62	24 12.1	-10	3 5.4	-3 6.4	163 30.6	-4 8.3
20	307 37.7	61	24 10.1	-13	33 9.9	-3 6.1	193 35.2	-4 8.4
22	336 27.9	61	24 7.6	-16	63 14.3	-3 5.9	223 39.8	-4 8.5
Δ					22	1	23	-1

φ	SUNCE IZLAZ	SUNCE ZALAZ	TRAJANJE SUMRAKA GRAĐ.	TRAJANJE SUMRAKA ASTR.	MJESEC IZLAZ	MJESEC Δ/24	MJESEC ZALAZ	MJESEC Δ/24
N	h min	h min	h min	h min	h min	min	h min	min
60	9 1	14 54	0 58	2 46	13 52	2.9	8 26	2.1
55	8 22	15 33	0 46	2 18	14 38	2.8	7 39	2.2
50	7 55	15 60	0 39	1 60	15 10	2.7	7 8	2.3
45	7 35	16 21	0 34	1 47	15 33	2.7	6 45	2.3
40	7 18	16 37	0 31	1 38	15 52	2.6	6 26	2.3
35	7 3	16 52	0 28	1 31	16 8	2.6	6 10	2.4
30	6 51	17 4	0 26	1 26	16 21	2.6	5 56	2.4
20	6 30	17 25	0 24	1 19	16 45	2.5	5 33	2.4
10	6 11	17 44	0 23	1 15	17 5	2.5	5 13	2.4
0	5 54	18 1	0 23	1 15	17 24	2.4	4 54	2.4
10	5 36	18 19	0 23	1 18	17 43	2.4	4 35	2.4
20	5 17	18 38	0 25	1 24	18 3	2.3	4 15	2.4
30	4 55	19 0	0 27	1 37	18 27	2.3	3 52	2.4
35	4 42	19 13	0 30	1 47	18 40	2.2	3 38	2.4
40	4 27	19 28	0 33	2 3	18 56	2.2	3 22	2.4
45	4 9	19 46	0 37	2 33	19 15	2.2	3 3	2.4
50	3 46	20 9	0 45	: ::	19 39	2.1	2 40	2.5
55	3 16	20 39	0 58	: ::	20 11	2.0	2 8	2.5
60	2 32	21 24	1 47	: ::	20 57	1.7	1 22	2.4
S								

SUNCE UT	SUNCE $e = T_p - UT$	SUNCE Δ/24	SUNCE r	MJESEC Prolaz	MJESEC Δ/24	MJESEC $\pi_\leftmoon$	MJESEC r
h	min s	s	′	h min	min	′	′
00	2 40.7	-1.2	16.3	$T_{\overline{m}}$ 23 38	2.4	57.3	15.6
12	2 25.9	$T_{\overline{m}_\odot}$ 11 h 57.6 min		Starost 14.3 d	Faza ○		

PLANETE Pl.	$T_{\overline{m}}$	π	360−α	Vel.	Pl.	$T_{\overline{m}}$	π	360−α	Vel.
	h min	′	°			h min	′	°	
♀	8 51	.3	139	-4.5	♃	17 48	.0	4	-2.3
♂	12 46	.1	80	1.3	♄	7 8	.0	164	.8

UT	SUNCE $S_\odot$	SUNCE $\delta_\odot$	PROLJ. TAČKA S_Υ	VENERA S_φ	VENERA δ_φ	MARS S_σ	MARS δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	180 32.7	-23 26.0	89 27.2	227 19.1	-12 53.1	168 36.8	-24 .2
2	210 32.1	-23 26.1	119 32.1	257 19.9	-12 54.1	198 37.5	-23 59.9
4	240 31.5	-23 26.1	149 37.0	287 20.6	-12 55.1	228 38.3	-23 59.6
6	270 30.9	-23 26.1	179 41.9	317 21.4	-12 56.2	258 39.0	-23 59.4
8	300 30.3	-23 26.2	209 46.9	347 22.1	-12 57.2	288 39.7	-23 59.1
10	330 29.6	-23 26.2	239 51.8	17 22.8	-12 58.2	318 40.5	-23 58.8
12	0 29.0	-23 26.2	269 56.7	47 23.5	-12 59.2	348 41.2	-23 58.6
14	30 28.4	-23 26.2	300 1.7	77 24.2	-13 .2	18 42.0	-23 58.3
16	60 27.8	-23 26.2	330 6.6	107 25.0	-13 1.2	48 42.7	-23 58.0
18	90 27.2	-23 26.2	0 11.5	137 25.7	-13 2.2	78 43.5	-23 57.7
20	120 26.5	-23 26.3	30 16.4	167 26.4	-13 3.3	108 44.2	-23 57.5
22	150 25.9	-23 26.3	60 21.4	197 27.0	-13 4.3	138 45.0	-23 57.2
Δ	-3	0		4	-5	4	1

UT	MJESEC $S_\leftmoon$	MJESEC Δ	MJESEC $\delta_\leftmoon$	MJESEC Δ	JUPITER $S_\jupiter$	JUPITER $\delta_\jupiter$	SATURN $S_\saturn$	SATURN $\delta_\saturn$
h	° ′		° ′		° ′	° ′	° ′	° ′
0	5 18.1	60	24 4.4	-19	93 18.8	- 3 5.7	253 44.5	- 4 8.6
2	34 8.2	60	24 .7	-22	123 23.2	- 3 5.5	283 49.1	- 4 8.7
4	62 58.2	60	23 56.3	-25	153 27.7	- 3 5.2	313 53.7	- 4 8.8
6	91 48.2	60	23 51.3	-28	183 32.1	- 3 5.0	343 58.4	- 4 8.9
8	120 38.1	60	23 45.6	-31	213 36.6	- 3 4.8	14 3.0	- 4 9.0
10	149 28.1	60	23 39.4	-34	243 41.1	- 3 4.5	44 7.6	- 4 9.1
12	178 18.0	60	23 32.6	-37	273 45.5	- 3 4.3	74 12.3	- 4 9.2
14	207 8.0	60	23 25.1	-40	303 49.9	- 3 4.1	104 16.9	- 4 9.3
16	235 57.9	60	23 17.0	-43	333 54.4	- 3 3.9	134 21.6	- 4 9.4
18	264 47.9	60	23 8.4	-46	3 58.8	- 3 3.6	164 26.2	- 4 9.5
20	293 38.0	61	22 59.1	-49	34 3.3	- 3 3.4	194 30.8	- 4 9.6
22	322 28.1	61	22 49.2	-52	64 7.7	- 3 3.2	224 35.5	- 4 9.7
Δ					22	1	23	0

φ	SUNCE IZLAZ	SUNCE ZALAZ	TRAJANJE SUMRAKA GRAĐ.	TRAJANJE SUMRAKA ASTR.	MJESEC IZLAZ	MJESEC Δ/24	MJESEC ZALAZ	MJESEC Δ/24
N	h min	h min	h min	h min	h min	min	h min	min
60	9 2	14 54	0 58	2 46	15 2	3.6	9 17	1.4
55	8 23	15 33	0 46	2 18	15 45	3.3	8 33	1.7
50	7 56	16 0	0 39	1 60	16 14	3.1	8 3	1.9
45	7 35	16 21	0 34	1 47	16 37	3.0	7 40	2.0
40	7 18	16 38	0 31	1 38	16 55	2.9	7 22	2.1
35	7 4	16 52	0 28	1 31	17 10	2.8	7 7	2.1
30	6 52	17 5	0 26	1 26	17 23	2.7	6 53	2.2
20	6 30	17 26	0 24	1 19	17 45	2.6	6 30	2.3
10	6 12	17 44	0 23	1 15	18 4	2.5	6 10	2.4
0	5 54	18 2	0 23	1 15	18 22	2.4	5 52	2.4
10	5 37	18 19	0 23	1 18	18 40	2.3	5 33	2.5
20	5 18	18 38	0 25	1 24	18 59	2.2	5 13	2.6
30	4 56	19 1	0 27	1 37	19 22	2.1	4 50	2.6
35	4 43	19 14	0 30	1 47	19 34	2.0	4 36	2.7
40	4 27	19 29	0 33	2 3	19 49	1.9	4 21	2.8
45	4 9	19 47	0 37	2 33	20 7	1.8	4 2	2.8
50	3 47	20 9	0 45	: ::	20 29	1.7	3 38	2.9
55	3 17	20 39	0 58	: ::	20 57	1.4	3 7	3.1
60	2 32	21 24	1 47	: ::	21 38	1.1	2 21	3.3
S								

SUNCE UT	SUNCE $e = T_p - UT$	SUNCE Δ/24	SUNCE r	MJESEC Prolaz	MJESEC Δ/24	MJESEC $\pi_\leftmoon$	MJESEC r
h	min s	s	′	h min	min	′	′
00	2 11.1	-1.2	16.3	$T_{\overline{m}}$	1.0	58.0	15.8
12	1 56.2	$T_{\overline{m}_\odot}$ 11 h 58.1 min		Starost 15.3 d	Faza ○		

PLANETE

Pl.	$T_{\overline{m}}$	π	360−α	Vel.	Pl.	$T_{\overline{m}}$	π	360−α	Vel.
	h min	′	°			h min	′	°	
♀	8 51	.3	138	-4.5	♃	17 44	.0	4	-2.3
♂	12 45	.1	79	1.2	♄	7 4	.0	164	.8

UT	SUNCE $S_\odot$	SUNCE $\delta_\odot$	PROLJ. TAČKA S_Υ	VENERA S_φ	VENERA δ_φ	MARS S_σ	MARS δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	180 25.3	-23 26.3	90 26.3	227 27.7	-13 5.3	168 45.7	-23 56.9
2	210 24.7	-23 26.3	120 31.2	257 28.4	-13 6.3	198 46.5	-23 56.6
4	240 24.1	-23 26.3	150 36.2	287 29.1	-13 7.4	228 47.2	-23 56.3
6	270 23.4	-23 26.2	180 41.1	317 29.8	-13 8.4	258 47.9	-23 56.1
8	300 22.8	-23 26.2	210 46.0	347 30.4	-13 9.4	288 48.7	-23 55.8
10	330 22.2	-23 26.2	240 50.9	17 31.1	-13 10.5	318 49.4	-23 55.5
12	0 21.6	-23 26.2	270 55.9	47 31.7	-13 11.5	348 50.2	-23 55.2
14	30 21.0	-23 26.2	301 .8	77 32.4	-13 12.5	18 50.9	-23 54.9
16	60 20.3	-23 26.2	331 5.7	107 33.0	-13 13.6	48 51.7	-23 54.6
18	90 19.7	-23 26.1	1 10.7	137 33.7	-13 14.6	78 52.4	-23 54.3
20	120 19.1	-23 26.1	31 15.6	167 34.3	-13 15.7	108 53.2	-23 54.0
22	150 18.5	-23 26.1	61 20.5	197 34.9	-13 16.7	138 53.9	-23 53.7
Δ	-3	0		3	-5	4	1

UT	MJESEC $S_\leftmoon$	MJESEC Δ	MJESEC $\delta_\leftmoon$	MJESEC Δ	JUPITER $S_\jupiter$	JUPITER $\delta_\jupiter$	SATURN $S_\saturn$	SATURN $\delta_\saturn$
h	° ′		° ′		° ′	° ′	° ′	° ′
0	351 18.4	61	22 38.8	-55	94 12.2	- 3 2.9	254 40.1	- 4 9.8
2	20 8.7	62	22 27.7	-58	124 16.6	- 3 2.7	284 44.8	- 4 9.9
4	48 59.0	63	22 16.0	-61	154 21.1	- 3 2.5	314 49.4	- 4 10.0
6	77 49.6	63	22 3.8	-64	184 25.5	- 3 2.2	344 54.0	- 4 10.1
8	106 40.2	64	21 51.0	-67	214 29.9	- 3 2.0	14 58.7	- 4 10.2
10	135 30.9	65	21 37.6	-70	244 34.4	- 3 1.8	45 3.3	- 4 10.3
12	164 21.9	65	21 23.7	-72	274 38.8	- 3 1.5	75 8.0	- 4 10.4
14	193 12.9	66	21 9.2	-75	304 43.3	- 3 1.3	105 12.6	- 4 10.5
16	222 4.1	67	20 54.1	-78	334 47.7	- 3 1.1	135 17.3	- 4 10.6
18	250 55.5	68	20 38.5	-81	4 52.1	- 3 .8	165 21.9	- 4 10.7
20	279 47.1	69	20 22.4	-83	34 56.6	- 3 .6	195 26.6	- 4 10.7
22	308 38.8	70	20 5.8	-86	65 1.0	- 3 .4	225 31.2	- 4 10.8
Δ					22	1	23	0

φ	SUNCE IZLAZ	SUNCE ZALAZ	TRAJANJE SUMRAKA GRAĐ.	TRAJANJE SUMRAKA ASTR.	MJESEC IZLAZ	MJESEC Δ/24	MJESEC ZALAZ	MJESEC Δ/24
N	h min	h min	h min	h min	h min	min	h min	min
60	9 2	14 55	0 58	2 46	16 29	4.0	9 50	.9
55	8 24	15 34	0 46	2 18	17 4	3.6	9 14	1.2
50	7 56	16 1	0 39	1 60	17 29	3.3	8 48	1.5
45	7 36	16 22	0 34	1 47	17 48	3.1	8 28	1.6
40	7 19	16 38	0 31	1 38	18 4	3.0	8 11	1.8
35	7 5	16 53	0 28	1 31	18 17	2.9	7 58	1.9
30	6 52	17 5	0 26	1 26	18 28	2.8	7 46	2.0
20	6 31	17 26	0 24	1 19	18 47	2.6	7 25	2.1
10	6 12	17 45	0 23	1 15	19 4	2.5	7 7	2.3
0	5 55	18 2	0 23	1 15	19 20	2.3	6 50	2.4
10	5 37	18 20	0 23	1 18	19 36	2.2	6 33	2.5
20	5 18	18 39	0 25	1 24	19 52	2.0	6 15	2.6
30	4 56	19 1	0 27	1 37	20 11	1.9	5 54	2.8
35	4 43	19 14	0 30	1 47	20 23	1.8	5 41	2.8
40	4 28	19 29	0 33	2 3	20 35	1.6	5 27	3.0
45	4 10	19 47	0 37	2 33	20 50	1.5	5 10	3.1
50	3 47	20 10	0 45	: ::	21 9	1.3	4 49	3.2
55	3 17	20 40	0 58	: ::	21 32	1.1	4 21	3.5
60	2 32	21 25	1 47	: ::	22 4	.7	3 41	3.9
S								

SUNCE UT	SUNCE $e = T_p - UT$	SUNCE Δ/24	SUNCE r	MJESEC Prolaz	MJESEC Δ/24	MJESEC $\pi_\leftmoon$	MJESEC r
h	min s	s	′	h min	min	′	′
00	1 41.4	-1.2	16.3	$T_{\overline{m}}$ 0 36	2.4	58.6	16.0
12	1 26.5	$T_{\overline{m}_\odot}$ 11 h 58.6 min		Starost 16.3 d	Faza ○		

PLANETE

Pl.	$T_{\overline{m}}$	π	360−α	Vel.	Pl.	$T_{\overline{m}}$	π	360−α	Vel.
	h min	′	°			h min	′	°	
♀	8 50	.3	137	-4.5	♃	17 41	.0	4	-2.3
♂	12 45	.1	78	1.2	♄	7 0	.0	164	.8

UT	SUNCE		PROLJ. TAČKA	VENERA		MARS	
	$S_\odot$	$\delta_\odot$	S_Υ	S_φ	δ_φ	S_σ	δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	180 17.9	-23 26.0	91 25.4	227 35.6	-13 17.7	168 54.6	-23 53.4
2	210 17.2	-23 26.0	121 30.4	257 36.2	-13 18.8	198 55.4	-23 53.1
4	240 16.6	-23 25.9	151 35.3	287 36.8	-13 19.8	228 56.1	-23 52.8
6	270 16.0	-23 25.9	181 40.2	317 37.4	-13 20.9	258 56.9	-23 52.5
8	300 15.4	-23 25.8	211 45.1	347 38.0	-13 21.9	288 57.6	-23 52.2
10	330 14.8	-23 25.8	241 50.1	17 38.6	-13 23.0	318 58.4	-23 51.8
12	0 14.1	-23 25.7	271 55.0	47 39.2	-13 24.0	348 59.1	-23 51.5
14	30 13.5	-23 25.7	301 59.9	77 39.8	-13 25.1	18 59.9	-23 51.2
16	60 12.9	-23 25.6	332 4.9	107 40.3	-13 26.2	49 .6	-23 50.9
18	90 12.3	-23 25.5	2 9.8	137 40.9	-13 27.2	79 1.4	-23 50.6
20	120 11.7	-23 25.5	32 14.7	167 41.5	-13 28.3	109 2.1	-23 50.2
22	150 11.0	-23 25.4	62 19.6	197 42.0	-13 29.3	139 2.8	-23 49.9
Δ	-3	0		3	-5	4	2

UT	MJESEC				JUPITER		SATURN	
	$S_\leftmoon$	Δ	$\delta_\leftmoon$	Δ	S_4	δ_4	S_η	δ_η
h	° ′		° ′		° ′	° ′	° ′	° ′
0	337 30.7	71	19 48.6	-88	95 5.4	- 3 .1	255 35.9	- 4 10.9
2	6 22.9	72	19 30.9	-91	125 9.9	- 2 59.9	285 40.5	- 4 11.0
4	35 15.2	73	19 12.7	-93	155 14.3	- 2 59.6	315 45.2	- 4 11.1
6	64 7.7	74	18 54.1	-96	185 18.7	- 2 59.4	345 49.8	- 4 11.2
8	93 .5	75	18 34.9	-98	215 23.1	- 2 59.2	15 54.5	- 4 11.3
10	121 53.5	76	18 15.3	-100	245 27.6	- 2 58.9	45 59.1	- 4 11.4
12	150 46.7	77	17 55.2	-103	275 32.0	- 2 58.7	76 3.8	- 4 11.5
14	179 40.1	78	17 34.7	-105	305 36.4	- 2 58.5	106 8.4	- 4 11.6
16	208 33.7	79	17 13.7	-107	335 40.8	- 2 58.2	136 13.1	- 4 11.7
18	237 27.6	80	16 52.3	-109	5 45.2	- 2 58.0	166 17.7	- 4 11.8
20	266 21.7	82	16 30.4	-111	35 49.7	- 2 57.7	196 22.4	- 4 11.8
22	295 16.0	83	16 8.2	-113	65 54.1	- 2 57.5	226 27.0	- 4 11.9
Δ					22	1	23	0

φ	SUNCE		TRAJANJE SUMRAKA		MJESEC			
	IZLAZ	ZALAZ	GRAĐ.	ASTR.	IZLAZ	Δ/24	ZALAZ	Δ/24
N	h min	h min	h min	h min	h min	min	h min	min
60	9 3	14 55	0 58	2 46	18 5	4.1	10 10	.6
55	8 24	15 34	0 46	2 18	18 30	3.7	9 43	.9
50	7 57	16 1	0 39	1 60	18 49	3.4	9 23	1.2
45	7 36	16 22	0 34	1 47	19 4	3.2	9 7	1.4
40	7 19	16 39	0 31	1 38	19 16	3.0	8 54	1.5
35	7 5	16 53	0 28	1 31	19 26	2.9	8 43	1.7
30	6 53	17 6	0 26	1 26	19 35	2.8	8 33	1.8
20	6 31	17 27	0 24	1 19	19 50	2.6	8 16	2.0
10	6 13	17 45	0 23	1 15	20 3	2.4	8 1	2.1
0	5 55	18 3	0 23	1 15	20 16	2.2	7 47	2.3
10	5 38	18 20	0 23	1 18	20 28	2.1	7 33	2.4
20	5 19	18 39	0 25	1 24	20 41	1.9	7 17	2.6
30	4 57	19 1	0 27	1 37	20 56	1.7	6 60	2.8
35	4 44	19 15	0 30	1 47	21 5	1.6	6 50	2.9
40	4 28	19 30	0 33	2 3	21 15	1.4	6 38	3.0
45	4 10	19 48	0 37	2 33	21 26	1.3	6 24	3.2
50	3 48	20 10	0 45	: ::	21 40	1.1	6 7	3.4
55	3 18	20 40	0 58	: ::	21 57	.8	5 44	3.7
60	2 33	21 25	1 46	: ::	22 20	.5	5 14	4.1
S								

SUNCE				MJESEC			
UT	e = Tp − UT	Δ/24	r	Prolaz	Δ/24	$\pi_\leftmoon$	r
h	min s	s	′	h min	min	′	′
00	1 11.6	-1.2	16.3	$T_{\overline{m}}$ 1 33	2.3	59.0	16.1
12	0 56.7	$T_{\overline{m}_\odot}$ 11 h 59.1 min		Starost 17.3 d	Faza ❍		

PLANETE									
Pl.	$T_{\overline{m}}$	π	360−α	Vel.	Pl.	$T_{\overline{m}}$	π	360−α	Vel.
	h min	′	°			h min	′	°	
♀	8 49	.3	136	-4.5	♃	17 37	.0	4	-2.2
♂	12 44	.1	77	1.2	♄	6 57	.0	164	.8

UT	SUNCE		PROLJ. TAČKA	VENERA		MARS	
	$S_\odot$	$\delta_\odot$	S_Υ	S_φ	δ_φ	S_σ	δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	180 10.4	-23 25.3	92 24.6	227 42.6	-13 30.4	169 3.6	-23 49.6
2	210 9.8	-23 25.2	122 29.5	257 43.2	-13 31.5	199 4.3	-23 49.3
4	240 9.2	-23 25.1	152 34.4	287 43.7	-13 32.5	229 5.1	-23 48.9
6	270 8.6	-23 25.1	182 39.4	317 44.2	-13 33.6	259 5.8	-23 48.6
8	300 7.9	-23 25.0	212 44.3	347 44.8	-13 34.7	289 6.6	-23 48.3
10	330 7.3	-23 24.9	242 49.2	17 45.3	-13 35.7	319 7.3	-23 47.9
12	0 6.7	-23 24.8	272 54.1	47 45.8	-13 36.8	349 8.1	-23 47.6
14	30 6.1	-23 24.7	302 59.1	77 46.4	-13 37.9	19 8.8	-23 47.3
16	60 5.5	-23 24.6	333 4.0	107 46.9	-13 38.9	49 9.5	-23 46.9
18	90 4.8	-23 24.5	3 8.9	137 47.4	-13 40.0	79 10.3	-23 46.6
20	120 4.2	-23 24.4	33 13.9	167 47.9	-13 41.1	109 11.0	-23 46.2
22	150 3.6	-23 24.2	63 18.8	197 48.4	-13 42.2	139 11.8	-23 45.9
Δ	-3	0		3	-5	4	2

UT	MJESEC				JUPITER		SATURN	
	$S_\leftmoon$	Δ	$\delta_\leftmoon$	Δ	S_4	δ_4	S_η	δ_η
h	° ′		° ′		° ′	° ′	° ′	° ′
0	324 10.5	84	15 45.6	-115	95 58.5	- 2 57.2	256 31.7	- 4 12.0
2	353 5.3	85	15 22.5	-117	126 2.9	- 2 57.0	286 36.3	- 4 12.1
4	22 .3	86	14 59.1	-119	156 7.3	- 2 56.8	316 41.0	- 4 12.2
6	50 55.6	87	14 35.4	-121	186 11.8	- 2 56.5	346 45.7	- 4 12.3
8	79 51.1	88	14 11.3	-122	216 16.2	- 2 56.3	16 50.3	- 4 12.4
10	108 46.8	90	13 46.8	-124	246 20.6	- 2 56.0	46 55.0	- 4 12.5
12	137 42.7	91	13 22.0	-125	276 25.0	- 2 55.8	76 59.6	- 4 12.6
14	166 38.8	92	12 56.9	-127	306 29.4	- 2 55.5	107 4.3	- 4 12.6
16	195 35.2	93	12 31.5	-128	336 33.8	- 2 55.3	137 9.0	- 4 12.7
18	224 31.8	94	12 5.8	-130	6 38.2	- 2 55.0	167 13.6	- 4 12.8
20	253 28.5	95	11 39.9	-131	36 42.6	- 2 54.8	197 18.3	- 4 12.9
22	282 25.5	96	11 13.6	-133	66 47.0	- 2 54.6	227 22.9	- 4 13.0
Δ					22	1	23	0

φ	SUNCE		TRAJANJE SUMRAKA		MJESEC			
	IZLAZ	ZALAZ	GRAĐ.	ASTR.	IZLAZ	Δ/24	ZALAZ	Δ/24
N	h min	h min	h min	h min	h min	min	h min	min
60	9 3	14 56	0 58	2 46	19 42	4.0	10 24	.4
55	8 24	15 35	0 46	2 18	19 58	3.6	10 6	.7
50	7 57	16 2	0 39	1 60	20 11	3.4	9 52	1.0
45	7 36	16 23	0 34	1 47	20 20	3.2	9 40	1.2
40	7 20	16 40	0 31	1 38	20 28	3.0	9 31	1.4
35	7 5	16 54	0 28	1 31	20 35	2.9	9 23	1.5
30	6 53	17 6	0 26	1 26	20 41	2.7	9 16	1.6
20	6 32	17 27	0 24	1 19	20 52	2.5	9 3	1.8
10	6 13	17 46	0 23	1 15	21 1	2.3	8 52	2.0
0	5 56	18 3	0 23	1 15	21 9	2.1	8 41	2.2
10	5 38	18 21	0 23	1 18	21 18	2.0	8 31	2.4
20	5 19	18 40	0 25	1 24	21 27	1.8	8 20	2.5
30	4 57	19 2	0 27	1 37	21 37	1.6	8 7	2.8
35	4 44	19 15	0 30	1 47	21 43	1.4	7 59	2.9
40	4 29	19 30	0 33	2 3	21 49	1.3	7 50	3.0
45	4 11	19 48	0 37	2 33	21 57	1.1	7 40	3.2
50	3 48	20 11	0 45	: ::	22 6	.9	7 28	3.4
55	3 18	20 41	0 58	: ::	22 17	.7	7 12	3.7
60	2 34	21 25	1 46	: ::	22 32	.4	6 51	4.0
S								

SUNCE				MJESEC			
UT	e = Tp − UT	Δ/24	r	Prolaz	Δ/24	$\pi_\leftmoon$	r
h	min s	s	′	h min	min	′	′
00	0 41.9	-1.2	16.3	$T_{\overline{m}}$ 2 29	2.2	59.3	16.2
12	0 27.0	$T_{\overline{m}_\odot}$ 11 h 59.6 min		Starost 18.3 d	Faza ❍		

PLANETE									
Pl.	$T_{\overline{m}}$	π	360−α	Vel.	Pl.	$T_{\overline{m}}$	π	360−α	Vel.
	h min	′	°			h min	′	°	
♀	8 49	.3	135	-4.4	♃	17 34	.0	4	-2.2
♂	12 43	.1	77	1.2	♄	6 53	.0	164	.8

25. DECEMBAR 2010. SUBOTA

UT	SUNCE $S_\odot$	SUNCE $\delta_\odot$	PROLJ. TAČKA S_Υ	VENERA S_φ	VENERA δ_φ	MARS S_σ	MARS δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	180 3.0	-23 24.1	93 23.7	227 48.9	-13 43.2	169 12.5	-23 45.5
2	210 2.4	-23 24.0	123 28.6	257 49.4	-13 44.3	199 13.3	-23 45.2
4	240 1.8	-23 23.9	153 33.6	287 49.9	-13 45.4	229 14.0	-23 44.8
6	270 1.1	-23 23.8	183 38.5	317 50.3	-13 46.5	259 14.8	-23 44.5
8	300 .5	-23 23.6	213 43.4	347 50.8	-13 47.6	289 15.5	-23 44.1
10	329 59.9	-23 23.5	243 48.4	17 51.3	-13 48.7	319 16.3	-23 43.8
12	359 59.3	-23 23.4	273 53.3	47 51.8	-13 49.7	349 17.0	-23 43.4
14	29 58.7	-23 23.2	303 58.2	77 52.2	-13 50.8	19 17.7	-23 43.0
16	59 58.0	-23 23.1	334 3.1	107 52.7	-13 51.9	49 18.5	-23 42.7
18	89 57.4	-23 22.9	4 8.1	137 53.1	-13 53.0	79 19.2	-23 42.3
20	119 56.8	-23 22.8	34 13.0	167 53.6	-13 54.1	109 20.0	-23 41.9
22	149 56.2	-23 22.6	64 17.9	197 54.0	-13 55.2	139 20.7	-23 41.6
Δ	-3	1		2	-5	4	2

UT	MJESEC $S_\leftmoon$	MJESEC Δ	MJESEC $\delta_\leftmoon$	MJESEC Δ	JUPITER S_4	JUPITER δ_4	SATURN S_η	SATURN δ_η
h	° ′		° ′		° ′	° ′	° ′	° ′
0	311 22.7	97	10 47.1	-134	96 51.4	- 2 54.3	257 27.6	- 4 13.1
2	340 20.1	98	10 20.4	-135	126 55.8	- 2 54.1	287 32.3	- 4 13.2
4	9 17.7	99	9 53.4	-136	157 .3	- 2 53.8	317 36.9	- 4 13.3
6	38 15.4	100	9 26.2	-137	187 4.7	- 2 53.6	347 41.6	- 4 13.3
8	67 13.4	101	8 58.8	-138	217 9.1	- 2 53.3	17 46.3	- 4 13.4
10	96 11.5	101	8 31.2	-139	247 13.5	- 2 53.1	47 50.9	- 4 13.5
12	125 9.8	102	8 3.4	-140	277 17.9	- 2 52.8	77 55.6	- 4 13.6
14	154 8.3	103	7 35.4	-141	307 22.3	- 2 52.6	108 .3	- 4 13.7
16	183 6.9	104	7 7.3	-141	337 26.7	- 2 52.3	138 4.9	- 4 13.8
18	212 5.6	104	6 39.0	-142	7 31.0	- 2 52.1	168 9.6	- 4 13.8
20	241 4.5	105	6 10.5	-143	37 35.4	- 2 51.8	198 14.3	- 4 13.9
22	270 3.6	106	5 42.0	-143	67 39.8	- 2 51.6	228 18.9	- 4 14.0
Δ					22	1	23	0

φ	SUNCE IZLAZ	SUNCE ZALAZ	TRAJANJE SUMRAKA GRAĐ.	TRAJANJE SUMRAKA ASTR.	MJESEC IZLAZ	MJESEC Δ/24	MJESEC ZALAZ	MJESEC Δ/24
N	h min	h min	h min	h min	h min	min	h min	min
60	9 3	14 57	0 58	2 46	21 18	3.9	10 34	.3
55	8 25	15 36	0 46	2 18	21 26	3.6	10 24	.6
50	7 58	16 3	0 39	1 60	21 32	3.3	10 16	.9
45	7 37	16 23	0 34	1 47	21 36	3.1	10 9	1.1
40	7 20	16 40	0 31	1 38	21 40	3.0	10 3	1.2
35	7 6	16 54	0 28	1 31	21 44	2.8	9 59	1.4
30	6 53	17 7	0 26	1 26	21 47	2.7	9 54	1.5
20	6 32	17 28	0 24	1 19	21 52	2.5	9 47	1.7
10	6 14	17 46	0 23	1 15	21 56	2.3	9 40	1.9
0	5 56	18 4	0 23	1 15	22 0	2.1	9 34	2.1
10	5 39	18 21	0 23	1 18	22 5	1.9	9 27	2.3
20	5 20	18 40	0 25	1 24	22 9	1.7	9 20	2.5
30	4 58	19 2	0 27	1 37	22 14	1.5	9 13	2.7
35	4 45	19 15	0 30	1 47	22 17	1.4	9 8	2.8
40	4 30	19 30	0 33	2 3	22 20	1.2	9 3	3.0
45	4 12	19 48	0 37	2 33	22 24	1.1	8 57	3.2
50	3 49	20 11	0 45	: ::	22 28	.9	8 49	3.4
55	3 19	20 41	0 58	: ::	22 34	.6	8 40	3.6
60	2 34	21 25	1 45	: ::	22 41	.3	8 28	4.0
S								

SUNCE UT	SUNCE $e = T_p - UT$	SUNCE Δ/24	SUNCE r	MJESEC Prolaz	MJESEC Δ/24	MJESEC $\pi_\leftmoon$	MJESEC r
h	min s	s	′	h min	min	′	′
00	0 12.1	-1.2	16.3	$T_{\overline{m}}$ 3 21	2.1	59.5	16.2
12	- 0 2.7	$T_{\overline{m}_\odot}$ 12 h .0 min		Starost 19.3 d	Faza ◑		

PLANETE

Pl.	$T_{\overline{m}}$	π	360−α	Vel.	Pl.	$T_{\overline{m}}$	π	360−α	Vel.
	h min	′	°			h min	′	°	
♀	8 49	.3	134	-4.4	♃	17 30	.0	3	-2.2
♂	12 43	.1	76	1.2	♄	6 49	.0	164	.8

26. DECEMBAR NEDJELJA

UT	SUNCE $S_\odot$	SUNCE $\delta_\odot$	PROLJ. TAČKA S_Υ	VENERA S_φ	VENERA δ_φ	MARS S_σ	MARS δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	179 55.6	-23 22.5	94 22.9	227 54.4	-13 56.3	169 21.5	-23 41.2
2	209 55.0	-23 22.3	124 27.8	257 54.9	-13 57.4	199 22.2	-23 40.8
4	239 54.3	-23 22.2	154 32.7	287 55.3	-13 58.4	229 23.0	-23 40.4
6	269 53.7	-23 22.0	184 37.6	317 55.7	-13 59.5	259 23.7	-23 40.1
8	299 53.1	-23 21.8	214 42.6	347 56.1	-14 .6	289 24.5	-23 39.7
10	329 52.5	-23 21.7	244 47.5	17 56.5	-14 1.7	319 25.2	-23 39.3
12	359 51.9	-23 21.5	274 52.4	47 56.9	-14 2.8	349 26.0	-23 38.9
14	29 51.2	-23 21.3	304 57.3	77 57.3	-14 3.9	19 26.7	-23 38.5
16	59 50.6	-23 21.1	335 2.3	107 57.7	-14 5.0	49 27.4	-23 38.2
18	89 50.0	-23 20.9	5 7.2	137 58.1	-14 6.1	79 28.2	-23 37.8
20	119 49.4	-23 20.7	35 12.1	167 58.5	-14 7.2	109 28.9	-23 37.4
22	149 48.8	-23 20.6	65 17.1	197 58.9	-14 8.3	139 29.7	-23 37.0
Δ	-3	1		2	-5	4	2

UT	MJESEC $S_\leftmoon$	MJESEC Δ	MJESEC $\delta_\leftmoon$	MJESEC Δ	JUPITER S_4	JUPITER δ_4	SATURN S_η	SATURN δ_η
h	° ′		° ′		° ′	° ′	° ′	° ′
0	299 2.7	106	5 13.3	-144	97 44.2	- 2 51.3	258 23.6	- 4 14.1
2	328 2.0	107	4 44.5	-144	127 48.6	- 2 51.0	288 28.3	- 4 14.2
4	357 1.4	107	4 15.7	-145	157 53.0	- 2 50.8	318 32.9	- 4 14.3
6	26 .9	108	3 46.7	-145	187 57.4	- 2 50.5	348 37.6	- 4 14.3
8	55 .5	108	3 17.7	-145	218 1.8	- 2 50.3	18 42.3	- 4 14.4
10	84 .2	109	2 48.6	-146	248 6.2	- 2 50.0	48 47.0	- 4 14.5
12	112 59.9	109	2 19.5	-146	278 10.6	- 2 49.8	78 51.6	- 4 14.6
14	141 59.8	110	1 50.3	-146	308 15.0	- 2 49.5	108 56.3	- 4 14.7
16	170 59.7	110	1 21.1	-146	338 19.3	- 2 49.3	139 1.0	- 4 14.8
18	199 59.6	110	0 51.9	-146	8 23.7	- 2 49.0	169 5.7	- 4 14.8
20	228 59.6	110	0 22.7	-146	38 28.1	- 2 48.8	199 10.3	- 4 14.9
22	257 59.7	110 - 0 6.5		-146	68 32.5	- 2 48.5	229 15.0	- 4 15.0
Δ					22	1	23	0

φ	SUNCE IZLAZ	SUNCE ZALAZ	TRAJANJE SUMRAKA GRAĐ.	TRAJANJE SUMRAKA ASTR.	MJESEC IZLAZ	MJESEC Δ/24	MJESEC ZALAZ	MJESEC Δ/24
N	h min	h min	h min	h min	h min	min	h min	min
60	9 4	14 58	0 58	2 46	22 53	3.9	10 43	.3
55	8 25	15 36	0 46	2 18	22 52	3.6	10 39	.6
50	7 58	16 3	0 38	1 59	22 52	3.3	10 37	.9
45	7 37	16 24	0 34	1 47	22 52	3.1	10 35	1.0
40	7 20	16 41	0 31	1 38	22 51	2.9	10 33	1.2
35	7 6	16 55	0 28	1 31	22 51	2.8	10 32	1.3
30	6 54	17 7	0 26	1 26	22 51	2.7	10 31	1.5
20	6 33	17 28	0 24	1 19	22 51	2.4	10 28	1.7
10	6 14	17 47	0 23	1 15	22 51	2.2	10 26	1.9
0	5 57	18 4	0 23	1 15	22 50	2.1	10 24	2.1
10	5 39	18 22	0 23	1 18	22 50	1.9	10 22	2.3
20	5 20	18 41	0 25	1 24	22 50	1.7	10 20	2.4
30	4 58	19 3	0 27	1 36	22 50	1.5	10 18	2.7
35	4 45	19 16	0 30	1 47	22 49	1.4	10 16	2.8
40	4 30	19 31	0 33	2 3	22 49	1.2	10 14	3.0
45	4 12	19 49	0 37	2 33	22 49	1.1	10 13	3.1
50	3 50	20 11	0 45	: ::	22 49	.9	10 10	3.3
55	3 20	20 41	0 58	: ::	22 49	.6	10 7	3.6
60	2 35	21 25	1 44	: ::	22 48	.3	10 4	3.9
S								

SUNCE UT	SUNCE $e = T_p - UT$	SUNCE Δ/24	SUNCE r	MJESEC Prolaz	MJESEC Δ/24	MJESEC $\pi_\leftmoon$	MJESEC r
h	min s	s	′	h min	min	′	′
00	- 0 17.5	-1.2	16.3	$T_{\overline{m}}$ 4 12	2.1	59.5	16.2
12	- 0 32.4	$T_{\overline{m}_\odot}$ 12 h .5 min		Starost 20.3 d	Faza ◑		

PLANETE

Pl.	$T_{\overline{m}}$	π	360−α	Vel.	Pl.	$T_{\overline{m}}$	π	360−α	Vel.
	h min	′	°			h min	′	°	
♀	8 48	.3	134	-4.4	♃	17 27	.0	3	-2.2
♂	12 42	.1	75	1.2	♄	6 45	.0	164	.8

27. DECEMBAR 2010. PONEDJELJAK

UT	SUNCE		PROLJ. TAČKA	VENERA		MARS	
	$S_\odot$	$\delta_\odot$	S_Υ	S_φ	δ_φ	S_σ	δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	179 48.2	-23 20.4	95 22.0	227 59.3	-14 9.4	169 30.4	-23 36.6
2	209 47.6	-23 20.2	125 26.9	257 59.6	-14 10.5	199 31.2	-23 36.2
4	239 46.9	-23 20.0	155 31.8	288 .0	-14 11.6	229 31.9	-23 35.8
6	269 46.3	-23 19.8	185 36.8	318 .4	-14 12.7	259 32.7	-23 35.4
8	299 45.7	-23 19.5	215 41.7	348 .7	-14 13.8	289 33.4	-23 35.0
10	329 45.1	-23 19.3	245 46.6	18 1.1	-14 14.9	319 34.2	-23 34.6
12	359 44.5	-23 19.1	275 51.6	48 1.4	-14 16.0	349 34.9	-23 34.2
14	29 43.9	-23 18.9	305 56.5	78 1.8	-14 17.1	19 35.7	-23 33.8
16	59 43.3	-23 18.7	336 1.4	108 2.1	-14 18.3	49 36.4	-23 33.4
18	89 42.6	-23 18.5	6 6.3	138 2.4	-14 19.4	79 37.2	-23 33.0
20	119 42.0	-23 18.2	36 11.3	168 2.8	-14 20.5	109 37.9	-23 32.5
22	149 41.4	-23 18.0	66 16.2	198 3.1	-14 21.6	139 38.7	-23 32.1
Δ	-3	1		2	-6	4	2

UT	MJESEC				JUPITER		SATURN	
	$S_\leftmoon$	Δ	$\delta_\leftmoon$	Δ	S_4	δ_4	S_η	δ_η
h	° ′		° ′		° ′	° ′	° ′	° ′
0	286 59.8	111	-0 35.7	-146	98 36.9	-2 48.2	259 19.7	-4 15.1
2	315 59.9	111	-1 4.9	-146	128 41.2	-2 48.0	289 24.4	-4 15.2
4	345 .0	111	-1 34.0	-145	158 45.6	-2 47.7	319 29.0	-4 15.2
6	14 .1	111	-2 3.1	-145	188 50.0	-2 47.5	349 33.7	-4 15.3
8	43 .3	111	-2 32.1	-145	218 54.4	-2 47.2	19 38.4	-4 15.4
10	72 .4	110	-3 1.1	-144	248 58.8	-2 46.9	49 43.1	-4 15.5
12	101 .5	110	-3 29.9	-144	279 3.1	-2 46.7	79 47.8	-4 15.5
14	130 .5	110	-3 58.7	-143	309 7.5	-2 46.4	109 52.4	-4 15.6
16	159 .6	110	-4 27.4	-143	339 11.9	-2 46.2	139 57.1	-4 15.7
18	188 .6	110	-4 55.9	-142	9 16.2	-2 45.9	170 1.8	-4 15.8
20	217 .5	109	-5 24.3	-141	39 20.6	-2 45.6	200 6.5	-4 15.9
22	246 .4	109	-5 52.6	-141	69 25.0	-2 45.4	230 11.2	-4 15.9
Δ					22	1	23	0

φ	SUNCE		TRAJANJE SUMRAKA		MJESEC			
	IZLAZ	ZALAZ	GRAĐ.	ASTR.	IZLAZ	Δ/24	ZALAZ	Δ/24
N	h min	h min	h min	h min	h min	min	h min	min
60	9 4	14 59	0 58	2 46	. . .	.0	10 50	.3
55	8 25	15 37	0 45	2 17	. . .	.0	10 54	.6
50	7 58	16 4	0 38	1 59	. . .	.0	10 57	.9
45	7 37	16 25	0 34	1 47	. . .	.0	11 0	1.1
40	7 21	16 41	0 31	1 38	. . .	.0	11 2	1.2
35	7 7	16 56	0 28	1 31	23 58	2.8	11 4	1.4
30	6 54	17 8	0 26	1 25	23 55	2.7	11 6	1.5
20	6 33	17 29	0 24	1 19	23 49	2.5	11 9	1.7
10	6 15	17 47	0 23	1 15	23 45	2.3	11 11	1.9
0	5 57	18 5	0 23	1 15	23 40	2.1	11 14	2.1
10	5 40	18 22	0 23	1 18	23 35	1.9	11 16	2.3
20	5 21	18 41	0 25	1 24	23 31	1.7	11 19	2.4
30	4 59	19 3	0 27	1 36	23 25	1.5	11 22	2.7
35	4 46	19 16	0 30	1 47	23 22	1.4	11 23	2.8
40	4 31	19 31	0 33	2 3	23 18	1.3	11 25	2.9
45	4 13	19 49	0 37	2 32	23 14	1.1	11 28	3.1
50	3 50	20 11	0 44	: ::	23 9	.9	11 30	3.3
55	3 21	20 41	0 58	: ::	23 4	.7	11 33	3.6
60	2 36	21 25	1 43	: ::	22 56	.4	11 38	3.9
S								

SUNCE				MJESEC			
UT	e = Tp − UT	Δ/24	r	Prolaz	Δ/24	$\pi_\leftmoon$	r
h	min s	s	′	h min	min	′	′
00	- 0 47.1	-1.2	16.3	$T_{\overline{m}}$ 5 2	2.1	59.4	16.2
12	- 1 1.9	$T_{\overline{m}_\odot}$ 12 h	1.0 min	Starost 21.3 d	Faza ◑		

PLANETE									
Pl.	$T_{\overline{m}}$	π	360−α	Vel.	Pl.	$T_{\overline{m}}$	π	360−α	Vel.
	h min	′	°			h min	′	°	
♀	8 48	.3	133	-4.4	♃	17 23	.0	3	-2.2
♂	12 42	.1	74	1.2	♄	6 42	.0	164	.8

28. DECEMBAR UTORAK

UT	SUNCE		PROLJ. TAČKA	VENERA		MARS	
	$S_\odot$	$\delta_\odot$	S_Υ	S_φ	δ_φ	S_σ	δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	179 40.8	-23 17.8	96 21.1	228 3.4	-14 22.7	169 39.4	-23 31.7
2	209 40.2	-23 17.5	126 26.1	258 3.7	-14 23.8	199 40.2	-23 31.3
4	239 39.6	-23 17.3	156 31.0	288 4.0	-14 24.9	229 40.9	-23 30.9
6	269 39.0	-23 17.0	186 35.9	318 4.3	-14 26.0	259 41.7	-23 30.5
8	299 38.3	-23 16.8	216 40.8	348 4.6	-14 27.1	289 42.4	-23 30.0
10	329 37.7	-23 16.6	246 45.8	18 4.9	-14 28.3	319 43.2	-23 29.6
12	359 37.1	-23 16.3	276 50.7	48 5.2	-14 29.4	349 43.9	-23 29.2
14	29 36.5	-23 16.0	306 55.6	78 5.5	-14 30.5	19 44.7	-23 28.8
16	59 35.9	-23 15.8	337 .6	108 5.8	-14 31.6	49 45.4	-23 28.3
18	89 35.3	-23 15.5	7 5.5	138 6.1	-14 32.7	79 46.2	-23 27.9
20	119 34.7	-23 15.3	37 10.4	168 6.3	-14 33.8	109 46.9	-23 27.5
22	149 34.1	-23 15.0	67 15.3	198 6.6	-14 34.9	139 47.6	-23 27.0
Δ	-3	1		1	-6	4	2

UT	MJESEC				JUPITER		SATURN	
	$S_\leftmoon$	Δ	$\delta_\leftmoon$	Δ	S_4	δ_4	S_η	δ_η
h	° ′		° ′		° ′	° ′	° ′	° ′
0	275 .2	109	-6 20.8	-140	99 29.4	-2 45.1	260 15.9	-4 16.0
2	304 .0	108	-6 48.8	-139	129 33.7	-2 44.8	290 20.5	-4 16.1
4	332 59.6	108	-7 16.6	-138	159 38.1	-2 44.6	320 25.2	-4 16.2
6	1 59.2	107	-7 44.2	-137	189 42.5	-2 44.3	350 29.9	-4 16.2
8	30 58.7	107	-8 11.7	-136	219 46.8	-2 44.1	20 34.6	-4 16.3
10	59 58.1	106	-8 39.0	-135	249 51.2	-2 43.8	50 39.3	-4 16.4
12	88 57.4	106	-9 6.1	-134	279 55.5	-2 43.5	80 44.0	-4 16.5
14	117 56.5	105	-9 32.9	-133	309 59.9	-2 43.3	110 48.7	-4 16.5
16	146 55.5	105	-9 59.5	-132	340 4.3	-2 43.0	140 53.3	-4 16.6
18	175 54.4	104	-10 25.9	-131	10 8.6	-2 42.7	170 58.0	-4 16.7
20	204 53.2	103	-10 52.0	-129	40 13.0	-2 42.5	201 2.7	-4 16.8
22	233 51.8	102	-11 17.9	-128	70 17.3	-2 42.2	231 7.4	-4 16.8
Δ					22	1	23	0

φ	SUNCE		TRAJANJE SUMRAKA		MJESEC			
	IZLAZ	ZALAZ	GRAĐ.	ASTR.	IZLAZ	Δ/24	ZALAZ	Δ/24
N	h min	h min	h min	h min	h min	min	h min	min
60	9 4	14 60	0 57	2 46	0 28	3.9	10 58	.4
55	8 25	15 38	0 45	2 17	0 19	3.6	11 10	.7
50	7 58	16 5	0 38	1 59	0 12	3.3	11 19	1.0
45	7 38	16 25	0 34	1 47	0 7	3.1	11 26	1.2
40	7 21	16 42	0 31	1 38	0 2	2.9	11 32	1.3
35	7 7	16 56	0 28	1 31	. . .	.0	11 37	1.5
30	6 55	17 8	0 26	1 25	. . .	.0	11 42	1.6
20	6 34	17 30	0 24	1 19	. . .	.0	11 50	1.8
10	6 15	17 48	0 23	1 15	. . .	.0	11 57	2.0
0	5 58	18 5	0 23	1 15	. . .	.0	12 4	2.1
10	5 40	18 23	0 23	1 18	. . .	.0	12 10	2.3
20	5 21	18 42	0 25	1 24	. . .	.0	12 18	2.5
30	4 59	19 3	0 27	1 36	. . .	.0	12 26	2.7
35	4 47	19 16	0 30	1 47	23 56	1.5	12 31	2.8
40	4 32	19 31	0 33	2 3	23 49	1.4	12 36	2.9
45	4 14	19 49	0 37	2 32	23 41	1.2	12 42	3.1
50	3 51	20 12	0 44	: ::	23 32	1.1	12 50	3.3
55	3 21	20 41	0 58	: ::	23 20	.8	12 59	3.6
60	2 37	21 25	1 42	: ::	23 5	.5	13 12	3.9
S								

SUNCE				MJESEC			
UT	e = Tp − UT	Δ/24	r	Prolaz	Δ/24	$\pi_\leftmoon$	r
h	min s	s	′	h min	min	′	′
00	- 1 16.6	-1.2	16.3	$T_{\overline{m}}$ 5 52	2.1	59.2	16.1
12	- 1 31.3	$T_{\overline{m}_\odot}$ 12 h	1.5 min	Starost 22.3 d	Faza ◑		

PLANETE									
Pl.	$T_{\overline{m}}$	π	360−α	Vel.	Pl.	$T_{\overline{m}}$	π	360−α	Vel.
	h min	′	°			h min	′	°	
♀	8 48	.3	132	-4.4	♃	17 20	.0	3	-2.2
♂	12 41	.1	73	1.2	♄	6 38	.0	164	.8

UT	SUNCE $S_\odot$	SUNCE $\delta_\odot$	PROLJ. TAČKA S_Υ	VENERA S_φ	VENERA δ_φ	MARS S_σ	MARS δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	179 33.5	-23 14.7	97 20.3	228 6.9	-14 36.1	169 48.4	-23 26.6
2	209 32.9	-23 14.4	127 25.2	258 7.1	-14 37.2	199 49.1	-23 26.1
4	239 32.2	-23 14.2	157 30.1	288 7.4	-14 38.3	229 49.9	-23 25.7
6	269 31.6	-23 13.9	187 35.1	318 7.6	-14 39.4	259 50.7	-23 25.2
8	299 31.0	-23 13.6	217 40.0	348 7.9	-14 40.5	289 51.4	-23 24.8
10	329 30.4	-23 13.3	247 44.9	18 8.1	-14 41.7	319 52.2	-23 24.4
12	359 29.8	-23 13.0	277 49.8	48 8.3	-14 42.8	349 52.9	-23 23.9
14	29 29.2	-23 12.7	307 54.8	78 8.6	-14 43.9	19 53.7	-23 23.5
16	59 28.6	-23 12.4	337 59.7	108 8.8	-14 45.0	49 54.4	-23 23.0
18	89 28.0	-23 12.1	8 4.6	138 9.0	-14 46.1	79 55.2	-23 22.5
20	119 27.4	-23 11.8	38 9.6	168 9.2	-14 47.3	109 55.9	-23 22.1
22	149 26.8	-23 11.5	68 14.5	198 9.4	-14 48.4	139 56.7	-23 21.6
Δ	-3	1		1	-6	4	2

UT	MJESEC $S_\leftmoon$	MJESEC Δ	MJESEC $\delta_\leftmoon$	MJESEC Δ	JUPITER $S_\jupiter$	JUPITER $\delta_\jupiter$	SATURN $S_\saturn$	SATURN $\delta_\saturn$
h	° ′		° ′		° ′	° ′	° ′	° ′
0	262 50.3	102	-11 43.5	-127	100 21.7	- 2 41.9	261 12.1	- 4 16.9
2	291 48.6	101	-12 8.9	-125	130 26.1	- 2 41.6	291 16.8	- 4 17.0
4	320 46.8	100	-12 33.9	-124	160 30.4	- 2 41.4	321 21.5	- 4 17.1
6	349 44.8	99	-12 58.7	-122	190 34.8	- 2 41.1	351 26.2	- 4 17.1
8	18 42.7	98	-13 23.2	-121	220 39.1	- 2 40.8	21 30.9	- 4 17.2
10	47 40.3	97	-13 47.3	-119	250 43.5	- 2 40.6	51 35.6	- 4 17.3
12	76 37.8	97	-14 11.1	-117	280 47.8	- 2 40.3	81 40.3	- 4 17.3
14	105 35.2	96	-14 34.6	-116	310 52.2	- 2 40.0	111 45.0	- 4 17.4
16	134 32.3	95	-14 57.7	-114	340 56.5	- 2 39.8	141 49.7	- 4 17.5
18	163 29.2	94	-15 20.5	-112	11 .9	- 2 39.5	171 54.4	- 4 17.6
20	192 26.0	93	-15 42.9	-110	41 5.2	- 2 39.2	201 59.1	- 4 17.6
22	221 22.6	92	-16 5.0	-108	71 9.6	- 2 38.9	232 3.8	- 4 17.7
Δ					22	1	23	0

φ	SUNCE IZLAZ	SUNCE ZALAZ	TRAJANJE SUMRAKA GRAĐ.	TRAJANJE SUMRAKA ASTR.	MJESEC IZLAZ	MJESEC Δ/24	MJESEC ZALAZ	MJESEC Δ/24
N	h min	h min	h min	h min	h min	min	h min	min
60	9 3	15 1	0 57	2 45	2 2	3.9	11 8	.6
55	8 25	15 39	0 45	2 17	1 45	3.6	11 27	.9
50	7 58	16 6	0 38	1 59	1 32	3.3	11 42	1.2
45	7 38	16 26	0 34	1 47	1 22	3.1	11 54	1.3
40	7 21	16 43	0 31	1 37	1 13	2.9	12 4	1.5
35	7 7	16 57	0 28	1 31	1 6	2.8	12 12	1.6
30	6 55	17 9	0 26	1 25	0 59	2.7	12 20	1.7
20	6 34	17 30	0 24	1 19	0 49	2.5	12 33	1.9
10	6 16	17 48	0 23	1 15	0 39	2.3	12 44	2.1
0	5 58	18 6	0 23	1 15	0 30	2.2	12 55	2.2
10	5 41	18 23	0 23	1 18	0 22	2.0	13 6	2.4
20	5 22	18 42	0 25	1 24	0 12	1.8	13 17	2.5
30	5 0	19 4	0 27	1 36	0 2	1.6	13 30	2.7
35	4 47	19 17	0 30	1 47	. . .	.0	13 38	2.8
40	4 32	19 32	0 33	2 3	. . .	.0	13 47	2.9
45	4 14	19 49	0 37	2 32	. . .	.0	13 57	3.1
50	3 52	20 12	0 44	: ::	23 57	1.3	14 9	3.3
55	3 22	20 41	0 57	: ::	23 40	1.0	14 25	3.5
60	2 38	21 25	1 40	: ::	23 16	.7	14 46	3.9
S								

SUNCE UT	SUNCE $e = T_p - UT$	SUNCE Δ/24	SUNCE r	MJESEC Prolaz	MJESEC Δ/24	MJESEC $\pi_\leftmoon$	MJESEC r
h	min s	s	′	h min	min	′	′
00	- 1 46.0	-1.2	16.3	$T_{\overline{m}}$ 6 42	2.2	58.9	16.0
12	- 2 .6	$T_{\overline{m}_\odot}$ 12 h 2.0 min		Starost 23.3 d	Faza ◑		

PLANETE Pl.	$T_{\overline{m}}$	π	360−α	Vel.	Pl.	$T_{\overline{m}}$	π	360−α	Vel.
	h min	′	°			h min	′	°	
♀	8 47	.2	131	-4.4	♃	17 16	.0	3	-2.2
♂	12 40	.1	72	1.2	♄	6 34	.0	164	.7

UT	SUNCE $S_\odot$	SUNCE $\delta_\odot$	PROLJ. TAČKA S_Υ	VENERA S_φ	VENERA δ_φ	MARS S_σ	MARS δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	179 26.2	-23 11.2	98 19.4	228 9.6	-14 49.5	169 57.4	-23 21.2
2	209 25.6	-23 10.9	128 24.3	258 9.8	-14 50.6	199 58.2	-23 20.7
4	239 25.0	-23 10.5	158 29.3	288 10.0	-14 51.7	229 58.9	-23 20.2
6	269 24.4	-23 10.2	188 34.2	318 10.2	-14 52.9	259 59.7	-23 19.8
8	299 23.8	-23 9.9	218 39.1	348 10.4	-14 54.0	290 .4	-23 19.3
10	329 23.2	-23 9.6	248 44.0	18 10.6	-14 55.1	320 1.2	-23 18.8
12	359 22.5	-23 9.2	278 49.0	48 10.8	-14 56.2	350 1.9	-23 18.4
14	29 21.9	-23 8.9	308 53.9	78 10.9	-14 57.4	20 2.7	-23 17.9
16	59 21.3	-23 8.6	338 58.8	108 11.1	-14 58.5	50 3.4	-23 17.4
18	89 20.7	-23 8.2	9 3.8	138 11.3	-14 59.6	80 4.2	-23 16.9
20	119 20.1	-23 7.9	39 8.7	168 11.4	-15 .7	110 4.9	-23 16.5
22	149 19.5	-23 7.5	69 13.6	198 11.6	-15 1.9	140 5.7	-23 16.0
Δ	-3	2		1	-6	4	2

UT	MJESEC $S_\leftmoon$	MJESEC Δ	MJESEC $\delta_\leftmoon$	MJESEC Δ	JUPITER $S_\jupiter$	JUPITER $\delta_\jupiter$	SATURN $S_\saturn$	SATURN $\delta_\saturn$
h	° ′		° ′		° ′	° ′	° ′	° ′
0	250 19.0	91	-16 26.6	-106	101 13.9	- 2 38.7	262 8.5	- 4 17.8
2	279 15.1	90	-16 47.9	-104	131 18.2	- 2 38.4	292 13.2	- 4 17.8
4	308 11.1	89	-17 8.8	-102	161 22.6	- 2 38.1	322 17.9	- 4 17.9
6	337 6.9	88	-17 29.2	-100	191 26.9	- 2 37.8	352 22.6	- 4 18.0
8	6 2.5	87	-17 49.3	-98	221 31.3	- 2 37.6	22 27.3	- 4 18.1
10	34 57.9	86	-18 8.9	-96	251 35.6	- 2 37.3	52 32.0	- 4 18.1
12	63 53.2	85	-18 28.1	-94	281 39.9	- 2 37.0	82 36.7	- 4 18.2
14	92 48.2	84	-18 46.8	-91	311 44.3	- 2 36.7	112 41.4	- 4 18.3
16	121 43.0	83	-19 5.1	-89	341 48.6	- 2 36.5	142 46.1	- 4 18.3
18	150 37.6	82	-19 23.0	-87	11 53.0	- 2 36.2	172 50.8	- 4 18.4
20	179 32.1	81	-19 40.3	-84	41 57.3	- 2 35.9	202 55.5	- 4 18.5
22	208 26.3	80	-19 57.2	-82	72 1.6	- 2 35.6	233 .2	- 4 18.5
Δ					22	1	24	0

φ	SUNCE IZLAZ	SUNCE ZALAZ	TRAJANJE SUMRAKA GRAĐ.	TRAJANJE SUMRAKA ASTR.	MJESEC IZLAZ	MJESEC Δ/24	MJESEC ZALAZ	MJESEC Δ/24
N	h min	h min	h min	h min	h min	min	h min	min
60	9 3	15 2	0 57	2 45	3 37	3.9	11 21	.8
55	8 25	15 40	0 45	2 17	3 10	3.5	11 49	1.2
50	7 59	16 7	0 38	1 59	2 51	3.2	12 10	1.4
45	7 38	16 27	0 34	1 47	2 36	3.0	12 26	1.6
40	7 22	16 44	0 30	1 37	2 24	2.9	12 40	1.7
35	7 8	16 58	0 28	1 31	2 13	2.8	12 51	1.8
30	6 55	17 10	0 26	1 25	2 4	2.7	13 1	1.9
20	6 34	17 31	0 24	1 19	1 48	2.5	13 18	2.1
10	6 16	17 49	0 23	1 15	1 35	2.4	13 34	2.2
0	5 59	18 6	0 22	1 15	1 22	2.2	13 48	2.3
10	5 41	18 24	0 23	1 18	1 10	2.1	14 2	2.4
20	5 23	18 42	0 25	1 24	0 56	2.0	14 17	2.5
30	5 1	19 4	0 27	1 36	0 41	1.8	14 35	2.7
35	4 48	19 17	0 30	1 46	0 33	1.7	14 45	2.8
40	4 33	19 32	0 33	2 2	0 23	1.6	14 57	2.9
45	4 15	19 50	0 37	2 31	0 11	1.5	15 11	3.0
50	3 53	20 12	0 44	: ::	. . .	.0	15 28	3.1
55	3 23	20 41	0 57	: ::	. . .	.0	15 50	3.4
60	2 40	21 25	1 39	: ::	23 33	1.1	16 20	3.7
S								

SUNCE UT	SUNCE $e = T_p - UT$	SUNCE Δ/24	SUNCE r	MJESEC Prolaz	MJESEC Δ/24	MJESEC $\pi_\leftmoon$	MJESEC r
h	min s	s	′	h min	min	′	′
00	- 2 15.1	-1.2	16.3	$T_{\overline{m}}$ 7 35	2.3	58.6	16.0
12	- 2 29.6	$T_{\overline{m}_\odot}$ 12 h 2.5 min		Starost 24.3 d	Faza ◑		

PLANETE Pl.	$T_{\overline{m}}$	π	360−α	Vel.	Pl.	$T_{\overline{m}}$	π	360−α	Vel.
	h min	′	°			h min	′	°	
♀	8 47	.2	130	-4.4	♃	17 13	.0	3	-2.2
♂	12 40	.1	72	1.2	♄	6 30	.0	164	.7

31. DECEMBAR 2010. PETAK

UT	SUNCE $S_\odot$	SUNCE $\delta_\odot$	PROLJ. TAČKA S_Υ	VENERA S_φ	VENERA δ_φ	MARS S_σ	MARS δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	179 18.9	-23 7.2	99 18.5	228 11.8	-15 3.0	170 6.4	-23 15.5
2	209 18.3	-23 6.8	129 23.5	258 11.9	-15 4.1	200 7.2	-23 15.0
4	239 17.7	-23 6.5	159 28.4	288 12.0	-15 5.2	230 8.0	-23 14.5
6	269 17.1	-23 6.1	189 33.3	318 12.2	-15 6.4	260 8.7	-23 14.0
8	299 16.5	-23 5.8	219 38.3	348 12.3	-15 7.5	290 9.5	-23 13.5
10	329 15.9	-23 5.4	249 43.2	18 12.5	-15 8.6	320 10.2	-23 13.1
12	359 15.3	-23 5.0	279 48.1	48 12.6	-15 9.7	350 11.0	-23 12.6
14	29 14.7	-23 4.6	309 53.0	78 12.7	-15 10.9	20 11.7	-23 12.1
16	59 14.1	-23 4.3	339 58.0	108 12.8	-15 12.0	50 12.5	-23 11.6
18	89 13.5	-23 3.9	10 2.9	138 12.9	-15 13.1	80 13.2	-23 11.1
20	119 13.0	-23 3.5	40 7.8	168 13.0	-15 14.2	110 14.0	-23 10.6
22	149 12.4	-23 3.1	70 12.8	198 13.1	-15 15.4	140 14.8	-23 10.1
Δ	-3	2		1	-6	4	2

UT	MJESEC $S_\leftmoon$	MJESEC Δ	MJESEC $\delta_\leftmoon$	MJESEC Δ	JUPITER S_4	JUPITER δ_4	SATURN S_η	SATURN δ_η
h	° ′		° ′		° ′	° ′	° ′	° ′
0	237 20.4	80	-20 13.6	-80	102 6.0	- 2 35.4	263 4.9	- 4 18.6
2	266 14.3	79	-20 29.5	-77	132 10.3	- 2 35.1	293 9.6	- 4 18.7
4	295 8.1	78	-20 45.0	-75	162 14.6	- 2 34.8	323 14.3	- 4 18.7
6	324 1.6	77	-20 59.9	-72	192 18.9	- 2 34.5	353 19.0	- 4 18.8
8	352 55.0	76	-21 14.3	-69	222 23.3	- 2 34.2	23 23.7	- 4 18.9
10	21 48.3	75	-21 28.2	-67	252 27.6	- 2 34.0	53 28.4	- 4 18.9
12	50 41.4	75	-21 41.5	-64	282 31.9	- 2 33.7	83 33.1	- 4 19.0
14	79 34.3	74	-21 54.3	-62	312 36.3	- 2 33.4	113 37.9	- 4 19.1
16	108 27.1	73	-22 6.6	-59	342 40.6	- 2 33.1	143 42.6	- 4 19.1
18	137 19.8	73	-22 18.4	-56	12 44.9	- 2 32.8	173 47.3	- 4 19.2
20	166 12.3	72	-22 29.6	-53	42 49.2	- 2 32.5	203 52.0	- 4 19.3
22	195 4.8	72	-22 40.3	-51	72 53.5	- 2 32.3	233 56.7	- 4 19.3
Δ					22	1	24	0

φ	SUNCE IZLAZ	SUNCE ZALAZ	TRAJANJE SUMRAKA GRAĐ.	TRAJANJE SUMRAKA ASTR.	MJESEC IZLAZ	MJESEC Δ/24	MJESEC ZALAZ	MJESEC Δ/24
N	h min	h min	h min	h min	h min	min	h min	min
60	9 3	15 3	0 57	2 45	5 9	3.5	11 41	1.3
55	8 25	15 41	0 45	2 17	4 34	3.2	12 18	1.6
50	7 59	16 8	0 38	1 59	4 8	3.0	12 44	1.8
45	7 38	16 28	0 34	1 47	3 49	2.9	13 4	1.9
40	7 22	16 44	0 30	1 37	3 33	2.8	13 21	2.0
35	7 8	16 58	0 28	1 31	3 20	2.7	13 35	2.1
30	6 56	17 10	0 26	1 25	3 9	2.6	13 47	2.1
20	6 35	17 31	0 24	1 19	2 49	2.5	14 8	2.2
10	6 16	17 50	0 23	1 15	2 32	2.4	14 26	2.3
0	5 59	18 7	0 22	1 15	2 16	2.3	14 43	2.3
10	5 42	18 24	0 23	1 17	2 1	2.2	14 60	2.4
20	5 23	18 43	0 24	1 24	1 44	2.1	15 18	2.5
30	5 1	19 4	0 27	1 36	1 25	2.0	15 39	2.6
35	4 49	19 17	0 30	1 46	1 14	1.9	15 51	2.6
40	4 34	19 32	0 33	2 2	1 1	1.9	16 5	2.7
45	4 16	19 50	0 37	2 30	0 46	1.7	16 22	2.7
50	3 54	20 12	0 44	: ::	0 28	1.6	16 43	2.8
55	3 25	20 41	0 57	: ::	0 5	1.4	17 10	3.0
60	2 41	21 24	1 37	: ::	23 58	1.7	17 49	3.2
S								

SUNCE UT	SUNCE $e = T_p - UT$	SUNCE Δ/24	SUNCE r	MJESEC Prolaz	MJESEC Δ/24	MJESEC $\pi_\leftmoon$	MJESEC r
h	min s	s	′	h min	min	′	′
00	- 2 44.1	-1.2	16.3	$T_{\overline{m}}$ 8 29	2.4	58.2	15.9
12	- 2 58.4	$T_{\overline{m}_\odot}$ 12 h 3.0 min		Starost 25.3 d	Faza ●		

PLANETE

Pl.	$T_{\overline{m}}$	π	360−α	Vel.	Pl.	$T_{\overline{m}}$	π	360−α	Vel.
	h min	′	°			h min	′	°	
♀	8 47	.2	129	-4.4	♃	17 9	.0	3	-2.2
♂	12 39	.1	71	1.2	♄	6 27	.0	164	.7

1. JANUAR SUBOTA

UT	SUNCE $S_\odot$	SUNCE $\delta_\odot$	PROLJ. TAČKA S_Υ	VENERA S_φ	VENERA δ_φ	MARS S_σ	MARS δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	179 11.8	-23 2.7	100 17.7	228 13.2	-15 16.5	170 15.5	-23 9.6
2	209 11.2	-23 2.3	130 22.6	258 13.3	-15 17.6	200 16.3	-23 9.0
4	239 10.6	-23 1.9	160 27.5	288 13.4	-15 18.7	230 17.0	-23 8.5
6	269 10.0	-23 1.5	190 32.5	318 13.5	-15 19.9	260 17.8	-23 8.0
8	299 9.4	-23 1.1	220 37.4	348 13.6	-15 21.0	290 18.5	-23 7.5
10	329 8.8	-23 .7	250 42.3	18 13.7	-15 22.1	320 19.3	-23 7.0
12	359 8.2	-23 .3	280 47.3	48 13.8	-15 23.3	350 20.1	-23 6.5
14	29 7.6	-22 59.9	310 52.2	78 13.8	-15 24.4	20 20.8	-23 6.0
16	59 7.0	-22 59.5	340 57.1	108 13.9	-15 25.5	50 21.6	-23 5.4
18	89 6.4	-22 59.1	11 2.0	138 13.9	-15 26.6	80 22.3	-23 4.9
20	119 5.8	-22 58.7	41 7.0	168 14.0	-15 27.8	110 23.1	-23 4.4
22	149 5.2	-22 58.2	71 11.9	198 14.1	-15 28.9	140 23.9	-23 3.9
Δ	-3	2		0	-6	4	3

UT	MJESEC $S_\leftmoon$	MJESEC Δ	MJESEC $\delta_\leftmoon$	MJESEC Δ	JUPITER S_4	JUPITER δ_4	SATURN S_η	SATURN δ_η
h	° ′		° ′		° ′	° ′	° ′	° ′
0	223 57.1	71	-22 50.4	-48	102 57.9	- 2 32.0	264 1.4	- 4 19.4
2	252 49.3	71	-22 59.9	-45	133 2.2	- 2 31.7	294 6.1	- 4 19.4
4	281 41.5	70	-23 8.9	-42	163 6.5	- 2 31.4	324 10.9	- 4 19.5
6	310 33.6	70	-23 17.3	-39	193 10.8	- 2 31.1	354 15.6	- 4 19.6
8	339 25.6	70	-23 25.2	-36	223 15.1	- 2 30.8	24 20.3	- 4 19.6
10	8 17.5	70	-23 32.4	-34	253 19.5	- 2 30.6	54 25.0	- 4 19.7
12	37 9.4	69	-23 39.1	-31	283 23.8	- 2 30.3	84 29.7	- 4 19.8
14	66 1.3	69	-23 45.2	-28	313 28.1	- 2 30.0	114 34.4	- 4 19.8
16	94 53.2	69	-23 50.8	-25	343 32.4	- 2 29.7	144 39.2	- 4 19.9
18	123 45.0	69	-23 55.7	-22	13 36.7	- 2 29.4	174 43.9	- 4 19.9
20	152 36.8	69	-24 .1	-19	43 41.0	- 2 29.1	204 48.6	- 4 20.0
22	181 28.7	69	-24 3.9	-16	73 45.3	- 2 28.8	234 53.3	- 4 20.1
Δ					22	1	24	0

φ	SUNCE IZLAZ	SUNCE ZALAZ	TRAJANJE SUMRAKA GRAĐ.	TRAJANJE SUMRAKA ASTR.	MJESEC IZLAZ	MJESEC Δ/24	MJESEC ZALAZ	MJESEC Δ/24
N	h min	h min	h min	h min	h min	min	h min	min
60	9 2	15 5	0 57	2 44	6 34	2.9	12 13	2.0
55	8 25	15 42	0 45	2 17	5 50	2.7	12 57	2.2
50	7 59	16 9	0 38	1 59	5 21	2.6	13 27	2.2
45	7 38	16 29	0 34	1 46	4 58	2.6	13 50	2.2
40	7 22	16 45	0 30	1 37	4 40	2.5	14 9	2.3
35	7 8	16 59	0 28	1 30	4 25	2.5	14 24	2.3
30	6 56	17 11	0 26	1 25	4 12	2.5	14 38	2.3
20	6 35	17 32	0 24	1 18	3 49	2.4	15 1	2.3
10	6 17	17 50	0 23	1 15	3 30	2.4	15 21	2.3
0	5 60	18 7	0 22	1 15	3 12	2.4	15 39	2.4
10	5 42	18 24	0 23	1 17	2 54	2.3	15 58	2.4
20	5 24	18 43	0 24	1 24	2 35	2.3	16 18	2.4
30	5 2	19 5	0 27	1 36	2 13	2.2	16 41	2.4
35	4 49	19 17	0 30	1 46	2 0	2.2	16 54	2.4
40	4 35	19 32	0 33	2 2	1 46	2.1	17 10	2.4
45	4 17	19 50	0 37	2 30	1 28	2.1	17 28	2.4
50	3 55	20 12	0 44	: ::	1 7	2.0	17 51	2.4
55	3 26	20 41	0 57	: ::	0 39	1.9	18 22	2.4
60	2 43	21 24	1 36	: ::	.. ..	.0	19 7	2.4
S								

SUNCE UT	SUNCE $e = T_p - UT$	SUNCE Δ/24	SUNCE r	MJESEC Prolaz	MJESEC Δ/24	MJESEC $\pi_\leftmoon$	MJESEC r
h	min s	s	′	h min	min	′	′
00	- 3 12.8	-1.2	16.3	$T_{\overline{m}}$ 9 26	2.3	57.8	15.7
12	- 3 27.0	$T_{\overline{m}_\odot}$ 12 h 3.5 min		Starost 26.3 d	Faza ●		

PLANETE

Pl.	$T_{\overline{m}}$	π	360−α	Vel.	Pl.	$T_{\overline{m}}$	π	360−α	Vel.
	h min	′	°			h min	′	°	
♀	8 47	.2	128	-4.4	♃	17 6	.0	3	-2.2
♂	12 39	.1	70	1.2	♄	6 23	.0	164	.7

Efemeride

NAUTIČKIH ZVJEZDA

SUREKTASCENZIJE NAUTIČKIH ZVJEZDA

za 1. u mjesecu

R.b.	Ime zvijezde	$360^{\circ}-\alpha$	2010 JAN	FEB	MAR	APR	MAJ	JUN	JUL	AVG	SEP	OKT	NOV	DEC	2011 JAN
		°	′	′	′	′	′	′	′	′	′	′	′	′	′
1	ALPHERATZ	357	46.2	46.3	46.4	46.3	46.2	46.0	45.7	45.5	45.3	45.2	45.2	45.3	45.4
2	CAPH	357	34.1	34.4	34.5	34.5	34.3	33.9	33.5	33.2	32.9	32.8	32.9	33.0	33.2
3	DIPHDA	348	58.4	58.5	58.5	58.5	58.4	58.2	58.0	57.8	57.6	57.5	57.5	57.5	57.6
4	ACHERNAR	335	28.3	28.6	28.8	28.9	28.9	28.7	28.4	28.0	27.7	27.5	27.5	27.6	27.8
5	HAMAL	328	3.5	3.6	3.7	3.8	3.7	3.6	3.4	3.1	2.9	2.7	2.6	2.6	2.6
6	POLARIS	318	46.0	58.5	10.4	19.7	21.5	15.8	4.7	50.1	35.1	23.2	16.2	16.1	23.0
7	MIRFAK	308	43.7	43.8	44.0	44.2	44.2	44.1	43.8	43.5	43.2	42.9	42.7	42.6	42.6
8	ALDEBARAN	290	52.0	52.0	52.1	52.3	52.3	52.3	52.2	51.9	51.7	51.5	51.3	51.1	51.1
9	RIGEL	281	14.2	14.2	14.3	14.4	14.5	14.5	14.4	14.3	14.0	13.8	13.6	13.5	13.4
10	CAPELLA	280	37.7	37.8	37.9	38.1	38.2	38.2	38.1	37.8	37.5	37.2	36.9	36.7	36.6
11	BELLATRIX	278	34.4	34.4	34.5	34.6	34.7	34.7	34.6	34.5	34.2	34.0	33.8	33.6	33.6
12	EL NATH	278	15.4	15.5	15.6	15.7	15.8	15.8	15.7	15.5	15.3	15.0	14.8	14.6	14.5
13	ALNILAM	275	48.6	48.6	48.7	48.8	48.9	48.9	48.9	48.7	48.5	48.3	48.1	47.9	47.8
14	BETELGEUSE	271	3.7	3.7	3.8	3.9	4.0	4.0	3.9	3.8	3.6	3.4	3.1	3.0	2.9
15	CANOPUS	263	56.7	56.8	57.0	57.3	57.5	57.6	57.7	57.5	57.3	57.0	56.7	56.5	56.4
16	SIRIUS	258	35.6	35.6	35.7	35.8	35.9	36.0	36.0	35.9	35.7	35.5	35.2	35.0	34.9
17	ADHARA	255	14.1	14.1	14.2	14.4	14.5	14.6	14.6	14.5	14.3	14.1	13.9	13.7	13.5
18	PROCYON	245	2.0	2.0	2.0	2.1	2.2	2.3	2.3	2.2	2.1	1.9	1.6	1.4	1.2
19	POLLUX	243	30.4	30.3	30.4	30.5	30.6	30.7	30.7	30.6	30.4	30.2	29.9	29.7	29.5
20	AVIOR	234	18.6	18.5	18.6	18.9	19.1	19.4	19.6	19.6	19.5	19.2	18.8	18.5	18.2
21	AL SUHAIL	222	54.0	53.9	53.9	54.0	54.2	54.3	54.4	54.5	54.4	54.2	53.9	53.7	53.4
22	MIAPLACIDUS	221	39.7	39.5	39.6	39.9	40.3	40.7	41.1	41.2	41.2	40.9	40.4	39.8	39.4
23	ALPHARD	217	58.3	58.2	58.1	58.2	58.3	58.4	58.4	58.4	58.4	58.2	58.0	57.8	57.6
24	REGULUS	207	46.0	45.8	45.7	45.7	45.8	45.9	46.0	46.0	46.0	45.8	45.6	45.4	45.2
25	DUBHE	193	54.3	53.9	53.7	53.7	53.9	54.2	54.4	54.6	54.6	54.5	54.2	53.9	53.4
26	DENEBOLA	182	36.1	35.9	35.7	35.7	35.7	35.8	35.9	36.0	36.0	35.9	35.8	35.6	35.4
27	ACRUX	173	12.4	11.9	11.7	11.5	11.6	11.7	11.9	12.2	12.4	12.4	12.2	11.9	11.4
28	GACRUX	172	3.9	3.5	3.3	3.1	3.2	3.3	3.5	3.7	3.8	3.8	3.7	3.4	3.0
29	MINOSA	167	55.1	54.7	54.5	54.3	54.3	54.4	54.6	54.8	55.0	55.0	54.9	54.6	54.2
30	ALIOTH	166	22.8	22.4	22.1	22.0	22.0	22.2	22.4	22.6	22.7	22.8	22.7	22.5	22.2
31	MIZAR	158	55.0	54.6	54.3	54.1	54.1	54.3	54.4	54.7	54.8	54.9	54.9	54.7	54.4
32	SPICA	158	34.0	33.7	33.6	33.4	33.4	33.4	33.4	33.5	33.6	33.6	33.6	33.4	33.2
33	ALKAID	153	0.9	0.6	0.3	0.1	0.1	0.2	0.3	0.5	0.7	0.8	0.8	0.6	0.4
34	MENKENT	148	10.8	10.5	10.2	10.1	10.0	9.9	10.0	10.1	10.2	10.3	10.3	10.1	9.8
35	ARCTURUS	145	58.1	57.9	57.7	57.5	57.4	57.4	57.5	57.6	57.7	57.8	57.8	57.7	57.5
36	RIGEL KENTAURUS	139	55.8	55.3	54.9	54.6	54.4	54.4	54.5	54.8	55.0	55.2	55.2	55.0	54.6
37	KOHAB	137	20.3	19.7	19.1	18.6	18.4	18.6	19.0	19.5	20.2	20.6	20.9	20.8	20.4
38	ALPHECCA	126	13.4	13.1	12.9	12.7	12.6	12.5	12.5	12.6	12.8	12.9	12.9	12.9	12.7
39	DSCHUBBA	119	46.1	45.9	45.6	45.4	45.2	45.1	45.1	45.1	45.3	45.4	45.4	45.4	45.2
40	ANTARES	112	29.7	29.5	29.2	29.0	28.8	28.6	28.6	28.6	28.7	28.9	28.9	28.9	28.8
41	ATRIA	107	34.4	33.9	33.3	32.8	32.3	31.9	31.9	32.0	32.4	32.7	33.0	33.0	32.7
42	SHAULA	96	25.8	25.5	25.3	25.0	24.7	24.5	24.4	24.4	24.5	24.7	24.8	24.8	24.7
43	RASALHAGUE	96	9.1	8.9	8.7	8.5	8.3	8.2	8.1	8.1	8.2	8.4	8.5	8.5	8.4
44	ELTANIN	90	47.9	47.7	47.4	47.1	46.8	46.7	46.6	46.7	46.9	47.1	47.4	47.5	47.5
45	KAUS AUSTRALIS	83	47.6	47.4	47.1	46.9	46.6	46.4	46.2	46.2	46.3	46.4	46.6	46.6	46.5
46	VEGA	80	41.1	41.0	40.8	40.5	40.3	40.1	40.0	40.0	40.1	40.3	40.5	40.6	40.6
47	NUNKI	76	1.8	1.7	1.5	1.2	1.0	0.7	0.6	0.5	0.6	0.7	0.8	0.9	0.9
48	ALTAIR	62	11.0	11.0	10.8	10.6	10.4	10.2	10.0	9.9	10.0	10.1	10.2	10.3	10.3
49	PEACOCK	53	23.6	23.6	23.4	23.0	22.7	22.3	22.0	21.8	21.8	22.0	22.2	22.4	22.5
50	DENEB	49	33.7	33.7	33.6	33.4	33.1	32.8	32.6	32.5	32.5	32.6	32.8	33.0	33.1
51	ENIF	33	49.9	49.9	49.8	49.7	49.5	49.2	49.0	48.8	48.8	48.8	48.9	49.0	49.1
52	AL NA IR	27	47.1	47.1	47.0	46.9	46.6	46.3	46.0	45.8	45.7	45.7	45.9	46.0	46.2
53	FOMALHAUT	15	26.9	26.9	26.9	26.8	26.6	26.4	26.1	25.9	25.8	25.8	25.8	25.9	26.0
54	MARKAB	13	41.0	41.1	41.1	41.0	40.8	40.6	40.3	40.2	40.0	40.0	40.1	40.1	40.2

DEKLINACIJE NAUTIČKIH ZVJEZDA

za 1. u mjesecu

R.b.	Zvijezda–Sazviježđe	δ	2010 JAN	FEB	MAR	APR	MAJ	JUN	JUL	AVG	SEP	OKT	NOV	DEC	2011 JAN
		°	′	′	′	′	′	′	′	′	′	′	′	′	′
1	α Andromedae	+29	9.0	8.9	8.9	8.8	8.8	8.8	8.9	9.0	9.1	9.2	9.3	9.3	9.3
2	β Cassiopeae	+59	12.7	12.6	12.5	12.4	12.3	12.2	12.3	12.4	12.6	12.8	12.9	13.0	13.0
3	β Ceti	−17	55.9	55.9	55.9	55.8	55.7	55.6	55.5	55.4	55.4	55.4	55.5	55.6	55.6
4	α Eridani	−57	11.3	11.3	11.3	11.1	10.9	10.8	10.6	10.6	10.6	10.7	10.8	11.0	11.1
5	α Arietis	+23	30.8	30.8	30.7	30.7	30.6	30.7	30.7	30.8	30.9	31.0	31.0	31.0	31.0
6	α Ursae Minoris	+89	18.8	18.9	18.9	18.8	18.6	18.5	18.4	18.4	18.4	18.5	18.7	18.9	19.1
7	α Persei	+49	54.0	54.1	54.1	54.0	53.9	53.8	53.8	53.8	53.8	53.9	54.0	54.1	54.2
8	α Tauri	+16	31.8	31.8	31.8	31.8	31.8	31.8	31.8	31.9	31.9	31.9	31.9	31.9	31.9
9	β Orionis	− 8	11.4	11.5	11.5	11.5	11.5	11.4	11.3	11.2	11.2	11.2	11.2	11.3	11.4
10	α Aurigae	+46	0.6	0.6	0.7	0.6	0.6	0.5	0.4	0.4	0.4	0.4	0.4	0.5	0.6
11	γ Orionis	+ 6	21.5	21.5	21.5	21.5	21.5	21.5	21.6	21.6	21.7	21.7	21.6	21.6	21.5
12	β Tauri	+28	37.0	37.0	37.0	37.0	37.0	37.0	36.9	36.9	36.9	37.0	37.0	37.0	37.0
13	ε Orionis	− 1	11.7	11.8	11.8	11.8	11.8	11.8	11.7	11.6	11.6	11.6	11.6	11.7	11.8
14	α Orionis	+ 7	24.5	24.5	24.5	24.5	24.5	24.5	24.5	24.6	24.6	24.6	24.6	24.5	24.5
15	α Carinae	−52	42.1	42.3	42.4	42.4	42.3	42.2	42.1	41.9	41.8	41.8	41.8	42.0	42.2
16	α Canis Majoris	−16	43.8	43.9	44.0	44.0	44.0	43.9	43.8	43.7	43.7	43.7	43.7	43.8	44.0
17	ε Canis Majoris	−28	59.2	59.3	59.4	59.4	59.4	59.3	59.2	59.1	59.0	59.0	59.0	59.1	59.3
18	α Canis Minoris	+ 5	11.9	11.8	11.8	11.8	11.8	11.8	11.9	11.9	11.9	11.9	11.8	11.8	11.7
19	β Geminorum	+28	0.0	0.0	0.0	0.1	0.1	0.1	0.0	0.0	60.0	59.9	59.9	59.8	59.8
20	ε Carinae	−59	32.4	32.6	32.8	32.9	32.9	32.9	32.8	32.6	32.5	32.4	32.4	32.5	32.7
21	λ Velorum	−43	28.3	28.5	28.7	28.8	28.8	28.8	28.7	28.6	28.5	28.4	28.4	28.4	28.6
22	β Carinae	−69	45.4	45.6	45.7	45.9	46.0	46.0	45.9	45.8	45.6	45.5	45.4	45.5	45.7
23	α Hydrae	− 8	42.2	42.3	42.4	42.4	42.4	42.4	42.4	42.3	42.3	42.2	42.3	42.4	42.5
24	α Leonis	+11	54.9	54.9	54.8	54.8	54.9	54.9	54.9	54.9	54.9	54.9	54.8	54.7	54.6
25	α Ursae Majoris	+61	41.4	41.5	41.6	41.7	41.8	41.8	41.8	41.7	41.6	41.4	41.2	41.1	41.1
26	β Leonis	+14	30.7	30.7	30.6	30.7	30.7	30.8	30.8	30.8	30.8	30.7	30.6	30.5	30.4
27	α Crucis	−63	9.1	9.2	9.4	9.5	9.7	9.8	9.8	9.8	9.7	9.5	9.4	9.4	9.4
28	γ Crucis	−57	10.0	10.1	10.3	10.4	10.6	10.7	10.7	10.7	10.6	10.4	10.3	10.3	10.3
29	β Crucis	−59	44.4	44.5	44.7	44.9	45.0	45.1	45.2	45.1	45.0	44.9	44.8	44.7	44.7
30	ε Ursae Majoris	+55	53.9	53.9	53.9	54.1	54.2	54.3	54.4	54.3	54.2	54.1	53.9	53.7	53.6
31	ζ Ursae Majoris	+54	52.0	51.9	52.0	52.1	52.2	52.3	52.4	52.4	52.3	52.2	52.0	51.8	51.7
32	α Virginis	−11	12.9	13.0	13.1	13.1	13.1	13.1	13.1	13.1	13.0	13.0	13.0	13.1	13.2
33	η Ursae Majoris	+49	15.4	15.4	15.4	15.5	15.6	15.7	15.8	15.8	15.8	15.6	15.5	15.3	15.2
34	θ Centauri	−36	25.1	25.2	25.3	25.4	25.5	25.5	25.5	25.5	25.5	25.4	25.4	25.3	25.3
35	α Bootis	+19	7.6	7.5	7.5	7.5	7.6	7.6	7.7	7.7	7.7	7.7	7.6	7.4	7.3
36	α Centauri	−60	52.4	52.5	52.6	52.7	52.8	53.0	53.0	53.1	53.0	52.9	52.8	52.7	52.6
37	β Ursae Minoris	+74	6.5	6.4	6.4	6.5	6.7	6.8	6.9	7.0	6.9	6.8	6.6	6.4	6.3
38	α Coronae Borealis	+26	40.7	40.5	40.5	40.5	40.6	40.7	40.8	40.9	40.9	40.9	40.8	40.6	40.5
39	δ Scorpii	−22	39.0	39.1	39.1	39.1	39.2	39.2	39.2	39.2	39.2	39.1	39.1	39.1	39.1
40	α Scorpii	−26	27.2	27.3	27.3	27.3	27.4	27.4	27.4	27.4	27.4	27.4	27.3	27.3	27.3
41	α Trianguli Australi	−69	2.6	2.6	2.5	2.6	2.7	2.8	2.9	3.0	3.1	3.0	2.9	2.8	2.7
42	λ Scorpii	−37	6.6	6.6	6.6	6.6	6.6	6.7	6.7	6.7	6.8	6.8	6.7	6.7	6.6
43	α Ophiuchi	+12	33.1	33.0	32.9	32.9	33.0	33.1	33.2	33.3	33.3	33.3	33.3	33.2	33.1
44	γ Draconis	+51	29.2	29.0	28.9	28.9	29.0	29.1	29.3	29.5	29.6	29.6	29.5	29.4	29.2
45	ε Sagittarii	−34	22.8	22.8	22.7	22.7	22.7	22.7	22.7	22.8	22.8	22.8	22.8	22.7	22.7
46	α Lyrae	+38	47.6	47.4	47.3	47.3	47.4	47.5	47.6	47.8	47.9	47.9	47.9	47.8	47.7
47	σ Sagittarii	−26	17.1	17.0	17.0	17.0	17.0	16.9	16.9	16.9	17.0	17.0	17.0	17.0	16.9
48	α Aquilae	+ 8	53.7	53.6	53.6	53.6	53.6	53.7	53.8	53.9	54.0	54.0	54.0	54.0	53.9
49	α Pavonis	−56	42.3	42.1	42.0	41.9	41.8	41.8	41.8	41.9	42.0	42.1	42.1	42.1	42.0
50	α Cygni	+45	19.1	19.0	18.9	18.8	18.8	18.9	19.0	19.2	19.4	19.5	19.5	19.5	19.4
51	ε Pegasi	+ 9	55.4	55.3	55.2	55.2	55.3	55.4	55.5	55.6	55.7	55.7	55.7	55.7	55.7
52	α Gruis	−46	54.9	54.8	54.7	54.5	54.4	54.3	54.3	54.3	54.4	54.5	54.6	54.6	54.6
53	α Piscis Austrini	−29	34.2	34.2	34.1	34.0	33.9	33.8	33.7	33.7	33.7	33.8	33.8	33.9	33.9
54	α Pegasi	+15	15.7	15.6	15.6	15.6	15.6	15.7	15.8	15.9	16.0	16.1	16.1	16.1	16.0

VREMENA GORNJIH PROLAZA NAUTIČKIH ZVJEZDA

kroz meridijan u Griniču

za 1. u mjesecu

R.b.	Ime zvijezde	2010 JAN		FEB		MAR		APR		MAJ		JUN		JUL		AVG		SEP		OKT		NOV		DEC		2011 JAN	
		h	min	h	min	h	min	h	min	h	min	h	min	h	min	h	min	h	min	h	min	h	min	h	min	h	min
1	ALPHERATZ	17	27	15	25	13	34	11	32	9	34	7	31	5	33	3	31	1	29	23	30	21	28	19	30	17	28
2	CAPH	17	28	15	25	13	35	11	33	9	34	7	32	5	34	3	32	1	30	23	31	21	29	19	31	17	29
3	DIPHDA	18	2	15	60	14	9	12	7	10	9	8	7	6	8	4	6	2	4	0	6	22	3	20	5	18	3
4	ACHERNAR	18	56	16	54	15	3	13	1	11	3	9	1	7	2	5	0	2	58	0	60	22	57	20	59	18	57
5	HAMAL	19	26	17	23	15	33	13	31	11	32	9	30	7	32	5	30	3	28	1	29	23	27	21	29	19	27
6	POLARIS	20	3	18	0	16	8	14	6	12	7	10	5	8	8	6	7	4	5	2	8	0	6	22	8	20	5
7	MIRFAK	20	43	18	41	16	50	14	48	12	50	10	48	8	49	6	47	4	45	2	47	0	44	22	46	20	44
8	ALDEBARAN	21	54	19	52	18	2	15	60	14	1	11	59	10	1	7	59	5	56	3	58	1	56	23	58	21	55
9	RIGEL	22	33	20	31	18	40	16	38	14	40	12	38	10	39	8	37	6	35	4	37	2	34	0	36	22	34
10	CAPELLA	22	35	20	33	18	43	16	40	14	42	12	40	10	42	8	39	6	37	4	39	2	37	0	39	22	36
11	BELLATRIX	22	44	20	41	18	51	16	49	14	50	12	48	10	50	8	48	6	45	4	47	2	45	0	47	22	45
12	EL NATH	22	45	20	43	18	52	16	50	14	52	12	49	10	51	8	49	6	47	4	49	2	46	0	48	22	46
13	ALNILAM	22	55	20	52	19	2	16	60	15	1	12	59	11	1	8	59	6	57	4	58	2	56	0	58	22	56
14	BETELGEUSE	23	14	21	11	19	21	17	19	15	20	13	18	11	20	9	18	7	16	5	17	3	15	1	17	23	15
15	CANOPUS	23	42	21	40	19	49	17	47	15	49	13	47	11	48	9	46	7	44	5	46	3	44	1	45	23	43
16	SIRIUS	0	3	22	1	20	11	18	9	16	10	14	8	12	10	10	8	8	5	6	7	4	5	2	7	0	4
17	ADHARA	0	17	22	15	20	24	18	22	16	24	14	22	12	23	10	21	8	19	6	21	4	18	2	20	0	18
18	PROCYON	0	58	22	55	21	5	19	3	17	5	15	2	13	4	11	2	8	60	7	1	4	59	3	1	0	59
19	POLLUX	1	4	23	2	21	11	19	9	17	11	15	8	13	10	11	8	9	6	7	7	5	5	3	7	1	5
20	AVIOR	1	41	23	38	21	48	19	46	17	47	15	45	13	47	11	45	9	42	7	44	5	42	3	44	1	42
21	AL SUHAIL	2	26	0	24	22	34	20	31	18	33	16	31	14	33	12	30	10	28	8	30	6	28	4	29	2	27
22	MIAPLACIDUS	2	31	0	29	22	39	20	36	18	38	16	36	14	37	12	35	10	33	8	35	6	33	4	34	2	32
23	ALPHARD	2	46	0	44	22	53	20	51	18	53	16	51	14	52	12	50	10	48	8	50	6	47	4	49	2	47
24	REGULUS	3	27	1	25	23	34	21	32	19	34	17	31	15	33	13	31	11	29	9	30	7	28	5	30	3	28
25	DUBHE	4	22	2	20	0	30	22	27	20	29	18	27	16	29	14	26	12	24	10	26	8	24	6	25	4	23
26	DENEBOLA	5	7	3	5	1	15	23	13	21	14	19	12	17	14	15	12	13	9	11	11	9	9	7	11	5	8
27	ACRUX	5	45	3	43	1	52	23	50	21	52	19	50	17	51	15	49	13	47	11	49	9	46	7	48	5	46
28	GACRUX	5	50	3	47	1	57	23	55	21	57	19	54	17	56	15	54	13	52	11	53	9	51	7	53	5	51
29	MINOSA	6	6	4	4	2	14	0	11	22	13	20	11	18	13	16	10	14	8	12	10	10	8	8	9	6	7
30	ALIOTH	6	12	4	10	2	20	0	18	22	19	20	17	18	19	16	16	14	14	12	16	10	14	8	16	6	13
31	MIZAR	6	42	4	40	2	50	0	47	22	49	20	47	18	49	16	46	14	44	12	46	10	44	8	45	6	43
32	SPICA	6	44	4	41	2	51	0	49	22	50	20	48	18	50	16	48	14	46	12	47	10	45	8	47	6	45
33	ALKAID	7	6	5	4	3	13	1	11	23	13	21	10	19	12	17	10	15	8	13	9	11	7	9	9	7	7
34	MENKENT	7	25	5	23	3	33	1	30	23	32	21	30	19	32	17	29	15	27	13	29	11	27	9	28	7	26
35	ARCTURUS	7	34	5	32	3	41	1	39	23	41	21	39	19	40	17	38	15	36	13	38	11	35	9	37	7	35
36	RIGEL KENTAURUS	7	58	5	56	4	6	2	3	0	5	22	3	20	5	18	2	16	0	14	2	11	60	10	1	7	59
37	KOHAB	8	8	6	6	4	16	2	14	0	15	22	13	20	15	18	13	16	10	14	12	12	10	10	12	8	9
38	ALPHECCA	8	53	6	51	5	0	2	58	0	60	22	58	20	59	18	57	16	55	14	57	12	54	10	56	8	54
39	DSCHUBBA	9	19	7	17	5	26	3	24	1	26	23	23	21	25	19	23	17	21	15	22	13	20	11	22	9	20
40	ANTARES	9	48	7	46	5	55	3	53	1	55	23	53	21	54	19	52	17	50	15	52	13	49	11	51	9	49
41	ATRIA	10	8	8	5	6	15	4	13	2	15	0	12	22	14	20	12	18	10	16	11	14	9	12	11	10	9
42	SHAULA	10	52	8	50	6	60	4	57	2	59	0	57	22	59	20	56	18	54	16	56	14	54	12	55	10	53
43	RASALHAGUE	10	53	8	51	7	1	4	58	3	0	0	58	22	60	20	57	18	55	16	57	14	55	12	56	10	54
44	ELTANIN	11	15	9	12	7	22	5	20	3	22	1	19	23	21	21	19	19	17	17	18	15	16	13	18	11	16
45	KAUS AUSTRALIS	11	43	9	40	7	50	5	48	3	50	1	47	23	49	21	47	19	45	17	46	15	44	13	46	11	44
46	VEGA	11	55	9	53	8	2	6	0	4	2	1	60	0	2	21	59	19	57	17	59	15	57	13	58	11	56
47	NUNKI	12	14	10	12	8	21	6	19	4	21	2	18	0	20	22	18	20	16	18	17	16	15	14	17	12	15
48	ALTAIR	13	9	11	7	9	16	7	14	5	16	3	14	1	16	23	13	21	11	19	13	17	11	15	12	13	10
49	PEACOCK	13	44	11	42	9	52	7	49	5	51	3	49	1	51	23	49	21	46	19	48	17	46	15	48	13	45
50	DENEB	13	60	11	57	10	7	8	5	6	7	4	4	2	6	0	4	22	2	20	3	18	1	16	3	14	1
51	ENIF	15	3	13	0	11	10	9	8	7	9	5	7	3	9	1	7	23	5	21	6	19	4	17	6	15	4
52	AL NA IR	15	27	13	24	11	34	9	32	7	34	5	31	3	33	1	31	23	29	21	30	19	28	17	30	15	28
53	FOMALHAUT	16	16	14	14	12	23	10	21	8	23	6	21	4	22	2	20	0	18	22	20	20	18	18	19	16	17
54	MARKAB	16	23	14	21	12	30	10	28	8	30	6	28	4	30	2	27	0	25	22	27	20	25	18	26	16	24

POPRAVKA ZA DATUM

uvijek se oduzima

1.	2.	3.	4.	5.	6.	7.	8.	9.	10.	11.	12.	13.	14.	15.	16.	17.	18.	19.	20.	21.	22.	23.	24.	25.	26.	27.	28.	29.	30.	31.
h min	h min	h min	h min	h min	h min	h min	h min	h min	h min	h min	h min	h min	h min	h min	h min	h min	h min	h min	h min	h min	h min	h min	h min	h min	h min	h min	h min	h min	h min	h min
0 00	0 04	0 08	0 12	0 16	0 20	0 24	0 28	0 31	0 35	0 39	0 43	0 47	0 51	0 55	0 59	1 03	1 07	1 11	1 15	1 19	1 23	1 27	1 30	1 34	1 38	1 42	1 46	1 50	1 54	1 58

⋆ ★ ★ ★ ⋆

Tablice

ZA

ODREĐIVANJE GEOGRAFSKE ŠIRINE

POMOĆU VISINE I AZIMUTA SJEVERNJAČE

TABLICA I

S♈	Popravka
°	′
0	-31.6
1	-32.0
2	-32.5
3	-32.9
4	-33.3
5	-33.8
6	-34.2
7	-34.6
8	-35.0
9	-35.3
10	-35.7
11	-36.1
12	-36.4
13	-36.7
14	-37.1
15	-37.4
16	-37.7
17	-38.0
18	-38.2
19	-38.5
20	-38.8
21	-39.0
22	-39.2
23	-39.5
24	-39.7
25	-39.9
26	-40.0
27	-40.2
28	-40.4
29	-40.5
30	-40.6
31	-40.8
32	-40.9
33	-41.0
34	-41.1
35	-41.1
36	-41.2
37	-41.2
38	-41.3
39	-41.3
40	-41.3
41	-41.3
42	-41.3
43	-41.2
44	-41.2
45	-41.2
46	-41.1
47	-41.0
48	-40.9
49	-40.8
50	-40.7
51	-40.6
52	-40.4
53	-40.3
54	-40.1
55	-39.9
56	-39.7
57	-39.5
58	-39.3
59	-39.1
60	-38.9

S♈	Popravka
°	′
60	-38.9
61	-38.6
62	-38.3
63	-38.1
64	-37.8
65	-37.5
66	-37.2
67	-36.9
68	-36.5
69	-36.2
70	-35.8
71	-35.5
72	-35.1
73	-34.7
74	-34.3
75	-33.9
76	-33.5
77	-33.1
78	-32.6
79	-32.2
80	-31.7
81	-31.3
82	-30.8
83	-30.3
84	-29.8
85	-29.3
86	-28.8
87	-28.3
88	-27.7
89	-27.2
90	-26.6
91	-26.1
92	-25.5
93	-25.0
94	-24.4
95	-23.8
96	-23.2
97	-22.6
98	-22.0
99	-21.4
100	-20.8
101	-20.1
102	-19.5
103	-18.9
104	-18.2
105	-17.6
106	-16.9
107	-16.3
108	-15.6
109	-14.9
110	-14.2
111	-13.6
112	-12.9
113	-12.2
114	-11.5
115	-10.8
116	-10.1
117	- 9.4
118	- 8.7
119	- 8.0
120	- 7.3

S♈	Popravka
°	′
120	-7.3
121	-6.6
122	-5.9
123	-5.2
124	-4.4
125	-3.7
126	-3.0
127	-2.3
128	-1.6
129	-0.9
130	-0.1
131	0.6
132	1.3
133	2.0
134	2.8
135	3.5
136	4.2
137	4.9
138	5.6
139	6.3
140	7.0
141	7.8
142	8.5
143	9.2
144	9.9
145	10.6
146	11.3
147	12.0
148	12.6
149	13.3
150	14.0
151	14.7
152	15.4
153	16.0
154	16.7
155	17.3
156	18.0
157	18.6
158	19.3
159	19.9
160	20.5
161	21.2
162	21.8
163	22.4
164	23.0
165	23.6
166	24.2
167	24.8
168	25.3
169	25.9
170	26.4
171	27.0
172	27.5
173	28.1
174	28.6
175	29.1
176	29.6
177	30.1
178	30.6
179	31.1
180	31.6

S♈	Popravka
°	′
180	31.6
181	32.0
182	32.5
183	32.9
184	33.3
185	33.8
186	34.2
187	34.6
188	35.0
189	35.3
190	35.7
191	36.1
192	36.4
193	36.7
194	37.1
195	37.4
196	37.7
197	38.0
198	38.2
199	38.5
200	38.8
201	39.0
202	39.2
203	39.5
204	39.7
205	39.9
206	40.0
207	40.2
208	40.4
209	40.5
210	40.6
211	40.8
212	40.9
213	41.0
214	41.1
215	41.1
216	41.2
217	41.2
218	41.3
219	41.3
220	41.3
221	41.3
222	41.3
223	41.2
224	41.2
225	41.2
226	41.1
227	41.0
228	40.9
229	40.8
230	40.7
231	40.6
232	40.4
233	40.3
234	40.1
235	39.9
236	39.7
237	39.5
238	39.3
239	39.1
240	38.9

S♈	Popravka
°	′
240	38.9
241	38.6
242	38.3
243	38.1
244	37.8
245	37.5
246	37.2
247	36.9
248	36.5
249	36.2
250	35.8
251	35.5
252	35.1
253	34.7
254	34.3
255	33.9
256	33.5
257	33.1
258	32.6
259	32.2
260	31.7
261	31.3
262	30.8
263	30.3
264	29.8
265	29.3
266	28.8
267	28.3
268	27.7
269	27.2
270	26.6
271	26.1
272	25.5
273	25.0
274	24.4
275	23.8
276	23.2
277	22.6
278	22.0
279	21.4
280	20.8
281	20.1
282	19.5
283	18.9
284	18.2
285	17.6
286	16.9
287	16.3
288	15.6
289	14.9
290	14.2
291	13.6
292	12.9
293	12.2
294	11.5
295	10.8
296	10.1
297	9.4
298	8.7
299	8.0
300	7.3

S♈	Popravka
°	′
300	7.3
301	6.6
302	5.9
303	5.2
304	4.4
305	3.7
306	3.0
307	2.3
308	1.6
309	0.9
310	0.1
311	- 0.6
312	- 1.3
313	- 2.0
314	- 2.8
315	- 3.5
316	- 4.2
317	- 4.9
318	- 5.6
319	- 6.3
320	- 7.0
321	- 7.8
322	- 8.5
323	- 9.2
324	- 9.9
325	-10.6
326	-11.3
327	-12.0
328	-12.6
329	-13.3
330	-14.0
331	-14.7
332	-15.4
333	-16.0
334	-16.7
335	-17.3
336	-18.0
337	-18.6
338	-19.3
339	-19.9
340	-20.5
341	-21.2
342	-21.8
343	-22.4
344	-23.0
345	-23.6
346	-24.2
347	-24.8
348	-25.3
349	-25.9
350	-26.4
351	-27.0
352	-27.5
353	-28.1
354	-28.6
355	-29.1
356	-29.6
357	-30.1
358	-30.6
359	-31.1
360	-31.6

TABLICA II

Sϒ \ φ		0°	10°	15°	20°	25°	30°	35°	40°	45°	50°	55°	60°	62°	64°	66°	φ \ Sϒ	
h	°	′	′	′	′	′	′	′	′	′	′	′	′	′	′	′	°	h
1	15	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1	15	1
2	30	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	30	2
3	45	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	45	3
4	60	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	60	4
5	75	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.2	75	5
6	90	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.2	0.3	0.3	0.3	90	6
7	105	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.2	0.2	0.2	0.3	0.4	0.4	0.4	105	7
8	120	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.2	0.2	0.2	0.3	0.3	0.4	0.5	0.5	120	8
9	135	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.2	0.2	0.2	0.3	0.4	0.5	0.5	0.6	135	9
10	150	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.2	0.2	0.2	0.3	0.3	0.4	0.5	0.5	150	10
11	165	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.2	0.2	0.2	0.3	0.4	0.4	165	11
12	180	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.2	0.2	0.2	180	12
13	195	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1	195	13
14	210	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	210	14
15	225	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	225	15
16	240	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	240	16
17	255	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.2	255	17
18	270	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.2	0.3	0.3	0.3	270	18
19	285	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.2	0.2	0.2	0.3	0.4	0.4	0.4	285	19
20	300	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.2	0.2	0.2	0.3	0.3	0.4	0.5	0.5	300	20
21	315	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.2	0.2	0.2	0.3	0.4	0.5	0.5	0.6	315	21
22	330	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.2	0.2	0.2	0.3	0.3	0.4	0.5	0.5	330	22
23	345	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.2	0.2	0.2	0.3	0.4	0.4	345	23
24	360	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.2	0.2	0.2	360	24

TABLICA III

Sϒ \ Datum		2010 1. JAN	1. FEB	1. MAR	1. APR	1. MAJ	1. JUN	1. JUL	1. AVG	1. SEP	1. OKT	1. NOV	1. DEC	2011 1. JAN	Datum \ Sϒ	
h	°	′	′	′	′	′	′	′	′	′	′	′	′	′	°	h
1	15	-.1	-.2	-.2	-.1	.0	.1	.2	.3	.3	.2	.0	-.1	-.3	15	1
2	30	-.1	-.2	-.2	-.1	.1	.2	.3	.3	.3	.2	.0	-.2	-.4	30	2
3	45	-.1	-.2	-.2	-.1	.1	.2	.3	.3	.3	.2	.0	-.2	-.4	45	3
4	60	-.1	-.2	-.2	-.1	.1	.2	.3	.3	.3	.2	.0	-.2	-.4	60	4
5	75	-.1	-.2	-.1	.0	.1	.2	.3	.3	.2	.1	-.1	-.2	-.4	75	5
6	90	-.1	-.1	-.1	.0	.1	.2	.2	.2	.2	.1	-.1	-.2	-.3	90	6
7	105	-.1	-.1	.0	.0	.1	.2	.2	.1	.1	.0	-.1	-.2	-.2	105	7
8	120	.0	.0	.0	.1	.1	.1	.1	.1	.0	.0	-.1	-.1	-.2	120	8
9	135	.0	.0	.1	.1	.1	.1	.0	.0	-.1	-.1	-.1	-.1	-.1	135	9
10	150	.0	.1	.1	.1	.1	.0	-.1	-.1	-.1	-.1	-.1	.0	.1	150	10
11	165	.0	.1	.2	.1	.0	.0	-.1	-.2	-.2	-.2	-.1	.0	.2	165	11
12	180	.1	.2	.2	.1	.0	-.1	-.2	-.2	-.3	-.2	-.1	.1	.2	180	12
13	195	.1	.2	.2	.1	.0	-.1	-.2	-.3	-.3	-.2	.0	.1	.3	195	13
14	210	.1	.2	.2	.1	-.1	-.2	-.3	-.3	-.3	-.2	.0	.2	.4	210	14
15	225	.1	.2	.2	.1	-.1	-.2	-.3	-.3	-.3	-.2	.0	.2	.4	225	15
16	240	.1	.2	.2	.1	-.1	-.2	-.3	-.3	-.3	-.2	.0	.2	.4	240	16
17	255	.1	.2	.1	.0	-.1	-.2	-.3	-.3	-.2	-.1	.1	.2	.4	255	17
18	270	.1	.1	.1	.0	-.1	-.2	-.2	-.2	-.2	-.1	.1	.2	.3	270	18
19	285	.1	.1	.0	.0	-.1	-.2	-.2	-.1	-.1	.0	.1	.2	.2	285	19
20	300	.0	.0	.0	-.1	-.1	-.1	-.1	-.1	.0	.0	.1	.1	.2	300	20
21	315	.0	.0	-.1	-.1	-.1	-.1	.0	.0	.1	.1	.1	.1	.1	315	21
22	330	.0	-.1	-.1	-.1	-.1	.0	.1	.1	.1	.1	.1	.0	-.1	330	22
23	345	.0	-.1	-.2	-.1	.0	.0	.1	.2	.2	.2	.1	.0	-.2	345	23
24	360	-.1	-.2	-.2	-.1	.0	.1	.2	.2	.3	.2	.1	-.1	-.2	360	24

AZIMUTI SJEVERNJAČE

$s\gamma$ \ φ	0°	30°	40°	50°	55°	60°	65°	70°	75°	$+\varphi = \nu$
°	°	°	°	°	°	°	°	°	°	°
0	0.5	0.6	0.6	0.8	0.8	1.0	1.2	1.4	1.9	0
15	0.3	0.4	0.4	0.5	0.6	0.7	0.8	1.0	1.3	15
30	0.1	0.2	0.2	0.2	0.2	0.3	0.3	0.4	0.6	30
45	360.0	359.9	359.9	359.9	359.9	359.9	359.9	359.9	359.8	45
60	359.8	359.7	359.7	359.6	359.6	359.5	359.4	359.3	359.1	60
75	359.6	359.5	359.5	359.4	359.3	359.2	359.0	358.8	358.4	75
90	359.5	359.4	359.3	359.1	359.0	358.9	358.7	358.4	357.8	90
105	359.3	359.2	359.1	359.0	358.9	358.7	358.4	358.1	357.4	105
120	359.3	359.2	359.1	358.9	358.8	358.6	358.3	357.9	357.2	120
135	359.3	359.2	359.1	358.9	358.7	358.6	358.3	357.9	357.2	135
150	359.3	359.2	359.1	358.9	358.8	358.6	358.4	358.0	357.4	150
165	359.4	359.3	359.2	359.1	359.0	358.8	358.6	358.3	357.7	165
180	359.5	359.5	359.4	359.3	359.2	359.1	358.9	358.6	358.2	180
195	359.7	359.6	359.6	359.5	359.5	359.4	359.3	359.1	358.8	195
210	359.9	359.8	359.8	359.8	359.8	359.7	359.7	359.6	359.5	210
225	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2	225
240	0.2	0.3	0.3	0.4	0.4	0.5	0.5	0.7	0.9	240
255	0.4	0.5	0.5	0.6	0.7	0.8	0.9	1.1	1.5	255
270	0.5	0.6	0.7	0.8	0.9	1.1	1.3	1.6	2.0	270
285	0.7	0.7	0.8	1.0	1.1	1.3	1.5	1.9	2.5	285
300	0.7	0.8	0.9	1.1	1.2	1.4	1.7	2.1	2.7	300
315	0.7	0.8	0.9	1.1	1.3	1.4	1.7	2.1	2.8	315
330	0.7	0.8	0.9	1.1	1.2	1.4	1.6	2.0	2.7	330
345	0.6	0.7	0.8	0.9	1.1	1.2	1.4	1.8	2.4	345
360	0.5	0.6	0.6	0.8	0.8	1.0	1.2	1.4	1.9	360

O B J A Š NJ E NJ E

Poslednja rubrika daje podatak, koji algebarski zbrojen sa geografskom širinom zbirne pozicije broda daje približnu visinu sa tačnošću od nekoliko lučnih minuta radi njenog prethodnog postavljanja na sekstant u cilju olakšanja rada pri mjerenju visine Sjevernjače.

⋆ ★ ★ ★ ⋆

$I_n$terpolacione

I

POMOĆNE TABLICE

INTERPOLACIONA TABLICA

za izračunavanje trenutaka izlaza i zalaza Sunca i Mjeseca

za $\varphi = 0^\circ$ do $\pm 30^\circ$										za $\varphi = 0^\circ$ do $\pm 30^\circ$									
$\Delta\varphi$ / Δt_s	1°	2°	3°	4°	5°	6°	7°	8°	9°	0°.1	0°.2	0°.3	0°.4	0°.5	0°.6	0°.7	0°.8	0°.9	$\Delta\varphi$ / Δt_s
1	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1	1
2	0.2	0.4	0.6	0.8	1.0	1.2	1.4	1.6	1.8	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.2	0.2	2
3	0.3	0.6	0.9	1.2	1.5	1.8	2.1	2.4	2.7	0.0	0.1	0.1	0.1	0.2	0.2	0.2	0.2	0.3	3
4	0.4	0.8	1.2	1.6	2.0	2.4	2.8	3.2	3.6	0.0	0.1	0.1	0.2	0.2	0.2	0.3	0.3	0.4	4
5	0.5	1.0	1.5	2.0	2.5	3.0	3.5	4.0	4.5	0.1	0.1	0.2	0.2	0.3	0.3	0.4	0.4	0.5	5
6	0.6	1.2	1.8	2.4	3.0	3.6	4.2	4.8	5.4	0.1	0.1	0.2	0.2	0.3	0.4	0.4	0.5	0.5	6
7	0.7	1.4	2.1	2.8	3.5	4.2	4.9	5.6	6.3	0.1	0.1	0.2	0.3	0.4	0.4	0.5	0.6	0.6	7
8	0.8	1.6	2.4	3.2	4.0	4.8	5.6	6.4	7.2	0.1	0.2	0.2	0.3	0.4	0.5	0.6	0.6	0.7	8
9	0.9	1.8	2.7	3.6	4.5	5.4	6.3	7.2	8.1	0.1	0.2	0.3	0.4	0.5	0.5	0.6	0.7	0.8	9
10	1.0	2.0	3.0	4.0	5.0	6.0	7.0	8.0	9.0	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9	10
11	1.1	2.2	3.3	4.4	5.5	6.6	7.7	8.8	9.9	0.1	0.2	0.3	0.4	0.6	0.7	0.8	0.9	1.0	11
12	1.2	2.4	3.6	4.8	6.0	7.2	8.4	9.6	10.8	0.1	0.2	0.4	0.5	0.6	0.7	0.8	1.0	1.1	12
13	1.3	2.6	3.9	5.2	6.5	7.8	9.1	10.4	11.7	0.1	0.3	0.4	0.5	0.7	0.8	0.9	1.0	1.2	13
14	1.4	2.8	4.2	5.6	7.0	8.4	9.8	11.2	12.6	0.1	0.3	0.4	0.6	0.7	0.8	1.0	1.1	1.3	14
15	1.5	3.0	4.5	6.0	7.5	9.0	10.5	12.0	13.5	0.2	0.3	0.5	0.6	0.8	0.9	1.1	1.2	1.4	15
16	1.6	3.2	4.8	6.4	8.0	9.6	11.2	12.8	14.4	0.2	0.3	0.5	0.6	0.8	1.0	1.1	1.3	1.4	16
17	1.7	3.4	5.1	6.8	8.5	10.2	11.9	13.6	15.3	0.2	0.3	0.5	0.7	0.9	1.0	1.2	1.4	1.5	17
18	1.8	3.6	5.4	7.2	9.0	10.8	12.6	14.4	16.2	0.2	0.4	0.5	0.7	0.9	1.1	1.3	1.4	1.6	18
19	1.9	3.8	5.7	7.6	9.5	11.4	13.3	15.2	17.1	0.2	0.4	0.6	0.8	1.0	1.1	1.3	1.5	1.7	19
20	2.0	4.0	6.0	8.0	10.0	12.0	14.0	16.0	18.0	0.2	0.4	0.6	0.8	1.0	1.2	1.4	1.6	1.8	20
21	2.1	4.2	6.3	8.4	10.5	12.6	14.7	16.8	18.9	0.2	0.4	0.6	0.8	1.1	1.3	1.5	1.7	1.9	21
22	2.2	4.4	6.6	8.8	11.0	13.2	15.4	17.6	19.8	0.2	0.4	0.7	0.9	1.1	1.3	1.5	1.8	2.0	22
23	2.3	4.6	6.9	9.2	11.5	13.8	16.1	18.4	20.7	0.2	0.5	0.7	0.9	1.2	1.4	1.6	1.8	2.1	23
24	2.4	4.8	7.2	9.6	12.0	14.4	16.8	19.2	21.6	0.2	0.5	0.7	1.0	1.2	1.4	1.7	1.9	2.2	24
25	2.5	5.0	7.5	10.0	12.5	15.0	17.5	20.0	22.5	0.3	0.5	0.8	1.0	1.3	1.5	1.8	2.0	2.3	25
26	2.6	5.2	7.8	10.4	13.0	15.6	18.2	20.8	23.4	0.3	0.5	0.8	1.0	1.3	1.6	1.8	2.1	2.3	26
27	2.7	5.4	8.1	10.8	13.5	16.2	18.9	21.6	24.3	0.3	0.5	0.8	1.1	1.4	1.6	1.9	2.2	2.4	27
28	2.8	5.6	8.4	11.2	14.0	16.8	19.6	22.4	25.2	0.3	0.6	0.8	1.1	1.4	1.7	2.0	2.2	2.5	28
29	2.9	5.8	8.7	11.6	14.5	17.4	20.3	23.2	26.1	0.3	0.6	0.9	1.2	1.5	1.7	2.0	2.3	2.6	29
30	3.0	6.0	9.0	12.0	15.0	18.0	21.0	24.0	27.0	0.3	0.6	0.9	1.2	1.5	1.8	2.1	2.4	2.7	30
31	3.1	6.2	9.3	12.4	15.5	18.6	21.7	24.8	27.9	0.3	0.6	0.9	1.2	1.6	1.9	2.2	2.5	2.8	31
32	3.2	6.4	9.6	12.8	16.0	19.2	22.4	25.6	28.8	0.3	0.6	1.0	1.3	1.6	1.9	2.2	2.6	2.9	32
33	3.3	6.6	9.9	13.2	16.5	19.8	23.1	26.4	29.7	0.3	0.7	1.0	1.3	1.7	2.0	2.3	2.6	3.0	33
34	3.4	6.8	10.2	13.6	17.0	20.4	23.8	27.2	30.6	0.3	0.7	1.0	1.4	1.7	2.0	2.4	2.7	3.1	34
35	3.5	7.0	10.5	14.0	17.5	21.0	24.5	28.0	31.5	0.4	0.7	1.1	1.4	1.8	2.1	2.5	2.8	3.2	35
36	3.6	7.2	10.8	14.4	18.0	21.6	25.2	28.8	32.4	0.4	0.7	1.1	1.4	1.8	2.2	2.5	2.9	3.2	36
37	3.7	7.4	11.1	14.8	18.5	22.2	25.9	29.6	33.3	0.4	0.7	1.1	1.5	1.9	2.2	2.6	3.0	3.3	37
38	3.8	7.6	11.4	15.2	19.0	22.8	26.6	30.4	34.2	0.4	0.8	1.1	1.5	1.9	2.3	2.7	3.0	3.4	38
39	3.9	7.8	11.7	15.6	19.5	23.4	27.3	31.2	35.1	0.4	0.8	1.2	1.6	2.0	2.3	2.7	3.1	3.5	39
40	4.0	8.0	12.0	16.0	20.0	24.0	28.0	32.0	36.0	0.4	0.8	1.2	1.6	2.0	2.4	2.8	3.2	3.6	40
41	4.1	8.2	12.3	16.4	20.5	24.6	28.7	32.8	36.9	0.4	0.8	1.2	1.6	2.1	2.5	2.9	3.3	3.7	41
42	4.2	8.4	12.6	16.8	21.0	25.2	29.4	33.6	37.8	0.4	0.8	1.3	1.7	2.1	2.5	2.9	3.4	3.8	42
43	4.3	8.6	12.9	17.2	21.5	25.8	30.1	34.4	38.7	0.4	0.9	1.3	1.7	2.2	2.6	3.0	3.4	3.9	43
44	4.4	8.8	13.2	17.6	22.0	26.4	30.8	35.2	39.6	0.4	0.9	1.3	1.8	2.2	2.6	3.1	3.5	4.0	44
45	4.5	9.0	13.5	18.0	22.5	27.0	31.5	36.0	40.5	0.5	0.9	1.4	1.8	2.3	2.7	3.2	3.6	4.1	45
46	4.6	9.2	13.8	18.4	23.0	27.6	32.2	36.8	41.4	0.5	0.9	1.4	1.8	2.3	2.8	3.2	3.7	4.1	46
47	4.7	9.4	14.1	18.8	23.5	28.2	32.9	37.6	42.3	0.5	0.9	1.4	1.9	2.4	2.8	3.3	3.8	4.2	47
48	4.8	9.6	14.4	19.2	24.0	28.8	33.6	38.4	43.2	0.5	1.0	1.4	1.9	2.4	2.9	3.4	3.8	4.3	48
49	4.9	9.8	14.7	19.6	24.5	29.4	34.3	39.2	44.1	0.5	1.0	1.5	2.0	2.5	2.9	3.4	3.9	4.4	49
50	5.0	10.0	15.0	20.0	25.0	30.0	35.0	40.0	45.0	0.5	1.0	1.5	2.0	2.5	3.0	3.5	4.0	4.5	50
51	5.1	10.2	15.3	20.4	25.5	30.6	35.7	40.8	45.9	0.5	1.0	1.5	2.0	2.6	3.1	3.6	4.1	4.6	51
52	5.2	10.4	15.6	20.8	26.0	31.2	36.4	41.6	46.8	0.5	1.0	1.6	2.1	2.6	3.1	3.6	4.2	4.7	52
53	5.3	10.6	15.9	21.2	26.5	31.8	37.1	42.4	47.7	0.5	1.1	1.6	2.1	2.7	3.2	3.7	4.2	4.8	53
54	5.4	10.8	16.2	21.6	27.0	32.4	37.8	43.2	48.6	0.5	1.1	1.6	2.2	2.7	3.2	3.8	4.3	4.9	54
55	5.5	11.0	16.5	22.0	27.5	33.0	38.5	44.0	49.5	0.6	1.1	1.7	2.2	2.8	3.3	3.9	4.4	5.0	55
56	5.6	11.2	16.8	22.4	28.0	33.6	39.2	44.8	50.4	0.6	1.1	1.7	2.2	2.8	3.4	3.9	4.5	5.0	56
57	5.7	11.4	17.1	22.8	28.5	34.2	39.9	45.6	51.3	0.6	1.1	1.7	2.3	2.9	3.4	4.0	4.6	5.1	57
58	5.8	11.6	17.4	23.2	29.0	34.8	40.6	46.4	52.2	0.6	1.2	1.7	2.3	2.9	3.5	4.1	4.6	5.2	58
59	5.9	11.8	17.7	23.6	29.5	35.4	41.3	47.2	53.1	0.6	1.2	1.8	2.4	3.0	3.5	4.1	4.7	5.3	59
60	6.0	12.0	18.0	24.0	30.0	36.0	42.0	48.0	54.0	0.6	1.2	1.8	2.4	3.0	3.6	4.2	4.8	5.4	60

INTERPOLACIONA TABLICA

za izračunavanje trenutaka izlaza i zalaza Sunca i Mjeseca

za $\varphi = \pm(30^\circ$ do $60^\circ)$				
Δt_s \ $\Delta\varphi$	1°	2°	3°	4°
1	0.2	0.4	0.6	0.8
2	0.4	0.8	1.2	1.6
3	0.6	1.2	1.8	2.4
4	0.8	1.6	2.4	3.2
5	1.0	2.0	3.0	4.0
6	1.2	2.4	3.6	4.8
7	1.4	2.8	4.2	5.6
8	1.6	3.2	4.8	6.4
9	1.8	3.6	5.4	7.2
10	2.0	4.0	6.0	8.0
11	2.2	4.4	6.6	8.8
12	2.4	4.8	7.2	9.6
13	2.6	5.2	7.8	10.4
14	2.8	5.6	8.4	11.2
15	3.0	6.0	9.0	12.0
16	3.2	6.4	9.6	12.8
17	3.4	6.8	10.2	13.6
18	3.6	7.2	10.8	14.4
19	3.8	7.6	11.4	15.2
20	4.0	8.0	12.0	16.0
21	4.2	8.4	12.6	16.8
22	4.4	8.8	13.2	17.6
23	4.6	9.2	13.8	18.4
24	4.8	9.6	14.4	19.2
25	5.0	10.0	15.0	20.0
26	5.2	10.4	15.6	20.8
27	5.4	10.8	16.2	21.6
28	5.6	11.2	16.8	22.4
29	5.8	11.6	17.4	23.2
30	6.0	12.0	18.0	24.0
31	6.2	12.4	18.6	24.8
32	6.4	12.8	19.2	25.6
33	6.6	13.2	19.8	26.4
34	6.8	13.6	20.4	27.2
35	7.0	14.0	21.0	28.0
36	7.2	14.4	21.6	28.8
37	7.4	14.8	22.2	29.6
38	7.6	15.2	22.8	30.4
39	7.8	15.6	23.4	31.2
40	8.0	16.0	24.0	32.0
41	8.2	16.4	24.6	32.8
42	8.4	16.8	25.2	33.6
43	8.6	17.2	25.8	34.4
44	8.8	17.6	26.4	35.2
45	9.0	18.0	27.0	36.0
46	9.2	18.4	27.6	36.8
47	9.4	18.8	28.2	37.6
48	9.6	19.2	28.8	38.4
49	9.8	19.6	29.4	39.2
50	10.0	20.0	30.0	40.0
51	10.2	20.4	30.6	40.8
52	10.4	20.8	31.2	41.6
53	10.6	21.2	31.8	42.4
54	10.8	21.6	32.4	43.2
55	11.0	22.0	33.0	44.0
56	11.2	22.4	33.6	44.8
57	11.4	22.8	34.2	45.6
58	11.6	23.2	34.8	46.4
59	11.8	23.6	35.4	47.2
60	12.0	24.0	36.0	48.0

za $\varphi = \pm(30^\circ$ do $60^\circ)$										
0°.1	0°.2	0°.3	0°.4	0°.5	0°.6	0°.7	0°.8	0°.9	$\Delta\varphi$ / Δt_s
0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.2	0.2	1
0.0	0.1	0.1	0.2	0.2	0.2	0.3	0.3	0.4	2
0.1	0.1	0.2	0.2	0.3	0.4	0.4	0.5	0.5	3
0.1	0.2	0.2	0.3	0.4	0.5	0.6	0.6	0.7	4
0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9	5
0.1	0.2	0.4	0.5	0.6	0.7	0.8	1.0	1.1	6
0.1	0.3	0.4	0.6	0.7	0.8	1.0	1.1	1.3	7
0.2	0.3	0.5	0.6	0.8	1.0	1.1	1.3	1.4	8
0.2	0.4	0.5	0.7	0.9	1.1	1.3	1.4	1.6	9
0.2	0.4	0.6	0.8	1.0	1.2	1.4	1.6	1.8	10
0.2	0.4	0.7	0.9	1.1	1.3	1.5	1.8	2.0	11
0.2	0.5	0.7	1.0	1.2	1.4	1.7	1.9	2.2	12
0.3	0.5	0.8	1.0	1.3	1.6	1.8	2.1	2.3	13
0.3	0.6	0.8	1.1	1.4	1.7	2.0	2.2	2.5	14
0.3	0.6	0.9	1.2	1.5	1.8	2.1	2.4	2.7	15
0.3	0.6	1.0	1.3	1.6	1.9	2.2	2.6	2.9	16
0.3	0.7	1.0	1.4	1.7	2.0	2.4	2.7	3.1	17
0.4	0.7	1.1	1.4	1.8	2.2	2.5	2.9	3.2	18
0.4	0.8	1.1	1.5	1.9	2.3	2.7	3.0	3.4	19
0.4	0.8	1.2	1.6	2.0	2.4	2.8	3.2	3.6	20
0.4	0.8	1.3	1.7	2.1	2.5	2.9	3.4	3.8	21
0.4	0.9	1.3	1.8	2.2	2.6	3.1	3.5	4.0	22
0.5	0.9	1.4	1.8	2.3	2.8	3.2	3.7	4.1	23
0.5	1.0	1.4	1.9	2.4	2.9	3.4	3.8	4.3	24
0.5	1.0	1.5	2.0	2.5	3.0	3.5	4.0	4.5	25
0.5	1.0	1.6	2.1	2.6	3.1	3.6	4.2	4.7	26
0.5	1.1	1.6	2.2	2.7	3.2	3.8	4.3	4.9	27
0.6	1.1	1.7	2.2	2.8	3.4	3.9	4.5	5.0	28
0.6	1.2	1.7	2.3	2.9	3.5	4.1	4.6	5.2	29
0.6	1.2	1.8	2.4	3.0	3.6	4.2	4.8	5.4	30
0.6	1.2	1.9	2.5	3.1	3.7	4.3	5.0	5.6	31
0.6	1.3	1.9	2.6	3.2	3.8	4.5	5.1	5.8	32
0.7	1.3	2.0	2.6	3.3	4.0	4.6	5.3	5.9	33
0.7	1.4	2.0	2.7	3.4	4.1	4.8	5.4	6.1	34
0.7	1.4	2.1	2.8	3.5	4.2	4.9	5.6	6.3	35
0.7	1.4	2.2	2.9	3.6	4.3	5.0	5.8	6.5	36
0.7	1.5	2.2	3.0	3.7	4.4	5.2	5.9	6.7	37
0.8	1.5	2.3	3.0	3.8	4.6	5.3	6.1	6.8	38
0.8	1.6	2.3	3.1	3.9	4.7	5.5	6.2	7.0	39
0.8	1.6	2.4	3.2	4.0	4.8	5.6	6.4	7.2	40
0.8	1.6	2.5	3.3	4.1	4.9	5.7	6.6	7.4	41
0.8	1.7	2.5	3.4	4.2	5.0	5.9	6.7	7.6	42
0.9	1.7	2.6	3.4	4.3	5.2	6.0	6.9	7.7	43
0.9	1.8	2.6	3.5	4.4	5.3	6.2	7.0	7.9	44
0.9	1.8	2.7	3.6	4.5	5.4	6.3	7.2	8.1	45
0.9	1.8	2.8	3.7	4.6	5.5	6.4	7.4	8.3	46
0.9	1.9	2.8	3.8	4.7	5.6	6.6	7.5	8.5	47
1.0	1.9	2.9	3.8	4.8	5.8	6.7	7.7	8.6	48
1.0	2.0	2.9	3.9	4.9	5.9	6.9	7.8	8.8	49
1.0	2.0	3.0	4.0	5.0	6.0	7.0	8.0	9.0	50
1.0	2.0	3.1	4.1	5.1	6.1	7.1	8.2	9.2	51
1.0	2.1	3.1	4.2	5.2	6.2	7.3	8.3	9.4	52
1.1	2.1	3.2	4.2	5.3	6.4	7.4	8.5	9.5	53
1.1	2.2	3.2	4.3	5.4	6.5	7.6	8.6	9.7	54
1.1	2.2	3.3	4.4	5.5	6.6	7.7	8.8	9.9	55
1.1	2.2	3.4	4.5	5.6	6.7	7.8	9.0	10.1	56
1.1	2.3	3.4	4.6	5.7	6.8	8.0	9.1	10.3	57
1.2	2.3	3.5	4.6	5.8	7.0	8.1	9.3	10.4	58
1.2	2.4	3.5	4.7	5.9	7.1	8.3	9.4	10.6	59
1.2	2.4	3.6	4.8	6.0	7.2	8.4	9.6	10.8	60

INTERPOLACIONA TABLICA

za izračunavanje trenutaka izlaza, zalaza i prolaza Mjeseca kroz meridijan

$\frac{\Delta}{24}$ \ λ	1°	2°	3°	4°	5°	6°	7°	8°	9°	10°	11°	12°	13°	14°	15°	16°	17°	18°	19°	20°	λ \ $\frac{\Delta}{24}$
0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
0.2	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.3	0.3	0.2
0.3	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.2	0.2	0.2	0.2	0.2	0.3	0.3	0.3	0.3	0.3	0.4	0.4	0.4	0.3
0.4	0.0	0.1	0.1	0.1	0.1	0.2	0.2	0.2	0.2	0.3	0.3	0.3	0.3	0.4	0.4	0.4	0.5	0.5	0.5	0.5	0.4
0.5	0.0	0.1	0.1	0.1	0.2	0.2	0.2	0.3	0.3	0.3	0.4	0.4	0.4	0.5	0.5	0.5	0.6	0.6	0.6	0.7	0.5
0.6	0.0	0.1	0.1	0.2	0.2	0.2	0.3	0.3	0.4	0.4	0.4	0.5	0.5	0.6	0.6	0.6	0.7	0.7	0.8	0.8	0.6
0.7	0.0	0.1	0.1	0.2	0.2	0.3	0.3	0.4	0.4	0.5	0.5	0.6	0.6	0.7	0.7	0.7	0.8	0.8	0.9	0.9	0.7
0.8	0.1	0.1	0.2	0.2	0.3	0.3	0.4	0.4	0.5	0.5	0.6	0.6	0.7	0.7	0.8	0.9	0.9	1.0	1.0	1.1	0.8
0.9	0.1	0.1	0.2	0.2	0.3	0.4	0.4	0.5	0.5	0.6	0.7	0.7	0.8	0.8	0.9	1.0	1.0	1.1	1.1	1.2	0.9
1.0	0.1	0.1	0.2	0.3	0.3	0.4	0.5	0.5	0.6	0.7	0.7	0.8	0.9	0.9	1.0	1.1	1.1	1.2	1.3	1.3	1.0
1.1	0.1	0.1	0.2	0.3	0.4	0.4	0.5	0.6	0.7	0.7	0.8	0.9	1.0	1.0	1.1	1.2	1.2	1.3	1.4	1.5	1.1
1.2	0.1	0.2	0.2	0.3	0.4	0.5	0.6	0.6	0.7	0.8	0.9	1.0	1.0	1.1	1.2	1.3	1.4	1.4	1.5	1.6	1.2
1.3	0.1	0.2	0.3	0.3	0.4	0.5	0.6	0.7	0.8	0.9	1.0	1.0	1.1	1.2	1.3	1.4	1.5	1.6	1.6	1.7	1.3
1.4	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.7	0.8	0.9	1.0	1.1	1.2	1.3	1.4	1.5	1.6	1.7	1.8	1.9	1.4
1.5	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9	1.0	1.1	1.2	1.3	1.4	1.5	1.6	1.7	1.8	1.9	2.0	1.5
1.6	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.9	1.0	1.1	1.2	1.3	1.4	1.5	1.6	1.7	1.8	1.9	2.0	2.1	1.6
1.7	0.1	0.2	0.3	0.5	0.6	0.7	0.8	0.9	1.0	1.1	1.2	1.4	1.5	1.6	1.7	1.8	1.9	2.0	2.2	2.3	1.7
1.8	0.1	0.2	0.4	0.5	0.6	0.7	0.8	1.0	1.1	1.2	1.3	1.4	1.6	1.7	1.8	1.9	2.0	2.2	2.3	2.4	1.8
1.9	0.1	0.3	0.4	0.5	0.6	0.8	0.9	1.0	1.1	1.3	1.4	1.5	1.6	1.8	1.9	2.0	2.2	2.3	2.4	2.5	1.9
2.0	0.1	0.3	0.4	0.5	0.7	0.8	0.9	1.1	1.2	1.3	1.5	1.6	1.7	1.9	2.0	2.1	2.3	2.4	2.5	2.7	2.0
2.1	0.1	0.3	0.4	0.6	0.7	0.8	1.0	1.1	1.3	1.4	1.5	1.7	1.8	2.0	2.1	2.2	2.4	2.5	2.7	2.8	2.1
2.2	0.1	0.3	0.4	0.6	0.7	0.9	1.0	1.2	1.3	1.5	1.6	1.8	1.9	2.1	2.2	2.3	2.5	2.6	2.8	2.9	2.2
2.3	0.2	0.3	0.5	0.6	0.8	0.9	1.1	1.2	1.4	1.5	1.7	1.8	2.0	2.1	2.3	2.5	2.6	2.8	2.9	3.1	2.3
2.4	0.2	0.3	0.5	0.6	0.8	1.0	1.1	1.3	1.4	1.6	1.8	1.9	2.1	2.2	2.4	2.6	2.7	2.9	3.0	3.2	2.4
2.5	0.2	0.3	0.5	0.7	0.8	1.0	1.2	1.3	1.5	1.7	1.8	2.0	2.2	2.3	2.5	2.7	2.8	3.0	3.2	3.3	2.5
2.6	0.2	0.3	0.5	0.7	0.9	1.0	1.2	1.4	1.6	1.7	1.9	2.1	2.3	2.4	2.6	2.8	2.9	3.1	3.3	3.5	2.6
2.7	0.2	0.4	0.5	0.7	0.9	1.1	1.3	1.4	1.6	1.8	2.0	2.2	2.3	2.5	2.7	2.9	3.1	3.2	3.4	3.6	2.7
2.8	0.2	0.4	0.6	0.7	0.9	1.1	1.3	1.5	1.7	1.9	2.1	2.2	2.4	2.6	2.8	3.0	3.2	3.4	3.5	3.7	2.8
2.9	0.2	0.4	0.6	0.8	1.0	1.2	1.4	1.5	1.7	1.9	2.1	2.3	2.5	2.7	2.9	3.1	3.3	3.5	3.7	3.9	2.9
3.0	0.2	0.4	0.6	0.8	1.0	1.2	1.4	1.6	1.8	2.0	2.2	2.4	2.6	2.8	3.0	3.2	3.4	3.6	3.8	4.0	3.0
3.1	0.2	0.4	0.6	0.8	1.0	1.2	1.4	1.7	1.9	2.1	2.3	2.5	2.7	2.9	3.1	3.3	3.5	3.7	3.9	4.1	3.1
3.2	0.2	0.4	0.6	0.9	1.1	1.3	1.5	1.7	1.9	2.1	2.3	2.6	2.8	3.0	3.2	3.4	3.6	3.8	4.1	4.3	3.2
3.3	0.2	0.4	0.7	0.9	1.1	1.3	1.5	1.8	2.0	2.2	2.4	2.6	2.9	3.1	3.3	3.5	3.7	4.0	4.2	4.4	3.3
3.4	0.2	0.5	0.7	0.9	1.1	1.4	1.6	1.8	2.0	2.3	2.5	2.7	2.9	3.2	3.4	3.6	3.9	4.1	4.3	4.5	3.4
3.5	0.2	0.5	0.7	0.9	1.2	1.4	1.6	1.9	2.1	2.3	2.6	2.8	3.0	3.3	3.5	3.7	4.0	4.2	4.4	4.7	3.5
3.6	0.2	0.5	0.7	1.0	1.2	1.4	1.7	1.9	2.2	2.4	2.6	2.9	3.1	3.4	3.6	3.8	4.1	4.3	4.6	4.8	3.6
3.7	0.2	0.5	0.7	1.0	1.2	1.5	1.7	2.0	2.2	2.5	2.7	3.0	3.2	3.5	3.7	3.9	4.2	4.4	4.7	4.9	3.7
3.8	0.3	0.5	0.8	1.0	1.3	1.5	1.8	2.0	2.3	2.5	2.8	3.0	3.3	3.5	3.8	4.1	4.3	4.6	4.8	5.1	3.8
3.9	0.3	0.5	0.8	1.0	1.3	1.6	1.8	2.1	2.3	2.6	2.9	3.1	3.4	3.6	3.9	4.2	4.4	4.7	4.9	5.2	3.9
4.0	0.3	0.5	0.8	1.1	1.3	1.6	1.9	2.1	2.4	2.7	2.9	3.2	3.5	3.7	4.0	4.3	4.5	4.8	5.1	5.3	4.0
4.1	0.3	0.5	0.8	1.1	1.4	1.6	1.9	2.2	2.5	2.7	3.0	3.3	3.6	3.8	4.1	4.4	4.6	4.9	5.2	5.5	4.1
4.2	0.3	0.6	0.8	1.1	1.4	1.7	2.0	2.2	2.5	2.8	3.1	3.4	3.6	3.9	4.2	4.5	4.8	5.0	5.3	5.6	4.2
4.3	0.3	0.6	0.9	1.1	1.4	1.7	2.0	2.3	2.6	2.9	3.2	3.4	3.7	4.0	4.3	4.6	4.9	5.2	5.4	5.7	4.3
4.4	0.3	0.6	0.9	1.2	1.5	1.8	2.1	2.3	2.6	2.9	3.2	3.5	3.8	4.1	4.4	4.7	5.0	5.3	5.6	5.9	4.4
4.5	0.3	0.6	0.9	1.2	1.5	1.8	2.1	2.4	2.7	3.0	3.3	3.6	3.9	4.2	4.5	4.8	5.1	5.4	5.7	6.0	4.5
4.6	0.3	0.6	0.9	1.2	1.5	1.8	2.1	2.5	2.8	3.1	3.4	3.7	4.0	4.3	4.6	4.9	5.2	5.5	5.8	6.1	4.6
4.7	0.3	0.6	0.9	1.3	1.6	1.9	2.2	2.5	2.8	3.1	3.4	3.8	4.1	4.4	4.7	5.0	5.3	5.6	6.0	6.3	4.7
4.8	0.3	0.6	1.0	1.3	1.6	1.9	2.2	2.6	2.9	3.2	3.5	3.8	4.2	4.5	4.8	5.1	5.4	5.8	6.1	6.4	4.8
4.9	0.3	0.7	1.0	1.3	1.6	2.0	2.3	2.6	2.9	3.3	3.6	3.9	4.2	4.6	4.9	5.2	5.6	5.9	6.2	6.5	4.9
5.0	0.3	0.7	1.0	1.3	1.7	2.0	2.3	2.7	3.0	3.3	3.7	4.0	4.3	4.7	5.0	5.3	5.7	6.0	6.3	6.7	5.0

INTERPOLACIONA TABLICA

za izračunavanje trenutaka izlaza, zalaza i prolaza Mjeseca kroz meridijan

$\frac{\lambda}{\frac{\Delta}{24}}$	20°	30°	40°	50°	60°	70°	80°	90°	100°	110°	120°	130°	140°	150°	160°	170°	180°	$\frac{\lambda}{\frac{\Delta}{24}}$
0.1	0.1	0.2	0.3	0.3	0.4	0.5	0.5	0.6	0.7	0.7	0.8	0.9	0.9	1.0	1.1	1.1	1.2	0.1
0.2	0.3	0.4	0.5	0.7	0.8	0.9	1.1	1.2	1.3	1.5	1.6	1.7	1.9	2.0	2.1	2.3	2.4	0.2
0.3	0.4	0.6	0.8	1.0	1.2	1.4	1.6	1.8	2.0	2.2	2.4	2.6	2.8	3.0	3.2	3.4	3.6	0.3
0.4	0.5	0.8	1.1	1.3	1.6	1.9	2.1	2.4	2.7	2.9	3.2	3.5	3.7	4.0	4.3	4.5	4.8	0.4
0.5	0.7	1.0	1.3	1.7	2.0	2.3	2.7	3.0	3.3	3.7	4.0	4.3	4.7	5.0	5.3	5.7	6.0	0.5
0.6	0.8	1.2	1.6	2.0	2.4	2.8	3.2	3.6	4.0	4.4	4.8	5.2	5.6	6.0	6.4	6.8	7.2	0.6
0.7	0.9	1.4	1.9	2.3	2.8	3.3	3.7	4.2	4.7	5.1	5.6	6.1	6.5	7.0	7.5	7.9	8.4	0.7
0.8	1.1	1.6	2.1	2.7	3.2	3.7	4.3	4.8	5.3	5.9	6.4	6.9	7.5	8.0	8.5	9.1	9.6	0.8
0.9	1.2	1.8	2.4	3.0	3.6	4.2	4.8	5.4	6.0	6.6	7.2	7.8	8.4	9.0	9.6	10.2	10.8	0.9
1.0	1.3	2.0	2.7	3.3	4.0	4.7	5.3	6.0	6.7	7.3	8.0	8.7	9.3	10.0	10.7	11.3	12.0	1.0
1.1	1.5	2.2	2.9	3.7	4.4	5.1	5.9	6.6	7.3	8.1	8.8	9.5	10.3	11.0	11.7	12.5	13.2	1.1
1.2	1.6	2.4	3.2	4.0	4.8	5.6	6.4	7.2	8.0	8.8	9.6	10.4	11.2	12.0	12.8	13.6	14.4	1.2
1.3	1.7	2.6	3.5	4.3	5.2	6.1	6.9	7.8	8.7	9.5	10.4	11.3	12.1	13.0	13.9	14.7	15.6	1.3
1.4	1.9	2.8	3.7	4.7	5.6	6.5	7.5	8.4	9.3	10.3	11.2	12.1	13.1	14.0	14.9	15.9	16.8	1.4
1.5	2.0	3.0	4.0	5.0	6.0	7.0	8.0	9.0	10.0	11.0	12.0	13.0	14.0	15.0	16.0	17.0	18.0	1.5
1.6	2.1	3.2	4.3	5.3	6.4	7.5	8.5	9.6	10.7	11.7	12.8	13.9	14.9	16.0	17.1	18.1	19.2	1.6
1.7	2.3	3.4	4.5	5.7	6.8	7.9	9.1	10.2	11.3	12.5	13.6	14.7	15.9	17.0	18.1	19.3	20.4	1.7
1.8	2.4	3.6	4.8	6.0	7.2	8.4	9.6	10.8	12.0	13.2	14.4	15.6	16.8	18.0	19.2	20.4	21.6	1.8
1.9	2.5	3.8	5.1	6.3	7.6	8.9	10.1	11.4	12.7	13.9	15.2	16.5	17.7	19.0	20.3	21.5	22.8	1.9
2.0	2.7	4.0	5.3	6.7	8.0	9.3	10.7	12.0	13.3	14.7	16.0	17.3	18.7	20.0	21.3	22.7	24.0	2.0
2.1	2.8	4.2	5.6	7.0	8.4	9.8	11.2	12.6	14.0	15.4	16.8	18.2	19.6	21.0	22.4	23.8	25.2	2.1
2.2	2.9	4.4	5.9	7.3	8.8	10.3	11.7	13.2	14.7	16.1	17.6	19.1	20.5	22.0	23.5	24.9	26.4	2.2
2.3	3.1	4.6	6.1	7.7	9.2	10.7	12.3	13.8	15.3	16.9	18.4	19.9	21.5	23.0	24.5	26.1	27.6	2.3
2.4	3.2	4.8	6.4	8.0	9.6	11.2	12.8	14.4	16.0	17.6	19.2	20.8	22.4	24.0	25.6	27.2	28.8	2.4
2.5	3.3	5.0	6.7	8.3	10.0	11.7	13.3	15.0	16.7	18.3	20.0	21.7	23.3	25.0	26.7	28.3	30.0	2.5
2.6	3.5	5.2	6.9	8.7	10.4	12.1	13.9	15.6	17.3	19.1	20.8	22.5	24.3	26.0	27.7	29.5	31.2	2.6
2.7	3.6	5.4	7.2	9.0	10.8	12.6	14.4	16.2	18.0	19.8	21.6	23.4	25.2	27.0	28.8	30.6	32.4	2.7
2.8	3.7	5.6	7.5	9.3	11.2	13.1	14.9	16.8	18.7	20.5	22.4	24.3	26.1	28.0	29.9	31.7	33.6	2.8
2.9	3.9	5.8	7.7	9.7	11.6	13.5	15.5	17.4	19.3	21.3	23.2	25.1	27.1	29.0	30.9	32.9	34.8	2.9
3.0	4.0	6.0	8.0	10.0	12.0	14.0	16.0	18.0	20.0	22.0	24.0	26.0	28.0	30.0	32.0	34.0	36.0	3.0
3.1	4.1	6.2	8.3	10.3	12.4	14.5	16.5	18.6	20.7	22.7	24.8	26.9	28.9	31.0	33.1	35.1	37.2	3.1
3.2	4.3	6.4	8.5	10.7	12.8	14.9	17.1	19.2	21.3	23.5	25.6	27.7	29.9	32.0	34.1	36.3	38.4	3.2
3.3	4.4	6.6	8.8	11.0	13.2	15.4	17.6	19.8	22.0	24.2	26.4	28.6	30.8	33.0	35.2	37.4	39.6	3.3
3.4	4.5	6.8	9.1	11.3	13.6	15.9	18.1	20.4	22.7	24.9	27.2	29.5	31.7	34.0	36.3	38.5	40.8	3.4
3.5	4.7	7.0	9.3	11.7	14.0	16.3	18.7	21.0	23.3	25.7	28.0	30.3	32.7	35.0	37.3	39.7	42.0	3.5
3.6	4.8	7.2	9.6	12.0	14.4	16.8	19.2	21.6	24.0	26.4	28.8	31.2	33.6	36.0	38.4	40.8	43.2	3.6
3.7	4.9	7.4	9.9	12.3	14.8	17.3	19.7	22.2	24.7	27.1	29.6	32.1	34.5	37.0	39.5	41.9	44.4	3.7
3.8	5.1	7.6	10.1	12.7	15.2	17.7	20.3	22.8	25.3	27.9	30.4	32.9	35.5	38.0	40.5	43.1	45.6	3.8
3.9	5.2	7.8	10.4	13.0	15.6	18.2	20.8	23.4	26.0	28.6	31.2	33.8	36.4	39.0	41.6	44.2	46.8	3.9
4.0	5.3	8.0	10.7	13.3	16.0	18.7	21.3	24.0	26.7	29.3	32.0	34.7	37.3	40.0	42.7	45.3	48.0	4.0
4.1	5.5	8.2	10.9	13.7	16.4	19.1	21.9	24.6	27.3	30.1	32.8	35.5	38.3	41.0	43.7	46.5	49.2	4.1
4.2	5.6	8.4	11.2	14.0	16.8	19.6	22.4	25.2	28.0	30.8	33.6	36.4	39.2	42.0	44.8	47.6	50.4	4.2
4.3	5.7	8.6	11.5	14.3	17.2	20.1	22.9	25.8	28.7	31.5	34.4	37.3	40.1	43.0	45.9	48.7	51.6	4.3
4.4	5.9	8.8	11.7	14.7	17.6	20.5	23.5	26.4	29.3	32.3	35.2	38.1	41.1	44.0	46.9	49.9	52.8	4.4
4.5	6.0	9.0	12.0	15.0	18.0	21.0	24.0	27.0	30.0	33.0	36.0	39.0	42.0	45.0	48.0	51.0	54.0	4.5
4.6	6.1	9.2	12.3	15.3	18.4	21.5	24.5	27.6	30.7	33.7	36.8	39.9	42.9	46.0	49.1	52.1	55.2	4.6
4.7	6.3	9.4	12.5	15.7	18.8	21.9	25.1	28.2	31.3	34.5	37.6	40.7	43.9	47.0	50.1	53.3	56.4	4.7
4.8	6.4	9.6	12.8	16.0	19.2	22.4	25.6	28.8	32.0	35.2	38.4	41.6	44.8	48.0	51.2	54.4	57.6	4.8
4.9	6.5	9.8	13.1	16.3	19.6	22.9	26.1	29.4	32.7	35.9	39.2	42.5	45.7	49.0	52.3	55.5	58.8	4.9
5.0	6.7	10.0	13.3	16.7	20.0	23.3	26.7	30.0	33.3	36.7	40.0	43.3	46.7	50.0	53.3	56.7	60.0	5.0

⋆ ★ ★ ★ ⋆

$I_n$terpolaciona tablica

ZA

POPRAVKU ČASOVNOG UGLA I DEKLINACIJE

0 h 0 min

POPRAVKA ČASOVNOG UGLA				POPRAVKA DRUGOG REDA za časovni ugao i deklinaciju Sunca, Mjeseca i planeta					
s	SUNCA I PLANETA	PROLJEĆNE TAČKE ♈	MJESECA ☾	Δ	popr.	Δ	popr.	Δ	popr.
	° ′	° ′	° ′		′		′		′
0	0 .0	0 .0	0 .0	0	.0	60	.1	120	.1
1	0 .3	0 .3	0 .2	1	.0	61	.1	121	.1
2	0 .5	0 .5	0 .5	2	.0	62	.1	122	.1
3	0 .8	0 .8	0 .7	3	.0	63	.1	123	.1
4	0 1.0	0 1.0	0 1.0	4	.0	64	.1	124	.1
5	0 1.3	0 1.3	0 1.2	5	.0	65	.1	125	.1
6	0 1.5	0 1.5	0 1.4	6	.0	66	.1	126	.1
7	0 1.8	0 1.8	0 1.7	7	.0	67	.1	127	.1
8	0 2.0	0 2.0	0 1.9	8	.0	68	.1	128	.1
9	0 2.3	0 2.3	0 2.1	9	.0	69	.1	129	.1
10	0 2.5	0 2.5	0 2.4	10	.0	70	.1	130	.1
11	0 2.8	0 2.8	0 2.6	11	.0	71	.1	131	.1
12	0 3.0	0 3.0	0 2.9	12	.0	72	.1	132	.1
13	0 3.3	0 3.3	0 3.1	13	.0	73	.1	133	.1
14	0 3.5	0 3.5	0 3.3	14	.0	74	.1	134	.1
15	0 3.8	0 3.8	0 3.6	15	.0	75	.1	135	.1
16	0 4.0	0 4.0	0 3.8	16	.0	76	.1	136	.1
17	0 4.3	0 4.3	0 4.1	17	.0	77	.1	137	.1
18	0 4.5	0 4.5	0 4.3	18	.0	78	.1	138	.1
19	0 4.8	0 4.8	0 4.5	19	.0	79	.1	139	.1
20	0 5.0	0 5.0	0 4.8	20	.0	80	.1	140	.1
21	0 5.3	0 5.3	0 5.0	21	.0	81	.1	141	.1
22	0 5.5	0 5.5	0 5.2	22	.0	82	.1	142	.1
23	0 5.8	0 5.8	0 5.5	23	.0	83	.1	143	.1
24	0 6.0	0 6.0	0 5.7	24	.0	84	.1	144	.1
25	0 6.3	0 6.3	0 6.0	25	.0	85	.1	145	.1
26	0 6.5	0 6.5	0 6.2	26	.0	86	.1	146	.1
27	0 6.8	0 6.8	0 6.4	27	.0	87	.1	147	.1
28	0 7.0	0 7.0	0 6.7	28	.0	88	.1	148	.1
29	0 7.3	0 7.3	0 6.9	29	.0	89	.1	149	.1
30	0 7.5	0 7.5	0 7.2	30	.0	90	.1	150	.1
31	0 7.8	0 7.8	0 7.4	31	.0	91	.1	151	.1
32	0 8.0	0 8.0	0 7.6	32	.0	92	.1	152	.1
33	0 8.3	0 8.3	0 7.9	33	.0	93	.1	153	.1
34	0 8.5	0 8.5	0 8.1	34	.0	94	.1	154	.1
35	0 8.8	0 8.8	0 8.4	35	.0	95	.1	155	.1
36	0 9.0	0 9.0	0 8.6	36	.0	96	.1	156	.1
37	0 9.3	0 9.3	0 8.8	37	.0	97	.1	157	.1
38	0 9.5	0 9.5	0 9.1	38	.0	98	.1	158	.1
39	0 9.8	0 9.8	0 9.3	39	.0	99	.1	159	.1
40	0 10.0	0 10.0	0 9.5	40	.0	100	.1	160	.1
41	0 10.3	0 10.3	0 9.8	41	.0	101	.1	161	.1
42	0 10.5	0 10.5	0 10.0	42	.0	102	.1	162	.1
43	0 10.8	0 10.8	0 10.3	43	.0	103	.1	163	.1
44	0 11.0	0 11.0	0 10.5	44	.0	104	.1	164	.1
45	0 11.3	0 11.3	0 10.7	45	.0	105	.1	165	.1
46	0 11.5	0 11.5	0 11.0	46	.0	106	.1	166	.1
47	0 11.8	0 11.8	0 11.2	47	.0	107	.1	167	.1
48	0 12.0	0 12.0	0 11.5	48	.0	108	.1	168	.1
49	0 12.3	0 12.3	0 11.7	49	.0	109	.1	169	.1
50	0 12.5	0 12.5	0 11.9	50	.0	110	.1	170	.1
51	0 12.8	0 12.8	0 12.2	51	.0	111	.1	171	.1
52	0 13.0	0 13.0	0 12.4	52	.0	112	.1	172	.1
53	0 13.3	0 13.3	0 12.6	53	.0	113	.1	173	.1
54	0 13.5	0 13.5	0 12.9	54	.0	114	.1	174	.1
55	0 13.8	0 13.8	0 13.1	55	.0	115	.1	175	.1
56	0 14.0	0 14.0	0 13.4	56	.0	116	.1	176	.1
57	0 14.3	0 14.3	0 13.6	57	.0	117	.1	177	.1
58	0 14.5	0 14.5	0 13.8	58	.0	118	.1	178	.1
59	0 14.8	0 14.8	0 14.1	59	.0	119	.1	179	.1
60	0 15.0	0 15.0	0 14.3	60	.1	120	.1	180	.2

0 h 1 min

POPRAVKA ČASOVNOG UGLA				POPRAVKA DRUGOG REDA za časovni ugao i deklinaciju Sunca, Mjeseca i planeta					
s	SUNCA I PLANETA	PROLJEĆNE TAČKE ♈	MJESECA ☾	Δ	popr.	Δ	popr.	Δ	popr.
	° ′	° ′	° ′		′		′		′
0	0 15.0	0 15.0	0 14.3	0	.0	60	.2	120	.3
1	0 15.3	0 15.3	0 14.6	1	.0	61	.2	121	.3
2	0 15.5	0 15.5	0 14.8	2	.0	62	.2	122	.3
3	0 15.8	0 15.8	0 15.0	3	.0	63	.2	123	.3
4	0 16.0	0 16.0	0 15.3	4	.0	64	.2	124	.3
5	0 16.3	0 16.3	0 15.5	5	.0	65	.2	125	.3
6	0 16.5	0 16.5	0 15.7	6	.0	66	.2	126	.3
7	0 16.8	0 16.8	0 16.0	7	.0	67	.2	127	.3
8	0 17.0	0 17.0	0 16.2	8	.0	68	.2	128	.3
9	0 17.3	0 17.3	0 16.5	9	.0	69	.2	129	.3
10	0 17.5	0 17.5	0 16.7	10	.0	70	.2	130	.3
11	0 17.8	0 17.8	0 16.9	11	.0	71	.2	131	.3
12	0 18.0	0 18.1	0 17.2	12	.0	72	.2	132	.3
13	0 18.3	0 18.3	0 17.4	13	.0	73	.2	133	.3
14	0 18.5	0 18.6	0 17.7	14	.0	74	.2	134	.3
15	0 18.8	0 18.8	0 17.9	15	.0	75	.2	135	.3
16	0 19.0	0 19.1	0 18.1	16	.0	76	.2	136	.3
17	0 19.3	0 19.3	0 18.4	17	.0	77	.2	137	.3
18	0 19.5	0 19.6	0 18.6	18	.0	78	.2	138	.3
19	0 19.8	0 19.8	0 18.9	19	.0	79	.2	139	.3
20	0 20.0	0 20.1	0 19.1	20	.1	80	.2	140	.4
21	0 20.3	0 20.3	0 19.3	21	.1	81	.2	141	.4
22	0 20.5	0 20.6	0 19.6	22	.1	82	.2	142	.4
23	0 20.8	0 20.8	0 19.8	23	.1	83	.2	143	.4
24	0 21.0	0 21.1	0 20.0	24	.1	84	.2	144	.4
25	0 21.3	0 21.3	0 20.3	25	.1	85	.2	145	.4
26	0 21.5	0 21.6	0 20.5	26	.1	86	.2	146	.4
27	0 21.8	0 21.8	0 20.8	27	.1	87	.2	147	.4
28	0 22.0	0 22.1	0 21.0	28	.1	88	.2	148	.4
29	0 22.3	0 22.3	0 21.2	29	.1	89	.2	149	.4
30	0 22.5	0 22.6	0 21.5	30	.1	90	.2	150	.4
31	0 22.8	0 22.8	0 21.7	31	.1	91	.2	151	.4
32	0 23.0	0 23.1	0 22.0	32	.1	92	.2	152	.4
33	0 23.3	0 23.3	0 22.2	33	.1	93	.2	153	.4
34	0 23.5	0 23.6	0 22.4	34	.1	94	.2	154	.4
35	0 23.8	0 23.8	0 22.7	35	.1	95	.2	155	.4
36	0 24.0	0 24.1	0 22.9	36	.1	96	.2	156	.4
37	0 24.3	0 24.3	0 23.1	37	.1	97	.2	157	.4
38	0 24.5	0 24.6	0 23.4	38	.1	98	.2	158	.4
39	0 24.8	0 24.8	0 23.6	39	.1	99	.2	159	.4
40	0 25.0	0 25.1	0 23.9	40	.1	100	.3	160	.4
41	0 25.3	0 25.3	0 24.1	41	.1	101	.3	161	.4
42	0 25.5	0 25.6	0 24.3	42	.1	102	.3	162	.4
43	0 25.8	0 25.8	0 24.6	43	.1	103	.3	163	.4
44	0 26.0	0 26.1	0 24.8	44	.1	104	.3	164	.4
45	0 26.3	0 26.3	0 25.1	45	.1	105	.3	165	.4
46	0 26.5	0 26.6	0 25.3	46	.1	106	.3	166	.4
47	0 26.8	0 26.8	0 25.5	47	.1	107	.3	167	.4
48	0 27.0	0 27.1	0 25.8	48	.1	108	.3	168	.4
49	0 27.3	0 27.3	0 26.0	49	.1	109	.3	169	.4
50	0 27.5	0 27.6	0 26.2	50	.1	110	.3	170	.4
51	0 27.8	0 27.8	0 26.5	51	.1	111	.3	171	.4
52	0 28.0	0 28.1	0 26.7	52	.1	112	.3	172	.4
53	0 28.3	0 28.3	0 27.0	53	.1	113	.3	173	.4
54	0 28.5	0 28.6	0 27.2	54	.1	114	.3	174	.4
55	0 28.8	0 28.8	0 27.4	55	.1	115	.3	175	.4
56	0 29.0	0 29.1	0 27.7	56	.1	116	.3	176	.4
57	0 29.3	0 29.3	0 27.9	57	.1	117	.3	177	.4
58	0 29.5	0 29.6	0 28.2	58	.1	118	.3	178	.4
59	0 29.8	0 29.8	0 28.4	59	.1	119	.3	179	.4
60	0 30.0	0 30.1	0 28.6	60	.2	120	.3	180	.5

0 h 2 min

POPRAVKA ČASOVNOG UGLA				POPRAVKA DRUGOG REDA za časovni ugao i deklinaciju Sunca, Mjeseca i planeta					
s	SUNCA I PLANETA	PROLJEĆNE TAČKE ♈	MJESECA ☾	Δ	popr.	Δ	popr.	Δ	popr.
	° ′	° ′	° ′		′		′		′
0	0 30.0	0 30.1	0 28.6	0	.0	60	.3	120	.5
1	0 30.3	0 30.3	0 28.9	1	.0	61	.3	121	.5
2	0 30.5	0 30.6	0 29.1	2	.0	62	.3	122	.5
3	0 30.8	0 30.8	0 29.3	3	.0	63	.3	123	.5
4	0 31.0	0 31.1	0 29.6	4	.0	64	.3	124	.5
5	0 31.3	0 31.3	0 29.8	5	.0	65	.3	125	.5
6	0 31.5	0 31.6	0 30.1	6	.0	66	.3	126	.5
7	0 31.8	0 31.8	0 30.3	7	.0	67	.3	127	.5
8	0 32.0	0 32.1	0 30.5	8	.0	68	.3	128	.5
9	0 32.3	0 32.3	0 30.8	9	.0	69	.3	129	.5
10	0 32.5	0 32.6	0 31.0	10	.0	70	.3	130	.5
11	0 32.8	0 32.8	0 31.3	11	.0	71	.3	131	.5
12	0 33.0	0 33.1	0 31.5	12	.1	72	.3	132	.6
13	0 33.3	0 33.3	0 31.7	13	.1	73	.3	133	.6
14	0 33.5	0 33.6	0 32.0	14	.1	74	.3	134	.6
15	0 33.8	0 33.8	0 32.2	15	.1	75	.3	135	.6
16	0 34.0	0 34.1	0 32.5	16	.1	76	.3	136	.6
17	0 34.3	0 34.3	0 32.7	17	.1	77	.3	137	.6
18	0 34.5	0 34.6	0 32.9	18	.1	78	.3	138	.6
19	0 34.8	0 34.8	0 33.2	19	.1	79	.3	139	.6
20	0 35.0	0 35.1	0 33.4	20	.1	80	.3	140	.6
21	0 35.3	0 35.3	0 33.6	21	.1	81	.3	141	.6
22	0 35.5	0 35.6	0 33.9	22	.1	82	.3	142	.6
23	0 35.8	0 35.8	0 34.1	23	.1	83	.3	143	.6
24	0 36.0	0 36.1	0 34.4	24	.1	84	.4	144	.6
25	0 36.3	0 36.4	0 34.6	25	.1	85	.4	145	.6
26	0 36.5	0 36.6	0 34.8	26	.1	86	.4	146	.6
27	0 36.8	0 36.9	0 35.1	27	.1	87	.4	147	.6
28	0 37.0	0 37.1	0 35.3	28	.1	88	.4	148	.6
29	0 37.3	0 37.4	0 35.6	29	.1	89	.4	149	.6
30	0 37.5	0 37.6	0 35.8	30	.1	90	.4	150	.6
31	0 37.8	0 37.9	0 36.0	31	.1	91	.4	151	.6
32	0 38.0	0 38.1	0 36.3	32	.1	92	.4	152	.6
33	0 38.3	0 38.4	0 36.5	33	.1	93	.4	153	.6
34	0 38.5	0 38.6	0 36.7	34	.1	94	.4	154	.6
35	0 38.8	0 38.9	0 37.0	35	.1	95	.4	155	.6
36	0 39.0	0 39.1	0 37.2	36	.2	96	.4	156	.7
37	0 39.3	0 39.4	0 37.5	37	.2	97	.4	157	.7
38	0 39.5	0 39.6	0 37.7	38	.2	98	.4	158	.7
39	0 39.8	0 39.9	0 37.9	39	.2	99	.4	159	.7
40	0 40.0	0 40.1	0 38.2	40	.2	100	.4	160	.7
41	0 40.3	0 40.4	0 38.4	41	.2	101	.4	161	.7
42	0 40.5	0 40.6	0 38.7	42	.2	102	.4	162	.7
43	0 40.8	0 40.9	0 38.9	43	.2	103	.4	163	.7
44	0 41.0	0 41.1	0 39.1	44	.2	104	.4	164	.7
45	0 41.3	0 41.4	0 39.4	45	.2	105	.4	165	.7
46	0 41.5	0 41.6	0 39.6	46	.2	106	.4	166	.7
47	0 41.8	0 41.9	0 39.8	47	.2	107	.4	167	.7
48	0 42.0	0 42.1	0 40.1	48	.2	108	.5	168	.7
49	0 42.3	0 42.4	0 40.3	49	.2	109	.5	169	.7
50	0 42.5	0 42.6	0 40.6	50	.2	110	.5	170	.7
51	0 42.8	0 42.9	0 40.8	51	.2	111	.5	171	.7
52	0 43.0	0 43.1	0 41.0	52	.2	112	.5	172	.7
53	0 43.3	0 43.4	0 41.3	53	.2	113	.5	173	.7
54	0 43.5	0 43.6	0 41.5	54	.2	114	.5	174	.7
55	0 43.8	0 43.9	0 41.8	55	.2	115	.5	175	.7
56	0 44.0	0 44.1	0 42.0	56	.2	116	.5	176	.7
57	0 44.3	0 44.4	0 42.2	57	.2	117	.5	177	.7
58	0 44.5	0 44.6	0 42.5	58	.2	118	.5	178	.7
59	0 44.8	0 44.9	0 42.7	59	.2	119	.5	179	.7
60	0 45.0	0 45.1	0 43.0	60	.3	120	.5	180	.8

0 h 3 min

POPRAVKA ČASOVNOG UGLA				POPRAVKA DRUGOG REDA za časovni ugao i deklinaciju Sunca, Mjeseca i planeta					
s	SUNCA I PLANETA	PROLJEĆNE TAČKE ♈	MJESECA ☾	Δ	popr.	Δ	popr.	Δ	popr.
	° ′	° ′	° ′		′		′		′
0	0 45.0	0 45.1	0 43.0	0	.0	60	.4	120	.7
1	0 45.3	0 45.4	0 43.2	1	.0	61	.4	121	.7
2	0 45.5	0 45.6	0 43.4	2	.0	62	.4	122	.7
3	0 45.8	0 45.9	0 43.7	3	.0	63	.4	123	.7
4	0 46.0	0 46.1	0 43.9	4	.0	64	.4	124	.7
5	0 46.3	0 46.4	0 44.1	5	.0	65	.4	125	.7
6	0 46.5	0 46.6	0 44.4	6	.0	66	.4	126	.7
7	0 46.8	0 46.9	0 44.6	7	.0	67	.4	127	.7
8	0 47.0	0 47.1	0 44.9	8	.0	68	.4	128	.7
9	0 47.3	0 47.4	0 45.1	9	.1	69	.4	129	.8
10	0 47.5	0 47.6	0 45.3	10	.1	70	.4	130	.8
11	0 47.8	0 47.9	0 45.6	11	.1	71	.4	131	.8
12	0 48.0	0 48.1	0 45.8	12	.1	72	.4	132	.8
13	0 48.3	0 48.4	0 46.1	13	.1	73	.4	133	.8
14	0 48.5	0 48.6	0 46.3	14	.1	74	.4	134	.8
15	0 48.8	0 48.9	0 46.5	15	.1	75	.4	135	.8
16	0 49.0	0 49.1	0 46.8	16	.1	76	.4	136	.8
17	0 49.3	0 49.4	0 47.0	17	.1	77	.4	137	.8
18	0 49.5	0 49.6	0 47.2	18	.1	78	.5	138	.8
19	0 49.8	0 49.9	0 47.5	19	.1	79	.5	139	.8
20	0 50.0	0 50.1	0 47.7	20	.1	80	.5	140	.8
21	0 50.3	0 50.4	0 48.0	21	.1	81	.5	141	.8
22	0 50.5	0 50.6	0 48.2	22	.1	82	.5	142	.8
23	0 50.8	0 50.9	0 48.4	23	.1	83	.5	143	.8
24	0 51.0	0 51.1	0 48.7	24	.1	84	.5	144	.8
25	0 51.3	0 51.4	0 48.9	25	.1	85	.5	145	.8
26	0 51.5	0 51.6	0 49.2	26	.2	86	.5	146	.9
27	0 51.8	0 51.9	0 49.4	27	.2	87	.5	147	.9
28	0 52.0	0 52.1	0 49.6	28	.2	88	.5	148	.9
29	0 52.3	0 52.4	0 49.9	29	.2	89	.5	149	.9
30	0 52.5	0 52.6	0 50.1	30	.2	90	.5	150	.9
31	0 52.8	0 52.9	0 50.3	31	.2	91	.5	151	.9
32	0 53.0	0 53.1	0 50.6	32	.2	92	.5	152	.9
33	0 53.3	0 53.4	0 50.8	33	.2	93	.5	153	.9
34	0 53.5	0 53.6	0 51.1	34	.2	94	.5	154	.9
35	0 53.8	0 53.9	0 51.3	35	.2	95	.6	155	.9
36	0 54.0	0 54.2	0 51.5	36	.2	96	.6	156	.9
37	0 54.3	0 54.4	0 51.8	37	.2	97	.6	157	.9
38	0 54.5	0 54.7	0 52.0	38	.2	98	.6	158	.9
39	0 54.8	0 54.9	0 52.3	39	.2	99	.6	159	.9
40	0 55.0	0 55.2	0 52.5	40	.2	100	.6	160	.9
41	0 55.3	0 55.4	0 52.7	41	.2	101	.6	161	.9
42	0 55.5	0 55.7	0 53.0	42	.2	102	.6	162	.9
43	0 55.8	0 55.9	0 53.2	43	.3	103	.6	163	1.0
44	0 56.0	0 56.2	0 53.4	44	.3	104	.6	164	1.0
45	0 56.3	0 56.4	0 53.7	45	.3	105	.6	165	1.0
46	0 56.5	0 56.7	0 53.9	46	.3	106	.6	166	1.0
47	0 56.8	0 56.9	0 54.2	47	.3	107	.6	167	1.0
48	0 57.0	0 57.2	0 54.4	48	.3	108	.6	168	1.0
49	0 57.3	0 57.4	0 54.6	49	.3	109	.6	169	1.0
50	0 57.5	0 57.7	0 54.9	50	.3	110	.6	170	1.0
51	0 57.8	0 57.9	0 55.1	51	.3	111	.6	171	1.0
52	0 58.0	0 58.2	0 55.4	52	.3	112	.7	172	1.0
53	0 58.3	0 58.4	0 55.6	53	.3	113	.7	173	1.0
54	0 58.5	0 58.7	0 55.8	54	.3	114	.7	174	1.0
55	0 58.8	0 58.9	0 56.1	55	.3	115	.7	175	1.0
56	0 59.0	0 59.2	0 56.3	56	.3	116	.7	176	1.0
57	0 59.3	0 59.4	0 56.6	57	.3	117	.7	177	1.0
58	0 59.5	0 59.7	0 56.8	58	.3	118	.7	178	1.0
59	0 59.8	0 59.9	0 57.0	59	.3	119	.7	179	1.0
60	1 .0	1 .2	0 57.3	60	.4	120	.7	180	1.1

0 h 4 min

POPRAVKA ČASOVNOG UGLA				POPRAVKA DRUGOG REDA za časovni ugao i deklinaciju Sunca, Mjeseca i planeta					
s	SUNCA I PLANETA	PROLJEĆNE TAČKE ♈	MJESECA ☾	Δ	popr.	Δ	popr.	Δ	popr.
	° ′	° ′	° ′		′		′		′
0	1 .0	1 .2	0 57.3	0	.0	60	.5	120	.9
1	1 .3	1 .4	0 57.5	1	.0	61	.5	121	.9
2	1 .5	1 .7	0 57.7	2	.0	62	.5	122	.9
3	1 .8	1 .9	0 58.0	3	.0	63	.5	123	.9
4	1 1.0	1 1.2	0 58.2	4	.0	64	.5	124	.9
5	1 1.3	1 1.4	0 58.5	5	.0	65	.5	125	.9
6	1 1.5	1 1.7	0 58.7	6	.0	66	.5	126	.9
7	1 1.8	1 1.9	0 58.9	7	.1	67	.5	127	1.0
8	1 2.0	1 2.2	0 59.2	8	.1	68	.5	128	1.0
9	1 2.3	1 2.4	0 59.4	9	.1	69	.5	129	1.0
10	1 2.5	1 2.7	0 59.7	10	.1	70	.5	130	1.0
11	1 2.8	1 2.9	0 59.9	11	.1	71	.5	131	1.0
12	1 3.0	1 3.2	1 .1	12	.1	72	.5	132	1.0
13	1 3.3	1 3.4	1 .4	13	.1	73	.5	133	1.0
14	1 3.5	1 3.7	1 .6	14	.1	74	.6	134	1.0
15	1 3.8	1 3.9	1 .8	15	.1	75	.6	135	1.0
16	1 4.0	1 4.2	1 1.1	16	.1	76	.6	136	1.0
17	1 4.3	1 4.4	1 1.3	17	.1	77	.6	137	1.0
18	1 4.5	1 4.7	1 1.6	18	.1	78	.6	138	1.0
19	1 4.8	1 4.9	1 1.8	19	.1	79	.6	139	1.0
20	1 5.0	1 5.2	1 2.0	20	.2	80	.6	140	1.1
21	1 5.3	1 5.4	1 2.3	21	.2	81	.6	141	1.1
22	1 5.5	1 5.7	1 2.5	22	.2	82	.6	142	1.1
23	1 5.8	1 5.9	1 2.8	23	.2	83	.6	143	1.1
24	1 6.0	1 6.2	1 3.0	24	.2	84	.6	144	1.1
25	1 6.3	1 6.4	1 3.2	25	.2	85	.6	145	1.1
26	1 6.5	1 6.7	1 3.5	26	.2	86	.6	146	1.1
27	1 6.8	1 6.9	1 3.7	27	.2	87	.7	147	1.1
28	1 7.0	1 7.2	1 3.9	28	.2	88	.7	148	1.1
29	1 7.3	1 7.4	1 4.2	29	.2	89	.7	149	1.1
30	1 7.5	1 7.7	1 4.4	30	.2	90	.7	150	1.1
31	1 7.8	1 7.9	1 4.7	31	.2	91	.7	151	1.1
32	1 8.0	1 8.2	1 4.9	32	.2	92	.7	152	1.1
33	1 8.3	1 8.4	1 5.1	33	.2	93	.7	153	1.1
34	1 8.5	1 8.7	1 5.4	34	.3	94	.7	154	1.2
35	1 8.8	1 8.9	1 5.6	35	.3	95	.7	155	1.2
36	1 9.0	1 9.2	1 5.9	36	.3	96	.7	156	1.2
37	1 9.3	1 9.4	1 6.1	37	.3	97	.7	157	1.2
38	1 9.5	1 9.7	1 6.3	38	.3	98	.7	158	1.2
39	1 9.8	1 9.9	1 6.6	39	.3	99	.7	159	1.2
40	1 10.0	1 10.2	1 6.8	40	.3	100	.8	160	1.2
41	1 10.3	1 10.4	1 7.0	41	.3	101	.8	161	1.2
42	1 10.5	1 10.7	1 7.3	42	.3	102	.8	162	1.2
43	1 10.8	1 10.9	1 7.5	43	.3	103	.8	163	1.2
44	1 11.0	1 11.2	1 7.8	44	.3	104	.8	164	1.2
45	1 11.3	1 11.4	1 8.0	45	.3	105	.8	165	1.2
46	1 11.5	1 11.7	1 8.2	46	.3	106	.8	166	1.2
47	1 11.8	1 11.9	1 8.5	47	.4	107	.8	167	1.3
48	1 12.0	1 12.2	1 8.7	48	.4	108	.8	168	1.3
49	1 12.3	1 12.5	1 9.0	49	.4	109	.8	169	1.3
50	1 12.5	1 12.7	1 9.2	50	.4	110	.8	170	1.3
51	1 12.8	1 13.0	1 9.4	51	.4	111	.8	171	1.3
52	1 13.0	1 13.2	1 9.7	52	.4	112	.8	172	1.3
53	1 13.3	1 13.5	1 9.9	53	.4	113	.8	173	1.3
54	1 13.5	1 13.7	1 10.2	54	.4	114	.9	174	1.3
55	1 13.8	1 14.0	1 10.4	55	.4	115	.9	175	1.3
56	1 14.0	1 14.2	1 10.6	56	.4	116	.9	176	1.3
57	1 14.3	1 14.5	1 10.9	57	.4	117	.9	177	1.3
58	1 14.5	1 14.7	1 11.1	58	.4	118	.9	178	1.3
59	1 14.8	1 15.0	1 11.3	59	.4	119	.9	179	1.3
60	1 15.0	1 15.2	1 11.6	60	.5	120	.9	180	1.4

0 h 5 min

POPRAVKA ČASOVNOG UGLA				POPRAVKA DRUGOG REDA za časovni ugao i deklinaciju Sunca, Mjeseca i planeta					
s	SUNCA I PLANETA	PROLJEĆNE TAČKE ♈	MJESECA ☾	Δ	popr.	Δ	popr.	Δ	popr.
	° ′	° ′	° ′		′		′		′
0	1 15.0	1 15.2	1 11.6	0	.0	60	.6	120	1.1
1	1 15.3	1 15.5	1 11.8	1	.0	61	.6	121	1.1
2	1 15.5	1 15.7	1 12.1	2	.0	62	.6	122	1.1
3	1 15.8	1 16.0	1 12.3	3	.0	63	.6	123	1.1
4	1 16.0	1 16.2	1 12.5	4	.0	64	.6	124	1.1
5	1 16.3	1 16.5	1 12.8	5	.0	65	.6	125	1.1
6	1 16.5	1 16.7	1 13.0	6	.1	66	.6	126	1.2
7	1 16.8	1 17.0	1 13.3	7	.1	67	.6	127	1.2
8	1 17.0	1 17.2	1 13.5	8	.1	68	.6	128	1.2
9	1 17.3	1 17.5	1 13.7	9	.1	69	.6	129	1.2
10	1 17.5	1 17.7	1 14.0	10	.1	70	.6	130	1.2
11	1 17.8	1 18.0	1 14.2	11	.1	71	.7	131	1.2
12	1 18.0	1 18.2	1 14.4	12	.1	72	.7	132	1.2
13	1 18.3	1 18.5	1 14.7	13	.1	73	.7	133	1.2
14	1 18.5	1 18.7	1 14.9	14	.1	74	.7	134	1.2
15	1 18.8	1 19.0	1 15.2	15	.1	75	.7	135	1.2
16	1 19.0	1 19.2	1 15.4	16	.1	76	.7	136	1.2
17	1 19.3	1 19.5	1 15.6	17	.2	77	.7	137	1.3
18	1 19.5	1 19.7	1 15.9	18	.2	78	.7	138	1.3
19	1 19.8	1 20.0	1 16.1	19	.2	79	.7	139	1.3
20	1 20.0	1 20.2	1 16.4	20	.2	80	.7	140	1.3
21	1 20.3	1 20.5	1 16.6	21	.2	81	.7	141	1.3
22	1 20.5	1 20.7	1 16.8	22	.2	82	.8	142	1.3
23	1 20.8	1 21.0	1 17.1	23	.2	83	.8	143	1.3
24	1 21.0	1 21.2	1 17.3	24	.2	84	.8	144	1.3
25	1 21.3	1 21.5	1 17.5	25	.2	85	.8	145	1.3
26	1 21.5	1 21.7	1 17.8	26	.2	86	.8	146	1.3
27	1 21.8	1 22.0	1 18.0	27	.2	87	.8	147	1.3
28	1 22.0	1 22.2	1 18.3	28	.3	88	.8	148	1.4
29	1 22.3	1 22.5	1 18.5	29	.3	89	.8	149	1.4
30	1 22.5	1 22.7	1 18.7	30	.3	90	.8	150	1.4
31	1 22.8	1 23.0	1 19.0	31	.3	91	.8	151	1.4
32	1 23.0	1 23.2	1 19.2	32	.3	92	.8	152	1.4
33	1 23.3	1 23.5	1 19.5	33	.3	93	.9	153	1.4
34	1 23.5	1 23.7	1 19.7	34	.3	94	.9	154	1.4
35	1 23.8	1 24.0	1 19.9	35	.3	95	.9	155	1.4
36	1 24.0	1 24.2	1 20.2	36	.3	96	.9	156	1.4
37	1 24.3	1 24.5	1 20.4	37	.3	97	.9	157	1.4
38	1 24.5	1 24.7	1 20.7	38	.3	98	.9	158	1.4
39	1 24.8	1 25.0	1 20.9	39	.4	99	.9	159	1.5
40	1 25.0	1 25.2	1 21.1	40	.4	100	.9	160	1.5
41	1 25.3	1 25.5	1 21.4	41	.4	101	.9	161	1.5
42	1 25.5	1 25.7	1 21.6	42	.4	102	.9	162	1.5
43	1 25.8	1 26.0	1 21.8	43	.4	103	.9	163	1.5
44	1 26.0	1 26.2	1 22.1	44	.4	104	1.0	164	1.5
45	1 26.3	1 26.5	1 22.3	45	.4	105	1.0	165	1.5
46	1 26.5	1 26.7	1 22.6	46	.4	106	1.0	166	1.5
47	1 26.8	1 27.0	1 22.8	47	.4	107	1.0	167	1.5
48	1 27.0	1 27.2	1 23.0	48	.4	108	1.0	168	1.5
49	1 27.3	1 27.5	1 23.3	49	.4	109	1.0	169	1.5
50	1 27.5	1 27.7	1 23.5	50	.5	110	1.0	170	1.6
51	1 27.8	1 28.0	1 23.8	51	.5	111	1.0	171	1.6
52	1 28.0	1 28.2	1 24.0	52	.5	112	1.0	172	1.6
53	1 28.3	1 28.5	1 24.2	53	.5	113	1.0	173	1.6
54	1 28.5	1 28.7	1 24.5	54	.5	114	1.0	174	1.6
55	1 28.8	1 29.0	1 24.7	55	.5	115	1.1	175	1.6
56	1 29.0	1 29.2	1 24.9	56	.5	116	1.1	176	1.6
57	1 29.3	1 29.5	1 25.2	57	.5	117	1.1	177	1.6
58	1 29.5	1 29.7	1 25.4	58	.5	118	1.1	178	1.6
59	1 29.8	1 30.0	1 25.7	59	.5	119	1.1	179	1.6
60	1 30.0	1 30.3	1 25.9	60	.6	120	1.1	180	1.7

0 h 6 min

POPRAVKA ČASOVNOG UGLA				POPRAVKA DRUGOG REDA za časovni ugao i deklinaciju Sunca, Mjeseca i planeta					
s	SUNCA I PLANETA	PROLJEĆNE TAČKE ♈	MJESECA ☾	Δ	poprav.	Δ	poprav.	Δ	poprav.
	° ′	° ′	° ′		′		′		′
0	1 30.0	1 30.3	1 25.9	0	.0	60	.7	120	1.3
1	1 30.3	1 30.5	1 26.1	1	.0	61	.7	121	1.3
2	1 30.5	1 30.8	1 26.4	2	.0	62	.7	122	1.3
3	1 30.8	1 31.0	1 26.6	3	.0	63	.7	123	1.3
4	1 31.0	1 31.3	1 26.9	4	.0	64	.7	124	1.3
5	1 31.3	1 31.5	1 27.1	5	.1	65	.7	125	1.4
6	1 31.5	1 31.8	1 27.3	6	.1	66	.7	126	1.4
7	1 31.8	1 32.0	1 27.6	7	.1	67	.7	127	1.4
8	1 32.0	1 32.3	1 27.8	8	.1	68	.7	128	1.4
9	1 32.3	1 32.5	1 28.0	9	.1	69	.7	129	1.4
10	1 32.5	1 32.8	1 28.3	10	.1	70	.8	130	1.4
11	1 32.8	1 33.0	1 28.5	11	.1	71	.8	131	1.4
12	1 33.0	1 33.3	1 28.8	12	.1	72	.8	132	1.4
13	1 33.3	1 33.5	1 29.0	13	.1	73	.8	133	1.4
14	1 33.5	1 33.8	1 29.2	14	.2	74	.8	134	1.5
15	1 33.8	1 34.0	1 29.5	15	.2	75	.8	135	1.5
16	1 34.0	1 34.3	1 29.7	16	.2	76	.8	136	1.5
17	1 34.3	1 34.5	1 30.0	17	.2	77	.8	137	1.5
18	1 34.5	1 34.8	1 30.2	18	.2	78	.8	138	1.5
19	1 34.8	1 35.0	1 30.4	19	.2	79	.9	139	1.5
20	1 35.0	1 35.3	1 30.7	20	.2	80	.9	140	1.5
21	1 35.3	1 35.5	1 30.9	21	.2	81	.9	141	1.5
22	1 35.5	1 35.8	1 31.1	22	.2	82	.9	142	1.5
23	1 35.8	1 36.0	1 31.4	23	.2	83	.9	143	1.5
24	1 36.0	1 36.3	1 31.6	24	.3	84	.9	144	1.6
25	1 36.3	1 36.5	1 31.9	25	.3	85	.9	145	1.6
26	1 36.5	1 36.8	1 32.1	26	.3	86	.9	146	1.6
27	1 36.8	1 37.0	1 32.3	27	.3	87	.9	147	1.6
28	1 37.0	1 37.3	1 32.6	28	.3	88	1.0	148	1.6
29	1 37.3	1 37.5	1 32.8	29	.3	89	1.0	149	1.6
30	1 37.5	1 37.8	1 33.1	30	.3	90	1.0	150	1.6
31	1 37.8	1 38.0	1 33.3	31	.3	91	1.0	151	1.6
32	1 38.0	1 38.3	1 33.5	32	.3	92	1.0	152	1.6
33	1 38.3	1 38.5	1 33.8	33	.4	93	1.0	153	1.7
34	1 38.5	1 38.8	1 34.0	34	.4	94	1.0	154	1.7
35	1 38.8	1 39.0	1 34.3	35	.4	95	1.0	155	1.7
36	1 39.0	1 39.3	1 34.5	36	.4	96	1.0	156	1.7
37	1 39.3	1 39.5	1 34.7	37	.4	97	1.1	157	1.7
38	1 39.5	1 39.8	1 35.0	38	.4	98	1.1	158	1.7
39	1 39.8	1 40.0	1 35.2	39	.4	99	1.1	159	1.7
40	1 40.0	1 40.3	1 35.4	40	.4	100	1.1	160	1.7
41	1 40.3	1 40.5	1 35.7	41	.4	101	1.1	161	1.7
42	1 40.5	1 40.8	1 35.9	42	.5	102	1.1	162	1.8
43	1 40.8	1 41.0	1 36.2	43	.5	103	1.1	163	1.8
44	1 41.0	1 41.3	1 36.4	44	.5	104	1.1	164	1.8
45	1 41.3	1 41.5	1 36.6	45	.5	105	1.1	165	1.8
46	1 41.5	1 41.8	1 36.9	46	.5	106	1.1	166	1.8
47	1 41.8	1 42.0	1 37.1	47	.5	107	1.2	167	1.8
48	1 42.0	1 42.3	1 37.4	48	.5	108	1.2	168	1.8
49	1 42.3	1 42.5	1 37.6	49	.5	109	1.2	169	1.8
50	1 42.5	1 42.8	1 37.8	50	.5	110	1.2	170	1.8
51	1 42.8	1 43.0	1 38.1	51	.6	111	1.2	171	1.9
52	1 43.0	1 43.3	1 38.3	52	.6	112	1.2	172	1.9
53	1 43.3	1 43.5	1 38.5	53	.6	113	1.2	173	1.9
54	1 43.5	1 43.8	1 38.8	54	.6	114	1.2	174	1.9
55	1 43.8	1 44.0	1 39.0	55	.6	115	1.2	175	1.9
56	1 44.0	1 44.3	1 39.3	56	.6	116	1.3	176	1.9
57	1 44.3	1 44.5	1 39.5	57	.6	117	1.3	177	1.9
58	1 44.5	1 44.8	1 39.7	58	.6	118	1.3	178	1.9
59	1 44.8	1 45.0	1 40.0	59	.6	119	1.3	179	1.9
60	1 45.0	1 45.3	1 40.2	60	.7	120	1.3	180	2.0

0 h 7 min

POPRAVKA ČASOVNOG UGLA				POPRAVKA DRUGOG REDA za časovni ugao i deklinaciju Sunca, Mjeseca i planeta					
s	SUNCA I PLANETA	PROLJEĆNE TAČKE ♈	MJESECA ☾	Δ	poprav.	Δ	poprav.	Δ	poprav.
	° ′	° ′	° ′		′		′		′
0	1 45.0	1 45.3	1 40.2	0	.0	60	.8	120	1.5
1	1 45.3	1 45.5	1 40.5	1	.0	61	.8	121	1.5
2	1 45.5	1 45.8	1 40.7	2	.0	62	.8	122	1.5
3	1 45.8	1 46.0	1 40.9	3	.0	63	.8	123	1.5
4	1 46.0	1 46.3	1 41.2	4	.1	64	.8	124	1.6
5	1 46.3	1 46.5	1 41.4	5	.1	65	.8	125	1.6
6	1 46.5	1 46.8	1 41.6	6	.1	66	.8	126	1.6
7	1 46.8	1 47.0	1 41.9	7	.1	67	.8	127	1.6
8	1 47.0	1 47.3	1 42.1	8	.1	68	.9	128	1.6
9	1 47.3	1 47.5	1 42.4	9	.1	69	.9	129	1.6
10	1 47.5	1 47.8	1 42.6	10	.1	70	.9	130	1.6
11	1 47.8	1 48.0	1 42.8	11	.1	71	.9	131	1.6
12	1 48.0	1 48.3	1 43.1	12	.2	72	.9	132	1.7
13	1 48.3	1 48.6	1 43.3	13	.2	73	.9	133	1.7
14	1 48.5	1 48.8	1 43.6	14	.2	74	.9	134	1.7
15	1 48.8	1 49.1	1 43.8	15	.2	75	.9	135	1.7
16	1 49.0	1 49.3	1 44.0	16	.2	76	1.0	136	1.7
17	1 49.3	1 49.6	1 44.3	17	.2	77	1.0	137	1.7
18	1 49.5	1 49.8	1 44.5	18	.2	78	1.0	138	1.7
19	1 49.8	1 50.1	1 44.8	19	.2	79	1.0	139	1.7
20	1 50.0	1 50.3	1 45.0	20	.3	80	1.0	140	1.8
21	1 50.3	1 50.6	1 45.2	21	.3	81	1.0	141	1.8
22	1 50.5	1 50.8	1 45.5	22	.3	82	1.0	142	1.8
23	1 50.8	1 51.1	1 45.7	23	.3	83	1.0	143	1.8
24	1 51.0	1 51.3	1 45.9	24	.3	84	1.1	144	1.8
25	1 51.3	1 51.6	1 46.2	25	.3	85	1.1	145	1.8
26	1 51.5	1 51.8	1 46.4	26	.3	86	1.1	146	1.8
27	1 51.8	1 52.1	1 46.7	27	.3	87	1.1	147	1.8
28	1 52.0	1 52.3	1 46.9	28	.4	88	1.1	148	1.9
29	1 52.3	1 52.6	1 47.1	29	.4	89	1.1	149	1.9
30	1 52.5	1 52.8	1 47.4	30	.4	90	1.1	150	1.9
31	1 52.8	1 53.1	1 47.6	31	.4	91	1.1	151	1.9
32	1 53.0	1 53.3	1 47.9	32	.4	92	1.2	152	1.9
33	1 53.3	1 53.6	1 48.1	33	.4	93	1.2	153	1.9
34	1 53.5	1 53.8	1 48.3	34	.4	94	1.2	154	1.9
35	1 53.8	1 54.1	1 48.6	35	.4	95	1.2	155	1.9
36	1 54.0	1 54.3	1 48.8	36	.5	96	1.2	156	2.0
37	1 54.3	1 54.6	1 49.0	37	.5	97	1.2	157	2.0
38	1 54.5	1 54.8	1 49.3	38	.5	98	1.2	158	2.0
39	1 54.8	1 55.1	1 49.5	39	.5	99	1.2	159	2.0
40	1 55.0	1 55.3	1 49.8	40	.5	100	1.3	160	2.0
41	1 55.3	1 55.6	1 50.0	41	.5	101	1.3	161	2.0
42	1 55.5	1 55.8	1 50.2	42	.5	102	1.3	162	2.0
43	1 55.8	1 56.1	1 50.5	43	.5	103	1.3	163	2.0
44	1 56.0	1 56.3	1 50.7	44	.6	104	1.3	164	2.1
45	1 56.3	1 56.6	1 51.0	45	.6	105	1.3	165	2.1
46	1 56.5	1 56.8	1 51.2	46	.6	106	1.3	166	2.1
47	1 56.8	1 57.1	1 51.4	47	.6	107	1.3	167	2.1
48	1 57.0	1 57.3	1 51.7	48	.6	108	1.4	168	2.1
49	1 57.3	1 57.6	1 51.9	49	.6	109	1.4	169	2.1
50	1 57.5	1 57.8	1 52.1	50	.6	110	1.4	170	2.1
51	1 57.8	1 58.1	1 52.4	51	.6	111	1.4	171	2.1
52	1 58.0	1 58.3	1 52.6	52	.7	112	1.4	172	2.2
53	1 58.3	1 58.6	1 52.9	53	.7	113	1.4	173	2.2
54	1 58.5	1 58.8	1 53.1	54	.7	114	1.4	174	2.2
55	1 58.8	1 59.1	1 53.3	55	.7	115	1.4	175	2.2
56	1 59.0	1 59.3	1 53.6	56	.7	116	1.5	176	2.2
57	1 59.3	1 59.6	1 53.8	57	.7	117	1.5	177	2.2
58	1 59.5	1 59.8	1 54.1	58	.7	118	1.5	178	2.2
59	1 59.8	2 .1	1 54.3	59	.7	119	1.5	179	2.2
60	2 .0	2 .3	1 54.5	60	.8	120	1.5	180	2.3

0 h 8 min

s	POPRAVKA ČASOVNOG UGLA: SUNCA I PLANETA	PROLJEĆNE TAČKE ♈	MJESECA ☾	POPRAVKA DRUGOG REDA za časovni ugao i deklinaciju Sunca, Mjeseca i planeta: Δ	popr.	Δ	popr.	Δ	popr.
	° ′	° ′	° ′		′		′		′
0	2 .0	2 .3	1 54.5	0	.0	60	.9	120	1.7
1	2 .3	2 .6	1 54.8	1	.0	61	.9	121	1.7
2	2 .5	2 .8	1 55.0	2	.0	62	.9	122	1.7
3	2 .8	2 1.1	1 55.2	3	.0	63	.9	123	1.7
4	2 1.0	2 1.3	1 55.5	4	.1	64	.9	124	1.8
5	2 1.3	2 1.6	1 55.7	5	.1	65	.9	125	1.8
6	2 1.5	2 1.8	1 56.0	6	.1	66	.9	126	1.8
7	2 1.8	2 2.1	1 56.2	7	.1	67	.9	127	1.8
8	2 2.0	2 2.3	1 56.4	8	.1	68	1.0	128	1.8
9	2 2.3	2 2.6	1 56.7	9	.1	69	1.0	129	1.8
10	2 2.5	2 2.8	1 56.9	10	.1	70	1.0	130	1.8
11	2 2.8	2 3.1	1 57.2	11	.2	71	1.0	131	1.9
12	2 3.0	2 3.3	1 57.4	12	.2	72	1.0	132	1.9
13	2 3.3	2 3.6	1 57.6	13	.2	73	1.0	133	1.9
14	2 3.5	2 3.8	1 57.9	14	.2	74	1.0	134	1.9
15	2 3.8	2 4.1	1 58.1	15	.2	75	1.1	135	1.9
16	2 4.0	2 4.3	1 58.4	16	.2	76	1.1	136	1.9
17	2 4.3	2 4.6	1 58.6	17	.2	77	1.1	137	1.9
18	2 4.5	2 4.8	1 58.8	18	.3	78	1.1	138	2.0
19	2 4.8	2 5.1	1 59.1	19	.3	79	1.1	139	2.0
20	2 5.0	2 5.3	1 59.3	20	.3	80	1.1	140	2.0
21	2 5.3	2 5.6	1 59.5	21	.3	81	1.1	141	2.0
22	2 5.5	2 5.8	1 59.8	22	.3	82	1.2	142	2.0
23	2 5.8	2 6.1	2 .0	23	.3	83	1.2	143	2.0
24	2 6.0	2 6.4	2 .3	24	.3	84	1.2	144	2.0
25	2 6.3	2 6.6	2 .5	25	.4	85	1.2	145	2.1
26	2 6.5	2 6.9	2 .7	26	.4	86	1.2	146	2.1
27	2 6.8	2 7.1	2 1.0	27	.4	87	1.2	147	2.1
28	2 7.0	2 7.4	2 1.2	28	.4	88	1.2	148	2.1
29	2 7.3	2 7.6	2 1.5	29	.4	89	1.3	149	2.1
30	2 7.5	2 7.9	2 1.7	30	.4	90	1.3	150	2.1
31	2 7.8	2 8.1	2 1.9	31	.4	91	1.3	151	2.1
32	2 8.0	2 8.4	2 2.2	32	.5	92	1.3	152	2.2
33	2 8.3	2 8.6	2 2.4	33	.5	93	1.3	153	2.2
34	2 8.5	2 8.9	2 2.6	34	.5	94	1.3	154	2.2
35	2 8.8	2 9.1	2 2.9	35	.5	95	1.3	155	2.2
36	2 9.0	2 9.4	2 3.1	36	.5	96	1.4	156	2.2
37	2 9.3	2 9.6	2 3.4	37	.5	97	1.4	157	2.2
38	2 9.5	2 9.9	2 3.6	38	.5	98	1.4	158	2.2
39	2 9.8	2 10.1	2 3.8	39	.6	99	1.4	159	2.3
40	2 10.0	2 10.4	2 4.1	40	.6	100	1.4	160	2.3
41	2 10.3	2 10.6	2 4.3	41	.6	101	1.4	161	2.3
42	2 10.5	2 10.9	2 4.6	42	.6	102	1.4	162	2.3
43	2 10.8	2 11.1	2 4.8	43	.6	103	1.5	163	2.3
44	2 11.0	2 11.4	2 5.0	44	.6	104	1.5	164	2.3
45	2 11.3	2 11.6	2 5.3	45	.6	105	1.5	165	2.3
46	2 11.5	2 11.9	2 5.5	46	.7	106	1.5	166	2.4
47	2 11.8	2 12.1	2 5.7	47	.7	107	1.5	167	2.4
48	2 12.0	2 12.4	2 6.0	48	.7	108	1.5	168	2.4
49	2 12.3	2 12.6	2 6.2	49	.7	109	1.5	169	2.4
50	2 12.5	2 12.9	2 6.5	50	.7	110	1.6	170	2.4
51	2 12.8	2 13.1	2 6.7	51	.7	111	1.6	171	2.4
52	2 13.0	2 13.4	2 6.9	52	.7	112	1.6	172	2.4
53	2 13.3	2 13.6	2 7.2	53	.8	113	1.6	173	2.5
54	2 13.5	2 13.9	2 7.4	54	.8	114	1.6	174	2.5
55	2 13.8	2 14.1	2 7.7	55	.8	115	1.6	175	2.5
56	2 14.0	2 14.4	2 7.9	56	.8	116	1.6	176	2.5
57	2 14.3	2 14.6	2 8.1	57	.8	117	1.7	177	2.5
58	2 14.5	2 14.9	2 8.4	58	.8	118	1.7	178	2.5
59	2 14.8	2 15.1	2 8.6	59	.8	119	1.7	179	2.5
60	2 15.0	2 15.4	2 8.9	60	.9	120	1.7	180	2.6

0 h 9 min

s	POPRAVKA ČASOVNOG UGLA: SUNCA I PLANETA	PROLJEĆNE TAČKE ♈	MJESECA ☾	POPRAVKA DRUGOG REDA za časovni ugao i deklinaciju Sunca, Mjeseca i planeta: Δ	popr.	Δ	popr.	Δ	popr.
	° ′	° ′	° ′		′		′		′
0	2 15.0	2 15.4	2 8.9	0	.0	60	1.0	120	1.9
1	2 15.3	2 15.6	2 9.1	1	.0	61	1.0	121	1.9
2	2 15.5	2 15.9	2 9.3	2	.0	62	1.0	122	1.9
3	2 15.8	2 16.1	2 9.6	3	.0	63	1.0	123	1.9
4	2 16.0	2 16.4	2 9.8	4	.1	64	1.0	124	2.0
5	2 16.3	2 16.6	2 10.0	5	.1	65	1.0	125	2.0
6	2 16.5	2 16.9	2 10.3	6	.1	66	1.0	126	2.0
7	2 16.8	2 17.1	2 10.5	7	.1	67	1.1	127	2.0
8	2 17.0	2 17.4	2 10.8	8	.1	68	1.1	128	2.0
9	2 17.3	2 17.6	2 11.0	9	.1	69	1.1	129	2.0
10	2 17.5	2 17.9	2 11.2	10	.2	70	1.1	130	2.1
11	2 17.8	2 18.1	2 11.5	11	.2	71	1.1	131	2.1
12	2 18.0	2 18.4	2 11.7	12	.2	72	1.1	132	2.1
13	2 18.3	2 18.6	2 12.0	13	.2	73	1.2	133	2.1
14	2 18.5	2 18.9	2 12.2	14	.2	74	1.2	134	2.1
15	2 18.8	2 19.1	2 12.4	15	.2	75	1.2	135	2.1
16	2 19.0	2 19.4	2 12.7	16	.3	76	1.2	136	2.2
17	2 19.3	2 19.6	2 12.9	17	.3	77	1.2	137	2.2
18	2 19.5	2 19.9	2 13.1	18	.3	78	1.2	138	2.2
19	2 19.8	2 20.1	2 13.4	19	.3	79	1.3	139	2.2
20	2 20.0	2 20.4	2 13.6	20	.3	80	1.3	140	2.2
21	2 20.3	2 20.6	2 13.9	21	.3	81	1.3	141	2.2
22	2 20.5	2 20.9	2 14.1	22	.3	82	1.3	142	2.2
23	2 20.8	2 21.1	2 14.3	23	.4	83	1.3	143	2.3
24	2 21.0	2 21.4	2 14.6	24	.4	84	1.3	144	2.3
25	2 21.3	2 21.6	2 14.8	25	.4	85	1.3	145	2.3
26	2 21.5	2 21.9	2 15.1	26	.4	86	1.4	146	2.3
27	2 21.8	2 22.1	2 15.3	27	.4	87	1.4	147	2.3
28	2 22.0	2 22.4	2 15.5	28	.4	88	1.4	148	2.3
29	2 22.3	2 22.6	2 15.8	29	.5	89	1.4	149	2.4
30	2 22.5	2 22.9	2 16.0	30	.5	90	1.4	150	2.4
31	2 22.8	2 23.1	2 16.2	31	.5	91	1.4	151	2.4
32	2 23.0	2 23.4	2 16.5	32	.5	92	1.5	152	2.4
33	2 23.3	2 23.6	2 16.7	33	.5	93	1.5	153	2.4
34	2 23.5	2 23.9	2 17.0	34	.5	94	1.5	154	2.4
35	2 23.8	2 24.1	2 17.2	35	.6	95	1.5	155	2.5
36	2 24.0	2 24.4	2 17.4	36	.6	96	1.5	156	2.5
37	2 24.3	2 24.7	2 17.7	37	.6	97	1.5	157	2.5
38	2 24.5	2 24.9	2 17.9	38	.6	98	1.6	158	2.5
39	2 24.8	2 25.2	2 18.2	39	.6	99	1.6	159	2.5
40	2 25.0	2 25.4	2 18.4	40	.6	100	1.6	160	2.5
41	2 25.3	2 25.7	2 18.6	41	.6	101	1.6	161	2.5
42	2 25.5	2 25.9	2 18.9	42	.7	102	1.6	162	2.6
43	2 25.8	2 26.2	2 19.1	43	.7	103	1.6	163	2.6
44	2 26.0	2 26.4	2 19.3	44	.7	104	1.6	164	2.6
45	2 26.3	2 26.7	2 19.6	45	.7	105	1.7	165	2.6
46	2 26.5	2 26.9	2 19.8	46	.7	106	1.7	166	2.6
47	2 26.8	2 27.2	2 20.1	47	.7	107	1.7	167	2.6
48	2 27.0	2 27.4	2 20.3	48	.8	108	1.7	168	2.7
49	2 27.3	2 27.7	2 20.5	49	.8	109	1.7	169	2.7
50	2 27.5	2 27.9	2 20.8	50	.8	110	1.7	170	2.7
51	2 27.8	2 28.2	2 21.0	51	.8	111	1.8	171	2.7
52	2 28.0	2 28.4	2 21.3	52	.8	112	1.8	172	2.7
53	2 28.3	2 28.7	2 21.5	53	.8	113	1.8	173	2.7
54	2 28.5	2 28.9	2 21.7	54	.9	114	1.8	174	2.8
55	2 28.8	2 29.2	2 22.0	55	.9	115	1.8	175	2.8
56	2 29.0	2 29.4	2 22.2	56	.9	116	1.8	176	2.8
57	2 29.3	2 29.7	2 22.5	57	.9	117	1.9	177	2.8
58	2 29.5	2 29.9	2 22.7	58	.9	118	1.9	178	2.8
59	2 29.8	2 30.2	2 22.9	59	.9	119	1.9	179	2.8
60	2 30.0	2 30.4	2 23.2	60	1.0	120	1.9	180	2.9

0 h 10 min

POPRAVKA ČASOVNOG UGLA				POPRAVKA DRUGOG REDA za časovni ugao i deklinaciju Sunca, Mjeseca i planeta					
s	SUNCA I PLANETA	PROLJEĆNE TAČKE ♈	MJESECA ☾	Δ	popr.	Δ	popr.	Δ	popr.
	° ′	° ′	° ′		′		′		′
0	2 30.0	2 30.4	2 23.2	0	.0	60	1.1	120	2.1
1	2 30.3	2 30.7	2 23.4	1	.0	61	1.1	121	2.1
2	2 30.5	2 30.9	2 23.6	2	.0	62	1.1	122	2.1
3	2 30.8	2 31.2	2 23.9	3	.1	63	1.1	123	2.2
4	2 31.0	2 31.4	2 24.1	4	.1	64	1.1	124	2.2
5	2 31.3	2 31.7	2 24.4	5	.1	65	1.1	125	2.2
6	2 31.5	2 31.9	2 24.6	6	.1	66	1.2	126	2.2
7	2 31.8	2 32.2	2 24.8	7	.1	67	1.2	127	2.2
8	2 32.0	2 32.4	2 25.1	8	.1	68	1.2	128	2.2
9	2 32.3	2 32.7	2 25.3	9	.2	69	1.2	129	2.3
10	2 32.5	2 32.9	2 25.6	10	.2	70	1.2	130	2.3
11	2 32.8	2 33.2	2 25.8	11	.2	71	1.2	131	2.3
12	2 33.0	2 33.4	2 26.0	12	.2	72	1.3	132	2.3
13	2 33.3	2 33.7	2 26.3	13	.2	73	1.3	133	2.3
14	2 33.5	2 33.9	2 26.5	14	.2	74	1.3	134	2.3
15	2 33.8	2 34.2	2 26.7	15	.3	75	1.3	135	2.4
16	2 34.0	2 34.4	2 27.0	16	.3	76	1.3	136	2.4
17	2 34.3	2 34.7	2 27.2	17	.3	77	1.3	137	2.4
18	2 34.5	2 34.9	2 27.5	18	.3	78	1.4	138	2.4
19	2 34.8	2 35.2	2 27.7	19	.3	79	1.4	139	2.4
20	2 35.0	2 35.4	2 27.9	20	.4	80	1.4	140	2.5
21	2 35.3	2 35.7	2 28.2	21	.4	81	1.4	141	2.5
22	2 35.5	2 35.9	2 28.4	22	.4	82	1.4	142	2.5
23	2 35.8	2 36.2	2 28.7	23	.4	83	1.5	143	2.5
24	2 36.0	2 36.4	2 28.9	24	.4	84	1.5	144	2.5
25	2 36.3	2 36.7	2 29.1	25	.4	85	1.5	145	2.5
26	2 36.5	2 36.9	2 29.4	26	.5	86	1.5	146	2.6
27	2 36.8	2 37.2	2 29.6	27	.5	87	1.5	147	2.6
28	2 37.0	2 37.4	2 29.8	28	.5	88	1.5	148	2.6
29	2 37.3	2 37.7	2 30.1	29	.5	89	1.6	149	2.6
30	2 37.5	2 37.9	2 30.3	30	.5	90	1.6	150	2.6
31	2 37.8	2 38.2	2 30.6	31	.5	91	1.6	151	2.6
32	2 38.0	2 38.4	2 30.8	32	.6	92	1.6	152	2.7
33	2 38.3	2 38.7	2 31.0	33	.6	93	1.6	153	2.7
34	2 38.5	2 38.9	2 31.3	34	.6	94	1.6	154	2.7
35	2 38.8	2 39.2	2 31.5	35	.6	95	1.7	155	2.7
36	2 39.0	2 39.4	2 31.8	36	.6	96	1.7	156	2.7
37	2 39.3	2 39.7	2 32.0	37	.6	97	1.7	157	2.7
38	2 39.5	2 39.9	2 32.2	38	.7	98	1.7	158	2.8
39	2 39.8	2 40.2	2 32.5	39	.7	99	1.7	159	2.8
40	2 40.0	2 40.4	2 32.7	40	.7	100	1.8	160	2.8
41	2 40.3	2 40.7	2 32.9	41	.7	101	1.8	161	2.8
42	2 40.5	2 40.9	2 33.2	42	.7	102	1.8	162	2.8
43	2 40.8	2 41.2	2 33.4	43	.8	103	1.8	163	2.9
44	2 41.0	2 41.4	2 33.7	44	.8	104	1.8	164	2.9
45	2 41.3	2 41.7	2 33.9	45	.8	105	1.8	165	2.9
46	2 41.5	2 41.9	2 34.1	46	.8	106	1.9	166	2.9
47	2 41.8	2 42.2	2 34.4	47	.8	107	1.9	167	2.9
48	2 42.0	2 42.5	2 34.6	48	.8	108	1.9	168	2.9
49	2 42.3	2 42.7	2 34.9	49	.9	109	1.9	169	3.0
50	2 42.5	2 43.0	2 35.1	50	.9	110	1.9	170	3.0
51	2 42.8	2 43.2	2 35.3	51	.9	111	1.9	171	3.0
52	2 43.0	2 43.5	2 35.6	52	.9	112	2.0	172	3.0
53	2 43.3	2 43.7	2 35.8	53	.9	113	2.0	173	3.0
54	2 43.5	2 44.0	2 36.1	54	.9	114	2.0	174	3.0
55	2 43.8	2 44.2	2 36.3	55	1.0	115	2.0	175	3.1
56	2 44.0	2 44.5	2 36.5	56	1.0	116	2.0	176	3.1
57	2 44.3	2 44.7	2 36.8	57	1.0	117	2.0	177	3.1
58	2 44.5	2 45.0	2 37.0	58	1.0	118	2.1	178	3.1
59	2 44.8	2 45.2	2 37.2	59	1.0	119	2.1	179	3.1
60	2 45.0	2 45.5	2 37.5	60	1.1	120	2.1	180	3.2

0 h 11 min

POPRAVKA ČASOVNOG UGLA				POPRAVKA DRUGOG REDA za časovni ugao i deklinaciju Sunca, Mjeseca i planeta					
s	SUNCA I PLANETA	PROLJEĆNE TAČKE ♈	MJESECA ☾	Δ	popr.	Δ	popr.	Δ	popr.
	° ′	° ′	° ′		′		′		′
0	2 45.0	2 45.5	2 37.5	0	.0	60	1.2	120	2.3
1	2 45.3	2 45.7	2 37.7	1	.0	61	1.2	121	2.3
2	2 45.5	2 46.0	2 38.0	2	.0	62	1.2	122	2.3
3	2 45.8	2 46.2	2 38.2	3	.1	63	1.2	123	2.4
4	2 46.0	2 46.5	2 38.4	4	.1	64	1.2	124	2.4
5	2 46.3	2 46.7	2 38.7	5	.1	65	1.2	125	2.4
6	2 46.5	2 47.0	2 38.9	6	.1	66	1.3	126	2.4
7	2 46.8	2 47.2	2 39.2	7	.1	67	1.3	127	2.4
8	2 47.0	2 47.5	2 39.4	8	.2	68	1.3	128	2.5
9	2 47.3	2 47.7	2 39.6	9	.2	69	1.3	129	2.5
10	2 47.5	2 48.0	2 39.9	10	.2	70	1.3	130	2.5
11	2 47.8	2 48.2	2 40.1	11	.2	71	1.4	131	2.5
12	2 48.0	2 48.5	2 40.3	12	.2	72	1.4	132	2.5
13	2 48.3	2 48.7	2 40.6	13	.2	73	1.4	133	2.5
14	2 48.5	2 49.0	2 40.8	14	.3	74	1.4	134	2.6
15	2 48.8	2 49.2	2 41.1	15	.3	75	1.4	135	2.6
16	2 49.0	2 49.5	2 41.3	16	.3	76	1.5	136	2.6
17	2 49.3	2 49.7	2 41.5	17	.3	77	1.5	137	2.6
18	2 49.5	2 50.0	2 41.8	18	.3	78	1.5	138	2.6
19	2 49.8	2 50.2	2 42.0	19	.4	79	1.5	139	2.7
20	2 50.0	2 50.5	2 42.3	20	.4	80	1.5	140	2.7
21	2 50.3	2 50.7	2 42.5	21	.4	81	1.6	141	2.7
22	2 50.5	2 51.0	2 42.7	22	.4	82	1.6	142	2.7
23	2 50.8	2 51.2	2 43.0	23	.4	83	1.6	143	2.7
24	2 51.0	2 51.5	2 43.2	24	.5	84	1.6	144	2.8
25	2 51.3	2 51.7	2 43.4	25	.5	85	1.6	145	2.8
26	2 51.5	2 52.0	2 43.7	26	.5	86	1.6	146	2.8
27	2 51.8	2 52.2	2 43.9	27	.5	87	1.7	147	2.8
28	2 52.0	2 52.5	2 44.2	28	.5	88	1.7	148	2.8
29	2 52.3	2 52.7	2 44.4	29	.6	89	1.7	149	2.9
30	2 52.5	2 53.0	2 44.6	30	.6	90	1.7	150	2.9
31	2 52.8	2 53.2	2 44.9	31	.6	91	1.7	151	2.9
32	2 53.0	2 53.5	2 45.1	32	.6	92	1.8	152	2.9
33	2 53.3	2 53.7	2 45.4	33	.6	93	1.8	153	2.9
34	2 53.5	2 54.0	2 45.6	34	.7	94	1.8	154	3.0
35	2 53.8	2 54.2	2 45.8	35	.7	95	1.8	155	3.0
36	2 54.0	2 54.5	2 46.1	36	.7	96	1.8	156	3.0
37	2 54.3	2 54.7	2 46.3	37	.7	97	1.9	157	3.0
38	2 54.5	2 55.0	2 46.6	38	.7	98	1.9	158	3.0
39	2 54.8	2 55.2	2 46.8	39	.7	99	1.9	159	3.0
40	2 55.0	2 55.5	2 47.0	40	.8	100	1.9	160	3.1
41	2 55.3	2 55.7	2 47.3	41	.8	101	1.9	161	3.1
42	2 55.5	2 56.0	2 47.5	42	.8	102	2.0	162	3.1
43	2 55.8	2 56.2	2 47.7	43	.8	103	2.0	163	3.1
44	2 56.0	2 56.5	2 48.0	44	.8	104	2.0	164	3.1
45	2 56.3	2 56.7	2 48.2	45	.9	105	2.0	165	3.2
46	2 56.5	2 57.0	2 48.5	46	.9	106	2.0	166	3.2
47	2 56.8	2 57.2	2 48.7	47	.9	107	2.1	167	3.2
48	2 57.0	2 57.5	2 48.9	48	.9	108	2.1	168	3.2
49	2 57.3	2 57.7	2 49.2	49	.9	109	2.1	169	3.2
50	2 57.5	2 58.0	2 49.4	50	1.0	110	2.1	170	3.3
51	2 57.8	2 58.2	2 49.7	51	1.0	111	2.1	171	3.3
52	2 58.0	2 58.5	2 49.9	52	1.0	112	2.1	172	3.3
53	2 58.3	2 58.7	2 50.1	53	1.0	113	2.2	173	3.3
54	2 58.5	2 59.0	2 50.4	54	1.0	114	2.2	174	3.3
55	2 58.8	2 59.2	2 50.6	55	1.1	115	2.2	175	3.4
56	2 59.0	2 59.5	2 50.8	56	1.1	116	2.2	176	3.4
57	2 59.3	2 59.7	2 51.1	57	1.1	117	2.2	177	3.4
58	2 59.5	2 60.0	2 51.3	58	1.1	118	2.3	178	3.4
59	2 59.8	3 .2	2 51.6	59	1.1	119	2.3	179	3.4
60	3 .0	3 .5	2 51.8	60	1.2	120	2.3	180	3.5

0 h 12 min

POPRAVKA ČASOVNOG UGLA				POPRAVKA DRUGOG REDA za časovni ugao i deklinaciju Sunca, Mjeseca i planeta					
s	SUNCA I PLANETA	PROLJEĆNE TAČKE ♈	MJESECA ☾	Δ	popr.	Δ	popr.	Δ	popr.
	° ′	° ′	° ′		′		′		′
0	3 .0	3 .5	2 51.8	0	.0	60	1.3	120	2.5
1	3 .3	3 .8	2 52.0	1	.0	61	1.3	121	2.5
2	3 .5	3 1.0	2 52.3	2	.0	62	1.3	122	2.5
3	3 .8	3 1.3	2 52.5	3	.1	63	1.3	123	2.6
4	3 1.0	3 1.5	2 52.8	4	.1	64	1.3	124	2.6
5	3 1.3	3 1.8	2 53.0	5	.1	65	1.4	125	2.6
6	3 1.5	3 2.0	2 53.2	6	.1	66	1.4	126	2.6
7	3 1.8	3 2.3	2 53.5	7	.1	67	1.4	127	2.6
8	3 2.0	3 2.5	2 53.7	8	.2	68	1.4	128	2.7
9	3 2.3	3 2.8	2 53.9	9	.2	69	1.4	129	2.7
10	3 2.5	3 3.0	2 54.2	10	.2	70	1.5	130	2.7
11	3 2.8	3 3.3	2 54.4	11	.2	71	1.5	131	2.7
12	3 3.0	3 3.5	2 54.7	12	.3	72	1.5	132	2.8
13	3 3.3	3 3.8	2 54.9	13	.3	73	1.5	133	2.8
14	3 3.5	3 4.0	2 55.1	14	.3	74	1.5	134	2.8
15	3 3.8	3 4.3	2 55.4	15	.3	75	1.6	135	2.8
16	3 4.0	3 4.5	2 55.6	16	.3	76	1.6	136	2.8
17	3 4.3	3 4.8	2 55.9	17	.4	77	1.6	137	2.9
18	3 4.5	3 5.0	2 56.1	18	.4	78	1.6	138	2.9
19	3 4.8	3 5.3	2 56.3	19	.4	79	1.6	139	2.9
20	3 5.0	3 5.5	2 56.6	20	.4	80	1.7	140	2.9
21	3 5.3	3 5.8	2 56.8	21	.4	81	1.7	141	2.9
22	3 5.5	3 6.0	2 57.0	22	.5	82	1.7	142	3.0
23	3 5.8	3 6.3	2 57.3	23	.5	83	1.7	143	3.0
24	3 6.0	3 6.5	2 57.5	24	.5	84	1.8	144	3.0
25	3 6.3	3 6.8	2 57.8	25	.5	85	1.8	145	3.0
26	3 6.5	3 7.0	2 58.0	26	.5	86	1.8	146	3.0
27	3 6.8	3 7.3	2 58.2	27	.6	87	1.8	147	3.1
28	3 7.0	3 7.5	2 58.5	28	.6	88	1.8	148	3.1
29	3 7.3	3 7.8	2 58.7	29	.6	89	1.9	149	3.1
30	3 7.5	3 8.0	2 59.0	30	.6	90	1.9	150	3.1
31	3 7.8	3 8.3	2 59.2	31	.6	91	1.9	151	3.1
32	3 8.0	3 8.5	2 59.4	32	.7	92	1.9	152	3.2
33	3 8.3	3 8.8	2 59.7	33	.7	93	1.9	153	3.2
34	3 8.5	3 9.0	2 59.9	34	.7	94	2.0	154	3.2
35	3 8.8	3 9.3	3 .2	35	.7	95	2.0	155	3.2
36	3 9.0	3 9.5	3 .4	36	.8	96	2.0	156	3.3
37	3 9.3	3 9.8	3 .6	37	.8	97	2.0	157	3.3
38	3 9.5	3 10.0	3 .9	38	.8	98	2.0	158	3.3
39	3 9.8	3 10.3	3 1.1	39	.8	99	2.1	159	3.3
40	3 10.0	3 10.5	3 1.3	40	.8	100	2.1	160	3.3
41	3 10.3	3 10.8	3 1.6	41	.9	101	2.1	161	3.4
42	3 10.5	3 11.0	3 1.8	42	.9	102	2.1	162	3.4
43	3 10.8	3 11.3	3 2.1	43	.9	103	2.1	163	3.4
44	3 11.0	3 11.5	3 2.3	44	.9	104	2.2	164	3.4
45	3 11.3	3 11.8	3 2.5	45	.9	105	2.2	165	3.4
46	3 11.5	3 12.0	3 2.8	46	1.0	106	2.2	166	3.5
47	3 11.8	3 12.3	3 3.0	47	1.0	107	2.2	167	3.5
48	3 12.0	3 12.5	3 3.3	48	1.0	108	2.3	168	3.5
49	3 12.3	3 12.8	3 3.5	49	1.0	109	2.3	169	3.5
50	3 12.5	3 13.0	3 3.7	50	1.0	110	2.3	170	3.5
51	3 12.8	3 13.3	3 4.0	51	1.1	111	2.3	171	3.6
52	3 13.0	3 13.5	3 4.2	52	1.1	112	2.3	172	3.6
53	3 13.3	3 13.8	3 4.4	53	1.1	113	2.4	173	3.6
54	3 13.5	3 14.0	3 4.7	54	1.1	114	2.4	174	3.6
55	3 13.8	3 14.3	3 4.9	55	1.1	115	2.4	175	3.6
56	3 14.0	3 14.5	3 5.2	56	1.2	116	2.4	176	3.7
57	3 14.3	3 14.8	3 5.4	57	1.2	117	2.4	177	3.7
58	3 14.5	3 15.0	3 5.6	58	1.2	118	2.5	178	3.7
59	3 14.8	3 15.3	3 5.9	59	1.2	119	2.5	179	3.7
60	3 15.0	3 15.5	3 6.1	60	1.3	120	2.5	180	3.8

0 h 13 min

POPRAVKA ČASOVNOG UGLA				POPRAVKA DRUGOG REDA za časovni ugao i deklinaciju Sunca, Mjeseca i planeta					
s	SUNCA I PLANETA	PROLJEĆNE TAČKE ♈	MJESECA ☾	Δ	popr.	Δ	popr.	Δ	popr.
	° ′	° ′	° ′		′		′		′
0	3 15.0	3 15.5	3 6.1	0	.0	60	1.4	120	2.7
1	3 15.3	3 15.8	3 6.4	1	.0	61	1.4	121	2.7
2	3 15.5	3 16.0	3 6.6	2	.0	62	1.4	122	2.7
3	3 15.8	3 16.3	3 6.8	3	.1	63	1.4	123	2.8
4	3 16.0	3 16.5	3 7.1	4	.1	64	1.4	124	2.8
5	3 16.3	3 16.8	3 7.3	5	.1	65	1.5	125	2.8
6	3 16.5	3 17.0	3 7.5	6	.1	66	1.5	126	2.8
7	3 16.8	3 17.3	3 7.8	7	.2	67	1.5	127	2.9
8	3 17.0	3 17.5	3 8.0	8	.2	68	1.5	128	2.9
9	3 17.3	3 17.8	3 8.3	9	.2	69	1.6	129	2.9
10	3 17.5	3 18.0	3 8.5	10	.2	70	1.6	130	2.9
11	3 17.8	3 18.3	3 8.7	11	.2	71	1.6	131	2.9
12	3 18.0	3 18.6	3 9.0	12	.3	72	1.6	132	3.0
13	3 18.3	3 18.8	3 9.2	13	.3	73	1.6	133	3.0
14	3 18.5	3 19.1	3 9.5	14	.3	74	1.7	134	3.0
15	3 18.8	3 19.3	3 9.7	15	.3	75	1.7	135	3.0
16	3 19.0	3 19.6	3 9.9	16	.4	76	1.7	136	3.1
17	3 19.3	3 19.8	3 10.2	17	.4	77	1.7	137	3.1
18	3 19.5	3 20.1	3 10.4	18	.4	78	1.8	138	3.1
19	3 19.8	3 20.3	3 10.7	19	.4	79	1.8	139	3.1
20	3 20.0	3 20.6	3 10.9	20	.5	80	1.8	140	3.2
21	3 20.3	3 20.8	3 11.1	21	.5	81	1.8	141	3.2
22	3 20.5	3 21.1	3 11.4	22	.5	82	1.8	142	3.2
23	3 20.8	3 21.3	3 11.6	23	.5	83	1.9	143	3.2
24	3 21.0	3 21.6	3 11.8	24	.5	84	1.9	144	3.2
25	3 21.3	3 21.8	3 12.1	25	.6	85	1.9	145	3.3
26	3 21.5	3 22.1	3 12.3	26	.6	86	1.9	146	3.3
27	3 21.8	3 22.3	3 12.6	27	.6	87	2.0	147	3.3
28	3 22.0	3 22.6	3 12.8	28	.6	88	2.0	148	3.3
29	3 22.3	3 22.8	3 13.0	29	.7	89	2.0	149	3.4
30	3 22.5	3 23.1	3 13.3	30	.7	90	2.0	150	3.4
31	3 22.8	3 23.3	3 13.5	31	.7	91	2.0	151	3.4
32	3 23.0	3 23.6	3 13.8	32	.7	92	2.1	152	3.4
33	3 23.3	3 23.8	3 14.0	33	.7	93	2.1	153	3.4
34	3 23.5	3 24.1	3 14.2	34	.8	94	2.1	154	3.5
35	3 23.8	3 24.3	3 14.5	35	.8	95	2.1	155	3.5
36	3 24.0	3 24.6	3 14.7	36	.8	96	2.2	156	3.5
37	3 24.3	3 24.8	3 14.9	37	.8	97	2.2	157	3.5
38	3 24.5	3 25.1	3 15.2	38	.9	98	2.2	158	3.6
39	3 24.8	3 25.3	3 15.4	39	.9	99	2.2	159	3.6
40	3 25.0	3 25.6	3 15.7	40	.9	100	2.3	160	3.6
41	3 25.3	3 25.8	3 15.9	41	.9	101	2.3	161	3.6
42	3 25.5	3 26.1	3 16.1	42	.9	102	2.3	162	3.6
43	3 25.8	3 26.3	3 16.4	43	1.0	103	2.3	163	3.7
44	3 26.0	3 26.6	3 16.6	44	1.0	104	2.3	164	3.7
45	3 26.3	3 26.8	3 16.9	45	1.0	105	2.4	165	3.7
46	3 26.5	3 27.1	3 17.1	46	1.0	106	2.4	166	3.7
47	3 26.8	3 27.3	3 17.3	47	1.1	107	2.4	167	3.8
48	3 27.0	3 27.6	3 17.6	48	1.1	108	2.4	168	3.8
49	3 27.3	3 27.8	3 17.8	49	1.1	109	2.5	169	3.8
50	3 27.5	3 28.1	3 18.0	50	1.1	110	2.5	170	3.8
51	3 27.8	3 28.3	3 18.3	51	1.1	111	2.5	171	3.8
52	3 28.0	3 28.6	3 18.5	52	1.2	112	2.5	172	3.9
53	3 28.3	3 28.8	3 18.8	53	1.2	113	2.5	173	3.9
54	3 28.5	3 29.1	3 19.0	54	1.2	114	2.6	174	3.9
55	3 28.8	3 29.3	3 19.2	55	1.2	115	2.6	175	3.9
56	3 29.0	3 29.6	3 19.5	56	1.3	116	2.6	176	4.0
57	3 29.3	3 29.8	3 19.7	57	1.3	117	2.6	177	4.0
58	3 29.5	3 30.1	3 20.0	58	1.3	118	2.7	178	4.0
59	3 29.8	3 30.3	3 20.2	59	1.3	119	2.7	179	4.0
60	3 30.0	3 30.6	3 20.4	60	1.4	120	2.7	180	4.1

0 h 14 min

s	POPRAVKA ČASOVNOG UGLA: SUNCA I PLANETA	PROLJEĆNE TAČKE ♈	MJESECA ☾	POPRAVKA DRUGOG REDA za časovni ugao i deklinaciju Sunca, Mjeseca i planeta: Δ	popr.	Δ	popr.	Δ	popr.
	° ′	° ′	° ′		′		′		′
0	3 30.0	3 30.6	3 20.4	0	.0	60	1.5	120	2.9
1	3 30.3	3 30.8	3 20.7	1	.0	61	1.5	121	2.9
2	3 30.5	3 31.1	3 20.9	2	.0	62	1.5	122	2.9
3	3 30.8	3 31.3	3 21.1	3	.1	63	1.5	123	3.0
4	3 31.0	3 31.6	3 21.4	4	.1	64	1.5	124	3.0
5	3 31.3	3 31.8	3 21.6	5	.1	65	1.6	125	3.0
6	3 31.5	3 32.1	3 21.9	6	.1	66	1.6	126	3.0
7	3 31.8	3 32.3	3 22.1	7	.2	67	1.6	127	3.1
8	3 32.0	3 32.6	3 22.3	8	.2	68	1.6	128	3.1
9	3 32.3	3 32.8	3 22.6	9	.2	69	1.7	129	3.1
10	3 32.5	3 33.1	3 22.8	10	.2	70	1.7	130	3.1
11	3 32.8	3 33.3	3 23.1	11	.3	71	1.7	131	3.2
12	3 33.0	3 33.6	3 23.3	12	.3	72	1.7	132	3.2
13	3 33.3	3 33.8	3 23.5	13	.3	73	1.8	133	3.2
14	3 33.5	3 34.1	3 23.8	14	.3	74	1.8	134	3.2
15	3 33.8	3 34.3	3 24.0	15	.4	75	1.8	135	3.3
16	3 34.0	3 34.6	3 24.3	16	.4	76	1.8	136	3.3
17	3 34.3	3 34.8	3 24.5	17	.4	77	1.9	137	3.3
18	3 34.5	3 35.1	3 24.7	18	.4	78	1.9	138	3.3
19	3 34.8	3 35.3	3 25.0	19	.5	79	1.9	139	3.4
20	3 35.0	3 35.6	3 25.2	20	.5	80	1.9	140	3.4
21	3 35.3	3 35.8	3 25.4	21	.5	81	2.0	141	3.4
22	3 35.5	3 36.1	3 25.7	22	.5	82	2.0	142	3.4
23	3 35.8	3 36.3	3 25.9	23	.6	83	2.0	143	3.5
24	3 36.0	3 36.6	3 26.2	24	.6	84	2.0	144	3.5
25	3 36.3	3 36.9	3 26.4	25	.6	85	2.1	145	3.5
26	3 36.5	3 37.1	3 26.6	26	.6	86	2.1	146	3.5
27	3 36.8	3 37.4	3 26.9	27	.7	87	2.1	147	3.6
28	3 37.0	3 37.6	3 27.1	28	.7	88	2.1	148	3.6
29	3 37.3	3 37.9	3 27.4	29	.7	89	2.2	149	3.6
30	3 37.5	3 38.1	3 27.6	30	.7	90	2.2	150	3.6
31	3 37.8	3 38.4	3 27.8	31	.7	91	2.2	151	3.6
32	3 38.0	3 38.6	3 28.1	32	.8	92	2.2	152	3.7
33	3 38.3	3 38.9	3 28.3	33	.8	93	2.2	153	3.7
34	3 38.5	3 39.1	3 28.5	34	.8	94	2.3	154	3.7
35	3 38.8	3 39.4	3 28.8	35	.8	95	2.3	155	3.7
36	3 39.0	3 39.6	3 29.0	36	.9	96	2.3	156	3.8
37	3 39.3	3 39.9	3 29.3	37	.9	97	2.3	157	3.8
38	3 39.5	3 40.1	3 29.5	38	.9	98	2.4	158	3.8
39	3 39.8	3 40.4	3 29.7	39	.9	99	2.4	159	3.8
40	3 40.0	3 40.6	3 30.0	40	1.0	100	2.4	160	3.9
41	3 40.3	3 40.9	3 30.2	41	1.0	101	2.4	161	3.9
42	3 40.5	3 41.1	3 30.5	42	1.0	102	2.5	162	3.9
43	3 40.8	3 41.4	3 30.7	43	1.0	103	2.5	163	3.9
44	3 41.0	3 41.6	3 30.9	44	1.1	104	2.5	164	4.0
45	3 41.3	3 41.9	3 31.2	45	1.1	105	2.5	165	4.0
46	3 41.5	3 42.1	3 31.4	46	1.1	106	2.6	166	4.0
47	3 41.8	3 42.4	3 31.6	47	1.1	107	2.6	167	4.0
48	3 42.0	3 42.6	3 31.9	48	1.2	108	2.6	168	4.1
49	3 42.3	3 42.9	3 32.1	49	1.2	109	2.6	169	4.1
50	3 42.5	3 43.1	3 32.4	50	1.2	110	2.7	170	4.1
51	3 42.8	3 43.4	3 32.6	51	1.2	111	2.7	171	4.1
52	3 43.0	3 43.6	3 32.8	52	1.3	112	2.7	172	4.2
53	3 43.3	3 43.9	3 33.1	53	1.3	113	2.7	173	4.2
54	3 43.5	3 44.1	3 33.3	54	1.3	114	2.8	174	4.2
55	3 43.8	3 44.4	3 33.6	55	1.3	115	2.8	175	4.2
56	3 44.0	3 44.6	3 33.8	56	1.4	116	2.8	176	4.3
57	3 44.3	3 44.9	3 34.0	57	1.4	117	2.8	177	4.3
58	3 44.5	3 45.1	3 34.3	58	1.4	118	2.9	178	4.3
59	3 44.8	3 45.4	3 34.5	59	1.4	119	2.9	179	4.3
60	3 45.0	3 45.6	3 34.8	60	1.5	120	2.9	180	4.4

0 h 15 min

s	POPRAVKA ČASOVNOG UGLA: SUNCA I PLANETA	PROLJEĆNE TAČKE ♈	MJESECA ☾	POPRAVKA DRUGOG REDA za časovni ugao i deklinaciju Sunca, Mjeseca i planeta: Δ	popr.	Δ	popr.	Δ	popr.
	° ′	° ′	° ′		′		′		′
0	3 45.0	3 45.6	3 34.8	0	.0	60	1.6	120	3.1
1	3 45.3	3 45.9	3 35.0	1	.0	61	1.6	121	3.1
2	3 45.5	3 46.1	3 35.2	2	.1	62	1.6	122	3.2
3	3 45.8	3 46.4	3 35.5	3	.1	63	1.6	123	3.2
4	3 46.0	3 46.6	3 35.7	4	.1	64	1.7	124	3.2
5	3 46.3	3 46.9	3 35.9	5	.1	65	1.7	125	3.2
6	3 46.5	3 47.1	3 36.2	6	.2	66	1.7	126	3.3
7	3 46.8	3 47.4	3 36.4	7	.2	67	1.7	127	3.3
8	3 47.0	3 47.6	3 36.7	8	.2	68	1.8	128	3.3
9	3 47.3	3 47.9	3 36.9	9	.2	69	1.8	129	3.3
10	3 47.5	3 48.1	3 37.1	10	.3	70	1.8	130	3.4
11	3 47.8	3 48.4	3 37.4	11	.3	71	1.8	131	3.4
12	3 48.0	3 48.6	3 37.6	12	.3	72	1.9	132	3.4
13	3 48.3	3 48.9	3 37.9	13	.3	73	1.9	133	3.4
14	3 48.5	3 49.1	3 38.1	14	.4	74	1.9	134	3.5
15	3 48.8	3 49.4	3 38.3	15	.4	75	1.9	135	3.5
16	3 49.0	3 49.6	3 38.6	16	.4	76	2.0	136	3.5
17	3 49.3	3 49.9	3 38.8	17	.4	77	2.0	137	3.5
18	3 49.5	3 50.1	3 39.0	18	.5	78	2.0	138	3.6
19	3 49.8	3 50.4	3 39.3	19	.5	79	2.0	139	3.6
20	3 50.0	3 50.6	3 39.5	20	.5	80	2.1	140	3.6
21	3 50.3	3 50.9	3 39.8	21	.5	81	2.1	141	3.6
22	3 50.5	3 51.1	3 40.0	22	.6	82	2.1	142	3.7
23	3 50.8	3 51.4	3 40.2	23	.6	83	2.1	143	3.7
24	3 51.0	3 51.6	3 40.5	24	.6	84	2.2	144	3.7
25	3 51.3	3 51.9	3 40.7	25	.6	85	2.2	145	3.7
26	3 51.5	3 52.1	3 41.0	26	.7	86	2.2	146	3.8
27	3 51.8	3 52.4	3 41.2	27	.7	87	2.2	147	3.8
28	3 52.0	3 52.6	3 41.4	28	.7	88	2.3	148	3.8
29	3 52.3	3 52.9	3 41.7	29	.7	89	2.3	149	3.8
30	3 52.5	3 53.1	3 41.9	30	.8	90	2.3	150	3.9
31	3 52.8	3 53.4	3 42.1	31	.8	91	2.4	151	3.9
32	3 53.0	3 53.6	3 42.4	32	.8	92	2.4	152	3.9
33	3 53.3	3 53.9	3 42.6	33	.9	93	2.4	153	4.0
34	3 53.5	3 54.1	3 42.9	34	.9	94	2.4	154	4.0
35	3 53.8	3 54.4	3 43.1	35	.9	95	2.5	155	4.0
36	3 54.0	3 54.7	3 43.3	36	.9	96	2.5	156	4.0
37	3 54.3	3 54.9	3 43.6	37	1.0	97	2.5	157	4.1
38	3 54.5	3 55.2	3 43.8	38	1.0	98	2.5	158	4.1
39	3 54.8	3 55.4	3 44.1	39	1.0	99	2.6	159	4.1
40	3 55.0	3 55.7	3 44.3	40	1.0	100	2.6	160	4.1
41	3 55.3	3 55.9	3 44.5	41	1.1	101	2.6	161	4.2
42	3 55.5	3 56.2	3 44.8	42	1.1	102	2.6	162	4.2
43	3 55.8	3 56.4	3 45.0	43	1.1	103	2.7	163	4.2
44	3 56.0	3 56.7	3 45.2	44	1.1	104	2.7	164	4.2
45	3 56.3	3 56.9	3 45.5	45	1.2	105	2.7	165	4.3
46	3 56.5	3 57.2	3 45.7	46	1.2	106	2.7	166	4.3
47	3 56.8	3 57.4	3 46.0	47	1.2	107	2.8	167	4.3
48	3 57.0	3 57.7	3 46.2	48	1.2	108	2.8	168	4.3
49	3 57.3	3 57.9	3 46.4	49	1.3	109	2.8	169	4.4
50	3 57.5	3 58.2	3 46.7	50	1.3	110	2.8	170	4.4
51	3 57.8	3 58.4	3 46.9	51	1.3	111	2.9	171	4.4
52	3 58.0	3 58.7	3 47.2	52	1.3	112	2.9	172	4.4
53	3 58.3	3 58.9	3 47.4	53	1.4	113	2.9	173	4.5
54	3 58.5	3 59.2	3 47.6	54	1.4	114	2.9	174	4.5
55	3 58.8	3 59.4	3 47.9	55	1.4	115	3.0	175	4.5
56	3 59.0	3 59.7	3 48.1	56	1.4	116	3.0	176	4.5
57	3 59.3	3 59.9	3 48.4	57	1.5	117	3.0	177	4.6
58	3 59.5	4 .2	3 48.6	58	1.5	118	3.0	178	4.6
59	3 59.8	4 .4	3 48.8	59	1.5	119	3.1	179	4.6
60	4 .0	4 .7	3 49.1	60	1.6	120	3.1	180	4.7

0 h 16 min

s	POPRAVKA ČASOVNOG UGLA: SUNCA I PLANETA	PROLJEĆNE TAČKE ♈	MJESECA ☾	POPRAVKA DRUGOG REDA za časovni ugao i deklinaciju Sunca, Mjeseca i planeta: Δ	poprava	Δ	poprava	Δ	poprava
	° ′	° ′	° ′		′		′		′
0	4 .0	4 .7	3 49.1	0	.0	60	1.7	120	3.3
1	4 .3	4 .9	3 49.3	1	.0	61	1.7	121	3.3
2	4 .5	4 1.2	3 49.5	2	.1	62	1.7	122	3.4
3	4 .8	4 1.4	3 49.8	3	.1	63	1.7	123	3.4
4	4 1.0	4 1.7	3 50.0	4	.1	64	1.8	124	3.4
5	4 1.3	4 1.9	3 50.3	5	.1	65	1.8	125	3.4
6	4 1.5	4 2.2	3 50.5	6	.2	66	1.8	126	3.5
7	4 1.8	4 2.4	3 50.7	7	.2	67	1.8	127	3.5
8	4 2.0	4 2.7	3 51.0	8	.2	68	1.9	128	3.5
9	4 2.3	4 2.9	3 51.2	9	.2	69	1.9	129	3.5
10	4 2.5	4 3.2	3 51.5	10	.3	70	1.9	130	3.6
11	4 2.8	4 3.4	3 51.7	11	.3	71	2.0	131	3.6
12	4 3.0	4 3.7	3 51.9	12	.3	72	2.0	132	3.6
13	4 3.3	4 3.9	3 52.2	13	.4	73	2.0	133	3.7
14	4 3.5	4 4.2	3 52.4	14	.4	74	2.0	134	3.7
15	4 3.8	4 4.4	3 52.6	15	.4	75	2.1	135	3.7
16	4 4.0	4 4.7	3 52.9	16	.4	76	2.1	136	3.7
17	4 4.3	4 4.9	3 53.1	17	.5	77	2.1	137	3.8
18	4 4.5	4 5.2	3 53.4	18	.5	78	2.1	138	3.8
19	4 4.8	4 5.4	3 53.6	19	.5	79	2.2	139	3.8
20	4 5.0	4 5.7	3 53.8	20	.6	80	2.2	140	3.9
21	4 5.3	4 5.9	3 54.1	21	.6	81	2.2	141	3.9
22	4 5.5	4 6.2	3 54.3	22	.6	82	2.3	142	3.9
23	4 5.8	4 6.4	3 54.6	23	.6	83	2.3	143	3.9
24	4 6.0	4 6.7	3 54.8	24	.7	84	2.3	144	4.0
25	4 6.3	4 6.9	3 55.0	25	.7	85	2.3	145	4.0
26	4 6.5	4 7.2	3 55.3	26	.7	86	2.4	146	4.0
27	4 6.8	4 7.4	3 55.5	27	.7	87	2.4	147	4.0
28	4 7.0	4 7.7	3 55.7	28	.8	88	2.4	148	4.1
29	4 7.3	4 7.9	3 56.0	29	.8	89	2.4	149	4.1
30	4 7.5	4 8.2	3 56.2	30	.8	90	2.5	150	4.1
31	4 7.8	4 8.4	3 56.5	31	.9	91	2.5	151	4.2
32	4 8.0	4 8.7	3 56.7	32	.9	92	2.5	152	4.2
33	4 8.3	4 8.9	3 56.9	33	.9	93	2.6	153	4.2
34	4 8.5	4 9.2	3 57.2	34	.9	94	2.6	154	4.2
35	4 8.8	4 9.4	3 57.4	35	1.0	95	2.6	155	4.3
36	4 9.0	4 9.7	3 57.7	36	1.0	96	2.6	156	4.3
37	4 9.3	4 9.9	3 57.9	37	1.0	97	2.7	157	4.3
38	4 9.5	4 10.2	3 58.1	38	1.0	98	2.7	158	4.3
39	4 9.8	4 10.4	3 58.4	39	1.1	99	2.7	159	4.4
40	4 10.0	4 10.7	3 58.6	40	1.1	100	2.8	160	4.4
41	4 10.3	4 10.9	3 58.8	41	1.1	101	2.8	161	4.4
42	4 10.5	4 11.2	3 59.1	42	1.2	102	2.8	162	4.5
43	4 10.8	4 11.4	3 59.3	43	1.2	103	2.8	163	4.5
44	4 11.0	4 11.7	3 59.6	44	1.2	104	2.9	164	4.5
45	4 11.3	4 11.9	3 59.8	45	1.2	105	2.9	165	4.5
46	4 11.5	4 12.2	4 .0	46	1.3	106	2.9	166	4.6
47	4 11.8	4 12.4	4 .3	47	1.3	107	2.9	167	4.6
48	4 12.0	4 12.7	4 .5	48	1.3	108	3.0	168	4.6
49	4 12.3	4 13.0	4 .8	49	1.3	109	3.0	169	4.6
50	4 12.5	4 13.2	4 1.0	50	1.4	110	3.0	170	4.7
51	4 12.8	4 13.5	4 1.2	51	1.4	111	3.1	171	4.7
52	4 13.0	4 13.7	4 1.5	52	1.4	112	3.1	172	4.7
53	4 13.3	4 14.0	4 1.7	53	1.5	113	3.1	173	4.8
54	4 13.5	4 14.2	4 2.0	54	1.5	114	3.1	174	4.8
55	4 13.8	4 14.5	4 2.2	55	1.5	115	3.2	175	4.8
56	4 14.0	4 14.7	4 2.4	56	1.5	116	3.2	176	4.8
57	4 14.3	4 15.0	4 2.7	57	1.6	117	3.2	177	4.9
58	4 14.5	4 15.2	4 2.9	58	1.6	118	3.2	178	4.9
59	4 14.8	4 15.5	4 3.1	59	1.6	119	3.3	179	4.9
60	4 15.0	4 15.7	4 3.4	60	1.7	120	3.3	180	5.0

0 h 17 min

s	POPRAVKA ČASOVNOG UGLA: SUNCA I PLANETA	PROLJEĆNE TAČKE ♈	MJESECA ☾	POPRAVKA DRUGOG REDA za časovni ugao i deklinaciju Sunca, Mjeseca i planeta: Δ	poprava	Δ	poprava	Δ	poprava
	° ′	° ′	° ′		′		′		′
0	4 15.0	4 15.7	4 3.4	0	.0	60	1.8	120	3.5
1	4 15.3	4 16.0	4 3.6	1	.0	61	1.8	121	3.5
2	4 15.5	4 16.2	4 3.9	2	.1	62	1.8	122	3.6
3	4 15.8	4 16.5	4 4.1	3	.1	63	1.8	123	3.6
4	4 16.0	4 16.7	4 4.3	4	.1	64	1.9	124	3.6
5	4 16.3	4 17.0	4 4.6	5	.1	65	1.9	125	3.6
6	4 16.5	4 17.2	4 4.8	6	.2	66	1.9	126	3.7
7	4 16.8	4 17.5	4 5.1	7	.2	67	2.0	127	3.7
8	4 17.0	4 17.7	4 5.3	8	.2	68	2.0	128	3.7
9	4 17.3	4 18.0	4 5.5	9	.3	69	2.0	129	3.8
10	4 17.5	4 18.2	4 5.8	10	.3	70	2.0	130	3.8
11	4 17.8	4 18.5	4 6.0	11	.3	71	2.1	131	3.8
12	4 18.0	4 18.7	4 6.2	12	.4	72	2.1	132	3.9
13	4 18.3	4 19.0	4 6.5	13	.4	73	2.1	133	3.9
14	4 18.5	4 19.2	4 6.7	14	.4	74	2.2	134	3.9
15	4 18.8	4 19.5	4 7.0	15	.4	75	2.2	135	3.9
16	4 19.0	4 19.7	4 7.2	16	.5	76	2.2	136	4.0
17	4 19.3	4 20.0	4 7.4	17	.5	77	2.2	137	4.0
18	4 19.5	4 20.2	4 7.7	18	.5	78	2.3	138	4.0
19	4 19.8	4 20.5	4 7.9	19	.6	79	2.3	139	4.1
20	4 20.0	4 20.7	4 8.2	20	.6	80	2.3	140	4.1
21	4 20.3	4 21.0	4 8.4	21	.6	81	2.4	141	4.1
22	4 20.5	4 21.2	4 8.6	22	.6	82	2.4	142	4.1
23	4 20.8	4 21.5	4 8.9	23	.7	83	2.4	143	4.2
24	4 21.0	4 21.7	4 9.1	24	.7	84	2.5	144	4.2
25	4 21.3	4 22.0	4 9.3	25	.7	85	2.5	145	4.2
26	4 21.5	4 22.2	4 9.6	26	.8	86	2.5	146	4.3
27	4 21.8	4 22.5	4 9.8	27	.8	87	2.5	147	4.3
28	4 22.0	4 22.7	4 10.1	28	.8	88	2.6	148	4.3
29	4 22.3	4 23.0	4 10.3	29	.8	89	2.6	149	4.3
30	4 22.5	4 23.2	4 10.5	30	.9	90	2.6	150	4.4
31	4 22.8	4 23.5	4 10.8	31	.9	91	2.7	151	4.4
32	4 23.0	4 23.7	4 11.0	32	.9	92	2.7	152	4.4
33	4 23.3	4 24.0	4 11.3	33	1.0	93	2.7	153	4.5
34	4 23.5	4 24.2	4 11.5	34	1.0	94	2.7	154	4.5
35	4 23.8	4 24.5	4 11.7	35	1.0	95	2.8	155	4.5
36	4 24.0	4 24.7	4 12.0	36	1.1	96	2.8	156	4.6
37	4 24.3	4 25.0	4 12.2	37	1.1	97	2.8	157	4.6
38	4 24.5	4 25.2	4 12.5	38	1.1	98	2.9	158	4.6
39	4 24.8	4 25.5	4 12.7	39	1.1	99	2.9	159	4.6
40	4 25.0	4 25.7	4 12.9	40	1.2	100	2.9	160	4.7
41	4 25.3	4 26.0	4 13.2	41	1.2	101	2.9	161	4.7
42	4 25.5	4 26.2	4 13.4	42	1.2	102	3.0	162	4.7
43	4 25.8	4 26.5	4 13.6	43	1.3	103	3.0	163	4.8
44	4 26.0	4 26.7	4 13.9	44	1.3	104	3.0	164	4.8
45	4 26.3	4 27.0	4 14.1	45	1.3	105	3.1	165	4.8
46	4 26.5	4 27.2	4 14.4	46	1.3	106	3.1	166	4.8
47	4 26.8	4 27.5	4 14.6	47	1.4	107	3.1	167	4.9
48	4 27.0	4 27.7	4 14.8	48	1.4	108	3.2	168	4.9
49	4 27.3	4 28.0	4 15.1	49	1.4	109	3.2	169	4.9
50	4 27.5	4 28.2	4 15.3	50	1.5	110	3.2	170	5.0
51	4 27.8	4 28.5	4 15.6	51	1.5	111	3.2	171	5.0
52	4 28.0	4 28.7	4 15.8	52	1.5	112	3.3	172	5.0
53	4 28.3	4 29.0	4 16.0	53	1.5	113	3.3	173	5.0
54	4 28.5	4 29.2	4 16.3	54	1.6	114	3.3	174	5.1
55	4 28.8	4 29.5	4 16.5	55	1.6	115	3.4	175	5.1
56	4 29.0	4 29.7	4 16.7	56	1.6	116	3.4	176	5.1
57	4 29.3	4 30.0	4 17.0	57	1.7	117	3.4	177	5.2
58	4 29.5	4 30.2	4 17.2	58	1.7	118	3.4	178	5.2
59	4 29.8	4 30.5	4 17.5	59	1.7	119	3.5	179	5.2
60	4 30.0	4 30.8	4 17.7	60	1.8	120	3.5	180	5.3

0 h 18 min

POPRAVKA ČASOVNOG UGLA				POPRAVKA DRUGOG REDA za časovni ugao i deklinaciju Sunca, Mjeseca i planeta					
s	SUNCA I PLANETA	PROLJEĆNE TAČKE ♈	MJESECA ☾	Δ	popr.	Δ	popr.	Δ	popr.
	° ′	° ′	° ′		′		′		′
0	4 30.0	4 30.8	4 17.7	0	.0	60	1.9	120	3.7
1	4 30.3	4 31.0	4 17.9	1	.0	61	1.9	121	3.7
2	4 30.5	4 31.3	4 18.2	2	.1	62	1.9	122	3.8
3	4 30.8	4 31.5	4 18.4	3	.1	63	1.9	123	3.8
4	4 31.0	4 31.8	4 18.7	4	.1	64	2.0	124	3.8
5	4 31.3	4 32.0	4 18.9	5	.2	65	2.0	125	3.9
6	4 31.5	4 32.3	4 19.1	6	.2	66	2.0	126	3.9
7	4 31.8	4 32.5	4 19.4	7	.2	67	2.1	127	3.9
8	4 32.0	4 32.8	4 19.6	8	.2	68	2.1	128	3.9
9	4 32.3	4 33.0	4 19.8	9	.3	69	2.1	129	4.0
10	4 32.5	4 33.3	4 20.1	10	.3	70	2.2	130	4.0
11	4 32.8	4 33.5	4 20.3	11	.3	71	2.2	131	4.0
12	4 33.0	4 33.8	4 20.6	12	.4	72	2.2	132	4.1
13	4 33.3	4 34.0	4 20.8	13	.4	73	2.3	133	4.1
14	4 33.5	4 34.3	4 21.0	14	.4	74	2.3	134	4.1
15	4 33.8	4 34.5	4 21.3	15	.5	75	2.3	135	4.2
16	4 34.0	4 34.8	4 21.5	16	.5	76	2.3	136	4.2
17	4 34.3	4 35.0	4 21.8	17	.5	77	2.4	137	4.2
18	4 34.5	4 35.3	4 22.0	18	.6	78	2.4	138	4.3
19	4 34.8	4 35.5	4 22.2	19	.6	79	2.4	139	4.3
20	4 35.0	4 35.8	4 22.5	20	.6	80	2.5	140	4.3
21	4 35.3	4 36.0	4 22.7	21	.6	81	2.5	141	4.3
22	4 35.5	4 36.3	4 22.9	22	.7	82	2.5	142	4.4
23	4 35.8	4 36.5	4 23.2	23	.7	83	2.6	143	4.4
24	4 36.0	4 36.8	4 23.4	24	.7	84	2.6	144	4.4
25	4 36.3	4 37.0	4 23.7	25	.8	85	2.6	145	4.5
26	4 36.5	4 37.3	4 23.9	26	.8	86	2.7	146	4.5
27	4 36.8	4 37.5	4 24.1	27	.8	87	2.7	147	4.5
28	4 37.0	4 37.8	4 24.4	28	.9	88	2.7	148	4.6
29	4 37.3	4 38.0	4 24.6	29	.9	89	2.7	149	4.6
30	4 37.5	4 38.3	4 24.9	30	.9	90	2.8	150	4.6
31	4 37.8	4 38.5	4 25.1	31	1.0	91	2.8	151	4.7
32	4 38.0	4 38.8	4 25.3	32	1.0	92	2.8	152	4.7
33	4 38.3	4 39.0	4 25.6	33	1.0	93	2.9	153	4.7
34	4 38.5	4 39.3	4 25.8	34	1.0	94	2.9	154	4.7
35	4 38.8	4 39.5	4 26.1	35	1.1	95	2.9	155	4.8
36	4 39.0	4 39.8	4 26.3	36	1.1	96	3.0	156	4.8
37	4 39.3	4 40.0	4 26.5	37	1.1	97	3.0	157	4.8
38	4 39.5	4 40.3	4 26.8	38	1.2	98	3.0	158	4.9
39	4 39.8	4 40.5	4 27.0	39	1.2	99	3.1	159	4.9
40	4 40.0	4 40.8	4 27.2	40	1.2	100	3.1	160	4.9
41	4 40.3	4 41.0	4 27.5	41	1.3	101	3.1	161	5.0
42	4 40.5	4 41.3	4 27.7	42	1.3	102	3.1	162	5.0
43	4 40.8	4 41.5	4 28.0	43	1.3	103	3.2	163	5.0
44	4 41.0	4 41.8	4 28.2	44	1.4	104	3.2	164	5.1
45	4 41.3	4 42.0	4 28.4	45	1.4	105	3.2	165	5.1
46	4 41.5	4 42.3	4 28.7	46	1.4	106	3.3	166	5.1
47	4 41.8	4 42.5	4 28.9	47	1.4	107	3.3	167	5.1
48	4 42.0	4 42.8	4 29.2	48	1.5	108	3.3	168	5.2
49	4 42.3	4 43.0	4 29.4	49	1.5	109	3.4	169	5.2
50	4 42.5	4 43.3	4 29.6	50	1.5	110	3.4	170	5.2
51	4 42.8	4 43.5	4 29.9	51	1.6	111	3.4	171	5.3
52	4 43.0	4 43.8	4 30.1	52	1.6	112	3.5	172	5.3
53	4 43.3	4 44.0	4 30.3	53	1.6	113	3.5	173	5.3
54	4 43.5	4 44.3	4 30.6	54	1.7	114	3.5	174	5.4
55	4 43.8	4 44.5	4 30.8	55	1.7	115	3.5	175	5.4
56	4 44.0	4 44.8	4 31.1	56	1.7	116	3.6	176	5.4
57	4 44.3	4 45.0	4 31.3	57	1.8	117	3.6	177	5.5
58	4 44.5	4 45.3	4 31.5	58	1.8	118	3.6	178	5.5
59	4 44.8	4 45.5	4 31.8	59	1.8	119	3.7	179	5.5
60	4 45.0	4 45.8	4 32.0	60	1.9	120	3.7	180	5.6

0 h 19 min

POPRAVKA ČASOVNOG UGLA				POPRAVKA DRUGOG REDA za časovni ugao i deklinaciju Sunca, Mjeseca i planeta					
s	SUNCA I PLANETA	PROLJEĆNE TAČKE ♈	MJESECA ☾	Δ	popr.	Δ	popr.	Δ	popr.
	° ′	° ′	° ′		′		′		′
0	4 45.0	4 45.8	4 32.0	0	.0	60	2.0	120	3.9
1	4 45.3	4 46.0	4 32.3	1	.0	61	2.0	121	3.9
2	4 45.5	4 46.3	4 32.5	2	.1	62	2.0	122	4.0
3	4 45.8	4 46.5	4 32.7	3	.1	63	2.0	123	4.0
4	4 46.0	4 46.8	4 33.0	4	.1	64	2.1	124	4.0
5	4 46.3	4 47.0	4 33.2	5	.2	65	2.1	125	4.1
6	4 46.5	4 47.3	4 33.4	6	.2	66	2.1	126	4.1
7	4 46.8	4 47.5	4 33.7	7	.2	67	2.2	127	4.1
8	4 47.0	4 47.8	4 33.9	8	.3	68	2.2	128	4.2
9	4 47.3	4 48.0	4 34.2	9	.3	69	2.2	129	4.2
10	4 47.5	4 48.3	4 34.4	10	.3	70	2.3	130	4.2
11	4 47.8	4 48.5	4 34.6	11	.4	71	2.3	131	4.3
12	4 48.0	4 48.8	4 34.9	12	.4	72	2.3	132	4.3
13	4 48.3	4 49.1	4 35.1	13	.4	73	2.4	133	4.3
14	4 48.5	4 49.3	4 35.4	14	.5	74	2.4	134	4.4
15	4 48.8	4 49.6	4 35.6	15	.5	75	2.4	135	4.4
16	4 49.0	4 49.8	4 35.8	16	.5	76	2.5	136	4.4
17	4 49.3	4 50.1	4 36.1	17	.6	77	2.5	137	4.5
18	4 49.5	4 50.3	4 36.3	18	.6	78	2.5	138	4.5
19	4 49.8	4 50.6	4 36.6	19	.6	79	2.6	139	4.5
20	4 50.0	4 50.8	4 36.8	20	.7	80	2.6	140	4.6
21	4 50.3	4 51.1	4 37.0	21	.7	81	2.6	141	4.6
22	4 50.5	4 51.3	4 37.3	22	.7	82	2.7	142	4.6
23	4 50.8	4 51.6	4 37.5	23	.7	83	2.7	143	4.6
24	4 51.0	4 51.8	4 37.7	24	.8	84	2.7	144	4.7
25	4 51.3	4 52.1	4 38.0	25	.8	85	2.8	145	4.7
26	4 51.5	4 52.3	4 38.2	26	.8	86	2.8	146	4.7
27	4 51.8	4 52.6	4 38.5	27	.9	87	2.8	147	4.8
28	4 52.0	4 52.8	4 38.7	28	.9	88	2.9	148	4.8
29	4 52.3	4 53.1	4 38.9	29	.9	89	2.9	149	4.8
30	4 52.5	4 53.3	4 39.2	30	1.0	90	2.9	150	4.9
31	4 52.8	4 53.6	4 39.4	31	1.0	91	3.0	151	4.9
32	4 53.0	4 53.8	4 39.7	32	1.0	92	3.0	152	4.9
33	4 53.3	4 54.1	4 39.9	33	1.1	93	3.0	153	5.0
34	4 53.5	4 54.3	4 40.1	34	1.1	94	3.1	154	5.0
35	4 53.8	4 54.6	4 40.4	35	1.1	95	3.1	155	5.0
36	4 54.0	4 54.8	4 40.6	36	1.2	96	3.1	156	5.1
37	4 54.3	4 55.1	4 40.8	37	1.2	97	3.2	157	5.1
38	4 54.5	4 55.3	4 41.1	38	1.2	98	3.2	158	5.1
39	4 54.8	4 55.6	4 41.3	39	1.3	99	3.2	159	5.2
40	4 55.0	4 55.8	4 41.6	40	1.3	100	3.3	160	5.2
41	4 55.3	4 56.1	4 41.8	41	1.3	101	3.3	161	5.2
42	4 55.5	4 56.3	4 42.0	42	1.4	102	3.3	162	5.3
43	4 55.8	4 56.6	4 42.3	43	1.4	103	3.3	163	5.3
44	4 56.0	4 56.8	4 42.5	44	1.4	104	3.4	164	5.3
45	4 56.3	4 57.1	4 42.8	45	1.5	105	3.4	165	5.4
46	4 56.5	4 57.3	4 43.0	46	1.5	106	3.4	166	5.4
47	4 56.8	4 57.6	4 43.2	47	1.5	107	3.5	167	5.4
48	4 57.0	4 57.8	4 43.5	48	1.6	108	3.5	168	5.5
49	4 57.3	4 58.1	4 43.7	49	1.6	109	3.5	169	5.5
50	4 57.5	4 58.3	4 43.9	50	1.6	110	3.6	170	5.5
51	4 57.8	4 58.6	4 44.2	51	1.7	111	3.6	171	5.6
52	4 58.0	4 58.8	4 44.4	52	1.7	112	3.6	172	5.6
53	4 58.3	4 59.1	4 44.7	53	1.7	113	3.7	173	5.6
54	4 58.5	4 59.3	4 44.9	54	1.8	114	3.7	174	5.7
55	4 58.8	4 59.6	4 45.1	55	1.8	115	3.7	175	5.7
56	4 59.0	4 59.8	4 45.4	56	1.8	116	3.8	176	5.7
57	4 59.3	5 .1	4 45.6	57	1.9	117	3.8	177	5.8
58	4 59.5	5 .3	4 45.9	58	1.9	118	3.8	178	5.8
59	4 59.8	5 .6	4 46.1	59	1.9	119	3.9	179	5.8
60	5 .0	5 .8	4 46.3	60	2.0	120	3.9	180	5.9

0 h 20 min

s	POPRAVKA ČASOVNOG UGLA: SUNCA I PLANETA	PROLJEĆNE TAČKE ♈	MJESECA ☾	POPRAVKA DRUGOG REDA za časovni ugao i deklinaciju Sunca, Mjeseca i planeta: Δ	poprav.	Δ	poprav.	Δ	poprav.
	° ′	° ′	° ′		′		′		′
0	5 .0	5 .8	4 46.3	0	.0	60	2.1	120	4.1
1	5 .3	5 1.1	4 46.6	1	.0	61	2.1	121	4.1
2	5 .5	5 1.3	4 46.8	2	.1	62	2.1	122	4.2
3	5 .8	5 1.6	4 47.0	3	.1	63	2.2	123	4.2
4	5 1.0	5 1.8	4 47.3	4	.1	64	2.2	124	4.2
5	5 1.3	5 2.1	4 47.5	5	.2	65	2.2	125	4.3
6	5 1.5	5 2.3	4 47.8	6	.2	66	2.3	126	4.3
7	5 1.8	5 2.6	4 48.0	7	.2	67	2.3	127	4.3
8	5 2.0	5 2.8	4 48.2	8	.3	68	2.3	128	4.4
9	5 2.3	5 3.1	4 48.5	9	.3	69	2.4	129	4.4
10	5 2.5	5 3.3	4 48.7	10	.3	70	2.4	130	4.4
11	5 2.8	5 3.6	4 49.0	11	.4	71	2.4	131	4.5
12	5 3.0	5 3.8	4 49.2	12	.4	72	2.5	132	4.5
13	5 3.3	5 4.1	4 49.4	13	.4	73	2.5	133	4.5
14	5 3.5	5 4.3	4 49.7	14	.5	74	2.5	134	4.6
15	5 3.8	5 4.6	4 49.9	15	.5	75	2.6	135	4.6
16	5 4.0	5 4.8	4 50.2	16	.5	76	2.6	136	4.6
17	5 4.3	5 5.1	4 50.4	17	.6	77	2.6	137	4.7
18	5 4.5	5 5.3	4 50.6	18	.6	78	2.7	138	4.7
19	5 4.8	5 5.6	4 50.9	19	.6	79	2.7	139	4.7
20	5 5.0	5 5.8	4 51.1	20	.7	80	2.7	140	4.8
21	5 5.3	5 6.1	4 51.3	21	.7	81	2.8	141	4.8
22	5 5.5	5 6.3	4 51.6	22	.8	82	2.8	142	4.9
23	5 5.8	5 6.6	4 51.8	23	.8	83	2.8	143	4.9
24	5 6.0	5 6.9	4 52.1	24	.8	84	2.9	144	4.9
25	5 6.3	5 7.1	4 52.3	25	.9	85	2.9	145	5.0
26	5 6.5	5 7.4	4 52.5	26	.9	86	2.9	146	5.0
27	5 6.8	5 7.6	4 52.8	27	.9	87	3.0	147	5.0
28	5 7.0	5 7.9	4 53.0	28	1.0	88	3.0	148	5.1
29	5 7.3	5 8.1	4 53.3	29	1.0	89	3.0	149	5.1
30	5 7.5	5 8.4	4 53.5	30	1.0	90	3.1	150	5.1
31	5 7.8	5 8.6	4 53.7	31	1.1	91	3.1	151	5.2
32	5 8.0	5 8.9	4 54.0	32	1.1	92	3.1	152	5.2
33	5 8.3	5 9.1	4 54.2	33	1.1	93	3.2	153	5.2
34	5 8.5	5 9.4	4 54.4	34	1.2	94	3.2	154	5.3
35	5 8.8	5 9.6	4 54.7	35	1.2	95	3.2	155	5.3
36	5 9.0	5 9.9	4 54.9	36	1.2	96	3.3	156	5.3
37	5 9.3	5 10.1	4 55.2	37	1.3	97	3.3	157	5.4
38	5 9.5	5 10.4	4 55.4	38	1.3	98	3.3	158	5.4
39	5 9.8	5 10.6	4 55.6	39	1.3	99	3.4	159	5.4
40	5 10.0	5 10.9	4 55.9	40	1.4	100	3.4	160	5.5
41	5 10.3	5 11.1	4 56.1	41	1.4	101	3.5	161	5.5
42	5 10.5	5 11.4	4 56.4	42	1.4	102	3.5	162	5.5
43	5 10.8	5 11.6	4 56.6	43	1.5	103	3.5	163	5.6
44	5 11.0	5 11.9	4 56.8	44	1.5	104	3.6	164	5.6
45	5 11.3	5 12.1	4 57.1	45	1.5	105	3.6	165	5.6
46	5 11.5	5 12.4	4 57.3	46	1.6	106	3.6	166	5.7
47	5 11.8	5 12.6	4 57.5	47	1.6	107	3.7	167	5.7
48	5 12.0	5 12.9	4 57.8	48	1.6	108	3.7	168	5.7
49	5 12.3	5 13.1	4 58.0	49	1.7	109	3.7	169	5.8
50	5 12.5	5 13.4	4 58.3	50	1.7	110	3.8	170	5.8
51	5 12.8	5 13.6	4 58.5	51	1.7	111	3.8	171	5.8
52	5 13.0	5 13.9	4 58.7	52	1.8	112	3.8	172	5.9
53	5 13.3	5 14.1	4 59.0	53	1.8	113	3.9	173	5.9
54	5 13.5	5 14.4	4 59.2	54	1.8	114	3.9	174	5.9
55	5 13.8	5 14.6	4 59.5	55	1.9	115	3.9	175	6.0
56	5 14.0	5 14.9	4 59.7	56	1.9	116	4.0	176	6.0
57	5 14.3	5 15.1	4 59.9	57	1.9	117	4.0	177	6.0
58	5 14.5	5 15.4	5 .2	58	2.0	118	4.0	178	6.1
59	5 14.8	5 15.6	5 .4	59	2.0	119	4.1	179	6.1
60	5 15.0	5 15.9	5 .7	60	2.1	120	4.1	180	6.2

0 h 21 min

s	POPRAVKA ČASOVNOG UGLA: SUNCA I PLANETA	PROLJEĆNE TAČKE ♈	MJESECA ☾	POPRAVKA DRUGOG REDA za časovni ugao i deklinaciju Sunca, Mjeseca i planeta: Δ	poprav.	Δ	poprav.	Δ	poprav.
	° ′	° ′	° ′		′		′		′
0	5 15.0	5 15.9	5 .7	0	.0	60	2.2	120	4.3
1	5 15.3	5 16.1	5 .9	1	.0	61	2.2	121	4.3
2	5 15.5	5 16.4	5 1.1	2	.1	62	2.2	122	4.4
3	5 15.8	5 16.6	5 1.4	3	.1	63	2.3	123	4.4
4	5 16.0	5 16.9	5 1.6	4	.1	64	2.3	124	4.4
5	5 16.3	5 17.1	5 1.8	5	.2	65	2.3	125	4.5
6	5 16.5	5 17.4	5 2.1	6	.2	66	2.4	126	4.5
7	5 16.8	5 17.6	5 2.3	7	.3	67	2.4	127	4.6
8	5 17.0	5 17.9	5 2.6	8	.3	68	2.4	128	4.6
9	5 17.3	5 18.1	5 2.8	9	.3	69	2.5	129	4.6
10	5 17.5	5 18.4	5 3.0	10	.4	70	2.5	130	4.7
11	5 17.8	5 18.6	5 3.3	11	.4	71	2.5	131	4.7
12	5 18.0	5 18.9	5 3.5	12	.4	72	2.6	132	4.7
13	5 18.3	5 19.1	5 3.8	13	.5	73	2.6	133	4.8
14	5 18.5	5 19.4	5 4.0	14	.5	74	2.7	134	4.8
15	5 18.8	5 19.6	5 4.2	15	.5	75	2.7	135	4.8
16	5 19.0	5 19.9	5 4.5	16	.6	76	2.7	136	4.9
17	5 19.3	5 20.1	5 4.7	17	.6	77	2.8	137	4.9
18	5 19.5	5 20.4	5 4.9	18	.6	78	2.8	138	4.9
19	5 19.8	5 20.6	5 5.2	19	.7	79	2.8	139	5.0
20	5 20.0	5 20.9	5 5.4	20	.7	80	2.9	140	5.0
21	5 20.3	5 21.1	5 5.7	21	.8	81	2.9	141	5.1
22	5 20.5	5 21.4	5 5.9	22	.8	82	2.9	142	5.1
23	5 20.8	5 21.6	5 6.1	23	.8	83	3.0	143	5.1
24	5 21.0	5 21.9	5 6.4	24	.9	84	3.0	144	5.2
25	5 21.3	5 22.1	5 6.6	25	.9	85	3.0	145	5.2
26	5 21.5	5 22.4	5 6.9	26	.9	86	3.1	146	5.2
27	5 21.8	5 22.6	5 7.1	27	1.0	87	3.1	147	5.3
28	5 22.0	5 22.9	5 7.3	28	1.0	88	3.2	148	5.3
29	5 22.3	5 23.1	5 7.6	29	1.0	89	3.2	149	5.3
30	5 22.5	5 23.4	5 7.8	30	1.1	90	3.2	150	5.4
31	5 22.8	5 23.6	5 8.0	31	1.1	91	3.3	151	5.4
32	5 23.0	5 23.9	5 8.3	32	1.1	92	3.3	152	5.4
33	5 23.3	5 24.1	5 8.5	33	1.2	93	3.3	153	5.5
34	5 23.5	5 24.4	5 8.8	34	1.2	94	3.4	154	5.5
35	5 23.8	5 24.6	5 9.0	35	1.3	95	3.4	155	5.6
36	5 24.0	5 24.9	5 9.2	36	1.3	96	3.4	156	5.6
37	5 24.3	5 25.2	5 9.5	37	1.3	97	3.5	157	5.6
38	5 24.5	5 25.4	5 9.7	38	1.4	98	3.5	158	5.7
39	5 24.8	5 25.7	5 10.0	39	1.4	99	3.5	159	5.7
40	5 25.0	5 25.9	5 10.2	40	1.4	100	3.6	160	5.7
41	5 25.3	5 26.2	5 10.4	41	1.5	101	3.6	161	5.8
42	5 25.5	5 26.4	5 10.7	42	1.5	102	3.7	162	5.8
43	5 25.8	5 26.7	5 10.9	43	1.5	103	3.7	163	5.8
44	5 26.0	5 26.9	5 11.1	44	1.6	104	3.7	164	5.9
45	5 26.3	5 27.2	5 11.4	45	1.6	105	3.8	165	5.9
46	5 26.5	5 27.4	5 11.6	46	1.6	106	3.8	166	5.9
47	5 26.8	5 27.7	5 11.9	47	1.7	107	3.8	167	6.0
48	5 27.0	5 27.9	5 12.1	48	1.7	108	3.9	168	6.0
49	5 27.3	5 28.2	5 12.3	49	1.8	109	3.9	169	6.1
50	5 27.5	5 28.4	5 12.6	50	1.8	110	3.9	170	6.1
51	5 27.8	5 28.7	5 12.8	51	1.8	111	4.0	171	6.1
52	5 28.0	5 28.9	5 13.1	52	1.9	112	4.0	172	6.2
53	5 28.3	5 29.2	5 13.3	53	1.9	113	4.0	173	6.2
54	5 28.5	5 29.4	5 13.5	54	1.9	114	4.1	174	6.2
55	5 28.8	5 29.7	5 13.8	55	2.0	115	4.1	175	6.3
56	5 29.0	5 29.9	5 14.0	56	2.0	116	4.2	176	6.3
57	5 29.3	5 30.2	5 14.3	57	2.0	117	4.2	177	6.3
58	5 29.5	5 30.4	5 14.5	58	2.1	118	4.2	178	6.4
59	5 29.8	5 30.7	5 14.7	59	2.1	119	4.3	179	6.4
60	5 30.0	5 30.9	5 15.0	60	2.2	120	4.3	180	6.5

0 h 22 min

POPRAVKA ČASOVNOG UGLA				POPRAVKA DRUGOG REDA za časovni ugao i deklinaciju Sunca, Mjeseca i planeta					
s	SUNCA I PLANETA	PROLJEĆNE TAČKE ♈	MJESECA ☾	Δ	popr.	Δ	popr.	Δ	popr.
	° ′	° ′	° ′		′		′		′
0	5 30.0	5 30.9	5 15.0	0	.0	60	2.3	120	4.5
1	5 30.3	5 31.2	5 15.2	1	.0	61	2.3	121	4.5
2	5 30.5	5 31.4	5 15.4	2	.1	62	2.3	122	4.6
3	5 30.8	5 31.7	5 15.7	3	.1	63	2.4	123	4.6
4	5 31.0	5 31.9	5 15.9	4	.2	64	2.4	124	4.7
5	5 31.3	5 32.2	5 16.2	5	.2	65	2.4	125	4.7
6	5 31.5	5 32.4	5 16.4	6	.2	66	2.5	126	4.7
7	5 31.8	5 32.7	5 16.6	7	.3	67	2.5	127	4.8
8	5 32.0	5 32.9	5 16.9	8	.3	68	2.6	128	4.8
9	5 32.3	5 33.2	5 17.1	9	.3	69	2.6	129	4.8
10	5 32.5	5 33.4	5 17.4	10	.4	70	2.6	130	4.9
11	5 32.8	5 33.7	5 17.6	11	.4	71	2.7	131	4.9
12	5 33.0	5 33.9	5 17.8	12	.5	72	2.7	132	5.0
13	5 33.3	5 34.2	5 18.1	13	.5	73	2.7	133	5.0
14	5 33.5	5 34.4	5 18.3	14	.5	74	2.8	134	5.0
15	5 33.8	5 34.7	5 18.5	15	.6	75	2.8	135	5.1
16	5 34.0	5 34.9	5 18.8	16	.6	76	2.9	136	5.1
17	5 34.3	5 35.2	5 19.0	17	.6	77	2.9	137	5.1
18	5 34.5	5 35.4	5 19.3	18	.7	78	2.9	138	5.2
19	5 34.8	5 35.7	5 19.5	19	.7	79	3.0	139	5.2
20	5 35.0	5 35.9	5 19.7	20	.8	80	3.0	140	5.3
21	5 35.3	5 36.2	5 20.0	21	.8	81	3.0	141	5.3
22	5 35.5	5 36.4	5 20.2	22	.8	82	3.1	142	5.3
23	5 35.8	5 36.7	5 20.5	23	.9	83	3.1	143	5.4
24	5 36.0	5 36.9	5 20.7	24	.9	84	3.2	144	5.4
25	5 36.3	5 37.2	5 20.9	25	.9	85	3.2	145	5.4
26	5 36.5	5 37.4	5 21.2	26	1.0	86	3.2	146	5.5
27	5 36.8	5 37.7	5 21.4	27	1.0	87	3.3	147	5.5
28	5 37.0	5 37.9	5 21.6	28	1.1	88	3.3	148	5.6
29	5 37.3	5 38.2	5 21.9	29	1.1	89	3.3	149	5.6
30	5 37.5	5 38.4	5 22.1	30	1.1	90	3.4	150	5.6
31	5 37.8	5 38.7	5 22.4	31	1.2	91	3.4	151	5.7
32	5 38.0	5 38.9	5 22.6	32	1.2	92	3.5	152	5.7
33	5 38.3	5 39.2	5 22.8	33	1.2	93	3.5	153	5.7
34	5 38.5	5 39.4	5 23.1	34	1.3	94	3.5	154	5.8
35	5 38.8	5 39.7	5 23.3	35	1.3	95	3.6	155	5.8
36	5 39.0	5 39.9	5 23.6	36	1.4	96	3.6	156	5.9
37	5 39.3	5 40.2	5 23.8	37	1.4	97	3.6	157	5.9
38	5 39.5	5 40.4	5 24.0	38	1.4	98	3.7	158	5.9
39	5 39.8	5 40.7	5 24.3	39	1.5	99	3.7	159	6.0
40	5 40.0	5 40.9	5 24.5	40	1.5	100	3.8	160	6.0
41	5 40.3	5 41.2	5 24.7	41	1.5	101	3.8	161	6.0
42	5 40.5	5 41.4	5 25.0	42	1.6	102	3.8	162	6.1
43	5 40.8	5 41.7	5 25.2	43	1.6	103	3.9	163	6.1
44	5 41.0	5 41.9	5 25.5	44	1.7	104	3.9	164	6.2
45	5 41.3	5 42.2	5 25.7	45	1.7	105	3.9	165	6.2
46	5 41.5	5 42.4	5 25.9	46	1.7	106	4.0	166	6.2
47	5 41.8	5 42.7	5 26.2	47	1.8	107	4.0	167	6.3
48	5 42.0	5 43.0	5 26.4	48	1.8	108	4.1	168	6.3
49	5 42.3	5 43.2	5 26.7	49	1.8	109	4.1	169	6.3
50	5 42.5	5 43.5	5 26.9	50	1.9	110	4.1	170	6.4
51	5 42.8	5 43.7	5 27.1	51	1.9	111	4.2	171	6.4
52	5 43.0	5 44.0	5 27.4	52	2.0	112	4.2	172	6.5
53	5 43.3	5 44.2	5 27.6	53	2.0	113	4.2	173	6.5
54	5 43.5	5 44.5	5 27.9	54	2.0	114	4.3	174	6.5
55	5 43.8	5 44.7	5 28.1	55	2.1	115	4.3	175	6.6
56	5 44.0	5 45.0	5 28.3	56	2.1	116	4.4	176	6.6
57	5 44.3	5 45.2	5 28.6	57	2.1	117	4.4	177	6.6
58	5 44.5	5 45.5	5 28.8	58	2.2	118	4.4	178	6.7
59	5 44.8	5 45.7	5 29.0	59	2.2	119	4.5	179	6.7
60	5 45.0	5 46.0	5 29.3	60	2.3	120	4.5	180	6.8

0 h 23 min

POPRAVKA ČASOVNOG UGLA				POPRAVKA DRUGOG REDA za časovni ugao i deklinaciju Sunca, Mjeseca i planeta					
s	SUNCA I PLANETA	PROLJEĆNE TAČKE ♈	MJESECA ☾	Δ	popr.	Δ	popr.	Δ	popr.
	° ′	° ′	° ′		′		′		′
0	5 45.0	5 46.0	5 29.3	0	.0	60	2.4	120	4.7
1	5 45.3	5 46.2	5 29.5	1	.0	61	2.4	121	4.7
2	5 45.5	5 46.5	5 29.8	2	.1	62	2.4	122	4.8
3	5 45.8	5 46.7	5 30.0	3	.1	63	2.5	123	4.8
4	5 46.0	5 47.0	5 30.2	4	.2	64	2.5	124	4.9
5	5 46.3	5 47.2	5 30.5	5	.2	65	2.5	125	4.9
6	5 46.5	5 47.5	5 30.7	6	.2	66	2.6	126	4.9
7	5 46.8	5 47.7	5 31.0	7	.3	67	2.6	127	5.0
8	5 47.0	5 48.0	5 31.2	8	.3	68	2.7	128	5.0
9	5 47.3	5 48.2	5 31.4	9	.4	69	2.7	129	5.1
10	5 47.5	5 48.5	5 31.7	10	.4	70	2.7	130	5.1
11	5 47.8	5 48.7	5 31.9	11	.4	71	2.8	131	5.1
12	5 48.0	5 49.0	5 32.1	12	.5	72	2.8	132	5.2
13	5 48.3	5 49.2	5 32.4	13	.5	73	2.9	133	5.2
14	5 48.5	5 49.5	5 32.6	14	.5	74	2.9	134	5.2
15	5 48.8	5 49.7	5 32.9	15	.6	75	2.9	135	5.3
16	5 49.0	5 50.0	5 33.1	16	.6	76	3.0	136	5.3
17	5 49.3	5 50.2	5 33.3	17	.7	77	3.0	137	5.4
18	5 49.5	5 50.5	5 33.6	18	.7	78	3.1	138	5.4
19	5 49.8	5 50.7	5 33.8	19	.7	79	3.1	139	5.4
20	5 50.0	5 51.0	5 34.1	20	.8	80	3.1	140	5.5
21	5 50.3	5 51.2	5 34.3	21	.8	81	3.2	141	5.5
22	5 50.5	5 51.5	5 34.5	22	.9	82	3.2	142	5.6
23	5 50.8	5 51.7	5 34.8	23	.9	83	3.3	143	5.6
24	5 51.0	5 52.0	5 35.0	24	.9	84	3.3	144	5.6
25	5 51.3	5 52.2	5 35.2	25	1.0	85	3.3	145	5.7
26	5 51.5	5 52.5	5 35.5	26	1.0	86	3.4	146	5.7
27	5 51.8	5 52.7	5 35.7	27	1.1	87	3.4	147	5.8
28	5 52.0	5 53.0	5 36.0	28	1.1	88	3.4	148	5.8
29	5 52.3	5 53.2	5 36.2	29	1.1	89	3.5	149	5.8
30	5 52.5	5 53.5	5 36.4	30	1.2	90	3.5	150	5.9
31	5 52.8	5 53.7	5 36.7	31	1.2	91	3.6	151	5.9
32	5 53.0	5 54.0	5 36.9	32	1.3	92	3.6	152	6.0
33	5 53.3	5 54.2	5 37.2	33	1.3	93	3.6	153	6.0
34	5 53.5	5 54.5	5 37.4	34	1.3	94	3.7	154	6.0
35	5 53.8	5 54.7	5 37.6	35	1.4	95	3.7	155	6.1
36	5 54.0	5 55.0	5 37.9	36	1.4	96	3.8	156	6.1
37	5 54.3	5 55.2	5 38.1	37	1.4	97	3.8	157	6.1
38	5 54.5	5 55.5	5 38.4	38	1.5	98	3.8	158	6.2
39	5 54.8	5 55.7	5 38.6	39	1.5	99	3.9	159	6.2
40	5 55.0	5 56.0	5 38.8	40	1.6	100	3.9	160	6.3
41	5 55.3	5 56.2	5 39.1	41	1.6	101	4.0	161	6.3
42	5 55.5	5 56.5	5 39.3	42	1.6	102	4.0	162	6.3
43	5 55.8	5 56.7	5 39.5	43	1.7	103	4.0	163	6.4
44	5 56.0	5 57.0	5 39.8	44	1.7	104	4.1	164	6.4
45	5 56.3	5 57.2	5 40.0	45	1.8	105	4.1	165	6.5
46	5 56.5	5 57.5	5 40.3	46	1.8	106	4.2	166	6.5
47	5 56.8	5 57.7	5 40.5	47	1.8	107	4.2	167	6.5
48	5 57.0	5 58.0	5 40.7	48	1.9	108	4.2	168	6.6
49	5 57.3	5 58.2	5 41.0	49	1.9	109	4.3	169	6.6
50	5 57.5	5 58.5	5 41.2	50	2.0	110	4.3	170	6.7
51	5 57.8	5 58.7	5 41.5	51	2.0	111	4.3	171	6.7
52	5 58.0	5 59.0	5 41.7	52	2.0	112	4.4	172	6.7
53	5 58.3	5 59.2	5 41.9	53	2.1	113	4.4	173	6.8
54	5 58.5	5 59.5	5 42.2	54	2.1	114	4.5	174	6.8
55	5 58.8	5 59.7	5 42.4	55	2.2	115	4.5	175	6.9
56	5 59.0	5 60.0	5 42.6	56	2.2	116	4.5	176	6.9
57	5 59.3	6 .2	5 42.9	57	2.2	117	4.6	177	6.9
58	5 59.5	6 .5	5 43.1	58	2.3	118	4.6	178	7.0
59	5 59.8	6 .7	5 43.4	59	2.3	119	4.7	179	7.0
60	6 .0	6 1.0	5 43.6	60	2.4	120	4.7	180	7.1

0 h 24 min

s	POPRAVKA ČASOVNOG UGLA: SUNCA I PLANETA	PROLJEĆNE TAČKE ♈	MJESECA ☾	POPRAVKA DRUGOG REDA za časovni ugao i deklinaciju Sunca, Mjeseca i planeta: Δ	poprav.	Δ	poprav.	Δ	poprav.
	° ′	° ′	° ′		′		′		′
0	6 .0	6 1.0	5 43.6	0	.0	60	2.5	120	4.9
1	6 .3	6 1.3	5 43.8	1	.0	61	2.5	121	4.9
2	6 .5	6 1.5	5 44.1	2	.1	62	2.5	122	5.0
3	6 .8	6 1.8	5 44.3	3	.1	63	2.6	123	5.0
4	6 1.0	6 2.0	5 44.6	4	.2	64	2.6	124	5.1
5	6 1.3	6 2.3	5 44.8	5	.2	65	2.7	125	5.1
6	6 1.5	6 2.5	5 45.0	6	.2	66	2.7	126	5.1
7	6 1.8	6 2.8	5 45.3	7	.3	67	2.7	127	5.2
8	6 2.0	6 3.0	5 45.5	8	.3	68	2.8	128	5.2
9	6 2.3	6 3.3	5 45.7	9	.4	69	2.8	129	5.3
10	6 2.5	6 3.5	5 46.0	10	.4	70	2.9	130	5.3
11	6 2.8	6 3.8	5 46.2	11	.4	71	2.9	131	5.3
12	6 3.0	6 4.0	5 46.5	12	.5	72	2.9	132	5.4
13	6 3.3	6 4.3	5 46.7	13	.5	73	3.0	133	5.4
14	6 3.5	6 4.5	5 46.9	14	.6	74	3.0	134	5.5
15	6 3.8	6 4.8	5 47.2	15	.6	75	3.1	135	5.5
16	6 4.0	6 5.0	5 47.4	16	.7	76	3.1	136	5.6
17	6 4.3	6 5.3	5 47.7	17	.7	77	3.1	137	5.6
18	6 4.5	6 5.5	5 47.9	18	.7	78	3.2	138	5.6
19	6 4.8	6 5.8	5 48.1	19	.8	79	3.2	139	5.7
20	6 5.0	6 6.0	5 48.4	20	.8	80	3.3	140	5.7
21	6 5.3	6 6.3	5 48.6	21	.9	81	3.3	141	5.8
22	6 5.5	6 6.5	5 48.8	22	.9	82	3.3	142	5.8
23	6 5.8	6 6.8	5 49.1	23	.9	83	3.4	143	5.8
24	6 6.0	6 7.0	5 49.3	24	1.0	84	3.4	144	5.9
25	6 6.3	6 7.3	5 49.6	25	1.0	85	3.5	145	5.9
26	6 6.5	6 7.5	5 49.8	26	1.1	86	3.5	146	6.0
27	6 6.8	6 7.8	5 50.0	27	1.1	87	3.6	147	6.0
28	6 7.0	6 8.0	5 50.3	28	1.1	88	3.6	148	6.0
29	6 7.3	6 8.3	5 50.5	29	1.2	89	3.6	149	6.1
30	6 7.5	6 8.5	5 50.8	30	1.2	90	3.7	150	6.1
31	6 7.8	6 8.8	5 51.0	31	1.3	91	3.7	151	6.2
32	6 8.0	6 9.0	5 51.2	32	1.3	92	3.8	152	6.2
33	6 8.3	6 9.3	5 51.5	33	1.3	93	3.8	153	6.2
34	6 8.5	6 9.5	5 51.7	34	1.4	94	3.8	154	6.3
35	6 8.8	6 9.8	5 52.0	35	1.4	95	3.9	155	6.3
36	6 9.0	6 10.0	5 52.2	36	1.5	96	3.9	156	6.4
37	6 9.3	6 10.3	5 52.4	37	1.5	97	4.0	157	6.4
38	6 9.5	6 10.5	5 52.7	38	1.6	98	4.0	158	6.5
39	6 9.8	6 10.8	5 52.9	39	1.6	99	4.0	159	6.5
40	6 10.0	6 11.0	5 53.1	40	1.6	100	4.1	160	6.5
41	6 10.3	6 11.3	5 53.4	41	1.7	101	4.1	161	6.6
42	6 10.5	6 11.5	5 53.6	42	1.7	102	4.2	162	6.6
43	6 10.8	6 11.8	5 53.9	43	1.8	103	4.2	163	6.7
44	6 11.0	6 12.0	5 54.1	44	1.8	104	4.2	164	6.7
45	6 11.3	6 12.3	5 54.3	45	1.8	105	4.3	165	6.7
46	6 11.5	6 12.5	5 54.6	46	1.9	106	4.3	166	6.8
47	6 11.8	6 12.8	5 54.8	47	1.9	107	4.4	167	6.8
48	6 12.0	6 13.0	5 55.1	48	2.0	108	4.4	168	6.9
49	6 12.3	6 13.3	5 55.3	49	2.0	109	4.5	169	6.9
50	6 12.5	6 13.5	5 55.5	50	2.0	110	4.5	170	6.9
51	6 12.8	6 13.8	5 55.8	51	2.1	111	4.5	171	7.0
52	6 13.0	6 14.0	5 56.0	52	2.1	112	4.6	172	7.0
53	6 13.3	6 14.3	5 56.2	53	2.2	113	4.6	173	7.1
54	6 13.5	6 14.5	5 56.5	54	2.2	114	4.7	174	7.1
55	6 13.8	6 14.8	5 56.7	55	2.2	115	4.7	175	7.1
56	6 14.0	6 15.0	5 57.0	56	2.3	116	4.7	176	7.2
57	6 14.3	6 15.3	5 57.2	57	2.3	117	4.8	177	7.2
58	6 14.5	6 15.5	5 57.4	58	2.4	118	4.8	178	7.3
59	6 14.8	6 15.8	5 57.7	59	2.4	119	4.9	179	7.3
60	6 15.0	6 16.0	5 57.9	60	2.5	120	4.9	180	7.4

0 h 25 min

s	POPRAVKA ČASOVNOG UGLA: SUNCA I PLANETA	PROLJEĆNE TAČKE ♈	MJESECA ☾	POPRAVKA DRUGOG REDA za časovni ugao i deklinaciju Sunca, Mjeseca i planeta: Δ	poprav.	Δ	poprav.	Δ	poprav.
	° ′	° ′	° ′		′		′		′
0	6 15.0	6 16.0	5 57.9	0	.0	60	2.6	120	5.1
1	6 15.3	6 16.3	5 58.2	1	.0	61	2.6	121	5.1
2	6 15.5	6 16.5	5 58.4	2	.1	62	2.6	122	5.2
3	6 15.8	6 16.8	5 58.6	3	.1	63	2.7	123	5.2
4	6 16.0	6 17.0	5 58.9	4	.2	64	2.7	124	5.3
5	6 16.3	6 17.3	5 59.1	5	.2	65	2.8	125	5.3
6	6 16.5	6 17.5	5 59.3	6	.3	66	2.8	126	5.4
7	6 16.8	6 17.8	5 59.6	7	.3	67	2.8	127	5.4
8	6 17.0	6 18.0	5 59.8	8	.3	68	2.9	128	5.4
9	6 17.3	6 18.3	6 .1	9	.4	69	2.9	129	5.5
10	6 17.5	6 18.5	6 .3	10	.4	70	3.0	130	5.5
11	6 17.8	6 18.8	6 .5	11	.5	71	3.0	131	5.6
12	6 18.0	6 19.1	6 .8	12	.5	72	3.1	132	5.6
13	6 18.3	6 19.3	6 1.0	13	.6	73	3.1	133	5.7
14	6 18.5	6 19.6	6 1.3	14	.6	74	3.1	134	5.7
15	6 18.8	6 19.8	6 1.5	15	.6	75	3.2	135	5.7
16	6 19.0	6 20.1	6 1.7	16	.7	76	3.2	136	5.8
17	6 19.3	6 20.3	6 2.0	17	.7	77	3.3	137	5.8
18	6 19.5	6 20.6	6 2.2	18	.8	78	3.3	138	5.9
19	6 19.8	6 20.8	6 2.5	19	.8	79	3.4	139	5.9
20	6 20.0	6 21.1	6 2.7	20	.9	80	3.4	140	6.0
21	6 20.3	6 21.3	6 2.9	21	.9	81	3.4	141	6.0
22	6 20.5	6 21.6	6 3.2	22	.9	82	3.5	142	6.0
23	6 20.8	6 21.8	6 3.4	23	1.0	83	3.5	143	6.1
24	6 21.0	6 22.1	6 3.6	24	1.0	84	3.6	144	6.1
25	6 21.3	6 22.3	6 3.9	25	1.1	85	3.6	145	6.2
26	6 21.5	6 22.6	6 4.1	26	1.1	86	3.7	146	6.2
27	6 21.8	6 22.8	6 4.4	27	1.1	87	3.7	147	6.2
28	6 22.0	6 23.1	6 4.6	28	1.2	88	3.7	148	6.3
29	6 22.3	6 23.3	6 4.8	29	1.2	89	3.8	149	6.3
30	6 22.5	6 23.6	6 5.1	30	1.3	90	3.8	150	6.4
31	6 22.8	6 23.8	6 5.3	31	1.3	91	3.9	151	6.4
32	6 23.0	6 24.1	6 5.6	32	1.4	92	3.9	152	6.5
33	6 23.3	6 24.3	6 5.8	33	1.4	93	4.0	153	6.5
34	6 23.5	6 24.6	6 6.0	34	1.4	94	4.0	154	6.5
35	6 23.8	6 24.8	6 6.3	35	1.5	95	4.0	155	6.6
36	6 24.0	6 25.1	6 6.5	36	1.5	96	4.1	156	6.6
37	6 24.3	6 25.3	6 6.7	37	1.6	97	4.1	157	6.7
38	6 24.5	6 25.6	6 7.0	38	1.6	98	4.2	158	6.7
39	6 24.8	6 25.8	6 7.2	39	1.7	99	4.2	159	6.8
40	6 25.0	6 26.1	6 7.5	40	1.7	100	4.3	160	6.8
41	6 25.3	6 26.3	6 7.7	41	1.7	101	4.3	161	6.8
42	6 25.5	6 26.6	6 7.9	42	1.8	102	4.3	162	6.9
43	6 25.8	6 26.8	6 8.2	43	1.8	103	4.4	163	6.9
44	6 26.0	6 27.1	6 8.4	44	1.9	104	4.4	164	7.0
45	6 26.3	6 27.3	6 8.7	45	1.9	105	4.5	165	7.0
46	6 26.5	6 27.6	6 8.9	46	2.0	106	4.5	166	7.1
47	6 26.8	6 27.8	6 9.1	47	2.0	107	4.5	167	7.1
48	6 27.0	6 28.1	6 9.4	48	2.0	108	4.6	168	7.1
49	6 27.3	6 28.3	6 9.6	49	2.1	109	4.6	169	7.2
50	6 27.5	6 28.6	6 9.8	50	2.1	110	4.7	170	7.2
51	6 27.8	6 28.8	6 10.1	51	2.2	111	4.7	171	7.3
52	6 28.0	6 29.1	6 10.3	52	2.2	112	4.8	172	7.3
53	6 28.3	6 29.3	6 10.6	53	2.3	113	4.8	173	7.4
54	6 28.5	6 29.6	6 10.8	54	2.3	114	4.8	174	7.4
55	6 28.8	6 29.8	6 11.0	55	2.3	115	4.9	175	7.4
56	6 29.0	6 30.1	6 11.3	56	2.4	116	4.9	176	7.5
57	6 29.3	6 30.3	6 11.5	57	2.4	117	5.0	177	7.5
58	6 29.5	6 30.6	6 11.8	58	2.5	118	5.0	178	7.6
59	6 29.8	6 30.8	6 12.0	59	2.5	119	5.1	179	7.6
60	6 30.0	6 31.1	6 12.2	60	2.6	120	5.1	180	7.7

0 h 26 min

s	POPRAVKA ČASOVNOG UGLA: SUNCA I PLANETA	PROLJEĆNE TAČKE ♈	MJESECA ☾	POPRAVKA DRUGOG REDA za časovni ugao i deklinaciju Sunca, Mjeseca i planeta: Δ	popr.	Δ	popr.	Δ	popr.
	° ′	° ′	° ′		′		′		′
0	6 30.0	6 31.1	6 12.2	0	.0	60	2.7	120	5.3
1	6 30.3	6 31.3	6 12.5	1	.0	61	2.7	121	5.3
2	6 30.5	6 31.6	6 12.7	2	.1	62	2.7	122	5.4
3	6 30.8	6 31.8	6 12.9	3	.1	63	2.8	123	5.4
4	6 31.0	6 32.1	6 13.2	4	.2	64	2.8	124	5.5
5	6 31.3	6 32.3	6 13.4	5	.2	65	2.9	125	5.5
6	6 31.5	6 32.6	6 13.7	6	.3	66	2.9	126	5.6
7	6 31.8	6 32.8	6 13.9	7	.3	67	3.0	127	5.6
8	6 32.0	6 33.1	6 14.1	8	.4	68	3.0	128	5.7
9	6 32.3	6 33.3	6 14.4	9	.4	69	3.0	129	5.7
10	6 32.5	6 33.6	6 14.6	10	.4	70	3.1	130	5.7
11	6 32.8	6 33.8	6 14.9	11	.5	71	3.1	131	5.8
12	6 33.0	6 34.1	6 15.1	12	.5	72	3.2	132	5.8
13	6 33.3	6 34.3	6 15.3	13	.6	73	3.2	133	5.9
14	6 33.5	6 34.6	6 15.6	14	.6	74	3.3	134	5.9
15	6 33.8	6 34.8	6 15.8	15	.7	75	3.3	135	6.0
16	6 34.0	6 35.1	6 16.1	16	.7	76	3.4	136	6.0
17	6 34.3	6 35.3	6 16.3	17	.8	77	3.4	137	6.1
18	6 34.5	6 35.6	6 16.5	18	.8	78	3.4	138	6.1
19	6 34.8	6 35.8	6 16.8	19	.8	79	3.5	139	6.1
20	6 35.0	6 36.1	6 17.0	20	.9	80	3.5	140	6.2
21	6 35.3	6 36.3	6 17.2	21	.9	81	3.6	141	6.2
22	6 35.5	6 36.6	6 17.5	22	1.0	82	3.6	142	6.3
23	6 35.8	6 36.8	6 17.7	23	1.0	83	3.7	143	6.3
24	6 36.0	6 37.1	6 18.0	24	1.1	84	3.7	144	6.4
25	6 36.3	6 37.4	6 18.2	25	1.1	85	3.8	145	6.4
26	6 36.5	6 37.6	6 18.4	26	1.1	86	3.8	146	6.4
27	6 36.8	6 37.9	6 18.7	27	1.2	87	3.8	147	6.5
28	6 37.0	6 38.1	6 18.9	28	1.2	88	3.9	148	6.5
29	6 37.3	6 38.4	6 19.2	29	1.3	89	3.9	149	6.6
30	6 37.5	6 38.6	6 19.4	30	1.3	90	4.0	150	6.6
31	6 37.8	6 38.9	6 19.6	31	1.4	91	4.0	151	6.7
32	6 38.0	6 39.1	6 19.9	32	1.4	92	4.1	152	6.7
33	6 38.3	6 39.4	6 20.1	33	1.5	93	4.1	153	6.8
34	6 38.5	6 39.6	6 20.3	34	1.5	94	4.2	154	6.8
35	6 38.8	6 39.9	6 20.6	35	1.5	95	4.2	155	6.8
36	6 39.0	6 40.1	6 20.8	36	1.6	96	4.2	156	6.9
37	6 39.3	6 40.4	6 21.1	37	1.6	97	4.3	157	6.9
38	6 39.5	6 40.6	6 21.3	38	1.7	98	4.3	158	7.0
39	6 39.8	6 40.9	6 21.5	39	1.7	99	4.4	159	7.0
40	6 40.0	6 41.1	6 21.8	40	1.8	100	4.4	160	7.1
41	6 40.3	6 41.4	6 22.0	41	1.8	101	4.5	161	7.1
42	6 40.5	6 41.6	6 22.3	42	1.9	102	4.5	162	7.2
43	6 40.8	6 41.9	6 22.5	43	1.9	103	4.5	163	7.2
44	6 41.0	6 42.1	6 22.7	44	1.9	104	4.6	164	7.2
45	6 41.3	6 42.4	6 23.0	45	2.0	105	4.6	165	7.3
46	6 41.5	6 42.6	6 23.2	46	2.0	106	4.7	166	7.3
47	6 41.8	6 42.9	6 23.4	47	2.1	107	4.7	167	7.4
48	6 42.0	6 43.1	6 23.7	48	2.1	108	4.8	168	7.4
49	6 42.3	6 43.4	6 23.9	49	2.2	109	4.8	169	7.5
50	6 42.5	6 43.6	6 24.2	50	2.2	110	4.9	170	7.5
51	6 42.8	6 43.9	6 24.4	51	2.3	111	4.9	171	7.6
52	6 43.0	6 44.1	6 24.6	52	2.3	112	4.9	172	7.6
53	6 43.3	6 44.4	6 24.9	53	2.3	113	5.0	173	7.6
54	6 43.5	6 44.6	6 25.1	54	2.4	114	5.0	174	7.7
55	6 43.8	6 44.9	6 25.4	55	2.4	115	5.1	175	7.7
56	6 44.0	6 45.1	6 25.6	56	2.5	116	5.1	176	7.8
57	6 44.3	6 45.4	6 25.8	57	2.5	117	5.2	177	7.8
58	6 44.5	6 45.6	6 26.1	58	2.6	118	5.2	178	7.9
59	6 44.8	6 45.9	6 26.3	59	2.6	119	5.3	179	7.9
60	6 45.0	6 46.1	6 26.6	60	2.7	120	5.3	180	8.0

0 h 27 min

s	POPRAVKA ČASOVNOG UGLA: SUNCA I PLANETA	PROLJEĆNE TAČKE ♈	MJESECA ☾	POPRAVKA DRUGOG REDA za časovni ugao i deklinaciju Sunca, Mjeseca i planeta: Δ	popr.	Δ	popr.	Δ	popr.
	° ′	° ′	° ′		′		′		′
0	6 45.0	6 46.1	6 26.6	0	.0	60	2.8	120	5.5
1	6 45.3	6 46.4	6 26.8	1	.0	61	2.8	121	5.5
2	6 45.5	6 46.6	6 27.0	2	.1	62	2.8	122	5.6
3	6 45.8	6 46.9	6 27.3	3	.1	63	2.9	123	5.6
4	6 46.0	6 47.1	6 27.5	4	.2	64	2.9	124	5.7
5	6 46.3	6 47.4	6 27.7	5	.2	65	3.0	125	5.7
6	6 46.5	6 47.6	6 28.0	6	.3	66	3.0	126	5.8
7	6 46.8	6 47.9	6 28.2	7	.3	67	3.1	127	5.8
8	6 47.0	6 48.1	6 28.5	8	.4	68	3.1	128	5.9
9	6 47.3	6 48.4	6 28.7	9	.4	69	3.2	129	5.9
10	6 47.5	6 48.6	6 28.9	10	.5	70	3.2	130	6.0
11	6 47.8	6 48.9	6 29.2	11	.5	71	3.3	131	6.0
12	6 48.0	6 49.1	6 29.4	12	.6	72	3.3	132	6.1
13	6 48.3	6 49.4	6 29.7	13	.6	73	3.3	133	6.1
14	6 48.5	6 49.6	6 29.9	14	.6	74	3.4	134	6.1
15	6 48.8	6 49.9	6 30.1	15	.7	75	3.4	135	6.2
16	6 49.0	6 50.1	6 30.4	16	.7	76	3.5	136	6.2
17	6 49.3	6 50.4	6 30.6	17	.8	77	3.5	137	6.3
18	6 49.5	6 50.6	6 30.8	18	.8	78	3.6	138	6.3
19	6 49.8	6 50.9	6 31.1	19	.9	79	3.6	139	6.4
20	6 50.0	6 51.1	6 31.3	20	.9	80	3.7	140	6.4
21	6 50.3	6 51.4	6 31.6	21	1.0	81	3.7	141	6.5
22	6 50.5	6 51.6	6 31.8	22	1.0	82	3.8	142	6.5
23	6 50.8	6 51.9	6 32.0	23	1.1	83	3.8	143	6.6
24	6 51.0	6 52.1	6 32.3	24	1.1	84	3.9	144	6.6
25	6 51.3	6 52.4	6 32.5	25	1.1	85	3.9	145	6.6
26	6 51.5	6 52.6	6 32.8	26	1.2	86	3.9	146	6.7
27	6 51.8	6 52.9	6 33.0	27	1.2	87	4.0	147	6.7
28	6 52.0	6 53.1	6 33.2	28	1.3	88	4.0	148	6.8
29	6 52.3	6 53.4	6 33.5	29	1.3	89	4.1	149	6.8
30	6 52.5	6 53.6	6 33.7	30	1.4	90	4.1	150	6.9
31	6 52.8	6 53.9	6 33.9	31	1.4	91	4.2	151	6.9
32	6 53.0	6 54.1	6 34.2	32	1.5	92	4.2	152	7.0
33	6 53.3	6 54.4	6 34.4	33	1.5	93	4.3	153	7.0
34	6 53.5	6 54.6	6 34.7	34	1.6	94	4.3	154	7.1
35	6 53.8	6 54.9	6 34.9	35	1.6	95	4.4	155	7.1
36	6 54.0	6 55.2	6 35.1	36	1.7	96	4.4	156	7.2
37	6 54.3	6 55.4	6 35.4	37	1.7	97	4.4	157	7.2
38	6 54.5	6 55.7	6 35.6	38	1.7	98	4.5	158	7.2
39	6 54.8	6 55.9	6 35.9	39	1.8	99	4.5	159	7.3
40	6 55.0	6 56.2	6 36.1	40	1.8	100	4.6	160	7.3
41	6 55.3	6 56.4	6 36.3	41	1.9	101	4.6	161	7.4
42	6 55.5	6 56.7	6 36.6	42	1.9	102	4.7	162	7.4
43	6 55.8	6 56.9	6 36.8	43	2.0	103	4.7	163	7.5
44	6 56.0	6 57.2	6 37.0	44	2.0	104	4.8	164	7.5
45	6 56.3	6 57.4	6 37.3	45	2.1	105	4.8	165	7.6
46	6 56.5	6 57.7	6 37.5	46	2.1	106	4.9	166	7.6
47	6 56.8	6 57.9	6 37.8	47	2.2	107	4.9	167	7.7
48	6 57.0	6 58.2	6 38.0	48	2.2	108	5.0	168	7.7
49	6 57.3	6 58.4	6 38.2	49	2.2	109	5.0	169	7.7
50	6 57.5	6 58.7	6 38.5	50	2.3	110	5.0	170	7.8
51	6 57.8	6 58.9	6 38.7	51	2.3	111	5.1	171	7.8
52	6 58.0	6 59.2	6 39.0	52	2.4	112	5.1	172	7.9
53	6 58.3	6 59.4	6 39.2	53	2.4	113	5.2	173	7.9
54	6 58.5	6 59.7	6 39.4	54	2.5	114	5.2	174	8.0
55	6 58.8	6 59.9	6 39.7	55	2.5	115	5.3	175	8.0
56	6 59.0	7 .2	6 39.9	56	2.6	116	5.3	176	8.1
57	6 59.3	7 .4	6 40.2	57	2.6	117	5.4	177	8.1
58	6 59.5	7 .7	6 40.4	58	2.7	118	5.4	178	8.2
59	6 59.8	7 .9	6 40.6	59	2.7	119	5.5	179	8.2
60	7 .0	7 1.2	6 40.9	60	2.8	120	5.5	180	8.3

0 h 28 min

s	POPRAVKA ČASOVNOG UGLA: SUNCA I PLANETA	PROLJEĆNE TAČKE ♈	MJESECA ☾	POPRAVKA DRUGOG REDA za časovni ugao i deklinaciju Sunca, Mjeseca i planeta: Δ	popr.	Δ	popr.	Δ	popr.
	° ′	° ′	° ′		′		′		′
0	7 .0	7 1.2	6 40.9	0	.0	60	2.9	120	5.7
1	7 .3	7 1.4	6 41.1	1	.0	61	2.9	121	5.7
2	7 .5	7 1.7	6 41.3	2	.1	62	2.9	122	5.8
3	7 .8	7 1.9	6 41.6	3	.1	63	3.0	123	5.8
4	7 1.0	7 2.2	6 41.8	4	.2	64	3.0	124	5.9
5	7 1.3	7 2.4	6 42.1	5	.2	65	3.1	125	5.9
6	7 1.5	7 2.7	6 42.3	6	.3	66	3.1	126	6.0
7	7 1.8	7 2.9	6 42.5	7	.3	67	3.2	127	6.0
8	7 2.0	7 3.2	6 42.8	8	.4	68	3.2	128	6.1
9	7 2.3	7 3.4	6 43.0	9	.4	69	3.3	129	6.1
10	7 2.5	7 3.7	6 43.3	10	.5	70	3.3	130	6.2
11	7 2.8	7 3.9	6 43.5	11	.5	71	3.4	131	6.2
12	7 3.0	7 4.2	6 43.7	12	.6	72	3.4	132	6.3
13	7 3.3	7 4.4	6 44.0	13	.6	73	3.5	133	6.3
14	7 3.5	7 4.7	6 44.2	14	.7	74	3.5	134	6.4
15	7 3.8	7 4.9	6 44.4	15	.7	75	3.6	135	6.4
16	7 4.0	7 5.2	6 44.7	16	.8	76	3.6	136	6.5
17	7 4.3	7 5.4	6 44.9	17	.8	77	3.7	137	6.5
18	7 4.5	7 5.7	6 45.2	18	.9	78	3.7	138	6.6
19	7 4.8	7 5.9	6 45.4	19	.9	79	3.8	139	6.6
20	7 5.0	7 6.2	6 45.6	20	1.0	80	3.8	140	6.7
21	7 5.3	7 6.4	6 45.9	21	1.0	81	3.8	141	6.7
22	7 5.5	7 6.7	6 46.1	22	1.0	82	3.9	142	6.7
23	7 5.8	7 6.9	6 46.4	23	1.1	83	3.9	143	6.8
24	7 6.0	7 7.2	6 46.6	24	1.1	84	4.0	144	6.8
25	7 6.3	7 7.4	6 46.8	25	1.2	85	4.0	145	6.9
26	7 6.5	7 7.7	6 47.1	26	1.2	86	4.1	146	6.9
27	7 6.8	7 7.9	6 47.3	27	1.3	87	4.1	147	7.0
28	7 7.0	7 8.2	6 47.5	28	1.3	88	4.2	148	7.0
29	7 7.3	7 8.4	6 47.8	29	1.4	89	4.2	149	7.1
30	7 7.5	7 8.7	6 48.0	30	1.4	90	4.3	150	7.1
31	7 7.8	7 8.9	6 48.3	31	1.5	91	4.3	151	7.2
32	7 8.0	7 9.2	6 48.5	32	1.5	92	4.4	152	7.2
33	7 8.3	7 9.4	6 48.7	33	1.6	93	4.4	153	7.3
34	7 8.5	7 9.7	6 49.0	34	1.6	94	4.5	154	7.3
35	7 8.8	7 9.9	6 49.2	35	1.7	95	4.5	155	7.4
36	7 9.0	7 10.2	6 49.5	36	1.7	96	4.6	156	7.4
37	7 9.3	7 10.4	6 49.7	37	1.8	97	4.6	157	7.5
38	7 9.5	7 10.7	6 49.9	38	1.8	98	4.7	158	7.5
39	7 9.8	7 10.9	6 50.2	39	1.9	99	4.7	159	7.6
40	7 10.0	7 11.2	6 50.4	40	1.9	100	4.8	160	7.6
41	7 10.3	7 11.4	6 50.6	41	1.9	101	4.8	161	7.6
42	7 10.5	7 11.7	6 50.9	42	2.0	102	4.8	162	7.7
43	7 10.8	7 11.9	6 51.1	43	2.0	103	4.9	163	7.7
44	7 11.0	7 12.2	6 51.4	44	2.1	104	4.9	164	7.8
45	7 11.3	7 12.4	6 51.6	45	2.1	105	5.0	165	7.8
46	7 11.5	7 12.7	6 51.8	46	2.2	106	5.0	166	7.9
47	7 11.8	7 12.9	6 52.1	47	2.2	107	5.1	167	7.9
48	7 12.0	7 13.2	6 52.3	48	2.3	108	5.1	168	8.0
49	7 12.3	7 13.5	6 52.6	49	2.3	109	5.2	169	8.0
50	7 12.5	7 13.7	6 52.8	50	2.4	110	5.2	170	8.1
51	7 12.8	7 14.0	6 53.0	51	2.4	111	5.3	171	8.1
52	7 13.0	7 14.2	6 53.3	52	2.5	112	5.3	172	8.2
53	7 13.3	7 14.5	6 53.5	53	2.5	113	5.4	173	8.2
54	7 13.5	7 14.7	6 53.8	54	2.6	114	5.4	174	8.3
55	7 13.8	7 15.0	6 54.0	55	2.6	115	5.5	175	8.3
56	7 14.0	7 15.2	6 54.2	56	2.7	116	5.5	176	8.4
57	7 14.3	7 15.5	6 54.5	57	2.7	117	5.6	177	8.4
58	7 14.5	7 15.7	6 54.7	58	2.8	118	5.6	178	8.5
59	7 14.8	7 16.0	6 54.9	59	2.8	119	5.7	179	8.5
60	7 15.0	7 16.2	6 55.2	60	2.9	120	5.7	180	8.6

0 h 29 min

s	POPRAVKA ČASOVNOG UGLA: SUNCA I PLANETA	PROLJEĆNE TAČKE ♈	MJESECA ☾	POPRAVKA DRUGOG REDA za časovni ugao i deklinaciju Sunca, Mjeseca i planeta: Δ	popr.	Δ	popr.	Δ	popr.
	° ′	° ′	° ′		′		′		′
0	7 15.0	7 16.2	6 55.2	0	.0	60	3.0	120	5.9
1	7 15.3	7 16.5	6 55.4	1	.0	61	3.0	121	5.9
2	7 15.5	7 16.7	6 55.7	2	.1	62	3.0	122	6.0
3	7 15.8	7 17.0	6 55.9	3	.1	63	3.1	123	6.0
4	7 16.0	7 17.2	6 56.1	4	.2	64	3.1	124	6.1
5	7 16.3	7 17.5	6 56.4	5	.2	65	3.2	125	6.1
6	7 16.5	7 17.7	6 56.6	6	.3	66	3.2	126	6.2
7	7 16.8	7 18.0	6 56.9	7	.3	67	3.3	127	6.2
8	7 17.0	7 18.2	6 57.1	8	.4	68	3.3	128	6.3
9	7 17.3	7 18.5	6 57.3	9	.4	69	3.4	129	6.3
10	7 17.5	7 18.7	6 57.6	10	.5	70	3.4	130	6.4
11	7 17.8	7 19.0	6 57.8	11	.5	71	3.5	131	6.4
12	7 18.0	7 19.2	6 58.0	12	.6	72	3.5	132	6.5
13	7 18.3	7 19.5	6 58.3	13	.6	73	3.6	133	6.5
14	7 18.5	7 19.7	6 58.5	14	.7	74	3.6	134	6.6
15	7 18.8	7 20.0	6 58.8	15	.7	75	3.7	135	6.6
16	7 19.0	7 20.2	6 59.0	16	.8	76	3.7	136	6.7
17	7 19.3	7 20.5	6 59.2	17	.8	77	3.8	137	6.7
18	7 19.5	7 20.7	6 59.5	18	.9	78	3.8	138	6.8
19	7 19.8	7 21.0	6 59.7	19	.9	79	3.9	139	6.8
20	7 20.0	7 21.2	6 60.0	20	1.0	80	3.9	140	6.9
21	7 20.3	7 21.5	7 .2	21	1.0	81	4.0	141	6.9
22	7 20.5	7 21.7	7 .4	22	1.1	82	4.0	142	7.0
23	7 20.8	7 22.0	7 .7	23	1.1	83	4.1	143	7.0
24	7 21.0	7 22.2	7 .9	24	1.2	84	4.1	144	7.1
25	7 21.3	7 22.5	7 1.1	25	1.2	85	4.2	145	7.1
26	7 21.5	7 22.7	7 1.4	26	1.3	86	4.2	146	7.2
27	7 21.8	7 23.0	7 1.6	27	1.3	87	4.3	147	7.2
28	7 22.0	7 23.2	7 1.9	28	1.4	88	4.3	148	7.3
29	7 22.3	7 23.5	7 2.1	29	1.4	89	4.4	149	7.3
30	7 22.5	7 23.7	7 2.3	30	1.5	90	4.4	150	7.4
31	7 22.8	7 24.0	7 2.6	31	1.5	91	4.5	151	7.4
32	7 23.0	7 24.2	7 2.8	32	1.6	92	4.5	152	7.5
33	7 23.3	7 24.5	7 3.1	33	1.6	93	4.6	153	7.5
34	7 23.5	7 24.7	7 3.3	34	1.7	94	4.6	154	7.6
35	7 23.8	7 25.0	7 3.5	35	1.7	95	4.7	155	7.6
36	7 24.0	7 25.2	7 3.8	36	1.8	96	4.7	156	7.7
37	7 24.3	7 25.5	7 4.0	37	1.8	97	4.8	157	7.7
38	7 24.5	7 25.7	7 4.3	38	1.9	98	4.8	158	7.8
39	7 24.8	7 26.0	7 4.5	39	1.9	99	4.9	159	7.8
40	7 25.0	7 26.2	7 4.7	40	2.0	100	4.9	160	7.9
41	7 25.3	7 26.5	7 5.0	41	2.0	101	5.0	161	7.9
42	7 25.5	7 26.7	7 5.2	42	2.1	102	5.0	162	8.0
43	7 25.8	7 27.0	7 5.4	43	2.1	103	5.1	163	8.0
44	7 26.0	7 27.2	7 5.7	44	2.2	104	5.1	164	8.1
45	7 26.3	7 27.5	7 5.9	45	2.2	105	5.2	165	8.1
46	7 26.5	7 27.7	7 6.2	46	2.3	106	5.2	166	8.2
47	7 26.8	7 28.0	7 6.4	47	2.3	107	5.3	167	8.2
48	7 27.0	7 28.2	7 6.6	48	2.4	108	5.3	168	8.3
49	7 27.3	7 28.5	7 6.9	49	2.4	109	5.4	169	8.3
50	7 27.5	7 28.7	7 7.1	50	2.5	110	5.4	170	8.4
51	7 27.8	7 29.0	7 7.4	51	2.5	111	5.5	171	8.4
52	7 28.0	7 29.2	7 7.6	52	2.6	112	5.5	172	8.5
53	7 28.3	7 29.5	7 7.8	53	2.6	113	5.6	173	8.5
54	7 28.5	7 29.7	7 8.1	54	2.7	114	5.6	174	8.6
55	7 28.8	7 30.0	7 8.3	55	2.7	115	5.7	175	8.6
56	7 29.0	7 30.2	7 8.5	56	2.8	116	5.7	176	8.7
57	7 29.3	7 30.5	7 8.8	57	2.8	117	5.8	177	8.7
58	7 29.5	7 30.7	7 9.0	58	2.9	118	5.8	178	8.8
59	7 29.8	7 31.0	7 9.3	59	2.9	119	5.9	179	8.8
60	7 30.0	7 31.3	7 9.5	60	3.0	120	5.9	180	8.9

0 h 30 min

POPRAVKA ČASOVNOG UGLA				POPRAVKA DRUGOG REDA za časovni ugao i deklinaciju Sunca, Mjeseca i planeta					
s	SUNCA I PLANETA	PROLJEĆNE TAČKE ♈	MJESECA ☾	Δ	poprav.	Δ	poprav.	Δ	poprav.
	° ′	° ′	° ′		′		′		′
0	7 30.0	7 31.3	7 9.5	0	.0	60	3.1	120	6.1
1	7 30.3	7 31.5	7 9.7	1	.1	61	3.1	121	6.2
2	7 30.5	7 31.8	7 10.0	2	.1	62	3.2	122	6.2
3	7 30.8	7 32.0	7 10.2	3	.2	63	3.2	123	6.3
4	7 31.0	7 32.3	7 10.5	4	.2	64	3.3	124	6.3
5	7 31.3	7 32.5	7 10.7	5	.3	65	3.3	125	6.4
6	7 31.5	7 32.8	7 10.9	6	.3	66	3.4	126	6.4
7	7 31.8	7 33.0	7 11.2	7	.4	67	3.4	127	6.5
8	7 32.0	7 33.3	7 11.4	8	.4	68	3.5	128	6.5
9	7 32.3	7 33.5	7 11.6	9	.5	69	3.5	129	6.6
10	7 32.5	7 33.8	7 11.9	10	.5	70	3.6	130	6.6
11	7 32.8	7 34.0	7 12.1	11	.6	71	3.6	131	6.7
12	7 33.0	7 34.3	7 12.4	12	.6	72	3.7	132	6.7
13	7 33.3	7 34.5	7 12.6	13	.7	73	3.7	133	6.8
14	7 33.5	7 34.8	7 12.8	14	.7	74	3.8	134	6.8
15	7 33.8	7 35.0	7 13.1	15	.8	75	3.8	135	6.9
16	7 34.0	7 35.3	7 13.3	16	.8	76	3.9	136	6.9
17	7 34.3	7 35.5	7 13.6	17	.9	77	3.9	137	7.0
18	7 34.5	7 35.8	7 13.8	18	.9	78	4.0	138	7.0
19	7 34.8	7 36.0	7 14.0	19	1.0	79	4.0	139	7.1
20	7 35.0	7 36.3	7 14.3	20	1.0	80	4.1	140	7.1
21	7 35.3	7 36.5	7 14.5	21	1.1	81	4.1	141	7.2
22	7 35.5	7 36.8	7 14.7	22	1.1	82	4.2	142	7.2
23	7 35.8	7 37.0	7 15.0	23	1.2	83	4.2	143	7.3
24	7 36.0	7 37.3	7 15.2	24	1.2	84	4.3	144	7.3
25	7 36.3	7 37.5	7 15.5	25	1.3	85	4.3	145	7.4
26	7 36.5	7 37.8	7 15.7	26	1.3	86	4.4	146	7.4
27	7 36.8	7 38.0	7 15.9	27	1.4	87	4.4	147	7.5
28	7 37.0	7 38.3	7 16.2	28	1.4	88	4.5	148	7.5
29	7 37.3	7 38.5	7 16.4	29	1.5	89	4.5	149	7.6
30	7 37.5	7 38.8	7 16.7	30	1.5	90	4.6	150	7.6
31	7 37.8	7 39.0	7 16.9	31	1.6	91	4.6	151	7.7
32	7 38.0	7 39.3	7 17.1	32	1.6	92	4.7	152	7.7
33	7 38.3	7 39.5	7 17.4	33	1.7	93	4.7	153	7.8
34	7 38.5	7 39.8	7 17.6	34	1.7	94	4.8	154	7.8
35	7 38.8	7 40.0	7 17.9	35	1.8	95	4.8	155	7.9
36	7 39.0	7 40.3	7 18.1	36	1.8	96	4.9	156	7.9
37	7 39.3	7 40.5	7 18.3	37	1.9	97	4.9	157	8.0
38	7 39.5	7 40.8	7 18.6	38	1.9	98	5.0	158	8.0
39	7 39.8	7 41.0	7 18.8	39	2.0	99	5.0	159	8.1
40	7 40.0	7 41.3	7 19.0	40	2.0	100	5.1	160	8.1
41	7 40.3	7 41.5	7 19.3	41	2.1	101	5.1	161	8.2
42	7 40.5	7 41.8	7 19.5	42	2.1	102	5.2	162	8.2
43	7 40.8	7 42.0	7 19.8	43	2.2	103	5.2	163	8.3
44	7 41.0	7 42.3	7 20.0	44	2.2	104	5.3	164	8.3
45	7 41.3	7 42.5	7 20.2	45	2.3	105	5.3	165	8.4
46	7 41.5	7 42.8	7 20.5	46	2.3	106	5.4	166	8.4
47	7 41.8	7 43.0	7 20.7	47	2.4	107	5.4	167	8.5
48	7 42.0	7 43.3	7 21.0	48	2.4	108	5.5	168	8.5
49	7 42.3	7 43.5	7 21.2	49	2.5	109	5.5	169	8.6
50	7 42.5	7 43.8	7 21.4	50	2.5	110	5.6	170	8.6
51	7 42.8	7 44.0	7 21.7	51	2.6	111	5.6	171	8.7
52	7 43.0	7 44.3	7 21.9	52	2.6	112	5.7	172	8.7
53	7 43.3	7 44.5	7 22.1	53	2.7	113	5.7	173	8.8
54	7 43.5	7 44.8	7 22.4	54	2.7	114	5.8	174	8.8
55	7 43.8	7 45.0	7 22.6	55	2.8	115	5.8	175	8.9
56	7 44.0	7 45.3	7 22.9	56	2.8	116	5.9	176	8.9
57	7 44.3	7 45.5	7 23.1	57	2.9	117	5.9	177	9.0
58	7 44.5	7 45.8	7 23.3	58	2.9	118	6.0	178	9.0
59	7 44.8	7 46.0	7 23.6	59	3.0	119	6.0	179	9.1
60	7 45.0	7 46.3	7 23.8	60	3.1	120	6.1	180	9.2

0 h 31 min

POPRAVKA ČASOVNOG UGLA				POPRAVKA DRUGOG REDA za časovni ugao i deklinaciju Sunca, Mjeseca i planeta					
s	SUNCA I PLANETA	PROLJEĆNE TAČKE ♈	MJESECA ☾	Δ	poprav.	Δ	poprav.	Δ	poprav.
	° ′	° ′	° ′		′		′		′
0	7 45.0	7 46.3	7 23.8	0	.0	60	3.2	120	6.3
1	7 45.3	7 46.5	7 24.1	1	.1	61	3.2	121	6.4
2	7 45.5	7 46.8	7 24.3	2	.1	62	3.3	122	6.4
3	7 45.8	7 47.0	7 24.5	3	.2	63	3.3	123	6.5
4	7 46.0	7 47.3	7 24.8	4	.2	64	3.4	124	6.5
5	7 46.3	7 47.5	7 25.0	5	.3	65	3.4	125	6.6
6	7 46.5	7 47.8	7 25.2	6	.3	66	3.5	126	6.6
7	7 46.8	7 48.0	7 25.5	7	.4	67	3.5	127	6.7
8	7 47.0	7 48.3	7 25.7	8	.4	68	3.6	128	6.7
9	7 47.3	7 48.5	7 26.0	9	.5	69	3.6	129	6.8
10	7 47.5	7 48.8	7 26.2	10	.5	70	3.7	130	6.8
11	7 47.8	7 49.0	7 26.4	11	.6	71	3.7	131	6.9
12	7 48.0	7 49.3	7 26.7	12	.6	72	3.8	132	6.9
13	7 48.3	7 49.6	7 26.9	13	.7	73	3.8	133	7.0
14	7 48.5	7 49.8	7 27.2	14	.7	74	3.9	134	7.0
15	7 48.8	7 50.1	7 27.4	15	.8	75	3.9	135	7.1
16	7 49.0	7 50.3	7 27.6	16	.8	76	4.0	136	7.1
17	7 49.3	7 50.6	7 27.9	17	.9	77	4.0	137	7.2
18	7 49.5	7 50.8	7 28.1	18	.9	78	4.1	138	7.2
19	7 49.8	7 51.1	7 28.4	19	1.0	79	4.1	139	7.3
20	7 50.0	7 51.3	7 28.6	20	1.1	80	4.2	140	7.4
21	7 50.3	7 51.6	7 28.8	21	1.1	81	4.3	141	7.4
22	7 50.5	7 51.8	7 29.1	22	1.2	82	4.3	142	7.5
23	7 50.8	7 52.1	7 29.3	23	1.2	83	4.4	143	7.5
24	7 51.0	7 52.3	7 29.5	24	1.3	84	4.4	144	7.6
25	7 51.3	7 52.6	7 29.8	25	1.3	85	4.5	145	7.6
26	7 51.5	7 52.8	7 30.0	26	1.4	86	4.5	146	7.7
27	7 51.8	7 53.1	7 30.3	27	1.4	87	4.6	147	7.7
28	7 52.0	7 53.3	7 30.5	28	1.5	88	4.6	148	7.8
29	7 52.3	7 53.6	7 30.7	29	1.5	89	4.7	149	7.8
30	7 52.5	7 53.8	7 31.0	30	1.6	90	4.7	150	7.9
31	7 52.8	7 54.1	7 31.2	31	1.6	91	4.8	151	7.9
32	7 53.0	7 54.3	7 31.5	32	1.7	92	4.8	152	8.0
33	7 53.3	7 54.6	7 31.7	33	1.7	93	4.9	153	8.0
34	7 53.5	7 54.8	7 31.9	34	1.8	94	4.9	154	8.1
35	7 53.8	7 55.1	7 32.2	35	1.8	95	5.0	155	8.1
36	7 54.0	7 55.3	7 32.4	36	1.9	96	5.0	156	8.2
37	7 54.3	7 55.6	7 32.6	37	1.9	97	5.1	157	8.2
38	7 54.5	7 55.8	7 32.9	38	2.0	98	5.1	158	8.3
39	7 54.8	7 56.1	7 33.1	39	2.0	99	5.2	159	8.3
40	7 55.0	7 56.3	7 33.4	40	2.1	100	5.3	160	8.4
41	7 55.3	7 56.6	7 33.6	41	2.2	101	5.3	161	8.5
42	7 55.5	7 56.8	7 33.8	42	2.2	102	5.4	162	8.5
43	7 55.8	7 57.1	7 34.1	43	2.3	103	5.4	163	8.6
44	7 56.0	7 57.3	7 34.3	44	2.3	104	5.5	164	8.6
45	7 56.3	7 57.6	7 34.6	45	2.4	105	5.5	165	8.7
46	7 56.5	7 57.8	7 34.8	46	2.4	106	5.6	166	8.7
47	7 56.8	7 58.1	7 35.0	47	2.5	107	5.6	167	8.8
48	7 57.0	7 58.3	7 35.3	48	2.5	108	5.7	168	8.8
49	7 57.3	7 58.6	7 35.5	49	2.6	109	5.7	169	8.9
50	7 57.5	7 58.8	7 35.7	50	2.6	110	5.8	170	8.9
51	7 57.8	7 59.1	7 36.0	51	2.7	111	5.8	171	9.0
52	7 58.0	7 59.3	7 36.2	52	2.7	112	5.9	172	9.0
53	7 58.3	7 59.6	7 36.5	53	2.8	113	5.9	173	9.1
54	7 58.5	7 59.8	7 36.7	54	2.8	114	6.0	174	9.1
55	7 58.8	8 .1	7 36.9	55	2.9	115	6.0	175	9.2
56	7 59.0	8 .3	7 37.2	56	2.9	116	6.1	176	9.2
57	7 59.3	8 .6	7 37.4	57	3.0	117	6.1	177	9.3
58	7 59.5	8 .8	7 37.7	58	3.0	118	6.2	178	9.3
59	7 59.8	8 1.1	7 37.9	59	3.1	119	6.2	179	9.4
60	8 .0	8 1.3	7 38.1	60	3.2	120	6.3	180	9.5

0 h 32 min

POPRAVKA ČASOVNOG UGLA				POPRAVKA DRUGOG REDA za časovni ugao i deklinaciju Sunca, Mjeseca i planeta					
s	SUNCA I PLANETA	PROLJEĆNE TAČKE ♈	MJESECA ☾	Δ	popr.	Δ	popr.	Δ	popr.
	° ′	° ′	° ′		′		′		′
0	8 .0	8 1.3	7 38.1	0	.0	60	3.3	120	6.5
1	8 .3	8 1.6	7 38.4	1	.1	61	3.3	121	6.6
2	8 .5	8 1.8	7 38.6	2	.1	62	3.4	122	6.6
3	8 .8	8 2.1	7 38.8	3	.2	63	3.4	123	6.7
4	8 1.0	8 2.3	7 39.1	4	.2	64	3.5	124	6.7
5	8 1.3	8 2.6	7 39.3	5	.3	65	3.5	125	6.8
6	8 1.5	8 2.8	7 39.6	6	.3	66	3.6	126	6.8
7	8 1.8	8 3.1	7 39.8	7	.4	67	3.6	127	6.9
8	8 2.0	8 3.3	7 40.0	8	.4	68	3.7	128	6.9
9	8 2.3	8 3.6	7 40.3	9	.5	69	3.7	129	7.0
10	8 2.5	8 3.8	7 40.5	10	.5	70	3.8	130	7.0
11	8 2.8	8 4.1	7 40.8	11	.6	71	3.8	131	7.1
12	8 3.0	8 4.3	7 41.0	12	.7	72	3.9	132	7.2
13	8 3.3	8 4.6	7 41.2	13	.7	73	4.0	133	7.2
14	8 3.5	8 4.8	7 41.5	14	.8	74	4.0	134	7.3
15	8 3.8	8 5.1	7 41.7	15	.8	75	4.1	135	7.3
16	8 4.0	8 5.3	7 42.0	16	.9	76	4.1	136	7.4
17	8 4.3	8 5.6	7 42.2	17	.9	77	4.2	137	7.4
18	8 4.5	8 5.8	7 42.4	18	1.0	78	4.2	138	7.5
19	8 4.8	8 6.1	7 42.7	19	1.0	79	4.3	139	7.5
20	8 5.0	8 6.3	7 42.9	20	1.1	80	4.3	140	7.6
21	8 5.3	8 6.6	7 43.1	21	1.1	81	4.4	141	7.6
22	8 5.5	8 6.8	7 43.4	22	1.2	82	4.4	142	7.7
23	8 5.8	8 7.1	7 43.6	23	1.2	83	4.5	143	7.7
24	8 6.0	8 7.4	7 43.9	24	1.3	84	4.6	144	7.8
25	8 6.3	8 7.6	7 44.1	25	1.4	85	4.6	145	7.9
26	8 6.5	8 7.9	7 44.3	26	1.4	86	4.7	146	7.9
27	8 6.8	8 8.1	7 44.6	27	1.5	87	4.7	147	8.0
28	8 7.0	8 8.4	7 44.8	28	1.5	88	4.8	148	8.0
29	8 7.3	8 8.6	7 45.1	29	1.6	89	4.8	149	8.1
30	8 7.5	8 8.9	7 45.3	30	1.6	90	4.9	150	8.1
31	8 7.8	8 9.1	7 45.5	31	1.7	91	4.9	151	8.2
32	8 8.0	8 9.4	7 45.8	32	1.7	92	5.0	152	8.2
33	8 8.3	8 9.6	7 46.0	33	1.8	93	5.0	153	8.3
34	8 8.5	8 9.9	7 46.2	34	1.8	94	5.1	154	8.3
35	8 8.8	8 10.1	7 46.5	35	1.9	95	5.1	155	8.4
36	8 9.0	8 10.4	7 46.7	36	2.0	96	5.2	156	8.5
37	8 9.3	8 10.6	7 47.0	37	2.0	97	5.3	157	8.5
38	8 9.5	8 10.9	7 47.2	38	2.1	98	5.3	158	8.6
39	8 9.8	8 11.1	7 47.4	39	2.1	99	5.4	159	8.6
40	8 10.0	8 11.4	7 47.7	40	2.2	100	5.4	160	8.7
41	8 10.3	8 11.6	7 47.9	41	2.2	101	5.5	161	8.7
42	8 10.5	8 11.9	7 48.2	42	2.3	102	5.5	162	8.8
43	8 10.8	8 12.1	7 48.4	43	2.3	103	5.6	163	8.8
44	8 11.0	8 12.4	7 48.6	44	2.4	104	5.6	164	8.9
45	8 11.3	8 12.6	7 48.9	45	2.4	105	5.7	165	8.9
46	8 11.5	8 12.9	7 49.1	46	2.5	106	5.7	166	9.0
47	8 11.8	8 13.1	7 49.3	47	2.5	107	5.8	167	9.0
48	8 12.0	8 13.4	7 49.6	48	2.6	108	5.9	168	9.1
49	8 12.3	8 13.6	7 49.8	49	2.7	109	5.9	169	9.2
50	8 12.5	8 13.9	7 50.1	50	2.7	110	6.0	170	9.2
51	8 12.8	8 14.1	7 50.3	51	2.8	111	6.0	171	9.3
52	8 13.0	8 14.4	7 50.5	52	2.8	112	6.1	172	9.3
53	8 13.3	8 14.6	7 50.8	53	2.9	113	6.1	173	9.4
54	8 13.5	8 14.9	7 51.0	54	2.9	114	6.2	174	9.4
55	8 13.8	8 15.1	7 51.3	55	3.0	115	6.2	175	9.5
56	8 14.0	8 15.4	7 51.5	56	3.0	116	6.3	176	9.5
57	8 14.3	8 15.6	7 51.7	57	3.1	117	6.3	177	9.6
58	8 14.5	8 15.9	7 52.0	58	3.1	118	6.4	178	9.6
59	8 14.8	8 16.1	7 52.2	59	3.2	119	6.4	179	9.7
60	8 15.0	8 16.4	7 52.5	60	3.3	120	6.5	180	9.8

0 h 33 min

POPRAVKA ČASOVNOG UGLA				POPRAVKA DRUGOG REDA za časovni ugao i deklinaciju Sunca, Mjeseca i planeta					
s	SUNCA I PLANETA	PROLJEĆNE TAČKE ♈	MJESECA ☾	Δ	popr.	Δ	popr.	Δ	popr.
	° ′	° ′	° ′		′		′		′
0	8 15.0	8 16.4	7 52.5	0	.0	60	3.4	120	6.7
1	8 15.3	8 16.6	7 52.7	1	.1	61	3.4	121	6.8
2	8 15.5	8 16.9	7 52.9	2	.1	62	3.5	122	6.8
3	8 15.8	8 17.1	7 53.2	3	.2	63	3.5	123	6.9
4	8 16.0	8 17.4	7 53.4	4	.2	64	3.6	124	6.9
5	8 16.3	8 17.6	7 53.6	5	.3	65	3.6	125	7.0
6	8 16.5	8 17.9	7 53.9	6	.3	66	3.7	126	7.0
7	8 16.8	8 18.1	7 54.1	7	.4	67	3.7	127	7.1
8	8 17.0	8 18.4	7 54.4	8	.4	68	3.8	128	7.1
9	8 17.3	8 18.6	7 54.6	9	.5	69	3.9	129	7.2
10	8 17.5	8 18.9	7 54.8	10	.6	70	3.9	130	7.3
11	8 17.8	8 19.1	7 55.1	11	.6	71	4.0	131	7.3
12	8 18.0	8 19.4	7 55.3	12	.7	72	4.0	132	7.4
13	8 18.3	8 19.6	7 55.6	13	.7	73	4.1	133	7.4
14	8 18.5	8 19.9	7 55.8	14	.8	74	4.1	134	7.5
15	8 18.8	8 20.1	7 56.0	15	.8	75	4.2	135	7.5
16	8 19.0	8 20.4	7 56.3	16	.9	76	4.2	136	7.6
17	8 19.3	8 20.6	7 56.5	17	.9	77	4.3	137	7.6
18	8 19.5	8 20.9	7 56.7	18	1.0	78	4.4	138	7.7
19	8 19.8	8 21.1	7 57.0	19	1.1	79	4.4	139	7.8
20	8 20.0	8 21.4	7 57.2	20	1.1	80	4.5	140	7.8
21	8 20.3	8 21.6	7 57.5	21	1.2	81	4.5	141	7.9
22	8 20.5	8 21.9	7 57.7	22	1.2	82	4.6	142	7.9
23	8 20.8	8 22.1	7 57.9	23	1.3	83	4.6	143	8.0
24	8 21.0	8 22.4	7 58.2	24	1.3	84	4.7	144	8.0
25	8 21.3	8 22.6	7 58.4	25	1.4	85	4.7	145	8.1
26	8 21.5	8 22.9	7 58.7	26	1.5	86	4.8	146	8.2
27	8 21.8	8 23.1	7 58.9	27	1.5	87	4.9	147	8.2
28	8 22.0	8 23.4	7 59.1	28	1.6	88	4.9	148	8.3
29	8 22.3	8 23.6	7 59.4	29	1.6	89	5.0	149	8.3
30	8 22.5	8 23.9	7 59.6	30	1.7	90	5.0	150	8.4
31	8 22.8	8 24.1	7 59.8	31	1.7	91	5.1	151	8.4
32	8 23.0	8 24.4	8 .1	32	1.8	92	5.1	152	8.5
33	8 23.3	8 24.6	8 .3	33	1.8	93	5.2	153	8.5
34	8 23.5	8 24.9	8 .6	34	1.9	94	5.2	154	8.6
35	8 23.8	8 25.1	8 .8	35	2.0	95	5.3	155	8.7
36	8 24.0	8 25.4	8 1.0	36	2.0	96	5.4	156	8.7
37	8 24.3	8 25.7	8 1.3	37	2.1	97	5.4	157	8.8
38	8 24.5	8 25.9	8 1.5	38	2.1	98	5.5	158	8.8
39	8 24.8	8 26.2	8 1.8	39	2.2	99	5.5	159	8.9
40	8 25.0	8 26.4	8 2.0	40	2.2	100	5.6	160	8.9
41	8 25.3	8 26.7	8 2.2	41	2.3	101	5.6	161	9.0
42	8 25.5	8 26.9	8 2.5	42	2.3	102	5.7	162	9.0
43	8 25.8	8 27.2	8 2.7	43	2.4	103	5.8	163	9.1
44	8 26.0	8 27.4	8 2.9	44	2.5	104	5.8	164	9.2
45	8 26.3	8 27.7	8 3.2	45	2.5	105	5.9	165	9.2
46	8 26.5	8 27.9	8 3.4	46	2.6	106	5.9	166	9.3
47	8 26.8	8 28.2	8 3.7	47	2.6	107	6.0	167	9.3
48	8 27.0	8 28.4	8 3.9	48	2.7	108	6.0	168	9.4
49	8 27.3	8 28.7	8 4.1	49	2.7	109	6.1	169	9.4
50	8 27.5	8 28.9	8 4.4	50	2.8	110	6.1	170	9.5
51	8 27.8	8 29.2	8 4.6	51	2.8	111	6.2	171	9.5
52	8 28.0	8 29.4	8 4.9	52	2.9	112	6.3	172	9.6
53	8 28.3	8 29.7	8 5.1	53	3.0	113	6.3	173	9.7
54	8 28.5	8 29.9	8 5.3	54	3.0	114	6.4	174	9.7
55	8 28.8	8 30.2	8 5.6	55	3.1	115	6.4	175	9.8
56	8 29.0	8 30.4	8 5.8	56	3.1	116	6.5	176	9.8
57	8 29.3	8 30.7	8 6.1	57	3.2	117	6.5	177	9.9
58	8 29.5	8 30.9	8 6.3	58	3.2	118	6.6	178	9.9
59	8 29.8	8 31.2	8 6.5	59	3.3	119	6.6	179	10.0
60	8 30.0	8 31.4	8 6.8	60	3.4	120	6.7	180	10.1

0 h 34 min

POPRAVKA ČASOVNOG UGLA				POPRAVKA DRUGOG REDA za časovni ugao i deklinaciju Sunca, Mjeseca i planeta					
s	SUNCA I PLANETA	PROLJEĆNE TAČKE ♈	MJESECA ☾	Δ	popr.	Δ	popr.	Δ	popr.
	° ′	° ′	° ′		′		′		′
0	8 30.0	8 31.4	8 6.8	0	.0	60	3.5	120	6.9
1	8 30.3	8 31.7	8 7.0	1	.1	61	3.5	121	7.0
2	8 30.5	8 31.9	8 7.2	2	.1	62	3.6	122	7.0
3	8 30.8	8 32.2	8 7.5	3	.2	63	3.6	123	7.1
4	8 31.0	8 32.4	8 7.7	4	.2	64	3.7	124	7.1
5	8 31.3	8 32.7	8 8.0	5	.3	65	3.7	125	7.2
6	8 31.5	8 32.9	8 8.2	6	.3	66	3.8	126	7.2
7	8 31.8	8 33.2	8 8.4	7	.4	67	3.9	127	7.3
8	8 32.0	8 33.4	8 8.7	8	.5	68	3.9	128	7.4
9	8 32.3	8 33.7	8 8.9	9	.5	69	4.0	129	7.4
10	8 32.5	8 33.9	8 9.2	10	.6	70	4.0	130	7.5
11	8 32.8	8 34.2	8 9.4	11	.6	71	4.1	131	7.5
12	8 33.0	8 34.4	8 9.6	12	.7	72	4.1	132	7.6
13	8 33.3	8 34.7	8 9.9	13	.7	73	4.2	133	7.6
14	8 33.5	8 34.9	8 10.1	14	.8	74	4.3	134	7.7
15	8 33.8	8 35.2	8 10.3	15	.9	75	4.3	135	7.8
16	8 34.0	8 35.4	8 10.6	16	.9	76	4.4	136	7.8
17	8 34.3	8 35.7	8 10.8	17	1.0	77	4.4	137	7.9
18	8 34.5	8 35.9	8 11.1	18	1.0	78	4.5	138	7.9
19	8 34.8	8 36.2	8 11.3	19	1.1	79	4.5	139	8.0
20	8 35.0	8 36.4	8 11.5	20	1.2	80	4.6	140	8.1
21	8 35.3	8 36.7	8 11.8	21	1.2	81	4.7	141	8.1
22	8 35.5	8 36.9	8 12.0	22	1.3	82	4.7	142	8.2
23	8 35.8	8 37.2	8 12.3	23	1.3	83	4.8	143	8.2
24	8 36.0	8 37.4	8 12.5	24	1.4	84	4.8	144	8.3
25	8 36.3	8 37.7	8 12.7	25	1.4	85	4.9	145	8.3
26	8 36.5	8 37.9	8 13.0	26	1.5	86	4.9	146	8.4
27	8 36.8	8 38.2	8 13.2	27	1.6	87	5.0	147	8.5
28	8 37.0	8 38.4	8 13.4	28	1.6	88	5.1	148	8.5
29	8 37.3	8 38.7	8 13.7	29	1.7	89	5.1	149	8.6
30	8 37.5	8 38.9	8 13.9	30	1.7	90	5.2	150	8.6
31	8 37.8	8 39.2	8 14.2	31	1.8	91	5.2	151	8.7
32	8 38.0	8 39.4	8 14.4	32	1.8	92	5.3	152	8.7
33	8 38.3	8 39.7	8 14.6	33	1.9	93	5.3	153	8.8
34	8 38.5	8 39.9	8 14.9	34	2.0	94	5.4	154	8.9
35	8 38.8	8 40.2	8 15.1	35	2.0	95	5.5	155	8.9
36	8 39.0	8 40.4	8 15.4	36	2.1	96	5.5	156	9.0
37	8 39.3	8 40.7	8 15.6	37	2.1	97	5.6	157	9.0
38	8 39.5	8 40.9	8 15.8	38	2.2	98	5.6	158	9.1
39	8 39.8	8 41.2	8 16.1	39	2.2	99	5.7	159	9.1
40	8 40.0	8 41.4	8 16.3	40	2.3	100	5.8	160	9.2
41	8 40.3	8 41.7	8 16.5	41	2.4	101	5.8	161	9.3
42	8 40.5	8 41.9	8 16.8	42	2.4	102	5.9	162	9.3
43	8 40.8	8 42.2	8 17.0	43	2.5	103	5.9	163	9.4
44	8 41.0	8 42.4	8 17.3	44	2.5	104	6.0	164	9.4
45	8 41.3	8 42.7	8 17.5	45	2.6	105	6.0	165	9.5
46	8 41.5	8 42.9	8 17.7	46	2.6	106	6.1	166	9.5
47	8 41.8	8 43.2	8 18.0	47	2.7	107	6.2	167	9.6
48	8 42.0	8 43.5	8 18.2	48	2.8	108	6.2	168	9.7
49	8 42.3	8 43.7	8 18.5	49	2.8	109	6.3	169	9.7
50	8 42.5	8 44.0	8 18.7	50	2.9	110	6.3	170	9.8
51	8 42.8	8 44.2	8 18.9	51	2.9	111	6.4	171	9.8
52	8 43.0	8 44.5	8 19.2	52	3.0	112	6.4	172	9.9
53	8 43.3	8 44.7	8 19.4	53	3.0	113	6.5	173	9.9
54	8 43.5	8 45.0	8 19.7	54	3.1	114	6.6	174	10.0
55	8 43.8	8 45.2	8 19.9	55	3.2	115	6.6	175	10.1
56	8 44.0	8 45.5	8 20.1	56	3.2	116	6.7	176	10.1
57	8 44.3	8 45.7	8 20.4	57	3.3	117	6.7	177	10.2
58	8 44.5	8 46.0	8 20.6	58	3.3	118	6.8	178	10.2
59	8 44.8	8 46.2	8 20.8	59	3.4	119	6.8	179	10.3
60	8 45.0	8 46.5	8 21.1	60	3.5	120	6.9	180	10.4

0 h 35 min

POPRAVKA ČASOVNOG UGLA				POPRAVKA DRUGOG REDA za časovni ugao i deklinaciju Sunca, Mjeseca i planeta					
s	SUNCA I PLANETA	PROLJEĆNE TAČKE ♈	MJESECA ☾	Δ	popr.	Δ	popr.	Δ	popr.
	° ′	° ′	° ′		′		′		′
0	8 45.0	8 46.5	8 21.1	0	.0	60	3.6	120	7.1
1	8 45.3	8 46.7	8 21.3	1	.1	61	3.6	121	7.2
2	8 45.5	8 47.0	8 21.6	2	.1	62	3.7	122	7.2
3	8 45.8	8 47.2	8 21.8	3	.2	63	3.7	123	7.3
4	8 46.0	8 47.5	8 22.0	4	.2	64	3.8	124	7.3
5	8 46.3	8 47.7	8 22.3	5	.3	65	3.8	125	7.4
6	8 46.5	8 48.0	8 22.5	6	.4	66	3.9	126	7.5
7	8 46.8	8 48.2	8 22.8	7	.4	67	4.0	127	7.5
8	8 47.0	8 48.5	8 23.0	8	.5	68	4.0	128	7.6
9	8 47.3	8 48.7	8 23.2	9	.5	69	4.1	129	7.6
10	8 47.5	8 49.0	8 23.5	10	.6	70	4.1	130	7.7
11	8 47.8	8 49.2	8 23.7	11	.7	71	4.2	131	7.8
12	8 48.0	8 49.5	8 23.9	12	.7	72	4.3	132	7.8
13	8 48.3	8 49.7	8 24.2	13	.8	73	4.3	133	7.9
14	8 48.5	8 50.0	8 24.4	14	.8	74	4.4	134	7.9
15	8 48.8	8 50.2	8 24.7	15	.9	75	4.4	135	8.0
16	8 49.0	8 50.5	8 24.9	16	.9	76	4.5	136	8.0
17	8 49.3	8 50.7	8 25.1	17	1.0	77	4.6	137	8.1
18	8 49.5	8 51.0	8 25.4	18	1.1	78	4.6	138	8.2
19	8 49.8	8 51.2	8 25.6	19	1.1	79	4.7	139	8.2
20	8 50.0	8 51.5	8 25.9	20	1.2	80	4.7	140	8.3
21	8 50.3	8 51.7	8 26.1	21	1.2	81	4.8	141	8.3
22	8 50.5	8 52.0	8 26.3	22	1.3	82	4.9	142	8.4
23	8 50.8	8 52.2	8 26.6	23	1.4	83	4.9	143	8.5
24	8 51.0	8 52.5	8 26.8	24	1.4	84	5.0	144	8.5
25	8 51.3	8 52.7	8 27.0	25	1.5	85	5.0	145	8.6
26	8 51.5	8 53.0	8 27.3	26	1.5	86	5.1	146	8.6
27	8 51.8	8 53.2	8 27.5	27	1.6	87	5.1	147	8.7
28	8 52.0	8 53.5	8 27.8	28	1.7	88	5.2	148	8.8
29	8 52.3	8 53.7	8 28.0	29	1.7	89	5.3	149	8.8
30	8 52.5	8 54.0	8 28.2	30	1.8	90	5.3	150	8.9
31	8 52.8	8 54.2	8 28.5	31	1.8	91	5.4	151	8.9
32	8 53.0	8 54.5	8 28.7	32	1.9	92	5.4	152	9.0
33	8 53.3	8 54.7	8 29.0	33	2.0	93	5.5	153	9.1
34	8 53.5	8 55.0	8 29.2	34	2.0	94	5.6	154	9.1
35	8 53.8	8 55.2	8 29.4	35	2.1	95	5.6	155	9.2
36	8 54.0	8 55.5	8 29.7	36	2.1	96	5.7	156	9.2
37	8 54.3	8 55.7	8 29.9	37	2.2	97	5.7	157	9.3
38	8 54.5	8 56.0	8 30.2	38	2.2	98	5.8	158	9.3
39	8 54.8	8 56.2	8 30.4	39	2.3	99	5.9	159	9.4
40	8 55.0	8 56.5	8 30.6	40	2.4	100	5.9	160	9.5
41	8 55.3	8 56.7	8 30.9	41	2.4	101	6.0	161	9.5
42	8 55.5	8 57.0	8 31.1	42	2.5	102	6.0	162	9.6
43	8 55.8	8 57.2	8 31.3	43	2.5	103	6.1	163	9.6
44	8 56.0	8 57.5	8 31.6	44	2.6	104	6.2	164	9.7
45	8 56.3	8 57.7	8 31.8	45	2.7	105	6.2	165	9.8
46	8 56.5	8 58.0	8 32.1	46	2.7	106	6.3	166	9.8
47	8 56.8	8 58.2	8 32.3	47	2.8	107	6.3	167	9.9
48	8 57.0	8 58.5	8 32.5	48	2.8	108	6.4	168	9.9
49	8 57.3	8 58.7	8 32.8	49	2.9	109	6.4	169	10.0
50	8 57.5	8 59.0	8 33.0	50	3.0	110	6.5	170	10.1
51	8 57.8	8 59.2	8 33.3	51	3.0	111	6.6	171	10.1
52	8 58.0	8 59.5	8 33.5	52	3.1	112	6.6	172	10.2
53	8 58.3	8 59.7	8 33.7	53	3.1	113	6.7	173	10.2
54	8 58.5	8 60.0	8 34.0	54	3.2	114	6.7	174	10.3
55	8 58.8	9 .2	8 34.2	55	3.3	115	6.8	175	10.4
56	8 59.0	9 .5	8 34.4	56	3.3	116	6.9	176	10.4
57	8 59.3	9 .7	8 34.7	57	3.4	117	6.9	177	10.5
58	8 59.5	9 1.0	8 34.9	58	3.4	118	7.0	178	10.5
59	8 59.8	9 1.2	8 35.2	59	3.5	119	7.0	179	10.6
60	9 .0	9 1.5	8 35.4	60	3.6	120	7.1	180	10.7

0 h 36 min

s	POPRAVKA ČASOVNOG UGLA: SUNCA I PLANETA	PROLJEĆNE TAČKE ♈	MJESECA ☾	POPRAVKA DRUGOG REDA za časovni ugao i deklinaciju Sunca, Mjeseca i planeta: Δ	poprav.	Δ	poprav.	Δ	poprav.
	° ′	° ′	° ′		′		′		′
0	9 .0	9 1.5	8 35.4	0	.0	60	3.7	120	7.3
1	9 .3	9 1.8	8 35.6	1	.1	61	3.7	121	7.4
2	9 .5	9 2.0	8 35.9	2	.1	62	3.8	122	7.4
3	9 .8	9 2.3	8 36.1	3	.2	63	3.8	123	7.5
4	9 1.0	9 2.5	8 36.4	4	.2	64	3.9	124	7.5
5	9 1.3	9 2.8	8 36.6	5	.3	65	4.0	125	7.6
6	9 1.5	9 3.0	8 36.8	6	.4	66	4.0	126	7.7
7	9 1.8	9 3.3	8 37.1	7	.4	67	4.1	127	7.7
8	9 2.0	9 3.5	8 37.3	8	.5	68	4.1	128	7.8
9	9 2.3	9 3.8	8 37.5	9	.5	69	4.2	129	7.8
10	9 2.5	9 4.0	8 37.8	10	.6	70	4.3	130	7.9
11	9 2.8	9 4.3	8 38.0	11	.7	71	4.3	131	8.0
12	9 3.0	9 4.5	8 38.3	12	.7	72	4.4	132	8.0
13	9 3.3	9 4.8	8 38.5	13	.8	73	4.4	133	8.1
14	9 3.5	9 5.0	8 38.7	14	.9	74	4.5	134	8.2
15	9 3.8	9 5.3	8 39.0	15	.9	75	4.6	135	8.2
16	9 4.0	9 5.5	8 39.2	16	1.0	76	4.6	136	8.3
17	9 4.3	9 5.8	8 39.5	17	1.0	77	4.7	137	8.3
18	9 4.5	9 6.0	8 39.7	18	1.1	78	4.7	138	8.4
19	9 4.8	9 6.3	8 39.9	19	1.2	79	4.8	139	8.5
20	9 5.0	9 6.5	8 40.2	20	1.2	80	4.9	140	8.5
21	9 5.3	9 6.8	8 40.4	21	1.3	81	4.9	141	8.6
22	9 5.5	9 7.0	8 40.6	22	1.3	82	5.0	142	8.6
23	9 5.8	9 7.3	8 40.9	23	1.4	83	5.0	143	8.7
24	9 6.0	9 7.5	8 41.1	24	1.5	84	5.1	144	8.8
25	9 6.3	9 7.8	8 41.4	25	1.5	85	5.2	145	8.8
26	9 6.5	9 8.0	8 41.6	26	1.6	86	5.2	146	8.9
27	9 6.8	9 8.3	8 41.8	27	1.6	87	5.3	147	8.9
28	9 7.0	9 8.5	8 42.1	28	1.7	88	5.4	148	9.0
29	9 7.3	9 8.8	8 42.3	29	1.8	89	5.4	149	9.1
30	9 7.5	9 9.0	8 42.6	30	1.8	90	5.5	150	9.1
31	9 7.8	9 9.3	8 42.8	31	1.9	91	5.5	151	9.2
32	9 8.0	9 9.5	8 43.0	32	1.9	92	5.6	152	9.2
33	9 8.3	9 9.8	8 43.3	33	2.0	93	5.7	153	9.3
34	9 8.5	9 10.0	8 43.5	34	2.1	94	5.7	154	9.4
35	9 8.8	9 10.3	8 43.8	35	2.1	95	5.8	155	9.4
36	9 9.0	9 10.5	8 44.0	36	2.2	96	5.8	156	9.5
37	9 9.3	9 10.8	8 44.2	37	2.3	97	5.9	157	9.6
38	9 9.5	9 11.0	8 44.5	38	2.3	98	6.0	158	9.6
39	9 9.8	9 11.3	8 44.7	39	2.4	99	6.0	159	9.7
40	9 10.0	9 11.5	8 44.9	40	2.4	100	6.1	160	9.7
41	9 10.3	9 11.8	8 45.2	41	2.5	101	6.1	161	9.8
42	9 10.5	9 12.0	8 45.4	42	2.6	102	6.2	162	9.9
43	9 10.8	9 12.3	8 45.7	43	2.6	103	6.3	163	9.9
44	9 11.0	9 12.5	8 45.9	44	2.7	104	6.3	164	10.0
45	9 11.3	9 12.8	8 46.1	45	2.7	105	6.4	165	10.0
46	9 11.5	9 13.0	8 46.4	46	2.8	106	6.4	166	10.1
47	9 11.8	9 13.3	8 46.6	47	2.9	107	6.5	167	10.2
48	9 12.0	9 13.5	8 46.9	48	2.9	108	6.6	168	10.2
49	9 12.3	9 13.8	8 47.1	49	3.0	109	6.6	169	10.3
50	9 12.5	9 14.0	8 47.3	50	3.0	110	6.7	170	10.3
51	9 12.8	9 14.3	8 47.6	51	3.1	111	6.8	171	10.4
52	9 13.0	9 14.5	8 47.8	52	3.2	112	6.8	172	10.5
53	9 13.3	9 14.8	8 48.0	53	3.2	113	6.9	173	10.5
54	9 13.5	9 15.0	8 48.3	54	3.3	114	6.9	174	10.6
55	9 13.8	9 15.3	8 48.5	55	3.3	115	7.0	175	10.6
56	9 14.0	9 15.5	8 48.8	56	3.4	116	7.1	176	10.7
57	9 14.3	9 15.8	8 49.0	57	3.5	117	7.1	177	10.8
58	9 14.5	9 16.0	8 49.2	58	3.5	118	7.2	178	10.8
59	9 14.8	9 16.3	8 49.5	59	3.6	119	7.2	179	10.9
60	9 15.0	9 16.5	8 49.7	60	3.7	120	7.3	180	11.0

0 h 37 min

s	POPRAVKA ČASOVNOG UGLA: SUNCA I PLANETA	PROLJEĆNE TAČKE ♈	MJESECA ☾	POPRAVKA DRUGOG REDA za časovni ugao i deklinaciju Sunca, Mjeseca i planeta: Δ	poprav.	Δ	poprav.	Δ	poprav.
	° ′	° ′	° ′		′		′		′
0	9 15.0	9 16.5	8 49.7	0	.0	60	3.8	120	7.5
1	9 15.3	9 16.8	8 50.0	1	.1	61	3.8	121	7.6
2	9 15.5	9 17.0	8 50.2	2	.1	62	3.9	122	7.6
3	9 15.8	9 17.3	8 50.4	3	.2	63	3.9	123	7.7
4	9 16.0	9 17.5	8 50.7	4	.3	64	4.0	124	7.8
5	9 16.3	9 17.8	8 50.9	5	.3	65	4.1	125	7.8
6	9 16.5	9 18.0	8 51.1	6	.4	66	4.1	126	7.9
7	9 16.8	9 18.3	8 51.4	7	.4	67	4.2	127	7.9
8	9 17.0	9 18.5	8 51.6	8	.5	68	4.3	128	8.0
9	9 17.3	9 18.8	8 51.9	9	.6	69	4.3	129	8.1
10	9 17.5	9 19.0	8 52.1	10	.6	70	4.4	130	8.1
11	9 17.8	9 19.3	8 52.3	11	.7	71	4.4	131	8.2
12	9 18.0	9 19.6	8 52.6	12	.8	72	4.5	132	8.3
13	9 18.3	9 19.8	8 52.8	13	.8	73	4.6	133	8.3
14	9 18.5	9 20.1	8 53.1	14	.9	74	4.6	134	8.4
15	9 18.8	9 20.3	8 53.3	15	.9	75	4.7	135	8.4
16	9 19.0	9 20.6	8 53.5	16	1.0	76	4.8	136	8.5
17	9 19.3	9 20.8	8 53.8	17	1.1	77	4.8	137	8.6
18	9 19.5	9 21.1	8 54.0	18	1.1	78	4.9	138	8.6
19	9 19.8	9 21.3	8 54.3	19	1.2	79	4.9	139	8.7
20	9 20.0	9 21.6	8 54.5	20	1.3	80	5.0	140	8.8
21	9 20.3	9 21.8	8 54.7	21	1.3	81	5.1	141	8.8
22	9 20.5	9 22.1	8 55.0	22	1.4	82	5.1	142	8.9
23	9 20.8	9 22.3	8 55.2	23	1.4	83	5.2	143	8.9
24	9 21.0	9 22.6	8 55.4	24	1.5	84	5.3	144	9.0
25	9 21.3	9 22.8	8 55.7	25	1.6	85	5.3	145	9.1
26	9 21.5	9 23.1	8 55.9	26	1.6	86	5.4	146	9.1
27	9 21.8	9 23.3	8 56.2	27	1.7	87	5.4	147	9.2
28	9 22.0	9 23.6	8 56.4	28	1.8	88	5.5	148	9.3
29	9 22.3	9 23.8	8 56.6	29	1.8	89	5.6	149	9.3
30	9 22.5	9 24.1	8 56.9	30	1.9	90	5.6	150	9.4
31	9 22.8	9 24.3	8 57.1	31	1.9	91	5.7	151	9.4
32	9 23.0	9 24.6	8 57.4	32	2.0	92	5.8	152	9.5
33	9 23.3	9 24.8	8 57.6	33	2.1	93	5.8	153	9.6
34	9 23.5	9 25.1	8 57.8	34	2.1	94	5.9	154	9.6
35	9 23.8	9 25.3	8 58.1	35	2.2	95	5.9	155	9.7
36	9 24.0	9 25.6	8 58.3	36	2.3	96	6.0	156	9.8
37	9 24.3	9 25.8	8 58.5	37	2.3	97	6.1	157	9.8
38	9 24.5	9 26.1	8 58.8	38	2.4	98	6.1	158	9.9
39	9 24.8	9 26.3	8 59.0	39	2.4	99	6.2	159	9.9
40	9 25.0	9 26.6	8 59.3	40	2.5	100	6.3	160	10.0
41	9 25.3	9 26.8	8 59.5	41	2.6	101	6.3	161	10.1
42	9 25.5	9 27.1	8 59.7	42	2.6	102	6.4	162	10.1
43	9 25.8	9 27.3	8 60.0	43	2.7	103	6.4	163	10.2
44	9 26.0	9 27.6	9 .2	44	2.8	104	6.5	164	10.3
45	9 26.3	9 27.8	9 .5	45	2.8	105	6.6	165	10.3
46	9 26.5	9 28.1	9 .7	46	2.9	106	6.6	166	10.4
47	9 26.8	9 28.3	9 .9	47	2.9	107	6.7	167	10.4
48	9 27.0	9 28.6	9 1.2	48	3.0	108	6.8	168	10.5
49	9 27.3	9 28.8	9 1.4	49	3.1	109	6.8	169	10.6
50	9 27.5	9 29.1	9 1.6	50	3.1	110	6.9	170	10.6
51	9 27.8	9 29.3	9 1.9	51	3.2	111	6.9	171	10.7
52	9 28.0	9 29.6	9 2.1	52	3.3	112	7.0	172	10.8
53	9 28.3	9 29.8	9 2.4	53	3.3	113	7.1	173	10.8
54	9 28.5	9 30.1	9 2.6	54	3.4	114	7.1	174	10.9
55	9 28.8	9 30.3	9 2.8	55	3.4	115	7.2	175	10.9
56	9 29.0	9 30.6	9 3.1	56	3.5	116	7.3	176	11.0
57	9 29.3	9 30.8	9 3.3	57	3.6	117	7.3	177	11.1
58	9 29.5	9 31.1	9 3.6	58	3.6	118	7.4	178	11.1
59	9 29.8	9 31.3	9 3.8	59	3.7	119	7.4	179	11.2
60	9 30.0	9 31.6	9 4.0	60	3.8	120	7.5	180	11.3

0 h 38 min

s	POPRAVKA ČASOVNOG UGLA: SUNCA I PLANETA	PROLJEĆNE TAČKE ♈	MJESECA ☾	POPRAVKA DRUGOG REDA za časovni ugao i deklinaciju Sunca, Mjeseca i planeta: Δ	popr.	Δ	popr.	Δ	popr.
	° ′	° ′	° ′		′		′		′
0	9 30.0	9 31.6	9 4.0	0	.0	60	3.9	120	7.7
1	9 30.3	9 31.8	9 4.3	1	.1	61	3.9	121	7.8
2	9 30.5	9 32.1	9 4.5	2	.1	62	4.0	122	7.8
3	9 30.8	9 32.3	9 4.7	3	.2	63	4.0	123	7.9
4	9 31.0	9 32.6	9 5.0	4	.3	64	4.1	124	8.0
5	9 31.3	9 32.8	9 5.2	5	.3	65	4.2	125	8.0
6	9 31.5	9 33.1	9 5.5	6	.4	66	4.2	126	8.1
7	9 31.8	9 33.3	9 5.7	7	.4	67	4.3	127	8.1
8	9 32.0	9 33.6	9 5.9	8	.5	68	4.4	128	8.2
9	9 32.3	9 33.8	9 6.2	9	.6	69	4.4	129	8.3
10	9 32.5	9 34.1	9 6.4	10	.6	70	4.5	130	8.3
11	9 32.8	9 34.3	9 6.7	11	.7	71	4.6	131	8.4
12	9 33.0	9 34.6	9 6.9	12	.8	72	4.6	132	8.5
13	9 33.3	9 34.8	9 7.1	13	.8	73	4.7	133	8.5
14	9 33.5	9 35.1	9 7.4	14	.9	74	4.7	134	8.6
15	9 33.8	9 35.3	9 7.6	15	1.0	75	4.8	135	8.7
16	9 34.0	9 35.6	9 7.9	16	1.0	76	4.9	136	8.7
17	9 34.3	9 35.8	9 8.1	17	1.1	77	4.9	137	8.8
18	9 34.5	9 36.1	9 8.3	18	1.2	78	5.0	138	8.9
19	9 34.8	9 36.3	9 8.6	19	1.2	79	5.1	139	8.9
20	9 35.0	9 36.6	9 8.8	20	1.3	80	5.1	140	9.0
21	9 35.3	9 36.8	9 9.0	21	1.3	81	5.2	141	9.0
22	9 35.5	9 37.1	9 9.3	22	1.4	82	5.3	142	9.1
23	9 35.8	9 37.3	9 9.5	23	1.5	83	5.3	143	9.2
24	9 36.0	9 37.6	9 9.8	24	1.5	84	5.4	144	9.2
25	9 36.3	9 37.9	9 10.0	25	1.6	85	5.5	145	9.3
26	9 36.5	9 38.1	9 10.2	26	1.7	86	5.5	146	9.4
27	9 36.8	9 38.4	9 10.5	27	1.7	87	5.6	147	9.4
28	9 37.0	9 38.6	9 10.7	28	1.8	88	5.6	148	9.5
29	9 37.3	9 38.9	9 11.0	29	1.9	89	5.7	149	9.6
30	9 37.5	9 39.1	9 11.2	30	1.9	90	5.8	150	9.6
31	9 37.8	9 39.4	9 11.4	31	2.0	91	5.8	151	9.7
32	9 38.0	9 39.6	9 11.7	32	2.1	92	5.9	152	9.8
33	9 38.3	9 39.9	9 11.9	33	2.1	93	6.0	153	9.8
34	9 38.5	9 40.1	9 12.1	34	2.2	94	6.0	154	9.9
35	9 38.8	9 40.4	9 12.4	35	2.2	95	6.1	155	9.9
36	9 39.0	9 40.6	9 12.6	36	2.3	96	6.2	156	10.0
37	9 39.3	9 40.9	9 12.9	37	2.4	97	6.2	157	10.1
38	9 39.5	9 41.1	9 13.1	38	2.4	98	6.3	158	10.1
39	9 39.8	9 41.4	9 13.3	39	2.5	99	6.4	159	10.2
40	9 40.0	9 41.6	9 13.6	40	2.6	100	6.4	160	10.3
41	9 40.3	9 41.9	9 13.8	41	2.6	101	6.5	161	10.3
42	9 40.5	9 42.1	9 14.1	42	2.7	102	6.5	162	10.4
43	9 40.8	9 42.4	9 14.3	43	2.8	103	6.6	163	10.5
44	9 41.0	9 42.6	9 14.5	44	2.8	104	6.7	164	10.5
45	9 41.3	9 42.9	9 14.8	45	2.9	105	6.7	165	10.6
46	9 41.5	9 43.1	9 15.0	46	3.0	106	6.8	166	10.7
47	9 41.8	9 43.4	9 15.2	47	3.0	107	6.9	167	10.7
48	9 42.0	9 43.6	9 15.5	48	3.1	108	6.9	168	10.8
49	9 42.3	9 43.9	9 15.7	49	3.1	109	7.0	169	10.8
50	9 42.5	9 44.1	9 16.0	50	3.2	110	7.1	170	10.9
51	9 42.8	9 44.4	9 16.2	51	3.3	111	7.1	171	11.0
52	9 43.0	9 44.6	9 16.4	52	3.3	112	7.2	172	11.0
53	9 43.3	9 44.9	9 16.7	53	3.4	113	7.3	173	11.1
54	9 43.5	9 45.1	9 16.9	54	3.5	114	7.3	174	11.2
55	9 43.8	9 45.4	9 17.2	55	3.5	115	7.4	175	11.2
56	9 44.0	9 45.6	9 17.4	56	3.6	116	7.4	176	11.3
57	9 44.3	9 45.9	9 17.6	57	3.7	117	7.5	177	11.4
58	9 44.5	9 46.1	9 17.9	58	3.7	118	7.6	178	11.4
59	9 44.8	9 46.4	9 18.1	59	3.8	119	7.6	179	11.5
60	9 45.0	9 46.6	9 18.4	60	3.9	120	7.7	180	11.6

0 h 39 min

s	POPRAVKA ČASOVNOG UGLA: SUNCA I PLANETA	PROLJEĆNE TAČKE ♈	MJESECA ☾	POPRAVKA DRUGOG REDA za časovni ugao i deklinaciju Sunca, Mjeseca i planeta: Δ	popr.	Δ	popr.	Δ	popr.
	° ′	° ′	° ′		′		′		′
0	9 45.0	9 46.6	9 18.4	0	.0	60	4.0	120	7.9
1	9 45.3	9 46.9	9 18.6	1	.1	61	4.0	121	8.0
2	9 45.5	9 47.1	9 18.8	2	.1	62	4.1	122	8.0
3	9 45.8	9 47.4	9 19.1	3	.2	63	4.1	123	8.1
4	9 46.0	9 47.6	9 19.3	4	.3	64	4.2	124	8.2
5	9 46.3	9 47.9	9 19.5	5	.3	65	4.3	125	8.2
6	9 46.5	9 48.1	9 19.8	6	.4	66	4.3	126	8.3
7	9 46.8	9 48.4	9 20.0	7	.5	67	4.4	127	8.4
8	9 47.0	9 48.6	9 20.3	8	.5	68	4.5	128	8.4
9	9 47.3	9 48.9	9 20.5	9	.6	69	4.5	129	8.5
10	9 47.5	9 49.1	9 20.7	10	.7	70	4.6	130	8.6
11	9 47.8	9 49.4	9 21.0	11	.7	71	4.7	131	8.6
12	9 48.0	9 49.6	9 21.2	12	.8	72	4.7	132	8.7
13	9 48.3	9 49.9	9 21.5	13	.9	73	4.8	133	8.8
14	9 48.5	9 50.1	9 21.7	14	.9	74	4.9	134	8.8
15	9 48.8	9 50.4	9 21.9	15	1.0	75	4.9	135	8.9
16	9 49.0	9 50.6	9 22.2	16	1.1	76	5.0	136	9.0
17	9 49.3	9 50.9	9 22.4	17	1.1	77	5.1	137	9.0
18	9 49.5	9 51.1	9 22.6	18	1.2	78	5.1	138	9.1
19	9 49.8	9 51.4	9 22.9	19	1.3	79	5.2	139	9.2
20	9 50.0	9 51.6	9 23.1	20	1.3	80	5.3	140	9.2
21	9 50.3	9 51.9	9 23.4	21	1.4	81	5.3	141	9.3
22	9 50.5	9 52.1	9 23.6	22	1.4	82	5.4	142	9.3
23	9 50.8	9 52.4	9 23.8	23	1.5	83	5.5	143	9.4
24	9 51.0	9 52.6	9 24.1	24	1.6	84	5.5	144	9.5
25	9 51.3	9 52.9	9 24.3	25	1.6	85	5.6	145	9.5
26	9 51.5	9 53.1	9 24.6	26	1.7	86	5.7	146	9.6
27	9 51.8	9 53.4	9 24.8	27	1.8	87	5.7	147	9.7
28	9 52.0	9 53.6	9 25.0	28	1.8	88	5.8	148	9.7
29	9 52.3	9 53.9	9 25.3	29	1.9	89	5.9	149	9.8
30	9 52.5	9 54.1	9 25.5	30	2.0	90	5.9	150	9.9
31	9 52.8	9 54.4	9 25.7	31	2.0	91	6.0	151	9.9
32	9 53.0	9 54.6	9 26.0	32	2.1	92	6.1	152	10.0
33	9 53.3	9 54.9	9 26.2	33	2.2	93	6.1	153	10.1
34	9 53.5	9 55.1	9 26.5	34	2.2	94	6.2	154	10.1
35	9 53.8	9 55.4	9 26.7	35	2.3	95	6.3	155	10.2
36	9 54.0	9 55.7	9 26.9	36	2.4	96	6.3	156	10.3
37	9 54.3	9 55.9	9 27.2	37	2.4	97	6.4	157	10.3
38	9 54.5	9 56.2	9 27.4	38	2.5	98	6.5	158	10.4
39	9 54.8	9 56.4	9 27.7	39	2.6	99	6.5	159	10.5
40	9 55.0	9 56.7	9 27.9	40	2.6	100	6.6	160	10.5
41	9 55.3	9 56.9	9 28.1	41	2.7	101	6.6	161	10.6
42	9 55.5	9 57.2	9 28.4	42	2.8	102	6.7	162	10.7
43	9 55.8	9 57.4	9 28.6	43	2.8	103	6.8	163	10.7
44	9 56.0	9 57.7	9 28.8	44	2.9	104	6.8	164	10.8
45	9 56.3	9 57.9	9 29.1	45	3.0	105	6.9	165	10.9
46	9 56.5	9 58.2	9 29.3	46	3.0	106	7.0	166	10.9
47	9 56.8	9 58.4	9 29.6	47	3.1	107	7.0	167	11.0
48	9 57.0	9 58.7	9 29.8	48	3.2	108	7.1	168	11.1
49	9 57.3	9 58.9	9 30.0	49	3.2	109	7.2	169	11.1
50	9 57.5	9 59.2	9 30.3	50	3.3	110	7.2	170	11.2
51	9 57.8	9 59.4	9 30.5	51	3.4	111	7.3	171	11.3
52	9 58.0	9 59.7	9 30.8	52	3.4	112	7.4	172	11.3
53	9 58.3	9 59.9	9 31.0	53	3.5	113	7.4	173	11.4
54	9 58.5	10 .2	9 31.2	54	3.6	114	7.5	174	11.5
55	9 58.8	10 .4	9 31.5	55	3.6	115	7.6	175	11.5
56	9 59.0	10 .7	9 31.7	56	3.7	116	7.6	176	11.6
57	9 59.3	10 .9	9 32.0	57	3.8	117	7.7	177	11.7
58	9 59.5	10 1.2	9 32.2	58	3.8	118	7.8	178	11.7
59	9 59.8	10 1.4	9 32.4	59	3.9	119	7.8	179	11.8
60	10 .0	10 1.7	9 32.7	60	4.0	120	7.9	180	11.9

0 h 40 min

POPRAVKA ČASOVNOG UGLA				POPRAVKA DRUGOG REDA za časovni ugao i deklinaciju Sunca, Mjeseca i planeta					
s	SUNCA I PLANETA	PROLJEĆNE TAČKE ♈	MJESECA ☾	Δ	popr.	Δ	popr.	Δ	popr.
	° ′	° ′	° ′		′		′		′
0	10 .0	10 1.7	9 32.7	0	.0	60	4.1	120	8.1
1	10 .3	10 1.9	9 32.9	1	.1	61	4.1	121	8.2
2	10 .5	10 2.2	9 33.1	2	.1	62	4.2	122	8.2
3	10 .8	10 2.4	9 33.4	3	.2	63	4.3	123	8.3
4	10 1.0	10 2.7	9 33.6	4	.3	64	4.3	124	8.4
5	10 1.3	10 2.9	9 33.9	5	.3	65	4.4	125	8.4
6	10 1.5	10 3.2	9 34.1	6	.4	66	4.5	126	8.5
7	10 1.8	10 3.4	9 34.3	7	.5	67	4.5	127	8.6
8	10 2.0	10 3.7	9 34.6	8	.5	68	4.6	128	8.6
9	10 2.3	10 3.9	9 34.8	9	.6	69	4.7	129	8.7
10	10 2.5	10 4.2	9 35.1	10	.7	70	4.7	130	8.8
11	10 2.8	10 4.4	9 35.3	11	.7	71	4.8	131	8.8
12	10 3.0	10 4.7	9 35.5	12	.8	72	4.9	132	8.9
13	10 3.3	10 4.9	9 35.8	13	.9	73	4.9	133	9.0
14	10 3.5	10 5.2	9 36.0	14	.9	74	5.0	134	9.0
15	10 3.8	10 5.4	9 36.2	15	1.0	75	5.1	135	9.1
16	10 4.0	10 5.7	9 36.5	16	1.1	76	5.1	136	9.2
17	10 4.3	10 5.9	9 36.7	17	1.1	77	5.2	137	9.2
18	10 4.5	10 6.2	9 37.0	18	1.2	78	5.3	138	9.3
19	10 4.8	10 6.4	9 37.2	19	1.3	79	5.3	139	9.4
20	10 5.0	10 6.7	9 37.4	20	1.4	80	5.4	140	9.5
21	10 5.3	10 6.9	9 37.7	21	1.4	81	5.5	141	9.5
22	10 5.5	10 7.2	9 37.9	22	1.5	82	5.5	142	9.6
23	10 5.8	10 7.4	9 38.2	23	1.6	83	5.6	143	9.7
24	10 6.0	10 7.7	9 38.4	24	1.6	84	5.7	144	9.7
25	10 6.3	10 7.9	9 38.6	25	1.7	85	5.7	145	9.8
26	10 6.5	10 8.2	9 38.9	26	1.8	86	5.8	146	9.9
27	10 6.8	10 8.4	9 39.1	27	1.8	87	5.9	147	9.9
28	10 7.0	10 8.7	9 39.3	28	1.9	88	5.9	148	10.0
29	10 7.3	10 8.9	9 39.6	29	2.0	89	6.0	149	10.1
30	10 7.5	10 9.2	9 39.8	30	2.0	90	6.1	150	10.1
31	10 7.8	10 9.4	9 40.1	31	2.1	91	6.1	151	10.2
32	10 8.0	10 9.7	9 40.3	32	2.2	92	6.2	152	10.3
33	10 8.3	10 9.9	9 40.5	33	2.2	93	6.3	153	10.3
34	10 8.5	10 10.2	9 40.8	34	2.3	94	6.3	154	10.4
35	10 8.8	10 10.4	9 41.0	35	2.4	95	6.4	155	10.5
36	10 9.0	10 10.7	9 41.3	36	2.4	96	6.5	156	10.5
37	10 9.3	10 10.9	9 41.5	37	2.5	97	6.5	157	10.6
38	10 9.5	10 11.2	9 41.7	38	2.6	98	6.6	158	10.7
39	10 9.8	10 11.4	9 42.0	39	2.6	99	6.7	159	10.7
40	10 10.0	10 11.7	9 42.2	40	2.7	100	6.8	160	10.8
41	10 10.3	10 11.9	9 42.4	41	2.8	101	6.8	161	10.9
42	10 10.5	10 12.2	9 42.7	42	2.8	102	6.9	162	10.9
43	10 10.8	10 12.4	9 42.9	43	2.9	103	7.0	163	11.0
44	10 11.0	10 12.7	9 43.2	44	3.0	104	7.0	164	11.1
45	10 11.3	10 12.9	9 43.4	45	3.0	105	7.1	165	11.1
46	10 11.5	10 13.2	9 43.6	46	3.1	106	7.2	166	11.2
47	10 11.8	10 13.4	9 43.9	47	3.2	107	7.2	167	11.3
48	10 12.0	10 13.7	9 44.1	48	3.2	108	7.3	168	11.3
49	10 12.3	10 14.0	9 44.4	49	3.3	109	7.4	169	11.4
50	10 12.5	10 14.2	9 44.6	50	3.4	110	7.4	170	11.5
51	10 12.8	10 14.5	9 44.8	51	3.4	111	7.5	171	11.5
52	10 13.0	10 14.7	9 45.1	52	3.5	112	7.6	172	11.6
53	10 13.3	10 15.0	9 45.3	53	3.6	113	7.6	173	11.7
54	10 13.5	10 15.2	9 45.6	54	3.6	114	7.7	174	11.7
55	10 13.8	10 15.5	9 45.8	55	3.7	115	7.8	175	11.8
56	10 14.0	10 15.7	9 46.0	56	3.8	116	7.8	176	11.9
57	10 14.3	10 16.0	9 46.3	57	3.8	117	7.9	177	11.9
58	10 14.5	10 16.2	9 46.5	58	3.9	118	8.0	178	12.0
59	10 14.8	10 16.5	9 46.7	59	4.0	119	8.0	179	12.1
60	10 15.0	10 16.7	9 47.0	60	4.1	120	8.1	180	12.2

0 h 41 min

POPRAVKA ČASOVNOG UGLA				POPRAVKA DRUGOG REDA za časovni ugao i deklinaciju Sunca, Mjeseca i planeta					
s	SUNCA I PLANETA	PROLJEĆNE TAČKE ♈	MJESECA ☾	Δ	popr.	Δ	popr.	Δ	popr.
	° ′	° ′	° ′		′		′		′
0	10 15.0	10 16.7	9 47.0	0	.0	60	4.2	120	8.3
1	10 15.3	10 17.0	9 47.2	1	.1	61	4.2	121	8.4
2	10 15.5	10 17.2	9 47.5	2	.1	62	4.3	122	8.4
3	10 15.8	10 17.5	9 47.7	3	.2	63	4.4	123	8.5
4	10 16.0	10 17.7	9 47.9	4	.3	64	4.4	124	8.6
5	10 16.3	10 18.0	9 48.2	5	.3	65	4.5	125	8.6
6	10 16.5	10 18.2	9 48.4	6	.4	66	4.6	126	8.7
7	10 16.8	10 18.5	9 48.7	7	.5	67	4.6	127	8.8
8	10 17.0	10 18.7	9 48.9	8	.6	68	4.7	128	8.9
9	10 17.3	10 19.0	9 49.1	9	.6	69	4.8	129	8.9
10	10 17.5	10 19.2	9 49.4	10	.7	70	4.8	130	9.0
11	10 17.8	10 19.5	9 49.6	11	.8	71	4.9	131	9.1
12	10 18.0	10 19.7	9 49.8	12	.8	72	5.0	132	9.1
13	10 18.3	10 20.0	9 50.1	13	.9	73	5.0	133	9.2
14	10 18.5	10 20.2	9 50.3	14	1.0	74	5.1	134	9.3
15	10 18.8	10 20.5	9 50.6	15	1.0	75	5.2	135	9.3
16	10 19.0	10 20.7	9 50.8	16	1.1	76	5.3	136	9.4
17	10 19.3	10 21.0	9 51.0	17	1.2	77	5.3	137	9.5
18	10 19.5	10 21.2	9 51.3	18	1.2	78	5.4	138	9.5
19	10 19.8	10 21.5	9 51.5	19	1.3	79	5.5	139	9.6
20	10 20.0	10 21.7	9 51.8	20	1.4	80	5.5	140	9.7
21	10 20.3	10 22.0	9 52.0	21	1.5	81	5.6	141	9.8
22	10 20.5	10 22.2	9 52.2	22	1.5	82	5.7	142	9.8
23	10 20.8	10 22.5	9 52.5	23	1.6	83	5.7	143	9.9
24	10 21.0	10 22.7	9 52.7	24	1.7	84	5.8	144	10.0
25	10 21.3	10 23.0	9 52.9	25	1.7	85	5.9	145	10.0
26	10 21.5	10 23.2	9 53.2	26	1.8	86	5.9	146	10.1
27	10 21.8	10 23.5	9 53.4	27	1.9	87	6.0	147	10.2
28	10 22.0	10 23.7	9 53.7	28	1.9	88	6.1	148	10.2
29	10 22.3	10 24.0	9 53.9	29	2.0	89	6.2	149	10.3
30	10 22.5	10 24.2	9 54.1	30	2.1	90	6.2	150	10.4
31	10 22.8	10 24.5	9 54.4	31	2.1	91	6.3	151	10.4
32	10 23.0	10 24.7	9 54.6	32	2.2	92	6.4	152	10.5
33	10 23.3	10 25.0	9 54.9	33	2.3	93	6.4	153	10.6
34	10 23.5	10 25.2	9 55.1	34	2.4	94	6.5	154	10.7
35	10 23.8	10 25.5	9 55.3	35	2.4	95	6.6	155	10.7
36	10 24.0	10 25.7	9 55.6	36	2.5	96	6.6	156	10.8
37	10 24.3	10 26.0	9 55.8	37	2.6	97	6.7	157	10.9
38	10 24.5	10 26.2	9 56.1	38	2.6	98	6.8	158	10.9
39	10 24.8	10 26.5	9 56.3	39	2.7	99	6.8	159	11.0
40	10 25.0	10 26.7	9 56.5	40	2.8	100	6.9	160	11.1
41	10 25.3	10 27.0	9 56.8	41	2.8	101	7.0	161	11.1
42	10 25.5	10 27.2	9 57.0	42	2.9	102	7.1	162	11.2
43	10 25.8	10 27.5	9 57.2	43	3.0	103	7.1	163	11.3
44	10 26.0	10 27.7	9 57.5	44	3.0	104	7.2	164	11.3
45	10 26.3	10 28.0	9 57.7	45	3.1	105	7.3	165	11.4
46	10 26.5	10 28.2	9 58.0	46	3.2	106	7.3	166	11.5
47	10 26.8	10 28.5	9 58.2	47	3.3	107	7.4	167	11.6
48	10 27.0	10 28.7	9 58.4	48	3.3	108	7.5	168	11.6
49	10 27.3	10 29.0	9 58.7	49	3.4	109	7.5	169	11.7
50	10 27.5	10 29.2	9 58.9	50	3.5	110	7.6	170	11.8
51	10 27.8	10 29.5	9 59.2	51	3.5	111	7.7	171	11.8
52	10 28.0	10 29.7	9 59.4	52	3.6	112	7.7	172	11.9
53	10 28.3	10 30.0	9 59.6	53	3.7	113	7.8	173	12.0
54	10 28.5	10 30.2	9 59.9	54	3.7	114	7.9	174	12.0
55	10 28.8	10 30.5	10 .1	55	3.8	115	8.0	175	12.1
56	10 29.0	10 30.7	10 .3	56	3.9	116	8.0	176	12.2
57	10 29.3	10 31.0	10 .6	57	3.9	117	8.1	177	12.2
58	10 29.5	10 31.2	10 .8	58	4.0	118	8.2	178	12.3
59	10 29.8	10 31.5	10 1.1	59	4.1	119	8.2	179	12.4
60	10 30.0	10 31.8	10 1.3	60	4.2	120	8.3	180	12.5

0 h 42 min

POPRAVKA ČASOVNOG UGLA				POPRAVKA DRUGOG REDA za časovni ugao i deklinaciju Sunca, Mjeseca i planeta					
s	SUNCA I PLANETA	PROLJEĆNE TAČKE ♈	MJESECA ☾	Δ	popr.	Δ	popr.	Δ	popr.
	° ′	° ′	° ′		′		′		′
0	10 30.0	10 31.8	10 1.3	0	.0	60	4.3	120	8.5
1	10 30.3	10 32.0	10 1.5	1	.1	61	4.3	121	8.6
2	10 30.5	10 32.3	10 1.8	2	.1	62	4.4	122	8.6
3	10 30.8	10 32.5	10 2.0	3	.2	63	4.5	123	8.7
4	10 31.0	10 32.8	10 2.3	4	.3	64	4.5	124	8.8
5	10 31.3	10 33.0	10 2.5	5	.4	65	4.6	125	8.9
6	10 31.5	10 33.3	10 2.7	6	.4	66	4.7	126	8.9
7	10 31.8	10 33.5	10 3.0	7	.5	67	4.7	127	9.0
8	10 32.0	10 33.8	10 3.2	8	.6	68	4.8	128	9.1
9	10 32.3	10 34.0	10 3.4	9	.6	69	4.9	129	9.1
10	10 32.5	10 34.3	10 3.7	10	.7	70	5.0	130	9.2
11	10 32.8	10 34.5	10 3.9	11	.8	71	5.0	131	9.3
12	10 33.0	10 34.8	10 4.2	12	.9	72	5.1	132	9.4
13	10 33.3	10 35.0	10 4.4	13	.9	73	5.2	133	9.4
14	10 33.5	10 35.3	10 4.6	14	1.0	74	5.2	134	9.5
15	10 33.8	10 35.5	10 4.9	15	1.1	75	5.3	135	9.6
16	10 34.0	10 35.8	10 5.1	16	1.1	76	5.4	136	9.6
17	10 34.3	10 36.0	10 5.4	17	1.2	77	5.5	137	9.7
18	10 34.5	10 36.3	10 5.6	18	1.3	78	5.5	138	9.8
19	10 34.8	10 36.5	10 5.8	19	1.3	79	5.6	139	9.8
20	10 35.0	10 36.8	10 6.1	20	1.4	80	5.7	140	9.9
21	10 35.3	10 37.0	10 6.3	21	1.5	81	5.7	141	10.0
22	10 35.5	10 37.3	10 6.5	22	1.6	82	5.8	142	10.1
23	10 35.8	10 37.5	10 6.8	23	1.6	83	5.9	143	10.1
24	10 36.0	10 37.8	10 7.0	24	1.7	84	6.0	144	10.2
25	10 36.3	10 38.0	10 7.3	25	1.8	85	6.0	145	10.3
26	10 36.5	10 38.3	10 7.5	26	1.8	86	6.1	146	10.3
27	10 36.8	10 38.5	10 7.7	27	1.9	87	6.2	147	10.4
28	10 37.0	10 38.8	10 8.0	28	2.0	88	6.2	148	10.5
29	10 37.3	10 39.0	10 8.2	29	2.1	89	6.3	149	10.6
30	10 37.5	10 39.3	10 8.5	30	2.1	90	6.4	150	10.6
31	10 37.8	10 39.5	10 8.7	31	2.2	91	6.4	151	10.7
32	10 38.0	10 39.8	10 8.9	32	2.3	92	6.5	152	10.8
33	10 38.3	10 40.0	10 9.2	33	2.3	93	6.6	153	10.8
34	10 38.5	10 40.3	10 9.4	34	2.4	94	6.7	154	10.9
35	10 38.8	10 40.5	10 9.7	35	2.5	95	6.7	155	11.0
36	10 39.0	10 40.8	10 9.9	36	2.6	96	6.8	156	11.1
37	10 39.3	10 41.0	10 10.1	37	2.6	97	6.9	157	11.1
38	10 39.5	10 41.3	10 10.4	38	2.7	98	6.9	158	11.2
39	10 39.8	10 41.5	10 10.6	39	2.8	99	7.0	159	11.3
40	10 40.0	10 41.8	10 10.8	40	2.8	100	7.1	160	11.3
41	10 40.3	10 42.0	10 11.1	41	2.9	101	7.2	161	11.4
42	10 40.5	10 42.3	10 11.3	42	3.0	102	7.2	162	11.5
43	10 40.8	10 42.5	10 11.6	43	3.0	103	7.3	163	11.5
44	10 41.0	10 42.8	10 11.8	44	3.1	104	7.4	164	11.6
45	10 41.3	10 43.0	10 12.0	45	3.2	105	7.4	165	11.7
46	10 41.5	10 43.3	10 12.3	46	3.3	106	7.5	166	11.8
47	10 41.8	10 43.5	10 12.5	47	3.3	107	7.6	167	11.8
48	10 42.0	10 43.8	10 12.8	48	3.4	108	7.7	168	11.9
49	10 42.3	10 44.0	10 13.0	49	3.5	109	7.7	169	12.0
50	10 42.5	10 44.3	10 13.2	50	3.5	110	7.8	170	12.0
51	10 42.8	10 44.5	10 13.5	51	3.6	111	7.9	171	12.1
52	10 43.0	10 44.8	10 13.7	52	3.7	112	7.9	172	12.2
53	10 43.3	10 45.0	10 13.9	53	3.8	113	8.0	173	12.3
54	10 43.5	10 45.3	10 14.2	54	3.8	114	8.1	174	12.3
55	10 43.8	10 45.5	10 14.4	55	3.9	115	8.1	175	12.4
56	10 44.0	10 45.8	10 14.7	56	4.0	116	8.2	176	12.5
57	10 44.3	10 46.0	10 14.9	57	4.0	117	8.3	177	12.5
58	10 44.5	10 46.3	10 15.1	58	4.1	118	8.4	178	12.6
59	10 44.8	10 46.5	10 15.4	59	4.2	119	8.4	179	12.7
60	10 45.0	10 46.8	10 15.6	60	4.3	120	8.5	180	12.8

0 h 43 min

POPRAVKA ČASOVNOG UGLA				POPRAVKA DRUGOG REDA za časovni ugao i deklinaciju Sunca, Mjeseca i planeta					
s	SUNCA I PLANETA	PROLJEĆNE TAČKE ♈	MJESECA ☾	Δ	popr.	Δ	popr.	Δ	popr.
	° ′	° ′	° ′		′		′		′
0	10 45.0	10 46.8	10 15.6	0	.0	60	4.4	120	8.7
1	10 45.3	10 47.0	10 15.9	1	.1	61	4.4	121	8.8
2	10 45.5	10 47.3	10 16.1	2	.1	62	4.5	122	8.8
3	10 45.8	10 47.5	10 16.3	3	.2	63	4.6	123	8.9
4	10 46.0	10 47.8	10 16.6	4	.3	64	4.6	124	9.0
5	10 46.3	10 48.0	10 16.8	5	.4	65	4.7	125	9.1
6	10 46.5	10 48.3	10 17.0	6	.4	66	4.8	126	9.1
7	10 46.8	10 48.5	10 17.3	7	.5	67	4.9	127	9.2
8	10 47.0	10 48.8	10 17.5	8	.6	68	4.9	128	9.3
9	10 47.3	10 49.0	10 17.8	9	.7	69	5.0	129	9.4
10	10 47.5	10 49.3	10 18.0	10	.7	70	5.1	130	9.4
11	10 47.8	10 49.5	10 18.2	11	.8	71	5.1	131	9.5
12	10 48.0	10 49.8	10 18.5	12	.9	72	5.2	132	9.6
13	10 48.3	10 50.1	10 18.7	13	.9	73	5.3	133	9.6
14	10 48.5	10 50.3	10 19.0	14	1.0	74	5.4	134	9.7
15	10 48.8	10 50.6	10 19.2	15	1.1	75	5.4	135	9.8
16	10 49.0	10 50.8	10 19.4	16	1.2	76	5.5	136	9.9
17	10 49.3	10 51.1	10 19.7	17	1.2	77	5.6	137	9.9
18	10 49.5	10 51.3	10 19.9	18	1.3	78	5.7	138	10.0
19	10 49.8	10 51.6	10 20.2	19	1.4	79	5.7	139	10.1
20	10 50.0	10 51.8	10 20.4	20	1.5	80	5.8	140	10.2
21	10 50.3	10 52.1	10 20.6	21	1.5	81	5.9	141	10.2
22	10 50.5	10 52.3	10 20.9	22	1.6	82	5.9	142	10.3
23	10 50.8	10 52.6	10 21.1	23	1.7	83	6.0	143	10.4
24	10 51.0	10 52.8	10 21.3	24	1.7	84	6.1	144	10.4
25	10 51.3	10 53.1	10 21.6	25	1.8	85	6.2	145	10.5
26	10 51.5	10 53.3	10 21.8	26	1.9	86	6.2	146	10.6
27	10 51.8	10 53.6	10 22.1	27	2.0	87	6.3	147	10.7
28	10 52.0	10 53.8	10 22.3	28	2.0	88	6.4	148	10.7
29	10 52.3	10 54.1	10 22.5	29	2.1	89	6.5	149	10.8
30	10 52.5	10 54.3	10 22.8	30	2.2	90	6.5	150	10.9
31	10 52.8	10 54.6	10 23.0	31	2.2	91	6.6	151	10.9
32	10 53.0	10 54.8	10 23.3	32	2.3	92	6.7	152	11.0
33	10 53.3	10 55.1	10 23.5	33	2.4	93	6.7	153	11.1
34	10 53.5	10 55.3	10 23.7	34	2.5	94	6.8	154	11.2
35	10 53.8	10 55.6	10 24.0	35	2.5	95	6.9	155	11.2
36	10 54.0	10 55.8	10 24.2	36	2.6	96	7.0	156	11.3
37	10 54.3	10 56.1	10 24.4	37	2.7	97	7.0	157	11.4
38	10 54.5	10 56.3	10 24.7	38	2.8	98	7.1	158	11.5
39	10 54.8	10 56.6	10 24.9	39	2.8	99	7.2	159	11.5
40	10 55.0	10 56.8	10 25.2	40	2.9	100	7.3	160	11.6
41	10 55.3	10 57.1	10 25.4	41	3.0	101	7.3	161	11.7
42	10 55.5	10 57.3	10 25.6	42	3.0	102	7.4	162	11.7
43	10 55.8	10 57.6	10 25.9	43	3.1	103	7.5	163	11.8
44	10 56.0	10 57.8	10 26.1	44	3.2	104	7.5	164	11.9
45	10 56.3	10 58.1	10 26.4	45	3.3	105	7.6	165	12.0
46	10 56.5	10 58.3	10 26.6	46	3.3	106	7.7	166	12.0
47	10 56.8	10 58.6	10 26.8	47	3.4	107	7.8	167	12.1
48	10 57.0	10 58.8	10 27.1	48	3.5	108	7.8	168	12.2
49	10 57.3	10 59.1	10 27.3	49	3.6	109	7.9	169	12.3
50	10 57.5	10 59.3	10 27.5	50	3.6	110	8.0	170	12.3
51	10 57.8	10 59.6	10 27.8	51	3.7	111	8.0	171	12.4
52	10 58.0	10 59.8	10 28.0	52	3.8	112	8.1	172	12.5
53	10 58.3	11 .1	10 28.3	53	3.8	113	8.2	173	12.5
54	10 58.5	11 .3	10 28.5	54	3.9	114	8.3	174	12.6
55	10 58.8	11 .6	10 28.7	55	4.0	115	8.3	175	12.7
56	10 59.0	11 .8	10 29.0	56	4.1	116	8.4	176	12.8
57	10 59.3	11 1.1	10 29.2	57	4.1	117	8.5	177	12.8
58	10 59.5	11 1.3	10 29.5	58	4.2	118	8.6	178	12.9
59	10 59.8	11 1.6	10 29.7	59	4.3	119	8.6	179	13.0
60	11 .0	11 1.8	10 29.9	60	4.4	120	8.7	180	13.1

0 h 44 min

POPRAVKA ČASOVNOG UGLA						POPRAVKA DRUGOG REDA za časovni ugao i deklinaciju Sunca, Mjeseca i planeta					
s	SUNCA I PLANETA		PROLJEĆNE TAČKE ♈		MJESECA ☾		Δ	poprav.	Δ	poprav.	Δ	poprav.
	°	′	°	′	°	′		′		′		′
0	11	.0	11	1.8	10	29.9	0	.0	60	4.5	120	8.9
1	11	.3	11	2.1	10	30.2	1	.1	61	4.5	121	9.0
2	11	.5	11	2.3	10	30.4	2	.1	62	4.6	122	9.0
3	11	.8	11	2.6	10	30.6	3	.2	63	4.7	123	9.1
4	11	1.0	11	2.8	10	30.9	4	.3	64	4.7	124	9.2
5	11	1.3	11	3.1	10	31.1	5	.4	65	4.8	125	9.3
6	11	1.5	11	3.3	10	31.4	6	.4	66	4.9	126	9.3
7	11	1.8	11	3.6	10	31.6	7	.5	67	5.0	127	9.4
8	11	2.0	11	3.8	10	31.8	8	.6	68	5.0	128	9.5
9	11	2.3	11	4.1	10	32.1	9	.7	69	5.1	129	9.6
10	11	2.5	11	4.3	10	32.3	10	.7	70	5.2	130	9.6
11	11	2.8	11	4.6	10	32.6	11	.8	71	5.3	131	9.7
12	11	3.0	11	4.8	10	32.8	12	.9	72	5.3	132	9.8
13	11	3.3	11	5.1	10	33.0	13	1.0	73	5.4	133	9.9
14	11	3.5	11	5.3	10	33.3	14	1.0	74	5.5	134	9.9
15	11	3.8	11	5.6	10	33.5	15	1.1	75	5.6	135	10.0
16	11	4.0	11	5.8	10	33.8	16	1.2	76	5.6	136	10.1
17	11	4.3	11	6.1	10	34.0	17	1.3	77	5.7	137	10.2
18	11	4.5	11	6.3	10	34.2	18	1.3	78	5.8	138	10.2
19	11	4.8	11	6.6	10	34.5	19	1.4	79	5.9	139	10.3
20	11	5.0	11	6.8	10	34.7	20	1.5	80	5.9	140	10.4
21	11	5.3	11	7.1	10	34.9	21	1.6	81	6.0	141	10.5
22	11	5.5	11	7.3	10	35.2	22	1.6	82	6.1	142	10.5
23	11	5.8	11	7.6	10	35.4	23	1.7	83	6.2	143	10.6
24	11	6.0	11	7.9	10	35.7	24	1.8	84	6.2	144	10.7
25	11	6.3	11	8.1	10	35.9	25	1.9	85	6.3	145	10.8
26	11	6.5	11	8.4	10	36.1	26	1.9	86	6.4	146	10.8
27	11	6.8	11	8.6	10	36.4	27	2.0	87	6.5	147	10.9
28	11	7.0	11	8.9	10	36.6	28	2.1	88	6.5	148	11.0
29	11	7.3	11	9.1	10	36.9	29	2.2	89	6.6	149	11.1
30	11	7.5	11	9.4	10	37.1	30	2.2	90	6.7	150	11.1
31	11	7.8	11	9.6	10	37.3	31	2.3	91	6.7	151	11.2
32	11	8.0	11	9.9	10	37.6	32	2.4	92	6.8	152	11.3
33	11	8.3	11	10.1	10	37.8	33	2.4	93	6.9	153	11.3
34	11	8.5	11	10.4	10	38.0	34	2.5	94	7.0	154	11.4
35	11	8.8	11	10.6	10	38.3	35	2.6	95	7.0	155	11.5
36	11	9.0	11	10.9	10	38.5	36	2.7	96	7.1	156	11.6
37	11	9.3	11	11.1	10	38.8	37	2.7	97	7.2	157	11.6
38	11	9.5	11	11.4	10	39.0	38	2.8	98	7.3	158	11.7
39	11	9.8	11	11.6	10	39.2	39	2.9	99	7.3	159	11.8
40	11	10.0	11	11.9	10	39.5	40	3.0	100	7.4	160	11.9
41	11	10.3	11	12.1	10	39.7	41	3.0	101	7.5	161	11.9
42	11	10.5	11	12.4	10	40.0	42	3.1	102	7.6	162	12.0
43	11	10.8	11	12.6	10	40.2	43	3.2	103	7.6	163	12.1
44	11	11.0	11	12.9	10	40.4	44	3.3	104	7.7	164	12.2
45	11	11.3	11	13.1	10	40.7	45	3.3	105	7.8	165	12.2
46	11	11.5	11	13.4	10	40.9	46	3.4	106	7.9	166	12.3
47	11	11.8	11	13.6	10	41.1	47	3.5	107	7.9	167	12.4
48	11	12.0	11	13.9	10	41.4	48	3.6	108	8.0	168	12.5
49	11	12.3	11	14.1	10	41.6	49	3.6	109	8.1	169	12.5
50	11	12.5	11	14.4	10	41.9	50	3.7	110	8.2	170	12.6
51	11	12.8	11	14.6	10	42.1	51	3.8	111	8.2	171	12.7
52	11	13.0	11	14.9	10	42.3	52	3.9	112	8.3	172	12.8
53	11	13.3	11	15.1	10	42.6	53	3.9	113	8.4	173	12.8
54	11	13.5	11	15.4	10	42.8	54	4.0	114	8.5	174	12.9
55	11	13.8	11	15.6	10	43.1	55	4.1	115	8.5	175	13.0
56	11	14.0	11	15.9	10	43.3	56	4.2	116	8.6	176	13.1
57	11	14.3	11	16.1	10	43.5	57	4.2	117	8.7	177	13.1
58	11	14.5	11	16.4	10	43.8	58	4.3	118	8.8	178	13.2
59	11	14.8	11	16.6	10	44.0	59	4.4	119	8.8	179	13.3
60	11	15.0	11	16.9	10	44.3	60	4.5	120	8.9	180	13.4

0 h 45 min

POPRAVKA ČASOVNOG UGLA						POPRAVKA DRUGOG REDA za časovni ugao i deklinaciju Sunca, Mjeseca i planeta					
s	SUNCA I PLANETA		PROLJEĆNE TAČKE ♈		MJESECA ☾		Δ	poprav.	Δ	poprav.	Δ	poprav.
	°	′	°	′	°	′		′		′		′
0	11	15.0	11	16.9	10	44.3	0	.0	60	4.6	120	9.1
1	11	15.3	11	17.1	10	44.5	1	.1	61	4.6	121	9.2
2	11	15.5	11	17.4	10	44.7	2	.2	62	4.7	122	9.3
3	11	15.8	11	17.6	10	45.0	3	.2	63	4.8	123	9.3
4	11	16.0	11	17.9	10	45.2	4	.3	64	4.9	124	9.4
5	11	16.3	11	18.1	10	45.4	5	.4	65	4.9	125	9.5
6	11	16.5	11	18.4	10	45.7	6	.5	66	5.0	126	9.6
7	11	16.8	11	18.6	10	45.9	7	.5	67	5.1	127	9.6
8	11	17.0	11	18.9	10	46.2	8	.6	68	5.2	128	9.7
9	11	17.3	11	19.1	10	46.4	9	.7	69	5.2	129	9.8
10	11	17.5	11	19.4	10	46.6	10	.8	70	5.3	130	9.9
11	11	17.8	11	19.6	10	46.9	11	.8	71	5.4	131	9.9
12	11	18.0	11	19.9	10	47.1	12	.9	72	5.5	132	10.0
13	11	18.3	11	20.1	10	47.4	13	1.0	73	5.5	133	10.1
14	11	18.5	11	20.4	10	47.6	14	1.1	74	5.6	134	10.2
15	11	18.8	11	20.6	10	47.8	15	1.1	75	5.7	135	10.2
16	11	19.0	11	20.9	10	48.1	16	1.2	76	5.8	136	10.3
17	11	19.3	11	21.1	10	48.3	17	1.3	77	5.8	137	10.4
18	11	19.5	11	21.4	10	48.5	18	1.4	78	5.9	138	10.5
19	11	19.8	11	21.6	10	48.8	19	1.4	79	6.0	139	10.5
20	11	20.0	11	21.9	10	49.0	20	1.5	80	6.1	140	10.6
21	11	20.3	11	22.1	10	49.3	21	1.6	81	6.1	141	10.7
22	11	20.5	11	22.4	10	49.5	22	1.7	82	6.2	142	10.8
23	11	20.8	11	22.6	10	49.7	23	1.7	83	6.3	143	10.8
24	11	21.0	11	22.9	10	50.0	24	1.8	84	6.4	144	10.9
25	11	21.3	11	23.1	10	50.2	25	1.9	85	6.4	145	11.0
26	11	21.5	11	23.4	10	50.5	26	2.0	86	6.5	146	11.1
27	11	21.8	11	23.6	10	50.7	27	2.0	87	6.6	147	11.1
28	11	22.0	11	23.9	10	50.9	28	2.1	88	6.7	148	11.2
29	11	22.3	11	24.1	10	51.2	29	2.2	89	6.7	149	11.3
30	11	22.5	11	24.4	10	51.4	30	2.3	90	6.8	150	11.4
31	11	22.8	11	24.6	10	51.6	31	2.4	91	6.9	151	11.5
32	11	23.0	11	24.9	10	51.9	32	2.4	92	7.0	152	11.5
33	11	23.3	11	25.1	10	52.1	33	2.5	93	7.1	153	11.6
34	11	23.5	11	25.4	10	52.4	34	2.6	94	7.1	154	11.7
35	11	23.8	11	25.6	10	52.6	35	2.7	95	7.2	155	11.8
36	11	24.0	11	25.9	10	52.8	36	2.7	96	7.3	156	11.8
37	11	24.3	11	26.2	10	53.1	37	2.8	97	7.4	157	11.9
38	11	24.5	11	26.4	10	53.3	38	2.9	98	7.4	158	12.0
39	11	24.8	11	26.7	10	53.6	39	3.0	99	7.5	159	12.1
40	11	25.0	11	26.9	10	53.8	40	3.0	100	7.6	160	12.1
41	11	25.3	11	27.2	10	54.0	41	3.1	101	7.7	161	12.2
42	11	25.5	11	27.4	10	54.3	42	3.2	102	7.7	162	12.3
43	11	25.8	11	27.7	10	54.5	43	3.3	103	7.8	163	12.4
44	11	26.0	11	27.9	10	54.7	44	3.3	104	7.9	164	12.4
45	11	26.3	11	28.2	10	55.0	45	3.4	105	8.0	165	12.5
46	11	26.5	11	28.4	10	55.2	46	3.5	106	8.0	166	12.6
47	11	26.8	11	28.7	10	55.5	47	3.6	107	8.1	167	12.7
48	11	27.0	11	28.9	10	55.7	48	3.6	108	8.2	168	12.7
49	11	27.3	11	29.2	10	55.9	49	3.7	109	8.3	169	12.8
50	11	27.5	11	29.4	10	56.2	50	3.8	110	8.3	170	12.9
51	11	27.8	11	29.7	10	56.4	51	3.9	111	8.4	171	13.0
52	11	28.0	11	29.9	10	56.7	52	3.9	112	8.5	172	13.0
53	11	28.3	11	30.2	10	56.9	53	4.0	113	8.6	173	13.1
54	11	28.5	11	30.4	10	57.1	54	4.1	114	8.6	174	13.2
55	11	28.8	11	30.7	10	57.4	55	4.2	115	8.7	175	13.3
56	11	29.0	11	30.9	10	57.6	56	4.2	116	8.8	176	13.3
57	11	29.3	11	31.2	10	57.9	57	4.3	117	8.9	177	13.4
58	11	29.5	11	31.4	10	58.1	58	4.4	118	8.9	178	13.5
59	11	29.8	11	31.7	10	58.3	59	4.5	119	9.0	179	13.6
60	11	30.0	11	31.9	10	58.6	60	4.6	120	9.1	180	13.7

0 h 46 min

POPRAVKA ČASOVNOG UGLA				POPRAVKA DRUGOG REDA za časovni ugao i deklinaciju Sunca, Mjeseca i planeta					
s	SUNCA I PLANETA	PROLJEĆNE TAČKE ♈	MJESECA ☾	Δ	popr.	Δ	popr.	Δ	popr.
	° ′	° ′	° ′		′		′		′
0	11 30.0	11 31.9	10 58.6	0	.0	60	4.7	120	9.3
1	11 30.3	11 32.2	10 58.8	1	.1	61	4.7	121	9.4
2	11 30.5	11 32.4	10 59.0	2	.2	62	4.8	122	9.5
3	11 30.8	11 32.7	10 59.3	3	.2	63	4.9	123	9.5
4	11 31.0	11 32.9	10 59.5	4	.3	64	5.0	124	9.6
5	11 31.3	11 33.2	10 59.8	5	.4	65	5.0	125	9.7
6	11 31.5	11 33.4	10 60.0	6	.5	66	5.1	126	9.8
7	11 31.8	11 33.7	11 .2	7	.5	67	5.2	127	9.8
8	11 32.0	11 33.9	11 .5	8	.6	68	5.3	128	9.9
9	11 32.3	11 34.2	11 .7	9	.7	69	5.3	129	10.0
10	11 32.5	11 34.4	11 1.0	10	.8	70	5.4	130	10.1
11	11 32.8	11 34.7	11 1.2	11	.9	71	5.5	131	10.2
12	11 33.0	11 34.9	11 1.4	12	.9	72	5.6	132	10.2
13	11 33.3	11 35.2	11 1.7	13	1.0	73	5.7	133	10.3
14	11 33.5	11 35.4	11 1.9	14	1.1	74	5.7	134	10.4
15	11 33.8	11 35.7	11 2.1	15	1.2	75	5.8	135	10.5
16	11 34.0	11 35.9	11 2.4	16	1.2	76	5.9	136	10.5
17	11 34.3	11 36.2	11 2.6	17	1.3	77	6.0	137	10.6
18	11 34.5	11 36.4	11 2.9	18	1.4	78	6.0	138	10.7
19	11 34.8	11 36.7	11 3.1	19	1.5	79	6.1	139	10.8
20	11 35.0	11 36.9	11 3.3	20	1.6	80	6.2	140	10.9
21	11 35.3	11 37.2	11 3.6	21	1.6	81	6.3	141	10.9
22	11 35.5	11 37.4	11 3.8	22	1.7	82	6.4	142	11.0
23	11 35.8	11 37.7	11 4.1	23	1.8	83	6.4	143	11.1
24	11 36.0	11 37.9	11 4.3	24	1.9	84	6.5	144	11.2
25	11 36.3	11 38.2	11 4.5	25	1.9	85	6.6	145	11.2
26	11 36.5	11 38.4	11 4.8	26	2.0	86	6.7	146	11.3
27	11 36.8	11 38.7	11 5.0	27	2.1	87	6.7	147	11.4
28	11 37.0	11 38.9	11 5.2	28	2.2	88	6.8	148	11.5
29	11 37.3	11 39.2	11 5.5	29	2.2	89	6.9	149	11.5
30	11 37.5	11 39.4	11 5.7	30	2.3	90	7.0	150	11.6
31	11 37.8	11 39.7	11 6.0	31	2.4	91	7.1	151	11.7
32	11 38.0	11 39.9	11 6.2	32	2.5	92	7.1	152	11.8
33	11 38.3	11 40.2	11 6.4	33	2.6	93	7.2	153	11.9
34	11 38.5	11 40.4	11 6.7	34	2.6	94	7.3	154	11.9
35	11 38.8	11 40.7	11 6.9	35	2.7	95	7.4	155	12.0
36	11 39.0	11 40.9	11 7.2	36	2.8	96	7.4	156	12.1
37	11 39.3	11 41.2	11 7.4	37	2.9	97	7.5	157	12.2
38	11 39.5	11 41.4	11 7.6	38	2.9	98	7.6	158	12.2
39	11 39.8	11 41.7	11 7.9	39	3.0	99	7.7	159	12.3
40	11 40.0	11 41.9	11 8.1	40	3.1	100	7.8	160	12.4
41	11 40.3	11 42.2	11 8.3	41	3.2	101	7.8	161	12.5
42	11 40.5	11 42.4	11 8.6	42	3.3	102	7.9	162	12.6
43	11 40.8	11 42.7	11 8.8	43	3.3	103	8.0	163	12.6
44	11 41.0	11 42.9	11 9.1	44	3.4	104	8.1	164	12.7
45	11 41.3	11 43.2	11 9.3	45	3.5	105	8.1	165	12.8
46	11 41.5	11 43.4	11 9.5	46	3.6	106	8.2	166	12.9
47	11 41.8	11 43.7	11 9.8	47	3.6	107	8.3	167	12.9
48	11 42.0	11 44.0	11 10.0	48	3.7	108	8.4	168	13.0
49	11 42.3	11 44.2	11 10.3	49	3.8	109	8.4	169	13.1
50	11 42.5	11 44.5	11 10.5	50	3.9	110	8.5	170	13.2
51	11 42.8	11 44.7	11 10.7	51	4.0	111	8.6	171	13.3
52	11 43.0	11 45.0	11 11.0	52	4.0	112	8.7	172	13.3
53	11 43.3	11 45.2	11 11.2	53	4.1	113	8.8	173	13.4
54	11 43.5	11 45.5	11 11.5	54	4.2	114	8.8	174	13.5
55	11 43.8	11 45.7	11 11.7	55	4.3	115	8.9	175	13.6
56	11 44.0	11 46.0	11 11.9	56	4.3	116	9.0	176	13.6
57	11 44.3	11 46.2	11 12.2	57	4.4	117	9.1	177	13.7
58	11 44.5	11 46.5	11 12.4	58	4.5	118	9.1	178	13.8
59	11 44.8	11 46.7	11 12.6	59	4.6	119	9.2	179	13.9
60	11 45.0	11 47.0	11 12.9	60	4.7	120	9.3	180	14.0

0 h 47 min

POPRAVKA ČASOVNOG UGLA				POPRAVKA DRUGOG REDA za časovni ugao i deklinaciju Sunca, Mjeseca i planeta					
s	SUNCA I PLANETA	PROLJEĆNE TAČKE ♈	MJESECA ☾	Δ	popr.	Δ	popr.	Δ	popr.
	° ′	° ′	° ′		′		′		′
0	11 45.0	11 47.0	11 12.9	0	.0	60	4.8	120	9.5
1	11 45.3	11 47.2	11 13.1	1	.1	61	4.8	121	9.6
2	11 45.5	11 47.5	11 13.4	2	.2	62	4.9	122	9.7
3	11 45.8	11 47.7	11 13.6	3	.2	63	5.0	123	9.7
4	11 46.0	11 48.0	11 13.8	4	.3	64	5.1	124	9.8
5	11 46.3	11 48.2	11 14.1	5	.4	65	5.1	125	9.9
6	11 46.5	11 48.5	11 14.3	6	.5	66	5.2	126	10.0
7	11 46.8	11 48.7	11 14.6	7	.6	67	5.3	127	10.1
8	11 47.0	11 49.0	11 14.8	8	.6	68	5.4	128	10.1
9	11 47.3	11 49.2	11 15.0	9	.7	69	5.5	129	10.2
10	11 47.5	11 49.5	11 15.3	10	.8	70	5.5	130	10.3
11	11 47.8	11 49.7	11 15.5	11	.9	71	5.6	131	10.4
12	11 48.0	11 50.0	11 15.7	12	1.0	72	5.7	132	10.5
13	11 48.3	11 50.2	11 16.0	13	1.0	73	5.8	133	10.5
14	11 48.5	11 50.5	11 16.2	14	1.1	74	5.9	134	10.6
15	11 48.8	11 50.7	11 16.5	15	1.2	75	5.9	135	10.7
16	11 49.0	11 51.0	11 16.7	16	1.3	76	6.0	136	10.8
17	11 49.3	11 51.2	11 16.9	17	1.3	77	6.1	137	10.8
18	11 49.5	11 51.5	11 17.2	18	1.4	78	6.2	138	10.9
19	11 49.8	11 51.7	11 17.4	19	1.5	79	6.3	139	11.0
20	11 50.0	11 52.0	11 17.7	20	1.6	80	6.3	140	11.1
21	11 50.3	11 52.2	11 17.9	21	1.7	81	6.4	141	11.2
22	11 50.5	11 52.5	11 18.1	22	1.7	82	6.5	142	11.2
23	11 50.8	11 52.7	11 18.4	23	1.8	83	6.6	143	11.3
24	11 51.0	11 53.0	11 18.6	24	1.9	84	6.7	144	11.4
25	11 51.3	11 53.2	11 18.8	25	2.0	85	6.7	145	11.5
26	11 51.5	11 53.5	11 19.1	26	2.1	86	6.8	146	11.6
27	11 51.8	11 53.7	11 19.3	27	2.1	87	6.9	147	11.6
28	11 52.0	11 54.0	11 19.6	28	2.2	88	7.0	148	11.7
29	11 52.3	11 54.2	11 19.8	29	2.3	89	7.0	149	11.8
30	11 52.5	11 54.5	11 20.0	30	2.4	90	7.1	150	11.9
31	11 52.8	11 54.7	11 20.3	31	2.5	91	7.2	151	12.0
32	11 53.0	11 55.0	11 20.5	32	2.5	92	7.3	152	12.0
33	11 53.3	11 55.2	11 20.8	33	2.6	93	7.4	153	12.1
34	11 53.5	11 55.5	11 21.0	34	2.7	94	7.4	154	12.2
35	11 53.8	11 55.7	11 21.2	35	2.8	95	7.5	155	12.3
36	11 54.0	11 56.0	11 21.5	36	2.9	96	7.6	156	12.4
37	11 54.3	11 56.2	11 21.7	37	2.9	97	7.7	157	12.4
38	11 54.5	11 56.5	11 22.0	38	3.0	98	7.8	158	12.5
39	11 54.8	11 56.7	11 22.2	39	3.1	99	7.8	159	12.6
40	11 55.0	11 57.0	11 22.4	40	3.2	100	7.9	160	12.7
41	11 55.3	11 57.2	11 22.7	41	3.2	101	8.0	161	12.7
42	11 55.5	11 57.5	11 22.9	42	3.3	102	8.1	162	12.8
43	11 55.8	11 57.7	11 23.1	43	3.4	103	8.2	163	12.9
44	11 56.0	11 58.0	11 23.4	44	3.5	104	8.2	164	13.0
45	11 56.3	11 58.2	11 23.6	45	3.6	105	8.3	165	13.1
46	11 56.5	11 58.5	11 23.9	46	3.6	106	8.4	166	13.1
47	11 56.8	11 58.7	11 24.1	47	3.7	107	8.5	167	13.2
48	11 57.0	11 59.0	11 24.3	48	3.8	108	8.6	168	13.3
49	11 57.3	11 59.2	11 24.6	49	3.9	109	8.6	169	13.4
50	11 57.5	11 59.5	11 24.8	50	4.0	110	8.7	170	13.5
51	11 57.8	11 59.7	11 25.1	51	4.0	111	8.8	171	13.5
52	11 58.0	11 60.0	11 25.3	52	4.1	112	8.9	172	13.6
53	11 58.3	12 .2	11 25.5	53	4.2	113	8.9	173	13.7
54	11 58.5	12 .5	11 25.8	54	4.3	114	9.0	174	13.8
55	11 58.8	12 .7	11 26.0	55	4.4	115	9.1	175	13.9
56	11 59.0	12 1.0	11 26.2	56	4.4	116	9.2	176	13.9
57	11 59.3	12 1.2	11 26.5	57	4.5	117	9.3	177	14.0
58	11 59.5	12 1.5	11 26.7	58	4.6	118	9.3	178	14.1
59	11 59.8	12 1.7	11 27.0	59	4.7	119	9.4	179	14.2
60	12 .0	12 2.0	11 27.2	60	4.8	120	9.5	180	14.3

0 h 48 min

POPRAVKA ČASOVNOG UGLA				POPRAVKA DRUGOG REDA za časovni ugao i deklinaciju Sunca, Mjeseca i planeta					
s	SUNCA I PLANETA	PROLJEĆNE TAČKE ♈	MJESECA ☾	Δ	popr.	Δ	popr.	Δ	popr.
	° ′	° ′	° ′		′		′		′
0	12 .0	12 2.0	11 27.2	0	.0	60	4.9	120	9.7
1	12 .3	12 2.3	11 27.4	1	.1	61	4.9	121	9.8
2	12 .5	12 2.5	11 27.7	2	.2	62	5.0	122	9.9
3	12 .8	12 2.8	11 27.9	3	.2	63	5.1	123	9.9
4	12 1.0	12 3.0	11 28.2	4	.3	64	5.2	124	10.0
5	12 1.3	12 3.3	11 28.4	5	.4	65	5.3	125	10.1
6	12 1.5	12 3.5	11 28.6	6	.5	66	5.3	126	10.2
7	12 1.8	12 3.8	11 28.9	7	.6	67	5.4	127	10.3
8	12 2.0	12 4.0	11 29.1	8	.6	68	5.5	128	10.3
9	12 2.3	12 4.3	11 29.3	9	.7	69	5.6	129	10.4
10	12 2.5	12 4.5	11 29.6	10	.8	70	5.7	130	10.5
11	12 2.8	12 4.8	11 29.8	11	.9	71	5.7	131	10.6
12	12 3.0	12 5.0	11 30.1	12	1.0	72	5.8	132	10.7
13	12 3.3	12 5.3	11 30.3	13	1.1	73	5.9	133	10.8
14	12 3.5	12 5.5	11 30.5	14	1.1	74	6.0	134	10.8
15	12 3.8	12 5.8	11 30.8	15	1.2	75	6.1	135	10.9
16	12 4.0	12 6.0	11 31.0	16	1.3	76	6.1	136	11.0
17	12 4.3	12 6.3	11 31.3	17	1.4	77	6.2	137	11.1
18	12 4.5	12 6.5	11 31.5	18	1.5	78	6.3	138	11.2
19	12 4.8	12 6.8	11 31.7	19	1.5	79	6.4	139	11.2
20	12 5.0	12 7.0	11 32.0	20	1.6	80	6.5	140	11.3
21	12 5.3	12 7.3	11 32.2	21	1.7	81	6.5	141	11.4
22	12 5.5	12 7.5	11 32.4	22	1.8	82	6.6	142	11.5
23	12 5.8	12 7.8	11 32.7	23	1.9	83	6.7	143	11.6
24	12 6.0	12 8.0	11 32.9	24	1.9	84	6.8	144	11.6
25	12 6.3	12 8.3	11 33.2	25	2.0	85	6.9	145	11.7
26	12 6.5	12 8.5	11 33.4	26	2.1	86	7.0	146	11.8
27	12 6.8	12 8.8	11 33.6	27	2.2	87	7.0	147	11.9
28	12 7.0	12 9.0	11 33.9	28	2.3	88	7.1	148	12.0
29	12 7.3	12 9.3	11 34.1	29	2.3	89	7.2	149	12.0
30	12 7.5	12 9.5	11 34.4	30	2.4	90	7.3	150	12.1
31	12 7.8	12 9.8	11 34.6	31	2.5	91	7.4	151	12.2
32	12 8.0	12 10.0	11 34.8	32	2.6	92	7.4	152	12.3
33	12 8.3	12 10.3	11 35.1	33	2.7	93	7.5	153	12.4
34	12 8.5	12 10.5	11 35.3	34	2.7	94	7.6	154	12.4
35	12 8.8	12 10.8	11 35.6	35	2.8	95	7.7	155	12.5
36	12 9.0	12 11.0	11 35.8	36	2.9	96	7.8	156	12.6
37	12 9.3	12 11.3	11 36.0	37	3.0	97	7.8	157	12.7
38	12 9.5	12 11.5	11 36.3	38	3.1	98	7.9	158	12.8
39	12 9.8	12 11.8	11 36.5	39	3.2	99	8.0	159	12.9
40	12 10.0	12 12.0	11 36.7	40	3.2	100	8.1	160	12.9
41	12 10.3	12 12.3	11 37.0	41	3.3	101	8.2	161	13.0
42	12 10.5	12 12.5	11 37.2	42	3.4	102	8.2	162	13.1
43	12 10.8	12 12.8	11 37.5	43	3.5	103	8.3	163	13.2
44	12 11.0	12 13.0	11 37.7	44	3.6	104	8.4	164	13.3
45	12 11.3	12 13.3	11 37.9	45	3.6	105	8.5	165	13.3
46	12 11.5	12 13.5	11 38.2	46	3.7	106	8.6	166	13.4
47	12 11.8	12 13.8	11 38.4	47	3.8	107	8.6	167	13.5
48	12 12.0	12 14.0	11 38.7	48	3.9	108	8.7	168	13.6
49	12 12.3	12 14.3	11 38.9	49	4.0	109	8.8	169	13.7
50	12 12.5	12 14.5	11 39.1	50	4.0	110	8.9	170	13.7
51	12 12.8	12 14.8	11 39.4	51	4.1	111	9.0	171	13.8
52	12 13.0	12 15.0	11 39.6	52	4.2	112	9.1	172	13.9
53	12 13.3	12 15.3	11 39.8	53	4.3	113	9.1	173	14.0
54	12 13.5	12 15.5	11 40.1	54	4.4	114	9.2	174	14.1
55	12 13.8	12 15.8	11 40.3	55	4.4	115	9.3	175	14.1
56	12 14.0	12 16.0	11 40.6	56	4.5	116	9.4	176	14.2
57	12 14.3	12 16.3	11 40.8	57	4.6	117	9.5	177	14.3
58	12 14.5	12 16.5	11 41.0	58	4.7	118	9.5	178	14.4
59	12 14.8	12 16.8	11 41.3	59	4.8	119	9.6	179	14.5
60	12 15.0	12 17.0	11 41.5	60	4.9	120	9.7	180	14.6

0 h 49 min

POPRAVKA ČASOVNOG UGLA				POPRAVKA DRUGOG REDA za časovni ugao i deklinaciju Sunca, Mjeseca i planeta					
s	SUNCA I PLANETA	PROLJEĆNE TAČKE ♈	MJESECA ☾	Δ	popr.	Δ	popr.	Δ	popr.
	° ′	° ′	° ′		′		′		′
0	12 15.0	12 17.0	11 41.5	0	.0	60	5.0	120	9.9
1	12 15.3	12 17.3	11 41.8	1	.1	61	5.0	121	10.0
2	12 15.5	12 17.5	11 42.0	2	.2	62	5.1	122	10.1
3	12 15.8	12 17.8	11 42.2	3	.2	63	5.2	123	10.1
4	12 16.0	12 18.0	11 42.5	4	.3	64	5.3	124	10.2
5	12 16.3	12 18.3	11 42.7	5	.4	65	5.4	125	10.3
6	12 16.5	12 18.5	11 42.9	6	.5	66	5.4	126	10.4
7	12 16.8	12 18.8	11 43.2	7	.6	67	5.5	127	10.5
8	12 17.0	12 19.0	11 43.4	8	.7	68	5.6	128	10.6
9	12 17.3	12 19.3	11 43.7	9	.7	69	5.7	129	10.6
10	12 17.5	12 19.5	11 43.9	10	.8	70	5.8	130	10.7
11	12 17.8	12 19.8	11 44.1	11	.9	71	5.9	131	10.8
12	12 18.0	12 20.1	11 44.4	12	1.0	72	5.9	132	10.9
13	12 18.3	12 20.3	11 44.6	13	1.1	73	6.0	133	11.0
14	12 18.5	12 20.6	11 44.9	14	1.2	74	6.1	134	11.1
15	12 18.8	12 20.8	11 45.1	15	1.2	75	6.2	135	11.1
16	12 19.0	12 21.1	11 45.3	16	1.3	76	6.3	136	11.2
17	12 19.3	12 21.3	11 45.6	17	1.4	77	6.4	137	11.3
18	12 19.5	12 21.6	11 45.8	18	1.5	78	6.4	138	11.4
19	12 19.8	12 21.8	11 46.1	19	1.6	79	6.5	139	11.5
20	12 20.0	12 22.1	11 46.3	20	1.7	80	6.6	140	11.6
21	12 20.3	12 22.3	11 46.5	21	1.7	81	6.7	141	11.6
22	12 20.5	12 22.6	11 46.8	22	1.8	82	6.8	142	11.7
23	12 20.8	12 22.8	11 47.0	23	1.9	83	6.8	143	11.8
24	12 21.0	12 23.1	11 47.2	24	2.0	84	6.9	144	11.9
25	12 21.3	12 23.3	11 47.5	25	2.1	85	7.0	145	12.0
26	12 21.5	12 23.6	11 47.7	26	2.1	86	7.1	146	12.0
27	12 21.8	12 23.8	11 48.0	27	2.2	87	7.2	147	12.1
28	12 22.0	12 24.1	11 48.2	28	2.3	88	7.3	148	12.2
29	12 22.3	12 24.3	11 48.4	29	2.4	89	7.3	149	12.3
30	12 22.5	12 24.6	11 48.7	30	2.5	90	7.4	150	12.4
31	12 22.8	12 24.8	11 48.9	31	2.6	91	7.5	151	12.5
32	12 23.0	12 25.1	11 49.2	32	2.6	92	7.6	152	12.5
33	12 23.3	12 25.3	11 49.4	33	2.7	93	7.7	153	12.6
34	12 23.5	12 25.6	11 49.6	34	2.8	94	7.8	154	12.7
35	12 23.8	12 25.8	11 49.9	35	2.9	95	7.8	155	12.8
36	12 24.0	12 26.1	11 50.1	36	3.0	96	7.9	156	12.9
37	12 24.3	12 26.3	11 50.3	37	3.1	97	8.0	157	13.0
38	12 24.5	12 26.6	11 50.6	38	3.1	98	8.1	158	13.0
39	12 24.8	12 26.8	11 50.8	39	3.2	99	8.2	159	13.1
40	12 25.0	12 27.1	11 51.1	40	3.3	100	8.3	160	13.2
41	12 25.3	12 27.3	11 51.3	41	3.4	101	8.3	161	13.3
42	12 25.5	12 27.6	11 51.5	42	3.5	102	8.4	162	13.4
43	12 25.8	12 27.8	11 51.8	43	3.5	103	8.5	163	13.4
44	12 26.0	12 28.1	11 52.0	44	3.6	104	8.6	164	13.5
45	12 26.3	12 28.3	11 52.3	45	3.7	105	8.7	165	13.6
46	12 26.5	12 28.6	11 52.5	46	3.8	106	8.7	166	13.7
47	12 26.8	12 28.8	11 52.7	47	3.9	107	8.8	167	13.8
48	12 27.0	12 29.1	11 53.0	48	4.0	108	8.9	168	13.9
49	12 27.3	12 29.3	11 53.2	49	4.0	109	9.0	169	13.9
50	12 27.5	12 29.6	11 53.4	50	4.1	110	9.1	170	14.0
51	12 27.8	12 29.8	11 53.7	51	4.2	111	9.2	171	14.1
52	12 28.0	12 30.1	11 53.9	52	4.3	112	9.2	172	14.2
53	12 28.3	12 30.3	11 54.2	53	4.4	113	9.3	173	14.3
54	12 28.5	12 30.6	11 54.4	54	4.5	114	9.4	174	14.4
55	12 28.8	12 30.8	11 54.6	55	4.5	115	9.5	175	14.4
56	12 29.0	12 31.1	11 54.9	56	4.6	116	9.6	176	14.5
57	12 29.3	12 31.3	11 55.1	57	4.7	117	9.7	177	14.6
58	12 29.5	12 31.6	11 55.4	58	4.8	118	9.7	178	14.7
59	12 29.8	12 31.8	11 55.6	59	4.9	119	9.8	179	14.8
60	12 30.0	12 32.1	11 55.8	60	5.0	120	9.9	180	14.9

0 h 50 min

s	POPRAVKA ČASOVNOG UGLA: SUNCA I PLANETA	PROLJEĆNE TAČKE ♈	MJESECA ☾	POPRAVKA DRUGOG REDA za časovni ugao i deklinaciju Sunca, Mjeseca i planeta: Δ	poprav.	Δ	poprav.	Δ	poprav.
	° ′	° ′	° ′		′		′		′
0	12 30.0	12 32.1	11 55.8	0	.0	60	5.1	120	10.1
1	12 30.3	12 32.3	11 56.1	1	.1	61	5.1	121	10.2
2	12 30.5	12 32.6	11 56.3	2	.2	62	5.2	122	10.3
3	12 30.8	12 32.8	11 56.5	3	.3	63	5.3	123	10.4
4	12 31.0	12 33.1	11 56.8	4	.3	64	5.4	124	10.4
5	12 31.3	12 33.3	11 57.0	5	.4	65	5.5	125	10.5
6	12 31.5	12 33.6	11 57.3	6	.5	66	5.6	126	10.6
7	12 31.8	12 33.8	11 57.5	7	.6	67	5.6	127	10.7
8	12 32.0	12 34.1	11 57.7	8	.7	68	5.7	128	10.8
9	12 32.3	12 34.3	11 58.0	9	.8	69	5.8	129	10.9
10	12 32.5	12 34.6	11 58.2	10	.8	70	5.9	130	10.9
11	12 32.8	12 34.8	11 58.5	11	.9	71	6.0	131	11.0
12	12 33.0	12 35.1	11 58.7	12	1.0	72	6.1	132	11.1
13	12 33.3	12 35.3	11 58.9	13	1.1	73	6.1	133	11.2
14	12 33.5	12 35.6	11 59.2	14	1.2	74	6.2	134	11.3
15	12 33.8	12 35.8	11 59.4	15	1.3	75	6.3	135	11.4
16	12 34.0	12 36.1	11 59.7	16	1.3	76	6.4	136	11.4
17	12 34.3	12 36.3	11 59.9	17	1.4	77	6.5	137	11.5
18	12 34.5	12 36.6	12 .1	18	1.5	78	6.6	138	11.6
19	12 34.8	12 36.8	12 .4	19	1.6	79	6.6	139	11.7
20	12 35.0	12 37.1	12 .6	20	1.7	80	6.7	140	11.8
21	12 35.3	12 37.3	12 .8	21	1.8	81	6.8	141	11.9
22	12 35.5	12 37.6	12 1.1	22	1.9	82	6.9	142	12.0
23	12 35.8	12 37.8	12 1.3	23	1.9	83	7.0	143	12.0
24	12 36.0	12 38.1	12 1.6	24	2.0	84	7.1	144	12.1
25	12 36.3	12 38.4	12 1.8	25	2.1	85	7.2	145	12.2
26	12 36.5	12 38.6	12 2.0	26	2.2	86	7.2	146	12.3
27	12 36.8	12 38.9	12 2.3	27	2.3	87	7.3	147	12.4
28	12 37.0	12 39.1	12 2.5	28	2.4	88	7.4	148	12.5
29	12 37.3	12 39.4	12 2.8	29	2.4	89	7.5	149	12.5
30	12 37.5	12 39.6	12 3.0	30	2.5	90	7.6	150	12.6
31	12 37.8	12 39.9	12 3.2	31	2.6	91	7.7	151	12.7
32	12 38.0	12 40.1	12 3.5	32	2.7	92	7.7	152	12.8
33	12 38.3	12 40.4	12 3.7	33	2.8	93	7.8	153	12.9
34	12 38.5	12 40.6	12 3.9	34	2.9	94	7.9	154	13.0
35	12 38.8	12 40.9	12 4.2	35	2.9	95	8.0	155	13.0
36	12 39.0	12 41.1	12 4.4	36	3.0	96	8.1	156	13.1
37	12 39.3	12 41.4	12 4.7	37	3.1	97	8.2	157	13.2
38	12 39.5	12 41.6	12 4.9	38	3.2	98	8.2	158	13.3
39	12 39.8	12 41.9	12 5.1	39	3.3	99	8.3	159	13.4
40	12 40.0	12 42.1	12 5.4	40	3.4	100	8.4	160	13.5
41	12 40.3	12 42.4	12 5.6	41	3.5	101	8.5	161	13.6
42	12 40.5	12 42.6	12 5.9	42	3.5	102	8.6	162	13.6
43	12 40.8	12 42.9	12 6.1	43	3.6	103	8.7	163	13.7
44	12 41.0	12 43.1	12 6.3	44	3.7	104	8.8	164	13.8
45	12 41.3	12 43.4	12 6.6	45	3.8	105	8.8	165	13.9
46	12 41.5	12 43.6	12 6.8	46	3.9	106	8.9	166	14.0
47	12 41.8	12 43.9	12 7.0	47	4.0	107	9.0	167	14.1
48	12 42.0	12 44.1	12 7.3	48	4.0	108	9.1	168	14.1
49	12 42.3	12 44.4	12 7.5	49	4.1	109	9.2	169	14.2
50	12 42.5	12 44.6	12 7.8	50	4.2	110	9.3	170	14.3
51	12 42.8	12 44.9	12 8.0	51	4.3	111	9.3	171	14.4
52	12 43.0	12 45.1	12 8.2	52	4.4	112	9.4	172	14.5
53	12 43.3	12 45.4	12 8.5	53	4.5	113	9.5	173	14.6
54	12 43.5	12 45.6	12 8.7	54	4.5	114	9.6	174	14.6
55	12 43.8	12 45.9	12 9.0	55	4.6	115	9.7	175	14.7
56	12 44.0	12 46.1	12 9.2	56	4.7	116	9.8	176	14.8
57	12 44.3	12 46.4	12 9.4	57	4.8	117	9.8	177	14.9
58	12 44.5	12 46.6	12 9.7	58	4.9	118	9.9	178	15.0
59	12 44.8	12 46.9	12 9.9	59	5.0	119	10.0	179	15.1
60	12 45.0	12 47.1	12 10.2	60	5.1	120	10.1	180	15.2

0 h 51 min

s	POPRAVKA ČASOVNOG UGLA: SUNCA I PLANETA	PROLJEĆNE TAČKE ♈	MJESECA ☾	POPRAVKA DRUGOG REDA za časovni ugao i deklinaciju Sunca, Mjeseca i planeta: Δ	poprav.	Δ	poprav.	Δ	poprav.
	° ′	° ′	° ′		′		′		′
0	12 45.0	12 47.1	12 10.2	0	.0	60	5.2	120	10.3
1	12 45.3	12 47.4	12 10.4	1	.1	61	5.2	121	10.4
2	12 45.5	12 47.6	12 10.6	2	.2	62	5.3	122	10.5
3	12 45.8	12 47.9	12 10.9	3	.3	63	5.4	123	10.6
4	12 46.0	12 48.1	12 11.1	4	.3	64	5.5	124	10.6
5	12 46.3	12 48.4	12 11.3	5	.4	65	5.6	125	10.7
6	12 46.5	12 48.6	12 11.6	6	.5	66	5.7	126	10.8
7	12 46.8	12 48.9	12 11.8	7	.6	67	5.8	127	10.9
8	12 47.0	12 49.1	12 12.1	8	.7	68	5.8	128	11.0
9	12 47.3	12 49.4	12 12.3	9	.8	69	5.9	129	11.1
10	12 47.5	12 49.6	12 12.5	10	.9	70	6.0	130	11.2
11	12 47.8	12 49.9	12 12.8	11	.9	71	6.1	131	11.2
12	12 48.0	12 50.1	12 13.0	12	1.0	72	6.2	132	11.3
13	12 48.3	12 50.4	12 13.3	13	1.1	73	6.3	133	11.4
14	12 48.5	12 50.6	12 13.5	14	1.2	74	6.4	134	11.5
15	12 48.8	12 50.9	12 13.7	15	1.3	75	6.4	135	11.6
16	12 49.0	12 51.1	12 14.0	16	1.4	76	6.5	136	11.7
17	12 49.3	12 51.4	12 14.2	17	1.5	77	6.6	137	11.8
18	12 49.5	12 51.6	12 14.4	18	1.5	78	6.7	138	11.8
19	12 49.8	12 51.9	12 14.7	19	1.6	79	6.8	139	11.9
20	12 50.0	12 52.1	12 14.9	20	1.7	80	6.9	140	12.0
21	12 50.3	12 52.4	12 15.2	21	1.8	81	7.0	141	12.1
22	12 50.5	12 52.6	12 15.4	22	1.9	82	7.0	142	12.2
23	12 50.8	12 52.9	12 15.6	23	2.0	83	7.1	143	12.3
24	12 51.0	12 53.1	12 15.9	24	2.1	84	7.2	144	12.4
25	12 51.3	12 53.4	12 16.1	25	2.1	85	7.3	145	12.4
26	12 51.5	12 53.6	12 16.4	26	2.2	86	7.4	146	12.5
27	12 51.8	12 53.9	12 16.6	27	2.3	87	7.5	147	12.6
28	12 52.0	12 54.1	12 16.8	28	2.4	88	7.6	148	12.7
29	12 52.3	12 54.4	12 17.1	29	2.5	89	7.6	149	12.8
30	12 52.5	12 54.6	12 17.3	30	2.6	90	7.7	150	12.9
31	12 52.8	12 54.9	12 17.5	31	2.7	91	7.8	151	13.0
32	12 53.0	12 55.1	12 17.8	32	2.7	92	7.9	152	13.0
33	12 53.3	12 55.4	12 18.0	33	2.8	93	8.0	153	13.1
34	12 53.5	12 55.6	12 18.3	34	2.9	94	8.1	154	13.2
35	12 53.8	12 55.9	12 18.5	35	3.0	95	8.2	155	13.3
36	12 54.0	12 56.2	12 18.7	36	3.1	96	8.2	156	13.4
37	12 54.3	12 56.4	12 19.0	37	3.2	97	8.3	157	13.5
38	12 54.5	12 56.7	12 19.2	38	3.3	98	8.4	158	13.6
39	12 54.8	12 56.9	12 19.5	39	3.3	99	8.5	159	13.6
40	12 55.0	12 57.2	12 19.7	40	3.4	100	8.6	160	13.7
41	12 55.3	12 57.4	12 19.9	41	3.5	101	8.7	161	13.8
42	12 55.5	12 57.7	12 20.2	42	3.6	102	8.8	162	13.9
43	12 55.8	12 57.9	12 20.4	43	3.7	103	8.8	163	14.0
44	12 56.0	12 58.2	12 20.6	44	3.8	104	8.9	164	14.1
45	12 56.3	12 58.4	12 20.9	45	3.9	105	9.0	165	14.2
46	12 56.5	12 58.7	12 21.1	46	3.9	106	9.1	166	14.2
47	12 56.8	12 58.9	12 21.4	47	4.0	107	9.2	167	14.3
48	12 57.0	12 59.2	12 21.6	48	4.1	108	9.3	168	14.4
49	12 57.3	12 59.4	12 21.8	49	4.2	109	9.4	169	14.5
50	12 57.5	12 59.7	12 22.1	50	4.3	110	9.4	170	14.6
51	12 57.8	12 59.9	12 22.3	51	4.4	111	9.5	171	14.7
52	12 58.0	13 .2	12 22.6	52	4.5	112	9.6	172	14.8
53	12 58.3	13 .4	12 22.8	53	4.5	113	9.7	173	14.8
54	12 58.5	13 .7	12 23.0	54	4.6	114	9.8	174	14.9
55	12 58.8	13 .9	12 23.3	55	4.7	115	9.9	175	15.0
56	12 59.0	13 1.2	12 23.5	56	4.8	116	10.0	176	15.1
57	12 59.3	13 1.4	12 23.8	57	4.9	117	10.0	177	15.2
58	12 59.5	13 1.7	12 24.0	58	5.0	118	10.1	178	15.3
59	12 59.8	13 1.9	12 24.2	59	5.1	119	10.2	179	15.4
60	13 .0	13 2.2	12 24.5	60	5.2	120	10.3	180	15.5

0 h 52 min

POPRAVKA ČASOVNOG UGLA				POPRAVKA DRUGOG REDA za časovni ugao i deklinaciju Sunca, Mjeseca i planeta					
s	SUNCA I PLANETA	PROLJEĆNE TAČKE ♈	MJESECA ☾	Δ	popr.	Δ	popr.	Δ	popr.
	° ′	° ′	° ′		′		′		′
0	13 .0	13 2.2	12 24.5	0	.0	60	5.3	120	10.5
1	13 .3	13 2.4	12 24.7	1	.1	61	5.3	121	10.6
2	13 .5	13 2.7	12 24.9	2	.2	62	5.4	122	10.7
3	13 .8	13 2.9	12 25.2	3	.3	63	5.5	123	10.8
4	13 1.0	13 3.2	12 25.4	4	.4	64	5.6	124	10.9
5	13 1.3	13 3.4	12 25.7	5	.4	65	5.7	125	10.9
6	13 1.5	13 3.7	12 25.9	6	.5	66	5.8	126	11.0
7	13 1.8	13 3.9	12 26.1	7	.6	67	5.9	127	11.1
8	13 2.0	13 4.2	12 26.4	8	.7	68	6.0	128	11.2
9	13 2.3	13 4.4	12 26.6	9	.8	69	6.0	129	11.3
10	13 2.5	13 4.7	12 26.9	10	.9	70	6.1	130	11.4
11	13 2.8	13 4.9	12 27.1	11	1.0	71	6.2	131	11.5
12	13 3.0	13 5.2	12 27.3	12	1.1	72	6.3	132	11.6
13	13 3.3	13 5.4	12 27.6	13	1.1	73	6.4	133	11.6
14	13 3.5	13 5.7	12 27.8	14	1.2	74	6.5	134	11.7
15	13 3.8	13 5.9	12 28.0	15	1.3	75	6.6	135	11.8
16	13 4.0	13 6.2	12 28.3	16	1.4	76	6.7	136	11.9
17	13 4.3	13 6.4	12 28.5	17	1.5	77	6.7	137	12.0
18	13 4.5	13 6.7	12 28.8	18	1.6	78	6.8	138	12.1
19	13 4.8	13 6.9	12 29.0	19	1.7	79	6.9	139	12.2
20	13 5.0	13 7.2	12 29.2	20	1.8	80	7.0	140	12.3
21	13 5.3	13 7.4	12 29.5	21	1.8	81	7.1	141	12.3
22	13 5.5	13 7.7	12 29.7	22	1.9	82	7.2	142	12.4
23	13 5.8	13 7.9	12 30.0	23	2.0	83	7.3	143	12.5
24	13 6.0	13 8.2	12 30.2	24	2.1	84	7.4	144	12.6
25	13 6.3	13 8.4	12 30.4	25	2.2	85	7.4	145	12.7
26	13 6.5	13 8.7	12 30.7	26	2.3	86	7.5	146	12.8
27	13 6.8	13 8.9	12 30.9	27	2.4	87	7.6	147	12.9
28	13 7.0	13 9.2	12 31.1	28	2.5	88	7.7	148	13.0
29	13 7.3	13 9.4	12 31.4	29	2.5	89	7.8	149	13.0
30	13 7.5	13 9.7	12 31.6	30	2.6	90	7.9	150	13.1
31	13 7.8	13 9.9	12 31.9	31	2.7	91	8.0	151	13.2
32	13 8.0	13 10.2	12 32.1	32	2.8	92	8.1	152	13.3
33	13 8.3	13 10.4	12 32.3	33	2.9	93	8.1	153	13.4
34	13 8.5	13 10.7	12 32.6	34	3.0	94	8.2	154	13.5
35	13 8.8	13 10.9	12 32.8	35	3.1	95	8.3	155	13.6
36	13 9.0	13 11.2	12 33.1	36	3.2	96	8.4	156	13.7
37	13 9.3	13 11.4	12 33.3	37	3.2	97	8.5	157	13.7
38	13 9.5	13 11.7	12 33.5	38	3.3	98	8.6	158	13.8
39	13 9.8	13 11.9	12 33.8	39	3.4	99	8.7	159	13.9
40	13 10.0	13 12.2	12 34.0	40	3.5	100	8.8	160	14.0
41	13 10.3	13 12.4	12 34.2	41	3.6	101	8.8	161	14.1
42	13 10.5	13 12.7	12 34.5	42	3.7	102	8.9	162	14.2
43	13 10.8	13 12.9	12 34.7	43	3.8	103	9.0	163	14.3
44	13 11.0	13 13.2	12 35.0	44	3.9	104	9.1	164	14.4
45	13 11.3	13 13.4	12 35.2	45	3.9	105	9.2	165	14.4
46	13 11.5	13 13.7	12 35.4	46	4.0	106	9.3	166	14.5
47	13 11.8	13 13.9	12 35.7	47	4.1	107	9.4	167	14.6
48	13 12.0	13 14.2	12 35.9	48	4.2	108	9.5	168	14.7
49	13 12.3	13 14.5	12 36.2	49	4.3	109	9.5	169	14.8
50	13 12.5	13 14.7	12 36.4	50	4.4	110	9.6	170	14.9
51	13 12.8	13 15.0	12 36.6	51	4.5	111	9.7	171	15.0
52	13 13.0	13 15.2	12 36.9	52	4.6	112	9.8	172	15.1
53	13 13.3	13 15.5	12 37.1	53	4.6	113	9.9	173	15.1
54	13 13.5	13 15.7	12 37.4	54	4.7	114	10.0	174	15.2
55	13 13.8	13 16.0	12 37.6	55	4.8	115	10.1	175	15.3
56	13 14.0	13 16.2	12 37.8	56	4.9	116	10.2	176	15.4
57	13 14.3	13 16.5	12 38.1	57	5.0	117	10.2	177	15.5
58	13 14.5	13 16.7	12 38.3	58	5.1	118	10.3	178	15.6
59	13 14.8	13 17.0	12 38.5	59	5.2	119	10.4	179	15.7
60	13 15.0	13 17.2	12 38.8	60	5.3	120	10.5	180	15.8

0 h 53 min

POPRAVKA ČASOVNOG UGLA				POPRAVKA DRUGOG REDA za časovni ugao i deklinaciju Sunca, Mjeseca i planeta					
s	SUNCA I PLANETA	PROLJEĆNE TAČKE ♈	MJESECA ☾	Δ	popr.	Δ	popr.	Δ	popr.
	° ′	° ′	° ′		′		′		′
0	13 15.0	13 17.2	12 38.8	0	.0	60	5.4	120	10.7
1	13 15.3	13 17.5	12 39.0	1	.1	61	5.4	121	10.8
2	13 15.5	13 17.7	12 39.3	2	.2	62	5.5	122	10.9
3	13 15.8	13 18.0	12 39.5	3	.3	63	5.6	123	11.0
4	13 16.0	13 18.2	12 39.7	4	.4	64	5.7	124	11.1
5	13 16.3	13 18.5	12 40.0	5	.4	65	5.8	125	11.1
6	13 16.5	13 18.7	12 40.2	6	.5	66	5.9	126	11.2
7	13 16.8	13 19.0	12 40.5	7	.6	67	6.0	127	11.3
8	13 17.0	13 19.2	12 40.7	8	.7	68	6.1	128	11.4
9	13 17.3	13 19.5	12 40.9	9	.8	69	6.2	129	11.5
10	13 17.5	13 19.7	12 41.2	10	.9	70	6.2	130	11.6
11	13 17.8	13 20.0	12 41.4	11	1.0	71	6.3	131	11.7
12	13 18.0	13 20.2	12 41.6	12	1.1	72	6.4	132	11.8
13	13 18.3	13 20.5	12 41.9	13	1.2	73	6.5	133	11.9
14	13 18.5	13 20.7	12 42.1	14	1.2	74	6.6	134	11.9
15	13 18.8	13 21.0	12 42.4	15	1.3	75	6.7	135	12.0
16	13 19.0	13 21.2	12 42.6	16	1.4	76	6.8	136	12.1
17	13 19.3	13 21.5	12 42.8	17	1.5	77	6.9	137	12.2
18	13 19.5	13 21.7	12 43.1	18	1.6	78	7.0	138	12.3
19	13 19.8	13 22.0	12 43.3	19	1.7	79	7.0	139	12.4
20	13 20.0	13 22.2	12 43.6	20	1.8	80	7.1	140	12.5
21	13 20.3	13 22.5	12 43.8	21	1.9	81	7.2	141	12.6
22	13 20.5	13 22.7	12 44.0	22	2.0	82	7.3	142	12.7
23	13 20.8	13 23.0	12 44.3	23	2.1	83	7.4	143	12.8
24	13 21.0	13 23.2	12 44.5	24	2.1	84	7.5	144	12.8
25	13 21.3	13 23.5	12 44.7	25	2.2	85	7.6	145	12.9
26	13 21.5	13 23.7	12 45.0	26	2.3	86	7.7	146	13.0
27	13 21.8	13 24.0	12 45.2	27	2.4	87	7.8	147	13.1
28	13 22.0	13 24.2	12 45.5	28	2.5	88	7.8	148	13.2
29	13 22.3	13 24.5	12 45.7	29	2.6	89	7.9	149	13.3
30	13 22.5	13 24.7	12 45.9	30	2.7	90	8.0	150	13.4
31	13 22.8	13 25.0	12 46.2	31	2.8	91	8.1	151	13.5
32	13 23.0	13 25.2	12 46.4	32	2.9	92	8.2	152	13.6
33	13 23.3	13 25.5	12 46.7	33	2.9	93	8.3	153	13.6
34	13 23.5	13 25.7	12 46.9	34	3.0	94	8.4	154	13.7
35	13 23.8	13 26.0	12 47.1	35	3.1	95	8.5	155	13.8
36	13 24.0	13 26.2	12 47.4	36	3.2	96	8.6	156	13.9
37	13 24.3	13 26.5	12 47.6	37	3.3	97	8.6	157	14.0
38	13 24.5	13 26.7	12 47.9	38	3.4	98	8.7	158	14.1
39	13 24.8	13 27.0	12 48.1	39	3.5	99	8.8	159	14.2
40	13 25.0	13 27.2	12 48.3	40	3.6	100	8.9	160	14.3
41	13 25.3	13 27.5	12 48.6	41	3.7	101	9.0	161	14.4
42	13 25.5	13 27.7	12 48.8	42	3.7	102	9.1	162	14.4
43	13 25.8	13 28.0	12 49.0	43	3.8	103	9.2	163	14.5
44	13 26.0	13 28.2	12 49.3	44	3.9	104	9.3	164	14.6
45	13 26.3	13 28.5	12 49.5	45	4.0	105	9.4	165	14.7
46	13 26.5	13 28.7	12 49.8	46	4.1	106	9.5	166	14.8
47	13 26.8	13 29.0	12 50.0	47	4.2	107	9.5	167	14.9
48	13 27.0	13 29.2	12 50.2	48	4.3	108	9.6	168	15.0
49	13 27.3	13 29.5	12 50.5	49	4.4	109	9.7	169	15.1
50	13 27.5	13 29.7	12 50.7	50	4.5	110	9.8	170	15.2
51	13 27.8	13 30.0	12 51.0	51	4.5	111	9.9	171	15.2
52	13 28.0	13 30.2	12 51.2	52	4.6	112	10.0	172	15.3
53	13 28.3	13 30.5	12 51.4	53	4.7	113	10.1	173	15.4
54	13 28.5	13 30.7	12 51.7	54	4.8	114	10.2	174	15.5
55	13 28.8	13 31.0	12 51.9	55	4.9	115	10.3	175	15.6
56	13 29.0	13 31.2	12 52.1	56	5.0	116	10.3	176	15.7
57	13 29.3	13 31.5	12 52.4	57	5.1	117	10.4	177	15.8
58	13 29.5	13 31.7	12 52.6	58	5.2	118	10.5	178	15.9
59	13 29.8	13 32.0	12 52.9	59	5.3	119	10.6	179	16.0
60	13 30.0	13 32.3	12 53.1	60	5.4	120	10.7	180	16.1

0 h 54 min

POPRAVKA ČASOVNOG UGLA				POPRAVKA DRUGOG REDA za časovni ugao i deklinaciju Sunca, Mjeseca i planeta					
s	SUNCA I PLANETA	PROLJEĆNE TAČKE ♈	MJESECA ☾	Δ	popr.	Δ	popr.	Δ	popr.
	° ′	° ′	° ′		′		′		′
0	13 30.0	13 32.3	12 53.1	0	.0	60	5.5	120	10.9
1	13 30.3	13 32.5	12 53.3	1	.1	61	5.5	121	11.0
2	13 30.5	13 32.8	12 53.6	2	.2	62	5.6	122	11.1
3	13 30.8	13 33.0	12 53.8	3	.3	63	5.7	123	11.2
4	13 31.0	13 33.3	12 54.1	4	.4	64	5.8	124	11.3
5	13 31.3	13 33.5	12 54.3	5	.5	65	5.9	125	11.4
6	13 31.5	13 33.8	12 54.5	6	.5	66	6.0	126	11.4
7	13 31.8	13 34.0	12 54.8	7	.6	67	6.1	127	11.5
8	13 32.0	13 34.3	12 55.0	8	.7	68	6.2	128	11.6
9	13 32.3	13 34.5	12 55.2	9	.8	69	6.3	129	11.7
10	13 32.5	13 34.8	12 55.5	10	.9	70	6.4	130	11.8
11	13 32.8	13 35.0	12 55.7	11	1.0	71	6.4	131	11.9
12	13 33.0	13 35.3	12 56.0	12	1.1	72	6.5	132	12.0
13	13 33.3	13 35.5	12 56.2	13	1.2	73	6.6	133	12.1
14	13 33.5	13 35.8	12 56.4	14	1.3	74	6.7	134	12.2
15	13 33.8	13 36.0	12 56.7	15	1.4	75	6.8	135	12.3
16	13 34.0	13 36.3	12 56.9	16	1.5	76	6.9	136	12.4
17	13 34.3	13 36.5	12 57.2	17	1.5	77	7.0	137	12.4
18	13 34.5	13 36.8	12 57.4	18	1.6	78	7.1	138	12.5
19	13 34.8	13 37.0	12 57.6	19	1.7	79	7.2	139	12.6
20	13 35.0	13 37.3	12 57.9	20	1.8	80	7.3	140	12.7
21	13 35.3	13 37.5	12 58.1	21	1.9	81	7.4	141	12.8
22	13 35.5	13 37.8	12 58.3	22	2.0	82	7.4	142	12.9
23	13 35.8	13 38.0	12 58.6	23	2.1	83	7.5	143	13.0
24	13 36.0	13 38.3	12 58.8	24	2.2	84	7.6	144	13.1
25	13 36.3	13 38.5	12 59.1	25	2.3	85	7.7	145	13.2
26	13 36.5	13 38.8	12 59.3	26	2.4	86	7.8	146	13.3
27	13 36.8	13 39.0	12 59.5	27	2.5	87	7.9	147	13.4
28	13 37.0	13 39.3	12 59.8	28	2.5	88	8.0	148	13.4
29	13 37.3	13 39.5	13 .0	29	2.6	89	8.1	149	13.5
30	13 37.5	13 39.8	13 .3	30	2.7	90	8.2	150	13.6
31	13 37.8	13 40.0	13 .5	31	2.8	91	8.3	151	13.7
32	13 38.0	13 40.3	13 .7	32	2.9	92	8.4	152	13.8
33	13 38.3	13 40.5	13 1.0	33	3.0	93	8.4	153	13.9
34	13 38.5	13 40.8	13 1.2	34	3.1	94	8.5	154	14.0
35	13 38.8	13 41.0	13 1.5	35	3.2	95	8.6	155	14.1
36	13 39.0	13 41.3	13 1.7	36	3.3	96	8.7	156	14.2
37	13 39.3	13 41.5	13 1.9	37	3.4	97	8.8	157	14.3
38	13 39.5	13 41.8	13 2.2	38	3.5	98	8.9	158	14.4
39	13 39.8	13 42.0	13 2.4	39	3.5	99	9.0	159	14.4
40	13 40.0	13 42.3	13 2.6	40	3.6	100	9.1	160	14.5
41	13 40.3	13 42.5	13 2.9	41	3.7	101	9.2	161	14.6
42	13 40.5	13 42.8	13 3.1	42	3.8	102	9.3	162	14.7
43	13 40.8	13 43.0	13 3.4	43	3.9	103	9.4	163	14.8
44	13 41.0	13 43.3	13 3.6	44	4.0	104	9.4	164	14.9
45	13 41.3	13 43.5	13 3.8	45	4.1	105	9.5	165	15.0
46	13 41.5	13 43.8	13 4.1	46	4.2	106	9.6	166	15.1
47	13 41.8	13 44.0	13 4.3	47	4.3	107	9.7	167	15.2
48	13 42.0	13 44.3	13 4.6	48	4.4	108	9.8	168	15.3
49	13 42.3	13 44.5	13 4.8	49	4.5	109	9.9	169	15.4
50	13 42.5	13 44.8	13 5.0	50	4.5	110	10.0	170	15.4
51	13 42.8	13 45.0	13 5.3	51	4.6	111	10.1	171	15.5
52	13 43.0	13 45.3	13 5.5	52	4.7	112	10.2	172	15.6
53	13 43.3	13 45.5	13 5.7	53	4.8	113	10.3	173	15.7
54	13 43.5	13 45.8	13 6.0	54	4.9	114	10.4	174	15.8
55	13 43.8	13 46.0	13 6.2	55	5.0	115	10.4	175	15.9
56	13 44.0	13 46.3	13 6.5	56	5.1	116	10.5	176	16.0
57	13 44.3	13 46.5	13 6.7	57	5.2	117	10.6	177	16.1
58	13 44.5	13 46.8	13 6.9	58	5.3	118	10.7	178	16.2
59	13 44.8	13 47.0	13 7.2	59	5.4	119	10.8	179	16.3
60	13 45.0	13 47.3	13 7.4	60	5.5	120	10.9	180	16.4

0 h 55 min

POPRAVKA ČASOVNOG UGLA				POPRAVKA DRUGOG REDA za časovni ugao i deklinaciju Sunca, Mjeseca i planeta					
s	SUNCA I PLANETA	PROLJEĆNE TAČKE ♈	MJESECA ☾	Δ	popr.	Δ	popr.	Δ	popr.
	° ′	° ′	° ′		′		′		′
0	13 45.0	13 47.3	13 7.4	0	.0	60	5.6	120	11.1
1	13 45.3	13 47.5	13 7.7	1	.1	61	5.6	121	11.2
2	13 45.5	13 47.8	13 7.9	2	.2	62	5.7	122	11.3
3	13 45.8	13 48.0	13 8.1	3	.3	63	5.8	123	11.4
4	13 46.0	13 48.3	13 8.4	4	.4	64	5.9	124	11.5
5	13 46.3	13 48.5	13 8.6	5	.5	65	6.0	125	11.6
6	13 46.5	13 48.8	13 8.8	6	.6	66	6.1	126	11.7
7	13 46.8	13 49.0	13 9.1	7	.6	67	6.2	127	11.7
8	13 47.0	13 49.3	13 9.3	8	.7	68	6.3	128	11.8
9	13 47.3	13 49.5	13 9.6	9	.8	69	6.4	129	11.9
10	13 47.5	13 49.8	13 9.8	10	.9	70	6.5	130	12.0
11	13 47.8	13 50.0	13 10.0	11	1.0	71	6.6	131	12.1
12	13 48.0	13 50.3	13 10.3	12	1.1	72	6.7	132	12.2
13	13 48.3	13 50.6	13 10.5	13	1.2	73	6.8	133	12.3
14	13 48.5	13 50.8	13 10.8	14	1.3	74	6.8	134	12.4
15	13 48.8	13 51.1	13 11.0	15	1.4	75	6.9	135	12.5
16	13 49.0	13 51.3	13 11.2	16	1.5	76	7.0	136	12.6
17	13 49.3	13 51.6	13 11.5	17	1.6	77	7.1	137	12.7
18	13 49.5	13 51.8	13 11.7	18	1.7	78	7.2	138	12.8
19	13 49.8	13 52.1	13 12.0	19	1.8	79	7.3	139	12.9
20	13 50.0	13 52.3	13 12.2	20	1.9	80	7.4	140	13.0
21	13 50.3	13 52.6	13 12.4	21	1.9	81	7.5	141	13.0
22	13 50.5	13 52.8	13 12.7	22	2.0	82	7.6	142	13.1
23	13 50.8	13 53.1	13 12.9	23	2.1	83	7.7	143	13.2
24	13 51.0	13 53.3	13 13.1	24	2.2	84	7.8	144	13.3
25	13 51.3	13 53.6	13 13.4	25	2.3	85	7.9	145	13.4
26	13 51.5	13 53.8	13 13.6	26	2.4	86	8.0	146	13.5
27	13 51.8	13 54.1	13 13.9	27	2.5	87	8.0	147	13.6
28	13 52.0	13 54.3	13 14.1	28	2.6	88	8.1	148	13.7
29	13 52.3	13 54.6	13 14.3	29	2.7	89	8.2	149	13.8
30	13 52.5	13 54.8	13 14.6	30	2.8	90	8.3	150	13.9
31	13 52.8	13 55.1	13 14.8	31	2.9	91	8.4	151	14.0
32	13 53.0	13 55.3	13 15.1	32	3.0	92	8.5	152	14.1
33	13 53.3	13 55.6	13 15.3	33	3.1	93	8.6	153	14.2
34	13 53.5	13 55.8	13 15.5	34	3.1	94	8.7	154	14.2
35	13 53.8	13 56.1	13 15.8	35	3.2	95	8.8	155	14.3
36	13 54.0	13 56.3	13 16.0	36	3.3	96	8.9	156	14.4
37	13 54.3	13 56.6	13 16.2	37	3.4	97	9.0	157	14.5
38	13 54.5	13 56.8	13 16.5	38	3.5	98	9.1	158	14.6
39	13 54.8	13 57.1	13 16.7	39	3.6	99	9.2	159	14.7
40	13 55.0	13 57.3	13 17.0	40	3.7	100	9.3	160	14.8
41	13 55.3	13 57.6	13 17.2	41	3.8	101	9.3	161	14.9
42	13 55.5	13 57.8	13 17.4	42	3.9	102	9.4	162	15.0
43	13 55.8	13 58.1	13 17.7	43	4.0	103	9.5	163	15.1
44	13 56.0	13 58.3	13 17.9	44	4.1	104	9.6	164	15.2
45	13 56.3	13 58.6	13 18.2	45	4.2	105	9.7	165	15.3
46	13 56.5	13 58.8	13 18.4	46	4.3	106	9.8	166	15.4
47	13 56.8	13 59.1	13 18.6	47	4.3	107	9.9	167	15.4
48	13 57.0	13 59.3	13 18.9	48	4.4	108	10.0	168	15.5
49	13 57.3	13 59.6	13 19.1	49	4.5	109	10.1	169	15.6
50	13 57.5	13 59.8	13 19.3	50	4.6	110	10.2	170	15.7
51	13 57.8	14 .1	13 19.6	51	4.7	111	10.3	171	15.8
52	13 58.0	14 .3	13 19.8	52	4.8	112	10.4	172	15.9
53	13 58.3	14 .6	13 20.1	53	4.9	113	10.5	173	16.0
54	13 58.5	14 .8	13 20.3	54	5.0	114	10.5	174	16.1
55	13 58.8	14 1.1	13 20.5	55	5.1	115	10.6	175	16.2
56	13 59.0	14 1.3	13 20.8	56	5.2	116	10.7	176	16.3
57	13 59.3	14 1.6	13 21.0	57	5.3	117	10.8	177	16.4
58	13 59.5	14 1.8	13 21.3	58	5.4	118	10.9	178	16.5
59	13 59.8	14 2.1	13 21.5	59	5.5	119	11.0	179	16.6
60	14 .0	14 2.3	13 21.7	60	5.6	120	11.1	180	16.7

0 h 56 min

POPRAVKA ČASOVNOG UGLA				POPRAVKA DRUGOG REDA za časovni ugao i deklinaciju Sunca, Mjeseca i planeta					
s	SUNCA I PLANETA	PROLJEĆNE TAČKE ♈	MJESECA ☾	Δ	popr.	Δ	popr.	Δ	popr.
	° ′	° ′	° ′		′		′		′
0	14 .0	14 2.3	13 21.7	0	.0	60	5.7	120	11.3
1	14 .3	14 2.6	13 22.0	1	.1	61	5.7	121	11.4
2	14 .5	14 2.8	13 22.2	2	.2	62	5.8	122	11.5
3	14 .8	14 3.1	13 22.4	3	.3	63	5.9	123	11.6
4	14 1.0	14 3.3	13 22.7	4	.4	64	6.0	124	11.7
5	14 1.3	14 3.6	13 22.9	5	.5	65	6.1	125	11.8
6	14 1.5	14 3.8	13 23.2	6	.6	66	6.2	126	11.9
7	14 1.8	14 4.1	13 23.4	7	.7	67	6.3	127	12.0
8	14 2.0	14 4.3	13 23.6	8	.8	68	6.4	128	12.1
9	14 2.3	14 4.6	13 23.9	9	.8	69	6.5	129	12.1
10	14 2.5	14 4.8	13 24.1	10	.9	70	6.6	130	12.2
11	14 2.8	14 5.1	13 24.4	11	1.0	71	6.7	131	12.3
12	14 3.0	14 5.3	13 24.6	12	1.1	72	6.8	132	12.4
13	14 3.3	14 5.6	13 24.8	13	1.2	73	6.9	133	12.5
14	14 3.5	14 5.8	13 25.1	14	1.3	74	7.0	134	12.6
15	14 3.8	14 6.1	13 25.3	15	1.4	75	7.1	135	12.7
16	14 4.0	14 6.3	13 25.6	16	1.5	76	7.2	136	12.8
17	14 4.3	14 6.6	13 25.8	17	1.6	77	7.3	137	12.9
18	14 4.5	14 6.8	13 26.0	18	1.7	78	7.3	138	13.0
19	14 4.8	14 7.1	13 26.3	19	1.8	79	7.4	139	13.1
20	14 5.0	14 7.3	13 26.5	20	1.9	80	7.5	140	13.2
21	14 5.3	14 7.6	13 26.7	21	2.0	81	7.6	141	13.3
22	14 5.5	14 7.8	13 27.0	22	2.1	82	7.7	142	13.4
23	14 5.8	14 8.1	13 27.2	23	2.2	83	7.8	143	13.5
24	14 6.0	14 8.4	13 27.5	24	2.3	84	7.9	144	13.6
25	14 6.3	14 8.6	13 27.7	25	2.4	85	8.0	145	13.7
26	14 6.5	14 8.9	13 27.9	26	2.4	86	8.1	146	13.7
27	14 6.8	14 9.1	13 28.2	27	2.5	87	8.2	147	13.8
28	14 7.0	14 9.4	13 28.4	28	2.6	88	8.3	148	13.9
29	14 7.3	14 9.6	13 28.7	29	2.7	89	8.4	149	14.0
30	14 7.5	14 9.9	13 28.9	30	2.8	90	8.5	150	14.1
31	14 7.8	14 10.1	13 29.1	31	2.9	91	8.6	151	14.2
32	14 8.0	14 10.4	13 29.4	32	3.0	92	8.7	152	14.3
33	14 8.3	14 10.6	13 29.6	33	3.1	93	8.8	153	14.4
34	14 8.5	14 10.9	13 29.8	34	3.2	94	8.9	154	14.5
35	14 8.8	14 11.1	13 30.1	35	3.3	95	8.9	155	14.6
36	14 9.0	14 11.4	13 30.3	36	3.4	96	9.0	156	14.7
37	14 9.3	14 11.6	13 30.6	37	3.5	97	9.1	157	14.8
38	14 9.5	14 11.9	13 30.8	38	3.6	98	9.2	158	14.9
39	14 9.8	14 12.1	13 31.0	39	3.7	99	9.3	159	15.0
40	14 10.0	14 12.4	13 31.3	40	3.8	100	9.4	160	15.1
41	14 10.3	14 12.6	13 31.5	41	3.9	101	9.5	161	15.2
42	14 10.5	14 12.9	13 31.8	42	4.0	102	9.6	162	15.3
43	14 10.8	14 13.1	13 32.0	43	4.0	103	9.7	163	15.3
44	14 11.0	14 13.4	13 32.2	44	4.1	104	9.8	164	15.4
45	14 11.3	14 13.6	13 32.5	45	4.2	105	9.9	165	15.5
46	14 11.5	14 13.9	13 32.7	46	4.3	106	10.0	166	15.6
47	14 11.8	14 14.1	13 32.9	47	4.4	107	10.1	167	15.7
48	14 12.0	14 14.4	13 33.2	48	4.5	108	10.2	168	15.8
49	14 12.3	14 14.6	13 33.4	49	4.6	109	10.3	169	15.9
50	14 12.5	14 14.9	13 33.7	50	4.7	110	10.4	170	16.0
51	14 12.8	14 15.1	13 33.9	51	4.8	111	10.5	171	16.1
52	14 13.0	14 15.4	13 34.1	52	4.9	112	10.5	172	16.2
53	14 13.3	14 15.6	13 34.4	53	5.0	113	10.6	173	16.3
54	14 13.5	14 15.9	13 34.6	54	5.1	114	10.7	174	16.4
55	14 13.8	14 16.1	13 34.9	55	5.2	115	10.8	175	16.5
56	14 14.0	14 16.4	13 35.1	56	5.3	116	10.9	176	16.6
57	14 14.3	14 16.6	13 35.3	57	5.4	117	11.0	177	16.7
58	14 14.5	14 16.9	13 35.6	58	5.5	118	11.1	178	16.8
59	14 14.8	14 17.1	13 35.8	59	5.6	119	11.2	179	16.9
60	14 15.0	14 17.4	13 36.1	60	5.7	120	11.3	180	17.0

0 h 57 min

POPRAVKA ČASOVNOG UGLA				POPRAVKA DRUGOG REDA za časovni ugao i deklinaciju Sunca, Mjeseca i planeta					
s	SUNCA I PLANETA	PROLJEĆNE TAČKE ♈	MJESECA ☾	Δ	popr.	Δ	popr.	Δ	popr.
	° ′	° ′	° ′		′		′		′
0	14 15.0	14 17.4	13 36.1	0	.0	60	5.8	120	11.5
1	14 15.3	14 17.6	13 36.3	1	.1	61	5.8	121	11.6
2	14 15.5	14 17.9	13 36.5	2	.2	62	5.9	122	11.7
3	14 15.8	14 18.1	13 36.8	3	.3	63	6.0	123	11.8
4	14 16.0	14 18.4	13 37.0	4	.4	64	6.1	124	11.9
5	14 16.3	14 18.6	13 37.2	5	.5	65	6.2	125	12.0
6	14 16.5	14 18.9	13 37.5	6	.6	66	6.3	126	12.1
7	14 16.8	14 19.1	13 37.7	7	.7	67	6.4	127	12.2
8	14 17.0	14 19.4	13 38.0	8	.8	68	6.5	128	12.3
9	14 17.3	14 19.6	13 38.2	9	.9	69	6.6	129	12.4
10	14 17.5	14 19.9	13 38.4	10	1.0	70	6.7	130	12.5
11	14 17.8	14 20.1	13 38.7	11	1.1	71	6.8	131	12.6
12	14 18.0	14 20.4	13 38.9	12	1.2	72	6.9	132	12.7
13	14 18.3	14 20.6	13 39.2	13	1.2	73	7.0	133	12.7
14	14 18.5	14 20.9	13 39.4	14	1.3	74	7.1	134	12.8
15	14 18.8	14 21.1	13 39.6	15	1.4	75	7.2	135	12.9
16	14 19.0	14 21.4	13 39.9	16	1.5	76	7.3	136	13.0
17	14 19.3	14 21.6	13 40.1	17	1.6	77	7.4	137	13.1
18	14 19.5	14 21.9	13 40.3	18	1.7	78	7.5	138	13.2
19	14 19.8	14 22.1	13 40.6	19	1.8	79	7.6	139	13.3
20	14 20.0	14 22.4	13 40.8	20	1.9	80	7.7	140	13.4
21	14 20.3	14 22.6	13 41.1	21	2.0	81	7.8	141	13.5
22	14 20.5	14 22.9	13 41.3	22	2.1	82	7.9	142	13.6
23	14 20.8	14 23.1	13 41.5	23	2.2	83	8.0	143	13.7
24	14 21.0	14 23.4	13 41.8	24	2.3	84	8.1	144	13.8
25	14 21.3	14 23.6	13 42.0	25	2.4	85	8.1	145	13.9
26	14 21.5	14 23.9	13 42.3	26	2.5	86	8.2	146	14.0
27	14 21.8	14 24.1	13 42.5	27	2.6	87	8.3	147	14.1
28	14 22.0	14 24.4	13 42.7	28	2.7	88	8.4	148	14.2
29	14 22.3	14 24.6	13 43.0	29	2.8	89	8.5	149	14.3
30	14 22.5	14 24.9	13 43.2	30	2.9	90	8.6	150	14.4
31	14 22.8	14 25.1	13 43.4	31	3.0	91	8.7	151	14.5
32	14 23.0	14 25.4	13 43.7	32	3.1	92	8.8	152	14.6
33	14 23.3	14 25.6	13 43.9	33	3.2	93	8.9	153	14.7
34	14 23.5	14 25.9	13 44.2	34	3.3	94	9.0	154	14.8
35	14 23.8	14 26.1	13 44.4	35	3.4	95	9.1	155	14.9
36	14 24.0	14 26.4	13 44.6	36	3.5	96	9.2	156	15.0
37	14 24.3	14 26.7	13 44.9	37	3.5	97	9.3	157	15.0
38	14 24.5	14 26.9	13 45.1	38	3.6	98	9.4	158	15.1
39	14 24.8	14 27.2	13 45.4	39	3.7	99	9.5	159	15.2
40	14 25.0	14 27.4	13 45.6	40	3.8	100	9.6	160	15.3
41	14 25.3	14 27.7	13 45.8	41	3.9	101	9.7	161	15.4
42	14 25.5	14 27.9	13 46.1	42	4.0	102	9.8	162	15.5
43	14 25.8	14 28.2	13 46.3	43	4.1	103	9.9	163	15.6
44	14 26.0	14 28.4	13 46.5	44	4.2	104	10.0	164	15.7
45	14 26.3	14 28.7	13 46.8	45	4.3	105	10.1	165	15.8
46	14 26.5	14 28.9	13 47.0	46	4.4	106	10.2	166	15.9
47	14 26.8	14 29.2	13 47.3	47	4.5	107	10.3	167	16.0
48	14 27.0	14 29.4	13 47.5	48	4.6	108	10.4	168	16.1
49	14 27.3	14 29.7	13 47.7	49	4.7	109	10.4	169	16.2
50	14 27.5	14 29.9	13 48.0	50	4.8	110	10.5	170	16.3
51	14 27.8	14 30.2	13 48.2	51	4.9	111	10.6	171	16.4
52	14 28.0	14 30.4	13 48.5	52	5.0	112	10.7	172	16.5
53	14 28.3	14 30.7	13 48.7	53	5.1	113	10.8	173	16.6
54	14 28.5	14 30.9	13 48.9	54	5.2	114	10.9	174	16.7
55	14 28.8	14 31.2	13 49.2	55	5.3	115	11.0	175	16.8
56	14 29.0	14 31.4	13 49.4	56	5.4	116	11.1	176	16.9
57	14 29.3	14 31.7	13 49.7	57	5.5	117	11.2	177	17.0
58	14 29.5	14 31.9	13 49.9	58	5.6	118	11.3	178	17.1
59	14 29.8	14 32.2	13 50.1	59	5.7	119	11.4	179	17.2
60	14 30.0	14 32.4	13 50.4	60	5.8	120	11.5	180	17.3

0 h 58 min

s	POPRAVKA ČASOVNOG UGLA: SUNCA I PLANETA	PROLJEĆNE TAČKE ♈	MJESECA ☾	POPRAVKA DRUGOG REDA za časovni ugao i deklinaciju Sunca, Mjeseca i planeta: Δ	poprav.	Δ	poprav.	Δ	poprav.
	° ′	° ′	° ′		′		′		′
0	14 30.0	14 32.4	13 50.4	0	.0	60	5.9	120	11.7
1	14 30.3	14 32.7	13 50.6	1	.1	61	5.9	121	11.8
2	14 30.5	14 32.9	13 50.8	2	.2	62	6.0	122	11.9
3	14 30.8	14 33.2	13 51.1	3	.3	63	6.1	123	12.0
4	14 31.0	14 33.4	13 51.3	4	.4	64	6.2	124	12.1
5	14 31.3	14 33.7	13 51.6	5	.5	65	6.3	125	12.2
6	14 31.5	14 33.9	13 51.8	6	.6	66	6.4	126	12.3
7	14 31.8	14 34.2	13 52.0	7	.7	67	6.5	127	12.4
8	14 32.0	14 34.4	13 52.3	8	.8	68	6.6	128	12.5
9	14 32.3	14 34.7	13 52.5	9	.9	69	6.7	129	12.6
10	14 32.5	14 34.9	13 52.8	10	1.0	70	6.8	130	12.7
11	14 32.8	14 35.2	13 53.0	11	1.1	71	6.9	131	12.8
12	14 33.0	14 35.4	13 53.2	12	1.2	72	7.0	132	12.9
13	14 33.3	14 35.7	13 53.5	13	1.3	73	7.1	133	13.0
14	14 33.5	14 35.9	13 53.7	14	1.4	74	7.2	134	13.1
15	14 33.8	14 36.2	13 53.9	15	1.5	75	7.3	135	13.2
16	14 34.0	14 36.4	13 54.2	16	1.6	76	7.4	136	13.3
17	14 34.3	14 36.7	13 54.4	17	1.7	77	7.5	137	13.4
18	14 34.5	14 36.9	13 54.7	18	1.8	78	7.6	138	13.5
19	14 34.8	14 37.2	13 54.9	19	1.9	79	7.7	139	13.6
20	14 35.0	14 37.4	13 55.1	20	2.0	80	7.8	140	13.7
21	14 35.3	14 37.7	13 55.4	21	2.0	81	7.9	141	13.7
22	14 35.5	14 37.9	13 55.6	22	2.1	82	8.0	142	13.8
23	14 35.8	14 38.2	13 55.9	23	2.2	83	8.1	143	13.9
24	14 36.0	14 38.4	13 56.1	24	2.3	84	8.2	144	14.0
25	14 36.3	14 38.7	13 56.3	25	2.4	85	8.3	145	14.1
26	14 36.5	14 38.9	13 56.6	26	2.5	86	8.4	146	14.2
27	14 36.8	14 39.2	13 56.8	27	2.6	87	8.5	147	14.3
28	14 37.0	14 39.4	13 57.0	28	2.7	88	8.6	148	14.4
29	14 37.3	14 39.7	13 57.3	29	2.8	89	8.7	149	14.5
30	14 37.5	14 39.9	13 57.5	30	2.9	90	8.8	150	14.6
31	14 37.8	14 40.2	13 57.8	31	3.0	91	8.9	151	14.7
32	14 38.0	14 40.4	13 58.0	32	3.1	92	9.0	152	14.8
33	14 38.3	14 40.7	13 58.2	33	3.2	93	9.1	153	14.9
34	14 38.5	14 40.9	13 58.5	34	3.3	94	9.2	154	15.0
35	14 38.8	14 41.2	13 58.7	35	3.4	95	9.3	155	15.1
36	14 39.0	14 41.4	13 59.0	36	3.5	96	9.4	156	15.2
37	14 39.3	14 41.7	13 59.2	37	3.6	97	9.5	157	15.3
38	14 39.5	14 41.9	13 59.4	38	3.7	98	9.6	158	15.4
39	14 39.8	14 42.2	13 59.7	39	3.8	99	9.7	159	15.5
40	14 40.0	14 42.4	13 59.9	40	3.9	100	9.8	160	15.6
41	14 40.3	14 42.7	14 .1	41	4.0	101	9.8	161	15.7
42	14 40.5	14 42.9	14 .4	42	4.1	102	9.9	162	15.8
43	14 40.8	14 43.2	14 .6	43	4.2	103	10.0	163	15.9
44	14 41.0	14 43.4	14 .9	44	4.3	104	10.1	164	16.0
45	14 41.3	14 43.7	14 1.1	45	4.4	105	10.2	165	16.1
46	14 41.5	14 43.9	14 1.3	46	4.5	106	10.3	166	16.2
47	14 41.8	14 44.2	14 1.6	47	4.6	107	10.4	167	16.3
48	14 42.0	14 44.5	14 1.8	48	4.7	108	10.5	168	16.4
49	14 42.3	14 44.7	14 2.1	49	4.8	109	10.6	169	16.5
50	14 42.5	14 45.0	14 2.3	50	4.9	110	10.7	170	16.6
51	14 42.8	14 45.2	14 2.5	51	5.0	111	10.8	171	16.7
52	14 43.0	14 45.5	14 2.8	52	5.1	112	10.9	172	16.8
53	14 43.3	14 45.7	14 3.0	53	5.2	113	11.0	173	16.9
54	14 43.5	14 46.0	14 3.3	54	5.3	114	11.1	174	17.0
55	14 43.8	14 46.2	14 3.5	55	5.4	115	11.2	175	17.1
56	14 44.0	14 46.5	14 3.7	56	5.5	116	11.3	176	17.2
57	14 44.3	14 46.7	14 4.0	57	5.6	117	11.4	177	17.3
58	14 44.5	14 47.0	14 4.2	58	5.7	118	11.5	178	17.4
59	14 44.8	14 47.2	14 4.4	59	5.8	119	11.6	179	17.5
60	14 45.0	14 47.5	14 4.7	60	5.9	120	11.7	180	17.6

0 h 59 min

s	POPRAVKA ČASOVNOG UGLA: SUNCA I PLANETA	PROLJEĆNE TAČKE ♈	MJESECA ☾	POPRAVKA DRUGOG REDA za časovni ugao i deklinaciju Sunca, Mjeseca i planeta: Δ	poprav.	Δ	poprav.	Δ	poprav.
	° ′	° ′	° ′		′		′		′
0	14 45.0	14 47.5	14 4.7	0	.0	60	6.0	120	11.9
1	14 45.3	14 47.7	14 4.9	1	.1	61	6.0	121	12.0
2	14 45.5	14 48.0	14 5.2	2	.2	62	6.1	122	12.1
3	14 45.8	14 48.2	14 5.4	3	.3	63	6.2	123	12.2
4	14 46.0	14 48.5	14 5.6	4	.4	64	6.3	124	12.3
5	14 46.3	14 48.7	14 5.9	5	.5	65	6.4	125	12.4
6	14 46.5	14 49.0	14 6.1	6	.6	66	6.5	126	12.5
7	14 46.8	14 49.2	14 6.4	7	.7	67	6.6	127	12.6
8	14 47.0	14 49.5	14 6.6	8	.8	68	6.7	128	12.7
9	14 47.3	14 49.7	14 6.8	9	.9	69	6.8	129	12.8
10	14 47.5	14 50.0	14 7.1	10	1.0	70	6.9	130	12.9
11	14 47.8	14 50.2	14 7.3	11	1.1	71	7.0	131	13.0
12	14 48.0	14 50.5	14 7.5	12	1.2	72	7.1	132	13.1
13	14 48.3	14 50.7	14 7.8	13	1.3	73	7.2	133	13.2
14	14 48.5	14 51.0	14 8.0	14	1.4	74	7.3	134	13.3
15	14 48.8	14 51.2	14 8.3	15	1.5	75	7.4	135	13.4
16	14 49.0	14 51.5	14 8.5	16	1.6	76	7.5	136	13.5
17	14 49.3	14 51.7	14 8.7	17	1.7	77	7.6	137	13.6
18	14 49.5	14 52.0	14 9.0	18	1.8	78	7.7	138	13.7
19	14 49.8	14 52.2	14 9.2	19	1.9	79	7.8	139	13.8
20	14 50.0	14 52.5	14 9.5	20	2.0	80	7.9	140	13.9
21	14 50.3	14 52.7	14 9.7	21	2.1	81	8.0	141	14.0
22	14 50.5	14 53.0	14 9.9	22	2.2	82	8.1	142	14.1
23	14 50.8	14 53.2	14 10.2	23	2.3	83	8.2	143	14.2
24	14 51.0	14 53.5	14 10.4	24	2.4	84	8.3	144	14.3
25	14 51.3	14 53.7	14 10.6	25	2.5	85	8.4	145	14.4
26	14 51.5	14 54.0	14 10.9	26	2.6	86	8.5	146	14.5
27	14 51.8	14 54.2	14 11.1	27	2.7	87	8.6	147	14.6
28	14 52.0	14 54.5	14 11.4	28	2.8	88	8.7	148	14.7
29	14 52.3	14 54.7	14 11.6	29	2.9	89	8.8	149	14.8
30	14 52.5	14 55.0	14 11.8	30	3.0	90	8.9	150	14.9
31	14 52.8	14 55.2	14 12.1	31	3.1	91	9.0	151	15.0
32	14 53.0	14 55.5	14 12.3	32	3.2	92	9.1	152	15.1
33	14 53.3	14 55.7	14 12.6	33	3.3	93	9.2	153	15.2
34	14 53.5	14 56.0	14 12.8	34	3.4	94	9.3	154	15.3
35	14 53.8	14 56.2	14 13.0	35	3.5	95	9.4	155	15.4
36	14 54.0	14 56.5	14 13.3	36	3.6	96	9.5	156	15.5
37	14 54.3	14 56.7	14 13.5	37	3.7	97	9.6	157	15.6
38	14 54.5	14 57.0	14 13.8	38	3.8	98	9.7	158	15.7
39	14 54.8	14 57.2	14 14.0	39	3.9	99	9.8	159	15.8
40	14 55.0	14 57.5	14 14.2	40	4.0	100	9.9	160	15.9
41	14 55.3	14 57.7	14 14.5	41	4.1	101	10.0	161	16.0
42	14 55.5	14 58.0	14 14.7	42	4.2	102	10.1	162	16.1
43	14 55.8	14 58.2	14 14.9	43	4.3	103	10.2	163	16.2
44	14 56.0	14 58.5	14 15.2	44	4.4	104	10.3	164	16.3
45	14 56.3	14 58.7	14 15.4	45	4.5	105	10.4	165	16.4
46	14 56.5	14 59.0	14 15.7	46	4.6	106	10.5	166	16.5
47	14 56.8	14 59.2	14 15.9	47	4.7	107	10.6	167	16.6
48	14 57.0	14 59.5	14 16.1	48	4.8	108	10.7	168	16.7
49	14 57.3	14 59.7	14 16.4	49	4.9	109	10.8	169	16.8
50	14 57.5	14 60.0	14 16.6	50	5.0	110	10.9	170	16.9
51	14 57.8	15 .2	14 16.9	51	5.1	111	11.0	171	17.0
52	14 58.0	15 .5	14 17.1	52	5.2	112	11.1	172	17.1
53	14 58.3	15 .7	14 17.3	53	5.3	113	11.2	173	17.2
54	14 58.5	15 1.0	14 17.6	54	5.4	114	11.3	174	17.3
55	14 58.8	15 1.2	14 17.8	55	5.5	115	11.4	175	17.4
56	14 59.0	15 1.5	14 18.0	56	5.6	116	11.5	176	17.5
57	14 59.3	15 1.7	14 18.3	57	5.7	117	11.6	177	17.6
58	14 59.5	15 2.0	14 18.5	58	5.8	118	11.7	178	17.7
59	14 59.8	15 2.2	14 18.8	59	5.9	119	11.8	179	17.8
60	15 .0	15 2.5	14 19.0	60	6.0	120	11.9	180	17.9

1 h 0 min

POPRAVKA ČASOVNOG UGLA				POPRAVKA DRUGOG REDA za časovni ugao i deklinaciju Sunca, Mjeseca i planeta					
s	SUNCA I PLANETA	PROLJEĆNE TAČKE ♈	MJESECA ☾	Δ	popr.	Δ	popr.	Δ	popr.
	° ′	° ′	° ′		′		′		′
0	15 .0	15 2.5	14 19.0	0	.0	60	6.1	120	12.1
1	15 .3	15 2.8	14 19.2	1	.1	61	6.2	121	12.2
2	15 .5	15 3.0	14 19.5	2	.2	62	6.3	122	12.3
3	15 .8	15 3.3	14 19.7	3	.3	63	6.4	123	12.4
4	15 1.0	15 3.5	14 20.0	4	.4	64	6.5	124	12.5
5	15 1.3	15 3.8	14 20.2	5	.5	65	6.6	125	12.6
6	15 1.5	15 4.0	14 20.4	6	.6	66	6.7	126	12.7
7	15 1.8	15 4.3	14 20.7	7	.7	67	6.8	127	12.8
8	15 2.0	15 4.5	14 20.9	8	.8	68	6.9	128	12.9
9	15 2.3	15 4.8	14 21.1	9	.9	69	7.0	129	13.0
10	15 2.5	15 5.0	14 21.4	10	1.0	70	7.1	130	13.1
11	15 2.8	15 5.3	14 21.6	11	1.1	71	7.2	131	13.2
12	15 3.0	15 5.5	14 21.9	12	1.2	72	7.3	132	13.3
13	15 3.3	15 5.8	14 22.1	13	1.3	73	7.4	133	13.4
14	15 3.5	15 6.0	14 22.3	14	1.4	74	7.5	134	13.5
15	15 3.8	15 6.3	14 22.6	15	1.5	75	7.6	135	13.6
16	15 4.0	15 6.5	14 22.8	16	1.6	76	7.7	136	13.7
17	15 4.3	15 6.8	14 23.1	17	1.7	77	7.8	137	13.8
18	15 4.5	15 7.0	14 23.3	18	1.8	78	7.9	138	13.9
19	15 4.8	15 7.3	14 23.5	19	1.9	79	8.0	139	14.0
20	15 5.0	15 7.5	14 23.8	20	2.0	80	8.1	140	14.1
21	15 5.3	15 7.8	14 24.0	21	2.1	81	8.2	141	14.2
22	15 5.5	15 8.0	14 24.2	22	2.2	82	8.3	142	14.3
23	15 5.8	15 8.3	14 24.5	23	2.3	83	8.4	143	14.4
24	15 6.0	15 8.5	14 24.7	24	2.4	84	8.5	144	14.5
25	15 6.3	15 8.8	14 25.0	25	2.5	85	8.6	145	14.6
26	15 6.5	15 9.0	14 25.2	26	2.6	86	8.7	146	14.7
27	15 6.8	15 9.3	14 25.4	27	2.7	87	8.8	147	14.8
28	15 7.0	15 9.5	14 25.7	28	2.8	88	8.9	148	14.9
29	15 7.3	15 9.8	14 25.9	29	2.9	89	9.0	149	15.0
30	15 7.5	15 10.0	14 26.2	30	3.0	90	9.1	150	15.1
31	15 7.8	15 10.3	14 26.4	31	3.1	91	9.2	151	15.2
32	15 8.0	15 10.5	14 26.6	32	3.2	92	9.3	152	15.3
33	15 8.3	15 10.8	14 26.9	33	3.3	93	9.4	153	15.4
34	15 8.5	15 11.0	14 27.1	34	3.4	94	9.5	154	15.5
35	15 8.8	15 11.3	14 27.4	35	3.5	95	9.6	155	15.6
36	15 9.0	15 11.5	14 27.6	36	3.6	96	9.7	156	15.7
37	15 9.3	15 11.8	14 27.8	37	3.7	97	9.8	157	15.8
38	15 9.5	15 12.0	14 28.1	38	3.8	98	9.9	158	15.9
39	15 9.8	15 12.3	14 28.3	39	3.9	99	10.0	159	16.0
40	15 10.0	15 12.5	14 28.5	40	4.0	100	10.1	160	16.1
41	15 10.3	15 12.8	14 28.8	41	4.1	101	10.2	161	16.2
42	15 10.5	15 13.0	14 29.0	42	4.2	102	10.3	162	16.3
43	15 10.8	15 13.3	14 29.3	43	4.3	103	10.4	163	16.4
44	15 11.0	15 13.5	14 29.5	44	4.4	104	10.5	164	16.5
45	15 11.3	15 13.8	14 29.7	45	4.5	105	10.6	165	16.6
46	15 11.5	15 14.0	14 30.0	46	4.6	106	10.7	166	16.7
47	15 11.8	15 14.3	14 30.2	47	4.7	107	10.8	167	16.8
48	15 12.0	15 14.5	14 30.5	48	4.8	108	10.9	168	16.9
49	15 12.3	15 14.8	14 30.7	49	4.9	109	11.0	169	17.0
50	15 12.5	15 15.0	14 30.9	50	5.0	110	11.1	170	17.1
51	15 12.8	15 15.3	14 31.2	51	5.1	111	11.2	171	17.2
52	15 13.0	15 15.5	14 31.4	52	5.2	112	11.3	172	17.3
53	15 13.3	15 15.8	14 31.6	53	5.3	113	11.4	173	17.4
54	15 13.5	15 16.0	14 31.9	54	5.4	114	11.5	174	17.5
55	15 13.8	15 16.3	14 32.1	55	5.5	115	11.6	175	17.6
56	15 14.0	15 16.5	14 32.4	56	5.6	116	11.7	176	17.7
57	15 14.3	15 16.8	14 32.6	57	5.7	117	11.8	177	17.8
58	15 14.5	15 17.0	14 32.8	58	5.8	118	11.9	178	17.9
59	15 14.8	15 17.3	14 33.1	59	5.9	119	12.0	179	18.0
60	15 15.0	15 17.5	14 33.3	60	6.1	120	12.1	180	18.2

1 h 1 min

POPRAVKA ČASOVNOG UGLA				POPRAVKA DRUGOG REDA za časovni ugao i deklinaciju Sunca, Mjeseca i planeta					
s	SUNCA I PLANETA	PROLJEĆNE TAČKE ♈	MJESECA ☾	Δ	popr.	Δ	popr.	Δ	popr.
	° ′	° ′	° ′		′		′		′
0	15 15.0	15 17.5	14 33.3	0	.0	60	6.2	120	12.3
1	15 15.3	15 17.8	14 33.6	1	.1	61	6.3	121	12.4
2	15 15.5	15 18.0	14 33.8	2	.2	62	6.4	122	12.5
3	15 15.8	15 18.3	14 34.0	3	.3	63	6.5	123	12.6
4	15 16.0	15 18.5	14 34.3	4	.4	64	6.6	124	12.7
5	15 16.3	15 18.8	14 34.5	5	.5	65	6.7	125	12.8
6	15 16.5	15 19.0	14 34.7	6	.6	66	6.8	126	12.9
7	15 16.8	15 19.3	14 35.0	7	.7	67	6.9	127	13.0
8	15 17.0	15 19.5	14 35.2	8	.8	68	7.0	128	13.1
9	15 17.3	15 19.8	14 35.5	9	.9	69	7.1	129	13.2
10	15 17.5	15 20.0	14 35.7	10	1.0	70	7.2	130	13.3
11	15 17.8	15 20.3	14 35.9	11	1.1	71	7.3	131	13.4
12	15 18.0	15 20.6	14 36.2	12	1.2	72	7.4	132	13.5
13	15 18.3	15 20.8	14 36.4	13	1.3	73	7.5	133	13.6
14	15 18.5	15 21.1	14 36.7	14	1.4	74	7.6	134	13.7
15	15 18.8	15 21.3	14 36.9	15	1.5	75	7.7	135	13.8
16	15 19.0	15 21.6	14 37.1	16	1.6	76	7.8	136	13.9
17	15 19.3	15 21.8	14 37.4	17	1.7	77	7.9	137	14.0
18	15 19.5	15 22.1	14 37.6	18	1.8	78	8.0	138	14.1
19	15 19.8	15 22.3	14 37.9	19	1.9	79	8.1	139	14.2
20	15 20.0	15 22.6	14 38.1	20	2.1	80	8.2	140	14.4
21	15 20.3	15 22.8	14 38.3	21	2.2	81	8.3	141	14.5
22	15 20.5	15 23.1	14 38.6	22	2.3	82	8.4	142	14.6
23	15 20.8	15 23.3	14 38.8	23	2.4	83	8.5	143	14.7
24	15 21.0	15 23.6	14 39.0	24	2.5	84	8.6	144	14.8
25	15 21.3	15 23.8	14 39.3	25	2.6	85	8.7	145	14.9
26	15 21.5	15 24.1	14 39.5	26	2.7	86	8.8	146	15.0
27	15 21.8	15 24.3	14 39.8	27	2.8	87	8.9	147	15.1
28	15 22.0	15 24.6	14 40.0	28	2.9	88	9.0	148	15.2
29	15 22.3	15 24.8	14 40.2	29	3.0	89	9.1	149	15.3
30	15 22.5	15 25.1	14 40.5	30	3.1	90	9.2	150	15.4
31	15 22.8	15 25.3	14 40.7	31	3.2	91	9.3	151	15.5
32	15 23.0	15 25.6	14 41.0	32	3.3	92	9.4	152	15.6
33	15 23.3	15 25.8	14 41.2	33	3.4	93	9.5	153	15.7
34	15 23.5	15 26.1	14 41.4	34	3.5	94	9.6	154	15.8
35	15 23.8	15 26.3	14 41.7	35	3.6	95	9.7	155	15.9
36	15 24.0	15 26.6	14 41.9	36	3.7	96	9.8	156	16.0
37	15 24.3	15 26.8	14 42.1	37	3.8	97	9.9	157	16.1
38	15 24.5	15 27.1	14 42.4	38	3.9	98	10.0	158	16.2
39	15 24.8	15 27.3	14 42.6	39	4.0	99	10.1	159	16.3
40	15 25.0	15 27.6	14 42.9	40	4.1	100	10.3	160	16.4
41	15 25.3	15 27.8	14 43.1	41	4.2	101	10.4	161	16.5
42	15 25.5	15 28.1	14 43.3	42	4.3	102	10.5	162	16.6
43	15 25.8	15 28.3	14 43.6	43	4.4	103	10.6	163	16.7
44	15 26.0	15 28.6	14 43.8	44	4.5	104	10.7	164	16.8
45	15 26.3	15 28.8	14 44.1	45	4.6	105	10.8	165	16.9
46	15 26.5	15 29.1	14 44.3	46	4.7	106	10.9	166	17.0
47	15 26.8	15 29.3	14 44.5	47	4.8	107	11.0	167	17.1
48	15 27.0	15 29.6	14 44.8	48	4.9	108	11.1	168	17.2
49	15 27.3	15 29.8	14 45.0	49	5.0	109	11.2	169	17.3
50	15 27.5	15 30.1	14 45.2	50	5.1	110	11.3	170	17.4
51	15 27.8	15 30.3	14 45.5	51	5.2	111	11.4	171	17.5
52	15 28.0	15 30.6	14 45.7	52	5.3	112	11.5	172	17.6
53	15 28.3	15 30.8	14 46.0	53	5.4	113	11.6	173	17.7
54	15 28.5	15 31.1	14 46.2	54	5.5	114	11.7	174	17.8
55	15 28.8	15 31.3	14 46.4	55	5.6	115	11.8	175	17.9
56	15 29.0	15 31.6	14 46.7	56	5.7	116	11.9	176	18.0
57	15 29.3	15 31.8	14 46.9	57	5.8	117	12.0	177	18.1
58	15 29.5	15 32.1	14 47.2	58	5.9	118	12.1	178	18.2
59	15 29.8	15 32.3	14 47.4	59	6.0	119	12.2	179	18.3
60	15 30.0	15 32.6	14 47.6	60	6.2	120	12.3	180	18.5

1 h 2 min

POPRAVKA ČASOVNOG UGLA				POPRAVKA DRUGOG REDA za časovni ugao i deklinaciju Sunca, Mjeseca i planeta					
s	SUNCA I PLANETA	PROLJEĆNE TAČKE ♈	MJESECA ☾	Δ	popr.	Δ	popr.	Δ	popr.
	° ′	° ′	° ′		′		′		′
0	15 30.0	15 32.6	14 47.6	0	.0	60	6.3	120	12.5
1	15 30.3	15 32.8	14 47.9	1	.1	61	6.4	121	12.6
2	15 30.5	15 33.1	14 48.1	2	.2	62	6.5	122	12.7
3	15 30.8	15 33.3	14 48.3	3	.3	63	6.6	123	12.8
4	15 31.0	15 33.6	14 48.6	4	.4	64	6.7	124	12.9
5	15 31.3	15 33.8	14 48.8	5	.5	65	6.8	125	13.0
6	15 31.5	15 34.1	14 49.1	6	.6	66	6.9	126	13.1
7	15 31.8	15 34.3	14 49.3	7	.7	67	7.0	127	13.2
8	15 32.0	15 34.6	14 49.5	8	.8	68	7.1	128	13.3
9	15 32.3	15 34.8	14 49.8	9	.9	69	7.2	129	13.4
10	15 32.5	15 35.1	14 50.0	10	1.0	70	7.3	130	13.5
11	15 32.8	15 35.3	14 50.3	11	1.1	71	7.4	131	13.6
12	15 33.0	15 35.6	14 50.5	12	1.3	72	7.5	132	13.8
13	15 33.3	15 35.8	14 50.7	13	1.4	73	7.6	133	13.9
14	15 33.5	15 36.1	14 51.0	14	1.5	74	7.7	134	14.0
15	15 33.8	15 36.3	14 51.2	15	1.6	75	7.8	135	14.1
16	15 34.0	15 36.6	14 51.5	16	1.7	76	7.9	136	14.2
17	15 34.3	15 36.8	14 51.7	17	1.8	77	8.0	137	14.3
18	15 34.5	15 37.1	14 51.9	18	1.9	78	8.1	138	14.4
19	15 34.8	15 37.3	14 52.2	19	2.0	79	8.2	139	14.5
20	15 35.0	15 37.6	14 52.4	20	2.1	80	8.3	140	14.6
21	15 35.3	15 37.8	14 52.6	21	2.2	81	8.4	141	14.7
22	15 35.5	15 38.1	14 52.9	22	2.3	82	8.5	142	14.8
23	15 35.8	15 38.3	14 53.1	23	2.4	83	8.6	143	14.9
24	15 36.0	15 38.6	14 53.4	24	2.5	84	8.8	144	15.0
25	15 36.3	15 38.9	14 53.6	25	2.6	85	8.9	145	15.1
26	15 36.5	15 39.1	14 53.8	26	2.7	86	9.0	146	15.2
27	15 36.8	15 39.4	14 54.1	27	2.8	87	9.1	147	15.3
28	15 37.0	15 39.6	14 54.3	28	2.9	88	9.2	148	15.4
29	15 37.3	15 39.9	14 54.6	29	3.0	89	9.3	149	15.5
30	15 37.5	15 40.1	14 54.8	30	3.1	90	9.4	150	15.6
31	15 37.8	15 40.4	14 55.0	31	3.2	91	9.5	151	15.7
32	15 38.0	15 40.6	14 55.3	32	3.3	92	9.6	152	15.8
33	15 38.3	15 40.9	14 55.5	33	3.4	93	9.7	153	15.9
34	15 38.5	15 41.1	14 55.7	34	3.5	94	9.8	154	16.0
35	15 38.8	15 41.4	14 56.0	35	3.6	95	9.9	155	16.1
36	15 39.0	15 41.6	14 56.2	36	3.8	96	10.0	156	16.3
37	15 39.3	15 41.9	14 56.5	37	3.9	97	10.1	157	16.4
38	15 39.5	15 42.1	14 56.7	38	4.0	98	10.2	158	16.5
39	15 39.8	15 42.4	14 56.9	39	4.1	99	10.3	159	16.6
40	15 40.0	15 42.6	14 57.2	40	4.2	100	10.4	160	16.7
41	15 40.3	15 42.9	14 57.4	41	4.3	101	10.5	161	16.8
42	15 40.5	15 43.1	14 57.7	42	4.4	102	10.6	162	16.9
43	15 40.8	15 43.4	14 57.9	43	4.5	103	10.7	163	17.0
44	15 41.0	15 43.6	14 58.1	44	4.6	104	10.8	164	17.1
45	15 41.3	15 43.9	14 58.4	45	4.7	105	10.9	165	17.2
46	15 41.5	15 44.1	14 58.6	46	4.8	106	11.0	166	17.3
47	15 41.8	15 44.4	14 58.8	47	4.9	107	11.1	167	17.4
48	15 42.0	15 44.6	14 59.1	48	5.0	108	11.3	168	17.5
49	15 42.3	15 44.9	14 59.3	49	5.1	109	11.4	169	17.6
50	15 42.5	15 45.1	14 59.6	50	5.2	110	11.5	170	17.7
51	15 42.8	15 45.4	14 59.8	51	5.3	111	11.6	171	17.8
52	15 43.0	15 45.6	15 .0	52	5.4	112	11.7	172	17.9
53	15 43.3	15 45.9	15 .3	53	5.5	113	11.8	173	18.0
54	15 43.5	15 46.1	15 .5	54	5.6	114	11.9	174	18.1
55	15 43.8	15 46.4	15 .8	55	5.7	115	12.0	175	18.2
56	15 44.0	15 46.6	15 1.0	56	5.8	116	12.1	176	18.3
57	15 44.3	15 46.9	15 1.2	57	5.9	117	12.2	177	18.4
58	15 44.5	15 47.1	15 1.5	58	6.0	118	12.3	178	18.5
59	15 44.8	15 47.4	15 1.7	59	6.1	119	12.4	179	18.6
60	15 45.0	15 47.6	15 2.0	60	6.3	120	12.5	180	18.8

1 h 3 min

POPRAVKA ČASOVNOG UGLA				POPRAVKA DRUGOG REDA za časovni ugao i deklinaciju Sunca, Mjeseca i planeta					
s	SUNCA I PLANETA	PROLJEĆNE TAČKE ♈	MJESECA ☾	Δ	popr.	Δ	popr.	Δ	popr.
	° ′	° ′	° ′		′		′		′
0	15 45.0	15 47.6	15 2.0	0	.0	60	6.4	120	12.7
1	15 45.3	15 47.9	15 2.2	1	.1	61	6.5	121	12.8
2	15 45.5	15 48.1	15 2.4	2	.2	62	6.6	122	12.9
3	15 45.8	15 48.4	15 2.7	3	.3	63	6.7	123	13.0
4	15 46.0	15 48.6	15 2.9	4	.4	64	6.8	124	13.1
5	15 46.3	15 48.9	15 3.1	5	.5	65	6.9	125	13.2
6	15 46.5	15 49.1	15 3.4	6	.6	66	7.0	126	13.3
7	15 46.8	15 49.4	15 3.6	7	.7	67	7.1	127	13.4
8	15 47.0	15 49.6	15 3.9	8	.8	68	7.2	128	13.5
9	15 47.3	15 49.9	15 4.1	9	1.0	69	7.3	129	13.7
10	15 47.5	15 50.1	15 4.3	10	1.1	70	7.4	130	13.8
11	15 47.8	15 50.4	15 4.6	11	1.2	71	7.5	131	13.9
12	15 48.0	15 50.6	15 4.8	12	1.3	72	7.6	132	14.0
13	15 48.3	15 50.9	15 5.1	13	1.4	73	7.7	133	14.1
14	15 48.5	15 51.1	15 5.3	14	1.5	74	7.8	134	14.2
15	15 48.8	15 51.4	15 5.5	15	1.6	75	7.9	135	14.3
16	15 49.0	15 51.6	15 5.8	16	1.7	76	8.0	136	14.4
17	15 49.3	15 51.9	15 6.0	17	1.8	77	8.1	137	14.5
18	15 49.5	15 52.1	15 6.2	18	1.9	78	8.3	138	14.6
19	15 49.8	15 52.4	15 6.5	19	2.0	79	8.4	139	14.7
20	15 50.0	15 52.6	15 6.7	20	2.1	80	8.5	140	14.8
21	15 50.3	15 52.9	15 7.0	21	2.2	81	8.6	141	14.9
22	15 50.5	15 53.1	15 7.2	22	2.3	82	8.7	142	15.0
23	15 50.8	15 53.4	15 7.4	23	2.4	83	8.8	143	15.1
24	15 51.0	15 53.6	15 7.7	24	2.5	84	8.9	144	15.2
25	15 51.3	15 53.9	15 7.9	25	2.6	85	9.0	145	15.3
26	15 51.5	15 54.1	15 8.2	26	2.8	86	9.1	146	15.5
27	15 51.8	15 54.4	15 8.4	27	2.9	87	9.2	147	15.6
28	15 52.0	15 54.6	15 8.6	28	3.0	88	9.3	148	15.7
29	15 52.3	15 54.9	15 8.9	29	3.1	89	9.4	149	15.8
30	15 52.5	15 55.1	15 9.1	30	3.2	90	9.5	150	15.9
31	15 52.8	15 55.4	15 9.3	31	3.3	91	9.6	151	16.0
32	15 53.0	15 55.6	15 9.6	32	3.4	92	9.7	152	16.1
33	15 53.3	15 55.9	15 9.8	33	3.5	93	9.8	153	16.2
34	15 53.5	15 56.1	15 10.1	34	3.6	94	9.9	154	16.3
35	15 53.8	15 56.4	15 10.3	35	3.7	95	10.1	155	16.4
36	15 54.0	15 56.7	15 10.5	36	3.8	96	10.2	156	16.5
37	15 54.3	15 56.9	15 10.8	37	3.9	97	10.3	157	16.6
38	15 54.5	15 57.2	15 11.0	38	4.0	98	10.4	158	16.7
39	15 54.8	15 57.4	15 11.3	39	4.1	99	10.5	159	16.8
40	15 55.0	15 57.7	15 11.5	40	4.2	100	10.6	160	16.9
41	15 55.3	15 57.9	15 11.7	41	4.3	101	10.7	161	17.0
42	15 55.5	15 58.2	15 12.0	42	4.4	102	10.8	162	17.1
43	15 55.8	15 58.4	15 12.2	43	4.6	103	10.9	163	17.3
44	15 56.0	15 58.7	15 12.4	44	4.7	104	11.0	164	17.4
45	15 56.3	15 58.9	15 12.7	45	4.8	105	11.1	165	17.5
46	15 56.5	15 59.2	15 12.9	46	4.9	106	11.2	166	17.6
47	15 56.8	15 59.4	15 13.2	47	5.0	107	11.3	167	17.7
48	15 57.0	15 59.7	15 13.4	48	5.1	108	11.4	168	17.8
49	15 57.3	15 59.9	15 13.6	49	5.2	109	11.5	169	17.9
50	15 57.5	16 .2	15 13.9	50	5.3	110	11.6	170	18.0
51	15 57.8	16 .4	15 14.1	51	5.4	111	11.7	171	18.1
52	15 58.0	16 .7	15 14.4	52	5.5	112	11.9	172	18.2
53	15 58.3	16 .9	15 14.6	53	5.6	113	12.0	173	18.3
54	15 58.5	16 1.2	15 14.8	54	5.7	114	12.1	174	18.4
55	15 58.8	16 1.4	15 15.1	55	5.8	115	12.2	175	18.5
56	15 59.0	16 1.7	15 15.3	56	5.9	116	12.3	176	18.6
57	15 59.3	16 1.9	15 15.6	57	6.0	117	12.4	177	18.7
58	15 59.5	16 2.2	15 15.8	58	6.1	118	12.5	178	18.8
59	15 59.8	16 2.4	15 16.0	59	6.2	119	12.6	179	18.9
60	16 .0	16 2.7	15 16.3	60	6.4	120	12.7	180	19.1

1 h 4 min

POPRAVKA ČASOVNOG UGLA					POPRAVKA DRUGOG REDA za časovni ugao i deklinaciju Sunca, Mjeseca i planeta					
s	SUNCA I PLANETA		PROLJEĆNE TAČKE ♈		MJESECA ☾		Δ	popr.	Δ	popr.	Δ	popr.
	°	′	°	′	°	′		′		′		′
0	16	.0	16	2.7	15	16.3	0	.0	60	6.5	120	12.9
1	16	.3	16	2.9	15	16.5	1	.1	61	6.6	121	13.0
2	16	.5	16	3.2	15	16.7	2	.2	62	6.7	122	13.1
3	16	.8	16	3.4	15	17.0	3	.3	63	6.8	123	13.2
4	16	1.0	16	3.7	15	17.2	4	.4	64	6.9	124	13.3
5	16	1.3	16	3.9	15	17.5	5	.5	65	7.0	125	13.4
6	16	1.5	16	4.2	15	17.7	6	.6	66	7.1	126	13.5
7	16	1.8	16	4.4	15	17.9	7	.8	67	7.2	127	13.7
8	16	2.0	16	4.7	15	18.2	8	.9	68	7.3	128	13.8
9	16	2.3	16	4.9	15	18.4	9	1.0	69	7.4	129	13.9
10	16	2.5	16	5.2	15	18.7	10	1.1	70	7.5	130	14.0
11	16	2.8	16	5.4	15	18.9	11	1.2	71	7.6	131	14.1
12	16	3.0	16	5.7	15	19.1	12	1.3	72	7.7	132	14.2
13	16	3.3	16	5.9	15	19.4	13	1.4	73	7.8	133	14.3
14	16	3.5	16	6.2	15	19.6	14	1.5	74	8.0	134	14.4
15	16	3.8	16	6.4	15	19.8	15	1.6	75	8.1	135	14.5
16	16	4.0	16	6.7	15	20.1	16	1.7	76	8.2	136	14.6
17	16	4.3	16	6.9	15	20.3	17	1.8	77	8.3	137	14.7
18	16	4.5	16	7.2	15	20.6	18	1.9	78	8.4	138	14.8
19	16	4.8	16	7.4	15	20.8	19	2.0	79	8.5	139	14.9
20	16	5.0	16	7.7	15	21.0	20	2.2	80	8.6	140	15.1
21	16	5.3	16	7.9	15	21.3	21	2.3	81	8.7	141	15.2
22	16	5.5	16	8.2	15	21.5	22	2.4	82	8.8	142	15.3
23	16	5.8	16	8.4	15	21.8	23	2.5	83	8.9	143	15.4
24	16	6.0	16	8.7	15	22.0	24	2.6	84	9.0	144	15.5
25	16	6.3	16	8.9	15	22.2	25	2.7	85	9.1	145	15.6
26	16	6.5	16	9.2	15	22.5	26	2.8	86	9.2	146	15.7
27	16	6.8	16	9.4	15	22.7	27	2.9	87	9.4	147	15.8
28	16	7.0	16	9.7	15	22.9	28	3.0	88	9.5	148	15.9
29	16	7.3	16	9.9	15	23.2	29	3.1	89	9.6	149	16.0
30	16	7.5	16	10.2	15	23.4	30	3.2	90	9.7	150	16.1
31	16	7.8	16	10.4	15	23.7	31	3.3	91	9.8	151	16.2
32	16	8.0	16	10.7	15	23.9	32	3.4	92	9.9	152	16.3
33	16	8.3	16	10.9	15	24.1	33	3.5	93	10.0	153	16.4
34	16	8.5	16	11.2	15	24.4	34	3.7	94	10.1	154	16.6
35	16	8.8	16	11.4	15	24.6	35	3.8	95	10.2	155	16.7
36	16	9.0	16	11.7	15	24.9	36	3.9	96	10.3	156	16.8
37	16	9.3	16	11.9	15	25.1	37	4.0	97	10.4	157	16.9
38	16	9.5	16	12.2	15	25.3	38	4.1	98	10.5	158	17.0
39	16	9.8	16	12.4	15	25.6	39	4.2	99	10.6	159	17.1
40	16	10.0	16	12.7	15	25.8	40	4.3	100	10.8	160	17.2
41	16	10.3	16	12.9	15	26.0	41	4.4	101	10.9	161	17.3
42	16	10.5	16	13.2	15	26.3	42	4.5	102	11.0	162	17.4
43	16	10.8	16	13.4	15	26.5	43	4.6	103	11.1	163	17.5
44	16	11.0	16	13.7	15	26.8	44	4.7	104	11.2	164	17.6
45	16	11.3	16	13.9	15	27.0	45	4.8	105	11.3	165	17.7
46	16	11.5	16	14.2	15	27.2	46	4.9	106	11.4	166	17.8
47	16	11.8	16	14.4	15	27.5	47	5.1	107	11.5	167	18.0
48	16	12.0	16	14.7	15	27.7	48	5.2	108	11.6	168	18.1
49	16	12.3	16	15.0	15	28.0	49	5.3	109	11.7	169	18.2
50	16	12.5	16	15.2	15	28.2	50	5.4	110	11.8	170	18.3
51	16	12.8	16	15.5	15	28.4	51	5.5	111	11.9	171	18.4
52	16	13.0	16	15.7	15	28.7	52	5.6	112	12.0	172	18.5
53	16	13.3	16	16.0	15	28.9	53	5.7	113	12.1	173	18.6
54	16	13.5	16	16.2	15	29.2	54	5.8	114	12.3	174	18.7
55	16	13.8	16	16.5	15	29.4	55	5.9	115	12.4	175	18.8
56	16	14.0	16	16.7	15	29.6	56	6.0	116	12.5	176	18.9
57	16	14.3	16	17.0	15	29.9	57	6.1	117	12.6	177	19.0
58	16	14.5	16	17.2	15	30.1	58	6.2	118	12.7	178	19.1
59	16	14.8	16	17.5	15	30.3	59	6.3	119	12.8	179	19.2
60	16	15.0	16	17.7	15	30.6	60	6.5	120	12.9	180	19.4

1 h 5 min

POPRAVKA ČASOVNOG UGLA					POPRAVKA DRUGOG REDA za časovni ugao i deklinaciju Sunca, Mjeseca i planeta					
s	SUNCA I PLANETA		PROLJEĆNE TAČKE ♈		MJESECA ☾		Δ	popr.	Δ	popr.	Δ	popr.
	°	′	°	′	°	′		′		′		′
0	16	15.0	16	17.7	15	30.6	0	.0	60	6.6	120	13.1
1	16	15.3	16	18.0	15	30.8	1	.1	61	6.7	121	13.2
2	16	15.5	16	18.2	15	31.1	2	.2	62	6.8	122	13.3
3	16	15.8	16	18.5	15	31.3	3	.3	63	6.9	123	13.4
4	16	16.0	16	18.7	15	31.5	4	.4	64	7.0	124	13.5
5	16	16.3	16	19.0	15	31.8	5	.5	65	7.1	125	13.6
6	16	16.5	16	19.2	15	32.0	6	.7	66	7.2	126	13.8
7	16	16.8	16	19.5	15	32.3	7	.8	67	7.3	127	13.9
8	16	17.0	16	19.7	15	32.5	8	.9	68	7.4	128	14.0
9	16	17.3	16	20.0	15	32.7	9	1.0	69	7.5	129	14.1
10	16	17.5	16	20.2	15	33.0	10	1.1	70	7.6	130	14.2
11	16	17.8	16	20.5	15	33.2	11	1.2	71	7.8	131	14.3
12	16	18.0	16	20.7	15	33.4	12	1.3	72	7.9	132	14.4
13	16	18.3	16	21.0	15	33.7	13	1.4	73	8.0	133	14.5
14	16	18.5	16	21.2	15	33.9	14	1.5	74	8.1	134	14.6
15	16	18.8	16	21.5	15	34.2	15	1.6	75	8.2	135	14.7
16	16	19.0	16	21.7	15	34.4	16	1.7	76	8.3	136	14.8
17	16	19.3	16	22.0	15	34.6	17	1.9	77	8.4	137	15.0
18	16	19.5	16	22.2	15	34.9	18	2.0	78	8.5	138	15.1
19	16	19.8	16	22.5	15	35.1	19	2.1	79	8.6	139	15.2
20	16	20.0	16	22.7	15	35.4	20	2.2	80	8.7	140	15.3
21	16	20.3	16	23.0	15	35.6	21	2.3	81	8.8	141	15.4
22	16	20.5	16	23.2	15	35.8	22	2.4	82	9.0	142	15.5
23	16	20.8	16	23.5	15	36.1	23	2.5	83	9.1	143	15.6
24	16	21.0	16	23.7	15	36.3	24	2.6	84	9.2	144	15.7
25	16	21.3	16	24.0	15	36.5	25	2.7	85	9.3	145	15.8
26	16	21.5	16	24.2	15	36.8	26	2.8	86	9.4	146	15.9
27	16	21.8	16	24.5	15	37.0	27	2.9	87	9.5	147	16.0
28	16	22.0	16	24.7	15	37.3	28	3.1	88	9.6	148	16.2
29	16	22.3	16	25.0	15	37.5	29	3.2	89	9.7	149	16.3
30	16	22.5	16	25.2	15	37.7	30	3.3	90	9.8	150	16.4
31	16	22.8	16	25.5	15	38.0	31	3.4	91	9.9	151	16.5
32	16	23.0	16	25.7	15	38.2	32	3.5	92	10.0	152	16.6
33	16	23.3	16	26.0	15	38.5	33	3.6	93	10.2	153	16.7
34	16	23.5	16	26.2	15	38.7	34	3.7	94	10.3	154	16.8
35	16	23.8	16	26.5	15	38.9	35	3.8	95	10.4	155	16.9
36	16	24.0	16	26.7	15	39.2	36	3.9	96	10.5	156	17.0
37	16	24.3	16	27.0	15	39.4	37	4.0	97	10.6	157	17.1
38	16	24.5	16	27.2	15	39.7	38	4.1	98	10.7	158	17.2
39	16	24.8	16	27.5	15	39.9	39	4.3	99	10.8	159	17.4
40	16	25.0	16	27.7	15	40.1	40	4.4	100	10.9	160	17.5
41	16	25.3	16	28.0	15	40.4	41	4.5	101	11.0	161	17.6
42	16	25.5	16	28.2	15	40.6	42	4.6	102	11.1	162	17.7
43	16	25.8	16	28.5	15	40.8	43	4.7	103	11.2	163	17.8
44	16	26.0	16	28.7	15	41.1	44	4.8	104	11.4	164	17.9
45	16	26.3	16	29.0	15	41.3	45	4.9	105	11.5	165	18.0
46	16	26.5	16	29.2	15	41.6	46	5.0	106	11.6	166	18.1
47	16	26.8	16	29.5	15	41.8	47	5.1	107	11.7	167	18.2
48	16	27.0	16	29.7	15	42.0	48	5.2	108	11.8	168	18.3
49	16	27.3	16	30.0	15	42.3	49	5.3	109	11.9	169	18.4
50	16	27.5	16	30.2	15	42.5	50	5.5	110	12.0	170	18.6
51	16	27.8	16	30.5	15	42.8	51	5.6	111	12.1	171	18.7
52	16	28.0	16	30.7	15	43.0	52	5.7	112	12.2	172	18.8
53	16	28.3	16	31.0	15	43.2	53	5.8	113	12.3	173	18.9
54	16	28.5	16	31.2	15	43.5	54	5.9	114	12.4	174	19.0
55	16	28.8	16	31.5	15	43.7	55	6.0	115	12.6	175	19.1
56	16	29.0	16	31.7	15	43.9	56	6.1	116	12.7	176	19.2
57	16	29.3	16	32.0	15	44.2	57	6.2	117	12.8	177	19.3
58	16	29.5	16	32.2	15	44.4	58	6.3	118	12.9	178	19.4
59	16	29.8	16	32.5	15	44.7	59	6.4	119	13.0	179	19.5
60	16	30.0	16	32.8	15	44.9	60	6.6	120	13.1	180	19.7

1 h 6 min

POPRAVKA ČASOVNOG UGLA				POPRAVKA DRUGOG REDA za časovni ugao i deklinaciju Sunca, Mjeseca i planeta					
s	SUNCA I PLANETA	PROLJEĆNE TAČKE ♈	MJESECA ☾	Δ	popr.	Δ	popr.	Δ	popr.
	° ′	° ′	° ′		′		′		′
0	16 30.0	16 32.8	15 44.9	0	.0	60	6.7	120	13.3
1	16 30.3	16 33.0	15 45.1	1	.1	61	6.8	121	13.4
2	16 30.5	16 33.3	15 45.4	2	.2	62	6.9	122	13.5
3	16 30.8	16 33.5	15 45.6	3	.3	63	7.0	123	13.6
4	16 31.0	16 33.8	15 45.9	4	.4	64	7.1	124	13.7
5	16 31.3	16 34.0	15 46.1	5	.6	65	7.2	125	13.9
6	16 31.5	16 34.3	15 46.3	6	.7	66	7.3	126	14.0
7	16 31.8	16 34.5	15 46.6	7	.8	67	7.4	127	14.1
8	16 32.0	16 34.8	15 46.8	8	.9	68	7.5	128	14.2
9	16 32.3	16 35.0	15 47.0	9	1.0	69	7.6	129	14.3
10	16 32.5	16 35.3	15 47.3	10	1.1	70	7.8	130	14.4
11	16 32.8	16 35.5	15 47.5	11	1.2	71	7.9	131	14.5
12	16 33.0	16 35.8	15 47.8	12	1.3	72	8.0	132	14.6
13	16 33.3	16 36.0	15 48.0	13	1.4	73	8.1	133	14.7
14	16 33.5	16 36.3	15 48.2	14	1.6	74	8.2	134	14.9
15	16 33.8	16 36.5	15 48.5	15	1.7	75	8.3	135	15.0
16	16 34.0	16 36.8	15 48.7	16	1.8	76	8.4	136	15.1
17	16 34.3	16 37.0	15 49.0	17	1.9	77	8.5	137	15.2
18	16 34.5	16 37.3	15 49.2	18	2.0	78	8.6	138	15.3
19	16 34.8	16 37.5	15 49.4	19	2.1	79	8.8	139	15.4
20	16 35.0	16 37.8	15 49.7	20	2.2	80	8.9	140	15.5
21	16 35.3	16 38.0	15 49.9	21	2.3	81	9.0	141	15.6
22	16 35.5	16 38.3	15 50.1	22	2.4	82	9.1	142	15.7
23	16 35.8	16 38.5	15 50.4	23	2.5	83	9.2	143	15.8
24	16 36.0	16 38.8	15 50.6	24	2.7	84	9.3	144	16.0
25	16 36.3	16 39.0	15 50.9	25	2.8	85	9.4	145	16.1
26	16 36.5	16 39.3	15 51.1	26	2.9	86	9.5	146	16.2
27	16 36.8	16 39.5	15 51.3	27	3.0	87	9.6	147	16.3
28	16 37.0	16 39.8	15 51.6	28	3.1	88	9.8	148	16.4
29	16 37.3	16 40.0	15 51.8	29	3.2	89	9.9	149	16.5
30	16 37.5	16 40.3	15 52.1	30	3.3	90	10.0	150	16.6
31	16 37.8	16 40.5	15 52.3	31	3.4	91	10.1	151	16.7
32	16 38.0	16 40.8	15 52.5	32	3.5	92	10.2	152	16.8
33	16 38.3	16 41.0	15 52.8	33	3.7	93	10.3	153	17.0
34	16 38.5	16 41.3	15 53.0	34	3.8	94	10.4	154	17.1
35	16 38.8	16 41.5	15 53.3	35	3.9	95	10.5	155	17.2
36	16 39.0	16 41.8	15 53.5	36	4.0	96	10.6	156	17.3
37	16 39.3	16 42.0	15 53.7	37	4.1	97	10.8	157	17.4
38	16 39.5	16 42.3	15 54.0	38	4.2	98	10.9	158	17.5
39	16 39.8	16 42.5	15 54.2	39	4.3	99	11.0	159	17.6
40	16 40.0	16 42.8	15 54.4	40	4.4	100	11.1	160	17.7
41	16 40.3	16 43.0	15 54.7	41	4.5	101	11.2	161	17.8
42	16 40.5	16 43.3	15 54.9	42	4.7	102	11.3	162	18.0
43	16 40.8	16 43.5	15 55.2	43	4.8	103	11.4	163	18.1
44	16 41.0	16 43.8	15 55.4	44	4.9	104	11.5	164	18.2
45	16 41.3	16 44.0	15 55.6	45	5.0	105	11.6	165	18.3
46	16 41.5	16 44.3	15 55.9	46	5.1	106	11.7	166	18.4
47	16 41.8	16 44.5	15 56.1	47	5.2	107	11.9	167	18.5
48	16 42.0	16 44.8	15 56.4	48	5.3	108	12.0	168	18.6
49	16 42.3	16 45.0	15 56.6	49	5.4	109	12.1	169	18.7
50	16 42.5	16 45.3	15 56.8	50	5.5	110	12.2	170	18.8
51	16 42.8	16 45.5	15 57.1	51	5.7	111	12.3	171	19.0
52	16 43.0	16 45.8	15 57.3	52	5.8	112	12.4	172	19.1
53	16 43.3	16 46.0	15 57.5	53	5.9	113	12.5	173	19.2
54	16 43.5	16 46.3	15 57.8	54	6.0	114	12.6	174	19.3
55	16 43.8	16 46.5	15 58.0	55	6.1	115	12.7	175	19.4
56	16 44.0	16 46.8	15 58.3	56	6.2	116	12.9	176	19.5
57	16 44.3	16 47.0	15 58.5	57	6.3	117	13.0	177	19.6
58	16 44.5	16 47.3	15 58.7	58	6.4	118	13.1	178	19.7
59	16 44.8	16 47.5	15 59.0	59	6.5	119	13.2	179	19.8
60	16 45.0	16 47.8	15 59.2	60	6.7	120	13.3	180	20.0

1 h 7 min

POPRAVKA ČASOVNOG UGLA				POPRAVKA DRUGOG REDA za časovni ugao i deklinaciju Sunca, Mjeseca i planeta					
s	SUNCA I PLANETA	PROLJEĆNE TAČKE ♈	MJESECA ☾	Δ	popr.	Δ	popr.	Δ	popr.
	° ′	° ′	° ′		′		′		′
0	16 45.0	16 47.8	15 59.2	0	.0	60	6.8	120	13.5
1	16 45.3	16 48.0	15 59.5	1	.1	61	6.9	121	13.6
2	16 45.5	16 48.3	15 59.7	2	.2	62	7.0	122	13.7
3	16 45.8	16 48.5	15 59.9	3	.3	63	7.1	123	13.8
4	16 46.0	16 48.8	16 .2	4	.5	64	7.2	124	14.0
5	16 46.3	16 49.0	16 .4	5	.6	65	7.3	125	14.1
6	16 46.5	16 49.3	16 .6	6	.7	66	7.4	126	14.2
7	16 46.8	16 49.5	16 .9	7	.8	67	7.5	127	14.3
8	16 47.0	16 49.8	16 1.1	8	.9	68	7.7	128	14.4
9	16 47.3	16 50.0	16 1.4	9	1.0	69	7.8	129	14.5
10	16 47.5	16 50.3	16 1.6	10	1.1	70	7.9	130	14.6
11	16 47.8	16 50.5	16 1.8	11	1.2	71	8.0	131	14.7
12	16 48.0	16 50.8	16 2.1	12	1.4	72	8.1	132	14.9
13	16 48.3	16 51.1	16 2.3	13	1.5	73	8.2	133	15.0
14	16 48.5	16 51.3	16 2.6	14	1.6	74	8.3	134	15.1
15	16 48.8	16 51.6	16 2.8	15	1.7	75	8.4	135	15.2
16	16 49.0	16 51.8	16 3.0	16	1.8	76	8.6	136	15.3
17	16 49.3	16 52.1	16 3.3	17	1.9	77	8.7	137	15.4
18	16 49.5	16 52.3	16 3.5	18	2.0	78	8.8	138	15.5
19	16 49.8	16 52.6	16 3.8	19	2.1	79	8.9	139	15.6
20	16 50.0	16 52.8	16 4.0	20	2.3	80	9.0	140	15.8
21	16 50.3	16 53.1	16 4.2	21	2.4	81	9.1	141	15.9
22	16 50.5	16 53.3	16 4.5	22	2.5	82	9.2	142	16.0
23	16 50.8	16 53.6	16 4.7	23	2.6	83	9.3	143	16.1
24	16 51.0	16 53.8	16 4.9	24	2.7	84	9.5	144	16.2
25	16 51.3	16 54.1	16 5.2	25	2.8	85	9.6	145	16.3
26	16 51.5	16 54.3	16 5.4	26	2.9	86	9.7	146	16.4
27	16 51.8	16 54.6	16 5.7	27	3.0	87	9.8	147	16.5
28	16 52.0	16 54.8	16 5.9	28	3.2	88	9.9	148	16.7
29	16 52.3	16 55.1	16 6.1	29	3.3	89	10.0	149	16.8
30	16 52.5	16 55.3	16 6.4	30	3.4	90	10.1	150	16.9
31	16 52.8	16 55.6	16 6.6	31	3.5	91	10.2	151	17.0
32	16 53.0	16 55.8	16 6.9	32	3.6	92	10.4	152	17.1
33	16 53.3	16 56.1	16 7.1	33	3.7	93	10.5	153	17.2
34	16 53.5	16 56.3	16 7.3	34	3.8	94	10.6	154	17.3
35	16 53.8	16 56.6	16 7.6	35	3.9	95	10.7	155	17.4
36	16 54.0	16 56.8	16 7.8	36	4.1	96	10.8	156	17.6
37	16 54.3	16 57.1	16 8.0	37	4.2	97	10.9	157	17.7
38	16 54.5	16 57.3	16 8.3	38	4.3	98	11.0	158	17.8
39	16 54.8	16 57.6	16 8.5	39	4.4	99	11.1	159	17.9
40	16 55.0	16 57.8	16 8.8	40	4.5	100	11.3	160	18.0
41	16 55.3	16 58.1	16 9.0	41	4.6	101	11.4	161	18.1
42	16 55.5	16 58.3	16 9.2	42	4.7	102	11.5	162	18.2
43	16 55.8	16 58.6	16 9.5	43	4.8	103	11.6	163	18.3
44	16 56.0	16 58.8	16 9.7	44	5.0	104	11.7	164	18.5
45	16 56.3	16 59.1	16 10.0	45	5.1	105	11.8	165	18.6
46	16 56.5	16 59.3	16 10.2	46	5.2	106	11.9	166	18.7
47	16 56.8	16 59.6	16 10.4	47	5.3	107	12.0	167	18.8
48	16 57.0	16 59.8	16 10.7	48	5.4	108	12.2	168	18.9
49	16 57.3	17 .1	16 10.9	49	5.5	109	12.3	169	19.0
50	16 57.5	17 .3	16 11.1	50	5.6	110	12.4	170	19.1
51	16 57.8	17 .6	16 11.4	51	5.7	111	12.5	171	19.2
52	16 58.0	17 .8	16 11.6	52	5.9	112	12.6	172	19.4
53	16 58.3	17 1.1	16 11.9	53	6.0	113	12.7	173	19.5
54	16 58.5	17 1.3	16 12.1	54	6.1	114	12.8	174	19.6
55	16 58.8	17 1.6	16 12.3	55	6.2	115	12.9	175	19.7
56	16 59.0	17 1.8	16 12.6	56	6.3	116	13.1	176	19.8
57	16 59.3	17 2.1	16 12.8	57	6.4	117	13.2	177	19.9
58	16 59.5	17 2.3	16 13.1	58	6.5	118	13.3	178	20.0
59	16 59.8	17 2.6	16 13.3	59	6.6	119	13.4	179	20.1
60	17 .0	17 2.8	16 13.5	60	6.8	120	13.5	180	20.3

1 h 8 min

POPRAVKA ČASOVNOG UGLA					POPRAVKA DRUGOG REDA za časovni ugao i deklinaciju Sunca, Mjeseca i planeta					
s	SUNCA I PLANETA		PROLJEĆNE TAČKE ♈		MJESECA ☾		Δ	popr.	Δ	popr.	Δ	popr.
	°	′	°	′	°	′		′		′		′
0	17	.0	17	2.8	16	13.5	0	.0	60	6.9	120	13.7
1	17	.3	17	3.1	16	13.8	1	.1	61	7.0	121	13.8
2	17	.5	17	3.3	16	14.0	2	.2	62	7.1	122	13.9
3	17	.8	17	3.6	16	14.2	3	.3	63	7.2	123	14.0
4	17	1.0	17	3.8	16	14.5	4	.5	64	7.3	124	14.2
5	17	1.3	17	4.1	16	14.7	5	.6	65	7.4	125	14.3
6	17	1.5	17	4.3	16	15.0	6	.7	66	7.5	126	14.4
7	17	1.8	17	4.6	16	15.2	7	.8	67	7.6	127	14.5
8	17	2.0	17	4.8	16	15.4	8	.9	68	7.8	128	14.6
9	17	2.3	17	5.1	16	15.7	9	1.0	69	7.9	129	14.7
10	17	2.5	17	5.3	16	15.9	10	1.1	70	8.0	130	14.8
11	17	2.8	17	5.6	16	16.2	11	1.3	71	8.1	131	15.0
12	17	3.0	17	5.8	16	16.4	12	1.4	72	8.2	132	15.1
13	17	3.3	17	6.1	16	16.6	13	1.5	73	8.3	133	15.2
14	17	3.5	17	6.3	16	16.9	14	1.6	74	8.4	134	15.3
15	17	3.8	17	6.6	16	17.1	15	1.7	75	8.6	135	15.4
16	17	4.0	17	6.8	16	17.4	16	1.8	76	8.7	136	15.5
17	17	4.3	17	7.1	16	17.6	17	1.9	77	8.8	137	15.6
18	17	4.5	17	7.3	16	17.8	18	2.1	78	8.9	138	15.8
19	17	4.8	17	7.6	16	18.1	19	2.2	79	9.0	139	15.9
20	17	5.0	17	7.8	16	18.3	20	2.3	80	9.1	140	16.0
21	17	5.3	17	8.1	16	18.5	21	2.4	81	9.2	141	16.1
22	17	5.5	17	8.3	16	18.8	22	2.5	82	9.4	142	16.2
23	17	5.8	17	8.6	16	19.0	23	2.6	83	9.5	143	16.3
24	17	6.0	17	8.9	16	19.3	24	2.7	84	9.6	144	16.4
25	17	6.3	17	9.1	16	19.5	25	2.9	85	9.7	145	16.6
26	17	6.5	17	9.4	16	19.7	26	3.0	86	9.8	146	16.7
27	17	6.8	17	9.6	16	20.0	27	3.1	87	9.9	147	16.8
28	17	7.0	17	9.9	16	20.2	28	3.2	88	10.0	148	16.9
29	17	7.3	17	10.1	16	20.5	29	3.3	89	10.2	149	17.0
30	17	7.5	17	10.4	16	20.7	30	3.4	90	10.3	150	17.1
31	17	7.8	17	10.6	16	20.9	31	3.5	91	10.4	151	17.2
32	17	8.0	17	10.9	16	21.2	32	3.7	92	10.5	152	17.4
33	17	8.3	17	11.1	16	21.4	33	3.8	93	10.6	153	17.5
34	17	8.5	17	11.4	16	21.6	34	3.9	94	10.7	154	17.6
35	17	8.8	17	11.6	16	21.9	35	4.0	95	10.8	155	17.7
36	17	9.0	17	11.9	16	22.1	36	4.1	96	11.0	156	17.8
37	17	9.3	17	12.1	16	22.4	37	4.2	97	11.1	157	17.9
38	17	9.5	17	12.4	16	22.6	38	4.3	98	11.2	158	18.0
39	17	9.8	17	12.6	16	22.8	39	4.5	99	11.3	159	18.2
40	17	10.0	17	12.9	16	23.1	40	4.6	100	11.4	160	18.3
41	17	10.3	17	13.1	16	23.3	41	4.7	101	11.5	161	18.4
42	17	10.5	17	13.4	16	23.6	42	4.8	102	11.6	162	18.5
43	17	10.8	17	13.6	16	23.8	43	4.9	103	11.8	163	18.6
44	17	11.0	17	13.9	16	24.0	44	5.0	104	11.9	164	18.7
45	17	11.3	17	14.1	16	24.3	45	5.1	105	12.0	165	18.8
46	17	11.5	17	14.4	16	24.5	46	5.3	106	12.1	166	19.0
47	17	11.8	17	14.6	16	24.7	47	5.4	107	12.2	167	19.1
48	17	12.0	17	14.9	16	25.0	48	5.5	108	12.3	168	19.2
49	17	12.3	17	15.1	16	25.2	49	5.6	109	12.4	169	19.3
50	17	12.5	17	15.4	16	25.5	50	5.7	110	12.6	170	19.4
51	17	12.8	17	15.6	16	25.7	51	5.8	111	12.7	171	19.5
52	17	13.0	17	15.9	16	25.9	52	5.9	112	12.8	172	19.6
53	17	13.3	17	16.1	16	26.2	53	6.1	113	12.9	173	19.8
54	17	13.5	17	16.4	16	26.4	54	6.2	114	13.0	174	19.9
55	17	13.8	17	16.6	16	26.7	55	6.3	115	13.1	175	20.0
56	17	14.0	17	16.9	16	26.9	56	6.4	116	13.2	176	20.1
57	17	14.3	17	17.1	16	27.1	57	6.5	117	13.4	177	20.2
58	17	14.5	17	17.4	16	27.4	58	6.6	118	13.5	178	20.3
59	17	14.8	17	17.6	16	27.6	59	6.7	119	13.6	179	20.4
60	17	15.0	17	17.9	16	27.9	60	6.9	120	13.7	180	20.6

1 h 9 min

POPRAVKA ČASOVNOG UGLA					POPRAVKA DRUGOG REDA za časovni ugao i deklinaciju Sunca, Mjeseca i planeta					
s	SUNCA I PLANETA		PROLJEĆNE TAČKE ♈		MJESECA ☾		Δ	popr.	Δ	popr.	Δ	popr.
	°	′	°	′	°	′		′		′		′
0	17	15.0	17	17.9	16	27.9	0	.0	60	7.0	120	13.9
1	17	15.3	17	18.1	16	28.1	1	.1	61	7.1	121	14.0
2	17	15.5	17	18.4	16	28.3	2	.2	62	7.2	122	14.1
3	17	15.8	17	18.6	16	28.6	3	.3	63	7.3	123	14.2
4	17	16.0	17	18.9	16	28.8	4	.5	64	7.4	124	14.4
5	17	16.3	17	19.1	16	29.0	5	.6	65	7.5	125	14.5
6	17	16.5	17	19.4	16	29.3	6	.7	66	7.6	126	14.6
7	17	16.8	17	19.6	16	29.5	7	.8	67	7.8	127	14.7
8	17	17.0	17	19.9	16	29.8	8	.9	68	7.9	128	14.8
9	17	17.3	17	20.1	16	30.0	9	1.0	69	8.0	129	14.9
10	17	17.5	17	20.4	16	30.2	10	1.2	70	8.1	130	15.1
11	17	17.8	17	20.6	16	30.5	11	1.3	71	8.2	131	15.2
12	17	18.0	17	20.9	16	30.7	12	1.4	72	8.3	132	15.3
13	17	18.3	17	21.1	16	31.0	13	1.5	73	8.5	133	15.4
14	17	18.5	17	21.4	16	31.2	14	1.6	74	8.6	134	15.5
15	17	18.8	17	21.6	16	31.4	15	1.7	75	8.7	135	15.6
16	17	19.0	17	21.9	16	31.7	16	1.9	76	8.8	136	15.8
17	17	19.3	17	22.1	16	31.9	17	2.0	77	8.9	137	15.9
18	17	19.5	17	22.4	16	32.1	18	2.1	78	9.0	138	16.0
19	17	19.8	17	22.6	16	32.4	19	2.2	79	9.2	139	16.1
20	17	20.0	17	22.9	16	32.6	20	2.3	80	9.3	140	16.2
21	17	20.3	17	23.1	16	32.9	21	2.4	81	9.4	141	16.3
22	17	20.5	17	23.4	16	33.1	22	2.5	82	9.5	142	16.4
23	17	20.8	17	23.6	16	33.3	23	2.7	83	9.6	143	16.6
24	17	21.0	17	23.9	16	33.6	24	2.8	84	9.7	144	16.7
25	17	21.3	17	24.1	16	33.8	25	2.9	85	9.8	145	16.8
26	17	21.5	17	24.4	16	34.1	26	3.0	86	10.0	146	16.9
27	17	21.8	17	24.6	16	34.3	27	3.1	87	10.1	147	17.0
28	17	22.0	17	24.9	16	34.5	28	3.2	88	10.2	148	17.1
29	17	22.3	17	25.1	16	34.8	29	3.4	89	10.3	149	17.3
30	17	22.5	17	25.4	16	35.0	30	3.5	90	10.4	150	17.4
31	17	22.8	17	25.6	16	35.2	31	3.6	91	10.5	151	17.5
32	17	23.0	17	25.9	16	35.5	32	3.7	92	10.7	152	17.6
33	17	23.3	17	26.1	16	35.7	33	3.8	93	10.8	153	17.7
34	17	23.5	17	26.4	16	36.0	34	3.9	94	10.9	154	17.8
35	17	23.8	17	26.6	16	36.2	35	4.1	95	11.0	155	18.0
36	17	24.0	17	26.9	16	36.4	36	4.2	96	11.1	156	18.1
37	17	24.3	17	27.2	16	36.7	37	4.3	97	11.2	157	18.2
38	17	24.5	17	27.4	16	36.9	38	4.4	98	11.4	158	18.3
39	17	24.8	17	27.7	16	37.2	39	4.5	99	11.5	159	18.4
40	17	25.0	17	27.9	16	37.4	40	4.6	100	11.6	160	18.5
41	17	25.3	17	28.2	16	37.6	41	4.7	101	11.7	161	18.6
42	17	25.5	17	28.4	16	37.9	42	4.9	102	11.8	162	18.8
43	17	25.8	17	28.7	16	38.1	43	5.0	103	11.9	163	18.9
44	17	26.0	17	28.9	16	38.3	44	5.1	104	12.0	164	19.0
45	17	26.3	17	29.2	16	38.6	45	5.2	105	12.2	165	19.1
46	17	26.5	17	29.4	16	38.8	46	5.3	106	12.3	166	19.2
47	17	26.8	17	29.7	16	39.1	47	5.4	107	12.4	167	19.3
48	17	27.0	17	29.9	16	39.3	48	5.6	108	12.5	168	19.5
49	17	27.3	17	30.2	16	39.5	49	5.7	109	12.6	169	19.6
50	17	27.5	17	30.4	16	39.8	50	5.8	110	12.7	170	19.7
51	17	27.8	17	30.7	16	40.0	51	5.9	111	12.9	171	19.8
52	17	28.0	17	30.9	16	40.3	52	6.0	112	13.0	172	19.9
53	17	28.3	17	31.2	16	40.5	53	6.1	113	13.1	173	20.0
54	17	28.5	17	31.4	16	40.7	54	6.3	114	13.2	174	20.2
55	17	28.8	17	31.7	16	41.0	55	6.4	115	13.3	175	20.3
56	17	29.0	17	31.9	16	41.2	56	6.5	116	13.4	176	20.4
57	17	29.3	17	32.2	16	41.5	57	6.6	117	13.6	177	20.5
58	17	29.5	17	32.4	16	41.7	58	6.7	118	13.7	178	20.6
59	17	29.8	17	32.7	16	41.9	59	6.8	119	13.8	179	20.7
60	17	30.0	17	32.9	16	42.2	60	7.0	120	13.9	180	20.9

1 h 10 min

POPRAVKA ČASOVNOG UGLA				POPRAVKA DRUGOG REDA za časovni ugao i deklinaciju Sunca, Mjeseca i planeta					
s	SUNCA I PLANETA	PROLJEĆNE TAČKE ♈	MJESECA ☾	Δ	popr.	Δ	popr.	Δ	popr.
	° ′	° ′	° ′		′		′		′
0	17 30.0	17 32.9	16 42.2	0	.0	60	7.1	120	14.1
1	17 30.3	17 33.2	16 42.4	1	.1	61	7.2	121	14.2
2	17 30.5	17 33.4	16 42.6	2	.2	62	7.3	122	14.3
3	17 30.8	17 33.7	16 42.9	3	.4	63	7.4	123	14.5
4	17 31.0	17 33.9	16 43.1	4	.5	64	7.5	124	14.6
5	17 31.3	17 34.2	16 43.4	5	.6	65	7.6	125	14.7
6	17 31.5	17 34.4	16 43.6	6	.7	66	7.8	126	14.8
7	17 31.8	17 34.7	16 43.8	7	.8	67	7.9	127	14.9
8	17 32.0	17 34.9	16 44.1	8	.9	68	8.0	128	15.0
9	17 32.3	17 35.2	16 44.3	9	1.1	69	8.1	129	15.2
10	17 32.5	17 35.4	16 44.6	10	1.2	70	8.2	130	15.3
11	17 32.8	17 35.7	16 44.8	11	1.3	71	8.3	131	15.4
12	17 33.0	17 35.9	16 45.0	12	1.4	72	8.5	132	15.5
13	17 33.3	17 36.2	16 45.3	13	1.5	73	8.6	133	15.6
14	17 33.5	17 36.4	16 45.5	14	1.6	74	8.7	134	15.7
15	17 33.8	17 36.7	16 45.7	15	1.8	75	8.8	135	15.9
16	17 34.0	17 36.9	16 46.0	16	1.9	76	8.9	136	16.0
17	17 34.3	17 37.2	16 46.2	17	2.0	77	9.0	137	16.1
18	17 34.5	17 37.4	16 46.5	18	2.1	78	9.2	138	16.2
19	17 34.8	17 37.7	16 46.7	19	2.2	79	9.3	139	16.3
20	17 35.0	17 37.9	16 46.9	20	2.4	80	9.4	140	16.5
21	17 35.3	17 38.2	16 47.2	21	2.5	81	9.5	141	16.6
22	17 35.5	17 38.4	16 47.4	22	2.6	82	9.6	142	16.7
23	17 35.8	17 38.7	16 47.7	23	2.7	83	9.8	143	16.8
24	17 36.0	17 38.9	16 47.9	24	2.8	84	9.9	144	16.9
25	17 36.3	17 39.2	16 48.1	25	2.9	85	10.0	145	17.0
26	17 36.5	17 39.4	16 48.4	26	3.1	86	10.1	146	17.2
27	17 36.8	17 39.7	16 48.6	27	3.2	87	10.2	147	17.3
28	17 37.0	17 39.9	16 48.8	28	3.3	88	10.3	148	17.4
29	17 37.3	17 40.2	16 49.1	29	3.4	89	10.5	149	17.5
30	17 37.5	17 40.4	16 49.3	30	3.5	90	10.6	150	17.6
31	17 37.8	17 40.7	16 49.6	31	3.6	91	10.7	151	17.7
32	17 38.0	17 40.9	16 49.8	32	3.8	92	10.8	152	17.9
33	17 38.3	17 41.2	16 50.0	33	3.9	93	10.9	153	18.0
34	17 38.5	17 41.4	16 50.3	34	4.0	94	11.0	154	18.1
35	17 38.8	17 41.7	16 50.5	35	4.1	95	11.2	155	18.2
36	17 39.0	17 41.9	16 50.8	36	4.2	96	11.3	156	18.3
37	17 39.3	17 42.2	16 51.0	37	4.3	97	11.4	157	18.4
38	17 39.5	17 42.4	16 51.2	38	4.5	98	11.5	158	18.6
39	17 39.8	17 42.7	16 51.5	39	4.6	99	11.6	159	18.7
40	17 40.0	17 42.9	16 51.7	40	4.7	100	11.8	160	18.8
41	17 40.3	17 43.2	16 51.9	41	4.8	101	11.9	161	18.9
42	17 40.5	17 43.4	16 52.2	42	4.9	102	12.0	162	19.0
43	17 40.8	17 43.7	16 52.4	43	5.1	103	12.1	163	19.2
44	17 41.0	17 43.9	16 52.7	44	5.2	104	12.2	164	19.3
45	17 41.3	17 44.2	16 52.9	45	5.3	105	12.3	165	19.4
46	17 41.5	17 44.4	16 53.1	46	5.4	106	12.5	166	19.5
47	17 41.8	17 44.7	16 53.4	47	5.5	107	12.6	167	19.6
48	17 42.0	17 45.0	16 53.6	48	5.6	108	12.7	168	19.7
49	17 42.3	17 45.2	16 53.9	49	5.8	109	12.8	169	19.9
50	17 42.5	17 45.5	16 54.1	50	5.9	110	12.9	170	20.0
51	17 42.8	17 45.7	16 54.3	51	6.0	111	13.0	171	20.1
52	17 43.0	17 46.0	16 54.6	52	6.1	112	13.2	172	20.2
53	17 43.3	17 46.2	16 54.8	53	6.2	113	13.3	173	20.3
54	17 43.5	17 46.5	16 55.1	54	6.3	114	13.4	174	20.4
55	17 43.8	17 46.7	16 55.3	55	6.5	115	13.5	175	20.6
56	17 44.0	17 47.0	16 55.5	56	6.6	116	13.6	176	20.7
57	17 44.3	17 47.2	16 55.8	57	6.7	117	13.7	177	20.8
58	17 44.5	17 47.5	16 56.0	58	6.8	118	13.9	178	20.9
59	17 44.8	17 47.7	16 56.2	59	6.9	119	14.0	179	21.0
60	17 45.0	17 48.0	16 56.5	60	7.1	120	14.1	180	21.2

1 h 11 min

POPRAVKA ČASOVNOG UGLA				POPRAVKA DRUGOG REDA za časovni ugao i deklinaciju Sunca, Mjeseca i planeta					
s	SUNCA I PLANETA	PROLJEĆNE TAČKE ♈	MJESECA ☾	Δ	popr.	Δ	popr.	Δ	popr.
	° ′	° ′	° ′		′		′		′
0	17 45.0	17 48.0	16 56.5	0	.0	60	7.2	120	14.3
1	17 45.3	17 48.2	16 56.7	1	.1	61	7.3	121	14.4
2	17 45.5	17 48.5	16 57.0	2	.2	62	7.4	122	14.5
3	17 45.8	17 48.7	16 57.2	3	.4	63	7.5	123	14.7
4	17 46.0	17 49.0	16 57.4	4	.5	64	7.6	124	14.8
5	17 46.3	17 49.2	16 57.7	5	.6	65	7.7	125	14.9
6	17 46.5	17 49.5	16 57.9	6	.7	66	7.9	126	15.0
7	17 46.8	17 49.7	16 58.2	7	.8	67	8.0	127	15.1
8	17 47.0	17 50.0	16 58.4	8	1.0	68	8.1	128	15.3
9	17 47.3	17 50.2	16 58.6	9	1.1	69	8.2	129	15.4
10	17 47.5	17 50.5	16 58.9	10	1.2	70	8.3	130	15.5
11	17 47.8	17 50.7	16 59.1	11	1.3	71	8.5	131	15.6
12	17 48.0	17 51.0	16 59.3	12	1.4	72	8.6	132	15.7
13	17 48.3	17 51.2	16 59.6	13	1.5	73	8.7	133	15.8
14	17 48.5	17 51.5	16 59.8	14	1.7	74	8.8	134	16.0
15	17 48.8	17 51.7	17 .1	15	1.8	75	8.9	135	16.1
16	17 49.0	17 52.0	17 .3	16	1.9	76	9.1	136	16.2
17	17 49.3	17 52.2	17 .5	17	2.0	77	9.2	137	16.3
18	17 49.5	17 52.5	17 .8	18	2.1	78	9.3	138	16.4
19	17 49.8	17 52.7	17 1.0	19	2.3	79	9.4	139	16.6
20	17 50.0	17 53.0	17 1.3	20	2.4	80	9.5	140	16.7
21	17 50.3	17 53.2	17 1.5	21	2.5	81	9.7	141	16.8
22	17 50.5	17 53.5	17 1.7	22	2.6	82	9.8	142	16.9
23	17 50.8	17 53.7	17 2.0	23	2.7	83	9.9	143	17.0
24	17 51.0	17 54.0	17 2.2	24	2.9	84	10.0	144	17.2
25	17 51.3	17 54.2	17 2.4	25	3.0	85	10.1	145	17.3
26	17 51.5	17 54.5	17 2.7	26	3.1	86	10.2	146	17.4
27	17 51.8	17 54.7	17 2.9	27	3.2	87	10.4	147	17.5
28	17 52.0	17 55.0	17 3.2	28	3.3	88	10.5	148	17.6
29	17 52.3	17 55.2	17 3.4	29	3.5	89	10.6	149	17.8
30	17 52.5	17 55.5	17 3.6	30	3.6	90	10.7	150	17.9
31	17 52.8	17 55.7	17 3.9	31	3.7	91	10.8	151	18.0
32	17 53.0	17 56.0	17 4.1	32	3.8	92	11.0	152	18.1
33	17 53.3	17 56.2	17 4.4	33	3.9	93	11.1	153	18.2
34	17 53.5	17 56.5	17 4.6	34	4.1	94	11.2	154	18.4
35	17 53.8	17 56.7	17 4.8	35	4.2	95	11.3	155	18.5
36	17 54.0	17 57.0	17 5.1	36	4.3	96	11.4	156	18.6
37	17 54.3	17 57.2	17 5.3	37	4.4	97	11.6	157	18.7
38	17 54.5	17 57.5	17 5.6	38	4.5	98	11.7	158	18.8
39	17 54.8	17 57.7	17 5.8	39	4.6	99	11.8	159	18.9
40	17 55.0	17 58.0	17 6.0	40	4.8	100	11.9	160	19.1
41	17 55.3	17 58.2	17 6.3	41	4.9	101	12.0	161	19.2
42	17 55.5	17 58.5	17 6.5	42	5.0	102	12.2	162	19.3
43	17 55.8	17 58.7	17 6.7	43	5.1	103	12.3	163	19.4
44	17 56.0	17 59.0	17 7.0	44	5.2	104	12.4	164	19.5
45	17 56.3	17 59.2	17 7.2	45	5.4	105	12.5	165	19.7
46	17 56.5	17 59.5	17 7.5	46	5.5	106	12.6	166	19.8
47	17 56.8	17 59.7	17 7.7	47	5.6	107	12.8	167	19.9
48	17 57.0	17 60.0	17 7.9	48	5.7	108	12.9	168	20.0
49	17 57.3	18 .2	17 8.2	49	5.8	109	13.0	169	20.1
50	17 57.5	18 .5	17 8.4	50	6.0	110	13.1	170	20.3
51	17 57.8	18 .7	17 8.7	51	6.1	111	13.2	171	20.4
52	17 58.0	18 1.0	17 8.9	52	6.2	112	13.3	172	20.5
53	17 58.3	18 1.2	17 9.1	53	6.3	113	13.5	173	20.6
54	17 58.5	18 1.5	17 9.4	54	6.4	114	13.6	174	20.7
55	17 58.8	18 1.7	17 9.6	55	6.6	115	13.7	175	20.9
56	17 59.0	18 2.0	17 9.8	56	6.7	116	13.8	176	21.0
57	17 59.3	18 2.2	17 10.1	57	6.8	117	13.9	177	21.1
58	17 59.5	18 2.5	17 10.3	58	6.9	118	14.1	178	21.2
59	17 59.8	18 2.7	17 10.6	59	7.0	119	14.2	179	21.3
60	18 .0	18 3.0	17 10.8	60	7.2	120	14.3	180	21.5

1 h 12 min

POPRAVKA ČASOVNOG UGLA					POPRAVKA DRUGOG REDA za časovni ugao i deklinaciju Sunca, Mjeseca i planeta					
s	SUNCA I PLANETA		PROLJEĆNE TAČKE ♈		MJESECA ☾		Δ	popr.	Δ	popr.	Δ	popr.
	°	′	°	′	°	′		′		′		′
0	18	.0	18	3.0	17	10.8	0	.0	60	7.3	120	14.5
1	18	.3	18	3.3	17	11.0	1	.1	61	7.4	121	14.6
2	18	.5	18	3.5	17	11.3	2	.2	62	7.5	122	14.7
3	18	.8	18	3.8	17	11.5	3	.4	63	7.6	123	14.9
4	18	1.0	18	4.0	17	11.8	4	.5	64	7.7	124	15.0
5	18	1.3	18	4.3	17	12.0	5	.6	65	7.9	125	15.1
6	18	1.5	18	4.5	17	12.2	6	.7	66	8.0	126	15.2
7	18	1.8	18	4.8	17	12.5	7	.8	67	8.1	127	15.3
8	18	2.0	18	5.0	17	12.7	8	1.0	68	8.2	128	15.5
9	18	2.3	18	5.3	17	12.9	9	1.1	69	8.3	129	15.6
10	18	2.5	18	5.5	17	13.2	10	1.2	70	8.5	130	15.7
11	18	2.8	18	5.8	17	13.4	11	1.3	71	8.6	131	15.8
12	18	3.0	18	6.0	17	13.7	12	1.5	72	8.7	132	16.0
13	18	3.3	18	6.3	17	13.9	13	1.6	73	8.8	133	16.1
14	18	3.5	18	6.5	17	14.1	14	1.7	74	8.9	134	16.2
15	18	3.8	18	6.8	17	14.4	15	1.8	75	9.1	135	16.3
16	18	4.0	18	7.0	17	14.6	16	1.9	76	9.2	136	16.4
17	18	4.3	18	7.3	17	14.9	17	2.1	77	9.3	137	16.6
18	18	4.5	18	7.5	17	15.1	18	2.2	78	9.4	138	16.7
19	18	4.8	18	7.8	17	15.3	19	2.3	79	9.5	139	16.8
20	18	5.0	18	8.0	17	15.6	20	2.4	80	9.7	140	16.9
21	18	5.3	18	8.3	17	15.8	21	2.5	81	9.8	141	17.0
22	18	5.5	18	8.5	17	16.0	22	2.7	82	9.9	142	17.2
23	18	5.8	18	8.8	17	16.3	23	2.8	83	10.0	143	17.3
24	18	6.0	18	9.0	17	16.5	24	2.9	84	10.2	144	17.4
25	18	6.3	18	9.3	17	16.8	25	3.0	85	10.3	145	17.5
26	18	6.5	18	9.5	17	17.0	26	3.1	86	10.4	146	17.6
27	18	6.8	18	9.8	17	17.2	27	3.3	87	10.5	147	17.8
28	18	7.0	18	10.0	17	17.5	28	3.4	88	10.6	148	17.9
29	18	7.3	18	10.3	17	17.7	29	3.5	89	10.8	149	18.0
30	18	7.5	18	10.5	17	18.0	30	3.6	90	10.9	150	18.1
31	18	7.8	18	10.8	17	18.2	31	3.7	91	11.0	151	18.2
32	18	8.0	18	11.0	17	18.4	32	3.9	92	11.1	152	18.4
33	18	8.3	18	11.3	17	18.7	33	4.0	93	11.2	153	18.5
34	18	8.5	18	11.5	17	18.9	34	4.1	94	11.4	154	18.6
35	18	8.8	18	11.8	17	19.2	35	4.2	95	11.5	155	18.7
36	18	9.0	18	12.0	17	19.4	36	4.4	96	11.6	156	18.9
37	18	9.3	18	12.3	17	19.6	37	4.5	97	11.7	157	19.0
38	18	9.5	18	12.5	17	19.9	38	4.6	98	11.8	158	19.1
39	18	9.8	18	12.8	17	20.1	39	4.7	99	12.0	159	19.2
40	18	10.0	18	13.0	17	20.3	40	4.8	100	12.1	160	19.3
41	18	10.3	18	13.3	17	20.6	41	5.0	101	12.2	161	19.5
42	18	10.5	18	13.5	17	20.8	42	5.1	102	12.3	162	19.6
43	18	10.8	18	13.8	17	21.1	43	5.2	103	12.4	163	19.7
44	18	11.0	18	14.0	17	21.3	44	5.3	104	12.6	164	19.8
45	18	11.3	18	14.3	17	21.5	45	5.4	105	12.7	165	19.9
46	18	11.5	18	14.5	17	21.8	46	5.6	106	12.8	166	20.1
47	18	11.8	18	14.8	17	22.0	47	5.7	107	12.9	167	20.2
48	18	12.0	18	15.0	17	22.3	48	5.8	108	13.1	168	20.3
49	18	12.3	18	15.3	17	22.5	49	5.9	109	13.2	169	20.4
50	18	12.5	18	15.5	17	22.7	50	6.0	110	13.3	170	20.5
51	18	12.8	18	15.8	17	23.0	51	6.2	111	13.4	171	20.7
52	18	13.0	18	16.0	17	23.2	52	6.3	112	13.5	172	20.8
53	18	13.3	18	16.3	17	23.4	53	6.4	113	13.7	173	20.9
54	18	13.5	18	16.5	17	23.7	54	6.5	114	13.8	174	21.0
55	18	13.8	18	16.8	17	23.9	55	6.6	115	13.9	175	21.1
56	18	14.0	18	17.0	17	24.2	56	6.8	116	14.0	176	21.3
57	18	14.3	18	17.3	17	24.4	57	6.9	117	14.1	177	21.4
58	18	14.5	18	17.5	17	24.6	58	7.0	118	14.3	178	21.5
59	18	14.8	18	17.8	17	24.9	59	7.1	119	14.4	179	21.6
60	18	15.0	18	18.0	17	25.1	60	7.3	120	14.5	180	21.8

1 h 13 min

POPRAVKA ČASOVNOG UGLA					POPRAVKA DRUGOG REDA za časovni ugao i deklinaciju Sunca, Mjeseca i planeta					
s	SUNCA I PLANETA		PROLJEĆNE TAČKE ♈		MJESECA ☾		Δ	popr.	Δ	popr.	Δ	popr.
	°	′	°	′	°	′		′		′		′
0	18	15.0	18	18.0	17	25.1	0	.0	60	7.4	120	14.7
1	18	15.3	18	18.3	17	25.4	1	.1	61	7.5	121	14.8
2	18	15.5	18	18.5	17	25.6	2	.2	62	7.6	122	14.9
3	18	15.8	18	18.8	17	25.8	3	.4	63	7.7	123	15.1
4	18	16.0	18	19.0	17	26.1	4	.5	64	7.8	124	15.2
5	18	16.3	18	19.3	17	26.3	5	.6	65	8.0	125	15.3
6	18	16.5	18	19.5	17	26.5	6	.7	66	8.1	126	15.4
7	18	16.8	18	19.8	17	26.8	7	.9	67	8.2	127	15.6
8	18	17.0	18	20.0	17	27.0	8	1.0	68	8.3	128	15.7
9	18	17.3	18	20.3	17	27.3	9	1.1	69	8.5	129	15.8
10	18	17.5	18	20.5	17	27.5	10	1.2	70	8.6	130	15.9
11	18	17.8	18	20.8	17	27.7	11	1.3	71	8.7	131	16.0
12	18	18.0	18	21.1	17	28.0	12	1.5	72	8.8	132	16.2
13	18	18.3	18	21.3	17	28.2	13	1.6	73	8.9	133	16.3
14	18	18.5	18	21.6	17	28.5	14	1.7	74	9.1	134	16.4
15	18	18.8	18	21.8	17	28.7	15	1.8	75	9.2	135	16.5
16	18	19.0	18	22.1	17	28.9	16	2.0	76	9.3	136	16.7
17	18	19.3	18	22.3	17	29.2	17	2.1	77	9.4	137	16.8
18	18	19.5	18	22.6	17	29.4	18	2.2	78	9.6	138	16.9
19	18	19.8	18	22.8	17	29.7	19	2.3	79	9.7	139	17.0
20	18	20.0	18	23.1	17	29.9	20	2.5	80	9.8	140	17.2
21	18	20.3	18	23.3	17	30.1	21	2.6	81	9.9	141	17.3
22	18	20.5	18	23.6	17	30.4	22	2.7	82	10.0	142	17.4
23	18	20.8	18	23.8	17	30.6	23	2.8	83	10.2	143	17.5
24	18	21.0	18	24.1	17	30.8	24	2.9	84	10.3	144	17.6
25	18	21.3	18	24.3	17	31.1	25	3.1	85	10.4	145	17.8
26	18	21.5	18	24.6	17	31.3	26	3.2	86	10.5	146	17.9
27	18	21.8	18	24.8	17	31.6	27	3.3	87	10.7	147	18.0
28	18	22.0	18	25.1	17	31.8	28	3.4	88	10.8	148	18.1
29	18	22.3	18	25.3	17	32.0	29	3.6	89	10.9	149	18.3
30	18	22.5	18	25.6	17	32.3	30	3.7	90	11.0	150	18.4
31	18	22.8	18	25.8	17	32.5	31	3.8	91	11.1	151	18.5
32	18	23.0	18	26.1	17	32.8	32	3.9	92	11.3	152	18.6
33	18	23.3	18	26.3	17	33.0	33	4.0	93	11.4	153	18.7
34	18	23.5	18	26.6	17	33.2	34	4.2	94	11.5	154	18.9
35	18	23.8	18	26.8	17	33.5	35	4.3	95	11.6	155	19.0
36	18	24.0	18	27.1	17	33.7	36	4.4	96	11.8	156	19.1
37	18	24.3	18	27.3	17	33.9	37	4.5	97	11.9	157	19.2
38	18	24.5	18	27.6	17	34.2	38	4.7	98	12.0	158	19.4
39	18	24.8	18	27.8	17	34.4	39	4.8	99	12.1	159	19.5
40	18	25.0	18	28.1	17	34.7	40	4.9	100	12.3	160	19.6
41	18	25.3	18	28.3	17	34.9	41	5.0	101	12.4	161	19.7
42	18	25.5	18	28.6	17	35.1	42	5.1	102	12.5	162	19.8
43	18	25.8	18	28.8	17	35.4	43	5.3	103	12.6	163	20.0
44	18	26.0	18	29.1	17	35.6	44	5.4	104	12.7	164	20.1
45	18	26.3	18	29.3	17	35.9	45	5.5	105	12.9	165	20.2
46	18	26.5	18	29.6	17	36.1	46	5.6	106	13.0	166	20.3
47	18	26.8	18	29.8	17	36.3	47	5.8	107	13.1	167	20.5
48	18	27.0	18	30.1	17	36.6	48	5.9	108	13.2	168	20.6
49	18	27.3	18	30.3	17	36.8	49	6.0	109	13.4	169	20.7
50	18	27.5	18	30.6	17	37.0	50	6.1	110	13.5	170	20.8
51	18	27.8	18	30.8	17	37.3	51	6.2	111	13.6	171	20.9
52	18	28.0	18	31.1	17	37.5	52	6.4	112	13.7	172	21.1
53	18	28.3	18	31.3	17	37.8	53	6.5	113	13.8	173	21.2
54	18	28.5	18	31.6	17	38.0	54	6.6	114	14.0	174	21.3
55	18	28.8	18	31.8	17	38.2	55	6.7	115	14.1	175	21.4
56	18	29.0	18	32.1	17	38.5	56	6.9	116	14.2	176	21.6
57	18	29.3	18	32.3	17	38.7	57	7.0	117	14.3	177	21.7
58	18	29.5	18	32.6	17	39.0	58	7.1	118	14.5	178	21.8
59	18	29.8	18	32.8	17	39.2	59	7.2	119	14.6	179	21.9
60	18	30.0	18	33.1	17	39.4	60	7.4	120	14.7	180	22.1

1 h 14 min

POPRAVKA ČASOVNOG UGLA				POPRAVKA DRUGOG REDA za časovni ugao i deklinaciju Sunca, Mjeseca i planeta					
s	SUNCA I PLANETA	PROLJEĆNE TAČKE ♈	MJESECA ☾	Δ	poprav.	Δ	poprav.	Δ	poprav.
	° ′	° ′	° ′		′		′		′
0	18 30.0	18 33.1	17 39.4	0	.0	60	7.5	120	14.9
1	18 30.3	18 33.3	17 39.7	1	.1	61	7.6	121	15.0
2	18 30.5	18 33.6	17 39.9	2	.2	62	7.7	122	15.1
3	18 30.8	18 33.8	17 40.1	3	.4	63	7.8	123	15.3
4	18 31.0	18 34.1	17 40.4	4	.5	64	7.9	124	15.4
5	18 31.3	18 34.3	17 40.6	5	.6	65	8.1	125	15.5
6	18 31.5	18 34.6	17 40.9	6	.7	66	8.2	126	15.6
7	18 31.8	18 34.8	17 41.1	7	.9	67	8.3	127	15.8
8	18 32.0	18 35.1	17 41.3	8	1.0	68	8.4	128	15.9
9	18 32.3	18 35.3	17 41.6	9	1.1	69	8.6	129	16.0
10	18 32.5	18 35.6	17 41.8	10	1.2	70	8.7	130	16.1
11	18 32.8	18 35.8	17 42.1	11	1.4	71	8.8	131	16.3
12	18 33.0	18 36.1	17 42.3	12	1.5	72	8.9	132	16.4
13	18 33.3	18 36.3	17 42.5	13	1.6	73	9.1	133	16.5
14	18 33.5	18 36.6	17 42.8	14	1.7	74	9.2	134	16.6
15	18 33.8	18 36.8	17 43.0	15	1.9	75	9.3	135	16.8
16	18 34.0	18 37.1	17 43.3	16	2.0	76	9.4	136	16.9
17	18 34.3	18 37.3	17 43.5	17	2.1	77	9.6	137	17.0
18	18 34.5	18 37.6	17 43.7	18	2.2	78	9.7	138	17.1
19	18 34.8	18 37.8	17 44.0	19	2.4	79	9.8	139	17.3
20	18 35.0	18 38.1	17 44.2	20	2.5	80	9.9	140	17.4
21	18 35.3	18 38.3	17 44.4	21	2.6	81	10.1	141	17.5
22	18 35.5	18 38.6	17 44.7	22	2.7	82	10.2	142	17.6
23	18 35.8	18 38.8	17 44.9	23	2.9	83	10.3	143	17.8
24	18 36.0	18 39.1	17 45.2	24	3.0	84	10.4	144	17.9
25	18 36.3	18 39.4	17 45.4	25	3.1	85	10.6	145	18.0
26	18 36.5	18 39.6	17 45.6	26	3.2	86	10.7	146	18.1
27	18 36.8	18 39.9	17 45.9	27	3.4	87	10.8	147	18.3
28	18 37.0	18 40.1	17 46.1	28	3.5	88	10.9	148	18.4
29	18 37.3	18 40.4	17 46.4	29	3.6	89	11.1	149	18.5
30	18 37.5	18 40.6	17 46.6	30	3.7	90	11.2	150	18.6
31	18 37.8	18 40.9	17 46.8	31	3.8	91	11.3	151	18.7
32	18 38.0	18 41.1	17 47.1	32	4.0	92	11.4	152	18.9
33	18 38.3	18 41.4	17 47.3	33	4.1	93	11.5	153	19.0
34	18 38.5	18 41.6	17 47.5	34	4.2	94	11.7	154	19.1
35	18 38.8	18 41.9	17 47.8	35	4.3	95	11.8	155	19.2
36	18 39.0	18 42.1	17 48.0	36	4.5	96	11.9	156	19.4
37	18 39.3	18 42.4	17 48.3	37	4.6	97	12.0	157	19.5
38	18 39.5	18 42.6	17 48.5	38	4.7	98	12.2	158	19.6
39	18 39.8	18 42.9	17 48.7	39	4.8	99	12.3	159	19.7
40	18 40.0	18 43.1	17 49.0	40	5.0	100	12.4	160	19.9
41	18 40.3	18 43.4	17 49.2	41	5.1	101	12.5	161	20.0
42	18 40.5	18 43.6	17 49.5	42	5.2	102	12.7	162	20.1
43	18 40.8	18 43.9	17 49.7	43	5.3	103	12.8	163	20.2
44	18 41.0	18 44.1	17 49.9	44	5.5	104	12.9	164	20.4
45	18 41.3	18 44.4	17 50.2	45	5.6	105	13.0	165	20.5
46	18 41.5	18 44.6	17 50.4	46	5.7	106	13.2	166	20.6
47	18 41.8	18 44.9	17 50.6	47	5.8	107	13.3	167	20.7
48	18 42.0	18 45.1	17 50.9	48	6.0	108	13.4	168	20.9
49	18 42.3	18 45.4	17 51.1	49	6.1	109	13.5	169	21.0
50	18 42.5	18 45.6	17 51.4	50	6.2	110	13.7	170	21.1
51	18 42.8	18 45.9	17 51.6	51	6.3	111	13.8	171	21.2
52	18 43.0	18 46.1	17 51.8	52	6.5	112	13.9	172	21.4
53	18 43.3	18 46.4	17 52.1	53	6.6	113	14.0	173	21.5
54	18 43.5	18 46.6	17 52.3	54	6.7	114	14.2	174	21.6
55	18 43.8	18 46.9	17 52.6	55	6.8	115	14.3	175	21.7
56	18 44.0	18 47.1	17 52.8	56	7.0	116	14.4	176	21.9
57	18 44.3	18 47.4	17 53.0	57	7.1	117	14.5	177	22.0
58	18 44.5	18 47.6	17 53.3	58	7.2	118	14.7	178	22.1
59	18 44.8	18 47.9	17 53.5	59	7.3	119	14.8	179	22.2
60	18 45.0	18 48.1	17 53.8	60	7.5	120	14.9	180	22.4

1 h 15 min

POPRAVKA ČASOVNOG UGLA				POPRAVKA DRUGOG REDA za časovni ugao i deklinaciju Sunca, Mjeseca i planeta					
s	SUNCA I PLANETA	PROLJEĆNE TAČKE ♈	MJESECA ☾	Δ	poprav.	Δ	poprav.	Δ	poprav.
	° ′	° ′	° ′		′		′		′
0	18 45.0	18 48.1	17 53.8	0	.0	60	7.6	120	15.1
1	18 45.3	18 48.4	17 54.0	1	.1	61	7.7	121	15.2
2	18 45.5	18 48.6	17 54.2	2	.3	62	7.8	122	15.4
3	18 45.8	18 48.9	17 54.5	3	.4	63	7.9	123	15.5
4	18 46.0	18 49.1	17 54.7	4	.5	64	8.1	124	15.6
5	18 46.3	18 49.4	17 54.9	5	.6	65	8.2	125	15.7
6	18 46.5	18 49.6	17 55.2	6	.8	66	8.3	126	15.9
7	18 46.8	18 49.9	17 55.4	7	.9	67	8.4	127	16.0
8	18 47.0	18 50.1	17 55.7	8	1.0	68	8.6	128	16.1
9	18 47.3	18 50.4	17 55.9	9	1.1	69	8.7	129	16.2
10	18 47.5	18 50.6	17 56.1	10	1.3	70	8.8	130	16.4
11	18 47.8	18 50.9	17 56.4	11	1.4	71	8.9	131	16.5
12	18 48.0	18 51.1	17 56.6	12	1.5	72	9.1	132	16.6
13	18 48.3	18 51.4	17 56.9	13	1.6	73	9.2	133	16.7
14	18 48.5	18 51.6	17 57.1	14	1.8	74	9.3	134	16.9
15	18 48.8	18 51.9	17 57.3	15	1.9	75	9.4	135	17.0
16	18 49.0	18 52.1	17 57.6	16	2.0	76	9.6	136	17.1
17	18 49.3	18 52.4	17 57.8	17	2.1	77	9.7	137	17.2
18	18 49.5	18 52.6	17 58.0	18	2.3	78	9.8	138	17.4
19	18 49.8	18 52.9	17 58.3	19	2.4	79	9.9	139	17.5
20	18 50.0	18 53.1	17 58.5	20	2.5	80	10.1	140	17.6
21	18 50.3	18 53.4	17 58.8	21	2.6	81	10.2	141	17.7
22	18 50.5	18 53.6	17 59.0	22	2.8	82	10.3	142	17.9
23	18 50.8	18 53.9	17 59.2	23	2.9	83	10.4	143	18.0
24	18 51.0	18 54.1	17 59.5	24	3.0	84	10.6	144	18.1
25	18 51.3	18 54.4	17 59.7	25	3.1	85	10.7	145	18.2
26	18 51.5	18 54.6	17 60.0	26	3.3	86	10.8	146	18.4
27	18 51.8	18 54.9	18 .2	27	3.4	87	10.9	147	18.5
28	18 52.0	18 55.1	18 .4	28	3.5	88	11.1	148	18.6
29	18 52.3	18 55.4	18 .7	29	3.6	89	11.2	149	18.7
30	18 52.5	18 55.6	18 .9	30	3.8	90	11.3	150	18.9
31	18 52.8	18 55.9	18 1.1	31	3.9	91	11.5	151	19.0
32	18 53.0	18 56.1	18 1.4	32	4.0	92	11.6	152	19.1
33	18 53.3	18 56.4	18 1.6	33	4.2	93	11.7	153	19.3
34	18 53.5	18 56.6	18 1.9	34	4.3	94	11.8	154	19.4
35	18 53.8	18 56.9	18 2.1	35	4.4	95	12.0	155	19.5
36	18 54.0	18 57.2	18 2.3	36	4.5	96	12.1	156	19.6
37	18 54.3	18 57.4	18 2.6	37	4.7	97	12.2	157	19.8
38	18 54.5	18 57.7	18 2.8	38	4.8	98	12.3	158	19.9
39	18 54.8	18 57.9	18 3.1	39	4.9	99	12.5	159	20.0
40	18 55.0	18 58.2	18 3.3	40	5.0	100	12.6	160	20.1
41	18 55.3	18 58.4	18 3.5	41	5.2	101	12.7	161	20.3
42	18 55.5	18 58.7	18 3.8	42	5.3	102	12.8	162	20.4
43	18 55.8	18 58.9	18 4.0	43	5.4	103	13.0	163	20.5
44	18 56.0	18 59.2	18 4.2	44	5.5	104	13.1	164	20.6
45	18 56.3	18 59.4	18 4.5	45	5.7	105	13.2	165	20.8
46	18 56.5	18 59.7	18 4.7	46	5.8	106	13.3	166	20.9
47	18 56.8	18 59.9	18 5.0	47	5.9	107	13.5	167	21.0
48	18 57.0	19 .2	18 5.2	48	6.0	108	13.6	168	21.1
49	18 57.3	19 .4	18 5.4	49	6.2	109	13.7	169	21.3
50	18 57.5	19 .7	18 5.7	50	6.3	110	13.8	170	21.4
51	18 57.8	19 .9	18 5.9	51	6.4	111	14.0	171	21.5
52	18 58.0	19 1.2	18 6.2	52	6.5	112	14.1	172	21.6
53	18 58.3	19 1.4	18 6.4	53	6.7	113	14.2	173	21.8
54	18 58.5	19 1.7	18 6.6	54	6.8	114	14.3	174	21.9
55	18 58.8	19 1.9	18 6.9	55	6.9	115	14.5	175	22.0
56	18 59.0	19 2.2	18 7.1	56	7.0	116	14.6	176	22.1
57	18 59.3	19 2.4	18 7.4	57	7.2	117	14.7	177	22.3
58	18 59.5	19 2.7	18 7.6	58	7.3	118	14.8	178	22.4
59	18 59.8	19 2.9	18 7.8	59	7.4	119	15.0	179	22.5
60	19 .0	19 3.2	18 8.1	60	7.6	120	15.1	180	22.7

1 h 16 min

POPRAVKA ČASOVNOG UGLA					POPRAVKA DRUGOG REDA za časovni ugao i deklinaciju Sunca, Mjeseca i planeta					
s	SUNCA I PLANETA		PROLJEĆNE TAČKE ♈		MJESECA ☾		Δ	poprav.	Δ	poprav.	Δ	poprav.
	°	′	°	′	°	′		′		′		′
0	19	.0	19	3.2	18	8.1	0	.0	60	7.7	120	15.3
1	19	.3	19	3.4	18	8.3	1	.1	61	7.8	121	15.4
2	19	.5	19	3.7	18	8.5	2	.3	62	7.9	122	15.6
3	19	.8	19	3.9	18	8.8	3	.4	63	8.0	123	15.7
4	19	1.0	19	4.2	18	9.0	4	.5	64	8.2	124	15.8
5	19	1.3	19	4.4	18	9.3	5	.6	65	8.3	125	15.9
6	19	1.5	19	4.7	18	9.5	6	.8	66	8.4	126	16.1
7	19	1.8	19	4.9	18	9.7	7	.9	67	8.5	127	16.2
8	19	2.0	19	5.2	18	10.0	8	1.0	68	8.7	128	16.3
9	19	2.3	19	5.4	18	10.2	9	1.1	69	8.8	129	16.4
10	19	2.5	19	5.7	18	10.5	10	1.3	70	8.9	130	16.6
11	19	2.8	19	5.9	18	10.7	11	1.4	71	9.1	131	16.7
12	19	3.0	19	6.2	18	10.9	12	1.5	72	9.2	132	16.8
13	19	3.3	19	6.4	18	11.2	13	1.7	73	9.3	133	17.0
14	19	3.5	19	6.7	18	11.4	14	1.8	74	9.4	134	17.1
15	19	3.8	19	6.9	18	11.6	15	1.9	75	9.6	135	17.2
16	19	4.0	19	7.2	18	11.9	16	2.0	76	9.7	136	17.3
17	19	4.3	19	7.4	18	12.1	17	2.2	77	9.8	137	17.5
18	19	4.5	19	7.7	18	12.4	18	2.3	78	9.9	138	17.6
19	19	4.8	19	7.9	18	12.6	19	2.4	79	10.1	139	17.7
20	19	5.0	19	8.2	18	12.8	20	2.6	80	10.2	140	17.9
21	19	5.3	19	8.4	18	13.1	21	2.7	81	10.3	141	18.0
22	19	5.5	19	8.7	18	13.3	22	2.8	82	10.5	142	18.1
23	19	5.8	19	8.9	18	13.6	23	2.9	83	10.6	143	18.2
24	19	6.0	19	9.2	18	13.8	24	3.1	84	10.7	144	18.4
25	19	6.3	19	9.4	18	14.0	25	3.2	85	10.8	145	18.5
26	19	6.5	19	9.7	18	14.3	26	3.3	86	11.0	146	18.6
27	19	6.8	19	9.9	18	14.5	27	3.4	87	11.1	147	18.7
28	19	7.0	19	10.2	18	14.7	28	3.6	88	11.2	148	18.9
29	19	7.3	19	10.4	18	15.0	29	3.7	89	11.3	149	19.0
30	19	7.5	19	10.7	18	15.2	30	3.8	90	11.5	150	19.1
31	19	7.8	19	10.9	18	15.5	31	4.0	91	11.6	151	19.3
32	19	8.0	19	11.2	18	15.7	32	4.1	92	11.7	152	19.4
33	19	8.3	19	11.4	18	15.9	33	4.2	93	11.9	153	19.5
34	19	8.5	19	11.7	18	16.2	34	4.3	94	12.0	154	19.6
35	19	8.8	19	11.9	18	16.4	35	4.5	95	12.1	155	19.8
36	19	9.0	19	12.2	18	16.7	36	4.6	96	12.2	156	19.9
37	19	9.3	19	12.4	18	16.9	37	4.7	97	12.4	157	20.0
38	19	9.5	19	12.7	18	17.1	38	4.8	98	12.5	158	20.1
39	19	9.8	19	12.9	18	17.4	39	5.0	99	12.6	159	20.3
40	19	10.0	19	13.2	18	17.6	40	5.1	100	12.8	160	20.4
41	19	10.3	19	13.4	18	17.8	41	5.2	101	12.9	161	20.5
42	19	10.5	19	13.7	18	18.1	42	5.4	102	13.0	162	20.7
43	19	10.8	19	13.9	18	18.3	43	5.5	103	13.1	163	20.8
44	19	11.0	19	14.2	18	18.6	44	5.6	104	13.3	164	20.9
45	19	11.3	19	14.4	18	18.8	45	5.7	105	13.4	165	21.0
46	19	11.5	19	14.7	18	19.0	46	5.9	106	13.5	166	21.2
47	19	11.8	19	14.9	18	19.3	47	6.0	107	13.6	167	21.3
48	19	12.0	19	15.2	18	19.5	48	6.1	108	13.8	168	21.4
49	19	12.3	19	15.5	18	19.8	49	6.2	109	13.9	169	21.5
50	19	12.5	19	15.7	18	20.0	50	6.4	110	14.0	170	21.7
51	19	12.8	19	16.0	18	20.2	51	6.5	111	14.2	171	21.8
52	19	13.0	19	16.2	18	20.5	52	6.6	112	14.3	172	21.9
53	19	13.3	19	16.5	18	20.7	53	6.8	113	14.4	173	22.1
54	19	13.5	19	16.7	18	21.0	54	6.9	114	14.5	174	22.2
55	19	13.8	19	17.0	18	21.2	55	7.0	115	14.7	175	22.3
56	19	14.0	19	17.2	18	21.4	56	7.1	116	14.8	176	22.4
57	19	14.3	19	17.5	18	21.7	57	7.3	117	14.9	177	22.6
58	19	14.5	19	17.7	18	21.9	58	7.4	118	15.0	178	22.7
59	19	14.8	19	18.0	18	22.1	59	7.5	119	15.2	179	22.8
60	19	15.0	19	18.2	18	22.4	60	7.7	120	15.3	180	23.0

1 h 17 min

POPRAVKA ČASOVNOG UGLA					POPRAVKA DRUGOG REDA za časovni ugao i deklinaciju Sunca, Mjeseca i planeta					
s	SUNCA I PLANETA		PROLJEĆNE TAČKE ♈		MJESECA ☾		Δ	poprav.	Δ	poprav.	Δ	poprav.
	°	′	°	′	°	′		′		′		′
0	19	15.0	19	18.2	18	22.4	0	.0	60	7.8	120	15.5
1	19	15.3	19	18.5	18	22.6	1	.1	61	7.9	121	15.6
2	19	15.5	19	18.7	18	22.9	2	.3	62	8.0	122	15.8
3	19	15.8	19	19.0	18	23.1	3	.4	63	8.1	123	15.9
4	19	16.0	19	19.2	18	23.3	4	.5	64	8.3	124	16.0
5	19	16.3	19	19.5	18	23.6	5	.6	65	8.4	125	16.1
6	19	16.5	19	19.7	18	23.8	6	.8	66	8.5	126	16.3
7	19	16.8	19	20.0	18	24.1	7	.9	67	8.7	127	16.4
8	19	17.0	19	20.2	18	24.3	8	1.0	68	8.8	128	16.5
9	19	17.3	19	20.5	18	24.5	9	1.2	69	8.9	129	16.7
10	19	17.5	19	20.7	18	24.8	10	1.3	70	9.0	130	16.8
11	19	17.8	19	21.0	18	25.0	11	1.4	71	9.2	131	16.9
12	19	18.0	19	21.2	18	25.2	12	1.6	72	9.3	132	17.1
13	19	18.3	19	21.5	18	25.5	13	1.7	73	9.4	133	17.2
14	19	18.5	19	21.7	18	25.7	14	1.8	74	9.6	134	17.3
15	19	18.8	19	22.0	18	26.0	15	1.9	75	9.7	135	17.4
16	19	19.0	19	22.2	18	26.2	16	2.1	76	9.8	136	17.6
17	19	19.3	19	22.5	18	26.4	17	2.2	77	9.9	137	17.7
18	19	19.5	19	22.7	18	26.7	18	2.3	78	10.1	138	17.8
19	19	19.8	19	23.0	18	26.9	19	2.5	79	10.2	139	18.0
20	19	20.0	19	23.2	18	27.2	20	2.6	80	10.3	140	18.1
21	19	20.3	19	23.5	18	27.4	21	2.7	81	10.5	141	18.2
22	19	20.5	19	23.7	18	27.6	22	2.8	82	10.6	142	18.3
23	19	20.8	19	24.0	18	27.9	23	3.0	83	10.7	143	18.5
24	19	21.0	19	24.2	18	28.1	24	3.1	84	10.9	144	18.6
25	19	21.3	19	24.5	18	28.3	25	3.2	85	11.0	145	18.7
26	19	21.5	19	24.7	18	28.6	26	3.4	86	11.1	146	18.9
27	19	21.8	19	25.0	18	28.8	27	3.5	87	11.2	147	19.0
28	19	22.0	19	25.2	18	29.1	28	3.6	88	11.4	148	19.1
29	19	22.3	19	25.5	18	29.3	29	3.7	89	11.5	149	19.2
30	19	22.5	19	25.7	18	29.5	30	3.9	90	11.6	150	19.4
31	19	22.8	19	26.0	18	29.8	31	4.0	91	11.8	151	19.5
32	19	23.0	19	26.2	18	30.0	32	4.1	92	11.9	152	19.6
33	19	23.3	19	26.5	18	30.3	33	4.3	93	12.0	153	19.8
34	19	23.5	19	26.7	18	30.5	34	4.4	94	12.1	154	19.9
35	19	23.8	19	27.0	18	30.7	35	4.5	95	12.3	155	20.0
36	19	24.0	19	27.2	18	31.0	36	4.7	96	12.4	156	20.2
37	19	24.3	19	27.5	18	31.2	37	4.8	97	12.5	157	20.3
38	19	24.5	19	27.7	18	31.5	38	4.9	98	12.7	158	20.4
39	19	24.8	19	28.0	18	31.7	39	5.0	99	12.8	159	20.5
40	19	25.0	19	28.2	18	31.9	40	5.2	100	12.9	160	20.7
41	19	25.3	19	28.5	18	32.2	41	5.3	101	13.0	161	20.8
42	19	25.5	19	28.7	18	32.4	42	5.4	102	13.2	162	20.9
43	19	25.8	19	29.0	18	32.6	43	5.6	103	13.3	163	21.1
44	19	26.0	19	29.2	18	32.9	44	5.7	104	13.4	164	21.2
45	19	26.3	19	29.5	18	33.1	45	5.8	105	13.6	165	21.3
46	19	26.5	19	29.7	18	33.4	46	5.9	106	13.7	166	21.4
47	19	26.8	19	30.0	18	33.6	47	6.1	107	13.8	167	21.6
48	19	27.0	19	30.2	18	33.8	48	6.2	108	14.0	168	21.7
49	19	27.3	19	30.5	18	34.1	49	6.3	109	14.1	169	21.8
50	19	27.5	19	30.7	18	34.3	50	6.5	110	14.2	170	22.0
51	19	27.8	19	31.0	18	34.6	51	6.6	111	14.3	171	22.1
52	19	28.0	19	31.2	18	34.8	52	6.7	112	14.5	172	22.2
53	19	28.3	19	31.5	18	35.0	53	6.8	113	14.6	173	22.3
54	19	28.5	19	31.7	18	35.3	54	7.0	114	14.7	174	22.5
55	19	28.8	19	32.0	18	35.5	55	7.1	115	14.9	175	22.6
56	19	29.0	19	32.2	18	35.7	56	7.2	116	15.0	176	22.7
57	19	29.3	19	32.5	18	36.0	57	7.4	117	15.1	177	22.9
58	19	29.5	19	32.7	18	36.2	58	7.5	118	15.2	178	23.0
59	19	29.8	19	33.0	18	36.5	59	7.6	119	15.4	179	23.1
60	19	30.0	19	33.3	18	36.7	60	7.8	120	15.5	180	23.3

1 h 18 min

POPRAVKA ČASOVNOG UGLA				POPRAVKA DRUGOG REDA za časovni ugao i deklinaciju Sunca, Mjeseca i planeta					
s	SUNCA I PLANETA	PROLJEĆNE TAČKE ♈	MJESECA ☾	Δ	poprav.	Δ	poprav.	Δ	poprav.
	° ′	° ′	° ′		′		′		′
0	19 30.0	19 33.3	18 36.7	0	.0	60	7.9	120	15.7
1	19 30.3	19 33.5	18 36.9	1	.1	61	8.0	121	15.8
2	19 30.5	19 33.8	18 37.2	2	.3	62	8.1	122	16.0
3	19 30.8	19 34.0	18 37.4	3	.4	63	8.2	123	16.1
4	19 31.0	19 34.3	18 37.7	4	.5	64	8.4	124	16.2
5	19 31.3	19 34.5	18 37.9	5	.7	65	8.5	125	16.4
6	19 31.5	19 34.8	18 38.1	6	.8	66	8.6	126	16.5
7	19 31.8	19 35.0	18 38.4	7	.9	67	8.8	127	16.6
8	19 32.0	19 35.3	18 38.6	8	1.0	68	8.9	128	16.7
9	19 32.3	19 35.5	18 38.8	9	1.2	69	9.0	129	16.9
10	19 32.5	19 35.8	18 39.1	10	1.3	70	9.2	130	17.0
11	19 32.8	19 36.0	18 39.3	11	1.4	71	9.3	131	17.1
12	19 33.0	19 36.3	18 39.6	12	1.6	72	9.4	132	17.3
13	19 33.3	19 36.5	18 39.8	13	1.7	73	9.6	133	17.4
14	19 33.5	19 36.8	18 40.0	14	1.8	74	9.7	134	17.5
15	19 33.8	19 37.0	18 40.3	15	2.0	75	9.8	135	17.7
16	19 34.0	19 37.3	18 40.5	16	2.1	76	9.9	136	17.8
17	19 34.3	19 37.5	18 40.8	17	2.2	77	10.1	137	17.9
18	19 34.5	19 37.8	18 41.0	18	2.4	78	10.2	138	18.1
19	19 34.8	19 38.0	18 41.2	19	2.5	79	10.3	139	18.2
20	19 35.0	19 38.3	18 41.5	20	2.6	80	10.5	140	18.3
21	19 35.3	19 38.5	18 41.7	21	2.7	81	10.6	141	18.4
22	19 35.5	19 38.8	18 41.9	22	2.9	82	10.7	142	18.6
23	19 35.8	19 39.0	18 42.2	23	3.0	83	10.9	143	18.7
24	19 36.0	19 39.3	18 42.4	24	3.1	84	11.0	144	18.8
25	19 36.3	19 39.5	18 42.7	25	3.3	85	11.1	145	19.0
26	19 36.5	19 39.8	18 42.9	26	3.4	86	11.3	146	19.1
27	19 36.8	19 40.0	18 43.1	27	3.5	87	11.4	147	19.2
28	19 37.0	19 40.3	18 43.4	28	3.7	88	11.5	148	19.4
29	19 37.3	19 40.5	18 43.6	29	3.8	89	11.6	149	19.5
30	19 37.5	19 40.8	18 43.9	30	3.9	90	11.8	150	19.6
31	19 37.8	19 41.0	18 44.1	31	4.1	91	11.9	151	19.8
32	19 38.0	19 41.3	18 44.3	32	4.2	92	12.0	152	19.9
33	19 38.3	19 41.5	18 44.6	33	4.3	93	12.2	153	20.0
34	19 38.5	19 41.8	18 44.8	34	4.4	94	12.3	154	20.1
35	19 38.8	19 42.0	18 45.1	35	4.6	95	12.4	155	20.3
36	19 39.0	19 42.3	18 45.3	36	4.7	96	12.6	156	20.4
37	19 39.3	19 42.5	18 45.5	37	4.8	97	12.7	157	20.5
38	19 39.5	19 42.8	18 45.8	38	5.0	98	12.8	158	20.7
39	19 39.8	19 43.0	18 46.0	39	5.1	99	13.0	159	20.8
40	19 40.0	19 43.3	18 46.2	40	5.2	100	13.1	160	20.9
41	19 40.3	19 43.5	18 46.5	41	5.4	101	13.2	161	21.1
42	19 40.5	19 43.8	18 46.7	42	5.5	102	13.3	162	21.2
43	19 40.8	19 44.0	18 47.0	43	5.6	103	13.5	163	21.3
44	19 41.0	19 44.3	18 47.2	44	5.8	104	13.6	164	21.5
45	19 41.3	19 44.5	18 47.4	45	5.9	105	13.7	165	21.6
46	19 41.5	19 44.8	18 47.7	46	6.0	106	13.9	166	21.7
47	19 41.8	19 45.0	18 47.9	47	6.1	107	14.0	167	21.8
48	19 42.0	19 45.3	18 48.2	48	6.3	108	14.1	168	22.0
49	19 42.3	19 45.5	18 48.4	49	6.4	109	14.3	169	22.1
50	19 42.5	19 45.8	18 48.6	50	6.5	110	14.4	170	22.2
51	19 42.8	19 46.0	18 48.9	51	6.7	111	14.5	171	22.4
52	19 43.0	19 46.3	18 49.1	52	6.8	112	14.7	172	22.5
53	19 43.3	19 46.5	18 49.3	53	6.9	113	14.8	173	22.6
54	19 43.5	19 46.8	18 49.6	54	7.1	114	14.9	174	22.8
55	19 43.8	19 47.0	18 49.8	55	7.2	115	15.0	175	22.9
56	19 44.0	19 47.3	18 50.1	56	7.3	116	15.2	176	23.0
57	19 44.3	19 47.5	18 50.3	57	7.5	117	15.3	177	23.2
58	19 44.5	19 47.8	18 50.5	58	7.6	118	15.4	178	23.3
59	19 44.8	19 48.0	18 50.8	59	7.7	119	15.6	179	23.4
60	19 45.0	19 48.3	18 51.0	60	7.9	120	15.7	180	23.6

1 h 19 min

POPRAVKA ČASOVNOG UGLA				POPRAVKA DRUGOG REDA za časovni ugao i deklinaciju Sunca, Mjeseca i planeta					
s	SUNCA I PLANETA	PROLJEĆNE TAČKE ♈	MJESECA ☾	Δ	poprav.	Δ	poprav.	Δ	poprav.
	° ′	° ′	° ′		′		′		′
0	19 45.0	19 48.3	18 51.0	0	.0	60	8.0	120	15.9
1	19 45.3	19 48.5	18 51.3	1	.1	61	8.1	121	16.0
2	19 45.5	19 48.8	18 51.5	2	.3	62	8.2	122	16.2
3	19 45.8	19 49.0	18 51.7	3	.4	63	8.3	123	16.3
4	19 46.0	19 49.3	18 52.0	4	.5	64	8.5	124	16.4
5	19 46.3	19 49.5	18 52.2	5	.7	65	8.6	125	16.6
6	19 46.5	19 49.8	18 52.4	6	.8	66	8.7	126	16.7
7	19 46.8	19 50.0	18 52.7	7	.9	67	8.9	127	16.8
8	19 47.0	19 50.3	18 52.9	8	1.1	68	9.0	128	17.0
9	19 47.3	19 50.5	18 53.2	9	1.2	69	9.1	129	17.1
10	19 47.5	19 50.8	18 53.4	10	1.3	70	9.3	130	17.2
11	19 47.8	19 51.0	18 53.6	11	1.5	71	9.4	131	17.4
12	19 48.0	19 51.3	18 53.9	12	1.6	72	9.5	132	17.5
13	19 48.3	19 51.6	18 54.1	13	1.7	73	9.7	133	17.6
14	19 48.5	19 51.8	18 54.4	14	1.9	74	9.8	134	17.8
15	19 48.8	19 52.1	18 54.6	15	2.0	75	9.9	135	17.9
16	19 49.0	19 52.3	18 54.8	16	2.1	76	10.1	136	18.0
17	19 49.3	19 52.6	18 55.1	17	2.3	77	10.2	137	18.2
18	19 49.5	19 52.8	18 55.3	18	2.4	78	10.3	138	18.3
19	19 49.8	19 53.1	18 55.6	19	2.5	79	10.5	139	18.4
20	19 50.0	19 53.3	18 55.8	20	2.7	80	10.6	140	18.6
21	19 50.3	19 53.6	18 56.0	21	2.8	81	10.7	141	18.7
22	19 50.5	19 53.8	18 56.3	22	2.9	82	10.9	142	18.8
23	19 50.8	19 54.1	18 56.5	23	3.0	83	11.0	143	18.9
24	19 51.0	19 54.3	18 56.7	24	3.2	84	11.1	144	19.1
25	19 51.3	19 54.6	18 57.0	25	3.3	85	11.3	145	19.2
26	19 51.5	19 54.8	18 57.2	26	3.4	86	11.4	146	19.3
27	19 51.8	19 55.1	18 57.5	27	3.6	87	11.5	147	19.5
28	19 52.0	19 55.3	18 57.7	28	3.7	88	11.7	148	19.6
29	19 52.3	19 55.6	18 57.9	29	3.8	89	11.8	149	19.7
30	19 52.5	19 55.8	18 58.2	30	4.0	90	11.9	150	19.9
31	19 52.8	19 56.1	18 58.4	31	4.1	91	12.1	151	20.0
32	19 53.0	19 56.3	18 58.7	32	4.2	92	12.2	152	20.1
33	19 53.3	19 56.6	18 58.9	33	4.4	93	12.3	153	20.3
34	19 53.5	19 56.8	18 59.1	34	4.5	94	12.5	154	20.4
35	19 53.8	19 57.1	18 59.4	35	4.6	95	12.6	155	20.5
36	19 54.0	19 57.3	18 59.6	36	4.8	96	12.7	156	20.7
37	19 54.3	19 57.6	18 59.8	37	4.9	97	12.9	157	20.8
38	19 54.5	19 57.8	19 .1	38	5.0	98	13.0	158	20.9
39	19 54.8	19 58.1	19 .3	39	5.2	99	13.1	159	21.1
40	19 55.0	19 58.3	19 .6	40	5.3	100	13.3	160	21.2
41	19 55.3	19 58.6	19 .8	41	5.4	101	13.4	161	21.3
42	19 55.5	19 58.8	19 1.0	42	5.6	102	13.5	162	21.5
43	19 55.8	19 59.1	19 1.3	43	5.7	103	13.6	163	21.6
44	19 56.0	19 59.3	19 1.5	44	5.8	104	13.8	164	21.7
45	19 56.3	19 59.6	19 1.8	45	6.0	105	13.9	165	21.9
46	19 56.5	19 59.8	19 2.0	46	6.1	106	14.0	166	22.0
47	19 56.8	20 .1	19 2.2	47	6.2	107	14.2	167	22.1
48	19 57.0	20 .3	19 2.5	48	6.4	108	14.3	168	22.3
49	19 57.3	20 .6	19 2.7	49	6.5	109	14.4	169	22.4
50	19 57.5	20 .8	19 2.9	50	6.6	110	14.6	170	22.5
51	19 57.8	20 1.1	19 3.2	51	6.8	111	14.7	171	22.7
52	19 58.0	20 1.3	19 3.4	52	6.9	112	14.8	172	22.8
53	19 58.3	20 1.6	19 3.7	53	7.0	113	15.0	173	22.9
54	19 58.5	20 1.8	19 3.9	54	7.2	114	15.1	174	23.1
55	19 58.8	20 2.1	19 4.1	55	7.3	115	15.2	175	23.2
56	19 59.0	20 2.3	19 4.4	56	7.4	116	15.4	176	23.3
57	19 59.3	20 2.6	19 4.6	57	7.6	117	15.5	177	23.5
58	19 59.5	20 2.8	19 4.9	58	7.7	118	15.6	178	23.6
59	19 59.8	20 3.1	19 5.1	59	7.8	119	15.8	179	23.7
60	20 .0	20 3.3	19 5.3	60	8.0	120	15.9	180	23.9

1 h 20 min

POPRAVKA ČASOVNOG UGLA						POPRAVKA DRUGOG REDA za časovni ugao i deklinaciju Sunca, Mjeseca i planeta					
s	SUNCA I PLANETA		PROLJEĆNE TAČKE ♈		MJESECA ☾		Δ	popr.	Δ	popr.	Δ	popr.
	°	′	°	′	°	′		′		′		′
0	20	.0	20	3.3	19	5.3	0	.0	60	8.1	120	16.1
1	20	.3	20	3.6	19	5.6	1	.1	61	8.2	121	16.2
2	20	.5	20	3.8	19	5.8	2	.3	62	8.3	122	16.4
3	20	.8	20	4.1	19	6.0	3	.4	63	8.5	123	16.5
4	20	1.0	20	4.3	19	6.3	4	.5	64	8.6	124	16.6
5	20	1.3	20	4.6	19	6.5	5	.7	65	8.7	125	16.8
6	20	1.5	20	4.8	19	6.8	6	.8	66	8.9	126	16.9
7	20	1.8	20	5.1	19	7.0	7	.9	67	9.0	127	17.0
8	20	2.0	20	5.3	19	7.2	8	1.1	68	9.1	128	17.2
9	20	2.3	20	5.6	19	7.5	9	1.2	69	9.3	129	17.3
10	20	2.5	20	5.8	19	7.7	10	1.3	70	9.4	130	17.4
11	20	2.8	20	6.1	19	8.0	11	1.5	71	9.5	131	17.6
12	20	3.0	20	6.3	19	8.2	12	1.6	72	9.7	132	17.7
13	20	3.3	20	6.6	19	8.4	13	1.7	73	9.8	133	17.8
14	20	3.5	20	6.8	19	8.7	14	1.9	74	9.9	134	18.0
15	20	3.8	20	7.1	19	8.9	15	2.0	75	10.1	135	18.1
16	20	4.0	20	7.3	19	9.2	16	2.1	76	10.2	136	18.2
17	20	4.3	20	7.6	19	9.4	17	2.3	77	10.3	137	18.4
18	20	4.5	20	7.8	19	9.6	18	2.4	78	10.5	138	18.5
19	20	4.8	20	8.1	19	9.9	19	2.5	79	10.6	139	18.6
20	20	5.0	20	8.3	19	10.1	20	2.7	80	10.7	140	18.8
21	20	5.3	20	8.6	19	10.3	21	2.8	81	10.9	141	18.9
22	20	5.5	20	8.8	19	10.6	22	3.0	82	11.0	142	19.1
23	20	5.8	20	9.1	19	10.8	23	3.1	83	11.1	143	19.2
24	20	6.0	20	9.4	19	11.1	24	3.2	84	11.3	144	19.3
25	20	6.3	20	9.6	19	11.3	25	3.4	85	11.4	145	19.5
26	20	6.5	20	9.9	19	11.5	26	3.5	86	11.5	146	19.6
27	20	6.8	20	10.1	19	11.8	27	3.6	87	11.7	147	19.7
28	20	7.0	20	10.4	19	12.0	28	3.8	88	11.8	148	19.9
29	20	7.3	20	10.6	19	12.3	29	3.9	89	11.9	149	20.0
30	20	7.5	20	10.9	19	12.5	30	4.0	90	12.1	150	20.1
31	20	7.8	20	11.1	19	12.7	31	4.2	91	12.2	151	20.3
32	20	8.0	20	11.4	19	13.0	32	4.3	92	12.3	152	20.4
33	20	8.3	20	11.6	19	13.2	33	4.4	93	12.5	153	20.5
34	20	8.5	20	11.9	19	13.4	34	4.6	94	12.6	154	20.7
35	20	8.8	20	12.1	19	13.7	35	4.7	95	12.7	155	20.8
36	20	9.0	20	12.4	19	13.9	36	4.8	96	12.9	156	20.9
37	20	9.3	20	12.6	19	14.2	37	5.0	97	13.0	157	21.1
38	20	9.5	20	12.9	19	14.4	38	5.1	98	13.1	158	21.2
39	20	9.8	20	13.1	19	14.6	39	5.2	99	13.3	159	21.3
40	20	10.0	20	13.4	19	14.9	40	5.4	100	13.4	160	21.5
41	20	10.3	20	13.6	19	15.1	41	5.5	101	13.6	161	21.6
42	20	10.5	20	13.9	19	15.4	42	5.6	102	13.7	162	21.7
43	20	10.8	20	14.1	19	15.6	43	5.8	103	13.8	163	21.9
44	20	11.0	20	14.4	19	15.8	44	5.9	104	14.0	164	22.0
45	20	11.3	20	14.6	19	16.1	45	6.0	105	14.1	165	22.1
46	20	11.5	20	14.9	19	16.3	46	6.2	106	14.2	166	22.3
47	20	11.8	20	15.1	19	16.5	47	6.3	107	14.4	167	22.4
48	20	12.0	20	15.4	19	16.8	48	6.4	108	14.5	168	22.5
49	20	12.3	20	15.6	19	17.0	49	6.6	109	14.6	169	22.7
50	20	12.5	20	15.9	19	17.3	50	6.7	110	14.8	170	22.8
51	20	12.8	20	16.1	19	17.5	51	6.8	111	14.9	171	22.9
52	20	13.0	20	16.4	19	17.7	52	7.0	112	15.0	172	23.1
53	20	13.3	20	16.6	19	18.0	53	7.1	113	15.2	173	23.2
54	20	13.5	20	16.9	19	18.2	54	7.2	114	15.3	174	23.3
55	20	13.8	20	17.1	19	18.5	55	7.4	115	15.4	175	23.5
56	20	14.0	20	17.4	19	18.7	56	7.5	116	15.6	176	23.6
57	20	14.3	20	17.6	19	18.9	57	7.6	117	15.7	177	23.7
58	20	14.5	20	17.9	19	19.2	58	7.8	118	15.8	178	23.9
59	20	14.8	20	18.1	19	19.4	59	7.9	119	16.0	179	24.0
60	20	15.0	20	18.4	19	19.7	60	8.1	120	16.1	180	24.2

1 h 21 min

POPRAVKA ČASOVNOG UGLA						POPRAVKA DRUGOG REDA za časovni ugao i deklinaciju Sunca, Mjeseca i planeta					
s	SUNCA I PLANETA		PROLJEĆNE TAČKE ♈		MJESECA ☾		Δ	popr.	Δ	popr.	Δ	popr.
	°	′	°	′	°	′		′		′		′
0	20	15.0	20	18.4	19	19.7	0	.0	60	8.2	120	16.3
1	20	15.3	20	18.6	19	19.9	1	.1	61	8.3	121	16.4
2	20	15.5	20	18.9	19	20.1	2	.3	62	8.4	122	16.6
3	20	15.8	20	19.1	19	20.4	3	.4	63	8.6	123	16.7
4	20	16.0	20	19.4	19	20.6	4	.5	64	8.7	124	16.8
5	20	16.3	20	19.6	19	20.8	5	.7	65	8.8	125	17.0
6	20	16.5	20	19.9	19	21.1	6	.8	66	9.0	126	17.1
7	20	16.8	20	20.1	19	21.3	7	1.0	67	9.1	127	17.3
8	20	17.0	20	20.4	19	21.6	8	1.1	68	9.2	128	17.4
9	20	17.3	20	20.6	19	21.8	9	1.2	69	9.4	129	17.5
10	20	17.5	20	20.9	19	22.0	10	1.4	70	9.5	130	17.7
11	20	17.8	20	21.1	19	22.3	11	1.5	71	9.6	131	17.8
12	20	18.0	20	21.4	19	22.5	12	1.6	72	9.8	132	17.9
13	20	18.3	20	21.6	19	22.8	13	1.8	73	9.9	133	18.1
14	20	18.5	20	21.9	19	23.0	14	1.9	74	10.1	134	18.2
15	20	18.8	20	22.1	19	23.2	15	2.0	75	10.2	135	18.3
16	20	19.0	20	22.4	19	23.5	16	2.2	76	10.3	136	18.5
17	20	19.3	20	22.6	19	23.7	17	2.3	77	10.5	137	18.6
18	20	19.5	20	22.9	19	23.9	18	2.4	78	10.6	138	18.7
19	20	19.8	20	23.1	19	24.2	19	2.6	79	10.7	139	18.9
20	20	20.0	20	23.4	19	24.4	20	2.7	80	10.9	140	19.0
21	20	20.3	20	23.6	19	24.7	21	2.9	81	11.0	141	19.2
22	20	20.5	20	23.9	19	24.9	22	3.0	82	11.1	142	19.3
23	20	20.8	20	24.1	19	25.1	23	3.1	83	11.3	143	19.4
24	20	21.0	20	24.4	19	25.4	24	3.3	84	11.4	144	19.6
25	20	21.3	20	24.6	19	25.6	25	3.4	85	11.5	145	19.7
26	20	21.5	20	24.9	19	25.9	26	3.5	86	11.7	146	19.8
27	20	21.8	20	25.1	19	26.1	27	3.7	87	11.8	147	20.0
28	20	22.0	20	25.4	19	26.3	28	3.8	88	12.0	148	20.1
29	20	22.3	20	25.6	19	26.6	29	3.9	89	12.1	149	20.2
30	20	22.5	20	25.9	19	26.8	30	4.1	90	12.2	150	20.4
31	20	22.8	20	26.1	19	27.0	31	4.2	91	12.4	151	20.5
32	20	23.0	20	26.4	19	27.3	32	4.3	92	12.5	152	20.6
33	20	23.3	20	26.6	19	27.5	33	4.5	93	12.6	153	20.8
34	20	23.5	20	26.9	19	27.8	34	4.6	94	12.8	154	20.9
35	20	23.8	20	27.1	19	28.0	35	4.8	95	12.9	155	21.1
36	20	24.0	20	27.4	19	28.2	36	4.9	96	13.0	156	21.2
37	20	24.3	20	27.7	19	28.5	37	5.0	97	13.2	157	21.3
38	20	24.5	20	27.9	19	28.7	38	5.2	98	13.3	158	21.5
39	20	24.8	20	28.2	19	29.0	39	5.3	99	13.4	159	21.6
40	20	25.0	20	28.4	19	29.2	40	5.4	100	13.6	160	21.7
41	20	25.3	20	28.7	19	29.4	41	5.6	101	13.7	161	21.9
42	20	25.5	20	28.9	19	29.7	42	5.7	102	13.9	162	22.0
43	20	25.8	20	29.2	19	29.9	43	5.8	103	14.0	163	22.1
44	20	26.0	20	29.4	19	30.1	44	6.0	104	14.1	164	22.3
45	20	26.3	20	29.7	19	30.4	45	6.1	105	14.3	165	22.4
46	20	26.5	20	29.9	19	30.6	46	6.2	106	14.4	166	22.5
47	20	26.8	20	30.2	19	30.9	47	6.4	107	14.5	167	22.7
48	20	27.0	20	30.4	19	31.1	48	6.5	108	14.7	168	22.8
49	20	27.3	20	30.7	19	31.3	49	6.7	109	14.8	169	23.0
50	20	27.5	20	30.9	19	31.6	50	6.8	110	14.9	170	23.1
51	20	27.8	20	31.2	19	31.8	51	6.9	111	15.1	171	23.2
52	20	28.0	20	31.4	19	32.1	52	7.1	112	15.2	172	23.4
53	20	28.3	20	31.7	19	32.3	53	7.2	113	15.3	173	23.5
54	20	28.5	20	31.9	19	32.5	54	7.3	114	15.5	174	23.6
55	20	28.8	20	32.2	19	32.8	55	7.5	115	15.6	175	23.8
56	20	29.0	20	32.4	19	33.0	56	7.6	116	15.8	176	23.9
57	20	29.3	20	32.7	19	33.3	57	7.7	117	15.9	177	24.0
58	20	29.5	20	32.9	19	33.5	58	7.9	118	16.0	178	24.2
59	20	29.8	20	33.2	19	33.7	59	8.0	119	16.2	179	24.3
60	20	30.0	20	33.4	19	34.0	60	8.2	120	16.3	180	24.5

1 h 22 min

POPRAVKA ČASOVNOG UGLA				POPRAVKA DRUGOG REDA za časovni ugao i deklinaciju Sunca, Mjeseca i planeta					
s	SUNCA I PLANETA	PROLJEĆNE TAČKE ♈	MJESECA ☾	Δ	popr.	Δ	popr.	Δ	popr.
	° ′	° ′	° ′		′		′		′
0	20 30.0	20 33.4	19 34.0	0	.0	60	8.3	120	16.5
1	20 30.3	20 33.7	19 34.2	1	.1	61	8.4	121	16.6
2	20 30.5	20 33.9	19 34.4	2	.3	62	8.5	122	16.8
3	20 30.8	20 34.2	19 34.7	3	.4	63	8.7	123	16.9
4	20 31.0	20 34.4	19 34.9	4	.6	64	8.8	124	17.1
5	20 31.3	20 34.7	19 35.2	5	.7	65	8.9	125	17.2
6	20 31.5	20 34.9	19 35.4	6	.8	66	9.1	126	17.3
7	20 31.8	20 35.2	19 35.6	7	1.0	67	9.2	127	17.5
8	20 32.0	20 35.4	19 35.9	8	1.1	68	9.4	128	17.6
9	20 32.3	20 35.7	19 36.1	9	1.2	69	9.5	129	17.7
10	20 32.5	20 35.9	19 36.4	10	1.4	70	9.6	130	17.9
11	20 32.8	20 36.2	19 36.6	11	1.5	71	9.8	131	18.0
12	20 33.0	20 36.4	19 36.8	12	1.7	72	9.9	132	18.2
13	20 33.3	20 36.7	19 37.1	13	1.8	73	10.0	133	18.3
14	20 33.5	20 36.9	19 37.3	14	1.9	74	10.2	134	18.4
15	20 33.8	20 37.2	19 37.5	15	2.1	75	10.3	135	18.6
16	20 34.0	20 37.4	19 37.8	16	2.2	76	10.5	136	18.7
17	20 34.3	20 37.7	19 38.0	17	2.3	77	10.6	137	18.8
18	20 34.5	20 37.9	19 38.3	18	2.5	78	10.7	138	19.0
19	20 34.8	20 38.2	19 38.5	19	2.6	79	10.9	139	19.1
20	20 35.0	20 38.4	19 38.7	20	2.8	80	11.0	140	19.3
21	20 35.3	20 38.7	19 39.0	21	2.9	81	11.1	141	19.4
22	20 35.5	20 38.9	19 39.2	22	3.0	82	11.3	142	19.5
23	20 35.8	20 39.2	19 39.5	23	3.2	83	11.4	143	19.7
24	20 36.0	20 39.4	19 39.7	24	3.3	84	11.6	144	19.8
25	20 36.3	20 39.7	19 39.9	25	3.4	85	11.7	145	19.9
26	20 36.5	20 39.9	19 40.2	26	3.6	86	11.8	146	20.1
27	20 36.8	20 40.2	19 40.4	27	3.7	87	12.0	147	20.2
28	20 37.0	20 40.4	19 40.6	28	3.9	88	12.1	148	20.4
29	20 37.3	20 40.7	19 40.9	29	4.0	89	12.2	149	20.5
30	20 37.5	20 40.9	19 41.1	30	4.1	90	12.4	150	20.6
31	20 37.8	20 41.2	19 41.4	31	4.3	91	12.5	151	20.8
32	20 38.0	20 41.4	19 41.6	32	4.4	92	12.7	152	20.9
33	20 38.3	20 41.7	19 41.8	33	4.5	93	12.8	153	21.0
34	20 38.5	20 41.9	19 42.1	34	4.7	94	12.9	154	21.2
35	20 38.8	20 42.2	19 42.3	35	4.8	95	13.1	155	21.3
36	20 39.0	20 42.4	19 42.6	36	5.0	96	13.2	156	21.5
37	20 39.3	20 42.7	19 42.8	37	5.1	97	13.3	157	21.6
38	20 39.5	20 42.9	19 43.0	38	5.2	98	13.5	158	21.7
39	20 39.8	20 43.2	19 43.3	39	5.4	99	13.6	159	21.9
40	20 40.0	20 43.4	19 43.5	40	5.5	100	13.8	160	22.0
41	20 40.3	20 43.7	19 43.7	41	5.6	101	13.9	161	22.1
42	20 40.5	20 43.9	19 44.0	42	5.8	102	14.0	162	22.3
43	20 40.8	20 44.2	19 44.2	43	5.9	103	14.2	163	22.4
44	20 41.0	20 44.4	19 44.5	44	6.1	104	14.3	164	22.6
45	20 41.3	20 44.7	19 44.7	45	6.2	105	14.4	165	22.7
46	20 41.5	20 44.9	19 44.9	46	6.3	106	14.6	166	22.8
47	20 41.8	20 45.2	19 45.2	47	6.5	107	14.7	167	23.0
48	20 42.0	20 45.5	19 45.4	48	6.6	108	14.9	168	23.1
49	20 42.3	20 45.7	19 45.7	49	6.7	109	15.0	169	23.2
50	20 42.5	20 46.0	19 45.9	50	6.9	110	15.1	170	23.4
51	20 42.8	20 46.2	19 46.1	51	7.0	111	15.3	171	23.5
52	20 43.0	20 46.5	19 46.4	52	7.2	112	15.4	172	23.7
53	20 43.3	20 46.7	19 46.6	53	7.3	113	15.5	173	23.8
54	20 43.5	20 47.0	19 46.9	54	7.4	114	15.7	174	23.9
55	20 43.8	20 47.2	19 47.1	55	7.6	115	15.8	175	24.1
56	20 44.0	20 47.5	19 47.3	56	7.7	116	16.0	176	24.2
57	20 44.3	20 47.7	19 47.6	57	7.8	117	16.1	177	24.3
58	20 44.5	20 48.0	19 47.8	58	8.0	118	16.2	178	24.5
59	20 44.8	20 48.2	19 48.0	59	8.1	119	16.4	179	24.6
60	20 45.0	20 48.5	19 48.3	60	8.3	120	16.5	180	24.8

1 h 23 min

POPRAVKA ČASOVNOG UGLA				POPRAVKA DRUGOG REDA za časovni ugao i deklinaciju Sunca, Mjeseca i planeta					
s	SUNCA I PLANETA	PROLJEĆNE TAČKE ♈	MJESECA ☾	Δ	popr.	Δ	popr.	Δ	popr.
	° ′	° ′	° ′		′		′		′
0	20 45.0	20 48.5	19 48.3	0	.0	60	8.4	120	16.7
1	20 45.3	20 48.7	19 48.5	1	.1	61	8.5	121	16.8
2	20 45.5	20 49.0	19 48.8	2	.3	62	8.6	122	17.0
3	20 45.8	20 49.2	19 49.0	3	.4	63	8.8	123	17.1
4	20 46.0	20 49.5	19 49.2	4	.6	64	8.9	124	17.3
5	20 46.3	20 49.7	19 49.5	5	.7	65	9.0	125	17.4
6	20 46.5	20 50.0	19 49.7	6	.8	66	9.2	126	17.5
7	20 46.8	20 50.2	19 50.0	7	1.0	67	9.3	127	17.7
8	20 47.0	20 50.5	19 50.2	8	1.1	68	9.5	128	17.8
9	20 47.3	20 50.7	19 50.4	9	1.3	69	9.6	129	18.0
10	20 47.5	20 51.0	19 50.7	10	1.4	70	9.7	130	18.1
11	20 47.8	20 51.2	19 50.9	11	1.5	71	9.9	131	18.2
12	20 48.0	20 51.5	19 51.1	12	1.7	72	10.0	132	18.4
13	20 48.3	20 51.7	19 51.4	13	1.8	73	10.2	133	18.5
14	20 48.5	20 52.0	19 51.6	14	1.9	74	10.3	134	18.6
15	20 48.8	20 52.2	19 51.9	15	2.1	75	10.4	135	18.8
16	20 49.0	20 52.5	19 52.1	16	2.2	76	10.6	136	18.9
17	20 49.3	20 52.7	19 52.3	17	2.4	77	10.7	137	19.1
18	20 49.5	20 53.0	19 52.6	18	2.5	78	10.9	138	19.2
19	20 49.8	20 53.2	19 52.8	19	2.6	79	11.0	139	19.3
20	20 50.0	20 53.5	19 53.1	20	2.8	80	11.1	140	19.5
21	20 50.3	20 53.7	19 53.3	21	2.9	81	11.3	141	19.6
22	20 50.5	20 54.0	19 53.5	22	3.1	82	11.4	142	19.8
23	20 50.8	20 54.2	19 53.8	23	3.2	83	11.6	143	19.9
24	20 51.0	20 54.5	19 54.0	24	3.3	84	11.7	144	20.0
25	20 51.3	20 54.7	19 54.2	25	3.5	85	11.8	145	20.2
26	20 51.5	20 55.0	19 54.5	26	3.6	86	12.0	146	20.3
27	20 51.8	20 55.2	19 54.7	27	3.8	87	12.1	147	20.5
28	20 52.0	20 55.5	19 55.0	28	3.9	88	12.2	148	20.6
29	20 52.3	20 55.7	19 55.2	29	4.0	89	12.4	149	20.7
30	20 52.5	20 56.0	19 55.4	30	4.2	90	12.5	150	20.9
31	20 52.8	20 56.2	19 55.7	31	4.3	91	12.7	151	21.0
32	20 53.0	20 56.5	19 55.9	32	4.5	92	12.8	152	21.2
33	20 53.3	20 56.7	19 56.2	33	4.6	93	12.9	153	21.3
34	20 53.5	20 57.0	19 56.4	34	4.7	94	13.1	154	21.4
35	20 53.8	20 57.2	19 56.6	35	4.9	95	13.2	155	21.6
36	20 54.0	20 57.5	19 56.9	36	5.0	96	13.4	156	21.7
37	20 54.3	20 57.7	19 57.1	37	5.1	97	13.5	157	21.8
38	20 54.5	20 58.0	19 57.4	38	5.3	98	13.6	158	22.0
39	20 54.8	20 58.2	19 57.6	39	5.4	99	13.8	159	22.1
40	20 55.0	20 58.5	19 57.8	40	5.6	100	13.9	160	22.3
41	20 55.3	20 58.7	19 58.1	41	5.7	101	14.1	161	22.4
42	20 55.5	20 59.0	19 58.3	42	5.8	102	14.2	162	22.5
43	20 55.8	20 59.2	19 58.5	43	6.0	103	14.3	163	22.7
44	20 56.0	20 59.5	19 58.8	44	6.1	104	14.5	164	22.8
45	20 56.3	20 59.7	19 59.0	45	6.3	105	14.6	165	23.0
46	20 56.5	20 60.0	19 59.3	46	6.4	106	14.8	166	23.1
47	20 56.8	21 .2	19 59.5	47	6.5	107	14.9	167	23.2
48	20 57.0	21 .5	19 59.7	48	6.7	108	15.0	168	23.4
49	20 57.3	21 .7	19 60.0	49	6.8	109	15.2	169	23.5
50	20 57.5	21 1.0	20 .2	50	7.0	110	15.3	170	23.7
51	20 57.8	21 1.2	20 .5	51	7.1	111	15.4	171	23.8
52	20 58.0	21 1.5	20 .7	52	7.2	112	15.6	172	23.9
53	20 58.3	21 1.7	20 .9	53	7.4	113	15.7	173	24.1
54	20 58.5	21 2.0	20 1.2	54	7.5	114	15.9	174	24.2
55	20 58.8	21 2.2	20 1.4	55	7.7	115	16.0	175	24.4
56	20 59.0	21 2.5	20 1.6	56	7.8	116	16.1	176	24.5
57	20 59.3	21 2.7	20 1.9	57	7.9	117	16.3	177	24.6
58	20 59.5	21 3.0	20 2.1	58	8.1	118	16.4	178	24.8
59	20 59.8	21 3.2	20 2.4	59	8.2	119	16.6	179	24.9
60	21 .0	21 3.5	20 2.6	60	8.4	120	16.7	180	25.1

1 h 24 min

POPRAVKA ČASOVNOG UGLA						POPRAVKA DRUGOG REDA za časovni ugao i deklinaciju Sunca, Mjeseca i planeta					
s	SUNCA I PLANETA		PROLJEĆNE TAČKE ♈		MJESECA ☾		Δ	poprav.	Δ	poprav.	Δ	poprav.
	°	′	°	′	°	′		′		′		′
0	21	.0	21	3.5	20	2.6	0	.0	60	8.5	120	16.9
1	21	.3	21	3.8	20	2.8	1	.1	61	8.6	121	17.0
2	21	.5	21	4.0	20	3.1	2	.3	62	8.7	122	17.2
3	21	.8	21	4.3	20	3.3	3	.4	63	8.9	123	17.3
4	21	1.0	21	4.5	20	3.6	4	.6	64	9.0	124	17.5
5	21	1.3	21	4.8	20	3.8	5	.7	65	9.2	125	17.6
6	21	1.5	21	5.0	20	4.0	6	.8	66	9.3	126	17.7
7	21	1.8	21	5.3	20	4.3	7	1.0	67	9.4	127	17.9
8	21	2.0	21	5.5	20	4.5	8	1.1	68	9.6	128	18.0
9	21	2.3	21	5.8	20	4.7	9	1.3	69	9.7	129	18.2
10	21	2.5	21	6.0	20	5.0	10	1.4	70	9.9	130	18.3
11	21	2.8	21	6.3	20	5.2	11	1.5	71	10.0	131	18.4
12	21	3.0	21	6.5	20	5.5	12	1.7	72	10.1	132	18.6
13	21	3.3	21	6.8	20	5.7	13	1.8	73	10.3	133	18.7
14	21	3.5	21	7.0	20	5.9	14	2.0	74	10.4	134	18.9
15	21	3.8	21	7.3	20	6.2	15	2.1	75	10.6	135	19.0
16	21	4.0	21	7.5	20	6.4	16	2.3	76	10.7	136	19.2
17	21	4.3	21	7.8	20	6.7	17	2.4	77	10.8	137	19.3
18	21	4.5	21	8.0	20	6.9	18	2.5	78	11.0	138	19.4
19	21	4.8	21	8.3	20	7.1	19	2.7	79	11.1	139	19.6
20	21	5.0	21	8.5	20	7.4	20	2.8	80	11.3	140	19.7
21	21	5.3	21	8.8	20	7.6	21	3.0	81	11.4	141	19.9
22	21	5.5	21	9.0	20	7.8	22	3.1	82	11.5	142	20.0
23	21	5.8	21	9.3	20	8.1	23	3.2	83	11.7	143	20.1
24	21	6.0	21	9.5	20	8.3	24	3.4	84	11.8	144	20.3
25	21	6.3	21	9.8	20	8.6	25	3.5	85	12.0	145	20.4
26	21	6.5	21	10.0	20	8.8	26	3.7	86	12.1	146	20.6
27	21	6.8	21	10.3	20	9.0	27	3.8	87	12.3	147	20.7
28	21	7.0	21	10.5	20	9.3	28	3.9	88	12.4	148	20.8
29	21	7.3	21	10.8	20	9.5	29	4.1	89	12.5	149	21.0
30	21	7.5	21	11.0	20	9.8	30	4.2	90	12.7	150	21.1
31	21	7.8	21	11.3	20	10.0	31	4.4	91	12.8	151	21.3
32	21	8.0	21	11.5	20	10.2	32	4.5	92	13.0	152	21.4
33	21	8.3	21	11.8	20	10.5	33	4.6	93	13.1	153	21.5
34	21	8.5	21	12.0	20	10.7	34	4.8	94	13.2	154	21.7
35	21	8.8	21	12.3	20	11.0	35	4.9	95	13.4	155	21.8
36	21	9.0	21	12.5	20	11.2	36	5.1	96	13.5	156	22.0
37	21	9.3	21	12.8	20	11.4	37	5.2	97	13.7	157	22.1
38	21	9.5	21	13.0	20	11.7	38	5.4	98	13.8	158	22.3
39	21	9.8	21	13.3	20	11.9	39	5.5	99	13.9	159	22.4
40	21	10.0	21	13.5	20	12.1	40	5.6	100	14.1	160	22.5
41	21	10.3	21	13.8	20	12.4	41	5.8	101	14.2	161	22.7
42	21	10.5	21	14.0	20	12.6	42	5.9	102	14.4	162	22.8
43	21	10.8	21	14.3	20	12.9	43	6.1	103	14.5	163	23.0
44	21	11.0	21	14.5	20	13.1	44	6.2	104	14.6	164	23.1
45	21	11.3	21	14.8	20	13.3	45	6.3	105	14.8	165	23.2
46	21	11.5	21	15.0	20	13.6	46	6.5	106	14.9	166	23.4
47	21	11.8	21	15.3	20	13.8	47	6.6	107	15.1	167	23.5
48	21	12.0	21	15.5	20	14.1	48	6.8	108	15.2	168	23.7
49	21	12.3	21	15.8	20	14.3	49	6.9	109	15.4	169	23.8
50	21	12.5	21	16.0	20	14.5	50	7.0	110	15.5	170	23.9
51	21	12.8	21	16.3	20	14.8	51	7.2	111	15.6	171	24.1
52	21	13.0	21	16.5	20	15.0	52	7.3	112	15.8	172	24.2
53	21	13.3	21	16.8	20	15.2	53	7.5	113	15.9	173	24.4
54	21	13.5	21	17.0	20	15.5	54	7.6	114	16.1	174	24.5
55	21	13.8	21	17.3	20	15.7	55	7.7	115	16.2	175	24.6
56	21	14.0	21	17.5	20	16.0	56	7.9	116	16.3	176	24.8
57	21	14.3	21	17.8	20	16.2	57	8.0	117	16.5	177	24.9
58	21	14.5	21	18.0	20	16.4	58	8.2	118	16.6	178	25.1
59	21	14.8	21	18.3	20	16.7	59	8.3	119	16.8	179	25.2
60	21	15.0	21	18.5	20	16.9	60	8.5	120	16.9	180	25.4

1 h 25 min

POPRAVKA ČASOVNOG UGLA						POPRAVKA DRUGOG REDA za časovni ugao i deklinaciju Sunca, Mjeseca i planeta					
s	SUNCA I PLANETA		PROLJEĆNE TAČKE ♈		MJESECA ☾		Δ	poprav.	Δ	poprav.	Δ	poprav.
	°	′	°	′	°	′		′		′		′
0	21	15.0	21	18.5	20	16.9	0	.0	60	8.6	120	17.1
1	21	15.3	21	18.8	20	17.2	1	.1	61	8.7	121	17.2
2	21	15.5	21	19.0	20	17.4	2	.3	62	8.8	122	17.4
3	21	15.8	21	19.3	20	17.6	3	.4	63	9.0	123	17.5
4	21	16.0	21	19.5	20	17.9	4	.6	64	9.1	124	17.7
5	21	16.3	21	19.8	20	18.1	5	.7	65	9.3	125	17.8
6	21	16.5	21	20.0	20	18.3	6	.9	66	9.4	126	18.0
7	21	16.8	21	20.3	20	18.6	7	1.0	67	9.5	127	18.1
8	21	17.0	21	20.5	20	18.8	8	1.1	68	9.7	128	18.2
9	21	17.3	21	20.8	20	19.1	9	1.3	69	9.8	129	18.4
10	21	17.5	21	21.0	20	19.3	10	1.4	70	10.0	130	18.5
11	21	17.8	21	21.3	20	19.5	11	1.6	71	10.1	131	18.7
12	21	18.0	21	21.6	20	19.8	12	1.7	72	10.3	132	18.8
13	21	18.3	21	21.8	20	20.0	13	1.9	73	10.4	133	19.0
14	21	18.5	21	22.1	20	20.3	14	2.0	74	10.5	134	19.1
15	21	18.8	21	22.3	20	20.5	15	2.1	75	10.7	135	19.2
16	21	19.0	21	22.6	20	20.7	16	2.3	76	10.8	136	19.4
17	21	19.3	21	22.8	20	21.0	17	2.4	77	11.0	137	19.5
18	21	19.5	21	23.1	20	21.2	18	2.6	78	11.1	138	19.7
19	21	19.8	21	23.3	20	21.5	19	2.7	79	11.3	139	19.8
20	21	20.0	21	23.6	20	21.7	20	2.9	80	11.4	140	20.0
21	21	20.3	21	23.8	20	21.9	21	3.0	81	11.5	141	20.1
22	21	20.5	21	24.1	20	22.2	22	3.1	82	11.7	142	20.2
23	21	20.8	21	24.3	20	22.4	23	3.3	83	11.8	143	20.4
24	21	21.0	21	24.6	20	22.6	24	3.4	84	12.0	144	20.5
25	21	21.3	21	24.8	20	22.9	25	3.6	85	12.1	145	20.7
26	21	21.5	21	25.1	20	23.1	26	3.7	86	12.3	146	20.8
27	21	21.8	21	25.3	20	23.4	27	3.8	87	12.4	147	20.9
28	21	22.0	21	25.6	20	23.6	28	4.0	88	12.5	148	21.1
29	21	22.3	21	25.8	20	23.8	29	4.1	89	12.7	149	21.2
30	21	22.5	21	26.1	20	24.1	30	4.3	90	12.8	150	21.4
31	21	22.8	21	26.3	20	24.3	31	4.4	91	13.0	151	21.5
32	21	23.0	21	26.6	20	24.6	32	4.6	92	13.1	152	21.7
33	21	23.3	21	26.8	20	24.8	33	4.7	93	13.3	153	21.8
34	21	23.5	21	27.1	20	25.0	34	4.8	94	13.4	154	21.9
35	21	23.8	21	27.3	20	25.3	35	5.0	95	13.5	155	22.1
36	21	24.0	21	27.6	20	25.5	36	5.1	96	13.7	156	22.2
37	21	24.3	21	27.8	20	25.7	37	5.3	97	13.8	157	22.4
38	21	24.5	21	28.1	20	26.0	38	5.4	98	14.0	158	22.5
39	21	24.8	21	28.3	20	26.2	39	5.6	99	14.1	159	22.7
40	21	25.0	21	28.6	20	26.5	40	5.7	100	14.3	160	22.8
41	21	25.3	21	28.8	20	26.7	41	5.8	101	14.4	161	22.9
42	21	25.5	21	29.1	20	26.9	42	6.0	102	14.5	162	23.1
43	21	25.8	21	29.3	20	27.2	43	6.1	103	14.7	163	23.2
44	21	26.0	21	29.6	20	27.4	44	6.3	104	14.8	164	23.4
45	21	26.3	21	29.8	20	27.7	45	6.4	105	15.0	165	23.5
46	21	26.5	21	30.1	20	27.9	46	6.6	106	15.1	166	23.7
47	21	26.8	21	30.3	20	28.1	47	6.7	107	15.2	167	23.8
48	21	27.0	21	30.6	20	28.4	48	6.8	108	15.4	168	23.9
49	21	27.3	21	30.8	20	28.6	49	7.0	109	15.5	169	24.1
50	21	27.5	21	31.1	20	28.8	50	7.1	110	15.7	170	24.2
51	21	27.8	21	31.3	20	29.1	51	7.3	111	15.8	171	24.4
52	21	28.0	21	31.6	20	29.3	52	7.4	112	16.0	172	24.5
53	21	28.3	21	31.8	20	29.6	53	7.6	113	16.1	173	24.7
54	21	28.5	21	32.1	20	29.8	54	7.7	114	16.2	174	24.8
55	21	28.8	21	32.3	20	30.0	55	7.8	115	16.4	175	24.9
56	21	29.0	21	32.6	20	30.3	56	8.0	116	16.5	176	25.1
57	21	29.3	21	32.8	20	30.5	57	8.1	117	16.7	177	25.2
58	21	29.5	21	33.1	20	30.8	58	8.3	118	16.8	178	25.4
59	21	29.8	21	33.3	20	31.0	59	8.4	119	17.0	179	25.5
60	21	30.0	21	33.6	20	31.2	60	8.6	120	17.1	180	25.7

1 h 26 min

POPRAVKA ČASOVNOG UGLA				POPRAVKA DRUGOG REDA za časovni ugao i deklinaciju Sunca, Mjeseca i planeta					
s	SUNCA I PLANETA	PROLJEĆNE TAČKE ♈	MJESECA ☾	Δ	popr.	Δ	popr.	Δ	popr.
	° ′	° ′	° ′		′		′		′
0	21 30.0	21 33.6	20 31.2	0	.0	60	8.7	120	17.3
1	21 30.3	21 33.8	20 31.5	1	.1	61	8.8	121	17.4
2	21 30.5	21 34.1	20 31.7	2	.3	62	8.9	122	17.6
3	21 30.8	21 34.3	20 31.9	3	.4	63	9.1	123	17.7
4	21 31.0	21 34.6	20 32.2	4	.6	64	9.2	124	17.9
5	21 31.3	21 34.8	20 32.4	5	.7	65	9.4	125	18.0
6	21 31.5	21 35.1	20 32.7	6	.9	66	9.5	126	18.2
7	21 31.8	21 35.3	20 32.9	7	1.0	67	9.7	127	18.3
8	21 32.0	21 35.6	20 33.1	8	1.2	68	9.8	128	18.5
9	21 32.3	21 35.8	20 33.4	9	1.3	69	9.9	129	18.6
10	21 32.5	21 36.1	20 33.6	10	1.4	70	10.1	130	18.7
11	21 32.8	21 36.3	20 33.9	11	1.6	71	10.2	131	18.9
12	21 33.0	21 36.6	20 34.1	12	1.7	72	10.4	132	19.0
13	21 33.3	21 36.8	20 34.3	13	1.9	73	10.5	133	19.2
14	21 33.5	21 37.1	20 34.6	14	2.0	74	10.7	134	19.3
15	21 33.8	21 37.3	20 34.8	15	2.2	75	10.8	135	19.5
16	21 34.0	21 37.6	20 35.1	16	2.3	76	11.0	136	19.6
17	21 34.3	21 37.8	20 35.3	17	2.5	77	11.1	137	19.8
18	21 34.5	21 38.1	20 35.5	18	2.6	78	11.2	138	19.9
19	21 34.8	21 38.3	20 35.8	19	2.7	79	11.4	139	20.0
20	21 35.0	21 38.6	20 36.0	20	2.9	80	11.5	140	20.2
21	21 35.3	21 38.8	20 36.2	21	3.0	81	11.7	141	20.3
22	21 35.5	21 39.1	20 36.5	22	3.2	82	11.8	142	20.5
23	21 35.8	21 39.3	20 36.7	23	3.3	83	12.0	143	20.6
24	21 36.0	21 39.6	20 37.0	24	3.5	84	12.1	144	20.8
25	21 36.3	21 39.9	20 37.2	25	3.6	85	12.3	145	20.9
26	21 36.5	21 40.1	20 37.4	26	3.7	86	12.4	146	21.0
27	21 36.8	21 40.4	20 37.7	27	3.9	87	12.5	147	21.2
28	21 37.0	21 40.6	20 37.9	28	4.0	88	12.7	148	21.3
29	21 37.3	21 40.9	20 38.2	29	4.2	89	12.8	149	21.5
30	21 37.5	21 41.1	20 38.4	30	4.3	90	13.0	150	21.6
31	21 37.8	21 41.4	20 38.6	31	4.5	91	13.1	151	21.8
32	21 38.0	21 41.6	20 38.9	32	4.6	92	13.3	152	21.9
33	21 38.3	21 41.9	20 39.1	33	4.8	93	13.4	153	22.1
34	21 38.5	21 42.1	20 39.3	34	4.9	94	13.6	154	22.2
35	21 38.8	21 42.4	20 39.6	35	5.0	95	13.7	155	22.3
36	21 39.0	21 42.6	20 39.8	36	5.2	96	13.8	156	22.5
37	21 39.3	21 42.9	20 40.1	37	5.3	97	14.0	157	22.6
38	21 39.5	21 43.1	20 40.3	38	5.5	98	14.1	158	22.8
39	21 39.8	21 43.4	20 40.5	39	5.6	99	14.3	159	22.9
40	21 40.0	21 43.6	20 40.8	40	5.8	100	14.4	160	23.1
41	21 40.3	21 43.9	20 41.0	41	5.9	101	14.6	161	23.2
42	21 40.5	21 44.1	20 41.3	42	6.1	102	14.7	162	23.4
43	21 40.8	21 44.4	20 41.5	43	6.2	103	14.8	163	23.5
44	21 41.0	21 44.6	20 41.7	44	6.3	104	15.0	164	23.6
45	21 41.3	21 44.9	20 42.0	45	6.5	105	15.1	165	23.8
46	21 41.5	21 45.1	20 42.2	46	6.6	106	15.3	166	23.9
47	21 41.8	21 45.4	20 42.4	47	6.8	107	15.4	167	24.1
48	21 42.0	21 45.6	20 42.7	48	6.9	108	15.6	168	24.2
49	21 42.3	21 45.9	20 42.9	49	7.1	109	15.7	169	24.4
50	21 42.5	21 46.1	20 43.2	50	7.2	110	15.9	170	24.5
51	21 42.8	21 46.4	20 43.4	51	7.4	111	16.0	171	24.7
52	21 43.0	21 46.6	20 43.6	52	7.5	112	16.1	172	24.8
53	21 43.3	21 46.9	20 43.9	53	7.6	113	16.3	173	24.9
54	21 43.5	21 47.1	20 44.1	54	7.8	114	16.4	174	25.1
55	21 43.8	21 47.4	20 44.4	55	7.9	115	16.6	175	25.2
56	21 44.0	21 47.6	20 44.6	56	8.1	116	16.7	176	25.4
57	21 44.3	21 47.9	20 44.8	57	8.2	117	16.9	177	25.5
58	21 44.5	21 48.1	20 45.1	58	8.4	118	17.0	178	25.7
59	21 44.8	21 48.4	20 45.3	59	8.5	119	17.2	179	25.8
60	21 45.0	21 48.6	20 45.6	60	8.7	120	17.3	180	26.0

1 h 27 min

POPRAVKA ČASOVNOG UGLA				POPRAVKA DRUGOG REDA za časovni ugao i deklinaciju Sunca, Mjeseca i planeta					
s	SUNCA I PLANETA	PROLJEĆNE TAČKE ♈	MJESECA ☾	Δ	popr.	Δ	popr.	Δ	popr.
	° ′	° ′	° ′		′		′		′
0	21 45.0	21 48.6	20 45.6	0	.0	60	8.8	120	17.5
1	21 45.3	21 48.9	20 45.8	1	.1	61	8.9	121	17.6
2	21 45.5	21 49.1	20 46.0	2	.3	62	9.0	122	17.8
3	21 45.8	21 49.4	20 46.3	3	.4	63	9.2	123	17.9
4	21 46.0	21 49.6	20 46.5	4	.6	64	9.3	124	18.1
5	21 46.3	21 49.9	20 46.7	5	.7	65	9.5	125	18.2
6	21 46.5	21 50.1	20 47.0	6	.9	66	9.6	126	18.4
7	21 46.8	21 50.4	20 47.2	7	1.0	67	9.8	127	18.5
8	21 47.0	21 50.6	20 47.5	8	1.2	68	9.9	128	18.7
9	21 47.3	21 50.9	20 47.7	9	1.3	69	10.1	129	18.8
10	21 47.5	21 51.1	20 47.9	10	1.5	70	10.2	130	19.0
11	21 47.8	21 51.4	20 48.2	11	1.6	71	10.4	131	19.1
12	21 48.0	21 51.6	20 48.4	12	1.8	72	10.5	132	19.3
13	21 48.3	21 51.9	20 48.7	13	1.9	73	10.6	133	19.4
14	21 48.5	21 52.1	20 48.9	14	2.0	74	10.8	134	19.5
15	21 48.8	21 52.4	20 49.1	15	2.2	75	10.9	135	19.7
16	21 49.0	21 52.6	20 49.4	16	2.3	76	11.1	136	19.8
17	21 49.3	21 52.9	20 49.6	17	2.5	77	11.2	137	20.0
18	21 49.5	21 53.1	20 49.8	18	2.6	78	11.4	138	20.1
19	21 49.8	21 53.4	20 50.1	19	2.8	79	11.5	139	20.3
20	21 50.0	21 53.6	20 50.3	20	2.9	80	11.7	140	20.4
21	21 50.3	21 53.9	20 50.6	21	3.1	81	11.8	141	20.6
22	21 50.5	21 54.1	20 50.8	22	3.2	82	12.0	142	20.7
23	21 50.8	21 54.4	20 51.0	23	3.4	83	12.1	143	20.9
24	21 51.0	21 54.6	20 51.3	24	3.5	84	12.3	144	21.0
25	21 51.3	21 54.9	20 51.5	25	3.6	85	12.4	145	21.1
26	21 51.5	21 55.1	20 51.8	26	3.8	86	12.5	146	21.3
27	21 51.8	21 55.4	20 52.0	27	3.9	87	12.7	147	21.4
28	21 52.0	21 55.6	20 52.2	28	4.1	88	12.8	148	21.6
29	21 52.3	21 55.9	20 52.5	29	4.2	89	13.0	149	21.7
30	21 52.5	21 56.1	20 52.7	30	4.4	90	13.1	150	21.9
31	21 52.8	21 56.4	20 52.9	31	4.5	91	13.3	151	22.0
32	21 53.0	21 56.6	20 53.2	32	4.7	92	13.4	152	22.2
33	21 53.3	21 56.9	20 53.4	33	4.8	93	13.6	153	22.3
34	21 53.5	21 57.1	20 53.7	34	5.0	94	13.7	154	22.5
35	21 53.8	21 57.4	20 53.9	35	5.1	95	13.9	155	22.6
36	21 54.0	21 57.7	20 54.1	36	5.3	96	14.0	156	22.8
37	21 54.3	21 57.9	20 54.4	37	5.4	97	14.1	157	22.9
38	21 54.5	21 58.2	20 54.6	38	5.5	98	14.3	158	23.0
39	21 54.8	21 58.4	20 54.9	39	5.7	99	14.4	159	23.2
40	21 55.0	21 58.7	20 55.1	40	5.8	100	14.6	160	23.3
41	21 55.3	21 58.9	20 55.3	41	6.0	101	14.7	161	23.5
42	21 55.5	21 59.2	20 55.6	42	6.1	102	14.9	162	23.6
43	21 55.8	21 59.4	20 55.8	43	6.3	103	15.0	163	23.8
44	21 56.0	21 59.7	20 56.0	44	6.4	104	15.2	164	23.9
45	21 56.3	21 59.9	20 56.3	45	6.6	105	15.3	165	24.1
46	21 56.5	22 .2	20 56.5	46	6.7	106	15.5	166	24.2
47	21 56.8	22 .4	20 56.8	47	6.9	107	15.6	167	24.4
48	21 57.0	22 .7	20 57.0	48	7.0	108	15.8	168	24.5
49	21 57.3	22 .9	20 57.2	49	7.1	109	15.9	169	24.6
50	21 57.5	22 1.2	20 57.5	50	7.3	110	16.0	170	24.8
51	21 57.8	22 1.4	20 57.7	51	7.4	111	16.2	171	24.9
52	21 58.0	22 1.7	20 58.0	52	7.6	112	16.3	172	25.1
53	21 58.3	22 1.9	20 58.2	53	7.7	113	16.5	173	25.2
54	21 58.5	22 2.2	20 58.4	54	7.9	114	16.6	174	25.4
55	21 58.8	22 2.4	20 58.7	55	8.0	115	16.8	175	25.5
56	21 59.0	22 2.7	20 58.9	56	8.2	116	16.9	176	25.7
57	21 59.3	22 2.9	20 59.2	57	8.3	117	17.1	177	25.8
58	21 59.5	22 3.2	20 59.4	58	8.5	118	17.2	178	26.0
59	21 59.8	22 3.4	20 59.6	59	8.6	119	17.4	179	26.1
60	22 .0	22 3.7	20 59.9	60	8.8	120	17.5	180	26.3

1 h 28 min

POPRAVKA ČASOVNOG UGLA				POPRAVKA DRUGOG REDA za časovni ugao i deklinaciju Sunca, Mjeseca i planeta					
s	SUNCA I PLANETA	PROLJEĆNE TAČKE ♈	MJESECA ☾	Δ	popr.	Δ	popr.	Δ	popr.
	° ′	° ′	° ′		′		′		′
0	22 .0	22 3.7	20 59.9	0	.0	60	8.9	120	17.7
1	22 .3	22 3.9	21 .1	1	.1	61	9.0	121	17.8
2	22 .5	22 4.2	21 .3	2	.3	62	9.1	122	18.0
3	22 .8	22 4.4	21 .6	3	.4	63	9.3	123	18.1
4	22 1.0	22 4.7	21 .8	4	.6	64	9.4	124	18.3
5	22 1.3	22 4.9	21 1.1	5	.7	65	9.6	125	18.4
6	22 1.5	22 5.2	21 1.3	6	.9	66	9.7	126	18.6
7	22 1.8	22 5.4	21 1.5	7	1.0	67	9.9	127	18.7
8	22 2.0	22 5.7	21 1.8	8	1.2	68	10.0	128	18.9
9	22 2.3	22 5.9	21 2.0	9	1.3	69	10.2	129	19.0
10	22 2.5	22 6.2	21 2.3	10	1.5	70	10.3	130	19.2
11	22 2.8	22 6.4	21 2.5	11	1.6	71	10.5	131	19.3
12	22 3.0	22 6.7	21 2.7	12	1.8	72	10.6	132	19.5
13	22 3.3	22 6.9	21 3.0	13	1.9	73	10.8	133	19.6
14	22 3.5	22 7.2	21 3.2	14	2.1	74	10.9	134	19.8
15	22 3.8	22 7.4	21 3.4	15	2.2	75	11.1	135	19.9
16	22 4.0	22 7.7	21 3.7	16	2.4	76	11.2	136	20.1
17	22 4.3	22 7.9	21 3.9	17	2.5	77	11.4	137	20.2
18	22 4.5	22 8.2	21 4.2	18	2.7	78	11.5	138	20.4
19	22 4.8	22 8.4	21 4.4	19	2.8	79	11.7	139	20.5
20	22 5.0	22 8.7	21 4.6	20	3.0	80	11.8	140	20.7
21	22 5.3	22 8.9	21 4.9	21	3.1	81	11.9	141	20.8
22	22 5.5	22 9.2	21 5.1	22	3.2	82	12.1	142	20.9
23	22 5.8	22 9.4	21 5.4	23	3.4	83	12.2	143	21.1
24	22 6.0	22 9.7	21 5.6	24	3.5	84	12.4	144	21.2
25	22 6.3	22 9.9	21 5.8	25	3.7	85	12.5	145	21.4
26	22 6.5	22 10.2	21 6.1	26	3.8	86	12.7	146	21.5
27	22 6.8	22 10.4	21 6.3	27	4.0	87	12.8	147	21.7
28	22 7.0	22 10.7	21 6.5	28	4.1	88	13.0	148	21.8
29	22 7.3	22 10.9	21 6.8	29	4.3	89	13.1	149	22.0
30	22 7.5	22 11.2	21 7.0	30	4.4	90	13.3	150	22.1
31	22 7.8	22 11.4	21 7.3	31	4.6	91	13.4	151	22.3
32	22 8.0	22 11.7	21 7.5	32	4.7	92	13.6	152	22.4
33	22 8.3	22 11.9	21 7.7	33	4.9	93	13.7	153	22.6
34	22 8.5	22 12.2	21 8.0	34	5.0	94	13.9	154	22.7
35	22 8.8	22 12.4	21 8.2	35	5.2	95	14.0	155	22.9
36	22 9.0	22 12.7	21 8.5	36	5.3	96	14.2	156	23.0
37	22 9.3	22 12.9	21 8.7	37	5.5	97	14.3	157	23.2
38	22 9.5	22 13.2	21 8.9	38	5.6	98	14.5	158	23.3
39	22 9.8	22 13.4	21 9.2	39	5.8	99	14.6	159	23.5
40	22 10.0	22 13.7	21 9.4	40	5.9	100	14.8	160	23.6
41	22 10.3	22 13.9	21 9.6	41	6.0	101	14.9	161	23.7
42	22 10.5	22 14.2	21 9.9	42	6.2	102	15.0	162	23.9
43	22 10.8	22 14.4	21 10.1	43	6.3	103	15.2	163	24.0
44	22 11.0	22 14.7	21 10.4	44	6.5	104	15.3	164	24.2
45	22 11.3	22 14.9	21 10.6	45	6.6	105	15.5	165	24.3
46	22 11.5	22 15.2	21 10.8	46	6.8	106	15.6	166	24.5
47	22 11.8	22 15.4	21 11.1	47	6.9	107	15.8	167	24.6
48	22 12.0	22 15.7	21 11.3	48	7.1	108	15.9	168	24.8
49	22 12.3	22 16.0	21 11.6	49	7.2	109	16.1	169	24.9
50	22 12.5	22 16.2	21 11.8	50	7.4	110	16.2	170	25.1
51	22 12.8	22 16.5	21 12.0	51	7.5	111	16.4	171	25.2
52	22 13.0	22 16.7	21 12.3	52	7.7	112	16.5	172	25.4
53	22 13.3	22 17.0	21 12.5	53	7.8	113	16.7	173	25.5
54	22 13.5	22 17.2	21 12.8	54	8.0	114	16.8	174	25.7
55	22 13.8	22 17.5	21 13.0	55	8.1	115	17.0	175	25.8
56	22 14.0	22 17.7	21 13.2	56	8.3	116	17.1	176	26.0
57	22 14.3	22 18.0	21 13.5	57	8.4	117	17.3	177	26.1
58	22 14.5	22 18.2	21 13.7	58	8.6	118	17.4	178	26.3
59	22 14.8	22 18.5	21 13.9	59	8.7	119	17.6	179	26.4
60	22 15.0	22 18.7	21 14.2	60	8.9	120	17.7	180	26.6

1 h 29 min

POPRAVKA ČASOVNOG UGLA				POPRAVKA DRUGOG REDA za časovni ugao i deklinaciju Sunca, Mjeseca i planeta					
s	SUNCA I PLANETA	PROLJEĆNE TAČKE ♈	MJESECA ☾	Δ	popr.	Δ	popr.	Δ	popr.
	° ′	° ′	° ′		′		′		′
0	22 15.0	22 18.7	21 14.2	0	.0	60	9.0	120	17.9
1	22 15.3	22 19.0	21 14.4	1	.1	61	9.1	121	18.0
2	22 15.5	22 19.2	21 14.7	2	.3	62	9.2	122	18.2
3	22 15.8	22 19.5	21 14.9	3	.4	63	9.4	123	18.3
4	22 16.0	22 19.7	21 15.1	4	.6	64	9.5	124	18.5
5	22 16.3	22 20.0	21 15.4	5	.7	65	9.7	125	18.6
6	22 16.5	22 20.2	21 15.6	6	.9	66	9.8	126	18.8
7	22 16.8	22 20.5	21 15.9	7	1.0	67	10.0	127	18.9
8	22 17.0	22 20.7	21 16.1	8	1.2	68	10.1	128	19.1
9	22 17.3	22 21.0	21 16.3	9	1.3	69	10.3	129	19.2
10	22 17.5	22 21.2	21 16.6	10	1.5	70	10.4	130	19.4
11	22 17.8	22 21.5	21 16.8	11	1.6	71	10.6	131	19.5
12	22 18.0	22 21.7	21 17.0	12	1.8	72	10.7	132	19.7
13	22 18.3	22 22.0	21 17.3	13	1.9	73	10.9	133	19.8
14	22 18.5	22 22.2	21 17.5	14	2.1	74	11.0	134	20.0
15	22 18.8	22 22.5	21 17.8	15	2.2	75	11.2	135	20.1
16	22 19.0	22 22.7	21 18.0	16	2.4	76	11.3	136	20.3
17	22 19.3	22 23.0	21 18.2	17	2.5	77	11.5	137	20.4
18	22 19.5	22 23.2	21 18.5	18	2.7	78	11.6	138	20.6
19	22 19.8	22 23.5	21 18.7	19	2.8	79	11.8	139	20.7
20	22 20.0	22 23.7	21 19.0	20	3.0	80	11.9	140	20.9
21	22 20.3	22 24.0	21 19.2	21	3.1	81	12.1	141	21.0
22	22 20.5	22 24.2	21 19.4	22	3.3	82	12.2	142	21.2
23	22 20.8	22 24.5	21 19.7	23	3.4	83	12.4	143	21.3
24	22 21.0	22 24.7	21 19.9	24	3.6	84	12.5	144	21.5
25	22 21.3	22 25.0	21 20.1	25	3.7	85	12.7	145	21.6
26	22 21.5	22 25.2	21 20.4	26	3.9	86	12.8	146	21.8
27	22 21.8	22 25.5	21 20.6	27	4.0	87	13.0	147	21.9
28	22 22.0	22 25.7	21 20.9	28	4.2	88	13.1	148	22.1
29	22 22.3	22 26.0	21 21.1	29	4.3	89	13.3	149	22.2
30	22 22.5	22 26.2	21 21.3	30	4.5	90	13.4	150	22.4
31	22 22.8	22 26.5	21 21.6	31	4.6	91	13.6	151	22.5
32	22 23.0	22 26.7	21 21.8	32	4.8	92	13.7	152	22.7
33	22 23.3	22 27.0	21 22.1	33	4.9	93	13.9	153	22.8
34	22 23.5	22 27.2	21 22.3	34	5.1	94	14.0	154	23.0
35	22 23.8	22 27.5	21 22.5	35	5.2	95	14.2	155	23.1
36	22 24.0	22 27.7	21 22.8	36	5.4	96	14.3	156	23.3
37	22 24.3	22 28.0	21 23.0	37	5.5	97	14.5	157	23.4
38	22 24.5	22 28.2	21 23.3	38	5.7	98	14.6	158	23.6
39	22 24.8	22 28.5	21 23.5	39	5.8	99	14.8	159	23.7
40	22 25.0	22 28.7	21 23.7	40	6.0	100	14.9	160	23.9
41	22 25.3	22 29.0	21 24.0	41	6.1	101	15.1	161	24.0
42	22 25.5	22 29.2	21 24.2	42	6.3	102	15.2	162	24.2
43	22 25.8	22 29.5	21 24.4	43	6.4	103	15.4	163	24.3
44	22 26.0	22 29.7	21 24.7	44	6.6	104	15.5	164	24.5
45	22 26.3	22 30.0	21 24.9	45	6.7	105	15.7	165	24.6
46	22 26.5	22 30.2	21 25.2	46	6.9	106	15.8	166	24.8
47	22 26.8	22 30.5	21 25.4	47	7.0	107	16.0	167	24.9
48	22 27.0	22 30.7	21 25.6	48	7.2	108	16.1	168	25.1
49	22 27.3	22 31.0	21 25.9	49	7.3	109	16.3	169	25.2
50	22 27.5	22 31.2	21 26.1	50	7.5	110	16.4	170	25.4
51	22 27.8	22 31.5	21 26.4	51	7.6	111	16.6	171	25.5
52	22 28.0	22 31.7	21 26.6	52	7.8	112	16.7	172	25.7
53	22 28.3	22 32.0	21 26.8	53	7.9	113	16.9	173	25.8
54	22 28.5	22 32.2	21 27.1	54	8.1	114	17.0	174	26.0
55	22 28.8	22 32.5	21 27.3	55	8.2	115	17.2	175	26.1
56	22 29.0	22 32.7	21 27.5	56	8.4	116	17.3	176	26.3
57	22 29.3	22 33.0	21 27.8	57	8.5	117	17.5	177	26.4
58	22 29.5	22 33.2	21 28.0	58	8.7	118	17.6	178	26.6
59	22 29.8	22 33.5	21 28.3	59	8.8	119	17.8	179	26.7
60	22 30.0	22 33.8	21 28.5	60	9.0	120	17.9	180	26.9

1 h 30 min

POPRAVKA ČASOVNOG UGLA				POPRAVKA DRUGOG REDA za časovni ugao i deklinaciju Sunca, Mjeseca i planeta					
s	SUNCA I PLANETA	PROLJEĆNE TAČKE ♈	MJESECA ☾	Δ	popr.	Δ	popr.	Δ	popr.
	° ′	° ′	° ′		′		′		′
0	22 30.0	22 33.8	21 28.5	0	.0	60	9.1	120	18.1
1	22 30.3	22 34.0	21 28.7	1	.2	61	9.2	121	18.3
2	22 30.5	22 34.3	21 29.0	2	.3	62	9.4	122	18.4
3	22 30.8	22 34.5	21 29.2	3	.5	63	9.5	123	18.6
4	22 31.0	22 34.8	21 29.5	4	.6	64	9.7	124	18.7
5	22 31.3	22 35.0	21 29.7	5	.8	65	9.8	125	18.9
6	22 31.5	22 35.3	21 29.9	6	.9	66	10.0	126	19.0
7	22 31.8	22 35.5	21 30.2	7	1.1	67	10.1	127	19.2
8	22 32.0	22 35.8	21 30.4	8	1.2	68	10.3	128	19.3
9	22 32.3	22 36.0	21 30.6	9	1.4	69	10.4	129	19.5
10	22 32.5	22 36.3	21 30.9	10	1.5	70	10.6	130	19.6
11	22 32.8	22 36.5	21 31.1	11	1.7	71	10.7	131	19.8
12	22 33.0	22 36.8	21 31.4	12	1.8	72	10.9	132	19.9
13	22 33.3	22 37.0	21 31.6	13	2.0	73	11.0	133	20.1
14	22 33.5	22 37.3	21 31.8	14	2.1	74	11.2	134	20.2
15	22 33.8	22 37.5	21 32.1	15	2.3	75	11.3	135	20.4
16	22 34.0	22 37.8	21 32.3	16	2.4	76	11.5	136	20.5
17	22 34.3	22 38.0	21 32.6	17	2.6	77	11.6	137	20.7
18	22 34.5	22 38.3	21 32.8	18	2.7	78	11.8	138	20.8
19	22 34.8	22 38.5	21 33.0	19	2.9	79	11.9	139	21.0
20	22 35.0	22 38.8	21 33.3	20	3.0	80	12.1	140	21.1
21	22 35.3	22 39.0	21 33.5	21	3.2	81	12.2	141	21.3
22	22 35.5	22 39.3	21 33.7	22	3.3	82	12.4	142	21.4
23	22 35.8	22 39.5	21 34.0	23	3.5	83	12.5	143	21.6
24	22 36.0	22 39.8	21 34.2	24	3.6	84	12.7	144	21.7
25	22 36.3	22 40.0	21 34.5	25	3.8	85	12.8	145	21.9
26	22 36.5	22 40.3	21 34.7	26	3.9	86	13.0	146	22.0
27	22 36.8	22 40.5	21 34.9	27	4.1	87	13.1	147	22.2
28	22 37.0	22 40.8	21 35.2	28	4.2	88	13.3	148	22.3
29	22 37.3	22 41.0	21 35.4	29	4.4	89	13.4	149	22.5
30	22 37.5	22 41.3	21 35.7	30	4.5	90	13.6	150	22.6
31	22 37.8	22 41.5	21 35.9	31	4.7	91	13.7	151	22.8
32	22 38.0	22 41.8	21 36.1	32	4.8	92	13.9	152	22.9
33	22 38.3	22 42.0	21 36.4	33	5.0	93	14.0	153	23.1
34	22 38.5	22 42.3	21 36.6	34	5.1	94	14.2	154	23.2
35	22 38.8	22 42.5	21 36.9	35	5.3	95	14.3	155	23.4
36	22 39.0	22 42.8	21 37.1	36	5.4	96	14.5	156	23.5
37	22 39.3	22 43.0	21 37.3	37	5.6	97	14.6	157	23.7
38	22 39.5	22 43.3	21 37.6	38	5.7	98	14.8	158	23.8
39	22 39.8	22 43.5	21 37.8	39	5.9	99	14.9	159	24.0
40	22 40.0	22 43.8	21 38.0	40	6.0	100	15.1	160	24.1
41	22 40.3	22 44.0	21 38.3	41	6.2	101	15.2	161	24.3
42	22 40.5	22 44.3	21 38.5	42	6.3	102	15.4	162	24.4
43	22 40.8	22 44.5	21 38.8	43	6.5	103	15.5	163	24.6
44	22 41.0	22 44.8	21 39.0	44	6.6	104	15.7	164	24.7
45	22 41.3	22 45.0	21 39.2	45	6.8	105	15.8	165	24.9
46	22 41.5	22 45.3	21 39.5	46	6.9	106	16.0	166	25.0
47	22 41.8	22 45.5	21 39.7	47	7.1	107	16.1	167	25.2
48	22 42.0	22 45.8	21 40.0	48	7.2	108	16.3	168	25.3
49	22 42.3	22 46.0	21 40.2	49	7.4	109	16.4	169	25.5
50	22 42.5	22 46.3	21 40.4	50	7.5	110	16.6	170	25.6
51	22 42.8	22 46.5	21 40.7	51	7.7	111	16.7	171	25.8
52	22 43.0	22 46.8	21 40.9	52	7.8	112	16.9	172	25.9
53	22 43.3	22 47.0	21 41.1	53	8.0	113	17.0	173	26.1
54	22 43.5	22 47.3	21 41.4	54	8.1	114	17.2	174	26.2
55	22 43.8	22 47.5	21 41.6	55	8.3	115	17.3	175	26.4
56	22 44.0	22 47.8	21 41.9	56	8.4	116	17.5	176	26.5
57	22 44.3	22 48.0	21 42.1	57	8.6	117	17.6	177	26.7
58	22 44.5	22 48.3	21 42.3	58	8.7	118	17.8	178	26.8
59	22 44.8	22 48.5	21 42.6	59	8.9	119	17.9	179	27.0
60	22 45.0	22 48.8	21 42.8	60	9.1	120	18.1	180	27.2

1 h 31 min

POPRAVKA ČASOVNOG UGLA				POPRAVKA DRUGOG REDA za časovni ugao i deklinaciju Sunca, Mjeseca i planeta					
s	SUNCA I PLANETA	PROLJEĆNE TAČKE ♈	MJESECA ☾	Δ	popr.	Δ	popr.	Δ	popr.
	° ′	° ′	° ′		′		′		′
0	22 45.0	22 48.8	21 42.8	0	.0	60	9.2	120	18.3
1	22 45.3	22 49.0	21 43.1	1	.2	61	9.3	121	18.5
2	22 45.5	22 49.3	21 43.3	2	.3	62	9.5	122	18.6
3	22 45.8	22 49.5	21 43.5	3	.5	63	9.6	123	18.8
4	22 46.0	22 49.8	21 43.8	4	.6	64	9.8	124	18.9
5	22 46.3	22 50.0	21 44.0	5	.8	65	9.9	125	19.1
6	22 46.5	22 50.3	21 44.2	6	.9	66	10.1	126	19.2
7	22 46.8	22 50.5	21 44.5	7	1.1	67	10.2	127	19.4
8	22 47.0	22 50.8	21 44.7	8	1.2	68	10.4	128	19.5
9	22 47.3	22 51.0	21 45.0	9	1.4	69	10.5	129	19.7
10	22 47.5	22 51.3	21 45.2	10	1.5	70	10.7	130	19.8
11	22 47.8	22 51.5	21 45.4	11	1.7	71	10.8	131	20.0
12	22 48.0	22 51.8	21 45.7	12	1.8	72	11.0	132	20.1
13	22 48.3	22 52.1	21 45.9	13	2.0	73	11.1	133	20.3
14	22 48.5	22 52.3	21 46.2	14	2.1	74	11.3	134	20.4
15	22 48.8	22 52.6	21 46.4	15	2.3	75	11.4	135	20.6
16	22 49.0	22 52.8	21 46.6	16	2.4	76	11.6	136	20.7
17	22 49.3	22 53.1	21 46.9	17	2.6	77	11.7	137	20.9
18	22 49.5	22 53.3	21 47.1	18	2.7	78	11.9	138	21.0
19	22 49.8	22 53.6	21 47.4	19	2.9	79	12.0	139	21.2
20	22 50.0	22 53.8	21 47.6	20	3.1	80	12.2	140	21.4
21	22 50.3	22 54.1	21 47.8	21	3.2	81	12.4	141	21.5
22	22 50.5	22 54.3	21 48.1	22	3.4	82	12.5	142	21.7
23	22 50.8	22 54.6	21 48.3	23	3.5	83	12.7	143	21.8
24	22 51.0	22 54.8	21 48.5	24	3.7	84	12.8	144	22.0
25	22 51.3	22 55.1	21 48.8	25	3.8	85	13.0	145	22.1
26	22 51.5	22 55.3	21 49.0	26	4.0	86	13.1	146	22.3
27	22 51.8	22 55.6	21 49.3	27	4.1	87	13.3	147	22.4
28	22 52.0	22 55.8	21 49.5	28	4.3	88	13.4	148	22.6
29	22 52.3	22 56.1	21 49.7	29	4.4	89	13.6	149	22.7
30	22 52.5	22 56.3	21 50.0	30	4.6	90	13.7	150	22.9
31	22 52.8	22 56.6	21 50.2	31	4.7	91	13.9	151	23.0
32	22 53.0	22 56.8	21 50.5	32	4.9	92	14.0	152	23.2
33	22 53.3	22 57.1	21 50.7	33	5.0	93	14.2	153	23.3
34	22 53.5	22 57.3	21 50.9	34	5.2	94	14.3	154	23.5
35	22 53.8	22 57.6	21 51.2	35	5.3	95	14.5	155	23.6
36	22 54.0	22 57.8	21 51.4	36	5.5	96	14.6	156	23.8
37	22 54.3	22 58.1	21 51.6	37	5.6	97	14.8	157	23.9
38	22 54.5	22 58.3	21 51.9	38	5.8	98	14.9	158	24.1
39	22 54.8	22 58.6	21 52.1	39	5.9	99	15.1	159	24.2
40	22 55.0	22 58.8	21 52.4	40	6.1	100	15.3	160	24.4
41	22 55.3	22 59.1	21 52.6	41	6.3	101	15.4	161	24.6
42	22 55.5	22 59.3	21 52.8	42	6.4	102	15.6	162	24.7
43	22 55.8	22 59.6	21 53.1	43	6.6	103	15.7	163	24.9
44	22 56.0	22 59.8	21 53.3	44	6.7	104	15.9	164	25.0
45	22 56.3	23 .1	21 53.6	45	6.9	105	16.0	165	25.2
46	22 56.5	23 .3	21 53.8	46	7.0	106	16.2	166	25.3
47	22 56.8	23 .6	21 54.0	47	7.2	107	16.3	167	25.5
48	22 57.0	23 .8	21 54.3	48	7.3	108	16.5	168	25.6
49	22 57.3	23 1.1	21 54.5	49	7.5	109	16.6	169	25.8
50	22 57.5	23 1.3	21 54.7	50	7.6	110	16.8	170	25.9
51	22 57.8	23 1.6	21 55.0	51	7.8	111	16.9	171	26.1
52	22 58.0	23 1.8	21 55.2	52	7.9	112	17.1	172	26.2
53	22 58.3	23 2.1	21 55.5	53	8.1	113	17.2	173	26.4
54	22 58.5	23 2.3	21 55.7	54	8.2	114	17.4	174	26.5
55	22 58.8	23 2.6	21 55.9	55	8.4	115	17.5	175	26.7
56	22 59.0	23 2.8	21 56.2	56	8.5	116	17.7	176	26.8
57	22 59.3	23 3.1	21 56.4	57	8.7	117	17.8	177	27.0
58	22 59.5	23 3.3	21 56.7	58	8.8	118	18.0	178	27.1
59	22 59.8	23 3.6	21 56.9	59	9.0	119	18.1	179	27.3
60	23 .0	23 3.8	21 57.1	60	9.2	120	18.3	180	27.5

1 h 32 min

POPRAVKA ČASOVNOG UGLA				POPRAVKA DRUGOG REDA za časovni ugao i deklinaciju Sunca, Mjeseca i planeta					
s	SUNCA I PLANETA	PROLJEĆNE TAČKE ♈	MJESECA ☾	Δ	popr.	Δ	popr.	Δ	popr.
	° ′	° ′	° ′		′		′		′
0	23 .0	23 3.8	21 57.1	0	.0	60	9.3	120	18.5
1	23 .3	23 4.1	21 57.4	1	.2	61	9.4	121	18.7
2	23 .5	23 4.3	21 57.6	2	.3	62	9.6	122	18.8
3	23 .8	23 4.6	21 57.8	3	.5	63	9.7	123	19.0
4	23 1.0	23 4.8	21 58.1	4	.6	64	9.9	124	19.1
5	23 1.3	23 5.1	21 58.3	5	.8	65	10.0	125	19.3
6	23 1.5	23 5.3	21 58.6	6	.9	66	10.2	126	19.4
7	23 1.8	23 5.6	21 58.8	7	1.1	67	10.3	127	19.6
8	23 2.0	23 5.8	21 59.0	8	1.2	68	10.5	128	19.7
9	23 2.3	23 6.1	21 59.3	9	1.4	69	10.6	129	19.9
10	23 2.5	23 6.3	21 59.5	10	1.5	70	10.8	130	20.0
11	23 2.8	23 6.6	21 59.8	11	1.7	71	10.9	131	20.2
12	23 3.0	23 6.8	22 60.0	12	1.9	72	11.1	132	20.4
13	23 3.3	23 7.1	22 .2	13	2.0	73	11.3	133	20.5
14	23 3.5	23 7.3	22 .5	14	2.2	74	11.4	134	20.7
15	23 3.8	23 7.6	22 .7	15	2.3	75	11.6	135	20.8
16	23 4.0	23 7.8	22 1.0	16	2.5	76	11.7	136	21.0
17	23 4.3	23 8.1	22 1.2	17	2.6	77	11.9	137	21.1
18	23 4.5	23 8.3	22 1.4	18	2.8	78	12.0	138	21.3
19	23 4.8	23 8.6	22 1.7	19	2.9	79	12.2	139	21.4
20	23 5.0	23 8.8	22 1.9	20	3.1	80	12.3	140	21.6
21	23 5.3	23 9.1	22 2.1	21	3.2	81	12.5	141	21.7
22	23 5.5	23 9.3	22 2.4	22	3.4	82	12.6	142	21.9
23	23 5.8	23 9.6	22 2.6	23	3.5	83	12.8	143	22.0
24	23 6.0	23 9.9	22 2.9	24	3.7	84	13.0	144	22.2
25	23 6.3	23 10.1	22 3.1	25	3.9	85	13.1	145	22.4
26	23 6.5	23 10.4	22 3.3	26	4.0	86	13.3	146	22.5
27	23 6.8	23 10.6	22 3.6	27	4.2	87	13.4	147	22.7
28	23 7.0	23 10.9	22 3.8	28	4.3	88	13.6	148	22.8
29	23 7.3	23 11.1	22 4.1	29	4.5	89	13.7	149	23.0
30	23 7.5	23 11.4	22 4.3	30	4.6	90	13.9	150	23.1
31	23 7.8	23 11.6	22 4.5	31	4.8	91	14.0	151	23.3
32	23 8.0	23 11.9	22 4.8	32	4.9	92	14.2	152	23.4
33	23 8.3	23 12.1	22 5.0	33	5.1	93	14.3	153	23.6
34	23 8.5	23 12.4	22 5.2	34	5.2	94	14.5	154	23.7
35	23 8.8	23 12.6	22 5.5	35	5.4	95	14.6	155	23.9
36	23 9.0	23 12.9	22 5.7	36	5.6	96	14.8	156	24.1
37	23 9.3	23 13.1	22 6.0	37	5.7	97	15.0	157	24.2
38	23 9.5	23 13.4	22 6.2	38	5.9	98	15.1	158	24.4
39	23 9.8	23 13.6	22 6.4	39	6.0	99	15.3	159	24.5
40	23 10.0	23 13.9	22 6.7	40	6.2	100	15.4	160	24.7
41	23 10.3	23 14.1	22 6.9	41	6.3	101	15.6	161	24.8
42	23 10.5	23 14.4	22 7.2	42	6.5	102	15.7	162	25.0
43	23 10.8	23 14.6	22 7.4	43	6.6	103	15.9	163	25.1
44	23 11.0	23 14.9	22 7.6	44	6.8	104	16.0	164	25.3
45	23 11.3	23 15.1	22 7.9	45	6.9	105	16.2	165	25.4
46	23 11.5	23 15.4	22 8.1	46	7.1	106	16.3	166	25.6
47	23 11.8	23 15.6	22 8.3	47	7.2	107	16.5	167	25.7
48	23 12.0	23 15.9	22 8.6	48	7.4	108	16.7	168	25.9
49	23 12.3	23 16.1	22 8.8	49	7.6	109	16.8	169	26.1
50	23 12.5	23 16.4	22 9.1	50	7.7	110	17.0	170	26.2
51	23 12.8	23 16.6	22 9.3	51	7.9	111	17.1	171	26.4
52	23 13.0	23 16.9	22 9.5	52	8.0	112	17.3	172	26.5
53	23 13.3	23 17.1	22 9.8	53	8.2	113	17.4	173	26.7
54	23 13.5	23 17.4	22 10.0	54	8.3	114	17.6	174	26.8
55	23 13.8	23 17.6	22 10.3	55	8.5	115	17.7	175	27.0
56	23 14.0	23 17.9	22 10.5	56	8.6	116	17.9	176	27.1
57	23 14.3	23 18.1	22 10.7	57	8.8	117	18.0	177	27.3
58	23 14.5	23 18.4	22 11.0	58	8.9	118	18.2	178	27.4
59	23 14.8	23 18.6	22 11.2	59	9.1	119	18.3	179	27.6
60	23 15.0	23 18.9	22 11.5	60	9.3	120	18.5	180	27.8

1 h 33 min

POPRAVKA ČASOVNOG UGLA				POPRAVKA DRUGOG REDA za časovni ugao i deklinaciju Sunca, Mjeseca i planeta					
s	SUNCA I PLANETA	PROLJEĆNE TAČKE ♈	MJESECA ☾	Δ	popr.	Δ	popr.	Δ	popr.
	° ′	° ′	° ′		′		′		′
0	23 15.0	23 18.9	22 11.5	0	.0	60	9.4	120	18.7
1	23 15.3	23 19.1	22 11.7	1	.2	61	9.5	121	18.9
2	23 15.5	23 19.4	22 11.9	2	.3	62	9.7	122	19.0
3	23 15.8	23 19.6	22 12.2	3	.5	63	9.8	123	19.2
4	23 16.0	23 19.9	22 12.4	4	.6	64	10.0	124	19.3
5	23 16.3	23 20.1	22 12.6	5	.8	65	10.1	125	19.5
6	23 16.5	23 20.4	22 12.9	6	.9	66	10.3	126	19.6
7	23 16.8	23 20.6	22 13.1	7	1.1	67	10.4	127	19.8
8	23 17.0	23 20.9	22 13.4	8	1.2	68	10.6	128	19.9
9	23 17.3	23 21.1	22 13.6	9	1.4	69	10.8	129	20.1
10	23 17.5	23 21.4	22 13.8	10	1.6	70	10.9	130	20.3
11	23 17.8	23 21.6	22 14.1	11	1.7	71	11.1	131	20.4
12	23 18.0	23 21.9	22 14.3	12	1.9	72	11.2	132	20.6
13	23 18.3	23 22.1	22 14.6	13	2.0	73	11.4	133	20.7
14	23 18.5	23 22.4	22 14.8	14	2.2	74	11.5	134	20.9
15	23 18.8	23 22.6	22 15.0	15	2.3	75	11.7	135	21.0
16	23 19.0	23 22.9	22 15.3	16	2.5	76	11.8	136	21.2
17	23 19.3	23 23.1	22 15.5	17	2.6	77	12.0	137	21.3
18	23 19.5	23 23.4	22 15.7	18	2.8	78	12.2	138	21.5
19	23 19.8	23 23.6	22 16.0	19	3.0	79	12.3	139	21.7
20	23 20.0	23 23.9	22 16.2	20	3.1	80	12.5	140	21.8
21	23 20.3	23 24.1	22 16.5	21	3.3	81	12.6	141	22.0
22	23 20.5	23 24.4	22 16.7	22	3.4	82	12.8	142	22.1
23	23 20.8	23 24.6	22 16.9	23	3.6	83	12.9	143	22.3
24	23 21.0	23 24.9	22 17.2	24	3.7	84	13.1	144	22.4
25	23 21.3	23 25.1	22 17.4	25	3.9	85	13.2	145	22.6
26	23 21.5	23 25.4	22 17.7	26	4.1	86	13.4	146	22.8
27	23 21.8	23 25.6	22 17.9	27	4.2	87	13.6	147	22.9
28	23 22.0	23 25.9	22 18.1	28	4.4	88	13.7	148	23.1
29	23 22.3	23 26.1	22 18.4	29	4.5	89	13.9	149	23.2
30	23 22.5	23 26.4	22 18.6	30	4.7	90	14.0	150	23.4
31	23 22.8	23 26.6	22 18.8	31	4.8	91	14.2	151	23.5
32	23 23.0	23 26.9	22 19.1	32	5.0	92	14.3	152	23.7
33	23 23.3	23 27.1	22 19.3	33	5.1	93	14.5	153	23.8
34	23 23.5	23 27.4	22 19.6	34	5.3	94	14.6	154	24.0
35	23 23.8	23 27.6	22 19.8	35	5.5	95	14.8	155	24.2
36	23 24.0	23 27.9	22 20.0	36	5.6	96	15.0	156	24.3
37	23 24.3	23 28.2	22 20.3	37	5.8	97	15.1	157	24.5
38	23 24.5	23 28.4	22 20.5	38	5.9	98	15.3	158	24.6
39	23 24.8	23 28.7	22 20.8	39	6.1	99	15.4	159	24.8
40	23 25.0	23 28.9	22 21.0	40	6.2	100	15.6	160	24.9
41	23 25.3	23 29.2	22 21.2	41	6.4	101	15.7	161	25.1
42	23 25.5	23 29.4	22 21.5	42	6.5	102	15.9	162	25.2
43	23 25.8	23 29.7	22 21.7	43	6.7	103	16.1	163	25.4
44	23 26.0	23 29.9	22 21.9	44	6.9	104	16.2	164	25.6
45	23 26.3	23 30.2	22 22.2	45	7.0	105	16.4	165	25.7
46	23 26.5	23 30.4	22 22.4	46	7.2	106	16.5	166	25.9
47	23 26.8	23 30.7	22 22.7	47	7.3	107	16.7	167	26.0
48	23 27.0	23 30.9	22 22.9	48	7.5	108	16.8	168	26.2
49	23 27.3	23 31.2	22 23.1	49	7.6	109	17.0	169	26.3
50	23 27.5	23 31.4	22 23.4	50	7.8	110	17.1	170	26.5
51	23 27.8	23 31.7	22 23.6	51	7.9	111	17.3	171	26.6
52	23 28.0	23 31.9	22 23.9	52	8.1	112	17.5	172	26.8
53	23 28.3	23 32.2	22 24.1	53	8.3	113	17.6	173	27.0
54	23 28.5	23 32.4	22 24.3	54	8.4	114	17.8	174	27.1
55	23 28.8	23 32.7	22 24.6	55	8.6	115	17.9	175	27.3
56	23 29.0	23 32.9	22 24.8	56	8.7	116	18.1	176	27.4
57	23 29.3	23 33.2	22 25.1	57	8.9	117	18.2	177	27.6
58	23 29.5	23 33.4	22 25.3	58	9.0	118	18.4	178	27.7
59	23 29.8	23 33.7	22 25.5	59	9.2	119	18.5	179	27.9
60	23 30.0	23 33.9	22 25.8	60	9.4	120	18.7	180	28.1

1 h 34 min

POPRAVKA ČASOVNOG UGLA				POPRAVKA DRUGOG REDA za časovni ugao i deklinaciju Sunca, Mjeseca i planeta					
s	SUNCA I PLANETA	PROLJEĆNE TAČKE ♈	MJESECA ☾	Δ	popr.	Δ	popr.	Δ	popr.
	° ′	° ′	° ′		′		′		′
0	23 30.0	23 33.9	22 25.8	0	.0	60	9.5	120	18.9
1	23 30.3	23 34.2	22 26.0	1	.2	61	9.6	121	19.1
2	23 30.5	23 34.4	22 26.2	2	.3	62	9.8	122	19.2
3	23 30.8	23 34.7	22 26.5	3	.5	63	9.9	123	19.4
4	23 31.0	23 34.9	22 26.7	4	.6	64	10.1	124	19.5
5	23 31.3	23 35.2	22 27.0	5	.8	65	10.2	125	19.7
6	23 31.5	23 35.4	22 27.2	6	.9	66	10.4	126	19.8
7	23 31.8	23 35.7	22 27.4	7	1.1	67	10.6	127	20.0
8	23 32.0	23 35.9	22 27.7	8	1.3	68	10.7	128	20.2
9	23 32.3	23 36.2	22 27.9	9	1.4	69	10.9	129	20.3
10	23 32.5	23 36.4	22 28.2	10	1.6	70	11.0	130	20.5
11	23 32.8	23 36.7	22 28.4	11	1.7	71	11.2	131	20.6
12	23 33.0	23 36.9	22 28.6	12	1.9	72	11.3	132	20.8
13	23 33.3	23 37.2	22 28.9	13	2.0	73	11.5	133	20.9
14	23 33.5	23 37.4	22 29.1	14	2.2	74	11.7	134	21.1
15	23 33.8	23 37.7	22 29.3	15	2.4	75	11.8	135	21.3
16	23 34.0	23 37.9	22 29.6	16	2.5	76	12.0	136	21.4
17	23 34.3	23 38.2	22 29.8	17	2.7	77	12.1	137	21.6
18	23 34.5	23 38.4	22 30.1	18	2.8	78	12.3	138	21.7
19	23 34.8	23 38.7	22 30.3	19	3.0	79	12.4	139	21.9
20	23 35.0	23 38.9	22 30.5	20	3.2	80	12.6	140	22.1
21	23 35.3	23 39.2	22 30.8	21	3.3	81	12.8	141	22.2
22	23 35.5	23 39.4	22 31.0	22	3.5	82	12.9	142	22.4
23	23 35.8	23 39.7	22 31.3	23	3.6	83	13.1	143	22.5
24	23 36.0	23 39.9	22 31.5	24	3.8	84	13.2	144	22.7
25	23 36.3	23 40.2	22 31.7	25	3.9	85	13.4	145	22.8
26	23 36.5	23 40.4	22 32.0	26	4.1	86	13.5	146	23.0
27	23 36.8	23 40.7	22 32.2	27	4.3	87	13.7	147	23.2
28	23 37.0	23 40.9	22 32.4	28	4.4	88	13.9	148	23.3
29	23 37.3	23 41.2	22 32.7	29	4.6	89	14.0	149	23.5
30	23 37.5	23 41.4	22 32.9	30	4.7	90	14.2	150	23.6
31	23 37.8	23 41.7	22 33.2	31	4.9	91	14.3	151	23.8
32	23 38.0	23 41.9	22 33.4	32	5.0	92	14.5	152	23.9
33	23 38.3	23 42.2	22 33.6	33	5.2	93	14.6	153	24.1
34	23 38.5	23 42.4	22 33.9	34	5.4	94	14.8	154	24.3
35	23 38.8	23 42.7	22 34.1	35	5.5	95	15.0	155	24.4
36	23 39.0	23 42.9	22 34.4	36	5.7	96	15.1	156	24.6
37	23 39.3	23 43.2	22 34.6	37	5.8	97	15.3	157	24.7
38	23 39.5	23 43.4	22 34.8	38	6.0	98	15.4	158	24.9
39	23 39.8	23 43.7	22 35.1	39	6.1	99	15.6	159	25.0
40	23 40.0	23 43.9	22 35.3	40	6.3	100	15.8	160	25.2
41	23 40.3	23 44.2	22 35.5	41	6.5	101	15.9	161	25.4
42	23 40.5	23 44.4	22 35.8	42	6.6	102	16.1	162	25.5
43	23 40.8	23 44.7	22 36.0	43	6.8	103	16.2	163	25.7
44	23 41.0	23 44.9	22 36.3	44	6.9	104	16.4	164	25.8
45	23 41.3	23 45.2	22 36.5	45	7.1	105	16.5	165	26.0
46	23 41.5	23 45.4	22 36.7	46	7.2	106	16.7	166	26.1
47	23 41.8	23 45.7	22 37.0	47	7.4	107	16.9	167	26.3
48	23 42.0	23 46.0	22 37.2	48	7.6	108	17.0	168	26.5
49	23 42.3	23 46.2	22 37.5	49	7.7	109	17.2	169	26.6
50	23 42.5	23 46.5	22 37.7	50	7.9	110	17.3	170	26.8
51	23 42.8	23 46.7	22 37.9	51	8.0	111	17.5	171	26.9
52	23 43.0	23 47.0	22 38.2	52	8.2	112	17.6	172	27.1
53	23 43.3	23 47.2	22 38.4	53	8.3	113	17.8	173	27.2
54	23 43.5	23 47.5	22 38.7	54	8.5	114	18.0	174	27.4
55	23 43.8	23 47.7	22 38.9	55	8.7	115	18.1	175	27.6
56	23 44.0	23 48.0	22 39.1	56	8.8	116	18.3	176	27.7
57	23 44.3	23 48.2	22 39.4	57	9.0	117	18.4	177	27.9
58	23 44.5	23 48.5	22 39.6	58	9.1	118	18.6	178	28.0
59	23 44.8	23 48.7	22 39.8	59	9.3	119	18.7	179	28.2
60	23 45.0	23 49.0	22 40.1	60	9.5	120	18.9	180	28.4

1 h 35 min

POPRAVKA ČASOVNOG UGLA				POPRAVKA DRUGOG REDA za časovni ugao i deklinaciju Sunca, Mjeseca i planeta					
s	SUNCA I PLANETA	PROLJEĆNE TAČKE ♈	MJESECA ☾	Δ	popr.	Δ	popr.	Δ	popr.
	° ′	° ′	° ′		′		′		′
0	23 45.0	23 49.0	22 40.1	0	.0	60	9.6	120	19.1
1	23 45.3	23 49.2	22 40.3	1	.2	61	9.7	121	19.3
2	23 45.5	23 49.5	22 40.6	2	.3	62	9.9	122	19.4
3	23 45.8	23 49.7	22 40.8	3	.5	63	10.0	123	19.6
4	23 46.0	23 50.0	22 41.0	4	.6	64	10.2	124	19.7
5	23 46.3	23 50.2	22 41.3	5	.8	65	10.3	125	19.9
6	23 46.5	23 50.5	22 41.5	6	1.0	66	10.5	126	20.1
7	23 46.8	23 50.7	22 41.8	7	1.1	67	10.7	127	20.2
8	23 47.0	23 51.0	22 42.0	8	1.3	68	10.8	128	20.4
9	23 47.3	23 51.2	22 42.2	9	1.4	69	11.0	129	20.5
10	23 47.5	23 51.5	22 42.5	10	1.6	70	11.1	130	20.7
11	23 47.8	23 51.7	22 42.7	11	1.8	71	11.3	131	20.9
12	23 48.0	23 52.0	22 42.9	12	1.9	72	11.5	132	21.0
13	23 48.3	23 52.2	22 43.2	13	2.1	73	11.6	133	21.2
14	23 48.5	23 52.5	22 43.4	14	2.2	74	11.8	134	21.3
15	23 48.8	23 52.7	22 43.7	15	2.4	75	11.9	135	21.5
16	23 49.0	23 53.0	22 43.9	16	2.5	76	12.1	136	21.6
17	23 49.3	23 53.2	22 44.1	17	2.7	77	12.3	137	21.8
18	23 49.5	23 53.5	22 44.4	18	2.9	78	12.4	138	22.0
19	23 49.8	23 53.7	22 44.6	19	3.0	79	12.6	139	22.1
20	23 50.0	23 54.0	22 44.9	20	3.2	80	12.7	140	22.3
21	23 50.3	23 54.2	22 45.1	21	3.3	81	12.9	141	22.4
22	23 50.5	23 54.5	22 45.3	22	3.5	82	13.1	142	22.6
23	23 50.8	23 54.7	22 45.6	23	3.7	83	13.2	143	22.8
24	23 51.0	23 55.0	22 45.8	24	3.8	84	13.4	144	22.9
25	23 51.3	23 55.2	22 46.0	25	4.0	85	13.5	145	23.1
26	23 51.5	23 55.5	22 46.3	26	4.1	86	13.7	146	23.2
27	23 51.8	23 55.7	22 46.5	27	4.3	87	13.8	147	23.4
28	23 52.0	23 56.0	22 46.8	28	4.5	88	14.0	148	23.6
29	23 52.3	23 56.2	22 47.0	29	4.6	89	14.2	149	23.7
30	23 52.5	23 56.5	22 47.2	30	4.8	90	14.3	150	23.9
31	23 52.8	23 56.7	22 47.5	31	4.9	91	14.5	151	24.0
32	23 53.0	23 57.0	22 47.7	32	5.1	92	14.6	152	24.2
33	23 53.3	23 57.2	22 48.0	33	5.3	93	14.8	153	24.4
34	23 53.5	23 57.5	22 48.2	34	5.4	94	15.0	154	24.5
35	23 53.8	23 57.7	22 48.4	35	5.6	95	15.1	155	24.7
36	23 54.0	23 58.0	22 48.7	36	5.7	96	15.3	156	24.8
37	23 54.3	23 58.2	22 48.9	37	5.9	97	15.4	157	25.0
38	23 54.5	23 58.5	22 49.2	38	6.0	98	15.6	158	25.1
39	23 54.8	23 58.7	22 49.4	39	6.2	99	15.8	159	25.3
40	23 55.0	23 59.0	22 49.6	40	6.4	100	15.9	160	25.5
41	23 55.3	23 59.2	22 49.9	41	6.5	101	16.1	161	25.6
42	23 55.5	23 59.5	22 50.1	42	6.7	102	16.2	162	25.8
43	23 55.8	23 59.7	22 50.3	43	6.8	103	16.4	163	25.9
44	23 56.0	23 60.0	22 50.6	44	7.0	104	16.6	164	26.1
45	23 56.3	24 .2	22 50.8	45	7.2	105	16.7	165	26.3
46	23 56.5	24 .5	22 51.1	46	7.3	106	16.9	166	26.4
47	23 56.8	24 .7	22 51.3	47	7.5	107	17.0	167	26.6
48	23 57.0	24 1.0	22 51.5	48	7.6	108	17.2	168	26.7
49	23 57.3	24 1.2	22 51.8	49	7.8	109	17.3	169	26.9
50	23 57.5	24 1.5	22 52.0	50	8.0	110	17.5	170	27.1
51	23 57.8	24 1.7	22 52.3	51	8.1	111	17.7	171	27.2
52	23 58.0	24 2.0	22 52.5	52	8.3	112	17.8	172	27.4
53	23 58.3	24 2.2	22 52.7	53	8.4	113	18.0	173	27.5
54	23 58.5	24 2.5	22 53.0	54	8.6	114	18.1	174	27.7
55	23 58.8	24 2.7	22 53.2	55	8.8	115	18.3	175	27.9
56	23 59.0	24 3.0	22 53.4	56	8.9	116	18.5	176	28.0
57	23 59.3	24 3.2	22 53.7	57	9.1	117	18.6	177	28.2
58	23 59.5	24 3.5	22 53.9	58	9.2	118	18.8	178	28.3
59	23 59.8	24 3.7	22 54.2	59	9.4	119	18.9	179	28.5
60	24 .0	24 4.0	22 54.4	60	9.6	120	19.1	180	28.7

1 h 36 min

POPRAVKA ČASOVNOG UGLA				POPRAVKA DRUGOG REDA za časovni ugao i deklinaciju Sunca, Mjeseca i planeta					
s	SUNCA I PLANETA	PROLJEĆNE TAČKE ♈	MJESECA ☾	Δ	popr.	Δ	popr.	Δ	popr.
	° ′	° ′	° ′		′		′		′
0	24 .0	24 4.0	22 54.4	0	.0	60	9.7	120	19.3
1	24 .3	24 4.3	22 54.6	1	.2	61	9.8	121	19.5
2	24 .5	24 4.5	22 54.9	2	.3	62	10.0	122	19.6
3	24 .8	24 4.8	22 55.1	3	.5	63	10.1	123	19.8
4	24 1.0	24 5.0	22 55.4	4	.6	64	10.3	124	19.9
5	24 1.3	24 5.3	22 55.6	5	.8	65	10.5	125	20.1
6	24 1.5	24 5.5	22 55.8	6	1.0	66	10.6	126	20.3
7	24 1.8	24 5.8	22 56.1	7	1.1	67	10.8	127	20.4
8	24 2.0	24 6.0	22 56.3	8	1.3	68	10.9	128	20.6
9	24 2.3	24 6.3	22 56.5	9	1.4	69	11.1	129	20.7
10	24 2.5	24 6.5	22 56.8	10	1.6	70	11.3	130	20.9
11	24 2.8	24 6.8	22 57.0	11	1.8	71	11.4	131	21.1
12	24 3.0	24 7.0	22 57.3	12	1.9	72	11.6	132	21.2
13	24 3.3	24 7.3	22 57.5	13	2.1	73	11.7	133	21.4
14	24 3.5	24 7.5	22 57.7	14	2.3	74	11.9	134	21.6
15	24 3.8	24 7.8	22 58.0	15	2.4	75	12.1	135	21.7
16	24 4.0	24 8.0	22 58.2	16	2.6	76	12.2	136	21.9
17	24 4.3	24 8.3	22 58.5	17	2.7	77	12.4	137	22.0
18	24 4.5	24 8.5	22 58.7	18	2.9	78	12.5	138	22.2
19	24 4.8	24 8.8	22 58.9	19	3.1	79	12.7	139	22.4
20	24 5.0	24 9.0	22 59.2	20	3.2	80	12.9	140	22.5
21	24 5.3	24 9.3	22 59.4	21	3.4	81	13.0	141	22.7
22	24 5.5	24 9.5	22 59.6	22	3.5	82	13.2	142	22.8
23	24 5.8	24 9.8	22 59.9	23	3.7	83	13.3	143	23.0
24	24 6.0	24 10.0	23 .1	24	3.9	84	13.5	144	23.2
25	24 6.3	24 10.3	23 .4	25	4.0	85	13.7	145	23.3
26	24 6.5	24 10.5	23 .6	26	4.2	86	13.8	146	23.5
27	24 6.8	24 10.8	23 .8	27	4.3	87	14.0	147	23.6
28	24 7.0	24 11.0	23 1.1	28	4.5	88	14.2	148	23.8
29	24 7.3	24 11.3	23 1.3	29	4.7	89	14.3	149	24.0
30	24 7.5	24 11.5	23 1.6	30	4.8	90	14.5	150	24.1
31	24 7.8	24 11.8	23 1.8	31	5.0	91	14.6	151	24.3
32	24 8.0	24 12.0	23 2.0	32	5.1	92	14.8	152	24.4
33	24 8.3	24 12.3	23 2.3	33	5.3	93	15.0	153	24.6
34	24 8.5	24 12.5	23 2.5	34	5.5	94	15.1	154	24.8
35	24 8.8	24 12.8	23 2.8	35	5.6	95	15.3	155	24.9
36	24 9.0	24 13.0	23 3.0	36	5.8	96	15.4	156	25.1
37	24 9.3	24 13.3	23 3.2	37	6.0	97	15.6	157	25.3
38	24 9.5	24 13.5	23 3.5	38	6.1	98	15.8	158	25.4
39	24 9.8	24 13.8	23 3.7	39	6.3	99	15.9	159	25.6
40	24 10.0	24 14.0	23 3.9	40	6.4	100	16.1	160	25.7
41	24 10.3	24 14.3	23 4.2	41	6.6	101	16.2	161	25.9
42	24 10.5	24 14.5	23 4.4	42	6.8	102	16.4	162	26.1
43	24 10.8	24 14.8	23 4.7	43	6.9	103	16.6	163	26.2
44	24 11.0	24 15.0	23 4.9	44	7.1	104	16.7	164	26.4
45	24 11.3	24 15.3	23 5.1	45	7.2	105	16.9	165	26.5
46	24 11.5	24 15.5	23 5.4	46	7.4	106	17.0	166	26.7
47	24 11.8	24 15.8	23 5.6	47	7.6	107	17.2	167	26.9
48	24 12.0	24 16.0	23 5.9	48	7.7	108	17.4	168	27.0
49	24 12.3	24 16.3	23 6.1	49	7.9	109	17.5	169	27.2
50	24 12.5	24 16.5	23 6.3	50	8.0	110	17.7	170	27.3
51	24 12.8	24 16.8	23 6.6	51	8.2	111	17.9	171	27.5
52	24 13.0	24 17.0	23 6.8	52	8.4	112	18.0	172	27.7
53	24 13.3	24 17.3	23 7.0	53	8.5	113	18.2	173	27.8
54	24 13.5	24 17.5	23 7.3	54	8.7	114	18.3	174	28.0
55	24 13.8	24 17.8	23 7.5	55	8.8	115	18.5	175	28.1
56	24 14.0	24 18.0	23 7.8	56	9.0	116	18.7	176	28.3
57	24 14.3	24 18.3	23 8.0	57	9.2	117	18.8	177	28.5
58	24 14.5	24 18.5	23 8.2	58	9.3	118	19.0	178	28.6
59	24 14.8	24 18.8	23 8.5	59	9.5	119	19.1	179	28.8
60	24 15.0	24 19.0	23 8.7	60	9.7	120	19.3	180	29.0

1 h 37 min

POPRAVKA ČASOVNOG UGLA				POPRAVKA DRUGOG REDA za časovni ugao i deklinaciju Sunca, Mjeseca i planeta					
s	SUNCA I PLANETA	PROLJEĆNE TAČKE ♈	MJESECA ☾	Δ	popr.	Δ	popr.	Δ	popr.
	° ′	° ′	° ′		′		′		′
0	24 15.0	24 19.0	23 8.7	0	.0	60	9.8	120	19.5
1	24 15.3	24 19.3	23 9.0	1	.2	61	9.9	121	19.7
2	24 15.5	24 19.5	23 9.2	2	.3	62	10.1	122	19.8
3	24 15.8	24 19.8	23 9.4	3	.5	63	10.2	123	20.0
4	24 16.0	24 20.0	23 9.7	4	.7	64	10.4	124	20.2
5	24 16.3	24 20.3	23 9.9	5	.8	65	10.6	125	20.3
6	24 16.5	24 20.5	23 10.1	6	1.0	66	10.7	126	20.5
7	24 16.8	24 20.8	23 10.4	7	1.1	67	10.9	127	20.6
8	24 17.0	24 21.0	23 10.6	8	1.3	68	11.1	128	20.8
9	24 17.3	24 21.3	23 10.9	9	1.5	69	11.2	129	21.0
10	24 17.5	24 21.5	23 11.1	10	1.6	70	11.4	130	21.1
11	24 17.8	24 21.8	23 11.3	11	1.8	71	11.5	131	21.3
12	24 18.0	24 22.1	23 11.6	12	2.0	72	11.7	132	21.5
13	24 18.3	24 22.3	23 11.8	13	2.1	73	11.9	133	21.6
14	24 18.5	24 22.6	23 12.1	14	2.3	74	12.0	134	21.8
15	24 18.8	24 22.8	23 12.3	15	2.4	75	12.2	135	21.9
16	24 19.0	24 23.1	23 12.5	16	2.6	76	12.4	136	22.1
17	24 19.3	24 23.3	23 12.8	17	2.8	77	12.5	137	22.3
18	24 19.5	24 23.6	23 13.0	18	2.9	78	12.7	138	22.4
19	24 19.8	24 23.8	23 13.3	19	3.1	79	12.8	139	22.6
20	24 20.0	24 24.1	23 13.5	20	3.3	80	13.0	140	22.8
21	24 20.3	24 24.3	23 13.7	21	3.4	81	13.2	141	22.9
22	24 20.5	24 24.6	23 14.0	22	3.6	82	13.3	142	23.1
23	24 20.8	24 24.8	23 14.2	23	3.7	83	13.5	143	23.2
24	24 21.0	24 25.1	23 14.4	24	3.9	84	13.7	144	23.4
25	24 21.3	24 25.3	23 14.7	25	4.1	85	13.8	145	23.6
26	24 21.5	24 25.6	23 14.9	26	4.2	86	14.0	146	23.7
27	24 21.8	24 25.8	23 15.2	27	4.4	87	14.1	147	23.9
28	24 22.0	24 26.1	23 15.4	28	4.6	88	14.3	148	24.1
29	24 22.3	24 26.3	23 15.6	29	4.7	89	14.5	149	24.2
30	24 22.5	24 26.6	23 15.9	30	4.9	90	14.6	150	24.4
31	24 22.8	24 26.8	23 16.1	31	5.0	91	14.8	151	24.5
32	24 23.0	24 27.1	23 16.4	32	5.2	92	15.0	152	24.7
33	24 23.3	24 27.3	23 16.6	33	5.4	93	15.1	153	24.9
34	24 23.5	24 27.6	23 16.8	34	5.5	94	15.3	154	25.0
35	24 23.8	24 27.8	23 17.1	35	5.7	95	15.4	155	25.2
36	24 24.0	24 28.1	23 17.3	36	5.9	96	15.6	156	25.4
37	24 24.3	24 28.3	23 17.5	37	6.0	97	15.8	157	25.5
38	24 24.5	24 28.6	23 17.8	38	6.2	98	15.9	158	25.7
39	24 24.8	24 28.8	23 18.0	39	6.3	99	16.1	159	25.8
40	24 25.0	24 29.1	23 18.3	40	6.5	100	16.3	160	26.0
41	24 25.3	24 29.3	23 18.5	41	6.7	101	16.4	161	26.2
42	24 25.5	24 29.6	23 18.7	42	6.8	102	16.6	162	26.3
43	24 25.8	24 29.8	23 19.0	43	7.0	103	16.7	163	26.5
44	24 26.0	24 30.1	23 19.2	44	7.2	104	16.9	164	26.7
45	24 26.3	24 30.3	23 19.5	45	7.3	105	17.1	165	26.8
46	24 26.5	24 30.6	23 19.7	46	7.5	106	17.2	166	27.0
47	24 26.8	24 30.8	23 19.9	47	7.6	107	17.4	167	27.1
48	24 27.0	24 31.1	23 20.2	48	7.8	108	17.6	168	27.3
49	24 27.3	24 31.3	23 20.4	49	8.0	109	17.7	169	27.5
50	24 27.5	24 31.6	23 20.6	50	8.1	110	17.9	170	27.6
51	24 27.8	24 31.8	23 20.9	51	8.3	111	18.0	171	27.8
52	24 28.0	24 32.1	23 21.1	52	8.5	112	18.2	172	28.0
53	24 28.3	24 32.3	23 21.4	53	8.6	113	18.4	173	28.1
54	24 28.5	24 32.6	23 21.6	54	8.8	114	18.5	174	28.3
55	24 28.8	24 32.8	23 21.8	55	8.9	115	18.7	175	28.4
56	24 29.0	24 33.1	23 22.1	56	9.1	116	18.9	176	28.6
57	24 29.3	24 33.3	23 22.3	57	9.3	117	19.0	177	28.8
58	24 29.5	24 33.6	23 22.6	58	9.4	118	19.2	178	28.9
59	24 29.8	24 33.8	23 22.8	59	9.6	119	19.3	179	29.1
60	24 30.0	24 34.1	23 23.0	60	9.8	120	19.5	180	29.3

1 h 38 min

POPRAVKA ČASOVNOG UGLA				POPRAVKA DRUGOG REDA za časovni ugao i deklinaciju Sunca, Mjeseca i planeta					
s	SUNCA I PLANETA	PROLJEĆNE TAČKE ♈	MJESECA ☾	Δ	poprav.	Δ	poprav.	Δ	poprav.
	° ′	° ′	° ′		′		′		′
0	24 30.0	24 34.1	23 23.0	0	.0	60	9.9	120	19.7
1	24 30.3	24 34.3	23 23.3	1	.2	61	10.0	121	19.9
2	24 30.5	24 34.6	23 23.5	2	.3	62	10.2	122	20.0
3	24 30.8	24 34.8	23 23.7	3	.5	63	10.3	123	20.2
4	24 31.0	24 35.1	23 24.0	4	.7	64	10.5	124	20.4
5	24 31.3	24 35.3	23 24.2	5	.8	65	10.7	125	20.5
6	24 31.5	24 35.6	23 24.5	6	1.0	66	10.8	126	20.7
7	24 31.8	24 35.8	23 24.7	7	1.1	67	11.0	127	20.8
8	24 32.0	24 36.1	23 24.9	8	1.3	68	11.2	128	21.0
9	24 32.3	24 36.3	23 25.2	9	1.5	69	11.3	129	21.2
10	24 32.5	24 36.6	23 25.4	10	1.6	70	11.5	130	21.3
11	24 32.8	24 36.8	23 25.7	11	1.8	71	11.7	131	21.5
12	24 33.0	24 37.1	23 25.9	12	2.0	72	11.8	132	21.7
13	24 33.3	24 37.3	23 26.1	13	2.1	73	12.0	133	21.8
14	24 33.5	24 37.6	23 26.4	14	2.3	74	12.1	134	22.0
15	24 33.8	24 37.8	23 26.6	15	2.5	75	12.3	135	22.2
16	24 34.0	24 38.1	23 26.9	16	2.6	76	12.5	136	22.3
17	24 34.3	24 38.3	23 27.1	17	2.8	77	12.6	137	22.5
18	24 34.5	24 38.6	23 27.3	18	3.0	78	12.8	138	22.7
19	24 34.8	24 38.8	23 27.6	19	3.1	79	13.0	139	22.8
20	24 35.0	24 39.1	23 27.8	20	3.3	80	13.1	140	23.0
21	24 35.3	24 39.3	23 28.0	21	3.4	81	13.3	141	23.1
22	24 35.5	24 39.6	23 28.3	22	3.6	82	13.5	142	23.3
23	24 35.8	24 39.8	23 28.5	23	3.8	83	13.6	143	23.5
24	24 36.0	24 40.1	23 28.8	24	3.9	84	13.8	144	23.6
25	24 36.3	24 40.4	23 29.0	25	4.1	85	14.0	145	23.8
26	24 36.5	24 40.6	23 29.2	26	4.3	86	14.1	146	24.0
27	24 36.8	24 40.9	23 29.5	27	4.4	87	14.3	147	24.1
28	24 37.0	24 41.1	23 29.7	28	4.6	88	14.4	148	24.3
29	24 37.3	24 41.4	23 30.0	29	4.8	89	14.6	149	24.5
30	24 37.5	24 41.6	23 30.2	30	4.9	90	14.8	150	24.6
31	24 37.8	24 41.9	23 30.4	31	5.1	91	14.9	151	24.8
32	24 38.0	24 42.1	23 30.7	32	5.3	92	15.1	152	25.0
33	24 38.3	24 42.4	23 30.9	33	5.4	93	15.3	153	25.1
34	24 38.5	24 42.6	23 31.1	34	5.6	94	15.4	154	25.3
35	24 38.8	24 42.9	23 31.4	35	5.7	95	15.6	155	25.4
36	24 39.0	24 43.1	23 31.6	36	5.9	96	15.8	156	25.6
37	24 39.3	24 43.4	23 31.9	37	6.1	97	15.9	157	25.8
38	24 39.5	24 43.6	23 32.1	38	6.2	98	16.1	158	25.9
39	24 39.8	24 43.9	23 32.3	39	6.4	99	16.3	159	26.1
40	24 40.0	24 44.1	23 32.6	40	6.6	100	16.4	160	26.3
41	24 40.3	24 44.4	23 32.8	41	6.7	101	16.6	161	26.4
42	24 40.5	24 44.6	23 33.1	42	6.9	102	16.7	162	26.6
43	24 40.8	24 44.9	23 33.3	43	7.1	103	16.9	163	26.8
44	24 41.0	24 45.1	23 33.5	44	7.2	104	17.1	164	26.9
45	24 41.3	24 45.4	23 33.8	45	7.4	105	17.2	165	27.1
46	24 41.5	24 45.6	23 34.0	46	7.6	106	17.4	166	27.3
47	24 41.8	24 45.9	23 34.2	47	7.7	107	17.6	167	27.4
48	24 42.0	24 46.1	23 34.5	48	7.9	108	17.7	168	27.6
49	24 42.3	24 46.4	23 34.7	49	8.0	109	17.9	169	27.7
50	24 42.5	24 46.6	23 35.0	50	8.2	110	18.1	170	27.9
51	24 42.8	24 46.9	23 35.2	51	8.4	111	18.2	171	28.1
52	24 43.0	24 47.1	23 35.4	52	8.5	112	18.4	172	28.2
53	24 43.3	24 47.4	23 35.7	53	8.7	113	18.6	173	28.4
54	24 43.5	24 47.6	23 35.9	54	8.9	114	18.7	174	28.6
55	24 43.8	24 47.9	23 36.2	55	9.0	115	18.9	175	28.7
56	24 44.0	24 48.1	23 36.4	56	9.2	116	19.0	176	28.9
57	24 44.3	24 48.4	23 36.6	57	9.4	117	19.2	177	29.1
58	24 44.5	24 48.6	23 36.9	58	9.5	118	19.4	178	29.2
59	24 44.8	24 48.9	23 37.1	59	9.7	119	19.5	179	29.4
60	24 45.0	24 49.1	23 37.4	60	9.9	120	19.7	180	29.6

1 h 39 min

POPRAVKA ČASOVNOG UGLA				POPRAVKA DRUGOG REDA za časovni ugao i deklinaciju Sunca, Mjeseca i planeta					
s	SUNCA I PLANETA	PROLJEĆNE TAČKE ♈	MJESECA ☾	Δ	poprav.	Δ	poprav.	Δ	poprav.
	° ′	° ′	° ′		′		′		′
0	24 45.0	24 49.1	23 37.4	0	.0	60	10.0	120	19.9
1	24 45.3	24 49.4	23 37.6	1	.2	61	10.1	121	20.1
2	24 45.5	24 49.6	23 37.8	2	.3	62	10.3	122	20.2
3	24 45.8	24 49.9	23 38.1	3	.5	63	10.4	123	20.4
4	24 46.0	24 50.1	23 38.3	4	.7	64	10.6	124	20.6
5	24 46.3	24 50.4	23 38.5	5	.8	65	10.8	125	20.7
6	24 46.5	24 50.6	23 38.8	6	1.0	66	10.9	126	20.9
7	24 46.8	24 50.9	23 39.0	7	1.2	67	11.1	127	21.1
8	24 47.0	24 51.1	23 39.3	8	1.3	68	11.3	128	21.2
9	24 47.3	24 51.4	23 39.5	9	1.5	69	11.4	129	21.4
10	24 47.5	24 51.6	23 39.7	10	1.7	70	11.6	130	21.6
11	24 47.8	24 51.9	23 40.0	11	1.8	71	11.8	131	21.7
12	24 48.0	24 52.1	23 40.2	12	2.0	72	11.9	132	21.9
13	24 48.3	24 52.4	23 40.5	13	2.2	73	12.1	133	22.1
14	24 48.5	24 52.6	23 40.7	14	2.3	74	12.3	134	22.2
15	24 48.8	24 52.9	23 40.9	15	2.5	75	12.4	135	22.4
16	24 49.0	24 53.1	23 41.2	16	2.7	76	12.6	136	22.6
17	24 49.3	24 53.4	23 41.4	17	2.8	77	12.8	137	22.7
18	24 49.5	24 53.6	23 41.6	18	3.0	78	12.9	138	22.9
19	24 49.8	24 53.9	23 41.9	19	3.2	79	13.1	139	23.1
20	24 50.0	24 54.1	23 42.1	20	3.3	80	13.3	140	23.2
21	24 50.3	24 54.4	23 42.4	21	3.5	81	13.4	141	23.4
22	24 50.5	24 54.6	23 42.6	22	3.6	82	13.6	142	23.5
23	24 50.8	24 54.9	23 42.8	23	3.8	83	13.8	143	23.7
24	24 51.0	24 55.1	23 43.1	24	4.0	84	13.9	144	23.9
25	24 51.3	24 55.4	23 43.3	25	4.1	85	14.1	145	24.0
26	24 51.5	24 55.6	23 43.6	26	4.3	86	14.3	146	24.2
27	24 51.8	24 55.9	23 43.8	27	4.5	87	14.4	147	24.4
28	24 52.0	24 56.1	23 44.0	28	4.6	88	14.6	148	24.5
29	24 52.3	24 56.4	23 44.3	29	4.8	89	14.8	149	24.7
30	24 52.5	24 56.6	23 44.5	30	5.0	90	14.9	150	24.9
31	24 52.8	24 56.9	23 44.7	31	5.1	91	15.1	151	25.0
32	24 53.0	24 57.1	23 45.0	32	5.3	92	15.3	152	25.2
33	24 53.3	24 57.4	23 45.2	33	5.5	93	15.4	153	25.4
34	24 53.5	24 57.6	23 45.5	34	5.6	94	15.6	154	25.5
35	24 53.8	24 57.9	23 45.7	35	5.8	95	15.8	155	25.7
36	24 54.0	24 58.2	23 45.9	36	6.0	96	15.9	156	25.9
37	24 54.3	24 58.4	23 46.2	37	6.1	97	16.1	157	26.0
38	24 54.5	24 58.7	23 46.4	38	6.3	98	16.3	158	26.2
39	24 54.8	24 58.9	23 46.7	39	6.5	99	16.4	159	26.4
40	24 55.0	24 59.2	23 46.9	40	6.6	100	16.6	160	26.5
41	24 55.3	24 59.4	23 47.1	41	6.8	101	16.7	161	26.7
42	24 55.5	24 59.7	23 47.4	42	7.0	102	16.9	162	26.9
43	24 55.8	24 59.9	23 47.6	43	7.1	103	17.1	163	27.0
44	24 56.0	25 .2	23 47.8	44	7.3	104	17.2	164	27.2
45	24 56.3	25 .4	23 48.1	45	7.5	105	17.4	165	27.4
46	24 56.5	25 .7	23 48.3	46	7.6	106	17.6	166	27.5
47	24 56.8	25 .9	23 48.6	47	7.8	107	17.7	167	27.7
48	24 57.0	25 1.2	23 48.8	48	8.0	108	17.9	168	27.9
49	24 57.3	25 1.4	23 49.0	49	8.1	109	18.1	169	28.0
50	24 57.5	25 1.7	23 49.3	50	8.3	110	18.2	170	28.2
51	24 57.8	25 1.9	23 49.5	51	8.5	111	18.4	171	28.4
52	24 58.0	25 2.2	23 49.8	52	8.6	112	18.6	172	28.5
53	24 58.3	25 2.4	23 50.0	53	8.8	113	18.7	173	28.7
54	24 58.5	25 2.7	23 50.2	54	9.0	114	18.9	174	28.9
55	24 58.8	25 2.9	23 50.5	55	9.1	115	19.1	175	29.0
56	24 59.0	25 3.2	23 50.7	56	9.3	116	19.2	176	29.2
57	24 59.3	25 3.4	23 51.0	57	9.5	117	19.4	177	29.4
58	24 59.5	25 3.7	23 51.2	58	9.6	118	19.6	178	29.5
59	24 59.8	25 3.9	23 51.4	59	9.8	119	19.7	179	29.7
60	25 .0	25 4.2	23 51.7	60	10.0	120	19.9	180	29.9

1 h 40 min

POPRAVKA ČASOVNOG UGLA				POPRAVKA DRUGOG REDA za časovni ugao i deklinaciju Sunca, Mjeseca i planeta					
s	SUNCA I PLANETA	PROLJEĆNE TAČKE ♈	MJESECA ☾	Δ	poprav.	Δ	poprav.	Δ	poprav.
	° ′	° ′	° ′		′		′		′
0	25 .0	25 4.2	23 51.7	0	.0	60	10.1	120	20.1
1	25 .3	25 4.4	23 51.9	1	.2	61	10.2	121	20.3
2	25 .5	25 4.7	23 52.1	2	.3	62	10.4	122	20.4
3	25 .8	25 4.9	23 52.4	3	.5	63	10.6	123	20.6
4	25 1.0	25 5.2	23 52.6	4	.7	64	10.7	124	20.8
5	25 1.3	25 5.4	23 52.9	5	.8	65	10.9	125	20.9
6	25 1.5	25 5.7	23 53.1	6	1.0	66	11.1	126	21.1
7	25 1.8	25 5.9	23 53.3	7	1.2	67	11.2	127	21.3
8	25 2.0	25 6.2	23 53.6	8	1.3	68	11.4	128	21.4
9	25 2.3	25 6.4	23 53.8	9	1.5	69	11.6	129	21.6
10	25 2.5	25 6.7	23 54.1	10	1.7	70	11.7	130	21.8
11	25 2.8	25 6.9	23 54.3	11	1.8	71	11.9	131	21.9
12	25 3.0	25 7.2	23 54.5	12	2.0	72	12.1	132	22.1
13	25 3.3	25 7.4	23 54.8	13	2.2	73	12.2	133	22.3
14	25 3.5	25 7.7	23 55.0	14	2.3	74	12.4	134	22.4
15	25 3.8	25 7.9	23 55.2	15	2.5	75	12.6	135	22.6
16	25 4.0	25 8.2	23 55.5	16	2.7	76	12.7	136	22.8
17	25 4.3	25 8.4	23 55.7	17	2.8	77	12.9	137	22.9
18	25 4.5	25 8.7	23 56.0	18	3.0	78	13.1	138	23.1
19	25 4.8	25 8.9	23 56.2	19	3.2	79	13.2	139	23.3
20	25 5.0	25 9.2	23 56.4	20	3.4	80	13.4	140	23.5
21	25 5.3	25 9.4	23 56.7	21	3.5	81	13.6	141	23.6
22	25 5.5	25 9.7	23 56.9	22	3.7	82	13.7	142	23.8
23	25 5.8	25 9.9	23 57.2	23	3.9	83	13.9	143	24.0
24	25 6.0	25 10.2	23 57.4	24	4.0	84	14.1	144	24.1
25	25 6.3	25 10.4	23 57.6	25	4.2	85	14.2	145	24.3
26	25 6.5	25 10.7	23 57.9	26	4.4	86	14.4	146	24.5
27	25 6.8	25 10.9	23 58.1	27	4.5	87	14.6	147	24.6
28	25 7.0	25 11.2	23 58.3	28	4.7	88	14.7	148	24.8
29	25 7.3	25 11.4	23 58.6	29	4.9	89	14.9	149	25.0
30	25 7.5	25 11.7	23 58.8	30	5.0	90	15.1	150	25.1
31	25 7.8	25 11.9	23 59.1	31	5.2	91	15.2	151	25.3
32	25 8.0	25 12.2	23 59.3	32	5.4	92	15.4	152	25.5
33	25 8.3	25 12.4	23 59.5	33	5.5	93	15.6	153	25.6
34	25 8.5	25 12.7	23 59.8	34	5.7	94	15.7	154	25.8
35	25 8.8	25 12.9	24 .0	35	5.9	95	15.9	155	26.0
36	25 9.0	25 13.2	24 .3	36	6.0	96	16.1	156	26.1
37	25 9.3	25 13.4	24 .5	37	6.2	97	16.2	157	26.3
38	25 9.5	25 13.7	24 .7	38	6.4	98	16.4	158	26.5
39	25 9.8	25 13.9	24 1.0	39	6.5	99	16.6	159	26.6
40	25 10.0	25 14.2	24 1.2	40	6.7	100	16.8	160	26.8
41	25 10.3	25 14.4	24 1.4	41	6.9	101	16.9	161	27.0
42	25 10.5	25 14.7	24 1.7	42	7.0	102	17.1	162	27.1
43	25 10.8	25 14.9	24 1.9	43	7.2	103	17.3	163	27.3
44	25 11.0	25 15.2	24 2.2	44	7.4	104	17.4	164	27.5
45	25 11.3	25 15.4	24 2.4	45	7.5	105	17.6	165	27.6
46	25 11.5	25 15.7	24 2.6	46	7.7	106	17.8	166	27.8
47	25 11.8	25 15.9	24 2.9	47	7.9	107	17.9	167	28.0
48	25 12.0	25 16.2	24 3.1	48	8.0	108	18.1	168	28.1
49	25 12.3	25 16.5	24 3.4	49	8.2	109	18.3	169	28.3
50	25 12.5	25 16.7	24 3.6	50	8.4	110	18.4	170	28.5
51	25 12.8	25 17.0	24 3.8	51	8.5	111	18.6	171	28.6
52	25 13.0	25 17.2	24 4.1	52	8.7	112	18.8	172	28.8
53	25 13.3	25 17.5	24 4.3	53	8.9	113	18.9	173	29.0
54	25 13.5	25 17.7	24 4.6	54	9.0	114	19.1	174	29.1
55	25 13.8	25 18.0	24 4.8	55	9.2	115	19.3	175	29.3
56	25 14.0	25 18.2	24 5.0	56	9.4	116	19.4	176	29.5
57	25 14.3	25 18.5	24 5.3	57	9.5	117	19.6	177	29.6
58	25 14.5	25 18.7	24 5.5	58	9.7	118	19.8	178	29.8
59	25 14.8	25 19.0	24 5.7	59	9.9	119	19.9	179	30.0
60	25 15.0	25 19.2	24 6.0	60	10.1	120	20.1	180	30.2

1 h 41 min

POPRAVKA ČASOVNOG UGLA				POPRAVKA DRUGOG REDA za časovni ugao i deklinaciju Sunca, Mjeseca i planeta					
s	SUNCA I PLANETA	PROLJEĆNE TAČKE ♈	MJESECA ☾	Δ	poprav.	Δ	poprav.	Δ	poprav.
	° ′	° ′	° ′		′		′		′
0	25 15.0	25 19.2	24 6.0	0	.0	60	10.2	120	20.3
1	25 15.3	25 19.5	24 6.2	1	.2	61	10.3	121	20.5
2	25 15.5	25 19.7	24 6.5	2	.3	62	10.5	122	20.6
3	25 15.8	25 20.0	24 6.7	3	.5	63	10.7	123	20.8
4	25 16.0	25 20.2	24 6.9	4	.7	64	10.8	124	21.0
5	25 16.3	25 20.5	24 7.2	5	.8	65	11.0	125	21.1
6	25 16.5	25 20.7	24 7.4	6	1.0	66	11.2	126	21.3
7	25 16.8	25 21.0	24 7.7	7	1.2	67	11.3	127	21.5
8	25 17.0	25 21.2	24 7.9	8	1.4	68	11.5	128	21.7
9	25 17.3	25 21.5	24 8.1	9	1.5	69	11.7	129	21.8
10	25 17.5	25 21.7	24 8.4	10	1.7	70	11.8	130	22.0
11	25 17.8	25 22.0	24 8.6	11	1.9	71	12.0	131	22.2
12	25 18.0	25 22.2	24 8.8	12	2.0	72	12.2	132	22.3
13	25 18.3	25 22.5	24 9.1	13	2.2	73	12.3	133	22.5
14	25 18.5	25 22.7	24 9.3	14	2.4	74	12.5	134	22.7
15	25 18.8	25 23.0	24 9.6	15	2.5	75	12.7	135	22.8
16	25 19.0	25 23.2	24 9.8	16	2.7	76	12.9	136	23.0
17	25 19.3	25 23.5	24 10.0	17	2.9	77	13.0	137	23.2
18	25 19.5	25 23.7	24 10.3	18	3.0	78	13.2	138	23.3
19	25 19.8	25 24.0	24 10.5	19	3.2	79	13.4	139	23.5
20	25 20.0	25 24.2	24 10.8	20	3.4	80	13.5	140	23.7
21	25 20.3	25 24.5	24 11.0	21	3.6	81	13.7	141	23.9
22	25 20.5	25 24.7	24 11.2	22	3.7	82	13.9	142	24.0
23	25 20.8	25 25.0	24 11.5	23	3.9	83	14.0	143	24.2
24	25 21.0	25 25.2	24 11.7	24	4.1	84	14.2	144	24.4
25	25 21.3	25 25.5	24 11.9	25	4.2	85	14.4	145	24.5
26	25 21.5	25 25.7	24 12.2	26	4.4	86	14.5	146	24.7
27	25 21.8	25 26.0	24 12.4	27	4.6	87	14.7	147	24.9
28	25 22.0	25 26.2	24 12.7	28	4.7	88	14.9	148	25.0
29	25 22.3	25 26.5	24 12.9	29	4.9	89	15.1	149	25.2
30	25 22.5	25 26.7	24 13.1	30	5.1	90	15.2	150	25.4
31	25 22.8	25 27.0	24 13.4	31	5.2	91	15.4	151	25.5
32	25 23.0	25 27.2	24 13.6	32	5.4	92	15.6	152	25.7
33	25 23.3	25 27.5	24 13.9	33	5.6	93	15.7	153	25.9
34	25 23.5	25 27.7	24 14.1	34	5.8	94	15.9	154	26.1
35	25 23.8	25 28.0	24 14.3	35	5.9	95	16.1	155	26.2
36	25 24.0	25 28.2	24 14.6	36	6.1	96	16.2	156	26.4
37	25 24.3	25 28.5	24 14.8	37	6.3	97	16.4	157	26.6
38	25 24.5	25 28.7	24 15.1	38	6.4	98	16.6	158	26.7
39	25 24.8	25 29.0	24 15.3	39	6.6	99	16.7	159	26.9
40	25 25.0	25 29.2	24 15.5	40	6.8	100	16.9	160	27.1
41	25 25.3	25 29.5	24 15.8	41	6.9	101	17.1	161	27.2
42	25 25.5	25 29.7	24 16.0	42	7.1	102	17.3	162	27.4
43	25 25.8	25 30.0	24 16.2	43	7.3	103	17.4	163	27.6
44	25 26.0	25 30.2	24 16.5	44	7.4	104	17.6	164	27.7
45	25 26.3	25 30.5	24 16.7	45	7.6	105	17.8	165	27.9
46	25 26.5	25 30.7	24 17.0	46	7.8	106	17.9	166	28.1
47	25 26.8	25 31.0	24 17.2	47	8.0	107	18.1	167	28.3
48	25 27.0	25 31.2	24 17.4	48	8.1	108	18.3	168	28.4
49	25 27.3	25 31.5	24 17.7	49	8.3	109	18.4	169	28.6
50	25 27.5	25 31.7	24 17.9	50	8.5	110	18.6	170	28.8
51	25 27.8	25 32.0	24 18.2	51	8.6	111	18.8	171	28.9
52	25 28.0	25 32.2	24 18.4	52	8.8	112	18.9	172	29.1
53	25 28.3	25 32.5	24 18.6	53	9.0	113	19.1	173	29.3
54	25 28.5	25 32.7	24 18.9	54	9.1	114	19.3	174	29.4
55	25 28.8	25 33.0	24 19.1	55	9.3	115	19.5	175	29.6
56	25 29.0	25 33.2	24 19.3	56	9.5	116	19.6	176	29.8
57	25 29.3	25 33.5	24 19.6	57	9.6	117	19.8	177	29.9
58	25 29.5	25 33.7	24 19.8	58	9.8	118	20.0	178	30.1
59	25 29.8	25 34.0	24 20.1	59	10.0	119	20.1	179	30.3
60	25 30.0	25 34.3	24 20.3	60	10.2	120	20.3	180	30.5

1 h 42 min

POPRAVKA ČASOVNOG UGLA				POPRAVKA DRUGOG REDA za časovni ugao i deklinaciju Sunca, Mjeseca i planeta					
s	SUNCA I PLANETA	PROLJEĆNE TAČKE ♈	MJESECA ☾	Δ	popr.	Δ	popr.	Δ	popr.
	° ′	° ′	° ′		′		′		′
0	25 30.0	25 34.3	24 20.3	0	.0	60	10.3	120	20.5
1	25 30.3	25 34.5	24 20.5	1	.2	61	10.4	121	20.7
2	25 30.5	25 34.8	24 20.8	2	.3	62	10.6	122	20.8
3	25 30.8	25 35.0	24 21.0	3	.5	63	10.8	123	21.0
4	25 31.0	25 35.3	24 21.3	4	.7	64	10.9	124	21.2
5	25 31.3	25 35.5	24 21.5	5	.9	65	11.1	125	21.4
6	25 31.5	25 35.8	24 21.7	6	1.0	66	11.3	126	21.5
7	25 31.8	25 36.0	24 22.0	7	1.2	67	11.4	127	21.7
8	25 32.0	25 36.3	24 22.2	8	1.4	68	11.6	128	21.9
9	25 32.3	25 36.5	24 22.4	9	1.5	69	11.8	129	22.0
10	25 32.5	25 36.8	24 22.7	10	1.7	70	12.0	130	22.2
11	25 32.8	25 37.0	24 22.9	11	1.9	71	12.1	131	22.4
12	25 33.0	25 37.3	24 23.2	12	2.1	72	12.3	132	22.6
13	25 33.3	25 37.5	24 23.4	13	2.2	73	12.5	133	22.7
14	25 33.5	25 37.8	24 23.6	14	2.4	74	12.6	134	22.9
15	25 33.8	25 38.0	24 23.9	15	2.6	75	12.8	135	23.1
16	25 34.0	25 38.3	24 24.1	16	2.7	76	13.0	136	23.2
17	25 34.3	25 38.5	24 24.4	17	2.9	77	13.2	137	23.4
18	25 34.5	25 38.8	24 24.6	18	3.1	78	13.3	138	23.6
19	25 34.8	25 39.0	24 24.8	19	3.2	79	13.5	139	23.7
20	25 35.0	25 39.3	24 25.1	20	3.4	80	13.7	140	23.9
21	25 35.3	25 39.5	24 25.3	21	3.6	81	13.8	141	24.1
22	25 35.5	25 39.8	24 25.5	22	3.8	82	14.0	142	24.3
23	25 35.8	25 40.0	24 25.8	23	3.9	83	14.2	143	24.4
24	25 36.0	25 40.3	24 26.0	24	4.1	84	14.4	144	24.6
25	25 36.3	25 40.5	24 26.3	25	4.3	85	14.5	145	24.8
26	25 36.5	25 40.8	24 26.5	26	4.4	86	14.7	146	24.9
27	25 36.8	25 41.0	24 26.7	27	4.6	87	14.9	147	25.1
28	25 37.0	25 41.3	24 27.0	28	4.8	88	15.0	148	25.3
29	25 37.3	25 41.5	24 27.2	29	5.0	89	15.2	149	25.5
30	25 37.5	25 41.8	24 27.5	30	5.1	90	15.4	150	25.6
31	25 37.8	25 42.0	24 27.7	31	5.3	91	15.5	151	25.8
32	25 38.0	25 42.3	24 27.9	32	5.5	92	15.7	152	26.0
33	25 38.3	25 42.5	24 28.2	33	5.6	93	15.9	153	26.1
34	25 38.5	25 42.8	24 28.4	34	5.8	94	16.1	154	26.3
35	25 38.8	25 43.0	24 28.7	35	6.0	95	16.2	155	26.5
36	25 39.0	25 43.3	24 28.9	36	6.2	96	16.4	156	26.7
37	25 39.3	25 43.5	24 29.1	37	6.3	97	16.6	157	26.8
38	25 39.5	25 43.8	24 29.4	38	6.5	98	16.7	158	27.0
39	25 39.8	25 44.0	24 29.6	39	6.7	99	16.9	159	27.2
40	25 40.0	25 44.3	24 29.8	40	6.8	100	17.1	160	27.3
41	25 40.3	25 44.5	24 30.1	41	7.0	101	17.3	161	27.5
42	25 40.5	25 44.8	24 30.3	42	7.2	102	17.4	162	27.7
43	25 40.8	25 45.0	24 30.6	43	7.3	103	17.6	163	27.8
44	25 41.0	25 45.3	24 30.8	44	7.5	104	17.8	164	28.0
45	25 41.3	25 45.5	24 31.0	45	7.7	105	17.9	165	28.2
46	25 41.5	25 45.8	24 31.3	46	7.9	106	18.1	166	28.4
47	25 41.8	25 46.0	24 31.5	47	8.0	107	18.3	167	28.5
48	25 42.0	25 46.3	24 31.8	48	8.2	108	18.5	168	28.7
49	25 42.3	25 46.5	24 32.0	49	8.4	109	18.6	169	28.9
50	25 42.5	25 46.8	24 32.2	50	8.5	110	18.8	170	29.0
51	25 42.8	25 47.0	24 32.5	51	8.7	111	19.0	171	29.2
52	25 43.0	25 47.3	24 32.7	52	8.9	112	19.1	172	29.4
53	25 43.3	25 47.5	24 32.9	53	9.1	113	19.3	173	29.6
54	25 43.5	25 47.8	24 33.2	54	9.2	114	19.5	174	29.7
55	25 43.8	25 48.0	24 33.4	55	9.4	115	19.6	175	29.9
56	25 44.0	25 48.3	24 33.7	56	9.6	116	19.8	176	30.1
57	25 44.3	25 48.5	24 33.9	57	9.7	117	20.0	177	30.2
58	25 44.5	25 48.8	24 34.1	58	9.9	118	20.2	178	30.4
59	25 44.8	25 49.0	24 34.4	59	10.1	119	20.3	179	30.6
60	25 45.0	25 49.3	24 34.6	60	10.3	120	20.5	180	30.8

1 h 43 min

POPRAVKA ČASOVNOG UGLA				POPRAVKA DRUGOG REDA za časovni ugao i deklinaciju Sunca, Mjeseca i planeta					
s	SUNCA I PLANETA	PROLJEĆNE TAČKE ♈	MJESECA ☾	Δ	popr.	Δ	popr.	Δ	popr.
	° ′	° ′	° ′		′		′		′
0	25 45.0	25 49.3	24 34.6	0	.0	60	10.4	120	20.7
1	25 45.3	25 49.5	24 34.9	1	.2	61	10.5	121	20.9
2	25 45.5	25 49.8	24 35.1	2	.3	62	10.7	122	21.0
3	25 45.8	25 50.0	24 35.3	3	.5	63	10.9	123	21.2
4	25 46.0	25 50.3	24 35.6	4	.7	64	11.0	124	21.4
5	25 46.3	25 50.5	24 35.8	5	.9	65	11.2	125	21.6
6	25 46.5	25 50.8	24 36.0	6	1.0	66	11.4	126	21.7
7	25 46.8	25 51.0	24 36.3	7	1.2	67	11.6	127	21.9
8	25 47.0	25 51.3	24 36.5	8	1.4	68	11.7	128	22.1
9	25 47.3	25 51.5	24 36.8	9	1.6	69	11.9	129	22.3
10	25 47.5	25 51.8	24 37.0	10	1.7	70	12.1	130	22.4
11	25 47.8	25 52.0	24 37.2	11	1.9	71	12.2	131	22.6
12	25 48.0	25 52.3	24 37.5	12	2.1	72	12.4	132	22.8
13	25 48.3	25 52.6	24 37.7	13	2.2	73	12.6	133	22.9
14	25 48.5	25 52.8	24 38.0	14	2.4	74	12.8	134	23.1
15	25 48.8	25 53.1	24 38.2	15	2.6	75	12.9	135	23.3
16	25 49.0	25 53.3	24 38.4	16	2.8	76	13.1	136	23.5
17	25 49.3	25 53.6	24 38.7	17	2.9	77	13.3	137	23.6
18	25 49.5	25 53.8	24 38.9	18	3.1	78	13.5	138	23.8
19	25 49.8	25 54.1	24 39.2	19	3.3	79	13.6	139	24.0
20	25 50.0	25 54.3	24 39.4	20	3.5	80	13.8	140	24.2
21	25 50.3	25 54.6	24 39.6	21	3.6	81	14.0	141	24.3
22	25 50.5	25 54.8	24 39.9	22	3.8	82	14.1	142	24.5
23	25 50.8	25 55.1	24 40.1	23	4.0	83	14.3	143	24.7
24	25 51.0	25 55.3	24 40.3	24	4.1	84	14.5	144	24.8
25	25 51.3	25 55.6	24 40.6	25	4.3	85	14.7	145	25.0
26	25 51.5	25 55.8	24 40.8	26	4.5	86	14.8	146	25.2
27	25 51.8	25 56.1	24 41.1	27	4.7	87	15.0	147	25.4
28	25 52.0	25 56.3	24 41.3	28	4.8	88	15.2	148	25.5
29	25 52.3	25 56.6	24 41.5	29	5.0	89	15.4	149	25.7
30	25 52.5	25 56.8	24 41.8	30	5.2	90	15.5	150	25.9
31	25 52.8	25 57.1	24 42.0	31	5.3	91	15.7	151	26.0
32	25 53.0	25 57.3	24 42.3	32	5.5	92	15.9	152	26.2
33	25 53.3	25 57.6	24 42.5	33	5.7	93	16.0	153	26.4
34	25 53.5	25 57.8	24 42.7	34	5.9	94	16.2	154	26.6
35	25 53.8	25 58.1	24 43.0	35	6.0	95	16.4	155	26.7
36	25 54.0	25 58.3	24 43.2	36	6.2	96	16.6	156	26.9
37	25 54.3	25 58.6	24 43.4	37	6.4	97	16.7	157	27.1
38	25 54.5	25 58.8	24 43.7	38	6.6	98	16.9	158	27.3
39	25 54.8	25 59.1	24 43.9	39	6.7	99	17.1	159	27.4
40	25 55.0	25 59.3	24 44.2	40	6.9	100	17.3	160	27.6
41	25 55.3	25 59.6	24 44.4	41	7.1	101	17.4	161	27.8
42	25 55.5	25 59.8	24 44.6	42	7.2	102	17.6	162	27.9
43	25 55.8	26 .1	24 44.9	43	7.4	103	17.8	163	28.1
44	25 56.0	26 .3	24 45.1	44	7.6	104	17.9	164	28.3
45	25 56.3	26 .6	24 45.4	45	7.8	105	18.1	165	28.5
46	25 56.5	26 .8	24 45.6	46	7.9	106	18.3	166	28.6
47	25 56.8	26 1.1	24 45.8	47	8.1	107	18.5	167	28.8
48	25 57.0	26 1.3	24 46.1	48	8.3	108	18.6	168	29.0
49	25 57.3	26 1.6	24 46.3	49	8.5	109	18.8	169	29.2
50	25 57.5	26 1.8	24 46.5	50	8.6	110	19.0	170	29.3
51	25 57.8	26 2.1	24 46.8	51	8.8	111	19.1	171	29.5
52	25 58.0	26 2.3	24 47.0	52	9.0	112	19.3	172	29.7
53	25 58.3	26 2.6	24 47.3	53	9.1	113	19.5	173	29.8
54	25 58.5	26 2.8	24 47.5	54	9.3	114	19.7	174	30.0
55	25 58.8	26 3.1	24 47.7	55	9.5	115	19.8	175	30.2
56	25 59.0	26 3.3	24 48.0	56	9.7	116	20.0	176	30.4
57	25 59.3	26 3.6	24 48.2	57	9.8	117	20.2	177	30.5
58	25 59.5	26 3.8	24 48.5	58	10.0	118	20.4	178	30.7
59	25 59.8	26 4.1	24 48.7	59	10.2	119	20.5	179	30.9
60	26 .0	26 4.3	24 48.9	60	10.4	120	20.7	180	31.1

1 h 44 min

POPRAVKA ČASOVNOG UGLA					POPRAVKA DRUGOG REDA za časovni ugao i deklinaciju Sunca, Mjeseca i planeta					
s	SUNCA I PLANETA		PROLJEĆNE TAČKE ♈		MJESECA ☾		Δ	poprav.	Δ	poprav.	Δ	poprav.
	°	′	°	′	°	′		′		′		′
0	26	.0	26	4.3	24	48.9	0	.0	60	10.5	120	20.9
1	26	.3	26	4.6	24	49.2	1	.2	61	10.6	121	21.1
2	26	.5	26	4.8	24	49.4	2	.3	62	10.8	122	21.2
3	26	.8	26	5.1	24	49.6	3	.5	63	11.0	123	21.4
4	26	1.0	26	5.3	24	49.9	4	.7	64	11.1	124	21.6
5	26	1.3	26	5.6	24	50.1	5	.9	65	11.3	125	21.8
6	26	1.5	26	5.8	24	50.4	6	1.0	66	11.5	126	21.9
7	26	1.8	26	6.1	24	50.6	7	1.2	67	11.7	127	22.1
8	26	2.0	26	6.3	24	50.8	8	1.4	68	11.8	128	22.3
9	26	2.3	26	6.6	24	51.1	9	1.6	69	12.0	129	22.5
10	26	2.5	26	6.8	24	51.3	10	1.7	70	12.2	130	22.6
11	26	2.8	26	7.1	24	51.6	11	1.9	71	12.4	131	22.8
12	26	3.0	26	7.3	24	51.8	12	2.1	72	12.5	132	23.0
13	26	3.3	26	7.6	24	52.0	13	2.3	73	12.7	133	23.2
14	26	3.5	26	7.8	24	52.3	14	2.4	74	12.9	134	23.3
15	26	3.8	26	8.1	24	52.5	15	2.6	75	13.1	135	23.5
16	26	4.0	26	8.3	24	52.8	16	2.8	76	13.2	136	23.7
17	26	4.3	26	8.6	24	53.0	17	3.0	77	13.4	137	23.9
18	26	4.5	26	8.8	24	53.2	18	3.1	78	13.6	138	24.0
19	26	4.8	26	9.1	24	53.5	19	3.3	79	13.8	139	24.2
20	26	5.0	26	9.3	24	53.7	20	3.5	80	13.9	140	24.4
21	26	5.3	26	9.6	24	53.9	21	3.7	81	14.1	141	24.6
22	26	5.5	26	9.8	24	54.2	22	3.8	82	14.3	142	24.7
23	26	5.8	26	10.1	24	54.4	23	4.0	83	14.5	143	24.9
24	26	6.0	26	10.4	24	54.7	24	4.2	84	14.6	144	25.1
25	26	6.3	26	10.6	24	54.9	25	4.4	85	14.8	145	25.3
26	26	6.5	26	10.9	24	55.1	26	4.5	86	15.0	146	25.4
27	26	6.8	26	11.1	24	55.4	27	4.7	87	15.2	147	25.6
28	26	7.0	26	11.4	24	55.6	28	4.9	88	15.3	148	25.8
29	26	7.3	26	11.6	24	55.9	29	5.1	89	15.5	149	26.0
30	26	7.5	26	11.9	24	56.1	30	5.2	90	15.7	150	26.1
31	26	7.8	26	12.1	24	56.3	31	5.4	91	15.8	151	26.3
32	26	8.0	26	12.4	24	56.6	32	5.6	92	16.0	152	26.5
33	26	8.3	26	12.6	24	56.8	33	5.7	93	16.2	153	26.6
34	26	8.5	26	12.9	24	57.0	34	5.9	94	16.4	154	26.8
35	26	8.8	26	13.1	24	57.3	35	6.1	95	16.5	155	27.0
36	26	9.0	26	13.4	24	57.5	36	6.3	96	16.7	156	27.2
37	26	9.3	26	13.6	24	57.8	37	6.4	97	16.9	157	27.3
38	26	9.5	26	13.9	24	58.0	38	6.6	98	17.1	158	27.5
39	26	9.8	26	14.1	24	58.2	39	6.8	99	17.2	159	27.7
40	26	10.0	26	14.4	24	58.5	40	7.0	100	17.4	160	27.9
41	26	10.3	26	14.6	24	58.7	41	7.1	101	17.6	161	28.0
42	26	10.5	26	14.9	24	59.0	42	7.3	102	17.8	162	28.2
43	26	10.8	26	15.1	24	59.2	43	7.5	103	17.9	163	28.4
44	26	11.0	26	15.4	24	59.4	44	7.7	104	18.1	164	28.6
45	26	11.3	26	15.6	24	59.7	45	7.8	105	18.3	165	28.7
46	26	11.5	26	15.9	24	59.9	46	8.0	106	18.5	166	28.9
47	26	11.8	26	16.1	25	.1	47	8.2	107	18.6	167	29.1
48	26	12.0	26	16.4	25	.4	48	8.4	108	18.8	168	29.3
49	26	12.3	26	16.6	25	.6	49	8.5	109	19.0	169	29.4
50	26	12.5	26	16.9	25	.9	50	8.7	110	19.2	170	29.6
51	26	12.8	26	17.1	25	1.1	51	8.9	111	19.3	171	29.8
52	26	13.0	26	17.4	25	1.3	52	9.1	112	19.5	172	30.0
53	26	13.3	26	17.6	25	1.6	53	9.2	113	19.7	173	30.1
54	26	13.5	26	17.9	25	1.8	54	9.4	114	19.9	174	30.3
55	26	13.8	26	18.1	25	2.1	55	9.6	115	20.0	175	30.5
56	26	14.0	26	18.4	25	2.3	56	9.8	116	20.2	176	30.7
57	26	14.3	26	18.6	25	2.5	57	9.9	117	20.4	177	30.8
58	26	14.5	26	18.9	25	2.8	58	10.1	118	20.6	178	31.0
59	26	14.8	26	19.1	25	3.0	59	10.3	119	20.7	179	31.2
60	26	15.0	26	19.4	25	3.3	60	10.5	120	20.9	180	31.4

1 h 45 min

POPRAVKA ČASOVNOG UGLA					POPRAVKA DRUGOG REDA za časovni ugao i deklinaciju Sunca, Mjeseca i planeta					
s	SUNCA I PLANETA		PROLJEĆNE TAČKE ♈		MJESECA ☾		Δ	poprav.	Δ	poprav.	Δ	poprav.
	°	′	°	′	°	′		′		′		′
0	26	15.0	26	19.4	25	3.3	0	.0	60	10.6	120	21.1
1	26	15.3	26	19.6	25	3.5	1	.2	61	10.7	121	21.3
2	26	15.5	26	19.9	25	3.7	2	.4	62	10.9	122	21.5
3	26	15.8	26	20.1	25	4.0	3	.5	63	11.1	123	21.6
4	26	16.0	26	20.4	25	4.2	4	.7	64	11.3	124	21.8
5	26	16.3	26	20.6	25	4.4	5	.9	65	11.4	125	22.0
6	26	16.5	26	20.9	25	4.7	6	1.1	66	11.6	126	22.2
7	26	16.8	26	21.1	25	4.9	7	1.2	67	11.8	127	22.3
8	26	17.0	26	21.4	25	5.2	8	1.4	68	12.0	128	22.5
9	26	17.3	26	21.6	25	5.4	9	1.6	69	12.1	129	22.7
10	26	17.5	26	21.9	25	5.6	10	1.8	70	12.3	130	22.9
11	26	17.8	26	22.1	25	5.9	11	1.9	71	12.5	131	23.0
12	26	18.0	26	22.4	25	6.1	12	2.1	72	12.7	132	23.2
13	26	18.3	26	22.6	25	6.4	13	2.3	73	12.8	133	23.4
14	26	18.5	26	22.9	25	6.6	14	2.5	74	13.0	134	23.6
15	26	18.8	26	23.1	25	6.8	15	2.6	75	13.2	135	23.7
16	26	19.0	26	23.4	25	7.1	16	2.8	76	13.4	136	23.9
17	26	19.3	26	23.6	25	7.3	17	3.0	77	13.5	137	24.1
18	26	19.5	26	23.9	25	7.5	18	3.2	78	13.7	138	24.3
19	26	19.8	26	24.1	25	7.8	19	3.3	79	13.9	139	24.4
20	26	20.0	26	24.4	25	8.0	20	3.5	80	14.1	140	24.6
21	26	20.3	26	24.6	25	8.3	21	3.7	81	14.2	141	24.8
22	26	20.5	26	24.9	25	8.5	22	3.9	82	14.4	142	25.0
23	26	20.8	26	25.1	25	8.7	23	4.0	83	14.6	143	25.1
24	26	21.0	26	25.4	25	9.0	24	4.2	84	14.8	144	25.3
25	26	21.3	26	25.6	25	9.2	25	4.4	85	14.9	145	25.5
26	26	21.5	26	25.9	25	9.5	26	4.6	86	15.1	146	25.7
27	26	21.8	26	26.1	25	9.7	27	4.7	87	15.3	147	25.8
28	26	22.0	26	26.4	25	9.9	28	4.9	88	15.5	148	26.0
29	26	22.3	26	26.6	25	10.2	29	5.1	89	15.6	149	26.2
30	26	22.5	26	26.9	25	10.4	30	5.3	90	15.8	150	26.4
31	26	22.8	26	27.1	25	10.6	31	5.5	91	16.0	151	26.6
32	26	23.0	26	27.4	25	10.9	32	5.6	92	16.2	152	26.7
33	26	23.3	26	27.6	25	11.1	33	5.8	93	16.4	153	26.9
34	26	23.5	26	27.9	25	11.4	34	6.0	94	16.5	154	27.1
35	26	23.8	26	28.1	25	11.6	35	6.2	95	16.7	155	27.3
36	26	24.0	26	28.4	25	11.8	36	6.3	96	16.9	156	27.4
37	26	24.3	26	28.7	25	12.1	37	6.5	97	17.1	157	27.6
38	26	24.5	26	28.9	25	12.3	38	6.7	98	17.2	158	27.8
39	26	24.8	26	29.2	25	12.6	39	6.9	99	17.4	159	28.0
40	26	25.0	26	29.4	25	12.8	40	7.0	100	17.6	160	28.1
41	26	25.3	26	29.7	25	13.0	41	7.2	101	17.8	161	28.3
42	26	25.5	26	29.9	25	13.3	42	7.4	102	17.9	162	28.5
43	26	25.8	26	30.2	25	13.5	43	7.6	103	18.1	163	28.7
44	26	26.0	26	30.4	25	13.7	44	7.7	104	18.3	164	28.8
45	26	26.3	26	30.7	25	14.0	45	7.9	105	18.5	165	29.0
46	26	26.5	26	30.9	25	14.2	46	8.1	106	18.6	166	29.2
47	26	26.8	26	31.2	25	14.5	47	8.3	107	18.8	167	29.4
48	26	27.0	26	31.4	25	14.7	48	8.4	108	19.0	168	29.5
49	26	27.3	26	31.7	25	14.9	49	8.6	109	19.2	169	29.7
50	26	27.5	26	31.9	25	15.2	50	8.8	110	19.3	170	29.9
51	26	27.8	26	32.2	25	15.4	51	9.0	111	19.5	171	30.1
52	26	28.0	26	32.4	25	15.7	52	9.1	112	19.7	172	30.2
53	26	28.3	26	32.7	25	15.9	53	9.3	113	19.9	173	30.4
54	26	28.5	26	32.9	25	16.1	54	9.5	114	20.0	174	30.6
55	26	28.8	26	33.2	25	16.4	55	9.7	115	20.2	175	30.8
56	26	29.0	26	33.4	25	16.6	56	9.8	116	20.4	176	30.9
57	26	29.3	26	33.7	25	16.9	57	10.0	117	20.6	177	31.1
58	26	29.5	26	33.9	25	17.1	58	10.2	118	20.7	178	31.3
59	26	29.8	26	34.2	25	17.3	59	10.4	119	20.9	179	31.5
60	26	30.0	26	34.4	25	17.6	60	10.6	120	21.1	180	31.7

1 h 46 min

POPRAVKA ČASOVNOG UGLA				POPRAVKA DRUGOG REDA za časovni ugao i deklinaciju Sunca, Mjeseca i planeta					
s	SUNCA I PLANETA	PROLJEĆNE TAČKE ♈	MJESECA ☾	Δ	popr.	Δ	popr.	Δ	popr.
	° ′	° ′	° ′		′		′		′
0	26 30.0	26 34.4	25 17.6	0	.0	60	10.7	120	21.3
1	26 30.3	26 34.7	25 17.8	1	.2	61	10.8	121	21.5
2	26 30.5	26 34.9	25 18.0	2	.4	62	11.0	122	21.7
3	26 30.8	26 35.2	25 18.3	3	.5	63	11.2	123	21.8
4	26 31.0	26 35.4	25 18.5	4	.7	64	11.4	124	22.0
5	26 31.3	26 35.7	25 18.8	5	.9	65	11.5	125	22.2
6	26 31.5	26 35.9	25 19.0	6	1.1	66	11.7	126	22.4
7	26 31.8	26 36.2	25 19.2	7	1.2	67	11.9	127	22.5
8	26 32.0	26 36.4	25 19.5	8	1.4	68	12.1	128	22.7
9	26 32.3	26 36.7	25 19.7	9	1.6	69	12.2	129	22.9
10	26 32.5	26 36.9	25 20.0	10	1.8	70	12.4	130	23.1
11	26 32.8	26 37.2	25 20.2	11	2.0	71	12.6	131	23.3
12	26 33.0	26 37.4	25 20.4	12	2.1	72	12.8	132	23.4
13	26 33.3	26 37.7	25 20.7	13	2.3	73	13.0	133	23.6
14	26 33.5	26 37.9	25 20.9	14	2.5	74	13.1	134	23.8
15	26 33.8	26 38.2	25 21.1	15	2.7	75	13.3	135	24.0
16	26 34.0	26 38.4	25 21.4	16	2.8	76	13.5	136	24.1
17	26 34.3	26 38.7	25 21.6	17	3.0	77	13.7	137	24.3
18	26 34.5	26 38.9	25 21.9	18	3.2	78	13.8	138	24.5
19	26 34.8	26 39.2	25 22.1	19	3.4	79	14.0	139	24.7
20	26 35.0	26 39.4	25 22.3	20	3.6	80	14.2	140	24.9
21	26 35.3	26 39.7	25 22.6	21	3.7	81	14.4	141	25.0
22	26 35.5	26 39.9	25 22.8	22	3.9	82	14.6	142	25.2
23	26 35.8	26 40.2	25 23.1	23	4.1	83	14.7	143	25.4
24	26 36.0	26 40.4	25 23.3	24	4.3	84	14.9	144	25.6
25	26 36.3	26 40.7	25 23.5	25	4.4	85	15.1	145	25.7
26	26 36.5	26 40.9	25 23.8	26	4.6	86	15.3	146	25.9
27	26 36.8	26 41.2	25 24.0	27	4.8	87	15.4	147	26.1
28	26 37.0	26 41.4	25 24.2	28	5.0	88	15.6	148	26.3
29	26 37.3	26 41.7	25 24.5	29	5.1	89	15.8	149	26.4
30	26 37.5	26 41.9	25 24.7	30	5.3	90	16.0	150	26.6
31	26 37.8	26 42.2	25 25.0	31	5.5	91	16.2	151	26.8
32	26 38.0	26 42.4	25 25.2	32	5.7	92	16.3	152	27.0
33	26 38.3	26 42.7	25 25.4	33	5.9	93	16.5	153	27.2
34	26 38.5	26 42.9	25 25.7	34	6.0	94	16.7	154	27.3
35	26 38.8	26 43.2	25 25.9	35	6.2	95	16.9	155	27.5
36	26 39.0	26 43.4	25 26.2	36	6.4	96	17.0	156	27.7
37	26 39.3	26 43.7	25 26.4	37	6.6	97	17.2	157	27.9
38	26 39.5	26 43.9	25 26.6	38	6.7	98	17.4	158	28.0
39	26 39.8	26 44.2	25 26.9	39	6.9	99	17.6	159	28.2
40	26 40.0	26 44.4	25 27.1	40	7.1	100	17.8	160	28.4
41	26 40.3	26 44.7	25 27.3	41	7.3	101	17.9	161	28.6
42	26 40.5	26 44.9	25 27.6	42	7.5	102	18.1	162	28.8
43	26 40.8	26 45.2	25 27.8	43	7.6	103	18.3	163	28.9
44	26 41.0	26 45.4	25 28.1	44	7.8	104	18.5	164	29.1
45	26 41.3	26 45.7	25 28.3	45	8.0	105	18.6	165	29.3
46	26 41.5	26 45.9	25 28.5	46	8.2	106	18.8	166	29.5
47	26 41.8	26 46.2	25 28.8	47	8.3	107	19.0	167	29.6
48	26 42.0	26 46.5	25 29.0	48	8.5	108	19.2	168	29.8
49	26 42.3	26 46.7	25 29.3	49	8.7	109	19.3	169	30.0
50	26 42.5	26 47.0	25 29.5	50	8.9	110	19.5	170	30.2
51	26 42.8	26 47.2	25 29.7	51	9.1	111	19.7	171	30.4
52	26 43.0	26 47.5	25 30.0	52	9.2	112	19.9	172	30.5
53	26 43.3	26 47.7	25 30.2	53	9.4	113	20.1	173	30.7
54	26 43.5	26 48.0	25 30.5	54	9.6	114	20.2	174	30.9
55	26 43.8	26 48.2	25 30.7	55	9.8	115	20.4	175	31.1
56	26 44.0	26 48.5	25 30.9	56	9.9	116	20.6	176	31.2
57	26 44.3	26 48.7	25 31.2	57	10.1	117	20.8	177	31.4
58	26 44.5	26 49.0	25 31.4	58	10.3	118	20.9	178	31.6
59	26 44.8	26 49.2	25 31.6	59	10.5	119	21.1	179	31.8
60	26 45.0	26 49.5	25 31.9	60	10.7	120	21.3	180	32.0

1 h 47 min

POPRAVKA ČASOVNOG UGLA				POPRAVKA DRUGOG REDA za časovni ugao i deklinaciju Sunca, Mjeseca i planeta					
s	SUNCA I PLANETA	PROLJEĆNE TAČKE ♈	MJESECA ☾	Δ	popr.	Δ	popr.	Δ	popr.
	° ′	° ′	° ′		′		′		′
0	26 45.0	26 49.5	25 31.9	0	.0	60	10.8	120	21.5
1	26 45.3	26 49.7	25 32.1	1	.2	61	10.9	121	21.7
2	26 45.5	26 50.0	25 32.4	2	.4	62	11.1	122	21.9
3	26 45.8	26 50.2	25 32.6	3	.5	63	11.3	123	22.0
4	26 46.0	26 50.5	25 32.8	4	.7	64	11.5	124	22.2
5	26 46.3	26 50.7	25 33.1	5	.9	65	11.6	125	22.4
6	26 46.5	26 51.0	25 33.3	6	1.1	66	11.8	126	22.6
7	26 46.8	26 51.2	25 33.6	7	1.3	67	12.0	127	22.8
8	26 47.0	26 51.5	25 33.8	8	1.4	68	12.2	128	22.9
9	26 47.3	26 51.7	25 34.0	9	1.6	69	12.4	129	23.1
10	26 47.5	26 52.0	25 34.3	10	1.8	70	12.5	130	23.3
11	26 47.8	26 52.2	25 34.5	11	2.0	71	12.7	131	23.5
12	26 48.0	26 52.5	25 34.7	12	2.2	72	12.9	132	23.7
13	26 48.3	26 52.7	25 35.0	13	2.3	73	13.1	133	23.8
14	26 48.5	26 53.0	25 35.2	14	2.5	74	13.3	134	24.0
15	26 48.8	26 53.2	25 35.5	15	2.7	75	13.4	135	24.2
16	26 49.0	26 53.5	25 35.7	16	2.9	76	13.6	136	24.4
17	26 49.3	26 53.7	25 35.9	17	3.0	77	13.8	137	24.5
18	26 49.5	26 54.0	25 36.2	18	3.2	78	14.0	138	24.7
19	26 49.8	26 54.2	25 36.4	19	3.4	79	14.2	139	24.9
20	26 50.0	26 54.5	25 36.7	20	3.6	80	14.3	140	25.1
21	26 50.3	26 54.7	25 36.9	21	3.8	81	14.5	141	25.3
22	26 50.5	26 55.0	25 37.1	22	3.9	82	14.7	142	25.4
23	26 50.8	26 55.2	25 37.4	23	4.1	83	14.9	143	25.6
24	26 51.0	26 55.5	25 37.6	24	4.3	84	15.1	144	25.8
25	26 51.3	26 55.7	25 37.8	25	4.5	85	15.2	145	26.0
26	26 51.5	26 56.0	25 38.1	26	4.7	86	15.4	146	26.2
27	26 51.8	26 56.2	25 38.3	27	4.8	87	15.6	147	26.3
28	26 52.0	26 56.5	25 38.6	28	5.0	88	15.8	148	26.5
29	26 52.3	26 56.7	25 38.8	29	5.2	89	15.9	149	26.7
30	26 52.5	26 57.0	25 39.0	30	5.4	90	16.1	150	26.9
31	26 52.8	26 57.2	25 39.3	31	5.6	91	16.3	151	27.1
32	26 53.0	26 57.5	25 39.5	32	5.7	92	16.5	152	27.2
33	26 53.3	26 57.7	25 39.8	33	5.9	93	16.7	153	27.4
34	26 53.5	26 58.0	25 40.0	34	6.1	94	16.8	154	27.6
35	26 53.8	26 58.2	25 40.2	35	6.3	95	17.0	155	27.8
36	26 54.0	26 58.5	25 40.5	36	6.5	96	17.2	156	28.0
37	26 54.3	26 58.7	25 40.7	37	6.6	97	17.4	157	28.1
38	26 54.5	26 59.0	25 41.0	38	6.8	98	17.6	158	28.3
39	26 54.8	26 59.2	25 41.2	39	7.0	99	17.7	159	28.5
40	26 55.0	26 59.5	25 41.4	40	7.2	100	17.9	160	28.7
41	26 55.3	26 59.7	25 41.7	41	7.3	101	18.1	161	28.8
42	26 55.5	26 60.0	25 41.9	42	7.5	102	18.3	162	29.0
43	26 55.8	27 .2	25 42.1	43	7.7	103	18.5	163	29.2
44	26 56.0	27 .5	25 42.4	44	7.9	104	18.6	164	29.4
45	26 56.3	27 .7	25 42.6	45	8.1	105	18.8	165	29.6
46	26 56.5	27 1.0	25 42.9	46	8.2	106	19.0	166	29.7
47	26 56.8	27 1.2	25 43.1	47	8.4	107	19.2	167	29.9
48	26 57.0	27 1.5	25 43.3	48	8.6	108	19.4	168	30.1
49	26 57.3	27 1.7	25 43.6	49	8.8	109	19.5	169	30.3
50	26 57.5	27 2.0	25 43.8	50	9.0	110	19.7	170	30.5
51	26 57.8	27 2.2	25 44.1	51	9.1	111	19.9	171	30.6
52	26 58.0	27 2.5	25 44.3	52	9.3	112	20.1	172	30.8
53	26 58.3	27 2.7	25 44.5	53	9.5	113	20.2	173	31.0
54	26 58.5	27 3.0	25 44.8	54	9.7	114	20.4	174	31.2
55	26 58.8	27 3.2	25 45.0	55	9.9	115	20.6	175	31.4
56	26 59.0	27 3.5	25 45.2	56	10.0	116	20.8	176	31.5
57	26 59.3	27 3.7	25 45.5	57	10.2	117	21.0	177	31.7
58	26 59.5	27 4.0	25 45.7	58	10.4	118	21.1	178	31.9
59	26 59.8	27 4.2	25 46.0	59	10.6	119	21.3	179	32.1
60	27 .0	27 4.5	25 46.2	60	10.8	120	21.5	180	32.3

1 h 48 min

POPRAVKA ČASOVNOG UGLA					POPRAVKA DRUGOG REDA za časovni ugao i deklinaciju Sunca, Mjeseca i planeta					
s	SUNCA I PLANETA		PROLJEĆNE TAČKE ♈		MJESECA ☾		Δ	popr.	Δ	popr.	Δ	popr.
	°	′	°	′	°	′		′		′		′
0	27	.0	27	4.5	25	46.2	0	.0	60	10.9	120	21.7
1	27	.3	27	4.8	25	46.4	1	.2	61	11.0	121	21.9
2	27	.5	27	5.0	25	46.7	2	.4	62	11.2	122	22.1
3	27	.8	27	5.3	25	46.9	3	.5	63	11.4	123	22.2
4	27	1.0	27	5.5	25	47.2	4	.7	64	11.6	124	22.4
5	27	1.3	27	5.8	25	47.4	5	.9	65	11.8	125	22.6
6	27	1.5	27	6.0	25	47.6	6	1.1	66	11.9	126	22.8
7	27	1.8	27	6.3	25	47.9	7	1.3	67	12.1	127	23.0
8	27	2.0	27	6.5	25	48.1	8	1.4	68	12.3	128	23.1
9	27	2.3	27	6.8	25	48.3	9	1.6	69	12.5	129	23.3
10	27	2.5	27	7.0	25	48.6	10	1.8	70	12.7	130	23.5
11	27	2.8	27	7.3	25	48.8	11	2.0	71	12.8	131	23.7
12	27	3.0	27	7.5	25	49.1	12	2.2	72	13.0	132	23.9
13	27	3.3	27	7.8	25	49.3	13	2.4	73	13.2	133	24.1
14	27	3.5	27	8.0	25	49.5	14	2.5	74	13.4	134	24.2
15	27	3.8	27	8.3	25	49.8	15	2.7	75	13.6	135	24.4
16	27	4.0	27	8.5	25	50.0	16	2.9	76	13.7	136	24.6
17	27	4.3	27	8.8	25	50.3	17	3.1	77	13.9	137	24.8
18	27	4.5	27	9.0	25	50.5	18	3.3	78	14.1	138	25.0
19	27	4.8	27	9.3	25	50.7	19	3.4	79	14.3	139	25.1
20	27	5.0	27	9.5	25	51.0	20	3.6	80	14.5	140	25.3
21	27	5.3	27	9.8	25	51.2	21	3.8	81	14.6	141	25.5
22	27	5.5	27	10.0	25	51.4	22	4.0	82	14.8	142	25.7
23	27	5.8	27	10.3	25	51.7	23	4.2	83	15.0	143	25.9
24	27	6.0	27	10.5	25	51.9	24	4.3	84	15.2	144	26.0
25	27	6.3	27	10.8	25	52.2	25	4.5	85	15.4	145	26.2
26	27	6.5	27	11.0	25	52.4	26	4.7	86	15.6	146	26.4
27	27	6.8	27	11.3	25	52.6	27	4.9	87	15.7	147	26.6
28	27	7.0	27	11.5	25	52.9	28	5.1	88	15.9	148	26.8
29	27	7.3	27	11.8	25	53.1	29	5.2	89	16.1	149	26.9
30	27	7.5	27	12.0	25	53.4	30	5.4	90	16.3	150	27.1
31	27	7.8	27	12.3	25	53.6	31	5.6	91	16.5	151	27.3
32	27	8.0	27	12.5	25	53.8	32	5.8	92	16.6	152	27.5
33	27	8.3	27	12.8	25	54.1	33	6.0	93	16.8	153	27.7
34	27	8.5	27	13.0	25	54.3	34	6.1	94	17.0	154	27.8
35	27	8.8	27	13.3	25	54.6	35	6.3	95	17.2	155	28.0
36	27	9.0	27	13.5	25	54.8	36	6.5	96	17.4	156	28.2
37	27	9.3	27	13.8	25	55.0	37	6.7	97	17.5	157	28.4
38	27	9.5	27	14.0	25	55.3	38	6.9	98	17.7	158	28.6
39	27	9.8	27	14.3	25	55.5	39	7.1	99	17.9	159	28.8
40	27	10.0	27	14.5	25	55.7	40	7.2	100	18.1	160	28.9
41	27	10.3	27	14.8	25	56.0	41	7.4	101	18.3	161	29.1
42	27	10.5	27	15.0	25	56.2	42	7.6	102	18.4	162	29.3
43	27	10.8	27	15.3	25	56.5	43	7.8	103	18.6	163	29.5
44	27	11.0	27	15.5	25	56.7	44	8.0	104	18.8	164	29.7
45	27	11.3	27	15.8	25	56.9	45	8.1	105	19.0	165	29.8
46	27	11.5	27	16.0	25	57.2	46	8.3	106	19.2	166	30.0
47	27	11.8	27	16.3	25	57.4	47	8.5	107	19.3	167	30.2
48	27	12.0	27	16.5	25	57.7	48	8.7	108	19.5	168	30.4
49	27	12.3	27	16.8	25	57.9	49	8.9	109	19.7	169	30.6
50	27	12.5	27	17.0	25	58.1	50	9.0	110	19.9	170	30.7
51	27	12.8	27	17.3	25	58.4	51	9.2	111	20.1	171	30.9
52	27	13.0	27	17.5	25	58.6	52	9.4	112	20.3	172	31.1
53	27	13.3	27	17.8	25	58.8	53	9.6	113	20.4	173	31.3
54	27	13.5	27	18.0	25	59.1	54	9.8	114	20.6	174	31.5
55	27	13.8	27	18.3	25	59.3	55	9.9	115	20.8	175	31.6
56	27	14.0	27	18.5	25	59.6	56	10.1	116	21.0	176	31.8
57	27	14.3	27	18.8	25	59.8	57	10.3	117	21.2	177	32.0
58	27	14.5	27	19.0	26	.0	58	10.5	118	21.3	178	32.2
59	27	14.8	27	19.3	26	.3	59	10.7	119	21.5	179	32.4
60	27	15.0	27	19.5	26	.5	60	10.9	120	21.7	180	32.6

1 h 49 min

POPRAVKA ČASOVNOG UGLA					POPRAVKA DRUGOG REDA za časovni ugao i deklinaciju Sunca, Mjeseca i planeta					
s	SUNCA I PLANETA		PROLJEĆNE TAČKE ♈		MJESECA ☾		Δ	popr.	Δ	popr.	Δ	popr.
	°	′	°	′	°	′		′		′		′
0	27	15.0	27	19.5	26	.5	0	.0	60	11.0	120	21.9
1	27	15.3	27	19.8	26	.8	1	.2	61	11.1	121	22.1
2	27	15.5	27	20.0	26	1.0	2	.4	62	11.3	122	22.3
3	27	15.8	27	20.3	26	1.2	3	.5	63	11.5	123	22.4
4	27	16.0	27	20.5	26	1.5	4	.7	64	11.7	124	22.6
5	27	16.3	27	20.8	26	1.7	5	.9	65	11.9	125	22.8
6	27	16.5	27	21.0	26	1.9	6	1.1	66	12.0	126	23.0
7	27	16.8	27	21.3	26	2.2	7	1.3	67	12.2	127	23.2
8	27	17.0	27	21.5	26	2.4	8	1.5	68	12.4	128	23.4
9	27	17.3	27	21.8	26	2.7	9	1.6	69	12.6	129	23.5
10	27	17.5	27	22.0	26	2.9	10	1.8	70	12.8	130	23.7
11	27	17.8	27	22.3	26	3.1	11	2.0	71	13.0	131	23.9
12	27	18.0	27	22.6	26	3.4	12	2.2	72	13.1	132	24.1
13	27	18.3	27	22.8	26	3.6	13	2.4	73	13.3	133	24.3
14	27	18.5	27	23.1	26	3.9	14	2.6	74	13.5	134	24.5
15	27	18.8	27	23.3	26	4.1	15	2.7	75	13.7	135	24.6
16	27	19.0	27	23.6	26	4.3	16	2.9	76	13.9	136	24.8
17	27	19.3	27	23.8	26	4.6	17	3.1	77	14.1	137	25.0
18	27	19.5	27	24.1	26	4.8	18	3.3	78	14.2	138	25.2
19	27	19.8	27	24.3	26	5.1	19	3.5	79	14.4	139	25.4
20	27	20.0	27	24.6	26	5.3	20	3.7	80	14.6	140	25.6
21	27	20.3	27	24.8	26	5.5	21	3.8	81	14.8	141	25.7
22	27	20.5	27	25.1	26	5.8	22	4.0	82	15.0	142	25.9
23	27	20.8	27	25.3	26	6.0	23	4.2	83	15.1	143	26.1
24	27	21.0	27	25.6	26	6.2	24	4.4	84	15.3	144	26.3
25	27	21.3	27	25.8	26	6.5	25	4.6	85	15.5	145	26.5
26	27	21.5	27	26.1	26	6.7	26	4.7	86	15.7	146	26.6
27	27	21.8	27	26.3	26	7.0	27	4.9	87	15.9	147	26.8
28	27	22.0	27	26.6	26	7.2	28	5.1	88	16.1	148	27.0
29	27	22.3	27	26.8	26	7.4	29	5.3	89	16.2	149	27.2
30	27	22.5	27	27.1	26	7.7	30	5.5	90	16.4	150	27.4
31	27	22.8	27	27.3	26	7.9	31	5.7	91	16.6	151	27.6
32	27	23.0	27	27.6	26	8.2	32	5.8	92	16.8	152	27.7
33	27	23.3	27	27.8	26	8.4	33	6.0	93	17.0	153	27.9
34	27	23.5	27	28.1	26	8.6	34	6.2	94	17.2	154	28.1
35	27	23.8	27	28.3	26	8.9	35	6.4	95	17.3	155	28.3
36	27	24.0	27	28.6	26	9.1	36	6.6	96	17.5	156	28.5
37	27	24.3	27	28.8	26	9.3	37	6.8	97	17.7	157	28.7
38	27	24.5	27	29.1	26	9.6	38	6.9	98	17.9	158	28.8
39	27	24.8	27	29.3	26	9.8	39	7.1	99	18.1	159	29.0
40	27	25.0	27	29.6	26	10.1	40	7.3	100	18.3	160	29.2
41	27	25.3	27	29.8	26	10.3	41	7.5	101	18.4	161	29.4
42	27	25.5	27	30.1	26	10.5	42	7.7	102	18.6	162	29.6
43	27	25.8	27	30.3	26	10.8	43	7.8	103	18.8	163	29.7
44	27	26.0	27	30.6	26	11.0	44	8.0	104	19.0	164	29.9
45	27	26.3	27	30.8	26	11.3	45	8.2	105	19.2	165	30.1
46	27	26.5	27	31.1	26	11.5	46	8.4	106	19.3	166	30.3
47	27	26.8	27	31.3	26	11.7	47	8.6	107	19.5	167	30.5
48	27	27.0	27	31.6	26	12.0	48	8.8	108	19.7	168	30.7
49	27	27.3	27	31.8	26	12.2	49	8.9	109	19.9	169	30.8
50	27	27.5	27	32.1	26	12.4	50	9.1	110	20.1	170	31.0
51	27	27.8	27	32.3	26	12.7	51	9.3	111	20.3	171	31.2
52	27	28.0	27	32.6	26	12.9	52	9.5	112	20.4	172	31.4
53	27	28.3	27	32.8	26	13.2	53	9.7	113	20.6	173	31.6
54	27	28.5	27	33.1	26	13.4	54	9.9	114	20.8	174	31.8
55	27	28.8	27	33.3	26	13.6	55	10.0	115	21.0	175	31.9
56	27	29.0	27	33.6	26	13.9	56	10.2	116	21.2	176	32.1
57	27	29.3	27	33.8	26	14.1	57	10.4	117	21.4	177	32.3
58	27	29.5	27	34.1	26	14.4	58	10.6	118	21.5	178	32.5
59	27	29.8	27	34.3	26	14.6	59	10.8	119	21.7	179	32.7
60	27	30.0	27	34.6	26	14.8	60	11.0	120	21.9	180	32.9

1 h 50 min

POPRAVKA ČASOVNOG UGLA				POPRAVKA DRUGOG REDA za časovni ugao i deklinaciju Sunca, Mjeseca i planeta					
s	SUNCA I PLANETA	PROLJEĆNE TAČKE ♈	MJESECA ☾	Δ	popr.	Δ	popr.	Δ	popr.
	° ′	° ′	° ′		′		′		′
0	27 30.0	27 34.6	26 14.8	0	.0	60	11.1	120	22.1
1	27 30.3	27 34.8	26 15.1	1	.2	61	11.2	121	22.3
2	27 30.5	27 35.1	26 15.3	2	.4	62	11.4	122	22.5
3	27 30.8	27 35.3	26 15.5	3	.6	63	11.6	123	22.7
4	27 31.0	27 35.6	26 15.8	4	.7	64	11.8	124	22.8
5	27 31.3	27 35.8	26 16.0	5	.9	65	12.0	125	23.0
6	27 31.5	27 36.1	26 16.3	6	1.1	66	12.2	126	23.2
7	27 31.8	27 36.3	26 16.5	7	1.3	67	12.3	127	23.4
8	27 32.0	27 36.6	26 16.7	8	1.5	68	12.5	128	23.6
9	27 32.3	27 36.8	26 17.0	9	1.7	69	12.7	129	23.8
10	27 32.5	27 37.1	26 17.2	10	1.8	70	12.9	130	23.9
11	27 32.8	27 37.3	26 17.5	11	2.0	71	13.1	131	24.1
12	27 33.0	27 37.6	26 17.7	12	2.2	72	13.3	132	24.3
13	27 33.3	27 37.8	26 17.9	13	2.4	73	13.4	133	24.5
14	27 33.5	27 38.1	26 18.2	14	2.6	74	13.6	134	24.7
15	27 33.8	27 38.3	26 18.4	15	2.8	75	13.8	135	24.9
16	27 34.0	27 38.6	26 18.7	16	2.9	76	14.0	136	25.0
17	27 34.3	27 38.8	26 18.9	17	3.1	77	14.2	137	25.2
18	27 34.5	27 39.1	26 19.1	18	3.3	78	14.4	138	25.4
19	27 34.8	27 39.3	26 19.4	19	3.5	79	14.5	139	25.6
20	27 35.0	27 39.6	26 19.6	20	3.7	80	14.7	140	25.8
21	27 35.3	27 39.8	26 19.8	21	3.9	81	14.9	141	26.0
22	27 35.5	27 40.1	26 20.1	22	4.1	82	15.1	142	26.2
23	27 35.8	27 40.3	26 20.3	23	4.2	83	15.3	143	26.3
24	27 36.0	27 40.6	26 20.6	24	4.4	84	15.5	144	26.5
25	27 36.3	27 40.9	26 20.8	25	4.6	85	15.7	145	26.7
26	27 36.5	27 41.1	26 21.0	26	4.8	86	15.8	146	26.9
27	27 36.8	27 41.4	26 21.3	27	5.0	87	16.0	147	27.1
28	27 37.0	27 41.6	26 21.5	28	5.2	88	16.2	148	27.3
29	27 37.3	27 41.9	26 21.8	29	5.3	89	16.4	149	27.4
30	27 37.5	27 42.1	26 22.0	30	5.5	90	16.6	150	27.6
31	27 37.8	27 42.4	26 22.2	31	5.7	91	16.8	151	27.8
32	27 38.0	27 42.6	26 22.5	32	5.9	92	16.9	152	28.0
33	27 38.3	27 42.9	26 22.7	33	6.1	93	17.1	153	28.2
34	27 38.5	27 43.1	26 22.9	34	6.3	94	17.3	154	28.4
35	27 38.8	27 43.4	26 23.2	35	6.4	95	17.5	155	28.5
36	27 39.0	27 43.6	26 23.4	36	6.6	96	17.7	156	28.7
37	27 39.3	27 43.9	26 23.7	37	6.8	97	17.9	157	28.9
38	27 39.5	27 44.1	26 23.9	38	7.0	98	18.0	158	29.1
39	27 39.8	27 44.4	26 24.1	39	7.2	99	18.2	159	29.3
40	27 40.0	27 44.6	26 24.4	40	7.4	100	18.4	160	29.5
41	27 40.3	27 44.9	26 24.6	41	7.6	101	18.6	161	29.7
42	27 40.5	27 45.1	26 24.9	42	7.7	102	18.8	162	29.8
43	27 40.8	27 45.4	26 25.1	43	7.9	103	19.0	163	30.0
44	27 41.0	27 45.6	26 25.3	44	8.1	104	19.2	164	30.2
45	27 41.3	27 45.9	26 25.6	45	8.3	105	19.3	165	30.4
46	27 41.5	27 46.1	26 25.8	46	8.5	106	19.5	166	30.6
47	27 41.8	27 46.4	26 26.0	47	8.7	107	19.7	167	30.8
48	27 42.0	27 46.6	26 26.3	48	8.8	108	19.9	168	30.9
49	27 42.3	27 46.9	26 26.5	49	9.0	109	20.1	169	31.1
50	27 42.5	27 47.1	26 26.8	50	9.2	110	20.3	170	31.3
51	27 42.8	27 47.4	26 27.0	51	9.4	111	20.4	171	31.5
52	27 43.0	27 47.6	26 27.2	52	9.6	112	20.6	172	31.7
53	27 43.3	27 47.9	26 27.5	53	9.8	113	20.8	173	31.9
54	27 43.5	27 48.1	26 27.7	54	9.9	114	21.0	174	32.0
55	27 43.8	27 48.4	26 28.0	55	10.1	115	21.2	175	32.2
56	27 44.0	27 48.6	26 28.2	56	10.3	116	21.4	176	32.4
57	27 44.3	27 48.9	26 28.4	57	10.5	117	21.5	177	32.6
58	27 44.5	27 49.1	26 28.7	58	10.7	118	21.7	178	32.8
59	27 44.8	27 49.4	26 28.9	59	10.9	119	21.9	179	33.0
60	27 45.0	27 49.6	26 29.2	60	11.1	120	22.1	180	33.2

1 h 51 min

POPRAVKA ČASOVNOG UGLA				POPRAVKA DRUGOG REDA za časovni ugao i deklinaciju Sunca, Mjeseca i planeta					
s	SUNCA I PLANETA	PROLJEĆNE TAČKE ♈	MJESECA ☾	Δ	popr.	Δ	popr.	Δ	popr.
	° ′	° ′	° ′		′		′		′
0	27 45.0	27 49.6	26 29.2	0	.0	60	11.2	120	22.3
1	27 45.3	27 49.9	26 29.4	1	.2	61	11.3	121	22.5
2	27 45.5	27 50.1	26 29.6	2	.4	62	11.5	122	22.7
3	27 45.8	27 50.4	26 29.9	3	.6	63	11.7	123	22.9
4	27 46.0	27 50.6	26 30.1	4	.7	64	11.9	124	23.0
5	27 46.3	27 50.9	26 30.3	5	.9	65	12.1	125	23.2
6	27 46.5	27 51.1	26 30.6	6	1.1	66	12.3	126	23.4
7	27 46.8	27 51.4	26 30.8	7	1.3	67	12.5	127	23.6
8	27 47.0	27 51.6	26 31.1	8	1.5	68	12.6	128	23.8
9	27 47.3	27 51.9	26 31.3	9	1.7	69	12.8	129	24.0
10	27 47.5	27 52.1	26 31.5	10	1.9	70	13.0	130	24.2
11	27 47.8	27 52.4	26 31.8	11	2.0	71	13.2	131	24.3
12	27 48.0	27 52.6	26 32.0	12	2.2	72	13.4	132	24.5
13	27 48.3	27 52.9	26 32.3	13	2.4	73	13.6	133	24.7
14	27 48.5	27 53.1	26 32.5	14	2.6	74	13.8	134	24.9
15	27 48.8	27 53.4	26 32.7	15	2.8	75	13.9	135	25.1
16	27 49.0	27 53.6	26 33.0	16	3.0	76	14.1	136	25.3
17	27 49.3	27 53.9	26 33.2	17	3.2	77	14.3	137	25.5
18	27 49.5	27 54.1	26 33.4	18	3.3	78	14.5	138	25.6
19	27 49.8	27 54.4	26 33.7	19	3.5	79	14.7	139	25.8
20	27 50.0	27 54.6	26 33.9	20	3.7	80	14.9	140	26.0
21	27 50.3	27 54.9	26 34.2	21	3.9	81	15.1	141	26.2
22	27 50.5	27 55.1	26 34.4	22	4.1	82	15.2	142	26.4
23	27 50.8	27 55.4	26 34.6	23	4.3	83	15.4	143	26.6
24	27 51.0	27 55.6	26 34.9	24	4.5	84	15.6	144	26.8
25	27 51.3	27 55.9	26 35.1	25	4.6	85	15.8	145	26.9
26	27 51.5	27 56.1	26 35.4	26	4.8	86	16.0	146	27.1
27	27 51.8	27 56.4	26 35.6	27	5.0	87	16.2	147	27.3
28	27 52.0	27 56.6	26 35.8	28	5.2	88	16.4	148	27.5
29	27 52.3	27 56.9	26 36.1	29	5.4	89	16.5	149	27.7
30	27 52.5	27 57.1	26 36.3	30	5.6	90	16.7	150	27.9
31	27 52.8	27 57.4	26 36.5	31	5.8	91	16.9	151	28.1
32	27 53.0	27 57.6	26 36.8	32	5.9	92	17.1	152	28.2
33	27 53.3	27 57.9	26 37.0	33	6.1	93	17.3	153	28.4
34	27 53.5	27 58.1	26 37.3	34	6.3	94	17.5	154	28.6
35	27 53.8	27 58.4	26 37.5	35	6.5	95	17.7	155	28.8
36	27 54.0	27 58.7	26 37.7	36	6.7	96	17.8	156	29.0
37	27 54.3	27 58.9	26 38.0	37	6.9	97	18.0	157	29.2
38	27 54.5	27 59.2	26 38.2	38	7.1	98	18.2	158	29.4
39	27 54.8	27 59.4	26 38.5	39	7.2	99	18.4	159	29.5
40	27 55.0	27 59.7	26 38.7	40	7.4	100	18.6	160	29.7
41	27 55.3	27 59.9	26 38.9	41	7.6	101	18.8	161	29.9
42	27 55.5	28 .2	26 39.2	42	7.8	102	19.0	162	30.1
43	27 55.8	28 .4	26 39.4	43	8.0	103	19.1	163	30.3
44	27 56.0	28 .7	26 39.6	44	8.2	104	19.3	164	30.5
45	27 56.3	28 .9	26 39.9	45	8.4	105	19.5	165	30.7
46	27 56.5	28 1.2	26 40.1	46	8.5	106	19.7	166	30.8
47	27 56.8	28 1.4	26 40.4	47	8.7	107	19.9	167	31.0
48	27 57.0	28 1.7	26 40.6	48	8.9	108	20.1	168	31.2
49	27 57.3	28 1.9	26 40.8	49	9.1	109	20.3	169	31.4
50	27 57.5	28 2.2	26 41.1	50	9.3	110	20.4	170	31.6
51	27 57.8	28 2.4	26 41.3	51	9.5	111	20.6	171	31.8
52	27 58.0	28 2.7	26 41.6	52	9.7	112	20.8	172	32.0
53	27 58.3	28 2.9	26 41.8	53	9.8	113	21.0	173	32.1
54	27 58.5	28 3.2	26 42.0	54	10.0	114	21.2	174	32.3
55	27 58.8	28 3.4	26 42.3	55	10.2	115	21.4	175	32.5
56	27 59.0	28 3.7	26 42.5	56	10.4	116	21.6	176	32.7
57	27 59.3	28 3.9	26 42.8	57	10.6	117	21.7	177	32.9
58	27 59.5	28 4.2	26 43.0	58	10.8	118	21.9	178	33.1
59	27 59.8	28 4.4	26 43.2	59	11.0	119	22.1	179	33.3
60	28 .0	28 4.7	26 43.5	60	11.2	120	22.3	180	33.5

1 h 52 min

POPRAVKA ČASOVNOG UGLA					POPRAVKA DRUGOG REDA za časovni ugao i deklinaciju Sunca, Mjeseca i planeta					
s	SUNCA I PLANETA		PROLJEĆNE TAČKE ♈		MJESECA ☾		Δ	popr.	Δ	popr.	Δ	popr.
	°	′	°	′	°	′		′		′		′
0	28	.0	28	4.7	26	43.5	0	.0	60	11.3	120	22.5
1	28	.3	28	4.9	26	43.7	1	.2	61	11.4	121	22.7
2	28	.5	28	5.2	26	43.9	2	.4	62	11.6	122	22.9
3	28	.8	28	5.4	26	44.2	3	.6	63	11.8	123	23.1
4	28	1.0	28	5.7	26	44.4	4	.8	64	12.0	124	23.3
5	28	1.3	28	5.9	26	44.7	5	.9	65	12.2	125	23.4
6	28	1.5	28	6.2	26	44.9	6	1.1	66	12.4	126	23.6
7	28	1.8	28	6.4	26	45.1	7	1.3	67	12.6	127	23.8
8	28	2.0	28	6.7	26	45.4	8	1.5	68	12.8	128	24.0
9	28	2.3	28	6.9	26	45.6	9	1.7	69	12.9	129	24.2
10	28	2.5	28	7.2	26	45.9	10	1.9	70	13.1	130	24.4
11	28	2.8	28	7.4	26	46.1	11	2.1	71	13.3	131	24.6
12	28	3.0	28	7.7	26	46.3	12	2.3	72	13.5	132	24.8
13	28	3.3	28	7.9	26	46.6	13	2.4	73	13.7	133	24.9
14	28	3.5	28	8.2	26	46.8	14	2.6	74	13.9	134	25.1
15	28	3.8	28	8.4	26	47.0	15	2.8	75	14.1	135	25.3
16	28	4.0	28	8.7	26	47.3	16	3.0	76	14.3	136	25.5
17	28	4.3	28	8.9	26	47.5	17	3.2	77	14.4	137	25.7
18	28	4.5	28	9.2	26	47.8	18	3.4	78	14.6	138	25.9
19	28	4.8	28	9.4	26	48.0	19	3.6	79	14.8	139	26.1
20	28	5.0	28	9.7	26	48.2	20	3.8	80	15.0	140	26.3
21	28	5.3	28	9.9	26	48.5	21	3.9	81	15.2	141	26.4
22	28	5.5	28	10.2	26	48.7	22	4.1	82	15.4	142	26.6
23	28	5.8	28	10.4	26	49.0	23	4.3	83	15.6	143	26.8
24	28	6.0	28	10.7	26	49.2	24	4.5	84	15.8	144	27.0
25	28	6.3	28	10.9	26	49.4	25	4.7	85	15.9	145	27.2
26	28	6.5	28	11.2	26	49.7	26	4.9	86	16.1	146	27.4
27	28	6.8	28	11.4	26	49.9	27	5.1	87	16.3	147	27.6
28	28	7.0	28	11.7	26	50.1	28	5.3	88	16.5	148	27.8
29	28	7.3	28	11.9	26	50.4	29	5.4	89	16.7	149	27.9
30	28	7.5	28	12.2	26	50.6	30	5.6	90	16.9	150	28.1
31	28	7.8	28	12.4	26	50.9	31	5.8	91	17.1	151	28.3
32	28	8.0	28	12.7	26	51.1	32	6.0	92	17.3	152	28.5
33	28	8.3	28	12.9	26	51.3	33	6.2	93	17.4	153	28.7
34	28	8.5	28	13.2	26	51.6	34	6.4	94	17.6	154	28.9
35	28	8.8	28	13.4	26	51.8	35	6.6	95	17.8	155	29.1
36	28	9.0	28	13.7	26	52.1	36	6.8	96	18.0	156	29.3
37	28	9.3	28	13.9	26	52.3	37	6.9	97	18.2	157	29.4
38	28	9.5	28	14.2	26	52.5	38	7.1	98	18.4	158	29.6
39	28	9.8	28	14.4	26	52.8	39	7.3	99	18.6	159	29.8
40	28	10.0	28	14.7	26	53.0	40	7.5	100	18.8	160	30.0
41	28	10.3	28	14.9	26	53.2	41	7.7	101	18.9	161	30.2
42	28	10.5	28	15.2	26	53.5	42	7.9	102	19.1	162	30.4
43	28	10.8	28	15.4	26	53.7	43	8.1	103	19.3	163	30.6
44	28	11.0	28	15.7	26	54.0	44	8.3	104	19.5	164	30.8
45	28	11.3	28	15.9	26	54.2	45	8.4	105	19.7	165	30.9
46	28	11.5	28	16.2	26	54.4	46	8.6	106	19.9	166	31.1
47	28	11.8	28	16.4	26	54.7	47	8.8	107	20.1	167	31.3
48	28	12.0	28	16.7	26	54.9	48	9.0	108	20.3	168	31.5
49	28	12.3	28	17.0	26	55.2	49	9.2	109	20.4	169	31.7
50	28	12.5	28	17.2	26	55.4	50	9.4	110	20.6	170	31.9
51	28	12.8	28	17.5	26	55.6	51	9.6	111	20.8	171	32.1
52	28	13.0	28	17.7	26	55.9	52	9.8	112	21.0	172	32.3
53	28	13.3	28	18.0	26	56.1	53	9.9	113	21.2	173	32.4
54	28	13.5	28	18.2	26	56.4	54	10.1	114	21.4	174	32.6
55	28	13.8	28	18.5	26	56.6	55	10.3	115	21.6	175	32.8
56	28	14.0	28	18.7	26	56.8	56	10.5	116	21.8	176	33.0
57	28	14.3	28	19.0	26	57.1	57	10.7	117	21.9	177	33.2
58	28	14.5	28	19.2	26	57.3	58	10.9	118	22.1	178	33.4
59	28	14.8	28	19.5	26	57.5	59	11.1	119	22.3	179	33.6
60	28	15.0	28	19.7	26	57.8	60	11.3	120	22.5	180	33.8

1 h 53 min

POPRAVKA ČASOVNOG UGLA					POPRAVKA DRUGOG REDA za časovni ugao i deklinaciju Sunca, Mjeseca i planeta					
s	SUNCA I PLANETA		PROLJEĆNE TAČKE ♈		MJESECA ☾		Δ	popr.	Δ	popr.	Δ	popr.
	°	′	°	′	°	′		′		′		′
0	28	15.0	28	19.7	26	57.8	0	.0	60	11.4	120	22.7
1	28	15.3	28	20.0	26	58.0	1	.2	61	11.5	121	22.9
2	28	15.5	28	20.2	26	58.3	2	.4	62	11.7	122	23.1
3	28	15.8	28	20.5	26	58.5	3	.6	63	11.9	123	23.3
4	28	16.0	28	20.7	26	58.7	4	.8	64	12.1	124	23.5
5	28	16.3	28	21.0	26	59.0	5	.9	65	12.3	125	23.6
6	28	16.5	28	21.2	26	59.2	6	1.1	66	12.5	126	23.8
7	28	16.8	28	21.5	26	59.5	7	1.3	67	12.7	127	24.0
8	28	17.0	28	21.7	26	59.7	8	1.5	68	12.9	128	24.2
9	28	17.3	28	22.0	26	59.9	9	1.7	69	13.1	129	24.4
10	28	17.5	28	22.2	27	.2	10	1.9	70	13.2	130	24.6
11	28	17.8	28	22.5	27	.4	11	2.1	71	13.4	131	24.8
12	28	18.0	28	22.7	27	.6	12	2.3	72	13.6	132	25.0
13	28	18.3	28	23.0	27	.9	13	2.5	73	13.8	133	25.2
14	28	18.5	28	23.2	27	1.1	14	2.6	74	14.0	134	25.3
15	28	18.8	28	23.5	27	1.4	15	2.8	75	14.2	135	25.5
16	28	19.0	28	23.7	27	1.6	16	3.0	76	14.4	136	25.7
17	28	19.3	28	24.0	27	1.8	17	3.2	77	14.6	137	25.9
18	28	19.5	28	24.2	27	2.1	18	3.4	78	14.8	138	26.1
19	28	19.8	28	24.5	27	2.3	19	3.6	79	14.9	139	26.3
20	28	20.0	28	24.7	27	2.6	20	3.8	80	15.1	140	26.5
21	28	20.3	28	25.0	27	2.8	21	4.0	81	15.3	141	26.7
22	28	20.5	28	25.2	27	3.0	22	4.2	82	15.5	142	26.9
23	28	20.8	28	25.5	27	3.3	23	4.4	83	15.7	143	27.1
24	28	21.0	28	25.7	27	3.5	24	4.5	84	15.9	144	27.2
25	28	21.3	28	26.0	27	3.7	25	4.7	85	16.1	145	27.4
26	28	21.5	28	26.2	27	4.0	26	4.9	86	16.3	146	27.6
27	28	21.8	28	26.5	27	4.2	27	5.1	87	16.5	147	27.8
28	28	22.0	28	26.7	27	4.5	28	5.3	88	16.6	148	28.0
29	28	22.3	28	27.0	27	4.7	29	5.5	89	16.8	149	28.2
30	28	22.5	28	27.2	27	4.9	30	5.7	90	17.0	150	28.4
31	28	22.8	28	27.5	27	5.2	31	5.9	91	17.2	151	28.6
32	28	23.0	28	27.7	27	5.4	32	6.1	92	17.4	152	28.8
33	28	23.3	28	28.0	27	5.7	33	6.2	93	17.6	153	28.9
34	28	23.5	28	28.2	27	5.9	34	6.4	94	17.8	154	29.1
35	28	23.8	28	28.5	27	6.1	35	6.6	95	18.0	155	29.3
36	28	24.0	28	28.7	27	6.4	36	6.8	96	18.2	156	29.5
37	28	24.3	28	29.0	27	6.6	37	7.0	97	18.3	157	29.7
38	28	24.5	28	29.2	27	6.9	38	7.2	98	18.5	158	29.9
39	28	24.8	28	29.5	27	7.1	39	7.4	99	18.7	159	30.1
40	28	25.0	28	29.7	27	7.3	40	7.6	100	18.9	160	30.3
41	28	25.3	28	30.0	27	7.6	41	7.8	101	19.1	161	30.5
42	28	25.5	28	30.2	27	7.8	42	7.9	102	19.3	162	30.6
43	28	25.8	28	30.5	27	8.0	43	8.1	103	19.5	163	30.8
44	28	26.0	28	30.7	27	8.3	44	8.3	104	19.7	164	31.0
45	28	26.3	28	31.0	27	8.5	45	8.5	105	19.9	165	31.2
46	28	26.5	28	31.2	27	8.8	46	8.7	106	20.1	166	31.4
47	28	26.8	28	31.5	27	9.0	47	8.9	107	20.2	167	31.6
48	28	27.0	28	31.7	27	9.2	48	9.1	108	20.4	168	31.8
49	28	27.3	28	32.0	27	9.5	49	9.3	109	20.6	169	32.0
50	28	27.5	28	32.2	27	9.7	50	9.5	110	20.8	170	32.2
51	28	27.8	28	32.5	27	10.0	51	9.6	111	21.0	171	32.3
52	28	28.0	28	32.7	27	10.2	52	9.8	112	21.2	172	32.5
53	28	28.3	28	33.0	27	10.4	53	10.0	113	21.4	173	32.7
54	28	28.5	28	33.2	27	10.7	54	10.2	114	21.6	174	32.9
55	28	28.8	28	33.5	27	10.9	55	10.4	115	21.8	175	33.1
56	28	29.0	28	33.7	27	11.1	56	10.6	116	21.9	176	33.3
57	28	29.3	28	34.0	27	11.4	57	10.8	117	22.1	177	33.5
58	28	29.5	28	34.2	27	11.6	58	11.0	118	22.3	178	33.7
59	28	29.8	28	34.5	27	11.9	59	11.2	119	22.5	179	33.9
60	28	30.0	28	34.8	27	12.1	60	11.4	120	22.7	180	34.1

1 h 54 min

POPRAVKA ČASOVNOG UGLA				POPRAVKA DRUGOG REDA za časovni ugao i deklinaciju Sunca, Mjeseca i planeta		
s	SUNCA I PLANETA	PROLJEĆNE TAČKE ♈	MJESECA ☾	Δ popr.	Δ popr.	Δ popr.
	° ′	° ′	° ′	′	′	′
0	28 30.0	28 34.8	27 12.1	0 .0	60 11.5	120 22.9
1	28 30.3	28 35.0	27 12.3	1 .2	61 11.6	121 23.1
2	28 30.5	28 35.3	27 12.6	2 .4	62 11.8	122 23.3
3	28 30.8	28 35.5	27 12.8	3 .6	63 12.0	123 23.5
4	28 31.0	28 35.8	27 13.1	4 .8	64 12.2	124 23.7
5	28 31.3	28 36.0	27 13.3	5 1.0	65 12.4	125 23.9
6	28 31.5	28 36.3	27 13.5	6 1.1	66 12.6	126 24.0
7	28 31.8	28 36.5	27 13.8	7 1.3	67 12.8	127 24.2
8	28 32.0	28 36.8	27 14.0	8 1.5	68 13.0	128 24.4
9	28 32.3	28 37.0	27 14.2	9 1.7	69 13.2	129 24.6
10	28 32.5	28 37.3	27 14.5	10 1.9	70 13.4	130 24.8
11	28 32.8	28 37.5	27 14.7	11 2.1	71 13.5	131 25.0
12	28 33.0	28 37.8	27 15.0	12 2.3	72 13.7	132 25.2
13	28 33.3	28 38.0	27 15.2	13 2.5	73 13.9	133 25.4
14	28 33.5	28 38.3	27 15.4	14 2.7	74 14.1	134 25.6
15	28 33.8	28 38.5	27 15.7	15 2.9	75 14.3	135 25.8
16	28 34.0	28 38.8	27 15.9	16 3.1	76 14.5	136 26.0
17	28 34.3	28 39.0	27 16.2	17 3.2	77 14.7	137 26.1
18	28 34.5	28 39.3	27 16.4	18 3.4	78 14.9	138 26.3
19	28 34.8	28 39.5	27 16.6	19 3.6	79 15.1	139 26.5
20	28 35.0	28 39.8	27 16.9	20 3.8	80 15.3	140 26.7
21	28 35.3	28 40.0	27 17.1	21 4.0	81 15.5	141 26.9
22	28 35.5	28 40.3	27 17.3	22 4.2	82 15.6	142 27.1
23	28 35.8	28 40.5	27 17.6	23 4.4	83 15.8	143 27.3
24	28 36.0	28 40.8	27 17.8	24 4.6	84 16.0	144 27.5
25	28 36.3	28 41.0	27 18.1	25 4.8	85 16.2	145 27.7
26	28 36.5	28 41.3	27 18.3	26 5.0	86 16.4	146 27.9
27	28 36.8	28 41.5	27 18.5	27 5.2	87 16.6	147 28.1
28	28 37.0	28 41.8	27 18.8	28 5.3	88 16.8	148 28.2
29	28 37.3	28 42.0	27 19.0	29 5.5	89 17.0	149 28.4
30	28 37.5	28 42.3	27 19.3	30 5.7	90 17.2	150 28.6
31	28 37.8	28 42.5	27 19.5	31 5.9	91 17.4	151 28.8
32	28 38.0	28 42.8	27 19.7	32 6.1	92 17.6	152 29.0
33	28 38.3	28 43.0	27 20.0	33 6.3	93 17.7	153 29.2
34	28 38.5	28 43.3	27 20.2	34 6.5	94 17.9	154 29.4
35	28 38.8	28 43.5	27 20.5	35 6.7	95 18.1	155 29.6
36	28 39.0	28 43.8	27 20.7	36 6.9	96 18.3	156 29.8
37	28 39.3	28 44.0	27 20.9	37 7.1	97 18.5	157 30.0
38	28 39.5	28 44.3	27 21.2	38 7.3	98 18.7	158 30.2
39	28 39.8	28 44.5	27 21.4	39 7.4	99 18.9	159 30.3
40	28 40.0	28 44.8	27 21.6	40 7.6	100 19.1	160 30.5
41	28 40.3	28 45.0	27 21.9	41 7.8	101 19.3	161 30.7
42	28 40.5	28 45.3	27 22.1	42 8.0	102 19.5	162 30.9
43	28 40.8	28 45.5	27 22.4	43 8.2	103 19.7	163 31.1
44	28 41.0	28 45.8	27 22.6	44 8.4	104 19.8	164 31.3
45	28 41.3	28 46.0	27 22.8	45 8.6	105 20.0	165 31.5
46	28 41.5	28 46.3	27 23.1	46 8.8	106 20.2	166 31.7
47	28 41.8	28 46.5	27 23.3	47 9.0	107 20.4	167 31.9
48	28 42.0	28 46.8	27 23.6	48 9.2	108 20.6	168 32.1
49	28 42.3	28 47.0	27 23.8	49 9.4	109 20.8	169 32.3
50	28 42.5	28 47.3	27 24.0	50 9.5	110 21.0	170 32.4
51	28 42.8	28 47.5	27 24.3	51 9.7	111 21.2	171 32.6
52	28 43.0	28 47.8	27 24.5	52 9.9	112 21.4	172 32.8
53	28 43.3	28 48.0	27 24.7	53 10.1	113 21.6	173 33.0
54	28 43.5	28 48.3	27 25.0	54 10.3	114 21.8	174 33.2
55	28 43.8	28 48.5	27 25.2	55 10.5	115 21.9	175 33.4
56	28 44.0	28 48.8	27 25.5	56 10.7	116 22.1	176 33.6
57	28 44.3	28 49.0	27 25.7	57 10.9	117 22.3	177 33.8
58	28 44.5	28 49.3	27 25.9	58 11.1	118 22.5	178 34.0
59	28 44.8	28 49.5	27 26.2	59 11.3	119 22.7	179 34.2
60	28 45.0	28 49.8	27 26.4	60 11.5	120 22.9	180 34.4

1 h 55 min

POPRAVKA ČASOVNOG UGLA				POPRAVKA DRUGOG REDA za časovni ugao i deklinaciju Sunca, Mjeseca i planeta		
s	SUNCA I PLANETA	PROLJEĆNE TAČKE ♈	MJESECA ☾	Δ popr.	Δ popr.	Δ popr.
	° ′	° ′	° ′	′	′	′
0	28 45.0	28 49.8	27 26.4	0 .0	60 11.6	120 23.1
1	28 45.3	28 50.0	27 26.7	1 .2	61 11.7	121 23.3
2	28 45.5	28 50.3	27 26.9	2 .4	62 11.9	122 23.5
3	28 45.8	28 50.5	27 27.1	3 .6	63 12.1	123 23.7
4	28 46.0	28 50.8	27 27.4	4 .8	64 12.3	124 23.9
5	28 46.3	28 51.0	27 27.6	5 1.0	65 12.5	125 24.1
6	28 46.5	28 51.3	27 27.8	6 1.2	66 12.7	126 24.3
7	28 46.8	28 51.5	27 28.1	7 1.3	67 12.9	127 24.4
8	28 47.0	28 51.8	27 28.3	8 1.5	68 13.1	128 24.6
9	28 47.3	28 52.0	27 28.6	9 1.7	69 13.3	129 24.8
10	28 47.5	28 52.3	27 28.8	10 1.9	70 13.5	130 25.0
11	28 47.8	28 52.5	27 29.0	11 2.1	71 13.7	131 25.2
12	28 48.0	28 52.8	27 29.3	12 2.3	72 13.9	132 25.4
13	28 48.3	28 53.1	27 29.5	13 2.5	73 14.1	133 25.6
14	28 48.5	28 53.3	27 29.8	14 2.7	74 14.2	134 25.8
15	28 48.8	28 53.6	27 30.0	15 2.9	75 14.4	135 26.0
16	28 49.0	28 53.8	27 30.2	16 3.1	76 14.6	136 26.2
17	28 49.3	28 54.1	27 30.5	17 3.3	77 14.8	137 26.4
18	28 49.5	28 54.3	27 30.7	18 3.5	78 15.0	138 26.6
19	28 49.8	28 54.6	27 31.0	19 3.7	79 15.2	139 26.8
20	28 50.0	28 54.8	27 31.2	20 3.9	80 15.4	140 27.0
21	28 50.3	28 55.1	27 31.4	21 4.0	81 15.6	141 27.1
22	28 50.5	28 55.3	27 31.7	22 4.2	82 15.8	142 27.3
23	28 50.8	28 55.6	27 31.9	23 4.4	83 16.0	143 27.5
24	28 51.0	28 55.8	27 32.1	24 4.6	84 16.2	144 27.7
25	28 51.3	28 56.1	27 32.4	25 4.8	85 16.4	145 27.9
26	28 51.5	28 56.3	27 32.6	26 5.0	86 16.6	146 28.1
27	28 51.8	28 56.6	27 32.9	27 5.2	87 16.7	147 28.3
28	28 52.0	28 56.8	27 33.1	28 5.4	88 16.9	148 28.5
29	28 52.3	28 57.1	27 33.3	29 5.6	89 17.1	149 28.7
30	28 52.5	28 57.3	27 33.6	30 5.8	90 17.3	150 28.9
31	28 52.8	28 57.6	27 33.8	31 6.0	91 17.5	151 29.1
32	28 53.0	28 57.8	27 34.1	32 6.2	92 17.7	152 29.3
33	28 53.3	28 58.1	27 34.3	33 6.4	93 17.9	153 29.5
34	28 53.5	28 58.3	27 34.5	34 6.5	94 18.1	154 29.6
35	28 53.8	28 58.6	27 34.8	35 6.7	95 18.3	155 29.8
36	28 54.0	28 58.8	27 35.0	36 6.9	96 18.5	156 30.0
37	28 54.3	28 59.1	27 35.2	37 7.1	97 18.7	157 30.2
38	28 54.5	28 59.3	27 35.5	38 7.3	98 18.9	158 30.4
39	28 54.8	28 59.6	27 35.7	39 7.5	99 19.1	159 30.6
40	28 55.0	28 59.8	27 36.0	40 7.7	100 19.3	160 30.8
41	28 55.3	29 .1	27 36.2	41 7.9	101 19.4	161 31.0
42	28 55.5	29 .3	27 36.4	42 8.1	102 19.6	162 31.2
43	28 55.8	29 .6	27 36.7	43 8.3	103 19.8	163 31.4
44	28 56.0	29 .8	27 36.9	44 8.5	104 20.0	164 31.6
45	28 56.3	29 1.1	27 37.2	45 8.7	105 20.2	165 31.8
46	28 56.5	29 1.3	27 37.4	46 8.9	106 20.4	166 32.0
47	28 56.8	29 1.6	27 37.6	47 9.0	107 20.6	167 32.1
48	28 57.0	29 1.8	27 37.9	48 9.2	108 20.8	168 32.3
49	28 57.3	29 2.1	27 38.1	49 9.4	109 21.0	169 32.5
50	28 57.5	29 2.3	27 38.3	50 9.6	110 21.2	170 32.7
51	28 57.8	29 2.6	27 38.6	51 9.8	111 21.4	171 32.9
52	28 58.0	29 2.8	27 38.8	52 10.0	112 21.6	172 33.1
53	28 58.3	29 3.1	27 39.1	53 10.2	113 21.8	173 33.3
54	28 58.5	29 3.3	27 39.3	54 10.4	114 21.9	174 33.5
55	28 58.8	29 3.6	27 39.5	55 10.6	115 22.1	175 33.7
56	28 59.0	29 3.8	27 39.8	56 10.8	116 22.3	176 33.9
57	28 59.3	29 4.1	27 40.0	57 11.0	117 22.5	177 34.1
58	28 59.5	29 4.3	27 40.3	58 11.2	118 22.7	178 34.3
59	28 59.8	29 4.6	27 40.5	59 11.4	119 22.9	179 34.5
60	29 .0	29 4.8	27 40.7	60 11.6	120 23.1	180 34.7

1 h 56 min

POPRAVKA ČASOVNOG UGLA				POPRAVKA DRUGOG REDA za časovni ugao i deklinaciju Sunca, Mjeseca i planeta		
s	SUNCA I PLANETA	PROLJEĆNE TAČKE ♈	MJESECA ☾	Δ poprav.	Δ poprav.	Δ poprav.
	° ′	° ′	° ′	′	′	′
0	29 .0	29 4.8	27 40.7	0 .0	60 11.7	120 23.3
1	29 .3	29 5.1	27 41.0	1 .2	61 11.8	121 23.5
2	29 .5	29 5.3	27 41.2	2 .4	62 12.0	122 23.7
3	29 .8	29 5.6	27 41.4	3 .6	63 12.2	123 23.9
4	29 1.0	29 5.8	27 41.7	4 .8	64 12.4	124 24.1
5	29 1.3	29 6.1	27 41.9	5 1.0	65 12.6	125 24.3
6	29 1.5	29 6.3	27 42.2	6 1.2	66 12.8	126 24.5
7	29 1.8	29 6.6	27 42.4	7 1.4	67 13.0	127 24.7
8	29 2.0	29 6.8	27 42.6	8 1.6	68 13.2	128 24.9
9	29 2.3	29 7.1	27 42.9	9 1.7	69 13.4	129 25.0
10	29 2.5	29 7.3	27 43.1	10 1.9	70 13.6	130 25.2
11	29 2.8	29 7.6	27 43.4	11 2.1	71 13.8	131 25.4
12	29 3.0	29 7.8	27 43.6	12 2.3	72 14.0	132 25.6
13	29 3.3	29 8.1	27 43.8	13 2.5	73 14.2	133 25.8
14	29 3.5	29 8.3	27 44.1	14 2.7	74 14.4	134 26.0
15	29 3.8	29 8.6	27 44.3	15 2.9	75 14.6	135 26.2
16	29 4.0	29 8.8	27 44.6	16 3.1	76 14.8	136 26.4
17	29 4.3	29 9.1	27 44.8	17 3.3	77 15.0	137 26.6
18	29 4.5	29 9.3	27 45.0	18 3.5	78 15.1	138 26.8
19	29 4.8	29 9.6	27 45.3	19 3.7	79 15.3	139 27.0
20	29 5.0	29 9.8	27 45.5	20 3.9	80 15.5	140 27.2
21	29 5.3	29 10.1	27 45.7	21 4.1	81 15.7	141 27.4
22	29 5.5	29 10.3	27 46.0	22 4.3	82 15.9	142 27.6
23	29 5.8	29 10.6	27 46.2	23 4.5	83 16.1	143 27.8
24	29 6.0	29 10.9	27 46.5	24 4.7	84 16.3	144 28.0
25	29 6.3	29 11.1	27 46.7	25 4.9	85 16.5	145 28.2
26	29 6.5	29 11.4	27 46.9	26 5.0	86 16.7	146 28.3
27	29 6.8	29 11.6	27 47.2	27 5.2	87 16.9	147 28.5
28	29 7.0	29 11.9	27 47.4	28 5.4	88 17.1	148 28.7
29	29 7.3	29 12.1	27 47.7	29 5.6	89 17.3	149 28.9
30	29 7.5	29 12.4	27 47.9	30 5.8	90 17.5	150 29.1
31	29 7.8	29 12.6	27 48.1	31 6.0	91 17.7	151 29.3
32	29 8.0	29 12.9	27 48.4	32 6.2	92 17.9	152 29.5
33	29 8.3	29 13.1	27 48.6	33 6.4	93 18.1	153 29.7
34	29 8.5	29 13.4	27 48.8	34 6.6	94 18.3	154 29.9
35	29 8.8	29 13.6	27 49.1	35 6.8	95 18.4	155 30.1
36	29 9.0	29 13.9	27 49.3	36 7.0	96 18.6	156 30.3
37	29 9.3	29 14.1	27 49.6	37 7.2	97 18.8	157 30.5
38	29 9.5	29 14.4	27 49.8	38 7.4	98 19.0	158 30.7
39	29 9.8	29 14.6	27 50.0	39 7.6	99 19.2	159 30.9
40	29 10.0	29 14.9	27 50.3	40 7.8	100 19.4	160 31.1
41	29 10.3	29 15.1	27 50.5	41 8.0	101 19.6	161 31.3
42	29 10.5	29 15.4	27 50.8	42 8.2	102 19.8	162 31.5
43	29 10.8	29 15.6	27 51.0	43 8.3	103 20.0	163 31.6
44	29 11.0	29 15.9	27 51.2	44 8.5	104 20.2	164 31.8
45	29 11.3	29 16.1	27 51.5	45 8.7	105 20.4	165 32.0
46	29 11.5	29 16.4	27 51.7	46 8.9	106 20.6	166 32.2
47	29 11.8	29 16.6	27 51.9	47 9.1	107 20.8	167 32.4
48	29 12.0	29 16.9	27 52.2	48 9.3	108 21.0	168 32.6
49	29 12.3	29 17.1	27 52.4	49 9.5	109 21.2	169 32.8
50	29 12.5	29 17.4	27 52.7	50 9.7	110 21.4	170 33.0
51	29 12.8	29 17.6	27 52.9	51 9.9	111 21.6	171 33.2
52	29 13.0	29 17.9	27 53.1	52 10.1	112 21.7	172 33.4
53	29 13.3	29 18.1	27 53.4	53 10.3	113 21.9	173 33.6
54	29 13.5	29 18.4	27 53.6	54 10.5	114 22.1	174 33.8
55	29 13.8	29 18.6	27 53.9	55 10.7	115 22.3	175 34.0
56	29 14.0	29 18.9	27 54.1	56 10.9	116 22.5	176 34.2
57	29 14.3	29 19.1	27 54.3	57 11.1	117 22.7	177 34.4
58	29 14.5	29 19.4	27 54.6	58 11.3	118 22.9	178 34.6
59	29 14.8	29 19.6	27 54.8	59 11.5	119 23.1	179 34.8
60	29 15.0	29 19.9	27 55.1	60 11.7	120 23.3	180 35.0

1 h 57 min

POPRAVKA ČASOVNOG UGLA				POPRAVKA DRUGOG REDA za časovni ugao i deklinaciju Sunca, Mjeseca i planeta		
s	SUNCA I PLANETA	PROLJEĆNE TAČKE ♈	MJESECA ☾	Δ poprav.	Δ poprav.	Δ poprav.
	° ′	° ′	° ′	′	′	′
0	29 15.0	29 19.9	27 55.1	0 .0	60 11.8	120 23.5
1	29 15.3	29 20.1	27 55.3	1 .2	61 11.9	121 23.7
2	29 15.5	29 20.4	27 55.5	2 .4	62 12.1	122 23.9
3	29 15.8	29 20.6	27 55.8	3 .6	63 12.3	123 24.1
4	29 16.0	29 20.9	27 56.0	4 .8	64 12.5	124 24.3
5	29 16.3	29 21.1	27 56.2	5 1.0	65 12.7	125 24.5
6	29 16.5	29 21.4	27 56.5	6 1.2	66 12.9	126 24.7
7	29 16.8	29 21.6	27 56.7	7 1.4	67 13.1	127 24.9
8	29 17.0	29 21.9	27 57.0	8 1.6	68 13.3	128 25.1
9	29 17.3	29 22.1	27 57.2	9 1.8	69 13.5	129 25.3
10	29 17.5	29 22.4	27 57.4	10 2.0	70 13.7	130 25.5
11	29 17.8	29 22.6	27 57.7	11 2.2	71 13.9	131 25.7
12	29 18.0	29 22.9	27 57.9	12 2.4	72 14.1	132 25.9
13	29 18.3	29 23.1	27 58.2	13 2.5	73 14.3	133 26.0
14	29 18.5	29 23.4	27 58.4	14 2.7	74 14.5	134 26.2
15	29 18.8	29 23.6	27 58.6	15 2.9	75 14.7	135 26.4
16	29 19.0	29 23.9	27 58.9	16 3.1	76 14.9	136 26.6
17	29 19.3	29 24.1	27 59.1	17 3.3	77 15.1	137 26.8
18	29 19.5	29 24.4	27 59.3	18 3.5	78 15.3	138 27.0
19	29 19.8	29 24.6	27 59.6	19 3.7	79 15.5	139 27.2
20	29 20.0	29 24.9	27 59.8	20 3.9	80 15.7	140 27.4
21	29 20.3	29 25.1	28 .1	21 4.1	81 15.9	141 27.6
22	29 20.5	29 25.4	28 .3	22 4.3	82 16.1	142 27.8
23	29 20.8	29 25.6	28 .5	23 4.5	83 16.3	143 28.0
24	29 21.0	29 25.9	28 .8	24 4.7	84 16.5	144 28.2
25	29 21.3	29 26.1	28 1.0	25 4.9	85 16.6	145 28.4
26	29 21.5	29 26.4	28 1.3	26 5.1	86 16.8	146 28.6
27	29 21.8	29 26.6	28 1.5	27 5.3	87 17.0	147 28.8
28	29 22.0	29 26.9	28 1.7	28 5.5	88 17.2	148 29.0
29	29 22.3	29 27.1	28 2.0	29 5.7	89 17.4	149 29.2
30	29 22.5	29 27.4	28 2.2	30 5.9	90 17.6	150 29.4
31	29 22.8	29 27.6	28 2.4	31 6.1	91 17.8	151 29.6
32	29 23.0	29 27.9	28 2.7	32 6.3	92 18.0	152 29.8
33	29 23.3	29 28.1	28 2.9	33 6.5	93 18.2	153 30.0
34	29 23.5	29 28.4	28 3.2	34 6.7	94 18.4	154 30.2
35	29 23.8	29 28.6	28 3.4	35 6.9	95 18.6	155 30.4
36	29 24.0	29 28.9	28 3.6	36 7.1	96 18.8	156 30.6
37	29 24.3	29 29.2	28 3.9	37 7.2	97 19.0	157 30.7
38	29 24.5	29 29.4	28 4.1	38 7.4	98 19.2	158 30.9
39	29 24.8	29 29.7	28 4.4	39 7.6	99 19.4	159 31.1
40	29 25.0	29 29.9	28 4.6	40 7.8	100 19.6	160 31.3
41	29 25.3	29 30.2	28 4.8	41 8.0	101 19.8	161 31.5
42	29 25.5	29 30.4	28 5.1	42 8.2	102 20.0	162 31.7
43	29 25.8	29 30.7	28 5.3	43 8.4	103 20.2	163 31.9
44	29 26.0	29 30.9	28 5.5	44 8.6	104 20.4	164 32.1
45	29 26.3	29 31.2	28 5.8	45 8.8	105 20.6	165 32.3
46	29 26.5	29 31.4	28 6.0	46 9.0	106 20.8	166 32.5
47	29 26.8	29 31.7	28 6.3	47 9.2	107 21.0	167 32.7
48	29 27.0	29 31.9	28 6.5	48 9.4	108 21.2	168 32.9
49	29 27.3	29 32.2	28 6.7	49 9.6	109 21.3	169 33.1
50	29 27.5	29 32.4	28 7.0	50 9.8	110 21.5	170 33.3
51	29 27.8	29 32.7	28 7.2	51 10.0	111 21.7	171 33.5
52	29 28.0	29 32.9	28 7.5	52 10.2	112 21.9	172 33.7
53	29 28.3	29 33.2	28 7.7	53 10.4	113 22.1	173 33.9
54	29 28.5	29 33.4	28 7.9	54 10.6	114 22.3	174 34.1
55	29 28.8	29 33.7	28 8.2	55 10.8	115 22.5	175 34.3
56	29 29.0	29 33.9	28 8.4	56 11.0	116 22.7	176 34.5
57	29 29.3	29 34.2	28 8.7	57 11.2	117 22.9	177 34.7
58	29 29.5	29 34.4	28 8.9	58 11.4	118 23.1	178 34.9
59	29 29.8	29 34.7	28 9.1	59 11.6	119 23.3	179 35.1
60	29 30.0	29 34.9	28 9.4	60 11.8	120 23.5	180 35.3

1 h 58 min

POPRAVKA ČASOVNOG UGLA				POPRAVKA DRUGOG REDA za časovni ugao i deklinaciju Sunca, Mjeseca i planeta		
s	SUNCA I PLANETA	PROLJEĆNE TAČKE ♈	MJESECA ☾	Δ popr.	Δ popr.	Δ popr.
	° ′	° ′	° ′	′	′	′
0	29 30.0	29 34.9	28 9.4	0 .0	60 11.9	120 23.7
1	29 30.3	29 35.2	28 9.6	1 .2	61 12.0	121 23.9
2	29 30.5	29 35.4	28 9.8	2 .4	62 12.2	122 24.1
3	29 30.8	29 35.7	28 10.1	3 .6	63 12.4	123 24.3
4	29 31.0	29 35.9	28 10.3	4 .8	64 12.6	124 24.5
5	29 31.3	29 36.2	28 10.6	5 1.0	65 12.8	125 24.7
6	29 31.5	29 36.4	28 10.8	6 1.2	66 13.0	126 24.9
7	29 31.8	29 36.7	28 11.0	7 1.4	67 13.2	127 25.1
8	29 32.0	29 36.9	28 11.3	8 1.6	68 13.4	128 25.3
9	29 32.3	29 37.2	28 11.5	9 1.8	69 13.6	129 25.5
10	29 32.5	29 37.4	28 11.8	10 2.0	70 13.8	130 25.7
11	29 32.8	29 37.7	28 12.0	11 2.2	71 14.0	131 25.9
12	29 33.0	29 37.9	28 12.2	12 2.4	72 14.2	132 26.1
13	29 33.3	29 38.2	28 12.5	13 2.6	73 14.4	133 26.3
14	29 33.5	29 38.4	28 12.7	14 2.8	74 14.6	134 26.5
15	29 33.8	29 38.7	28 12.9	15 3.0	75 14.8	135 26.7
16	29 34.0	29 38.9	28 13.2	16 3.2	76 15.0	136 26.9
17	29 34.3	29 39.2	28 13.4	17 3.4	77 15.2	137 27.1
18	29 34.5	29 39.4	28 13.7	18 3.6	78 15.4	138 27.3
19	29 34.8	29 39.7	28 13.9	19 3.8	79 15.6	139 27.5
20	29 35.0	29 39.9	28 14.1	20 4.0	80 15.8	140 27.7
21	29 35.3	29 40.2	28 14.4	21 4.1	81 16.0	141 27.8
22	29 35.5	29 40.4	28 14.6	22 4.3	82 16.2	142 28.0
23	29 35.8	29 40.7	28 14.9	23 4.5	83 16.4	143 28.2
24	29 36.0	29 40.9	28 15.1	24 4.7	84 16.6	144 28.4
25	29 36.3	29 41.2	28 15.3	25 4.9	85 16.8	145 28.6
26	29 36.5	29 41.4	28 15.6	26 5.1	86 17.0	146 28.8
27	29 36.8	29 41.7	28 15.8	27 5.3	87 17.2	147 29.0
28	29 37.0	29 41.9	28 16.0	28 5.5	88 17.4	148 29.2
29	29 37.3	29 42.2	28 16.3	29 5.7	89 17.6	149 29.4
30	29 37.5	29 42.4	28 16.5	30 5.9	90 17.8	150 29.6
31	29 37.8	29 42.7	28 16.8	31 6.1	91 18.0	151 29.8
32	29 38.0	29 42.9	28 17.0	32 6.3	92 18.2	152 30.0
33	29 38.3	29 43.2	28 17.2	33 6.5	93 18.4	153 30.2
34	29 38.5	29 43.4	28 17.5	34 6.7	94 18.6	154 30.4
35	29 38.8	29 43.7	28 17.7	35 6.9	95 18.8	155 30.6
36	29 39.0	29 43.9	28 18.0	36 7.1	96 19.0	156 30.8
37	29 39.3	29 44.2	28 18.2	37 7.3	97 19.2	157 31.0
38	29 39.5	29 44.4	28 18.4	38 7.5	98 19.4	158 31.2
39	29 39.8	29 44.7	28 18.7	39 7.7	99 19.6	159 31.4
40	29 40.0	29 44.9	28 18.9	40 7.9	100 19.8	160 31.6
41	29 40.3	29 45.2	28 19.1	41 8.1	101 19.9	161 31.8
42	29 40.5	29 45.4	28 19.4	42 8.3	102 20.1	162 32.0
43	29 40.8	29 45.7	28 19.6	43 8.5	103 20.3	163 32.2
44	29 41.0	29 45.9	28 19.9	44 8.7	104 20.5	164 32.4
45	29 41.3	29 46.2	28 20.1	45 8.9	105 20.7	165 32.6
46	29 41.5	29 46.4	28 20.3	46 9.1	106 20.9	166 32.8
47	29 41.8	29 46.7	28 20.6	47 9.3	107 21.1	167 33.0
48	29 42.0	29 47.0	28 20.8	48 9.5	108 21.3	168 33.2
49	29 42.3	29 47.2	28 21.1	49 9.7	109 21.5	169 33.4
50	29 42.5	29 47.5	28 21.3	50 9.9	110 21.7	170 33.6
51	29 42.8	29 47.7	28 21.5	51 10.1	111 21.9	171 33.8
52	29 43.0	29 48.0	28 21.8	52 10.3	112 22.1	172 34.0
53	29 43.3	29 48.2	28 22.0	53 10.5	113 22.3	173 34.2
54	29 43.5	29 48.5	28 22.3	54 10.7	114 22.5	174 34.4
55	29 43.8	29 48.7	28 22.5	55 10.9	115 22.7	175 34.6
56	29 44.0	29 49.0	28 22.7	56 11.1	116 22.9	176 34.8
57	29 44.3	29 49.2	28 23.0	57 11.3	117 23.1	177 35.0
58	29 44.5	29 49.5	28 23.2	58 11.5	118 23.3	178 35.2
59	29 44.8	29 49.7	28 23.4	59 11.7	119 23.5	179 35.4
60	29 45.0	29 50.0	28 23.7	60 11.9	120 23.7	180 35.6

1 h 59 min

POPRAVKA ČASOVNOG UGLA				POPRAVKA DRUGOG REDA za časovni ugao i deklinaciju Sunca, Mjeseca i planeta		
s	SUNCA I PLANETA	PROLJEĆNE TAČKE ♈	MJESECA ☾	Δ popr.	Δ popr.	Δ popr.
	° ′	° ′	° ′	′	′	′
0	29 45.0	29 50.0	28 23.7	0 .0	60 12.0	120 23.9
1	29 45.3	29 50.2	28 23.9	1 .2	61 12.1	121 24.1
2	29 45.5	29 50.5	28 24.2	2 .4	62 12.3	122 24.3
3	29 45.8	29 50.7	28 24.4	3 .6	63 12.5	123 24.5
4	29 46.0	29 51.0	28 24.6	4 .8	64 12.7	124 24.7
5	29 46.3	29 51.2	28 24.9	5 1.0	65 12.9	125 24.9
6	29 46.5	29 51.5	28 25.1	6 1.2	66 13.1	126 25.1
7	29 46.8	29 51.7	28 25.4	7 1.4	67 13.3	127 25.3
8	29 47.0	29 52.0	28 25.6	8 1.6	68 13.5	128 25.5
9	29 47.3	29 52.2	28 25.8	9 1.8	69 13.7	129 25.7
10	29 47.5	29 52.5	28 26.1	10 2.0	70 13.9	130 25.9
11	29 47.8	29 52.7	28 26.3	11 2.2	71 14.1	131 26.1
12	29 48.0	29 53.0	28 26.5	12 2.4	72 14.3	132 26.3
13	29 48.3	29 53.2	28 26.8	13 2.6	73 14.5	133 26.5
14	29 48.5	29 53.5	28 27.0	14 2.8	74 14.7	134 26.7
15	29 48.8	29 53.7	28 27.3	15 3.0	75 14.9	135 26.9
16	29 49.0	29 54.0	28 27.5	16 3.2	76 15.1	136 27.1
17	29 49.3	29 54.2	28 27.7	17 3.4	77 15.3	137 27.3
18	29 49.5	29 54.5	28 28.0	18 3.6	78 15.5	138 27.5
19	29 49.8	29 54.7	28 28.2	19 3.8	79 15.7	139 27.7
20	29 50.0	29 55.0	28 28.5	20 4.0	80 15.9	140 27.9
21	29 50.3	29 55.2	28 28.7	21 4.2	81 16.1	141 28.1
22	29 50.5	29 55.5	28 28.9	22 4.4	82 16.3	142 28.3
23	29 50.8	29 55.7	28 29.2	23 4.6	83 16.5	143 28.5
24	29 51.0	29 56.0	28 29.4	24 4.8	84 16.7	144 28.7
25	29 51.3	29 56.2	28 29.6	25 5.0	85 16.9	145 28.9
26	29 51.5	29 56.5	28 29.9	26 5.2	86 17.1	146 29.1
27	29 51.8	29 56.7	28 30.1	27 5.4	87 17.3	147 29.3
28	29 52.0	29 57.0	28 30.4	28 5.6	88 17.5	148 29.5
29	29 52.3	29 57.2	28 30.6	29 5.8	89 17.7	149 29.7
30	29 52.5	29 57.5	28 30.8	30 6.0	90 17.9	150 29.9
31	29 52.8	29 57.7	28 31.1	31 6.2	91 18.1	151 30.1
32	29 53.0	29 58.0	28 31.3	32 6.4	92 18.3	152 30.3
33	29 53.3	29 58.2	28 31.6	33 6.6	93 18.5	153 30.5
34	29 53.5	29 58.5	28 31.8	34 6.8	94 18.7	154 30.7
35	29 53.8	29 58.7	28 32.0	35 7.0	95 18.9	155 30.9
36	29 54.0	29 59.0	28 32.3	36 7.2	96 19.1	156 31.1
37	29 54.3	29 59.2	28 32.5	37 7.4	97 19.3	157 31.3
38	29 54.5	29 59.5	28 32.8	38 7.6	98 19.5	158 31.5
39	29 54.8	29 59.7	28 33.0	39 7.8	99 19.7	159 31.7
40	29 55.0	29 60.0	28 33.2	40 8.0	100 19.9	160 31.9
41	29 55.3	30 .2	28 33.5	41 8.2	101 20.1	161 32.1
42	29 55.5	30 .5	28 33.7	42 8.4	102 20.3	162 32.3
43	29 55.8	30 .7	28 33.9	43 8.6	103 20.5	163 32.5
44	29 56.0	30 1.0	28 34.2	44 8.8	104 20.7	164 32.7
45	29 56.3	30 1.2	28 34.4	45 9.0	105 20.9	165 32.9
46	29 56.5	30 1.5	28 34.7	46 9.2	106 21.1	166 33.1
47	29 56.8	30 1.7	28 34.9	47 9.4	107 21.3	167 33.3
48	29 57.0	30 2.0	28 35.1	48 9.6	108 21.5	168 33.5
49	29 57.3	30 2.2	28 35.4	49 9.8	109 21.7	169 33.7
50	29 57.5	30 2.5	28 35.6	50 10.0	110 21.9	170 33.9
51	29 57.8	30 2.7	28 35.9	51 10.2	111 22.1	171 34.1
52	29 58.0	30 3.0	28 36.1	52 10.4	112 22.3	172 34.3
53	29 58.3	30 3.2	28 36.3	53 10.6	113 22.5	173 34.5
54	29 58.5	30 3.5	28 36.6	54 10.8	114 22.7	174 34.7
55	29 58.8	30 3.7	28 36.8	55 11.0	115 22.9	175 34.9
56	29 59.0	30 4.0	28 37.0	56 11.2	116 23.1	176 35.1
57	29 59.3	30 4.2	28 37.3	57 11.4	117 23.3	177 35.3
58	29 59.5	30 4.5	28 37.5	58 11.6	118 23.5	178 35.5
59	29 59.8	30 4.7	28 37.8	59 11.8	119 23.7	179 35.7
60	30 .0	30 5.0	28 38.0	60 12.0	120 23.9	180 35.9

TABLICA ZA PRETVARANJE

UGAONIH U VREMENSKE VREDNOSTI

°	h min	°	h min	°	h min	°	h min	°	h min	°	h min
0	0 0	60	4 0	120	8 0	180	12 0	240	16 0	300	20 0
1	0 4	61	4 4	121	8 4	181	12 4	241	16 4	301	20 4
2	0 8	62	4 8	122	8 8	182	12 8	242	16 8	302	20 8
3	0 12	63	4 12	123	8 12	183	12 12	243	16 12	303	20 12
4	0 16	64	4 16	124	8 16	184	12 16	244	16 16	304	20 16
5	0 20	65	4 20	125	8 20	185	12 20	245	16 20	305	20 20
6	0 24	66	4 24	126	8 24	186	12 24	246	16 24	306	20 24
7	0 28	67	4 28	127	8 28	187	12 28	247	16 28	307	20 28
8	0 32	68	4 32	128	8 32	188	12 32	248	16 32	308	20 32
9	0 36	69	4 36	129	8 36	189	12 36	249	16 36	309	20 36
10	0 40	70	4 40	130	8 40	190	12 40	250	16 40	310	20 40
11	0 44	71	4 44	131	8 44	191	12 44	251	16 44	311	20 44
12	0 48	72	4 48	132	8 48	192	12 48	252	16 48	312	20 48
13	0 52	73	4 52	133	8 52	193	12 52	253	16 52	313	20 52
14	0 56	74	4 56	134	8 56	194	12 56	254	16 56	314	20 56
15	1 0	75	5 0	135	9 0	195	13 0	255	17 0	315	21 0
16	1 4	76	5 4	136	9 4	196	13 4	256	17 4	316	21 4
17	1 8	77	5 8	137	9 8	197	13 8	257	17 8	317	21 8
18	1 12	78	5 12	138	9 12	198	13 12	258	17 12	318	21 12
19	1 16	79	5 16	139	9 16	199	13 16	259	17 16	319	21 16
20	1 20	80	5 20	140	9 20	200	13 20	260	17 20	320	21 20
21	1 24	81	5 24	141	9 24	201	13 24	261	17 24	321	21 24
22	1 28	82	5 28	142	9 28	202	13 28	262	17 28	322	21 28
23	1 32	83	5 32	143	9 32	203	13 32	263	17 32	323	21 32
24	1 36	84	5 36	144	9 36	204	13 36	264	17 36	324	21 36
25	1 40	85	5 40	145	9 40	205	13 40	265	17 40	325	21 40
26	1 44	86	5 44	146	9 44	206	13 44	266	17 44	326	21 44
27	1 48	87	5 48	147	9 48	207	13 48	267	17 48	327	21 48
28	1 52	88	5 52	148	9 52	208	13 52	268	17 52	328	21 52
29	1 56	89	5 56	149	9 56	209	13 56	269	17 56	329	21 56
30	2 0	90	6 0	150	10 0	210	14 0	270	18 0	330	22 0
31	2 4	91	6 4	151	10 4	211	14 4	271	18 4	331	22 4
32	2 8	92	6 8	152	10 8	212	14 8	272	18 8	332	22 8
33	2 12	93	6 12	153	10 12	213	14 12	273	18 12	333	22 12
34	2 16	94	6 16	154	10 16	214	14 16	274	18 16	334	22 16
35	2 20	95	6 20	155	10 20	215	14 20	275	18 20	335	22 20
36	2 24	96	6 24	156	10 24	216	14 24	276	18 24	336	22 24
37	2 28	97	6 28	157	10 28	217	14 28	277	18 28	337	22 28
38	2 32	98	6 32	158	10 32	218	14 32	278	18 32	338	22 32
39	2 36	99	6 36	159	10 36	219	14 36	279	18 36	339	22 36
40	2 40	100	6 40	160	10 40	220	14 40	280	18 40	340	22 40
41	2 44	101	6 44	161	10 44	221	14 44	281	18 44	341	22 44
42	2 48	102	6 48	162	10 48	222	14 48	282	18 48	342	22 48
43	2 52	103	6 52	163	10 52	223	14 52	283	18 52	343	22 52
44	2 56	104	6 56	164	10 56	224	14 56	284	18 56	344	22 56
45	3 0	105	7 0	165	11 0	225	15 0	285	19 0	345	23 0
46	3 4	106	7 4	166	11 4	226	15 4	286	19 4	346	23 4
47	3 8	107	7 8	167	11 8	227	15 8	287	19 8	347	23 8
48	3 12	108	7 12	168	11 12	228	15 12	288	19 12	348	23 12
49	3 16	109	7 16	169	11 16	229	15 16	289	19 16	349	23 16
50	3 20	110	7 20	170	11 20	230	15 20	290	19 20	350	23 20
51	3 24	111	7 24	171	11 24	231	15 24	291	19 24	351	23 24
52	3 28	112	7 28	172	11 28	232	15 28	292	19 28	352	23 28
53	3 32	113	7 32	173	11 32	233	15 32	293	19 32	353	23 32
54	3 36	114	7 36	174	11 36	234	15 36	294	19 36	354	23 36
55	3 40	115	7 40	175	11 40	235	15 40	295	19 40	355	23 40
56	3 44	116	7 44	176	11 44	236	15 44	296	19 44	356	23 44
57	3 48	117	7 48	177	11 48	237	15 48	297	19 48	357	23 48
58	3 52	118	7 52	178	11 52	238	15 52	298	19 52	358	23 52
59	3 56	119	7 56	179	11 56	239	15 56	299	19 56	359	23 56
60	4 0	120	8 0	180	12 0	240	16 0	300	20 0	360	24 0

′	min s
0	0 0
1	0 4
2	0 8
3	0 12
4	0 16
5	0 20
6	0 24
7	0 28
8	0 32
9	0 36
10	0 40
11	0 44
12	0 48
13	0 52
14	0 56
15	1 0
16	1 4
17	1 8
18	1 12
19	1 16
20	1 20
21	1 24
22	1 28
23	1 32
24	1 36
25	1 40
26	1 44
27	1 48
28	1 52
29	1 56
30	2 0
31	2 4
32	2 8
33	2 12
34	2 16
35	2 20
36	2 24
37	2 28
38	2 32
39	2 36
40	2 40
41	2 44
42	2 48
43	2 52
44	2 56
45	3 0
46	3 4
47	3 8
48	3 12
49	3 16
50	3 20
51	3 24
52	3 28
53	3 32
54	3 36
55	3 40
56	3 44
57	3 48
58	3 52
59	3 56
60	4 0

″	s
0	.00
1	.07
2	.13
3	.20
4	.27
5	.33
6	.40
7	.47
8	.53
9	.60
10	.67
11	.73
12	.80
13	.87
14	.93
15	1.00
16	1.07
17	1.13
18	1.20
19	1.27
20	1.33
21	1.40
22	1.47
23	1.53
24	1.60
25	1.67
26	1.73
27	1.80
28	1.87
29	1.93
30	2.00
31	2.07
32	2.13
33	2.20
34	2.27
35	2.33
36	2.40
37	2.47
38	2.53
39	2.60
40	2.67
41	2.73
42	2.80
43	2.87
44	2.93
45	3.00
46	3.07
47	3.13
48	3.20
49	3.27
50	3.33
51	3.40
52	3.47
53	3.53
54	3.60
55	3.67
56	3.73
57	3.80
58	3.87
59	3.93
60	4.00

VREMENSKIH U UGAONE

h	°
0	0
1	15
2	30
3	45
4	60
5	75
6	90
7	105
8	120
9	135
10	150
11	165
12	180
13	195
14	210
15	225
16	240
17	255
18	270
19	285
20	300
21	315
22	330
23	345
24	360

$\frac{s}{10}$	″
.00	.00
.10	1.50
.20	3.00
.30	4.50
.40	6.00
.50	7.50
.60	9.00
.70	10.50
.80	12.00
.90	13.50
1.00	15.00

$\frac{s}{100}$	″
.00	.00
.01	.15
.02	.30
.03	.45
.04	.60
.05	.75
.06	.90
.07	1.05
.08	1.20
.09	1.35
.10	1.50

min	° ′
s	′ ″
0	0 0
1	0 15
2	0 30
3	0 45
4	1 0
5	1 15
6	1 30
7	1 45
8	2 0
9	2 15
10	2 30
11	2 45
12	3 0
13	3 15
14	3 30
15	3 45
16	4 0
17	4 15
18	4 30
19	4 45
20	5 0
21	5 15
22	5 30
23	5 45
24	6 0
25	6 15
26	6 30
27	6 45
28	7 0
29	7 15
30	7 30
31	7 45
32	8 0
33	8 15
34	8 30
35	8 45
36	9 0
37	9 15
38	9 30
39	9 45
40	10 0
41	10 15
42	10 30
43	10 45
44	11 0
45	11 15
46	11 30
47	11 45
48	12 0
49	12 15
50	12 30
51	12 45
52	13 0
53	13 15
54	13 30
55	13 45
56	14 0
57	14 15
58	14 30
59	14 45
60	15 0

⋆ ★ ★ ★ ⋆

Uputstvo

ZA

UPOTREBU NAUTIČKOG GODIŠNJAKA

UPUTSTVO
za upotrebu Nautičkog godišnjaka

Nautički godišnjak se sastoji od dva osnovna dijela:
1. **Promjenljivog** (efemeride Sunca, Mjeseca, Venere, Marsa, Jupitera, Saturna ...) i
2. **Stalnog** dijela.

Efemeride se mjenjaju svake godine, dok su u stalnom dijelu prilozi koji se ne mjenjaju.

Efemeride sadrže:

a) Mjesečeve mjene, perigej, apogej, vidljivost planeta, početke godišnjih doba, pomračenje Sunca i Mjeseca, te kalendar za 2010. godinu;

b) časovni ugao i deklinaciju Sunca, Mjeseca, Venere, Marsa, Jupitera i Saturna, časovni ugao Proljećne tačke za svaki parni čas univerzalnog vremena sa jednočasovnim srednjim i stvarnim razlikama;

c) vrijeme izlaza i zalaza Sunca i Mjeseca sa jednočasovnim promjenama za Mjesec, i trajanje građanskog i astronomskog sumraka za svaki datum za geografske širine od 60° N do 60° S;

d) vremensko izjednačenje za 00^h i 12^h univerzalnog vremena sa jednočasovnom promjenom, vrijeme gornjeg prolaza Sunca kroz meridijan u Griniču i prividni polupečnik Sunca (r);

e) vrijeme gornjeg prolaza Mjeseca kroz meridijan u Griniču sa jednočasovnom promjenom, horizontsku paralaksu Mjeseca i njegov prividni polupečnik za 00^h u Griniču. Dalje slijede starost Mjeseca u danima i glavne faze (mjene) za određene dane;

f) vrijeme gornjeg prolaza planeta kroz meridijan Griniča, horizontsku paralaksu, surektascenziju i prividnu veličinu za 00^h univerzalnog vremena;

g) surektascenzije, deklinacije i vremena gornjih prolaza zvjezda kroz meridijan Griniča za svaki prvi dan u mjesecu;

h) podatke za Sjevernjaču koje čine Tablice popravki I, II i III za određivanje geografske širine pomoću Sjevernjače i tablice azimuta Sjevernjače;

i) ovo uputstvo.

Sadržaj **stalnog** dijela je:

a) interpolacione tablice za izračunavanje trenutaka izlaza-zalaza Sunca i Mjeseca za $\varphi = 0°$ do 30° i za $\varphi = 30°$ do 60°;

b) interpolacione tablice za određivanje $\lambda\nu$ kao popravke srednjeg vremena pri izračunavanju trenutaka izlaza, zalaza i prolaza Mjeseca kroz meridijan;

c) interpolacione tablice za popravku časovnog ugla Sunca i planeta, proljećne tačke i Mjeseca i za popravku drugog reda za časovni ugao navedenih nebeskih tijela. Tablice omogućuju i popravku deklinacije tih nebeskih tijela, određivanje časovnog ugla i deklinacije za bilo koji trenutak;

d) pomoćne tablice za pretvaranje vremenskih u lučne vrednosti i obratno;

e) zvanična i zonska vremena i karta zonskih i zvaničnih vremena;

f) karte zvjezdanog neba.

Primeri za rad sa Godišnjakom grupisani su, radi lakšeg pronalaženja, prema sličnosti. Za vrijeme svakog izračunavanja mora se voditi računa o predznaku koji je jednako važan kao i sama brojka, jer su sva izračunavanja algebarska, gde predznak određuje da li će se vršiti sabiranje ili oduzimanje.

PREGLED PRIMJERA ZA KORIŠĆENJE NAUTIČKOG GODIŠNJAKA

1. Određivanje časovnog ugla i deklinacije nebeskih tijela — Primjer:

1.1. Određivanje časovnog ugla i deklinacije Sunca **1, 2**
1.2. Određivanje časovnog ugla i deklinacije Mjeseca **3, 4**
1.3. Određivanje časovnog ugla i deklinacije planeta **5, 6**
1.4. Određivanje časovnog ugla i deklinacije zvjezda **7, 8**

2. Određivanje izlaza i zalaza nebeskih tijela

2.1. Određivanje izlaza i zalaza Sunca, početka i završetka građanskog i astronomskog sumraka **9, 10**
2.2. Određivanje izlaza i zalaza Mjeseca **11, 12**

3. Određivanje gornjeg prolaza nebeskih tijela kroz meridijan Primer:
3.1. Određivanje gornjeg prolaza Sunca kroz meridijan . . . **13, 14**
3.2. Određivanje gornjeg prolaza Mjeseca kroz meridijan . . . **15, 16**
3.3. Određivanje gornjeg prolaza planeta kroz meridijan . . . **17**
3.4. Određivanje gornjeg prolaza zvjezda kroz meridijan . . . **18**

4. Sjevernjača
4.1. Određivanje geografske širine pomoću visine Sjevernjače i određivanje azimuta Sjevernjače . . . **19**

5. Pretvaranje raznih vrsta vremena
5.1. Pretvaranje zonskog, mjesnog srednjeg vremena i vremena po časovniku u univerzalno vrijeme i obratno . **20–22**
5.2. Pretvaranje zvjezdanog vremena u zonsko i mjesno srednje vrijeme . . . **23**

6. Identifikacija zvjezda pomoću zvjezdanih karata . . . **24–27**

1. ODREĐIVANJE ČASOVNOG UGLA I DEKLINACIJE NEBESKIH TIJELA

Efemeride daju časovni ugao i deklinaciju Sunca, Mjeseca i planeta za svaki parni čas i datum, a pomoćne interpolacione tablice omogućuju određivanje časovnog ugla i deklinacije za bilo koji trenutak.

Popravka časovnog ugla određuje se pomoću interpolacionih tablica u koloni „Popravka časovnog ugla“, a popravka drugog reda za časovni ugao na istoj strani u koloni „Popravka drugog reda za časovni ugao i deklinaciju Sunca, Mjeseca i planeta“.

Prva popravka časovnog ugla određena je pod pretpostavkom da jednočasovne promjene časovnih uglova za Sunce iznose 15°, za proljećnu tačku 15°02′.5 i za Mjesec 14°19′. Popravka drugog reda časovnog ugla Sunca, Mjeseca i planeta jeste popravka tih srednjih promjena, jer stvarne časovne promjene časovnih uglova razlikuju se za veće ili manje vrijednosti od usvojenih srednjih promjena. Veličina Δ za račun popravke drugog reda nalazi se na dnu efemerida Sunca i planeta, za Mjesec desno od vrijednosti časovnog ugla, a za popravku drugog reda proljećne tačke ne uzima se u obzir jer su odstupanja od srednje vrijednosti 15°02′.5 praktično zanemarljiva.

Određivanje deklinacije nekog nebeskog tijela za određeni trenutak vršimo na taj način da u efemeridama tog dana za parni čas pronađemo osnovnu vrijednost deklinacije. Popravku za određeni trenutak pronalazimo u interpolacionim tablicama u koloni „Popravka drugog reda za časovni ugao i deklinaciju Sunca, Mjeseca i planeta“, a pomoću vrijednosti Δ.

1.1. ODREĐIVANJE ČASOVNOG UGLA I DEKLINACIJE SUNCA

▶**PRIMJER 1.** Odrediti mjesni časovni ugao i deklinaciju Sunca za 14. april 2010. godine u UT = $7^h31^m46^s$ na $\lambda = 96°14'.6$E.

a) časovni ugao

Sa strane za 14. april S za 6^h	269°54′.1
Iz interpolacionih tablica za $1^h31^m46^s$ popravka časovnog ugla Sunca	22°56′.5
Iz interpolacionih tablica za 1^h31^m popravka drugog reda za S($\Delta = +2$)	0′.3
S	292°50′.9
$+\lambda$	+ 96°14′.6
s	389° 5′.5 → s_W = 29° 5′.5

b) deklinacija

Sa strane za 14. april δ za 6^h	+9°22′.9
Iz interpol. tablica za 1^h31^m popravka za $\delta(\Delta = +9)$	+ 1′.4
δ	+9°24′.3

▶**PRIMJER 2.** Odrediti mjesni časovni ugao i deklinaciju Sunca za 18. septembar 2010. godine u UT = $13^h05^m14^s$ na $\lambda = 28°53'.6$W.

a) časovni ugao

Sa strane za 18. septembar S za 12^h	1°26′.8
Iz interpolacionih tablica za $1^h5^m14^s$ popravka časovnog ugla Sunca	16°18′.5
Popravka drugog reda za S($\Delta = +2$)	0′.2
S	17°45′.5
$+\lambda$	− 28°53′.6
s_W	348°51′.9 → s_E = 11° 8′.1

b) deklinacija

Sa strane za 18. septembar δ za 12^h	+1°47′.9
Iz interpol. tablica za 1^h5^m popravka za $\delta(\Delta = -10)$	− 1′.1
δ	+1°46′.8

1.2. ODREĐIVANJE ČASOVNOG UGLA I DEKLINACIJE MJESECA

▶**PRIMJER 3.** Odrediti mjesni časovni ugao i deklinaciju Mjeseca za 15. mart 2010. godine u UT $= 8^h15^m25^s$ na $\lambda = 15^\circ32'.0$W.

a) časovni ugao

Sa strane za 15. mart S za 8^h	$305^\circ\ 0'.1$
Iz interpolacionih tablica za $0^h15^m25^s$ popravka časovnog ugla Mjeseca	$3^\circ40'.7$
Iz interpol. tablica za 0^h15^m popravka za S($\Delta = +163$)	$4'.2$
S	$308^\circ45'.0$
$+\lambda$	$-\ 15^\circ32'.0$
s_W	$293^\circ13'.0 \rightarrow s_E = 66^\circ47'.0$

b) deklinacija

Sa strane za 15. mart δ za 8^h	$-0^\circ30'.0$
Iz interpol. tablica za 0^h15^m popravka za $\delta(\Delta = 130)$	$+\ 3'.4$
δ	$-0^\circ26'.6$

▶**PRIMJER 4.** Odrediti mjesni časovni ugao i deklinaciju Mjeseca za 20. jun 2010. godine u UT $= 10^h31^m18^s$ na $\lambda = 34^\circ23'.8$E.

a) časovni ugao

Sa strane za 20. jun S za 10^h	$226^\circ45'.7$
Iz interpolacionih tablica za $0^h31^m18^s$ popravka časovnog ugla Mjeseca	$7^\circ28'.1$
Iz interpol. tablica za 0^h31^m popravka za S($\Delta = 111$)	$5'.8$
S	$234^\circ19'.6$
$+\lambda$	$+\ 34^\circ23'.8$
s_W	$268^\circ43'.4 \rightarrow s_E = \ 91^\circ16'.6$

b) deklinacija

Sa strane za 20. jun δ za 10^h	$-10^\circ45'.5$
Iz interpol. tablica za 0^h31^m popravka za $\delta(\Delta = -133)$	$-\ 7'.0$
δ	$-10^\circ52'.5$

1.3. ODREĐIVANJE ČASOVNOG UGLA I DEKLINACIJE PLANETA

▶**PRIMJER 5.** Odrediti mjesni časovni ugao i deklinaciju Venere za 7. decembar 2010. godine u UT $= 21^h15^m7^s$ na $\lambda = 58^\circ34'.2$E.

a) časovni ugao

Sa strane za 7. decembar S za 20^h	$167^\circ\ 0'.7$
Iz interpolacionih tablica za $1^h15^m7^s$ popravka časovnog ugla planete	$18^\circ46'.8$
Iz interpolacionih tablica za 1^h15^m popravka drugog reda za S($\Delta = +9$)	$+\ 1'.1$
S	$185^\circ48'.6$
$+\lambda$	$+\ 58^\circ34'.2$
s_W	$244^\circ28'.8 \rightarrow s_E = 115^\circ31'.2$

b) deklinacija

Sa strane za 7. decembar δ za 20^h	$-10^\circ49'.0$
Iz interpol. tablica za 1^h15^m popravka za $\delta(\Delta = -\ 2)$	$-\ 0'.3$
δ	$-10^\circ49'.5$

▶**PRIMJER 6.** Odrediti mjesni časovni ugao i deklinaciju Jupitera za 23. oktobar 2010. godine u UT $= 8^h55^m28^s$ na $\lambda = 145^\circ20'.1$W.

a) časovni ugao

Sa strane za 23. oktobar S za 8^h	$155^\circ55'.2$
Iz interpolacionih tablica za $0^h55^m28^s$ popravka časovnog ugla planete	$13^\circ52'.0$
Iz interpolacionih tablica za 0^h55^m popravka drugog reda za S($\Delta = +27$)	$2'.5$
S	$169^\circ49'.7$
$+\lambda$	$-145^\circ20'.1$
s	$24^\circ29'.6 \rightarrow s_E = 335^\circ30'.4$

b) deklinacija

Sa strane za 23. oktobar δ za 8^h	$-\ 3^\circ32'.7$
Iz interpol. tablica za 0^h55^m popravka za $\delta(\Delta = -1)$	$-\ 0'.1$
δ	$-\ 3^\circ32'.8$

1.4. ODREĐIVANJE ČASOVNOG UGLA I DEKLINACIJE ZVIJEZDE

Za određivanje časovnog ugla zvijezde prvo se određuje časovni ugao Proljećne tačke S_Υ, odnosno vrijednost zvjezdanog vremena izražena u stepenima. Njoj dodajemo surektascenziju ($360^\circ - \alpha$) te zvijezde prema jednačini $S_* = S_\Upsilon - \alpha_*$, odnosno $S_* = S_\Upsilon + (360^\circ - \alpha_*)$. Rektascenzija odnosno surektascenzija zvezda se tokom mjeseca neznatno mjenjaju, pa su stoga date njihove vrijednosti samo za prvi dan mjeseca. U slučaju veće promjene surektascenzije tokom mjeseca, njena interpolacija vrši se napamet. Isto tako, deklinacije zvjezda date su za prvi dan mjeseca. U slučaju potrebe interpolacije, ista se vrši napamet.

▶**PRIMJER 7.** Odrediti mjesni časovni ugao i deklinaciju zvijezde Regulus (α Leo) za 16. mart 2010. godine u UT $= 18^h11^m26^s$ na $\lambda = 62°13'.2$W.

a) časovni ugao Proljećne (Υ) tačke

Sa strane za 16. mart S_Υ za 18^h	$84°12'.6$
Iz interpolacionih tablica za $0^h11^m26^s$ popravka časovnog ugla Υ tačke	$2°52'.0$
S_Υ	$87°\ 4'.6$
Deklinacija (iz tablice deklinacija nautičkih zvjezda pod r.b. 24 za 1. mart): δ	$-\ 8°42'.4$

b) časovni ugao zvijezde

S_Υ	$87°\ 4'.6$
Iz tablice surektascenzija nautičkih zvjezda pod r.b. 24 za 1. mart	$207°45'.7$
S_*	$294°50'.3$
$+\lambda$	$-\ 62°13'.2$
s_*	$232°37'.1$
s_E	$127°22'.9$

▶**PRIMJER 8.** Odrediti mjesni časovni ugao i deklinaciju zvijezde Deneb (α Cyg) za 10. avgust 2010 . godine u UT $= 21^h42^m8^s$ na $\lambda = 93°14'.2$E.

a) časovni ugao Proljećne (Υ) tačke

Sa strane za 10. avgust S_Υ za 20^h	$259°11'.0$
Iz interpolacionih tablica za $1^h42^m8^s$ popravka časovnog ugla Υ tačke	$25°36'.3$
S_Υ	$284°47'.3$
Deklinacija (iz tablice deklinacija nautičkih zvjezda pod r.b. 50 za 1. avgust): δ	$-\ 56°41'.9$

b) časovni ugao zvijezde

S_Υ	$284°47'.3$
Iz tablice surektascenzija nautičkih zvjezda pod r.b. 50 za 1. avgust	$49°32'.5$
S_*	$334°19'.8$
$+\lambda$	$+\ 93°14'.2$
s_*	$427°34'.0$
s_*	$67°34'.0$

2. ODREĐIVANJE IZLAZA I ZALAZA NEBESKIH TIJELA

2.1. ODREĐIVANJE IZLAZA I ZALAZA SUNCA, POČETKA I ZAVRŠETKA GRAĐANSKOG I ASTRONOMSKOG SUMRAKA

Trenuci izlaza i zalaza Sunca (gornjeg ruba), te trajanja sumraka, dati su u efemeridama za sjeverne i južne širine od 0° do 60°. Početak građanskog ili astronomskog svitanja određuje se oduzimanjem trajanja sumraka od trenutka izlaza Sunca. Završetak građanskog ili astronomskog sumraka određuje se dodavanjem trajanja sumraka na trenutak zalaza Sunca. Dati su trenuci izlaza i zalaza Sunca, te trajanja sumraka, za svaki dan. Potrebno je izvršiti interpolaciju samo za određenu geografsku širinu pomoću dve interpolacione tablice. Prva tablica je za geografske širine od 0° do 30° N i S, a druga za širine od 30° do 60° N i S. Interpolacija trajanja sumraka vrši se po potrebi samo za celobrojne vrijednosti minuta.

▶**PRIMJER 9.** Odrediti trenutak izlaza i zalaza Sunca, početak građanskog svitanja i završetak građanskog sumraka za 5. jul 2010. godine na $\varphi = 48°28'.2$N, $\lambda = 72°43'.6$E, $\varphi = 48°.5$S, $\lambda = 4^h50^m.9$ ($x = +5^h$).

a) izlaz

UT $= t_s$ izlaza za $\varphi = 45°$S	$4^h19^m.0$
Popravka za $3°.5$ iz interpolacionih tablica ($\Delta = -23^m$)	$-\ 16^m.1$
t_s izlaza za $\varphi = 48°.5$S	$4^h\ 2^m.1$
$+(x - \lambda)$	$+\ 9^m.1$
t_x	$4^h12^m.0$
$-$ trajanje građanskog sumraka	$-\ 42^m.0$
početak građanskog svitanja	$3^h30^m.0$

b) zalaz

UT $= t_s$ zalaza za $\varphi = 45°$S	$19^h49^m.0$
Popravka za $3°.5$ iz interpolacionih tablica ($\Delta = +22^m$)	$+\ 15^m.4$
t_s zalaza za $\varphi = 48°.5$S	$20^h\ 4^m.4$
$+(x - \lambda)$	$+\ 9^m.1$
t_x	$20^h13^m.5$
$+$ trajanje građanskog sumraka	$+\ 42^m.0$
završetak građanskog sumraka	$20^h55^m.5$

▶**PRIMJER 10.** Odrediti trenutak izlaza i zalaza Sunca, početak astronomskog svitanja i završetak astronomskog sumraka za 21. septembar 2010. godine na $\varphi = 22°14'.0$N, $\lambda = 56°41'.2$W, $\varphi = 22°.2$N, $\lambda = 3^h46^m.7$ ($x = -4^h$).

a) izlaz

UT $= t_s$ izlaza za $\varphi = 20°$N	$5^h49^m.0$
Popravka za $2°.2$ iz interpolacionih tablica ($\Delta = -1^m$)	$-\ 0^m.2$

b) zalaz

UT $= t_s$ zalaza za $\varphi = 20°$N	$17^h57^m.0$
Popravka za $2°.2$ iz interpolacionih tablica ($\Delta = 1^m$)	$+\ 0^m.2$

t_s izlaza za $\varphi = 22°.2\,\mathrm{N}$	$5^h48^m.8$
$+(x-\lambda)$	$-\ 13^m.3$
t_x	$5^h35^m.5$
$-$ trajanje astronomskog sumraka	$-1^h14^m.5$
početak astronomskog svitanja	$4^h21^m.0$

t_s zalaza za $\varphi = 22°.2\,\mathrm{N}$	$17^h57^m.2$
$+(x-\lambda)$	$-\ 13^m.3$
t_x	$17^h43^m.9$
$+$ trajanje astronomskog sumraka	$+\ 1^h14^m.5$
završetak astronomskog sumraka	$18^h58^m.4$

2.2. ODREĐIVANJE IZLAZA I ZALAZA MJESECA

trenuci izlaza i zalaza Mjeseca (gornjeg ruba) za svaki dan, za sjeverne i južne geografske širine od 0° do 60°, te njihove promjene za jedan čas $\Delta/24$ date su u efemeridama. Pomoću promjene $\Delta/24$ određuje se popravka $\lambda\nu$ prilikom određivanja izlaza i zalaza Mjeseca. U slučaju određivanja izlaza i zalaza Mjeseca na istočnim geografskim dužinama u cilju postizanja tačnosti uzima se vrijednost $\Delta/24$ za prethodni dan. Veličina $\Delta/24$ je uvek pozitivna zbog kašnjenja Mjeseca. Popravka $\lambda\nu$ se uvek algebarski oduzima od trenutka izlaza ili zalaza Mjeseca u Griniču. Mora da se vodi računa o znacima uz $\lambda\Delta/24$. Popravka $\lambda\nu$ data je u interpolacionoj tablici za izračunavanje trenutaka izlaza, zalaza i prolaza Mjeseca kroz meridijan. Prvo se vrši interpolacija za geografsku širinu pomoću interpolacione tablice za određivanje trenutaka Sunčevih i Mesečevih izlaza i zalaza, a zatim se određuje popravka za geografsku dužinu.

Moguće je da za određeni dan i širinu u efemeridama nema potrebnih podataka. Ta mjesta označena su tačkama. U tim slučajevima koriste se podaci za naredni dan.

▶**PRIMJER 11.** Odrediti trenutak izlaza i zalaza Mjeseca za 19. jun 2010. godine na $\varphi = 17°36'.0\,\mathrm{N}$, $\lambda = 72°15'.0\,\mathrm{E}$, $\varphi = 17°.6\,\mathrm{N}$, $\lambda = 4^h49^m.0\,\mathrm{E}$ $(x = +5^h)$.

a) izlaz

UT $= t_s$ izlaza za $\varphi = 10°\,\mathrm{N}$	$12^h15^m.0$
Popravka za $7°.6$ iz interpolacionih tabl. $(\Delta = +\ 4^m)$	$+\ 3^m.0$
UT izlaza za $\varphi = 17°.6\,\mathrm{N}$	$19^h31^m.5$
$\lambda = 72°.3\,\mathrm{E}$	
$\Delta/24 = \nu = 2^m.2$ $\quad -\lambda\nu$	$-\ 10^m.6$
t_s	$12^h\ 7^m.4$
$+(x-\lambda)$	$+\ 11^m.0$
t_x	$12^h18^m.4$

b) zalaz

UT $= t_s$ zalaza za $\varphi = 10°\,\mathrm{N}$	$24^h27^m.0$
Popravka za $7°.6$ iz interpolacionih tabl. $(\Delta = -\ 6^m)$	$-\ 4^m.6$
UT zalaza za $\varphi = 17°.6\,\mathrm{N}$	$24^h22^m.4$
$\lambda = 72°.3\,\mathrm{E}$	
$\Delta/24 = \nu = 2^m.2$ $\quad -\lambda\nu$	$-\ 9^m.2$
t_s	$24^h13^m.2$
$+(x-\lambda)$	$+\ 11^m.0$
t_x	$24^h24^m.2$

▶**PRIMJER 12.** Odrediti trenutke izlaza i zalaza Mjeseca za 23. oktobar 2010. godine na $\varphi = 33°25'.0\,\mathrm{S}$, $\lambda = 38°53'.0\,\mathrm{W}$, $\varphi = 33°.4\,\mathrm{S}$, $\lambda = 2^h35^m.5\,\mathrm{W}$ $(x = -3^h)$.

a) izlaz

UT $= t_s$ izlaza za $\varphi = 30°\,\mathrm{S}$	$+18^h55^m.0$
Popravka za $3°.4$ iz interpolacionih tabl. $(\Delta = +10^m)$	$+\ 7^m.6$
UT izlaza za $\varphi = 33°.4\,\mathrm{S}$	$+19^h\ 2^m.6$
$\lambda = 38°.9\,\mathrm{W}$	
$\Delta/24 = \nu = 2^m.4$ $\quad -\lambda\nu$	$-\ 6^m.2$
t_s	$+18^h56^m.4$
$+(x-\lambda)$	$-\ 24^m.5$
t_x	$+18^h31^m.9$

b) zalaz

UT $= t_s$ zalaza za $\varphi = 30°\,\mathrm{S}$	$5^h\ 5^m.0$
Popravka za $3°.4$ iz interpolacionih tabl. $(\Delta = -\ 8^m)$	$-\ 5^m.5$
UT zalaza za $\varphi = 33°.4\,\mathrm{S}$	$4^h59^m.5$
$\lambda = 38°.9\,\mathrm{W}$	
$\Delta/24 = \nu = 1^m.6$ $\quad -\lambda\nu$	$-\ 4^m.2$
t_s	$4^h55^m.3$
$+(x-\lambda)$	$-\ 24^m.5$
t_x	$4^h30^m.8$

2.3. ODREĐIVANJE IZLAZA I ZALAZA PLANETA I ZVJEZDA

Trenutak izlaza i zalaza planeta i zvjezda se ne određuje jer se njihov izlaz i zalaz ne vide. Ali u slučaju potrebe može se odrediti dužina poludnevnog luka na osnovu deklinacije određene zvijezde i geografske širine posmatrača ili se ista veličina odredi pomoću Nautičkih tablica na osnovu zadatih vrijednosti. Tako određena dužina poludnevnog luka oduzima se od trenutka gornjeg prolaza određene zvijezde kroz meridijan i dobija se trenutak izlaza, a ako se veličina poludnevnog luka doda na trenutak prolaza dobija se trenutak zalaza.

3. ODREĐIVANJE GORNJEG PROLAZA NEBESKIH TIJELA KROZ MERIDIJAN

3.1. ODREĐIVANJE GORNJEG PROLAZA SUNCA KROZ MERIDIJAN

Za određivanje gornjeg prolaza Sunca kroz meridijan koristi se činjenica da Sunce u trenutku gornjeg prolaza kroz meridijan određenog mjesta ima časovni ugao 0°. Zapadna geografska dužina određenog mjesta, gdje je časovni ugao Sunca 0°, odgovara u tom momentu časovnom uglu Sunca u Griniču, odnosno $\lambda_W = S_\odot$. Za istočne geografske širine koristi se jednačina $(360^\circ - \lambda_E) = S_\odot$. Dakle, moramo odrediti trenutak UT za koji je časovni ugao Sunca $S_\odot$ jednak λ_W ili $(360^\circ - \lambda_E)$. Tako određenom trenutku dodaje se zonski indeks sa predznakom i dobija se zonsko vrijeme gornjeg prolaza Sunca kroz meridijan.

Gornji prolaz Sunca kroz meridijan određuje se i pomoću vremenskog izjednačenja, tj. iz $T_p - e = UT$. U efemeridama su date vrednosti vremenskog izjednačenja $e = T_p - UT$ za 00^h i 12^h sa odgovarajućom jednočasovnom promjenom. Preko e određuje se univerzalno vrijeme gornjeg prolaza Sunca kroz meridijan. Za istočne geografske širine koristi se $\Delta/24$ za prethodni dan radi postizanja veće tačnosti.

Treći (približni) način određivanja trenutka gornjeg prolaza Sunca kroz meridijan, uz najveću moguću grešku do $\pm 0^m.2$, je ako trenutku gornjeg prolaza Sunca kroz meridijan u Griniču T_m dodamo $x - \lambda$ (primjer 14b).

▶**PRIMJER 13.** Odrediti trenutak gornjeg prolaza Sunca kroz meridijan za 8. mart 2010. godine na $\lambda = 103^\circ 28'.8W$, $\lambda = 6^h 53^m 55^s$ $(x = -7^h)$.

a) pomoću časovnog ugla

$\lambda_W = S_\odot$	$103^\circ 28'.8$
u UT 18^h $S_\odot$	$87^\circ 18'.7$
Iz interpolacione tablice za Sunce u $1^h 04^m 40^s.4$	$16^\circ 10'.1$
UT	$19^h 04^m 40^s.4$
$+x$	$-\ 7^h 00^m 00^s.0$
t_x	$12^h 04^m 40^s.4$

b) pomoću vremenskog izjednačenja

t_p	$12^h 00^m 00^s.0$	e_{12^h}	$-10^m 48^s.8$
$-\lambda$	$+\ 6^h 53^m 55^s.0$	$\Delta/24$	$+\ 0^s.6$
T_p	$18^h 53^m 55^s.0$	Popravka	
$-e$	$+\ 10^m 44^s.7$	6.9×0.6	$4^s.1$
UT	$19^h 04^m 39^s.7$	e_{12^h}	$-10^m 48^s.8$
$+x$	$-\ 7^h 00^m 00^s.0$	Popravka	$+\ 4^s.1$
t_x	$12^h 04^m 39^s.7$	e	$-10^m 44^s.7$

▶**PRIMJER 14.** Odrediti trenutak gornjeg prolaza Sunca kroz meridijan za 22. januar 2010. godine na $\lambda = 145^\circ 52'.1E$, $\lambda = 9^h 43^m 28^s$ $(x = +10^h)$.

a) pomoću časovnog ugla

$(360^\circ - \lambda_E) = S_\odot$	$214^\circ 07'.9$
u UT 2^h $S_\odot$	$207^\circ\ 7'.7$
Iz interpolacione tablice za Sunce u $0^h 28^m\ 0^s.0$	$7^\circ\ 0'.2$
UT	$2^h 28^m\ 0^s.0$
$+x$	$+10^h 00^m 00^s.0$
t_x	$12^h 28^m\ 0^s.0$

b) skraćeni postupak

$T_m = t_m$	$12^h 11^m.6$	$T_m = t_m$	$12^h 11^m.6$
$-\lambda$	$-\ 9^h 43^m.5$	$+(x - \lambda)$	$0^h 16^m.5$
UT	$2^h 28^m.1$		
$+x$	$+10^h 00^m.0$		
t_x	$12^h 28^m.1$	t_x	$12^h 28^m.1$

3.2. ODREĐIVANJE GORNJEG PROLAZA MJESECA KROZ MERIDIJAN

Način određivanja gornjeg prolaza Mjeseca kroz meridijan je isti kao određivanje izlaza i zalaza Mjeseca. Iz efemerida se dobija univerzalno vrijeme gornjeg prolaza Mjeseca kroz meridijan u Griniču uz odgovarajuću časovnu promjenu $\Delta/24$. Ako se određuje popravka $\lambda\nu$ za zapadne geografske širine, veličina $\Delta/24$ uzima se za dan prolaza Mjeseca kroz meridijan, a za istočne geografske širine uzima se $\Delta/24$ za prethodni dan. Popravka $\lambda\nu$ data je u interpolacionoj tablici za izračunavanje trenutaka izlaza, zalaza i prolaza Mjeseca kroz meridijan.

Moguće je da za određeni dan u efemeridama nema potrebnih podataka. Ta mesta označena su tačkama. U tim slučajevima koriste se podaci za naredni dan.

▶**PRIMJER 15.** Odrediti trenutak gornjeg prolaza Mjeseca kroz meridijan za 18. januar 2010. godine na $\lambda = 48^\circ 6'.0W$.

T_m	$14^h 27^m.0$	$\Delta/24 = \nu$	$1^m.7$	x	$-\ 3^h 00^m.0$
$-\lambda\nu$	$+\ 5^m.4$	λ	$48^\circ.1$	$-\lambda$	$+\ 3^h 12^m.4$
t_m	$14^h 32^m.4$	$\lambda\nu$	$-\ 5^m.4$	$+(x - \lambda)$	$+\ 0^h 12^m.4$
$+(x - \lambda)$	$12^m.4$				
t_x	$14^h 44^m.8$				

▶**PRIMJER 16.** Odrediti trenutak gornjeg prolaza Mjeseca kroz meridijan u Griniču za 23. jun 2010. godine na $\lambda = 126^\circ 40'.2\text{E}$.

T_m	$21^h49^m.0$	$\Delta/24 = \nu$	$2^m.3$	x	$+\ 8^h00^m.0$
$-\lambda\nu$	$-\ 19^m.4$	λ	$126^\circ.7$	$-\lambda$	$-\ 8^h26^m.7$
t_m	$21^h29^m.6$	$\lambda\nu$	$19^m.4$	$+(x-\lambda)$	$-\ 0^h26^m.7$
$+(x-\lambda)$	$-\ 0^h26^m.7$				
t_x	$21^h\ 2^m.9$				

3.3. ODREĐIVANJE GORNJEG PROLAZA PLANETA KROZ MERIDIJAN

Metodologija određivanja trenutaka gornjih prolaza planeta kroz meridijan ista je kao za Mjesec, uz razliku da veličina $\Delta/24$ može biti pozitivna, kada planeta kasni kao Mjesec, ili negativna, kada planeta rani kao zvijezde. Obično je veličina $\Delta/24$ negativna.

Ako planeta rani u odnosu na prethodni dan na istočnim geografskim dužinama, vrijeme je veće od griničkog, a na zapadnim manje, t.j. suprotno nego kod Mjeseca. Ako planeta kasni postupak je isti kao u slučaju određivanja gornjeg prolaza Mjeseca kroz meridijan. Shodno tome, određuje se znak $\lambda\nu$. Obično je planetarni dan kraći od srednjeg sunčevog, pa se može desiti da planeta u jednom danu dva puta prolazi kroz meridijan mjesta, odmah posle pola noći i nešto pre pola noći.

Pošto je razlika između trenutaka dva uzastopna prolaza kroz meridijan mala, iznos $\lambda\nu$ se ne određuje (primjer 17b); univerzalno vrijeme prolaza kroz meridijan je isto kao mjesno srednje vrijeme kojem se samo dodaje $(x-\lambda)$ i na taj način se određuje zonsko vrijeme prolaza planeta kroz meridijan mjesta.

▶**PRIMJER 17.** Odrediti trenutak gornjeg prolaza Jupitera kroz meridijan za 14. jun 2010. godine na $\lambda = 46^\circ 17'.3\text{W}$, $\lambda = 3^h5^m.2$ $(x = -3^h)$.

a) tačan postupak

T_m	$6^h36^m.0$	λ	$3^h.1\text{W}$
$-\lambda\nu$	$0^m.5$	$\nu = \Delta/24$	$-4^m/24$
		$\lambda\nu = 3.1 \times \frac{-4}{24}$	$-0^m.5$
t_m	$6^h35^m.5$		
$+(x-\lambda)$	$+\ 5^m.2$		
t_x	$6^h40^m.7$		

b) približni postupak—u praksi dovoljno tačan

T_m	$6^h36^m.0$
$+(x-\lambda)$	$5^m.2$
t_x	$6^h41^m.2$

3.4. ODREĐIVANJE GORNJEG PROLAZA ZVJEZDA KROZ MERIDIJAN

Trenutak gornjeg prolaza zvijezde kroz meridijan Griniča dat je u efemeridama za svaki prvi dan u mjesecu. U slučaju određivanja trenutka prolaza kroz meridijan za bilo koji drugi dan u mjesecu, od vrednosti iz efemerida oduzima se popravka koja se nalazi na donjem dijelu stranice za izabrani dan.

Trenutak gornjeg prolaza kroz meridijan T_m izraženo preko UT može da se uzme kao mjesno srednje vrijeme prolaza kroz meridijan posmatrača t_m, što je približno, jer zvijezda dnevno rani oko 4 minuta, a što na većim geografskim dužinama stvara greške od 1 do 2 minuta. Dakle, potrebno je odrediti $\lambda\nu$, ali se to ne radi jer za svakodnevni rad tačnost je dovoljna, ako se griničko vrijeme prolaza kroz meridijan uzima kao mjesno srednje vrijeme i, uz dodavanje $(x-\lambda)$, pretvara u zonsko.

▶**PRIMJER 18.** Odrediti vrijeme gornjeg prolaza zvijezde Arcturus (α Boo) kroz meridijan 23. maja 2010. godine na $\lambda = 28^\circ 14'.2\text{E}$, $\lambda = 1^h52^m.9$, $(x = +2^h)$.

Iz tablice gornjih prolaza zvjezda kroz meridijan za 1. maj 2010. godine (r.b. zvezde 35) $T_m = t_m$	$23^h41^m.0$
Popravka za 23 dana iz iste tablice	$-\ 1^h27^m.0$
t_m	$22^h14^m.0$
$+(x-\lambda)$	$7^m.1$
t_x	$22^h21^m.1$

4. SJEVERNJAČA

4.1. ODREĐIVANJE GEOGRAFSKE ŠIRINE POMOĆU VISINE SJEVERNJAČE I ODREĐIVANJE AZIMUTA SJEVERNJAČE

Izmjerena visina Sjevernjače ispravlja se radi instrumentskih grešaka k_i i k_e, depresije i refrakcije. Rezultat ispravki je V_p, kojem se dodaju popravke I, II i III iz tablica Godišnjaka. Ulazne veličine tablice azimuta Sjevernjače su mjesni časovni ugao Proljećne tačke i geografska širina posmatrača.

▶**PRIMJER 19.** Odrediti geografsku širinu posmatrača pomoću visine zvijezde Sjevernjače; odrediti njen azimut za 18. septembar 2010. godine u UT $= 22^h36^m00^s$ na $\varphi = 42^\circ23'$N i $\lambda = 38^\circ47'$W zbirne pozicije, ako je prava visina Sjevernjače $V_p = 41^\circ54'.2$.

a) određivanje mjesnog časovnog ugla s_γ

S_γ za UT 22^h	$327^\circ42'.3$
Iz interpolacionih tablica popravka S_γ za 36^m	$9^\circ\ 1'.5$
S_γ	$336^\circ43'.8$
$+\lambda$	$-\ 38^\circ47'.0$
s_γ	$297^\circ56'.8$

b) određivanje visine

V_p	$41^\circ54'.2$
I	$+\ 8'.7$
II	$+\ 0'.2$
III	$-\ 0'.0$
φ	$42^\circ\ 3'.1$
ω	$1^\circ.0$

5. PRETVARANJE RAZNIH VRSTA VREMENA

5.1. PRETVARANJE ZONSKOG, MJESNOG SREDNJEG VREMENA I VREMENA PO ČASOVNIKU U UNIVERZALNO VRIJEME I OBRATNO

Podaci efemerida odnose se na grinički meridijan, pa je ulazna veličina univerzalno vreme UT.

U slučaju da časovnik posmatrača pokazuje zonsko vrijeme, vrijeme posmatranja je zonsko vrijeme t_x. Isto tako, može to vrijeme biti vrijeme po časovniku t_c ili mjesno zonsko vrijeme t_s, a što nije često.

▶**PRIMJER 20.** Odrediti UT ako su poznati zonsko vrijeme t_x, vrijeme po časovniku t_c i srednje mjesno vrijeme t_s na $\lambda = 13^\circ51'.0$E, $\lambda = 0^h55^m24^s$ ($x = +1^h$).

a) prelaz sa t_x na UT

t_x	$7^h39^m19^s$
$-x$	$-1^h00^m00^s$
UT	$6^h39^m19^s$

b) prelaz sa t_c na UT

t_c	$7^h31^m55^s$
$+U$	$-\ 53^m48^s$
t_h	$6^h38^m07^s$
$+S$	$+\ 1^m12^s$
UT	$6^h39^m19^s$

c) prelaz sa t_s na UT

t_s	$7^h34^m43^s$
$-\lambda$	$-\ 55^m24^s$
UT	$6^h36^m19^s$

Napomena: U—poređenje hronometra sa časovnikom,
S—stanje hronometra.

▶**PRIMJER 21.** Odrediti zonsko vrijeme t_x, vrijeme po časovniku t_c i srednje mjesno vrijeme t_s za UT na $\lambda = 57^\circ24'.0$E, $\lambda = 3^h49^m36^s$ ($x = -4^h$).

a) prelaz sa UT na t_x

UT	$9^h46^m12^s$
$+x$	$-4^h00^m00^s$
t_x	$5^h46^m12^s$

b) prelaz sa UT na t_c

UT	$9^h46^m12.0^s$
$-S$	$+\ 2^m06^s.5$
t_h	$9^h48^m18.5^s$
$-U$	$+3^h53^m27.5^s$
t_c	$5^h54^m51.0^s$

c) prelaz sa UT na t_s

UT	$9^h46^m12^s$
$+\lambda$	$-3^h49^m36^s$
t_s	$5^h56^m36^s$

Napomena: U—poređenje hronometra sa časovnikom,
S—stanje hronometra.

▶**PRIMJER 22.** Odrediti zonsko vrijeme t_x za mjesno srednje vrijeme $t_s = 13^h15^m36^s$ na $\lambda = 107°28'.0W$, $\lambda = 7^h9^m52^s$ $(x = -7)$.

a) duži postupak

t_s	$13^h15^m36^s$
$-\lambda$	$7^h09^m52^s$
UT	$20^h25^m28^s$
$+x$	$-\ 7^h00^m00^s$
t_x	$13^h25^m28^s$

b) kraći postupak

t_s	$13^h15^m36^s$
$+(x-\lambda)$	$+\ 9^m52^s$
t_x	$13^h25^m28^s$

x	$-7^h00^m00^s$
$-\lambda$	$7^h09^m52^s$
$(x-\lambda)$	9^m52^s

5.2. PRETVARANJE ZVJEZDANOG VREMENA U ZONSKO I MJESNO SREDNJE VRIJEME

Određeno zvjezdano vrijeme pretvorimo u mjesni časovni ugao Proljećne tačke. Griničkі časovni ugao Proljećne tačke dobija se oduzimanjem geografske dužine od mjesnog časovnog ugla Proljećne tačke. Iz efemerida pomoću griničkog časovnog ugla Proljećne tačke određujemo univerzalno vrijeme. Dodavanjem zonskog indeksa dobija se zonsko vrijeme, ili dodavanjem geografske dužine izražene u vremenu dobija se mjesno srednje vrijeme. Moguće je da dobijemo t_x ili t_s za prethodni dan ili naredni dan od datuma za koji tražimo t_x ili t_s. U tom slučaju postupak određivanja vremena se ponavlja, ali od zapadne geografske dužine se oduzima S_φ za naredni dan, a za istočne geografske dužine za prethodni dan.

▶**PRIMJER 23.** Odrediti zonsko vrijeme t_x odnosno mjesno srednje vrijeme t_s za 19. januar 2010. godine ako je zvjezdano vrijeme $t_z = 6^h36^m3^s$ na $\lambda = 112°10'.5E$, $\lambda = 7^h28^m42^s$ $(x = +7)$.

$t_z = 6^h36^m03^s = s_\Upsilon$	$99°0'.8 + 360°$
$-\lambda$	$-112°10'.5$
S_Υ	$346°50'.3$
20. januar u UT $14^h00^m00^s$	$-S_\Upsilon$ $-328°51'.0$
Iz interpol. tablice za Proljećnu tačku u UT $1^h11^m45^s$ $15^h11^m45^s$	$\leftarrow$ $17°59'.3$

a) t_s

UT	$15^h11^m45^s$
$+\lambda$	$7^h28^m42^s$
t_s	$22^h40^m27^s$

b) t_x

UT	$15^h11^m45^s$
$+x$	$+\ 7^h00^m00^s$
t_x	$22^h11^m45^s$

6. IDENTIFIKACIJA ZVJEZDA POMOĆU ZVJEZDANIH KARATA

Zvjezdane karte u prilogu služe za opštu orijentaciju na zvjezdanom nebu i prepoznavanje zvjezda na dva moguća načina.

1. Meridijan posmatrača moguće je odrediti na zvjezdanoj karti pomoću surektascenzije zvijezde na tom meridijanu. Ako je posmatrač na zapadnoj geografskoj dužini i zvijezda je tačno u meridijanu, vrijednost λ_W jednaka je griničkom časovnom uglu te zvijezde ($\lambda_W = S_*$). Za posmatrača na istoj geografskoj dužini odnos je $(360° - \lambda_E) = S_*$. Pošto je griničkі časovni ugao zvijezde S_* jednak griničkom časovnom uglu Proljećne tačke umanjenom za rektascenziju zvijezde ($S_* = S_\Upsilon - \alpha_*$), onda je ($\alpha_* = S_\Upsilon - S_*$). Surektascenzija je jednaka časovnom uglu zvijezde umanjenom za časovni ugao Proljećne tačke $(360° - \alpha_*) = S_* - S_\Upsilon$. Griničkі časovni ugao zvijezde odgovara zapadnoj geografskoj dužini ($S_* = \lambda_W$), pa je $(360° - \alpha_*) = \lambda_W - S_\Upsilon$, dok je za istočne geografske dužine $(360° - \alpha_*) = (360° - \lambda_E) - S_\Upsilon$.

▶**PRIMJER 24.** Odrediti za 5. jul 2010. godine u UT $= 00^h06^m.3$ na zvjezdanoj karti meridijan posmatrača i prepoznati zvijezdu u zenitu ako je posmatrač na $\varphi = 45°11'N$, $\lambda = 25°45'.6E$.

a) određivanje S_Υ

5. jul za 00^h S_Υ	$282°52'.7$
Popravka časovnog ugla Proljećne tačke za 06^m18^s	$+\ 1°34'.8$
S_Υ	$284°27'.5$

b) određivanje surektascenzije zvijezde pomoću izraza $(360° - \alpha_*) = (360° - \lambda_E) - S_\Upsilon$

	$360°00'.0$
$-\lambda$	$-\ 25°45'.6$
$(360° - \lambda)$	$334°14'.4$
$-S_\Upsilon$	$284°27'.5$
$(360° - \alpha_*)$	$49°46'.9$
	$\cong 49°.8$

Prepoznavanje zvijezde u posmatračevom zenitu je jednostavno, jer se tačka u zenitu nalazi na njegovom meridijanu, a deklinacija zvijezde jednaka je geografskoj širini posmatrača. Stoga je surektascenzija zvezde oko 49°.8, a njena deklinacija oko 45°11′.0N. Iz pregleda zvjezda Godišnjaka ili zvjezdane karte vidljivo je da je to zvijezda Deneb (α Cyg) sa stvarnom surektascenzijom 49°32′.6 i deklinacijom 45°19′.0. Ostale zvjezde koje nisu u zenitu raspoznaju se upoređenjem slike zvjezdanog neba sa zvjezdanom kartom.

▶**PRIMJER 25.** Odrediti za 22. januar 2010. godine u $t_x = 4^h8^m.6$ ($x = +2$) na zvjezdanoj karti meridijan posmatrača i prepoznati zvijezdu blizu zenita. Posmatrač se nalazi na $\varphi = 54°50'\,\mathrm{N}$, $\lambda = 47°20'.1\,\mathrm{E}$.

a) određivanje UT

t_x	$4^h08^m.6$
$-x$	$-2^h00^m.0$
UT	$2^h08^m.6$

b) određivanje S_Υ

22. januar u 02^h S_Υ	151°18′.9
Popravka časovnog ugla Proljećne tačke za $08^m.6$	2°09′.4
S_Υ	153°28′.3

c) određivanje surektascenzije zvijezde pomoću izraza $(360° - \alpha_*) = (360° - \lambda_E) - S_\Upsilon$

$(360° - \lambda)$	312°39′.9
$-S_\Upsilon$	153°28′.3
$(360° - \alpha_*)$	159°11′.6

Iz zvjezdane karte ili pregleda zvjezda vidljivo je da je zvijezda blizu zenita Mizar (ζ Ursae Majoris) čija je deklinacija 54°52′.0N, a surektascenzija 158°55′.0.

2. Zvjezdana karta u Merkatorovoj projekciji na gornjem i donjem rubu ima upisane mjesece i dane i time je posmatraču omogućeno da odmah vidi koji je dio zvjezdanog neba vidljiv određenog datuma u pola noći. Ako želimo tačno odrediti meridijan posmatrača, moramo odrediti mjesni časovni ugao Proljećne tačke (zvjezdano mjesno vrijeme) i izračunatu vrednost oduzeti od 360°. Na gornjem rubu karte pronalazimo odgovarajuću surektascenziju i time dobijamo mesto meridijana posmatrača. Zvjezde desno od meridijana su prema zapadu, a lijevo prema istoku od posmatrača, koji je okrenut prema jugu.

▶**PRIMJER 26.** Odrediti meridijan posmatrača i prepoznati zvijezdu blizu zenita 14. aprila 2010. godine u $t_x = 23^h17^m.9$ ($x = +2$) na $\varphi = 52°36'\,\mathrm{N}$, $\lambda = 37°55'.6\,\mathrm{E}$.

a) određivanje UT

t_x	$23^h17^m.9$
x	$-\ 2^h00^m.0$
UT	$21^h17^m.9$

b) određivanje s_Υ

14. april za 20^h S_Υ	142°52′.6
Popravka časovnog ugla Proljećne tačke za $1^h17^m53^s$	19°31′.5
$-S_\Upsilon$	162°24′.1
$+\lambda$	$+$ 37°55′.6
s_Υ	200°19′.7
α	200°19′.7
$(360° - s_\Upsilon)$	159°40′.3
$(360° - \alpha)$	159°40′.3

Meridijan posmatrača nalazi se na skali surektascenzije na 159°.7. Pošto je vrijednost posmatračeve geografske širine slična vrijednosti deklinacije zvijezde, zvijezda blizu zenita može biti Mizar (ζ UMa), čija je stvarna deklinacija 54°52′.1 i surektascenzija 158°54′.1.

3. Prepoznavanje zvijezde u blizini zenita moguće je i pomoću mjesnog vremena posmatrača. Zvjezdano nebo zvjezdane karte prikazano je u pola noći, odnosno kada je $t_s = 00^h$ posmatrača. Znači da je određivanje zenita posmatrača lako, na karti se kao apscisa koristi određeni datum, a ordinata je geografska širina (φ) mjesta posmatrača.

Ako se položaj zenita posmatrača određuje u drugom trenutku, prvo se određuje zenit u ponoć i zatim se određuje vremenska razlika između $t_s = 0^h$ i mjesnog vremena posmatrača, uzima šestarom na časovnoj podeli donjeg ruba zvjezdane karte i nanosi se od pozicije zenita u pola noći, ulijevo ako je traženo vrijeme posle pola noći ili udesno ako je vrijeme pre pola noći. Dobijena tačka je pozicija zenita posmatrača.

Na taj način, određeni zenit posmatrača može poslužiti za približnu orijentaciju mjerenjem zenitne udaljenosti zvijezde po levoj ili desnoj stepenskoj podjeli deklinacije. Isto tako, može se odrediti približan azimut slično određivanju na pomorskoj karti. U tom slučaju, navigacijski trougao mora se okrenuti jer su E i W strane zvjezdane karte suprotno okrenute u odnosu na navigacijsku kartu. Takođe je bitno da su na ovaj način određeni podaci u blizini horizonta posmatrača netačni.

▶**PRIMJER 27.** Prepoznajte zvijezdu čiji je azimut $A_w = 168°$ i zenitna udaljenost $z = 29°$ dana 11. marta 2010. godine na poziciji $\varphi = 41°20'\,\mathrm{N}$ i $\lambda = 17°56'\,\mathrm{E}$ u $t_x = 22^h15^m$ ($x = +1$).

a) određivanje t_s

t_x	22^h15^m
$-(x - \lambda)$	$+\ 12^m$
t_s	22^h27^m

b) razlika u odnosu na ponoć

t_{s_1}	0^h00^m
$-t_{s_2}$	22^h27^m
Δt_s (pre ponoći)	1^h33^m

Postupajući na gore opisani način, nalazi se pozicija zenita u ponoć, sa koordinatama: $\phi = \delta = 41°.3\mathrm{N}$ i $(360° - \alpha) = 215°$ (11. mart). Od ove pozicije, približno u smjeru 168° i na udaljenosti 29°, pronalazimo zvijezdu Regulus (α Leonis).

⋆ ★ ★ ★ ⋆

$Z_V$anična

I

ZONSKA VREMENA

ZVANIČNA I ZONSKA VREMENA

ZONSKO VRIJEME

Podela Zemlje na vremenske zone izvršena je tako da svaka vremenska zona obuhvata područje od 15° geografske dužine. Početna vremenska zona sa zonskim indeksom 0 ($x = 0^h$) proteže se od griničkog meridijana na istok i na zapad do $\lambda = 7°.5\,\mathrm{E}$ i $\lambda = 7°.5\,\mathrm{W}$, a ostale zone nadovezuju se na ove prema istoku, i to sa zonskim indeksima $+1^h$ do $+12^h$, a prema zapadu one sa zonskim indeksima od -1^h do -12^h. Zone sa indeksima $+12^h$ i -12^h predstavljaju, u stvari, jednu te istu zonu sa indeksom $\pm 12^h$ koja se proteže između $\lambda = 172°.5\,\mathrm{E}$ i $\lambda = 172°.5\,\mathrm{W}$, sa središnjim meridijanom 180° od Griniča.

Za prijelaz sa zonskog na griničko vrijeme koristi se obrazac, gdje x označava zonski indeks:

$$\mathrm{UT} = \mathrm{t_x} - \mathrm{x}$$

(O pretvaranju vremena vidi primjer u poglavlju 5 Uputstva za upotrebu Nautičkog godišnjaka).

DATUMSKA GRANICA

Linija na čijem se prelazu vrši promjena datuma zove se *datumska granica*. Ona se ne proteže tačno po meridijanu 180°, već zaobilazi nastanjeno kopno i ostrva, pa ide linijom koja se dobije spojnicom sledećih tačaka:

φ	λ	φ	λ
90°.0 N	180°	48°.0 N	180°
75°.0 N	180°	05°.0 S	180°
68°.0 N	168°58′22″ W (ostrva Diomede)	15°.0 S	172°.5 W
65°.5 N	168°58′22″ W (Beringov moreuz)	45°.0 S	172°.5 W
53°.0 N	170° E	51°.0 S	180°
		90°.0 S	180°

Prilikom prijelaza datumske granice, ploveći prema zapadu datum se *povećava* za jedan dan. Kada se ona prelazi ploveći prema istoku, *smanjuje* se za jedan dan.

ZVANIČNO VRIJEME I LJETNO VRIJEME

Zvanično vrijeme, tj. ono vrijeme koje se unutar granica pojedinih država ili unutar njihovih određenih teritorija koristi u službenom i svakodnevnom životu, najčešće je jednako odgovarajućem zonskom vremenu ili tzv. zimskom vremenu (vidi „Pregled zvaničnih vremena“). Veće zemlje imaju više zvaničnih vremena od kojih svako važi za određene teritorije.

Neke zemlje uvode i *ljetno vrijeme* zbog racionalnog iskorišćenja dnevnog svjetla. Ono se obično razlikuje od zonskog (zimskog) vremena za 1^h, a načelno važi na sjevernoj hemisferi za razdoblje od aprila do oktobra, a na južnoj hemisferi od oktobra do marta. Ipak, neke zemlje ne utvrđuju ni jednake ni fiksne datume prelaska, već ih uvode od slučaja do slučaja na nekoliko dana pre prelaska.

Za prijelaz sa *zvaničnog* na *griničko* vrijeme koristi se obrazac

$$\mathrm{UT} = \mathrm{t_{zv}} - \mathrm{zv},$$

gdje zv označava indeks zvaničnog vremena.

HRONOLOŠKI CIKLUSI I ERE

Epakta	14	Julijanski period	6723
Zlatni broj (Mjesečev ciklus)	XVI	Sunčev ciklus	3

Era	Godina	Počinje	Era	Godina	Počinje
Vizantijska	7519	14. Sep.	Japanska	2670	1. Jan.
Jevrejska	5771	8. Sep.	Grčka (Seleukidova)	2322	14. Sep.
Kineska (Geng Yin)	(4647)	14. Feb.	Indijska (Saka)	1932	22. Mart
Rimska	2763	14. Jan.	Dioklecijanova	1727	11. Sep.
Nabonasarova	2759	21. Apr.	Islamska (Hegira)	1432	7. Dec.

PREGLED ZVANIČNIH VREMENA

ISTOČNO OD GREENWICH-a
[+]

Albanija	1 00
Alžir	1 00
Angola	1 00
Australija:	
Capital Territory	10 00
New South Wales	10 00
Northern Territory	9 30
Queensland	10 00
South Australia	9 30
Tasmania	10 00
Victoria	10 00
Western Australia	8 00
Bahrein	3 00
Balearska ostrva	1 00
Bali	7 00
Bangladeš	6 00
Belgija	1 00
Benin (Dahomej)	1 00
Brunei	8 00
Bugarska	2 00
Burma	6 30
Burundi	2 00
Ceuta	1 00
Čad	1 00
Danska	1 00
Džibuti	3 00
Egipat	2 00
Etiopija	3 00
Fidži	12 00
Filipini	8 00
Finska	2 00
Francuska	1 00
Gabon	1 00
Gibraltar	1 00
Grčka	2 00
Holandija	1 00
Hong Kong	8 00
Indija	5 30
Indonezija:	
Bali, Java, Sumatra	7 00
Borneo, Flores, Timor	8 00
Irian, Molučka ostrva	9 00
Irak	3 00
Iran	3 30
Irska	0 00
Island	0 00
Italija	1 00
Izrael	2 00
Japan	9 00
Jemen	3 00
Jordan	2 00
Jugoslavija	1 00
Južnoafrička Republika	2 00
Kamčatka	12 00
Kamerun	1 00
Kampučija	7 00
Katar	3 00
Kenija	3 00
Kina	8 00
Kipar	2 00
Koreja	9 00
Krit	2 00
Kuvajt	3 00
Laos	7 00
Liban	2 00
Libija	1 00
Madagaskar	3 00
Makao	8 00
Maldivska ostrva	5 00
Malezija	8 00
Malta	1 00
Mandžurija	9 00
Marijanska ostrva	10 00
Mauricijus	4 00
Monako	1 00
Mozambik	2 00
Namibija	2 00
Nemačka	1 00
Nigerija	1 00
Norveška	1 00
Nova Kaledonija	11 00
Novi Zeland	12 00
Oman	4 00
Pakistan	5 00
Papua, Nova Gvineja	10 00
Poljska	1 00
Reunion	4 00
Rumunija	2 00
Rusija (10 zona):	
Novi Port	5 00
Sahalin	11 00
Sankt Petersburg	3 00
Vladivostok	10 00
Volgograd	4 00
Sao Tome i Principe	0 00
Sardinija	1 00
Saudijska Arabija	3 00
Sejšelska ostrva	4 00
Sicilija	1 00
Singapur	8 00
Sirija	2 00
Sokotra	3 00
Somalija	3 00
Sudan	2 00
Španija	1 00
Šri Lanka (Cejlon)	5 30
Švedska	1 00
Tajland	7 00
Tajvan	8 00
Tanzanija	3 00
Tunis	1 00
Turska	3 00
Uganda	3 00
Ujedinjeni Emirati	4 00
Velika Britanija	0 00
Vijetnam	7 00

ZAPADNO OD GREENWICH-a
[−]

Argentina	3 00
Azorska ostrva	1 00
Bahamska ostrva	5 00
Barbados	4 00
Belize	6 00
Bermuda	4 00
Bolivija	4 00
Brazil:	
Istočni deo	3 00
Srednji deo	4 00
Zapadni deo	5 00
Čile	4 00
Dominikanska Republika	4 00
Ekvador	5 00
Foklandska ostrva	4 00
Galapagos	6 00
Gambija	0 00
Gana	0 00
Grenada	4 00
Gvajana (Francuska)	3 00
Gvajana (Republika)	3 00
Gvatemala	6 00
Haiti	5 00
Honduras	6 00
Jamajka	5 00
Kajmanska ostrva	5 00
Kanada:	
British Columbia	8 00
Labrador	4 00
New Foundland	3 30
New Scotia	4 00
Yucon	8 00
Kanarska ostrva	0 00
Kapverdska ostrva	1 00
Kolumbija	5 00
Kostarika	6 00
Kuba	5 00
Martinik	4 00
Meksiko	6 00
Midvej	11 00
Nikaragva	6 00
Panamski kanal	5 00
Peru	5 00
Portoriko	4 00
SAD (6 zona):	
Aljaska	9 00
Atlantska obala	5 00
Florida	5 00
Havaji	10 00
Meksički zaliv	6 00
Pacifička obala	8 00
Salvador	6 00
Samoa	11 00
Surinam	3 00
Tobago	4 00
Trinidad	4 00
Urugvaj	3 00
Venecuela	4 00

Karte

ZVJEZDANOG NEBA