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Godina LXXIII

NAUTIČKI GODIŠNJAK

ZA

2015

GODINU

UPRAVA ZA SIGURNOST PLOVIDBE REPUBLIKE SRBIJE
ZEMUN – BEOGRAD SRBIJA

UKUPNA POPRAVKA VISINE

PRVA POPRAVKA VISINE
ZA SUNCE, ZVEZDE 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 PROMENE 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 vrednost *manje* dvostruki radijus (2r)

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var = promenljivi deo Nautičkog godišnjaka
const = stalni deo Nautičkog godišnjaka

PREDGOVOR

Stevo Šegan prvi put ove godine izdaje svoj broj NAUTIČKOG GODIŠNJAKA, koji je sedamdesetitreći u ukupnom nizu izdanja ove publikacije na našim prostorima.

Za sedamdesetitri broja Nautičkog godišnjaka, do sada, možemo zahvaliti nekolikim armijama, koje su dale svoj doprinos da ova publikacija bude 42 godine prisutna među pomorcima Kraljevine Jugoslavije, Socijalističke Jugoslavije i njihovih pravnih i bespravnih naslednika i Stevi Šeganu za preostalih 31 broj.

Put je išao preko preuzimanja ruskih Nautičkih godišnjaka, koji su prevođeni na naš jezik i kada su ručno ukucavane brojevne vrednosti efemerida, tablica popravki i svih ostalih delova Godišnjaka, do današnje 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 trideset, izvršio je prof. dr Stevo Šegan, profesor na Katedri za astronomiju Matematičkog fakulteta u Beogradu.

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

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

Godišnjak se sastoji iz dva dela—*efemeridskog* (var) i *stalnog* (const). Efemeridski deo sadrži efemeride Sunca, Meseca, četiri velike planete (Venere, Marsa, Jupitera i Saturna) i pedeset četiri najsjajnije (nautičke) zvezde za celu godinu i tablice za određivanje geografske širine pomoću visine i azimuta Severnjače. Stalni deo Godišnjaka sadrži interpolacione i pomoćne tablice.

Svi vremenski podaci u Nautičkom godišnjaku odnose se na Griniči meridijan. Prema tome, argument u svim efemeridama je univerzalno vreme, koje se računa od ponoći ($00^h.00$).

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

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

Sve primedbe, koje smo dobili nakon izlaženja prethodnih brojeva, ukoliko se pokazalo da su tačne, uvažili smo.

Molimo da nam i u buduće dostavite eventualne i opravdane primedbe i ispravke, koje ćemo, sa punim uvažavanjem, razmotriti.

STEVO ŠEGAN

ASTRONOMSKI ZNACI, SKRAĆENICE I KONSTANTE

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

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

OPŠTI ASTRONOMSKI ZNACI

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

SKRAĆENICE

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

ZODIJAČKI ZNACI I SAZVEŽĐA

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

♈ ... Prolećna tačka
♎ ... Jesenja tačka

OSNOVNE ASTRONOMSKE KONSTANTE
IAU(1976) XXIV(2000)

DEFINICIONE KONSTANTE

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

OSNOVNE KONSTANTE

Svetlosno vreme	$\tau_A = 499.004\,786\,s$
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 Meseca u jedinicama mase Zemlje	$\mu = 0.012\,300\,04$
Opšta precesija u longitudi, za Julijansko stoleće	$\rho = 5029''.7970$
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+Mesec	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 REČI

Domestic and English Abbreviations and Key Words

UT	Univerzalno (svetsko) vreme	**UT**	Universal Time
$\mathbf{T_p}$	Griničko pravo vreme	**GAT**	Greenwich Apparent Time
$\mathbf{T_z}$	Griničko zvezdano vreme	**GST**	Greenwich Sidereal Time
$\mathbf{T_{\overline{m}}}$	Srednje vreme 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 vreme donjeg prolaza kroz meridijan u Griniču	$\mathbf{T_{\underline{r}}}$	Greenwich Mean Time of the Lower Transit on the Meridian of Greenwich
$\mathbf{t_s}$	Mesno srednje vreme	**LMT**	Local Mean Time
$\mathbf{t_p}$	Mesno pravo vreme	**LAT**	Local Apparent Time
$\mathbf{t_z}$	Mesno zvezdano vreme	**LST**	Local Sidereal Time
$\mathbf{t_x}$	Zonsko vreme	**ZT**	Zone Time
$\mathbf{t_{zv}}$	Zvanično vreme	**LCT**	Local Civil Time
e	Jednačina vremena	**Eq.T.**	Equation of Time (App.-Mean)
S	Grinički časovni ugao	**GHA**	Greenwich Hour Angle
s	Mesni 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	Prolećna 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 zvezda	Review of Selected Stars
Prividni položaji zvezda	Apparent Places of Selected Stars
Popravka časovnog ugla	Increment to GHA
Druga popravka za časovni ugao i deklinaciju	Correction to GHA and Declination
Vreme prolaza zvezda	Upper Transit of Stars at Greenwich
Popravka	Correction
Tablice za određivanje geografske širine i azimuta pomoću Severnjače	Latitude and Azimuth by Polaris
Interpolacione tablice	Interpolation Tables
Izlaz, zalaz	Rise, Set
Trajanje sumraka	Twilight Duration
Građanski	Civil
Astronomski	Astronomic
Mesečeve mene	Moon Phases
Starost Meseca	Moon Age
Perigej	Perigee
Apogej	Apogee

PODACI O MESECU I POČETKU GODIŠNJIH DOBA

MESEČEVE MENE

mesec	MLAD MESEC ● dan	h	min	● dan	h	min	PRVA ČETVRT ◐ dan	h	min	◐ dan	h	min	PUN MESEC ○ dan	h	min	○ dan	h	min	POSLEDNJA ČETVRT ◑ dan	h	min	◑ dan	h	min	mesec
Januar	20	13	14				27	4	48				5	4	53				13	9	46				Januar
Februar	18	23	47				25	17	14				3	23	9				12	3	50				Februar
Mart	20	9	36				27	7	43				5	18	5				13	17	48				Mart
April	18	18	57				25	23	55				4	12	5				12	3	44				April
Maj	18	4	13				25	17	19				4	3	42				11	10	36				Maj
Jun	16	14	5				24	11	2				2	16	19				9	15	42				Jun
Jul	16	1	24				24	4	4				2	2	20	31	10	43	8	20	24				Jul
Avgust	14	14	53				22	19	31							29	18	35	7	2	3				Avgust
Septembar	13	6	41				21	8	59							28	2	50	5	9	54				Septembar
Oktobar	13	0	6				20	20	31							27	12	5	4	21	6				Oktobar
Novembar	11	17	47				19	6	27							25	22	44	3	12	24				Novembar
Decembar	11	10	29				18	15	14							25	11	11	3	7	40				Decembar

PERIGEJ I APOGEJ MESECA

mesec	PERIGEJ dan	h	min	dan	h	min		APOGEJ dan	h	min	dan	h	min	mesec
Januar	21	20	7.0					9	18	18.0				Januar
Februar	19	7	31.0					6	6	27.0				Februar
Mart	19	19	39.0					5	7	36.0				Mart
April	17	3	54.0					1	13	0.0	29	3	56.0	April
Maj	15	0	24.0								26	22	14.0	Maj
Jun	10	4	40.0								23	17	2.0	Jun
Jul	5	18	55.0								21	11	3.0	Jul
Avgust	2	10	12.0	30	15	25.0					18	2	34.0	Avgust
Septembar				28	1	47.0					14	11	29.0	Septembar
Oktobar				26	13	0.0					11	13	18.0	Oktobar
Novembar				23	20	7.0					7	21	50.0	Novembar
Decembar				21	8	54.0					5	14	57.0	Decembar

VIDLJIVOST PLANETA

Osenčeni deo dijagrama pokazuje kada je planeta nevidljiva

Planeta	Jan.	Feb.	Mart	Apr.	Maj	Jun	Jul	Avg.	Sep.	Okt.	Nov.	Dec.
♀ Venera							11.VIII	20.VIII				
♂ Mars				18.IV				6.VIII				
♃ Jupiter							13.VIII	10.IX				
♄ Saturn											13.XI	17.

POČECI GODIŠNJIH DOBA

PROLEĆE	LETO	JESEN	ZIMA
21. mart u $22^h\,45^m.0$	21. jun u $16^h\,38^m.0$	23. septembar u $8^h\,20^m.0$	22. decembar u $4^h\,48^m.0$

POMRAČENJA SUNCA I MESECA

u 2015. godini

DESIĆE SE UKUPNO ČETRI POMRAČENJA:
JEDNO POTPUNO I JEDNO DELIMIČNO POMRAČENJE SUNCA
I DVA POTPUNA POMRAČENJA MESECA

2.	20. MART	POTPUNO POMRAČENJE SUNCA	univerzalno (svetsko) vreme dan h min
•	→	POČETAK POMRAČENJA	20 7 40.8
•••	←	POČETAK POTPUNOG POMRAČENJA	20 9 12.7
••••	⇉⇇	MAKSIMUM POMRAČENJA	20 10 17.1
•••	→	KRAJ POTPUNOG POMRAČENJA	20 10 18.2
•	←	KRAJ POMRAČENJA	20 11 50.2
		VIDLJIVOST: ATLANTIK, GRENLAND, SEVEROIZAPADNA AFRIKA, EVROPA, BLISKI ISTOK, RUSIJA	

3.	4. APRIL	POTPUNO POMRAČENJE MESECA	univerzalno (svetsko) vreme dan h min
•	→	ULAZAK MESECA U POLUSENKU	4 8 59.6
•••	←	PRVI KONTAKT SA SENKOM	4 10 15.4
••••	⇉⇇	SREDINA POMRAČENJA	4 12 0.2
•••	→	POSLEDNJI KONTAKT SA SENKOM	4 13 45.1
•	←	IZLAZAK MESECA IZ POLUSENKE	4 15 0.8

4.	13. SEPTEMBAR	DELIMIČNO POMRAČENJE SUNCA	univerzalno (svetsko) vreme dan h min
•	→	POČETAK POMRAČENJA	13 4 41.7
••••	⇉⇇	SREDINA POMRAČENJA	13 6 54.2
•	←	KRAJ POMRAČENJA	13 9 6.4
		VIDLJIVOST: JUŽNA AFRIKA, ANTARKTIK, JUŽNI INDIJSKI OKEAN	

1.	28. SEPTEMBAR	POTPUNO POMRAČENJE MESECA	univerzalno (svetsko) vreme dan h min
•	→	ULAZAK MESECA U POLUSENKU	28 0 10.3
•••	←	PRVI KONTAKT SA SENKOM	28 1 6.8
••••	⇉⇇	SREDINA POMRAČENJA	28 2 47.1
•••	→	POSLEDNJI KONTAKT SA SENKOM	28 4 27.4
•	←	IZLAZAK MESECA IZ POLUSENKE	28 5 24.0

KALENDAR

za prostu 2015. godinu

JANUAR

Dan u sed.		Dan u mes.	Dan u god.	Julijanski datum
				245
ČE		1	1	7023.5
PE		2	2	7024.5
SU		3	3	7025.5
NE	1	4	4	7026.5
PO		5	5	7027.5
UT		6	6	7028.5
SR		7	7	7029.5
ČE		8	8	7030.5
PE		9	9	7031.5
SU		10	10	7032.5
NE	2	11	11	7033.5
PO		12	12	7034.5
UT		13	13	7035.5
SR		14	14	7036.5
ČE		15	15	7037.5
PE		16	16	7038.5
SU		17	17	7039.5
NE	3	18	18	7040.5
PO		19	19	7041.5
UT		20	20	7042.5
SR		21	21	7043.5
ČE		22	22	7044.5
PE		23	23	7045.5
SU		24	24	7046.5
NE	4	25	25	7047.5
PO		26	26	7048.5
UT		27	27	7049.5
SR		28	28	7050.5
ČE		29	29	7051.5
PE		30	30	7052.5
SU		31	31	7053.5

FEBRUAR

Dan u sed.		Dan u mes.	Dan u god.	Julijanski datum
				245
NE	5	1	32	7054.5
PO		2	33	7055.5
UT		3	34	7056.5
SR		4	35	7057.5
ČE		5	36	7058.5
PE		6	37	7059.5
SU		7	38	7060.5
NE	6	8	39	7061.5
PO		9	40	7062.5
UT		10	41	7063.5
SR		11	42	7064.5
ČE		12	43	7065.5
PE		13	44	7066.5
SU		14	45	7067.5
NE	7	15	46	7068.5
PO		16	47	7069.5
UT		17	48	7070.5
SR		18	49	7071.5
ČE		19	50	7072.5
PE		20	51	7073.5
SU		21	52	7074.5
NE	8	22	53	7075.5
PO		23	54	7076.5
UT		24	55	7077.5
SR		25	56	7078.5
ČE		26	57	7079.5
PE		27	58	7080.5
SU		28	59	7081.5

MART

Dan u sed.		Dan u mes.	Dan u god.	Julijanski datum
				245
NE	9	1	60	7082.5
PO		2	61	7083.5
UT		3	62	7084.5
SR		4	63	7085.5
ČE		5	64	7086.5
PE		6	65	7087.5
SU		7	66	7088.5
NE	10	8	67	7089.5
PO		9	68	7090.5
UT		10	69	7091.5
SR		11	70	7092.5
ČE		12	71	7093.5
PE		13	72	7094.5
SU		14	73	7095.5
NE	11	15	74	7096.5
PO		16	75	7097.5
UT		17	76	7098.5
SR		18	77	7099.5
ČE		19	78	7100.5
PE		20	79	7101.5
SU		21	80	7102.5
NE	12	22	81	7103.5
PO		23	82	7104.5
UT		24	83	7105.5
SR		25	84	7106.5
ČE		26	85	7107.5
PE		27	86	7108.5
SU		28	87	7109.5
NE	13	29	88	7110.5
PO		30	89	7111.5
UT		31	90	7112.5

APRIL

Dan u sed.		Dan u mes.	Dan u god.	Julijanski datum
				245
SR		1	91	7113.5
ČE		2	92	7114.5
PE		3	93	7115.5
SU		4	94	7116.5
NE	14	5	95	7117.5
PO		6	96	7118.5
UT		7	97	7119.5
SR		8	98	7120.5
ČE		9	99	7121.5
PE		10	100	7122.5
SU		11	101	7123.5
NE	15	12	102	7124.5
PO		13	103	7125.5
UT		14	104	7126.5
SR		15	105	7127.5
ČE		16	106	7128.5
PE		17	107	7129.5
SU		18	108	7130.5
NE	16	19	109	7131.5
PO		20	110	7132.5
UT		21	111	7133.5
SR		22	112	7134.5
ČE		23	113	7135.5
PE		24	114	7136.5
SU		25	115	7137.5
NE	17	26	116	7138.5
PO		27	117	7139.5
UT		28	118	7140.5
SR		29	119	7141.5
ČE		30	120	7142.5

MAJ

Dan u sed.		Dan u mes.	Dan u god.	Julijanski datum
				245
PE		1	121	7143.5
SU		2	122	7144.5
NE	18	3	123	7145.5
PO		4	124	7146.5
UT		5	125	7147.5
SR		6	126	7148.5
ČE		7	127	7149.5
PE		8	128	7150.5
SU		9	129	7151.5
NE	19	10	130	7152.5
PO		11	131	7153.5
UT		12	132	7154.5
SR		13	133	7155.5
ČE		14	134	7156.5
PE		15	135	7157.5
SU		16	136	7158.5
NE	20	17	137	7159.5
PO		18	138	7160.5
UT		19	139	7161.5
SR		20	140	7162.5
ČE		21	141	7163.5
PE		22	142	7164.5
SU		23	143	7165.5
NE	21	24	144	7166.5
PO		25	145	7167.5
UT		26	146	7168.5
SR		27	147	7169.5
ČE		28	148	7170.5
PE		29	149	7171.5
SU		30	150	7172.5
NE	22	31	151	7173.5

JUN

Dan u sed.		Dan u mes.	Dan u god.	Julijanski datum
				245
PO		1	152	7174.5
UT		2	153	7175.5
SR		3	154	7176.5
ČE		4	155	7177.5
PE		5	156	7178.5
SU		6	157	7179.5
NE	23	7	158	7180.5
PO		8	159	7181.5
UT		9	160	7182.5
SR		10	161	7183.5
ČE		11	162	7184.5
PE		12	163	7185.5
SU		13	164	7186.5
NE	24	14	165	7187.5
PO		15	166	7188.5
UT		16	167	7189.5
SR		17	168	7190.5
ČE		18	169	7191.5
PE		19	170	7192.5
SU		20	171	7193.5
NE	25	21	172	7194.5
PO		22	173	7195.5
UT		23	174	7196.5
SR		24	175	7197.5
ČE		25	176	7198.5
PE		26	177	7199.5
SU		27	178	7200.5
NE	26	28	179	7201.5
PO		29	180	7202.5
UT		30	181	7203.5

JUL

Dan u sed.		Dan u mes.	Dan u god.	Julijanski datum
				245
SR		1	182	7204.5
ČE		2	183	7205.5
PE		3	184	7206.5
SU		4	185	7207.5
NE	27	5	186	7208.5
PO		6	187	7209.5
UT		7	188	7210.5
SR		8	189	7211.5
ČE		9	190	7212.5
PE		10	191	7213.5
SU		11	192	7214.5
NE	28	12	193	7215.5
PO		13	194	7216.5
UT		14	195	7217.5
SR		15	196	7218.5
ČE		16	197	7219.5
PE		17	198	7220.5
SU		18	199	7221.5
NE	29	19	200	7222.5
PO		20	201	7223.5
UT		21	202	7224.5
SR		22	203	7225.5
ČE		23	204	7226.5
PE		24	205	7227.5
SU		25	206	7228.5
NE	30	26	207	7229.5
PO		27	208	7230.5
UT		28	209	7231.5
SR		29	210	7232.5
ČE		30	211	7233.5
PE		31	212	7234.5

AVGUST

Dan u sed.		Dan u mes.	Dan u god.	Julijanski datum
				245
SU		1	213	7235.5
NE	31	2	214	7236.5
PO		3	215	7237.5
UT		4	216	7238.5
SR		5	217	7239.5
ČE		6	218	7240.5
PE		7	219	7241.5
SU		8	220	7242.5
NE	32	9	221	7243.5
PO		10	222	7244.5
UT		11	223	7245.5
SR		12	224	7246.5
ČE		13	225	7247.5
PE		14	226	7248.5
SU		15	227	7249.5
NE	33	16	228	7250.5
PO		17	229	7251.5
UT		18	230	7252.5
SR		19	231	7253.5
ČE		20	232	7254.5
PE		21	233	7255.5
SU		22	234	7256.5
NE	34	23	235	7257.5
PO		24	236	7258.5
UT		25	237	7259.5
SR		26	238	7260.5
ČE		27	239	7261.5
PE		28	240	7262.5
SU		29	241	7263.5
NE	35	30	242	7264.5
PO		31	243	7265.5

SEPTEMBAR

Dan u sed.		Dan u mes.	Dan u god.	Julijanski datum
				245
UT		1	244	7266.5
SR		2	245	7267.5
ČE		3	246	7268.5
PE		4	247	7269.5
SU		5	248	7270.5
NE	36	6	249	7271.5
PO		7	250	7272.5
UT		8	251	7273.5
SR		9	252	7274.5
ČE		10	253	7275.5
PE		11	254	7276.5
SU		12	255	7277.5
NE	37	13	256	7278.5
PO		14	257	7279.5
UT		15	258	7280.5
SR		16	259	7281.5
ČE		17	260	7282.5
PE		18	261	7283.5
SU		19	262	7284.5
NE	38	20	263	7285.5
PO		21	264	7286.5
UT		22	265	7287.5
SR		23	266	7288.5
ČE		24	267	7289.5
PE		25	268	7290.5
SU		26	269	7291.5
NE	39	27	270	7292.5
PO		28	271	7293.5
UT		29	272	7294.5
SR		30	273	7295.5

OKTOBAR

Dan u sed.		Dan u mes.	Dan u god.	Julijanski datum
				245
ČE		1	274	7296.5
PE		2	275	7297.5
SU		3	276	7298.5
NE	40	4	277	7299.5
PO		5	278	7300.5
UT		6	279	7301.5
SR		7	280	7302.5
ČE		8	281	7303.5
PE		9	282	7304.5
SU		10	283	7305.5
NE	41	11	284	7306.5
PO		12	285	7307.5
UT		13	286	7308.5
SR		14	287	7309.5
ČE		15	288	7310.5
PE		16	289	7311.5
SU		17	290	7312.5
NE	42	18	291	7313.5
PO		19	292	7314.5
UT		20	293	7315.5
SR		21	294	7316.5
ČE		22	295	7317.5
PE		23	296	7318.5
SU		24	297	7319.5
NE	43	25	298	7320.5
PO		26	299	7321.5
UT		27	300	7322.5
SR		28	301	7323.5
ČE		29	302	7324.5
PE		30	303	7325.5
SU		31	304	7326.5

NOVEMBAR

Dan u sed.		Dan u mes.	Dan u god.	Julijanski datum
				245
NE	44	1	305	7327.5
PO		2	306	7328.5
UT		3	307	7329.5
SR		4	308	7330.5
ČE		5	309	7331.5
PE		6	310	7332.5
SU		7	311	7333.5
NE	45	8	312	7334.5
PO		9	313	7335.5
UT		10	314	7336.5
SR		11	315	7337.5
ČE		12	316	7338.5
PE		13	317	7339.5
SU		14	318	7340.5
NE	46	15	319	7341.5
PO		16	320	7342.5
UT		17	321	7343.5
SR		18	322	7344.5
ČE		19	323	7345.5
PE		20	324	7346.5
SU		21	325	7347.5
NE	47	22	326	7348.5
PO		23	327	7349.5
UT		24	328	7350.5
SR		25	329	7351.5
ČE		26	330	7352.5
PE		27	331	7353.5
SU		28	332	7354.5
NE	48	29	333	7355.5
PO		30	334	7356.5

DECEMBAR

Dan u sed.		Dan u mes.	Dan u god.	Julijanski datum
				245
UT		1	335	7357.5
SR		2	336	7358.5
ČE		3	337	7359.5
PE		4	338	7360.5
SU		5	339	7361.5
NE	49	6	340	7362.5
PO		7	341	7363.5
UT		8	342	7364.5
SR		9	343	7365.5
ČE		10	344	7366.5
PE		11	345	7367.5
SU		12	346	7368.5
NE	50	13	347	7369.5
PO		14	348	7370.5
UT		15	349	7371.5
SR		16	350	7372.5
ČE		17	351	7373.5
PE		18	352	7374.5
SU		19	353	7375.5
NE	51	20	354	7376.5
PO		21	355	7377.5
UT		22	356	7378.5
SR		23	357	7379.5
ČE		24	358	7380.5
PE		25	359	7381.5
SU		26	360	7382.5
NE	52	27	361	7383.5
PO		28	362	7384.5
UT		29	363	7385.5
SR		30	364	7386.5
ČE		31	365	7387.5

⋆ ★ ★ ★ ⋆

Efemeride

SUNCA, MESECA, VENERE,
MARSA, JUPITERA I SATURNA

1. JANUAR 2015. ČETVRTAK

UT	SUNCE		PROLEĆ. TAČKA	VENERA		MARS	
	$S_\odot$	$\delta_\odot$	S_Υ	S_φ	δ_φ	S_σ	δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	179 11.9	-23 2.4	100 19.5	161 18.0	-22 8.4	136 31.2	-15 33.3
2	209 11.3	-23 2.0	130 24.5	191 16.3	-22 7.3	166 32.3	-15 32.0
4	239 10.7	-23 1.7	160 29.4	221 14.6	-22 6.2	196 33.4	-15 30.7
6	269 10.1	-23 1.3	190 34.3	251 12.9	-22 5.1	226 34.5	-15 29.3
8	299 9.5	-23 .8	220 39.2	281 11.1	-22 3.9	256 35.6	-15 28.0
10	329 8.9	-23 .4	250 44.2	311 9.4	-22 2.8	286 36.7	-15 26.7
12	359 8.4	-23 .0	280 49.1	341 7.7	-22 1.7	316 37.8	-15 25.4
14	29 7.8	-22 59.6	310 54.0	11 6.0	-22 .6	346 38.9	-15 24.1
16	59 7.2	-22 59.2	340 59.0	41 4.3	-21 59.4	16 40.0	-15 22.8
18	89 6.6	-22 58.8	11 3.9	71 2.6	-21 58.3	46 41.1	-15 21.5
20	119 6.0	-22 58.4	41 8.8	101 .8	-21 57.1	76 42.2	-15 20.2
22	149 5.4	-22 57.9	71 13.7	130 59.1	-21 56.0	106 43.3	-15 18.9
Δ	-3	2		-9	6	6	7

UT	MESEC				JUPITER		SATURN	
	$S_\leftmoon$	Δ	$\delta_\leftmoon$	Δ	$S_{\mathrm{♃}}$	$\delta_{\mathrm{♃}}$	$S_{\mathrm{♄}}$	$\delta_{\mathrm{♄}}$
h	° ′		° ′		° ′	° ′	° ′	° ′
0	51 21.5	99	15 6.2	62	315 55.1	15 3.6	221 11.5	-18 26.3
2	80 19.3	98	15 18.7	61	346 .4	15 3.7	251 15.9	-18 26.4
4	109 17.0	98	15 30.8	59	16 5.7	15 3.9	281 20.3	-18 26.5
6	138 14.6	98	15 42.6	57	46 11.0	15 4.0	311 24.7	-18 26.6
8	167 12.2	98	15 54.0	55	76 16.3	15 4.1	341 29.1	-18 26.7
10	196 9.8	98	16 5.1	54	106 21.5	15 4.3	11 33.5	-18 26.8
12	225 7.3	97	16 15.8	52	136 26.8	15 4.4	41 37.9	-18 26.9
14	254 4.8	97	16 26.1	50	166 32.1	15 4.6	71 42.3	-18 27.0
16	283 2.3	97	16 36.1	48	196 37.4	15 4.7	101 46.7	-18 27.1
18	311 59.7	97	16 45.7	46	226 42.7	15 4.8	131 51.2	-18 27.2
20	340 57.1	97	16 54.9	44	256 48.0	15 5.0	161 55.6	-18 27.3
22	9 54.5	97	17 3.7	42	286 53.3	15 5.1	191 60.0	-18 27.4
Δ					26	1	22	0

φ	SUNCE		TRAJANJE SUMRAKA		MESEC			
	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 2	15 5	0 57	2 44	13 1	1.5	4 39	2.9
55	8 25	15 42	0 45	2 17	13 24	1.7	4 16	2.8
50	7 59	16 9	0 38	1 59	13 42	1.8	3 59	2.6
45	7 38	16 29	0 34	1 46	13 56	1.8	3 46	2.6
40	7 22	16 45	0 30	1 37	14 7	1.9	3 35	2.5
35	7 8	16 59	0 28	1 30	14 17	1.9	3 26	2.4
30	6 56	17 11	0 26	1 25	14 26	2.0	3 18	2.4
20	6 35	17 32	0 24	1 18	14 41	2.1	3 3	2.3
10	6 17	17 50	0 23	1 15	14 54	2.1	2 51	2.2
0	5 60	18 7	0 22	1 15	15 7	2.2	2 40	2.2
10	5 42	18 24	0 23	1 17	15 19	2.2	2 28	2.1
20	5 24	18 43	0 24	1 24	15 32	2.3	2 16	2.0
30	5 2	19 5	0 27	1 36	15 48	2.3	2 2	1.9
35	4 49	19 17	0 30	1 46	15 57	2.4	1 54	1.9
40	4 35	19 32	0 33	2 2	16 7	2.4	1 44	1.8
45	4 17	19 50	0 37	2 30	16 19	2.5	1 34	1.7
50	3 55	20 12	0 44	: ::	16 33	2.5	1 21	1.7
55	3 26	20 41	0 57	: ::	16 52	2.6	1 4	1.5
60	2 43	21 23	1 36	: ::	17 17	2.7	0 43	1.4
S								

SUNCE				MESEC				
UT	e = T_p − UT	Δ/24	r	Prolaz		Δ/24	$\pi_\leftmoon$	r
h	min s	s	′	$T_{\overline{m}}$	h min	min	′	′
00	− 3 12.4	-1.2	16.3		21 19	2.2	57.2	15.6
12	− 3 26.5	$T_{\overline{m}_\odot}$	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	′	°	
♀	13 16	.1	61	-3.0	♃	2 56	.0	216	-2.0
♂	14 53	.1	36	.9	♄	9 14	.0	121	.8

2. JANUAR PETAK

UT	SUNCE		PROLEĆ. TAČKA	VENERA		MARS	
	$S_\odot$	$\delta_\odot$	S_Υ	S_φ	δ_φ	S_σ	δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	179 4.8	-22 57.5	101 18.7	160 57.4	-21 54.8	136 44.4	-15 17.6
2	209 4.2	-22 57.1	131 23.6	190 55.7	-21 53.7	166 45.5	-15 16.3
4	239 3.7	-22 56.7	161 28.5	220 54.0	-21 52.5	196 46.6	-15 14.9
6	269 3.1	-22 56.2	191 33.5	250 52.3	-21 51.3	226 47.7	-15 13.6
8	299 2.5	-22 55.8	221 38.4	280 50.6	-21 50.2	256 48.8	-15 12.3
10	329 1.9	-22 55.3	251 43.3	310 48.9	-21 49.0	286 49.9	-15 11.0
12	359 1.3	-22 54.9	281 48.2	340 47.2	-21 47.8	316 51.0	-15 9.7
14	29 .8	-22 54.4	311 53.2	10 45.5	-21 46.6	346 52.1	-15 8.4
16	59 .2	-22 54.0	341 58.1	40 43.8	-21 45.4	16 53.2	-15 7.0
18	88 59.6	-22 53.5	12 3.0	70 42.1	-21 44.2	46 54.4	-15 5.7
20	118 59.0	-22 53.1	42 8.0	100 40.5	-21 43.0	76 55.5	-15 4.4
22	148 58.4	-22 52.6	72 12.9	130 38.8	-21 41.8	106 56.6	-15 3.1
Δ	-3	2		-8	6	6	7

UT	MESEC				JUPITER		SATURN	
	$S_\leftmoon$	Δ	$\delta_\leftmoon$	Δ	$S_{\mathrm{♃}}$	$\delta_{\mathrm{♃}}$	$S_{\mathrm{♄}}$	$\delta_{\mathrm{♄}}$
h	° ′		° ′		° ′	° ′	° ′	° ′
0	38 51.9	97	17 12.2	40	316 58.6	15 5.3	222 4.4	-18 27.5
2	67 49.3	97	17 20.3	38	347 3.9	15 5.4	252 8.8	-18 27.6
4	96 46.6	97	17 27.9	36	17 9.2	15 5.5	282 13.2	-18 27.7
6	125 44.0	97	17 35.2	35	47 14.5	15 5.7	312 17.6	-18 27.8
8	154 41.3	97	17 42.2	33	77 19.8	15 5.8	342 22.0	-18 27.9
10	183 38.7	97	17 48.7	31	107 25.1	15 6.0	12 26.4	-18 28.0
12	212 36.0	97	17 54.8	29	137 30.4	15 6.1	42 30.9	-18 28.1
14	241 33.4	97	18 .5	27	167 35.7	15 6.3	72 35.3	-18 28.2
16	270 30.8	97	18 5.8	25	197 41.0	15 6.4	102 39.7	-18 28.3
18	299 28.2	97	18 10.8	23	227 46.3	15 6.5	132 44.1	-18 28.3
20	328 25.6	97	18 15.3	21	257 51.6	15 6.7	162 48.5	-18 28.4
22	357 23.1	97	18 19.5	19	287 56.9	15 6.8	192 52.9	-18 28.5
Δ					27	1	22	0

φ	SUNCE		TRAJANJE SUMRAKA		MESEC			
	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 2	15 6	0 57	2 44	13 37	1.9	5 49	2.6
55	8 25	15 43	0 45	2 16	14 4	2.0	5 22	2.5
50	7 58	16 10	0 38	1 59	14 24	2.0	5 3	2.4
45	7 38	16 30	0 34	1 46	14 40	2.0	4 47	2.4
40	7 22	16 46	0 30	1 37	14 53	2.1	4 35	2.3
35	7 8	16 60	0 28	1 30	15 4	2.1	4 24	2.3
30	6 56	17 12	0 26	1 25	15 14	2.1	4 15	2.3
20	6 35	17 33	0 24	1 18	15 30	2.1	3 59	2.2
10	6 17	17 51	0 23	1 15	15 45	2.1	3 45	2.2
0	6 0	18 8	0 22	1 15	15 58	2.2	3 31	2.2
10	5 43	18 25	0 23	1 17	16 12	2.2	3 18	2.1
20	5 24	18 43	0 24	1 24	16 27	2.2	3 4	2.1
30	5 3	19 5	0 27	1 36	16 44	2.2	2 48	2.0
35	4 50	19 17	0 30	1 46	16 53	2.2	2 39	2.0
40	4 35	19 32	0 33	2 1	17 5	2.2	2 28	2.0
45	4 18	19 50	0 37	2 29	17 18	2.3	2 16	1.9
50	3 56	20 11	0 44	: ::	17 34	2.3	2 1	1.9
55	3 27	20 40	0 56	: ::	17 55	2.3	1 41	1.8
60	2 44	21 23	1 34	: ::	18 23	2.3	1 16	1.7
S								

SUNCE				MESEC				
UT	e = T_p − UT	Δ/24	r	Prolaz		Δ/24	$\pi_\leftmoon$	r
h	min s	s	′	$T_{\overline{m}}$	h min	min	′	′
00	− 3 40.7	-1.2	16.3		22 11	2.1	56.7	15.4
12	− 3 54.6	$T_{\overline{m}_\odot}$	12 h 3.9 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	′	°	
♀	13 17	.1	60	-3.0	♃	2 52	.0	216	-2.0
♂	14 52	.1	35	.9	♄	9 10	.0	121	.8

UT	SUNCE		PROLEĆ. TAČKA	VENERA		MARS	
	$S_\odot$	$\delta_\odot$	S_Υ	S_φ	δ_φ	S_σ	δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	178 57.9	-22 52.1	102 17.8	160 37.1	-21 40.6	136 57.7	-15 1.7
2	208 57.3	-22 51.7	132 22.7	190 35.4	-21 39.4	166 58.8	-15 .4
4	238 56.7	-22 51.2	162 27.7	220 33.7	-21 38.2	196 59.9	-14 59.1
6	268 56.1	-22 50.7	192 32.6	250 32.1	-21 37.0	227 1.0	-14 57.8
8	298 55.5	-22 50.2	222 37.5	280 30.4	-21 35.7	257 2.2	-14 56.4
10	328 55.0	-22 49.8	252 42.5	310 28.7	-21 34.5	287 3.3	-14 55.1
12	358 54.4	-22 49.3	282 47.4	340 27.0	-21 33.3	317 4.4	-14 53.8
14	28 53.8	-22 48.8	312 52.3	10 25.4	-21 32.0	347 5.5	-14 52.4
16	58 53.3	-22 48.3	342 57.2	40 23.7	-21 30.8	17 6.6	-14 51.1
18	88 52.7	-22 47.8	13 2.2	70 22.0	-21 29.5	47 7.8	-14 49.8
20	118 52.1	-22 47.3	43 7.1	100 20.4	-21 28.3	77 8.9	-14 48.4
22	148 51.5	-22 46.8	73 12.0	130 18.7	-21 27.0	107 10.0	-14 47.1
Δ	-3	2		-8	6	6	7

UT	MESEC				JUPITER		SATURN	
	$S_\leftmoon$	Δ	$\delta_\leftmoon$	Δ	$S_{\mathrm{♃}}$	$\delta_{\mathrm{♃}}$	$S_{\mathrm{♄}}$	$\delta_{\mathrm{♄}}$
h	° ′		° ′		° ′	° ′	° ′	° ′
0	26 20.5	98	18 23.2	17	318 2.2	15 7.0	222 57.3	-18 28.6
2	55 18.1	98	18 26.5	15	348 7.5	15 7.1	253 1.8	-18 28.7
4	84 15.7	98	18 29.5	13	18 12.8	15 7.3	283 6.2	-18 28.8
6	113 13.3	98	18 32.0	11	48 18.1	15 7.4	313 10.6	-18 28.9
8	142 11.0	99	18 34.2	9	78 23.5	15 7.6	343 15.0	-18 29.0
10	171 8.7	99	18 35.9	7	108 28.8	15 7.7	13 19.4	-18 29.1
12	200 6.5	99	18 37.3	5	138 34.1	15 7.9	43 23.8	-18 29.2
14	229 4.4	100	18 38.2	3	168 39.4	15 8.0	73 28.2	-18 29.3
16	258 2.4	100	18 38.8	1	198 44.7	15 8.1	103 32.7	-18 29.4
18	287 .4	101	18 39.0	-1	228 50.0	15 8.3	133 37.1	-18 29.5
20	315 58.5	101	18 38.7	-3	258 55.4	15 8.4	163 41.5	-18 29.6
22	344 56.7	102	18 38.1	-5	289 .7	15 8.6	193 45.9	-18 29.7
Δ					27	1	22	0

φ	SUNCE		TRAJANJE SUMRAKA		MESEC			
	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 1	15 8	0 56	2 44	14 23	2.3	6 50	2.1
55	8 24	15 45	0 45	2 16	14 51	2.2	6 21	2.1
50	7 58	16 11	0 38	1 59	15 12	2.2	6 1	2.1
45	7 38	16 31	0 34	1 46	15 29	2.2	5 44	2.1
40	7 22	16 47	0 30	1 37	15 42	2.2	5 31	2.1
35	7 8	17 1	0 28	1 30	15 54	2.2	5 19	2.1
30	6 56	17 13	0 26	1 25	16 4	2.2	5 9	2.1
20	6 36	17 33	0 24	1 18	16 21	2.1	4 52	2.1
10	6 18	17 51	0 23	1 15	16 36	2.1	4 37	2.1
0	6 1	18 8	0 22	1 15	16 50	2.1	4 23	2.1
10	5 44	18 25	0 23	1 17	17 4	2.1	4 9	2.1
20	5 25	18 44	0 24	1 23	17 19	2.1	3 54	2.1
30	5 4	19 5	0 27	1 36	17 37	2.1	3 37	2.1
35	4 51	19 18	0 29	1 46	17 47	2.0	3 27	2.1
40	4 36	19 32	0 33	2 1	17 58	2.0	3 16	2.1
45	4 19	19 50	0 37	2 28	18 12	2.0	3 2	2.1
50	3 57	20 11	0 44	: ::	18 29	2.0	2 46	2.1
55	3 28	20 40	0 56	: ::	18 50	1.9	2 25	2.1
60	2 46	21 22	1 33	: ::	19 19	1.9	1 56	2.1
S								

SUNCE				MESEC				
UT	e = T_p − UT	Δ/24	r	Prolaz		Δ/24	$\pi_\leftmoon$	r
h	min s	s	′		h min	min	′	′
00	- 4 8.6	-1.1	16.3	$T_{\overline{m}}$	23 2	2.1	56.2	15.3
12	- 4 22.4	$T_{\overline{m}_\odot}$	12 h 4.4 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	′	°	
♀	13 18	.1	58	-3.0	♄	2 47	.0	216	-2.0
♂	14 52	.1	35	.9	♃	9 7	.0	121	.8

UT	SUNCE		PROLEĆ. TAČKA	VENERA		MARS	
	$S_\odot$	$\delta_\odot$	S_Υ	S_φ	δ_φ	S_σ	δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	178 51.0	-22 46.3	103 17.0	160 17.0	-21 25.8	137 11.1	-14 45.8
2	208 50.4	-22 45.8	133 21.9	190 15.4	-21 24.5	167 12.3	-14 44.4
4	238 49.8	-22 45.3	163 26.8	220 13.7	-21 23.2	197 13.4	-14 43.1
6	268 49.3	-22 44.8	193 31.7	250 12.1	-21 22.0	227 14.5	-14 41.7
8	298 48.7	-22 44.3	223 36.7	280 10.4	-21 20.7	257 15.6	-14 40.4
10	328 48.1	-22 43.7	253 41.6	310 8.8	-21 19.4	287 16.8	-14 39.1
12	358 47.6	-22 43.2	283 46.5	340 7.1	-21 18.1	317 17.9	-14 37.7
14	28 47.0	-22 42.7	313 51.4	10 5.5	-21 16.8	347 19.0	-14 36.4
16	58 46.4	-22 42.2	343 56.4	40 3.8	-21 15.5	17 20.1	-14 35.0
18	88 45.9	-22 41.6	14 1.3	70 2.2	-21 14.2	47 21.3	-14 33.7
20	118 45.3	-22 41.1	44 6.2	100 .6	-21 12.9	77 22.4	-14 32.3
22	148 44.7	-22 40.6	74 11.2	129 58.9	-21 11.6	107 23.5	-14 31.0
Δ	-3	3		-8	6	6	7

UT	MESEC				JUPITER		SATURN	
	$S_\leftmoon$	Δ	$\delta_\leftmoon$	Δ	$S_{\mathrm{♃}}$	$\delta_{\mathrm{♃}}$	$S_{\mathrm{♄}}$	$\delta_{\mathrm{♄}}$
h	° ′		° ′		° ′	° ′	° ′	° ′
0	13 55.0	102	18 37.1	-7	319 6.0	15 8.7	223 50.3	-18 29.8
2	42 53.4	103	18 35.7	-9	349 11.3	15 8.9	253 54.8	-18 29.8
4	71 51.9	103	18 34.0	-11	19 16.7	15 9.0	283 59.2	-18 29.9
6	100 50.5	104	18 31.8	-13	49 22.0	15 9.2	314 3.6	-18 30.0
8	129 49.3	104	18 29.3	-15	79 27.3	15 9.3	344 8.0	-18 30.1
10	158 48.1	105	18 26.4	-16	109 32.6	15 9.5	14 12.4	-18 30.2
12	187 47.1	106	18 23.1	-18	139 38.0	15 9.6	44 16.9	-18 30.3
14	216 46.2	106	18 19.4	-20	169 43.3	15 9.8	74 21.3	-18 30.4
16	245 45.4	107	18 15.4	-22	199 48.6	15 9.9	104 25.7	-18 30.5
18	274 44.8	108	18 11.0	-24	229 54.0	15 10.1	134 30.1	-18 30.6
20	303 44.3	108	18 6.2	-26	259 59.3	15 10.2	164 34.5	-18 30.7
22	332 44.0	109	18 1.1	-27	290 4.6	15 10.4	194 39.0	-18 30.8
Δ					27	1	22	0

φ	SUNCE		TRAJANJE SUMRAKA		MESEC			
	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 1	15 9	0 56	2 43	15 17	2.6	7 41	1.7
55	8 24	15 46	0 45	2 16	15 45	2.5	7 12	1.8
50	7 58	16 12	0 38	1 58	16 5	2.4	6 52	1.8
45	7 38	16 32	0 34	1 46	16 21	2.3	6 35	1.9
40	7 22	16 48	0 30	1 37	16 35	2.3	6 22	1.9
35	7 8	17 1	0 28	1 30	16 46	2.2	6 11	2.0
30	6 56	17 13	0 26	1 25	16 56	2.2	6 1	2.0
20	6 36	17 34	0 24	1 18	17 12	2.2	5 44	2.0
10	6 18	17 52	0 23	1 15	17 27	2.1	5 29	2.1
0	6 1	18 9	0 22	1 15	17 41	2.1	5 15	2.1
10	5 44	18 26	0 23	1 17	17 55	2.0	5 1	2.1
20	5 26	18 44	0 24	1 23	18 9	2.0	4 46	2.2
30	5 4	19 5	0 27	1 35	18 26	1.9	4 28	2.2
35	4 52	19 18	0 29	1 46	18 36	1.9	4 18	2.2
40	4 37	19 32	0 32	2 1	18 47	1.8	4 7	2.2
45	4 20	19 49	0 37	2 28	19 0	1.8	3 53	2.3
50	3 58	20 11	0 44	: ::	19 16	1.7	3 37	2.3
55	3 29	20 40	0 56	: ::	19 37	1.6	3 15	2.4
60	2 47	21 21	1 31	: ::	20 4	1.5	2 46	2.4
S								

SUNCE				MESEC				
UT	e = T_p − UT	Δ/24	r	Prolaz		Δ/24	$\pi_\leftmoon$	r
h	min s	s	′		h min	min	′	′
00	- 4 36.1	-1.1	16.3	$T_{\overline{m}}$	23 53	2.0	55.7	15.2
12	- 4 49.7	$T_{\overline{m}_\odot}$	12 h 4.8 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	′	°	
♀	13 20	.1	57	-3.0	♄	2 43	.0	216	-2.0
♂	14 51	.1	34	.9	♃	9 3	.0	121	.8

UT	SUNCE		PROLEĆ. TAČKA	VENERA		MARS	
	$S_\odot$	$\delta_\odot$	S_Υ	S_φ	δ_φ	S_σ	δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	178 44.2	-22 40.0	104 16.1	159 57.3	-21 10.3	137 24.7	-14 29.6
2	208 43.6	-22 39.5	134 21.0	189 55.6	-21 9.0	167 25.8	-14 28.3
4	238 43.1	-22 38.9	164 25.9	219 54.0	-21 7.6	197 26.9	-14 26.9
6	268 42.5	-22 38.4	194 30.9	249 52.4	-21 6.3	227 28.1	-14 25.6
8	298 41.9	-22 37.8	224 35.8	279 50.8	-21 5.0	257 29.2	-14 24.2
10	328 41.4	-22 37.3	254 40.7	309 49.1	-21 3.6	287 30.3	-14 22.9
12	358 40.8	-22 36.7	284 45.7	339 47.5	-21 2.3	317 31.5	-14 21.5
14	28 40.3	-22 36.1	314 50.6	9 45.9	-21 1.0	347 32.6	-14 20.2
16	58 39.7	-22 35.6	344 55.5	39 44.3	-20 59.6	17 33.8	-14 18.8
18	88 39.2	-22 35.0	15 .4	69 42.7	-20 58.3	47 34.9	-14 17.4
20	118 38.6	-22 34.4	45 5.4	99 41.0	-20 56.9	77 36.0	-14 16.1
22	148 38.1	-22 33.9	75 10.3	129 39.4	-20 55.5	107 37.2	-14 14.7
Δ	-3	3		-8	7	6	7

UT	MESEC				JUPITER		SATURN	
	$S_\leftmoon$	Δ	$\delta_\leftmoon$	Δ	$S_{\mathrm{♃}}$	$\delta_{\mathrm{♃}}$	$S_{\mathrm{♄}}$	$\delta_{\mathrm{♄}}$
h	° ′		° ′		° ′	° ′	° ′	° ′
0	1 43.8	110	17 55.7	-29	320 10.0	15 10.6	224 43.4	-18 30.9
2	30 43.7	111	17 49.8	-31	350 15.3	15 10.7	254 47.8	-18 30.9
4	59 43.8	111	17 43.7	-33	20 20.6	15 10.9	284 52.2	-18 31.0
6	88 44.1	112	17 37.2	-34	50 26.0	15 11.0	314 56.7	-18 31.1
8	117 44.5	113	17 30.3	-36	80 31.3	15 11.2	345 1.1	-18 31.2
10	146 45.1	114	17 23.1	-38	110 36.7	15 11.3	15 5.5	-18 31.3
12	175 45.8	115	17 15.6	-39	140 42.0	15 11.5	45 9.9	-18 31.4
14	204 46.7	115	17 7.8	-41	170 47.3	15 11.6	75 14.4	-18 31.5
16	233 47.8	116	16 59.6	-42	200 52.7	15 11.8	105 18.8	-18 31.6
18	262 49.1	117	16 51.1	-44	230 58.0	15 11.9	135 23.2	-18 31.7
20	291 50.5	118	16 42.3	-46	261 3.4	15 12.1	165 27.6	-18 31.8
22	320 52.1	119	16 33.2	-47	291 8.7	15 12.3	195 32.1	-18 31.9
Δ					27	1	22	0

φ	SUNCE		TRAJANJE SUMRAKA		MESEC			
	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	16 19	2.8	8 21	1.3
55	8 24	15 47	0 45	2 16	16 44	2.6	7 55	1.5
50	7 58	16 13	0 38	1 58	17 3	2.5	7 36	1.6
45	7 38	16 33	0 33	1 46	17 17	2.4	7 21	1.7
40	7 22	16 49	0 30	1 37	17 29	2.3	7 8	1.7
35	7 8	17 2	0 28	1 30	17 40	2.3	6 58	1.8
30	6 57	17 14	0 26	1 25	17 49	2.2	6 48	1.8
20	6 36	17 34	0 24	1 18	18 4	2.1	6 32	1.9
10	6 18	17 52	0 23	1 15	18 18	2.1	6 18	2.0
0	6 2	18 9	0 22	1 15	18 30	2.0	6 5	2.0
10	5 45	18 26	0 23	1 17	18 43	1.9	5 51	2.1
20	5 26	18 44	0 24	1 23	18 56	1.8	5 37	2.1
30	5 5	19 5	0 27	1 35	19 12	1.7	5 21	2.2
35	4 53	19 18	0 29	1 45	19 21	1.7	5 11	2.3
40	4 38	19 32	0 32	2 0	19 31	1.6	5 0	2.3
45	4 21	19 49	0 37	2 27	19 43	1.5	4 48	2.4
50	3 59	20 11	0 43	: ::	19 57	1.5	4 32	2.4
55	3 31	20 39	0 55	: ::	20 15	1.3	4 12	2.6
60	2 49	21 20	1 30	: ::	20 40	1.2	3 45	2.7
S								

SUNCE				MESEC			
UT	e = T_p − UT	Δ/24	r	Prolaz	Δ/24	$\pi_\leftmoon$	r
h	min s	s	′	h min	min	′	′
00	- 5 3.3	-1.1	16.3	$T_{\overline{m}}$	1.0	55.3	15.1
12	- 5 16.6	$T_{\overline{m}_\odot}$ 12 h 5.3 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	′	°	
♀	13 21	.1	56	-3.0	♄	2 39	.0	216	-2.0
♂	14 50	.1	33	.9	♇	8 60	.0	120	.8

UT	SUNCE		PROLEĆ. TAČKA	VENERA		MARS	
	$S_\odot$	$\delta_\odot$	S_Υ	S_φ	δ_φ	S_σ	δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	178 37.5	-22 33.3	105 15.2	159 37.8	-20 54.2	137 38.3	-14 13.4
2	208 36.9	-22 32.7	135 20.2	189 36.2	-20 52.8	167 39.5	-14 12.0
4	238 36.4	-22 32.1	165 25.1	219 34.6	-20 51.4	197 40.6	-14 10.6
6	268 35.8	-22 31.5	195 30.0	249 33.0	-20 50.1	227 41.7	-14 9.3
8	298 35.3	-22 30.9	225 34.9	279 31.4	-20 48.7	257 42.9	-14 7.9
10	328 34.7	-22 30.4	255 39.9	309 29.8	-20 47.3	287 44.0	-14 6.6
12	358 34.2	-22 29.8	285 44.8	339 28.2	-20 45.9	317 45.2	-14 5.2
14	28 33.7	-22 29.2	315 49.7	9 26.6	-20 44.5	347 46.3	-14 3.8
16	58 33.1	-22 28.6	345 54.7	39 25.0	-20 43.1	17 47.5	-14 2.5
18	88 32.6	-22 27.9	15 59.6	69 23.4	-20 41.7	47 48.6	-14 1.1
20	118 32.0	-22 27.3	46 4.5	99 21.8	-20 40.3	77 49.8	-13 59.7
22	148 31.5	-22 26.7	76 9.4	129 20.3	-20 38.9	107 50.9	-13 58.3
Δ	-3	3		-8	7	6	7

UT	MESEC				JUPITER		SATURN	
	$S_\leftmoon$	Δ	$\delta_\leftmoon$	Δ	$S_{\mathrm{♃}}$	$\delta_{\mathrm{♃}}$	$S_{\mathrm{♄}}$	$\delta_{\mathrm{♄}}$
h	° ′		° ′		° ′	° ′	° ′	° ′
0	349 53.9	120	16 23.8	-49	321 14.1	15 12.4	225 36.5	-18 31.9
2	18 55.8	121	16 14.0	-50	351 19.4	15 12.6	255 40.9	-18 32.0
4	47 58.0	122	16 4.0	-52	21 24.8	15 12.7	285 45.4	-18 32.1
6	77 .3	122	15 53.7	-53	51 30.1	15 12.9	315 49.8	-18 32.2
8	106 2.8	123	15 43.1	-54	81 35.5	15 13.1	345 54.2	-18 32.3
10	135 5.4	124	15 32.3	-56	111 40.8	15 13.2	15 58.7	-18 32.4
12	164 8.3	125	15 21.1	-57	141 46.2	15 13.4	46 3.1	-18 32.5
14	193 11.3	126	15 9.7	-58	171 51.6	15 13.5	76 7.5	-18 32.6
16	222 14.6	127	14 58.0	-60	201 56.9	15 13.7	106 11.9	-18 32.7
18	251 17.9	128	14 46.1	-61	232 2.3	15 13.8	136 16.4	-18 32.7
20	280 21.5	129	14 33.9	-62	262 7.6	15 14.0	166 20.8	-18 32.8
22	309 25.3	130	14 21.4	-63	292 13.0	15 14.2	196 25.2	-18 32.9
Δ					27	1	22	0

φ	SUNCE		TRAJANJE SUMRAKA		MESEC			
	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	17 25	2.9	8 53	1.0
55	8 23	15 49	0 44	2 15	17 46	2.7	8 31	1.2
50	7 58	16 14	0 38	1 58	18 2	2.5	8 14	1.4
45	7 38	16 34	0 33	1 46	18 15	2.4	8 1	1.5
40	7 22	16 50	0 30	1 37	18 25	2.3	7 50	1.5
35	7 9	17 3	0 28	1 30	18 34	2.3	7 40	1.6
30	6 57	17 15	0 26	1 25	18 42	2.2	7 32	1.7
20	6 36	17 35	0 24	1 18	18 55	2.1	7 18	1.8
10	6 19	17 53	0 23	1 15	19 7	2.0	7 5	1.9
0	6 2	18 9	0 22	1 15	19 18	1.9	6 53	1.9
10	5 45	18 26	0 23	1 17	19 29	1.8	6 41	2.0
20	5 27	18 44	0 24	1 23	19 40	1.7	6 29	2.1
30	5 6	19 5	0 27	1 35	19 53	1.6	6 14	2.2
35	4 53	19 18	0 29	1 45	20 1	1.5	6 6	2.3
40	4 39	19 32	0 32	2 0	20 10	1.5	5 56	2.3
45	4 22	19 49	0 37	2 26	20 20	1.4	5 45	2.4
50	4 1	20 10	0 43	: ::	20 32	1.3	5 31	2.5
55	3 32	20 38	0 55	: ::	20 47	1.1	5 13	2.7
60	2 51	21 19	1 28	: ::	21 7	.9	4 50	2.8
S								

SUNCE				MESEC			
UT	e = T_p − UT	Δ/24	r	Prolaz	Δ/24	$\pi_\leftmoon$	r
h	min s	s	′	h min	min	′	′
00	- 5 30.0	-1.1	16.3	$T_{\overline{m}}$ 0 42	2.0	54.9	15.0
12	- 5 43.1	$T_{\overline{m}_\odot}$ 12 h 5.7 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	′	°	
♀	13 22	.1	54	-3.0	♄	2 35	.0	216	-2.0
♂	14 49	.1	32	.9	♇	8 56	.0	120	.8

UT	SUNCE		PROLEĆ. TAČKA	VENERA		MARS	
	$S_\odot$	$\delta_\odot$	S_Υ	S_φ	δ_φ	S_σ	δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	178 30.9	-22 26.1	106 14.4	159 18.7	-20 37.5	137 52.1	-13 57.0
2	208 30.4	-22 25.5	136 19.3	189 17.1	-20 36.0	167 53.2	-13 55.6
4	238 29.8	-22 24.9	166 24.2	219 15.5	-20 34.6	197 54.4	-13 54.2
6	268 29.3	-22 24.2	196 29.2	249 13.9	-20 33.2	227 55.5	-13 52.9
8	298 28.8	-22 23.6	226 34.1	279 12.4	-20 31.7	257 56.7	-13 51.5
10	328 28.2	-22 23.0	256 39.0	309 10.8	-20 30.3	287 57.8	-13 50.1
12	358 27.7	-22 22.4	286 43.9	339 9.2	-20 28.9	317 59.0	-13 48.7
14	28 27.2	-22 21.7	316 48.9	9 7.6	-20 27.4	348 .2	-13 47.3
16	58 26.6	-22 21.1	346 53.8	39 6.1	-20 26.0	18 1.3	-13 46.0
18	88 26.1	-22 20.4	16 58.7	69 4.5	-20 24.5	48 2.5	-13 44.6
20	118 25.5	-22 19.8	47 3.6	99 2.9	-20 23.1	78 3.6	-13 43.2
22	148 25.0	-22 19.1	77 8.6	129 1.4	-20 21.6	108 4.8	-13 41.8
Δ	-3	3		-8	7	6	7

UT	MESEC				JUPITER		SATURN	
	$S_\leftmoon$	Δ	$\delta_\leftmoon$	Δ	$S_{\mathrm{♃}}$	$\delta_{\mathrm{♃}}$	$S_{\mathrm{♄}}$	$\delta_{\mathrm{♄}}$
h	° ′		° ′		° ′	° ′	° ′	° ′
0	338 29.2	131	14 8.7	-65	322 18.4	15 14.3	226 29.7	-18 33.0
2	7 33.3	131	13 55.8	-66	352 23.7	15 14.5	256 34.1	-18 33.1
4	36 37.6	132	13 42.6	-67	22 29.1	15 14.7	286 38.5	-18 33.2
6	65 42.1	133	13 29.2	-68	52 34.5	15 14.8	316 43.0	-18 33.3
8	94 46.7	134	13 15.6	-69	82 39.8	15 15.0	346 47.4	-18 33.4
10	123 51.5	135	13 1.8	-70	112 45.2	15 15.1	16 51.8	-18 33.5
12	152 56.5	136	12 47.7	-71	142 50.6	15 15.3	46 56.3	-18 33.5
14	182 1.7	137	12 33.4	-72	172 55.9	15 15.5	77 .7	-18 33.6
16	211 7.0	137	12 19.0	-73	203 1.3	15 15.6	107 5.1	-18 33.7
18	240 12.5	138	12 4.3	-74	233 6.7	15 15.8	137 9.6	-18 33.8
20	269 18.1	139	11 49.4	-75	263 12.0	15 16.0	167 14.0	-18 33.9
22	298 23.9	140	11 34.4	-76	293 17.4	15 16.1	197 18.5	-18 34.0
Δ					27	1	22	0

φ	SUNCE		TRAJANJE SUMRAKA		MESEC			
	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	18 35	2.9	9 18	.8
55	8 23	15 50	0 44	2 15	18 51	2.7	8 60	1.0
50	7 57	16 15	0 38	1 58	19 3	2.6	8 46	1.2
45	7 38	16 35	0 33	1 46	19 13	2.4	8 36	1.3
40	7 22	16 51	0 30	1 37	19 21	2.3	8 27	1.4
35	7 9	17 4	0 28	1 30	19 28	2.2	8 19	1.5
30	6 57	17 16	0 26	1 25	19 35	2.2	8 12	1.5
20	6 37	17 36	0 24	1 18	19 45	2.0	8 0	1.7
10	6 19	17 53	0 23	1 15	19 55	1.9	7 50	1.8
0	6 2	18 10	0 22	1 14	20 3	1.8	7 40	1.9
10	5 46	18 27	0 23	1 17	20 12	1.7	7 30	2.0
20	5 28	18 45	0 24	1 23	20 21	1.6	7 19	2.1
30	5 7	19 5	0 27	1 35	20 32	1.5	7 7	2.2
35	4 54	19 18	0 29	1 45	20 38	1.4	7 0	2.3
40	4 40	19 32	0 32	1 60	20 45	1.3	6 52	2.3
45	4 23	19 49	0 37	2 25	20 53	1.2	6 43	2.4
50	4 2	20 10	0 43	: ::	21 2	1.1	6 31	2.6
55	3 34	20 38	0 55	: ::	21 14	1.0	6 17	2.7
60	2 53	21 18	1 26	: ::	21 30	.8	5 58	2.9
S								

SUNCE				MESEC			
UT	e = Tp − UT	Δ/24	r	Prolaz		Δ/24	$\pi_\leftmoon$	r
h	min s	s	′	$T_{\overline{m}}$	h min	min	′	′
00	- 5 56.3	-1.1	16.3		1 29	1.9	54.5	14.9
12	- 6 9.2	$T_{\overline{m}_\odot}$ 12 h	6.2 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	′	°	
♀	13 23	.1	53	-3.0	♄	2 30	.0	216	-2.0
♂	14 48	.1	32	.9	♃	8 53	.0	120	.8

UT	SUNCE		PROLEĆ. TAČKA	VENERA		MARS	
	$S_\odot$	$\delta_\odot$	S_Υ	S_φ	δ_φ	S_σ	δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	178 24.5	-22 18.5	107 13.5	158 59.8	-20 20.1	138 5.9	-13 40.4
2	208 23.9	-22 17.8	137 18.4	188 58.3	-20 18.7	168 7.1	-13 39.1
4	238 23.4	-22 17.2	167 23.4	218 56.7	-20 17.2	198 8.3	-13 37.7
6	268 22.9	-22 16.5	197 28.3	248 55.2	-20 15.7	228 9.4	-13 36.3
8	298 22.4	-22 15.8	227 33.2	278 53.6	-20 14.2	258 10.6	-13 34.9
10	328 21.8	-22 15.2	257 38.1	308 52.1	-20 12.7	288 11.7	-13 33.5
12	358 21.3	-22 14.5	287 43.1	338 50.5	-20 11.2	318 12.9	-13 32.1
14	28 20.8	-22 13.8	317 48.0	8 49.0	-20 9.8	348 14.1	-13 30.7
16	58 20.2	-22 13.2	347 52.9	38 47.4	-20 8.3	18 15.2	-13 29.3
18	88 19.7	-22 12.5	17 57.9	68 45.9	-20 6.7	48 16.4	-13 28.0
20	118 19.2	-22 11.8	48 2.8	98 44.4	-20 5.2	78 17.6	-13 26.6
22	148 18.7	-22 11.1	78 7.7	128 42.8	-20 3.7	108 18.7	-13 25.2
Δ	-3	3		-8	7	6	7

UT	MESEC				JUPITER		SATURN	
	$S_\leftmoon$	Δ	$\delta_\leftmoon$	Δ	$S_{\mathrm{♃}}$	$\delta_{\mathrm{♃}}$	$S_{\mathrm{♄}}$	$\delta_{\mathrm{♄}}$
h	° ′		° ′		° ′	° ′	° ′	° ′
0	327 29.9	141	11 19.1	-77	323 22.8	15 16.3	227 22.9	-18 34.1
2	356 36.0	141	11 3.7	-78	353 28.2	15 16.5	257 27.3	-18 34.2
4	25 42.3	142	10 48.1	-79	23 33.5	15 16.6	287 31.8	-18 34.2
6	54 48.7	143	10 32.3	-80	53 38.9	15 16.8	317 36.2	-18 34.3
8	83 55.2	143	10 16.4	-80	83 44.3	15 17.0	347 40.6	-18 34.4
10	113 1.9	144	10 .3	-81	113 49.7	15 17.1	17 45.1	-18 34.5
12	142 8.7	145	9 44.0	-82	143 55.1	15 17.3	47 49.5	-18 34.6
14	171 15.7	145	9 27.6	-83	174 .4	15 17.5	77 54.0	-18 34.7
16	200 22.8	146	9 11.1	-83	204 5.8	15 17.6	107 58.4	-18 34.8
18	229 30.0	147	8 54.4	-84	234 11.2	15 17.8	138 2.9	-18 34.8
20	258 37.3	147	8 37.6	-85	264 16.6	15 18.0	168 7.3	-18 34.9
22	287 44.8	148	8 20.6	-85	294 22.0	15 18.1	198 11.7	-18 35.0
Δ					27	1	22	0

φ	SUNCE		TRAJANJE SUMRAKA		MESEC			
	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 16	0 55	2 41	19 44	2.9	9 38	.7
55	8 22	15 52	0 44	2 15	19 56	2.7	9 25	.9
50	7 57	16 16	0 38	1 58	20 5	2.6	9 15	1.1
45	7 38	16 36	0 33	1 46	20 12	2.4	9 7	1.2
40	7 22	16 51	0 30	1 37	20 17	2.3	9 0	1.3
35	7 9	17 5	0 28	1 30	20 22	2.2	8 54	1.4
30	6 57	17 16	0 26	1 25	20 27	2.2	8 49	1.5
20	6 37	17 36	0 24	1 18	20 34	2.0	8 40	1.6
10	6 19	17 54	0 23	1 15	20 41	1.9	8 32	1.7
0	6 3	18 10	0 22	1 14	20 47	1.8	8 25	1.8
10	5 46	18 27	0 23	1 17	20 53	1.7	8 17	1.9
20	5 28	18 45	0 24	1 23	21 0	1.6	8 9	2.0
30	5 7	19 6	0 27	1 35	21 8	1.4	7 60	2.2
35	4 55	19 18	0 29	1 44	21 12	1.3	7 55	2.2
40	4 41	19 32	0 32	1 59	21 17	1.3	7 48	2.3
45	4 24	19 49	0 36	2 25	21 22	1.2	7 41	2.4
50	4 3	20 10	0 43	: ::	21 29	1.0	7 33	2.6
55	3 35	20 37	0 54	: ::	21 38	.9	7 22	2.7
60	2 55	21 17	1 25	: ::	21 48	.7	7 8	2.9
S								

SUNCE				MESEC			
UT	e = Tp − UT	Δ/24	r	Prolaz		Δ/24	$\pi_\leftmoon$	r
h	min s	s	′	$T_{\overline{m}}$	h min	min	′	′
00	- 6 22.1	-1.1	16.3		2 14	1.8	54.3	14.8
12	- 6 34.8	$T_{\overline{m}_\odot}$ 12 h	6.6 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	′	°	
♀	13 25	.1	52	-3.0	♄	2 26	.0	216	-2.0
♂	14 47	.1	31	.9	♃	8 49	.0	120	.8

UT	SUNCE		PROLEĆ. TAČKA	VENERA		MARS	
	$S_\odot$	$\delta_\odot$	S_Υ	S_φ	δ_φ	S_σ	δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	178 18.1	-22 10.4	108 12.6	158 41.3	-20 2.2	138 19.9	-13 23.8
2	208 17.6	-22 9.7	138 17.6	188 39.8	-20 .7	168 21.1	-13 22.4
4	238 17.1	-22 9.0	168 22.5	218 38.2	-19 59.2	198 22.2	-13 21.0
6	268 16.6	-22 8.3	198 27.4	248 36.7	-19 57.6	228 23.4	-13 19.6
8	298 16.1	-22 7.6	228 32.4	278 35.2	-19 56.1	258 24.6	-13 18.2
10	328 15.5	-22 6.9	258 37.3	308 33.7	-19 54.6	288 25.8	-13 16.8
12	358 15.0	-22 6.2	288 42.2	338 32.2	-19 53.0	318 26.9	-13 15.4
14	28 14.5	-22 5.5	318 47.1	8 30.6	-19 51.5	348 28.1	-13 14.0
16	58 14.0	-22 4.8	348 52.1	38 29.1	-19 50.0	18 29.3	-13 12.6
18	88 13.5	-22 4.1	18 57.0	68 27.6	-19 48.4	48 30.5	-13 11.2
20	118 13.0	-22 3.4	49 1.9	98 26.1	-19 46.8	78 31.6	-13 9.8
22	148 12.5	-22 2.7	79 6.9	128 24.6	-19 45.3	108 32.8	-13 8.4
Δ	-3	4		-8	8	6	7

UT	MESEC				JUPITER		SATURN	
	$S_\leftmoon$	Δ	$\delta_\leftmoon$	Δ	S_4	δ_4	S_η	δ_η
h	° ′		° ′		° ′	° ′	° ′	° ′
0	316 52.4	148	8 3.5	-86	324 27.4	15 18.3	228 16.2	-18 35.1
2	346 .0	149	7 46.3	-87	354 32.8	15 18.5	258 20.6	-18 35.2
4	15 7.8	149	7 29.0	-87	24 38.1	15 18.6	288 25.1	-18 35.3
6	44 15.7	150	7 11.5	-88	54 43.5	15 18.8	318 29.5	-18 35.4
8	73 23.7	150	6 54.0	-88	84 48.9	15 19.0	348 34.0	-18 35.4
10	102 31.7	151	6 36.3	-89	114 54.3	15 19.1	18 38.4	-18 35.5
12	131 39.9	151	6 18.6	-89	144 59.7	15 19.3	48 42.8	-18 35.6
14	160 48.1	152	6 .7	-90	175 5.1	15 19.5	78 47.3	-18 35.7
16	189 56.4	152	5 42.8	-90	205 10.5	15 19.6	108 51.7	-18 35.8
18	219 4.8	152	5 24.8	-91	235 15.9	15 19.8	138 56.2	-18 35.9
20	248 13.3	153	5 6.7	-91	265 21.3	15 20.0	169 .6	-18 36.0
22	277 21.8	153	4 48.5	-91	295 26.7	15 20.2	199 5.1	-18 36.0
Δ					27	1	22	0

φ	SUNCE		TRAJANJE SUMRAKA		MESEC			
	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 56	15 18	0 55	2 41	20 55	2.9	9 55	.7
55	8 21	15 53	0 44	2 15	21 1	2.7	9 47	.8
50	7 57	16 18	0 38	1 57	21 6	2.6	9 41	1.0
45	7 37	16 37	0 33	1 45	21 10	2.4	9 36	1.1
40	7 22	16 52	0 30	1 36	21 13	2.3	9 31	1.2
35	7 9	17 6	0 28	1 30	21 16	2.2	9 27	1.3
30	6 57	17 17	0 26	1 25	21 18	2.1	9 24	1.4
20	6 37	17 37	0 24	1 18	21 23	2.0	9 18	1.5
10	6 20	17 54	0 23	1 15	21 26	1.9	9 13	1.7
0	6 3	18 11	0 22	1 14	21 30	1.8	9 8	1.8
10	5 47	18 27	0 23	1 17	21 34	1.6	9 3	1.9
20	5 29	18 45	0 24	1 23	21 37	1.5	8 58	2.0
30	5 8	19 6	0 27	1 35	21 42	1.4	8 52	2.1
35	4 56	19 18	0 29	1 44	21 44	1.3	8 48	2.2
40	4 42	19 32	0 32	1 59	21 47	1.2	8 44	2.3
45	4 25	19 48	0 36	2 24	21 50	1.1	8 40	2.4
50	4 4	20 9	0 43	: ::	21 54	1.0	8 34	2.6
55	3 37	20 36	0 54	: ::	21 59	.8	8 27	2.7
60	2 57	21 16	1 23	: ::	22 5	.6	8 18	2.9
S								

SUNCE				MESEC			
UT	e = T_p − UT	Δ/24	r	Prolaz		Δ/24	$\pi_\leftmoon$	r
h	min s	s	′		h min	min	′	′
00	- 6 47.4	-1.0	16.3	$T_{\overline{m}}$	2 58	1.8	54.1	14.7
12	- 6 59.8	$T_{\overline{m}_\odot}$	12 h 7.0 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	′	°	
♀	13 26	.1	50	-3.0	♄	2 22	.0	216	-2.1
♂	14 46	.1	30	.9	♃	8 46	.0	120	.8

UT	SUNCE		PROLEĆ. TAČKA	VENERA		MARS	
	$S_\odot$	$\delta_\odot$	S_Υ	S_φ	δ_φ	S_σ	δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	178 11.9	-22 1.9	109 11.8	158 23.1	-19 43.7	138 34.0	-13 7.0
2	208 11.4	-22 1.2	139 16.7	188 21.6	-19 42.2	168 35.2	-13 5.6
4	238 10.9	-22 .5	169 21.6	218 20.1	-19 40.6	198 36.3	-13 4.2
6	268 10.4	-21 59.7	199 26.6	248 18.6	-19 39.0	228 37.5	-13 2.8
8	298 9.9	-21 59.0	229 31.5	278 17.1	-19 37.4	258 38.7	-13 1.4
10	328 9.4	-21 58.3	259 36.4	308 15.6	-19 35.8	288 39.9	-12 60.0
12	358 8.9	-21 57.5	289 41.4	338 14.1	-19 34.3	318 41.1	-12 58.6
14	28 8.4	-21 56.8	319 46.3	8 12.6	-19 32.7	348 42.2	-12 57.1
16	58 7.9	-21 56.0	349 51.2	38 11.1	-19 31.1	18 43.4	-12 55.7
18	88 7.4	-21 55.3	19 56.1	68 9.7	-19 29.5	48 44.6	-12 54.3
20	118 6.9	-21 54.5	50 1.1	98 8.2	-19 27.9	78 45.8	-12 52.9
22	148 6.4	-21 53.8	80 6.0	128 6.7	-19 26.3	108 47.0	-12 51.5
Δ	-3	4		-7	8	6	7

UT	MESEC				JUPITER		SATURN	
	$S_\leftmoon$	Δ	$\delta_\leftmoon$	Δ	S_4	δ_4	S_η	δ_η
h	° ′		° ′		° ′	° ′	° ′	° ′
0	306 30.4	153	4 30.2	-92	325 32.1	15 20.3	229 9.5	-18 36.1
2	335 39.0	153	4 11.9	-92	355 37.5	15 20.5	259 14.0	-18 36.2
4	4 47.6	154	3 53.5	-92	25 42.9	15 20.7	289 18.4	-18 36.3
6	33 56.4	154	3 35.0	-93	55 48.3	15 20.9	319 22.9	-18 36.4
8	63 5.1	154	3 16.5	-93	85 53.7	15 21.0	349 27.3	-18 36.5
10	92 13.9	154	2 57.9	-93	115 59.1	15 21.2	19 31.8	-18 36.5
12	121 22.7	154	2 39.3	-93	146 4.5	15 21.4	49 36.2	-18 36.6
14	150 31.5	154	2 20.7	-94	176 9.9	15 21.5	79 40.7	-18 36.7
16	179 40.3	154	2 1.9	-94	206 15.3	15 21.7	109 45.1	-18 36.8
18	208 49.1	154	1 43.2	-94	236 20.7	15 21.9	139 49.6	-18 36.9
20	237 58.0	154	1 24.4	-94	266 26.2	15 22.1	169 54.0	-18 37.0
22	267 6.8	154	1 5.6	-94	296 31.6	15 22.2	199 58.5	-18 37.0
Δ					27	1	22	0

φ	SUNCE		TRAJANJE SUMRAKA		MESEC			
	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 55	15 20	0 54	2 40	22 5	1.3	10 11	1.1
55	8 21	15 55	0 44	2 14	22 6	1.4	10 8	1.3
50	7 56	16 19	0 37	1 57	22 7	1.4	10 5	1.3
45	7 37	16 38	0 33	1 45	22 8	1.5	10 3	1.4
40	7 22	16 53	0 30	1 36	22 9	1.5	10 1	1.5
35	7 8	17 7	0 28	1 30	22 9	1.6	9 59	1.5
30	6 57	17 18	0 26	1 25	22 10	1.6	9 57	1.5
20	6 37	17 38	0 24	1 18	22 11	1.7	9 55	1.6
10	6 20	17 55	0 23	1 15	22 11	1.7	9 53	1.7
0	6 4	18 11	0 22	1 14	22 12	1.8	9 50	1.8
10	5 47	18 27	0 23	1 17	22 13	1.8	9 48	1.8
20	5 30	18 45	0 24	1 23	22 14	1.9	9 46	1.9
30	5 9	19 6	0 27	1 34	22 15	1.9	9 43	2.0
35	4 57	19 18	0 29	1 44	22 15	2.0	9 42	2.0
40	4 43	19 31	0 32	1 58	22 16	2.0	9 40	2.1
45	4 26	19 48	0 36	2 23	22 17	2.1	9 38	2.1
50	4 6	20 9	0 43	3 41	22 17	2.1	9 35	2.2
55	3 38	20 35	0 54	: ::	22 19	2.2	9 32	2.3
60	2 59	21 14	1 22	: ::	22 20	2.3	9 28	2.4
S								

SUNCE				MESEC			
UT	e = T_p − UT	Δ/24	r	Prolaz		Δ/24	$\pi_\leftmoon$	r
h	min s	s	′		h min	min	′	′
00	- 7 12.2	-1.0	16.3	$T_{\overline{m}}$	3 40	1.8	54.1	14.7
12	- 7 24.3	$T_{\overline{m}_\odot}$	12 h 7.4 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 27	.1	49	-3.0	♄	2 17	.0	216	-2.1
♂	14 45	.1	29	.9	♃	8 42	.0	120	.8

UT	SUNCE		PROLEĆ. TAČKA	VENERA		MARS	
	$S_\odot$	$\delta_\odot$	S_Υ	S_φ	δ_φ	S_σ	δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	178 5.9	−21 53.0	110 10.9	158 5.2	−19 24.7	138 48.2	−12 50.1
2	208 5.4	−21 52.2	140 15.9	188 3.7	−19 23.0	168 49.3	−12 48.7
4	238 4.9	−21 51.5	170 20.8	218 2.3	−19 21.4	198 50.5	−12 47.3
6	268 4.4	−21 50.7	200 25.7	248 .8	−19 19.8	228 51.7	−12 45.8
8	298 3.9	−21 49.9	230 30.6	277 59.3	−19 18.2	258 52.9	−12 44.4
10	328 3.4	−21 49.2	260 35.6	307 57.9	−19 16.6	288 54.1	−12 43.0
12	358 2.9	−21 48.4	290 40.5	337 56.4	−19 14.9	318 55.3	−12 41.6
14	28 2.4	−21 47.6	320 45.4	7 54.9	−19 13.3	348 56.5	−12 40.2
16	58 1.9	−21 46.8	350 50.3	37 53.5	−19 11.6	18 57.7	−12 38.7
18	88 1.4	−21 46.0	20 55.3	67 52.0	−19 10.0	48 58.9	−12 37.3
20	118 .9	−21 45.2	51 .2	97 50.6	−19 8.4	79 .0	−12 35.9
22	148 .4	−21 44.4	81 5.1	127 49.1	−19 6.7	109 1.2	−12 34.5
Δ	−2	4		−7	8	6	7

UT	MESEC				JUPITER		SATURN	
	$S_\leftmoon$	Δ	$\delta_\leftmoon$	Δ	S_{4}	δ_{4}	S_η	δ_η
h	° ′		° ′		° ′	° ′	° ′	° ′
0	296 15.6	154	0 46.8	−94	326 37.0	15 22.4	230 2.9	−18 37.1
2	325 24.4	154	0 28.0	−94	356 42.4	15 22.6	260 7.4	−18 37.2
4	354 33.2	154	0 9.1	3	26 47.8	15 22.8	290 11.8	−18 37.3
6	23 42.0	154	0 9.8	94	56 53.2	15 23.0	320 16.3	−18 37.4
8	52 50.7	153	0 28.6	94	86 58.6	15 23.1	350 20.7	−18 37.5
10	81 59.4	153	0 47.5	94	117 4.0	15 23.3	20 25.2	−18 37.5
12	111 8.0	153	1 6.4	94	147 9.5	15 23.5	50 29.6	−18 37.6
14	140 16.6	153	1 25.3	94	177 14.9	15 23.7	80 34.1	−18 37.7
16	169 25.1	152	1 44.1	94	207 20.3	15 23.8	110 38.6	−18 37.8
18	198 33.6	152	2 3.0	94	237 25.7	15 24.0	140 43.0	−18 37.9
20	227 42.0	152	2 21.8	94	267 31.1	15 24.2	170 47.5	−18 37.9
22	256 50.3	151	2 40.6	94	297 36.6	15 24.4	200 51.9	−18 38.0
Δ					27	1	22	0

φ	SUNCE		TRAJANJE SUMRAKA		MESEC			
	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 54	15 22	0 54	2 40	22 35	.6	10 39	3.0
55	8 20	15 56	0 44	2 14	22 39	.8	10 38	2.7
50	7 56	16 20	0 37	1 57	22 41	1.0	10 37	2.6
45	7 37	16 39	0 33	1 45	22 43	1.1	10 36	2.4
40	7 21	16 55	0 30	1 36	22 45	1.2	10 36	2.3
35	7 8	17 7	0 28	1 30	22 47	1.3	10 35	2.2
30	6 57	17 19	0 26	1 24	22 48	1.4	10 35	2.2
20	6 37	17 38	0 24	1 18	22 51	1.6	10 34	2.0
10	6 20	17 55	0 23	1 15	22 53	1.7	10 33	1.9
0	6 4	18 11	0 22	1 14	22 55	1.8	10 33	1.8
10	5 48	18 28	0 23	1 17	22 57	1.9	10 32	1.7
20	5 30	18 45	0 24	1 23	22 59	2.0	10 31	1.5
30	5 10	19 5	0 27	1 34	23 1	2.2	10 30	1.4
35	4 58	19 17	0 29	1 44	23 3	2.3	10 30	1.3
40	4 44	19 31	0 32	1 58	23 4	2.4	10 30	1.2
45	4 28	19 48	0 36	2 22	23 6	2.5	10 29	1.1
50	4 7	20 8	0 42	3 32	23 8	1.9	10 28	1.0
55	3 40	20 35	0 53	: ::	23 11	1.9	10 27	.8
60	3 1	21 13	1 20	: ::	23 15	1.9	10 26	.6
S								

SUNCE				MESEC			
UT	e = T_p − UT	Δ/24	r	Prolaz	Δ/24	$\pi_\leftmoon$	r
h	min s	s	′	h min	min	′	′
00	− 7 36.5	−1.0	16.3	$T_{\overline{m}}$ 4 22	1.8	54.2	14.8
12	− 7 48.3	$T_{\overline{m}_\odot}$ 12 h	7.8 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 28	.1	48	−3.0	♃	2 13	.0	216	−2.1
♂	14 44	.1	29	.9	♄	8 39	.0	120	.8

UT	SUNCE		PROLEĆ. TAČKA	VENERA		MARS	
	$S_\odot$	$\delta_\odot$	S_Υ	S_φ	δ_φ	S_σ	δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	178 .0	−21 43.6	111 10.1	157 47.7	−19 5.0	139 2.4	−12 33.1
2	207 59.5	−21 42.8	141 15.0	187 46.2	−19 3.4	169 3.6	−12 31.6
4	237 59.0	−21 42.0	171 19.9	217 44.8	−19 1.7	199 4.8	−12 30.2
6	267 58.5	−21 41.2	201 24.8	247 43.3	−19 .1	229 6.0	−12 28.8
8	297 58.0	−21 40.4	231 29.8	277 41.9	−18 58.4	259 7.2	−12 27.4
10	327 57.5	−21 39.6	261 34.7	307 40.4	−18 56.7	289 8.4	−12 25.9
12	357 57.0	−21 38.8	291 39.6	337 39.0	−18 55.0	319 9.6	−12 24.5
14	27 56.6	−21 38.0	321 44.6	7 37.6	−18 53.3	349 10.8	−12 23.1
16	57 56.1	−21 37.2	351 49.5	37 36.1	−18 51.7	19 12.0	−12 21.6
18	87 55.6	−21 36.4	21 54.4	67 34.7	−18 50.0	49 13.2	−12 20.2
20	117 55.1	−21 35.5	51 59.3	97 33.3	−18 48.3	79 14.4	−12 18.8
22	147 54.7	−21 34.7	82 4.3	127 31.8	−18 46.6	109 15.6	−12 17.3
Δ	−2	4		−7	8	6	7

UT	MESEC				JUPITER		SATURN	
	$S_\leftmoon$	Δ	$\delta_\leftmoon$	Δ	S_{4}	δ_{4}	S_η	δ_η
h	° ′		° ′		° ′	° ′	° ′	° ′
0	285 58.5	151	2 59.4	94	327 42.0	15 24.6	230 56.4	−18 38.1
2	315 6.7	150	3 18.2	94	357 47.4	15 24.7	261 .8	−18 38.2
4	344 14.7	150	3 36.9	93	27 52.8	15 24.9	291 5.3	−18 38.3
6	13 22.7	149	3 55.6	93	57 58.3	15 25.1	321 9.8	−18 38.4
8	42 30.5	149	4 14.2	93	88 3.7	15 25.3	351 14.2	−18 38.4
10	71 38.3	148	4 32.8	93	118 9.1	15 25.4	21 18.7	−18 38.5
12	100 45.9	147	4 51.3	92	148 14.5	15 25.6	51 23.1	−18 38.6
14	129 53.4	147	5 9.8	92	178 20.0	15 25.8	81 27.6	−18 38.7
16	159 .7	146	5 28.2	92	208 25.4	15 26.0	111 32.1	−18 38.8
18	188 8.0	145	5 46.5	91	238 30.8	15 26.2	141 36.5	−18 38.8
20	217 15.0	145	6 4.8	91	268 36.3	15 26.4	171 41.0	−18 38.9
22	246 22.0	144	6 23.0	91	298 41.7	15 26.5	201 45.4	−18 39.0
Δ					27	1	22	0

φ	SUNCE		TRAJANJE SUMRAKA		MESEC			
	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 52	15 24	0 54	2 39	22 51	.8	11 50	3.0
55	8 19	15 58	0 44	2 14	22 59	1.0	11 43	2.8
50	7 55	16 22	0 37	1 57	23 6	1.1	11 39	2.6
45	7 36	16 40	0 33	1 45	23 11	1.2	11 35	2.5
40	7 21	16 56	0 30	1 36	23 15	1.3	11 32	2.4
35	7 8	17 8	0 28	1 29	23 19	1.4	11 29	2.3
30	6 57	17 20	0 26	1 24	23 22	1.9	11 27	2.2
20	6 38	17 39	0 24	1 18	23 28	1.9	11 22	2.1
10	6 21	17 56	0 23	1 14	23 33	1.9	11 19	1.9
0	6 5	18 12	0 22	1 14	23 38	1.9	11 15	1.8
10	5 48	18 28	0 23	1 16	23 43	1.9	11 12	1.7
20	5 31	18 45	0 24	1 22	23 48	1.9	11 8	1.6
30	5 11	19 5	0 27	1 34	23 54	1.9	11 4	1.5
35	4 59	19 17	0 29	1 43	23 57	1.9	11 2	1.4
40	4 45	19 31	0 32	1 57	. . ..	.0	10 59	1.3
45	4 29	19 47	0 36	2 21	. . ..	.0	10 56	1.2
50	4 8	20 7	0 42	3 26	23 53	2.7	10 52	1.1
55	3 42	20 34	0 53	: ::	23 56	2.8	10 47	.9
60	3 4	21 11	1 19	: ::	23 60	3.1	10 42	.7
S								

SUNCE				MESEC			
UT	e = T_p − UT	Δ/24	r	Prolaz	Δ/24	$\pi_\leftmoon$	r
h	min s	s	′	h min	min	′	′
00	− 8 .2	−1.0	16.3	$T_{\overline{m}}$ 5 5	1.8	54.5	14.8
12	− 8 11.7	$T_{\overline{m}_\odot}$ 12 h	8.2 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 29	.1	47	−3.0	♃	2 9	.0	217	−2.1
♂	14 43	.1	28	.9	♄	8 35	.0	120	.8

UT	SUNCE		PROLEĆ. TAČKA	VENERA		MARS	
	$S_\odot$	$\delta_\odot$	S_Υ	S_φ	δ_φ	S_σ	δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	177 54.2	-21 33.9	112 9.2	157 30.4	-18 44.9	139 16.8	-12 15.9
2	207 53.7	-21 33.0	142 14.1	187 29.0	-18 43.2	169 18.0	-12 14.5
4	237 53.2	-21 32.2	172 19.1	217 27.6	-18 41.5	199 19.2	-12 13.0
6	267 52.8	-21 31.4	202 24.0	247 26.2	-18 39.8	229 20.4	-12 11.6
8	297 52.3	-21 30.5	232 28.9	277 24.7	-18 38.0	259 21.6	-12 10.2
10	327 51.8	-21 29.7	262 33.8	307 23.3	-18 36.3	289 22.8	-12 8.7
12	357 51.3	-21 28.8	292 38.8	337 21.9	-18 34.6	319 24.0	-12 7.3
14	27 50.9	-21 28.0	322 43.7	7 20.5	-18 32.9	349 25.2	-12 5.9
16	57 50.4	-21 27.1	352 48.6	37 19.1	-18 31.1	19 26.4	-12 4.4
18	87 49.9	-21 26.3	22 53.6	67 17.7	-18 29.4	49 27.7	-12 3.0
20	117 49.5	-21 25.4	52 58.5	97 16.3	-18 27.7	79 28.9	-12 1.5
22	147 49.0	-21 24.5	83 3.4	127 14.9	-18 25.9	109 30.1	-12 .1
Δ	-2	4		-7	9	6	7

UT	MESEC				JUPITER		SATURN	
	$S_\leftmoon$	Δ	$\delta_\leftmoon$	Δ	$S_{\mathrm{♃}}$	$\delta_{\mathrm{♃}}$	$S_{\mathrm{♄}}$	$\delta_{\mathrm{♄}}$
h	° ′		° ′		° ′	° ′	° ′	° ′
0	275 28.7	143	6 41.1	90	328 47.1	15 26.7	231 49.9	-18 39.1
2	304 35.4	142	6 59.2	90	358 52.6	15 26.9	261 54.4	-18 39.2
4	333 41.8	141	7 17.1	89	28 58.0	15 27.1	291 58.8	-18 39.2
6	2 48.1	140	7 34.9	89	59 3.5	15 27.3	322 3.3	-18 39.3
8	31 54.1	139	7 52.7	88	89 8.9	15 27.4	352 7.8	-18 39.4
10	61 .0	139	8 10.3	88	119 14.3	15 27.6	22 12.2	-18 39.5
12	90 5.8	138	8 27.8	87	149 19.8	15 27.8	52 16.7	-18 39.6
14	119 11.3	137	8 45.3	86	179 25.2	15 28.0	82 21.2	-18 39.6
16	148 16.6	135	9 2.5	86	209 30.7	15 28.2	112 25.6	-18 39.7
18	177 21.7	134	9 19.7	85	239 36.1	15 28.4	142 30.1	-18 39.8
20	206 26.5	133	9 36.7	84	269 41.5	15 28.6	172 34.6	-18 39.9
22	235 31.2	132	9 53.6	84	299 47.0	15 28.7	202 39.0	-18 39.9
Δ					27	1	22	0

φ	SUNCE		TRAJANJE SUMRAKA		MESEC			
	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 54	2 38	23 9	.9	13 1	3.0
55	8 18	15 60	0 43	2 13	23 22	1.1	12 50	2.8
50	7 54	16 23	0 37	1 57	23 32	2.0	12 42	2.7
45	7 36	16 42	0 33	1 45	23 40	2.0	12 35	2.5
40	7 21	16 57	0 30	1 36	23 47	2.0	12 29	2.4
35	7 8	17 9	0 28	1 29	23 53	2.0	12 24	2.3
30	6 57	17 20	0 26	1 24	. . .	.0	12 20	2.3
20	6 38	17 40	0 24	1 18	. . .	.0	12 12	2.1
10	6 21	17 56	0 23	1 14	. . .	.0	12 5	2.0
0	6 5	18 12	0 22	1 14	. . .	.0	11 59	1.9
10	5 49	18 28	0 23	1 16	. . .	.0	11 53	1.8
20	5 32	18 45	0 24	1 22	. . .	.0	11 46	1.7
30	5 12	19 5	0 27	1 34	. . .	.0	11 39	1.6
35	4 60	19 17	0 29	1 43	. . .	.0	11 35	1.5
40	4 46	19 31	0 32	1 57	0 1	2.4	11 30	1.4
45	4 30	19 47	0 36	2 20	0 6	2.5	11 24	1.3
50	4 10	20 7	0 42	3 20	. . .	.0	11 17	1.2
55	3 44	20 33	0 52	: ::	. . .	.0	11 9	1.0
60	3 6	21 10	1 17	: ::	. . .	.0	10 58	.8
S								

SUNCE				MESEC			
UT	e = T_p − UT	Δ/24	r	Prolaz		Δ/24	$\pi_\leftmoon$	r
h	min s	s	′		h min	min	′	′
00	- 8 23.3	-.9	16.3	$T_{\overline{m}}$	5 48	1.9	54.9	15.0
12	- 8 34.6	$T_{\overline{m}_\odot}$	12 h 8.6 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 31	.1	45	-3.0	♄	2 4	.0	217	-2.1
♂	14 42	.1	27	.9	♄	8 31	.0	120	.8

UT	SUNCE		PROLEĆ. TAČKA	VENERA		MARS	
	$S_\odot$	$\delta_\odot$	S_Υ	S_φ	δ_φ	S_σ	δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	177 48.5	-21 23.7	113 8.3	157 13.5	-18 24.2	139 31.3	-11 58.7
2	207 48.1	-21 22.8	143 13.3	187 12.1	-18 22.4	169 32.5	-11 57.2
4	237 47.6	-21 21.9	173 18.2	217 10.7	-18 20.7	199 33.7	-11 55.8
6	267 47.2	-21 21.1	203 23.1	247 9.3	-18 18.9	229 34.9	-11 54.3
8	297 46.7	-21 20.2	233 28.1	277 8.0	-18 17.2	259 36.1	-11 52.9
10	327 46.2	-21 19.3	263 33.0	307 6.6	-18 15.4	289 37.3	-11 51.4
12	357 45.8	-21 18.4	293 37.9	337 5.2	-18 13.6	319 38.6	-11 50.0
14	27 45.3	-21 17.5	323 42.8	7 3.8	-18 11.9	349 39.8	-11 48.5
16	57 44.9	-21 16.6	353 47.8	37 2.4	-18 10.1	19 41.0	-11 47.1
18	87 44.4	-21 15.8	23 52.7	67 1.1	-18 8.3	49 42.2	-11 45.6
20	117 44.0	-21 14.9	53 57.6	96 59.7	-18 6.5	79 43.4	-11 44.2
22	147 43.5	-21 14.0	84 2.5	126 58.3	-18 4.8	109 44.6	-11 42.7
Δ	-2	4		-7	9	6	7

UT	MESEC				JUPITER		SATURN	
	$S_\leftmoon$	Δ	$\delta_\leftmoon$	Δ	$S_{\mathrm{♃}}$	$\delta_{\mathrm{♃}}$	$S_{\mathrm{♄}}$	$\delta_{\mathrm{♄}}$
h	° ′		° ′		° ′	° ′	° ′	° ′
0	264 35.6	131	10 10.3	83	329 52.4	15 28.9	232 43.5	-18 40.0
2	293 39.8	130	10 26.9	82	359 57.9	15 29.1	262 48.0	-18 40.1
4	322 43.8	129	10 43.3	81	30 3.3	15 29.3	292 52.4	-18 40.2
6	351 47.5	127	10 59.6	80	60 8.8	15 29.5	322 56.9	-18 40.3
8	20 51.0	126	11 15.7	80	90 14.2	15 29.7	353 1.4	-18 40.3
10	49 54.2	125	11 31.6	79	120 19.7	15 29.8	23 5.8	-18 40.4
12	78 57.2	124	11 47.4	78	150 25.1	15 30.0	53 10.3	-18 40.5
14	107 59.9	122	12 2.9	77	180 30.6	15 30.2	83 14.8	-18 40.6
16	137 2.3	121	12 18.3	76	210 36.0	15 30.4	113 19.3	-18 40.6
18	166 4.5	119	12 33.5	75	240 41.5	15 30.6	143 23.7	-18 40.7
20	195 6.4	118	12 48.4	74	270 46.9	15 30.8	173 28.2	-18 40.8
22	224 8.0	117	13 3.1	73	300 52.4	15 31.0	203 32.7	-18 40.9
Δ					27	1	22	0

φ	SUNCE		TRAJANJE SUMRAKA		MESEC			
	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 50	15 29	0 53	2 38	23 31	2.1	14 15	3.1
55	8 17	16 1	0 43	2 13	23 49	2.1	13 58	2.9
50	7 54	16 25	0 37	1 56	. . .	.0	13 46	2.7
45	7 35	16 43	0 33	1 45	. . .	.0	13 36	2.6
40	7 20	16 58	0 30	1 36	. . .	.0	13 27	2.5
35	7 8	17 10	0 28	1 29	. . .	.0	13 20	2.4
30	6 57	17 21	0 26	1 24	0 -2	1.6	13 14	2.3
20	6 38	17 40	0 24	1 18	0 7	1.8	13 3	2.2
10	6 21	17 57	0 22	1 14	0 15	1.9	12 54	2.1
0	6 5	18 13	0 22	1 14	0 23	2.0	12 45	2.0
10	5 49	18 28	0 23	1 16	0 30	2.1	12 36	1.9
20	5 32	18 45	0 24	1 22	0 38	2.2	12 27	1.8
30	5 12	19 5	0 27	1 33	0 48	2.3	12 16	1.7
35	5 1	19 17	0 29	1 43	0 53	2.4	12 10	1.6
40	4 47	19 30	0 32	1 56	0 59	2.5	12 3	1.6
45	4 31	19 46	0 36	2 19	1 6	2.6	11 55	1.5
50	4 11	20 6	0 42	3 16	1 15	2.7	11 46	1.4
55	3 45	20 32	0 52	: ::	1 26	2.9	11 34	1.2
60	3 8	21 8	1 16	: ::	1 40	3.1	11 18	1.0
S								

SUNCE				MESEC			
UT	e = T_p − UT	Δ/24	r	Prolaz		Δ/24	$\pi_\leftmoon$	r
h	min s	s	′		h min	min	′	′
00	- 8 45.8	-.9	16.3	$T_{\overline{m}}$	6 34	2.0	55.5	15.1
12	- 8 56.8	$T_{\overline{m}_\odot}$	12 h 8.9 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 32	.1	44	-3.1	♄	2 0	.0	217	-2.1
♂	14 41	.1	26	1.0	♄	8 28	.0	120	.8

UT	SUNCE		PROLEĆ. TAČKA	VENERA		MARS	
	$S_\odot$	$\delta_\odot$	S_Υ	S_φ	δ_φ	S_σ	δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	177 43.1	-21 13.1	114 7.5	156 56.9	-18 3.0	139 45.9	-11 41.3
2	207 42.6	-21 12.2	144 12.4	186 55.6	-18 1.2	169 47.1	-11 39.8
4	237 42.2	-21 11.3	174 17.3	216 54.2	-17 59.4	199 48.3	-11 38.4
6	267 41.7	-21 10.3	204 22.3	246 52.8	-17 57.6	229 49.5	-11 36.9
8	297 41.3	-21 9.4	234 27.2	276 51.5	-17 55.8	259 50.7	-11 35.5
10	327 40.8	-21 8.5	264 32.1	306 50.1	-17 54.0	289 52.0	-11 34.0
12	357 40.4	-21 7.6	294 37.0	336 48.8	-17 52.2	319 53.2	-11 32.6
14	27 39.9	-21 6.7	324 42.0	6 47.4	-17 50.4	349 54.4	-11 31.1
16	57 39.5	-21 5.8	354 46.9	36 46.1	-17 48.5	19 55.6	-11 29.7
18	87 39.1	-21 4.8	24 51.8	66 44.7	-17 46.7	49 56.8	-11 28.2
20	117 38.6	-21 3.9	54 56.8	96 43.4	-17 44.9	79 58.1	-11 26.7
22	147 38.2	-21 3.0	85 1.7	126 42.0	-17 43.1	109 59.3	-11 25.3
Δ	-2	5		-7	9	6	7

UT	MESEC				JUPITER		SATURN	
	$S_\leftmoon$	Δ	$\delta_\leftmoon$	Δ	S_{4}	δ_{4}	S_η	δ_η
h	° ′		° ′		° ′	° ′	° ′	° ′
0	253 9.4	115	13 17.7	71	330 57.8	15 31.2	233 37.2	-18 41.0
2	282 10.4	114	13 32.0	70	1 3.3	15 31.3	263 41.6	-18 41.0
4	311 11.1	112	13 46.0	69	31 8.8	15 31.5	293 46.1	-18 41.1
6	340 11.6	111	13 59.8	68	61 14.2	15 31.7	323 50.6	-18 41.2
8	9 11.8	109	14 13.4	67	91 19.7	15 31.9	353 55.1	-18 41.3
10	38 11.6	108	14 26.7	65	121 25.1	15 32.1	23 59.5	-18 41.3
12	67 11.2	106	14 39.8	64	151 30.6	15 32.3	54 4.0	-18 41.4
14	96 10.5	105	14 52.5	62	181 36.1	15 32.5	84 8.5	-18 41.5
16	125 9.4	103	15 5.0	61	211 41.5	15 32.7	114 13.0	-18 41.6
18	154 8.0	102	15 17.2	60	241 47.0	15 32.9	144 17.4	-18 41.6
20	183 6.4	100	15 29.2	58	271 52.5	15 33.1	174 21.9	-18 41.7
22	212 4.4	99	15 40.8	57	301 57.9	15 33.2	204 26.4	-18 41.8
Δ					27	1	22	0

φ	SUNCE		TRAJANJE SUMRAKA		MESEC			
	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 48	15 31	0 53	2 37	. . . .	.0	15 28	3.0
55	8 16	16 3	0 43	2 13	. . . .	.0	15 7	2.8
50	7 53	16 26	0 37	1 56	0 3	1.5	14 51	2.7
45	7 35	16 44	0 33	1 44	0 14	1.6	14 38	2.6
40	7 20	16 59	0 30	1 36	0 23	1.7	14 27	2.5
35	7 8	17 11	0 28	1 29	0 31	1.8	14 18	2.5
30	6 57	17 22	0 26	1 24	0 38	1.8	14 10	2.4
20	6 38	17 41	0 24	1 17	0 50	1.9	13 57	2.3
10	6 21	17 57	0 22	1 14	1 0	2.0	13 45	2.2
0	6 6	18 13	0 22	1 14	1 10	2.1	13 34	2.2
10	5 50	18 29	0 23	1 16	1 20	2.2	13 23	2.1
20	5 33	18 46	0 24	1 22	1 31	2.3	13 11	2.0
30	5 13	19 5	0 27	1 33	1 43	2.4	12 58	1.9
35	5 2	19 17	0 29	1 42	1 50	2.4	12 50	1.9
40	4 48	19 30	0 32	1 56	1 59	2.5	12 41	1.8
45	4 32	19 46	0 36	2 18	2 8	2.6	12 31	1.7
50	4 13	20 5	0 42	3 12	2 20	2.7	12 18	1.6
55	3 47	20 30	0 52	: ::	2 34	2.9	12 3	1.5
60	3 11	21 7	1 15	: ::	2 54	3.1	11 42	1.3
S								

SUNCE				MESEC			
UT	e = T_p − UT	Δ/24	r	Prolaz		Δ/24	$\pi_\leftmoon$	r
h	min s	s	′		h min	min	′	′
00	- 9 7.7	-.9	16.3	$T_{\overline{m}}$	7 22	2.1	56.3	15.3
12	- 9 18.4	$T_{\overline{m}_\odot}$ 12 h 9.3 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 33	.1	43	-3.1	♃	1 56	.0	217	-2.1
♂	14 40	.1	26	1.0	♄	8 24	.0	119	.8

UT	SUNCE		PROLEĆ. TAČKA	VENERA		MARS	
	$S_\odot$	$\delta_\odot$	S_Υ	S_φ	δ_φ	S_σ	δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	177 37.8	-21 2.0	115 6.6	156 40.7	-17 41.2	140 .5	-11 23.8
2	207 37.3	-21 1.1	145 11.5	186 39.3	-17 39.4	170 1.7	-11 22.4
4	237 36.9	-21 .2	175 16.5	216 38.0	-17 37.6	200 3.0	-11 20.9
6	267 36.4	-20 59.2	205 21.4	246 36.7	-17 35.7	230 4.2	-11 19.4
8	297 36.0	-20 58.3	235 26.3	276 35.3	-17 33.9	260 5.4	-11 18.0
10	327 35.6	-20 57.3	265 31.3	306 34.0	-17 32.1	290 6.7	-11 16.5
12	357 35.2	-20 56.4	295 36.2	336 32.7	-17 30.2	320 7.9	-11 15.1
14	27 34.7	-20 55.4	325 41.1	6 31.4	-17 28.3	350 9.1	-11 13.6
16	57 34.3	-20 54.5	355 46.0	36 30.0	-17 26.5	20 10.4	-11 12.1
18	87 33.9	-20 53.5	25 51.0	66 28.7	-17 24.6	50 11.6	-11 10.7
20	117 33.4	-20 52.6	55 55.9	96 27.4	-17 22.8	80 12.8	-11 9.2
22	147 33.0	-20 51.6	86 .8	126 26.1	-17 20.9	110 14.0	-11 7.7
Δ	-2	5		-7	9	6	7

UT	MESEC				JUPITER		SATURN	
	$S_\leftmoon$	Δ	$\delta_\leftmoon$	Δ	S_{4}	δ_{4}	S_η	δ_η
h	° ′		° ′		° ′	° ′	° ′	° ′
0	241 2.1	97	15 52.1	55	332 3.4	15 33.4	234 30.9	-18 41.9
2	269 59.5	95	16 3.1	53	2 8.9	15 33.6	264 35.4	-18 41.9
4	298 56.6	94	16 13.8	52	32 14.3	15 33.8	294 39.8	-18 42.0
6	327 53.4	92	16 24.1	50	62 19.8	15 34.0	324 44.3	-18 42.1
8	356 49.8	91	16 34.1	48	92 25.3	15 34.2	354 48.8	-18 42.2
10	25 46.0	89	16 43.8	47	122 30.7	15 34.4	24 53.3	-18 42.2
12	54 41.8	88	16 53.1	45	152 36.2	15 34.6	54 57.8	-18 42.3
14	83 37.3	86	17 2.0	43	182 41.7	15 34.8	85 2.2	-18 42.4
16	112 32.5	85	17 10.6	41	212 47.1	15 35.0	115 6.7	-18 42.5
18	141 27.4	83	17 18.8	39	242 52.6	15 35.2	145 11.2	-18 42.5
20	170 22.1	82	17 26.7	37	272 58.1	15 35.3	175 15.7	-18 42.6
22	199 16.4	80	17 34.1	35	303 3.6	15 35.5	205 20.2	-18 42.7
Δ					27	1	22	0

φ	SUNCE		TRAJANJE SUMRAKA		MESEC			
	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 47	15 33	0 53	2 37	0 -1	1.5	16 40	2.8
55	8 15	16 5	0 43	2 12	0 22	1.7	16 14	2.7
50	7 52	16 28	0 37	1 56	0 39	1.8	15 55	2.6
45	7 34	16 45	0 33	1 44	0 52	1.9	15 40	2.6
40	7 20	16 60	0 30	1 36	1 3	1.9	15 28	2.5
35	7 7	17 12	0 27	1 29	1 13	2.0	15 17	2.5
30	6 57	17 23	0 26	1 24	1 21	2.0	15 8	2.4
20	6 38	17 42	0 24	1 17	1 36	2.1	14 53	2.4
10	6 21	17 58	0 22	1 14	1 49	2.2	14 39	2.3
0	6 6	18 13	0 22	1 14	2 1	2.2	14 26	2.3
10	5 50	18 29	0 23	1 16	2 13	2.3	14 13	2.3
20	5 34	18 46	0 24	1 22	2 26	2.4	13 59	2.2
30	5 14	19 5	0 27	1 33	2 40	2.4	13 44	2.1
35	5 3	19 16	0 29	1 42	2 49	2.5	13 34	2.1
40	4 49	19 29	0 32	1 55	2 59	2.5	13 24	2.1
45	4 34	19 45	0 35	2 17	3 11	2.6	13 12	2.0
50	4 14	20 4	0 41	3 8	3 25	2.7	12 57	2.0
55	3 49	20 29	0 51	: ::	3 43	2.8	12 38	1.9
60	3 13	21 5	1 13	: ::	4 7	2.9	12 13	1.7
S								

SUNCE				MESEC			
UT	e = T_p − UT	Δ/24	r	Prolaz		Δ/24	$\pi_\leftmoon$	r
h	min s	s	′		h min	min	′	′
00	- 9 29.0	-.9	16.3	$T_{\overline{m}}$	8 13	2.3	57.1	15.6
12	- 9 39.3	$T_{\overline{m}_\odot}$ 12 h 9.7 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 34	.1	42	-3.1	♃	1 51	.0	217	-2.1
♂	14 39	.1	25	1.0	♄	8 21	.0	119	.8

UT	SUNCE		PROLEĆ. TAČKA	VENERA		MARS	
	$S_\odot$	$\delta_\odot$	S_Υ	S_φ	δ_φ	S_σ	δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	177 32.6	-20 50.6	116 5.8	156 24.8	-17 19.0	140 15.3	-11 6.3
2	207 32.2	-20 49.7	146 10.7	186 23.5	-17 17.2	170 16.5	-11 4.8
4	237 31.8	-20 48.7	176 15.6	216 22.1	-17 15.3	200 17.7	-11 3.3
6	267 31.3	-20 47.7	206 20.5	246 20.8	-17 13.4	230 19.0	-11 1.8
8	297 30.9	-20 46.7	236 25.5	276 19.5	-17 11.5	260 20.2	-11 .4
10	327 30.5	-20 45.8	266 30.4	306 18.2	-17 9.6	290 21.5	-10 58.9
12	357 30.1	-20 44.8	296 35.3	336 16.9	-17 7.7	320 22.7	-10 57.4
14	27 29.7	-20 43.8	326 40.3	6 15.6	-17 5.9	350 23.9	-10 56.0
16	57 29.3	-20 42.8	356 45.2	36 14.3	-17 4.0	20 25.2	-10 54.5
18	87 28.8	-20 41.8	26 50.1	66 13.0	-17 2.1	50 26.4	-10 53.0
20	117 28.4	-20 40.8	56 55.0	96 11.8	-17 .2	80 27.6	-10 51.5
22	147 28.0	-20 39.8	87 .0	126 10.5	-16 58.2	110 28.9	-10 50.1
Δ	-2	5		-6	9	6	7

UT	MESEC				JUPITER		SATURN	
	$S_\leftmoon$	Δ	$\delta_\leftmoon$	Δ	$S_{\text{♃}}$	$\delta_{\text{♃}}$	$S_{\text{♄}}$	$\delta_{\text{♄}}$
h	° ′		° ′		° ′	° ′	° ′	° ′
0	228 10.4	79	17 41.1	33	333 9.1	15 35.7	235 24.7	-18 42.8
2	257 4.1	77	17 47.8	31	3 14.5	15 35.9	265 29.1	-18 42.8
4	285 57.5	76	17 54.0	29	33 20.0	15 36.1	295 33.6	-18 42.9
6	314 50.7	74	17 59.8	27	63 25.5	15 36.3	325 38.1	-18 43.0
8	343 43.5	73	18 5.2	25	93 31.0	15 36.5	355 42.6	-18 43.1
10	12 36.1	72	18 10.1	23	123 36.4	15 36.7	25 47.1	-18 43.1
12	41 28.4	70	18 14.6	20	153 41.9	15 36.9	55 51.6	-18 43.2
14	70 20.5	69	18 18.7	18	183 47.4	15 37.1	85 56.1	-18 43.3
16	99 12.3	68	18 22.3	16	213 52.9	15 37.3	116 .6	-18 43.4
18	128 3.8	67	18 25.4	13	243 58.4	15 37.5	146 5.0	-18 43.4
20	156 55.1	65	18 28.1	11	274 3.9	15 37.7	176 9.5	-18 43.5
22	185 46.2	64	18 30.4	9	304 9.3	15 37.9	206 14.0	-18 43.6
Δ					27	1	22	0

φ	SUNCE		TRAJANJE SUMRAKA		MESEC			
	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	0 36	2.0	17 47	2.4
55	8 14	16 7	0 43	2 12	1 2	2.1	17 19	2.4
50	7 51	16 29	0 37	1 56	1 22	2.2	16 58	2.4
45	7 34	16 47	0 33	1 44	1 37	2.2	16 42	2.4
40	7 19	17 1	0 30	1 35	1 50	2.2	16 28	2.4
35	7 7	17 13	0 27	1 29	2 1	2.3	16 17	2.4
30	6 56	17 24	0 26	1 24	2 10	2.3	16 7	2.4
20	6 38	17 42	0 24	1 17	2 26	2.3	15 50	2.4
10	6 22	17 58	0 22	1 14	2 41	2.3	15 35	2.4
0	6 6	18 14	0 22	1 14	2 54	2.4	15 21	2.4
10	5 51	18 29	0 23	1 16	3 8	2.4	15 7	2.4
20	5 34	18 46	0 24	1 22	3 22	2.4	14 52	2.4
30	5 15	19 5	0 27	1 33	3 39	2.4	14 35	2.4
35	5 4	19 16	0 29	1 42	3 49	2.5	14 25	2.4
40	4 51	19 29	0 31	1 55	3 60	2.5	14 14	2.4
45	4 35	19 44	0 35	2 16	4 13	2.5	14 0	2.4
50	4 16	20 3	0 41	3 4	4 29	2.5	13 44	2.4
55	3 51	20 28	0 51	: ::	4 49	2.6	13 23	2.3
60	3 15	21 3	1 12	: ::	5 17	2.6	12 55	2.3
S								

SUNCE				MESEC			
UT	e = T_p − UT	Δ/24	r	Prolaz	Δ/24	$\pi_\leftmoon$	r
h	min s	s	′	h min	min	′	′
00	- 9 49.6	-.8	16.3	$T_{\overline{m}}$ 9 8	2.4	58.0	15.8
12	- 9 59.6	$T_{\overline{m}_\odot}$ 12 h 10.0 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 35	.1	40	-3.1	♄	1 47	.0	217	-2.1
♂	14 38	.1	24	1.0	♃	8 17	.0	119	.8

UT	SUNCE		PROLEĆ. TAČKA	VENERA		MARS	
	$S_\odot$	$\delta_\odot$	S_Υ	S_φ	δ_φ	S_σ	δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	177 27.6	-20 38.8	117 4.9	156 9.2	-16 56.3	140 30.1	-10 48.6
2	207 27.2	-20 37.8	147 9.8	186 7.9	-16 54.4	170 31.4	-10 47.1
4	237 26.8	-20 36.8	177 14.8	216 6.6	-16 52.5	200 32.6	-10 45.6
6	267 26.4	-20 35.8	207 19.7	246 5.3	-16 50.6	230 33.9	-10 44.1
8	297 26.0	-20 34.8	237 24.6	276 4.1	-16 48.7	260 35.1	-10 42.7
10	327 25.6	-20 33.8	267 29.5	306 2.8	-16 46.7	290 36.3	-10 41.2
12	357 25.2	-20 32.8	297 34.5	336 1.5	-16 44.8	320 37.6	-10 39.7
14	27 24.8	-20 31.7	327 39.4	6 .2	-16 42.9	350 38.8	-10 38.2
16	57 24.4	-20 30.7	357 44.3	35 59.0	-16 40.9	20 40.1	-10 36.7
18	87 24.0	-20 29.7	27 49.2	65 57.7	-16 39.0	50 41.3	-10 35.3
20	117 23.6	-20 28.7	57 54.2	95 56.4	-16 37.1	80 42.6	-10 33.8
22	147 23.2	-20 27.6	87 59.1	125 55.2	-16 35.1	110 43.8	-10 32.3
Δ	-2	5		-6	10	6	7

UT	MESEC				JUPITER		SATURN	
	$S_\leftmoon$	Δ	$\delta_\leftmoon$	Δ	$S_{\text{♃}}$	$\delta_{\text{♃}}$	$S_{\text{♄}}$	$\delta_{\text{♄}}$
h	° ′		° ′		° ′	° ′	° ′	° ′
0	214 37.0	63	18 32.1	6	334 14.8	15 38.1	236 18.5	-18 43.6
2	243 27.6	62	18 33.4	4	4 20.3	15 38.3	266 23.0	-18 43.7
4	272 18.0	61	18 34.2	2	34 25.8	15 38.5	296 27.5	-18 43.8
6	301 8.2	60	18 34.5	-1	64 31.3	15 38.7	326 32.0	-18 43.9
8	329 58.2	59	18 34.3	-3	94 36.8	15 38.9	356 36.5	-18 43.9
10	358 48.1	58	18 33.7	-6	124 42.3	15 39.1	26 41.0	-18 44.0
12	27 37.7	57	18 32.5	-8	154 47.8	15 39.2	56 45.5	-18 44.1
14	56 27.2	57	18 30.8	-11	184 53.3	15 39.4	86 50.0	-18 44.2
16	85 16.5	56	18 28.6	-13	214 58.7	15 39.6	116 54.5	-18 44.2
18	114 5.7	55	18 26.0	-16	245 4.2	15 39.8	146 59.0	-18 44.3
20	142 54.7	55	18 22.8	-18	275 9.7	15 40.0	177 3.4	-18 44.4
22	171 43.7	54	18 19.1	-21	305 15.2	15 40.2	207 7.9	-18 44.4
Δ					27	1	22	0

φ	SUNCE		TRAJANJE SUMRAKA		MESEC			
	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	1 24	2.6	18 45	2.0
55	8 13	16 8	0 43	2 11	1 53	2.6	18 17	2.1
50	7 50	16 31	0 37	1 55	2 13	2.6	17 56	2.2
45	7 33	16 48	0 33	1 44	2 30	2.5	17 40	2.2
40	7 19	17 2	0 30	1 35	2 43	2.5	17 26	2.3
35	7 7	17 14	0 27	1 29	2 55	2.5	17 15	2.3
30	6 56	17 25	0 26	1 24	3 5	2.5	17 5	2.3
20	6 38	17 43	0 24	1 17	3 22	2.5	16 48	2.4
10	6 22	17 59	0 22	1 14	3 37	2.5	16 33	2.4
0	6 7	18 14	0 22	1 14	3 51	2.5	16 19	2.5
10	5 51	18 29	0 23	1 16	4 5	2.4	16 5	2.5
20	5 35	18 46	0 24	1 21	4 20	2.4	15 50	2.6
30	5 16	19 4	0 27	1 32	4 38	2.4	15 33	2.6
35	5 5	19 16	0 29	1 41	4 48	2.4	15 22	2.6
40	4 52	19 28	0 31	1 54	4 59	2.4	15 11	2.7
45	4 36	19 44	0 35	2 15	5 13	2.3	14 57	2.7
50	4 17	20 2	0 41	3 1	5 30	2.3	14 41	2.7
55	3 53	20 27	0 50	: ::	5 51	2.3	14 19	2.8
60	3 18	21 1	1 11	: ::	6 20	2.2	13 50	2.9
S								

SUNCE				MESEC			
UT	e = T_p − UT	Δ/24	r	Prolaz	Δ/24	$\pi_\leftmoon$	r
h	min s	s	′	h min	min	′	′
00	-10 9.5	-.8	16.3	$T_{\overline{m}}$ 10 5	2.5	59.0	16.1
12	-10 19.2	$T_{\overline{m}_\odot}$ 12 h 10.3 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 36	.1	39	-3.1	♄	1 43	.0	217	-2.1
♂	14 37	.1	23	1.0	♃	8 14	.0	119	.8

UT	SUNCE		PROLEĆ. TAČKA	VENERA		MARS	
	$S_\odot$	$\delta_\odot$	S_Υ	S_φ	δ_φ	S_σ	δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	177 22.8	-20 26.6	118 4.0	155 53.9	-16 33.2	140 45.1	-10 30.8
2	207 22.4	-20 25.6	148 9.0	185 52.7	-16 31.2	170 46.3	-10 29.3
4	237 22.0	-20 24.5	178 13.9	215 51.4	-16 29.3	200 47.6	-10 27.8
6	267 21.6	-20 23.5	208 18.8	245 50.1	-16 27.3	230 48.8	-10 26.4
8	297 21.2	-20 22.4	238 23.7	275 48.9	-16 25.3	260 50.1	-10 24.9
10	327 20.9	-20 21.4	268 28.7	305 47.6	-16 23.4	290 51.3	-10 23.4
12	357 20.5	-20 20.4	298 33.6	335 46.4	-16 21.4	320 52.6	-10 21.9
14	27 20.1	-20 19.3	328 38.5	5 45.2	-16 19.4	350 53.8	-10 20.4
16	57 19.7	-20 18.2	358 43.5	35 43.9	-16 17.5	20 55.1	-10 18.9
18	87 19.3	-20 17.2	28 48.4	65 42.7	-16 15.5	50 56.3	-10 17.4
20	117 18.9	-20 16.1	58 53.3	95 41.4	-16 13.5	80 57.6	-10 15.9
22	147 18.6	-20 15.1	88 58.2	125 40.2	-16 11.5	110 58.9	-10 14.4
Δ	-2	5		-6	10	6	7

UT	MESEC				JUPITER		SATURN	
	$S_\leftmoon$	Δ	$\delta_\leftmoon$	Δ	$S_{\mathrm{♃}}$	$\delta_{\mathrm{♃}}$	$S_{\mathrm{♄}}$	$\delta_{\mathrm{♄}}$
h	° ′		° ′		° ′	° ′	° ′	° ′
0	200 32.5	54	18 14.9	-24	335 20.7	15 40.4	237 12.4	-18 44.5
2	229 21.2	53	18 10.2	-26	5 26.2	15 40.6	267 16.9	-18 44.6
4	258 9.8	53	18 5.0	-29	35 31.7	15 40.8	297 21.4	-18 44.6
6	286 58.3	52	17 59.2	-31	65 37.2	15 41.0	327 25.9	-18 44.7
8	315 46.8	52	17 53.0	-34	95 42.7	15 41.2	357 30.4	-18 44.8
10	344 35.2	52	17 46.2	-36	125 48.2	15 41.4	27 34.9	-18 44.9
12	13 23.5	52	17 39.0	-39	155 53.7	15 41.6	57 39.4	-18 44.9
14	42 11.8	51	17 31.2	-41	185 59.2	15 41.8	87 43.9	-18 45.0
16	71 .1	51	17 22.9	-44	216 4.7	15 42.0	117 48.4	-18 45.1
18	99 48.4	51	17 14.2	-46	246 10.2	15 42.2	147 52.9	-18 45.1
20	128 36.7	51	17 4.9	-49	276 15.7	15 42.4	177 57.4	-18 45.2
22	157 24.9	51	16 55.2	-51	306 21.2	15 42.6	208 1.9	-18 45.3
Δ					28	1	22	0

φ	SUNCE		TRAJANJE SUMRAKA		MESEC			
	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 42	15 40	0 52	2 35	2 27	3.2	19 32	1.5
55	8 11	16 10	0 42	2 11	2 55	3.0	19 7	1.7
50	7 50	16 32	0 36	1 55	3 15	2.9	18 48	1.9
45	7 32	16 49	0 32	1 44	3 31	2.8	18 33	2.0
40	7 18	17 3	0 30	1 35	3 44	2.8	18 21	2.1
35	7 6	17 15	0 27	1 29	3 55	2.7	18 11	2.1
30	6 56	17 26	0 26	1 24	4 5	2.7	18 1	2.2
20	6 38	17 44	0 23	1 17	4 22	2.6	17 45	2.3
10	6 22	17 59	0 22	1 14	4 36	2.6	17 32	2.4
0	6 7	18 14	0 22	1 13	4 50	2.5	17 18	2.5
10	5 52	18 29	0 23	1 16	5 4	2.4	17 5	2.6
20	5 36	18 45	0 24	1 21	5 18	2.4	16 51	2.7
30	5 17	19 4	0 27	1 32	5 35	2.3	16 35	2.8
35	5 6	19 15	0 29	1 41	5 45	2.2	16 26	2.8
40	4 53	19 28	0 31	1 54	5 56	2.2	16 15	2.9
45	4 38	19 43	0 35	2 14	6 9	2.1	16 2	3.0
50	4 19	20 1	0 41	2 58	6 25	2.0	15 47	3.1
55	3 55	20 25	0 50	: ::	6 45	1.9	15 27	3.2
60	3 21	20 59	1 10	: ::	7 13	1.7	15 0	3.4
S								

SUNCE				MESEC				
UT	e = T_p − UT	Δ/24	r	Prolaz		Δ/24	$\pi_\leftmoon$	r
h	min s	s	′	$T_{\overline{m}}$	h min	min	′	′
00	-10 28.8	-.8	16.3	$T_{\overline{m}}$	11 4	2.5	59.8	16.3
12	-10 38.0	$T_{\overline{m}_\odot}$ 12 h 10.6 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 37	.1	38	-3.1	♄	1 38	.0	217	-2.1
♂	14 36	.1	23	1.0	♃	8 10	.0	119	.8

UT	SUNCE		PROLEĆ. TAČKA	VENERA		MARS	
	$S_\odot$	$\delta_\odot$	S_Υ	S_φ	δ_φ	S_σ	δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	177 18.2	-20 14.0	119 3.2	155 39.0	-16 9.5	141 .1	-10 13.0
2	207 17.8	-20 12.9	149 8.1	185 37.7	-16 7.6	171 1.4	-10 11.5
4	237 17.4	-20 11.9	179 13.0	215 36.5	-16 5.6	201 2.6	-10 10.0
6	267 17.0	-20 10.8	209 18.0	245 35.3	-16 3.6	231 3.9	-10 8.5
8	297 16.7	-20 9.7	239 22.9	275 34.1	-16 1.6	261 5.1	-10 7.0
10	327 16.3	-20 8.6	269 27.8	305 32.8	-15 59.6	291 6.4	-10 5.5
12	357 15.9	-20 7.6	299 32.7	335 31.6	-15 57.6	321 7.7	-10 4.0
14	27 15.6	-20 6.5	329 37.7	5 30.4	-15 55.6	351 8.9	-10 2.5
16	57 15.2	-20 5.4	359 42.6	35 29.2	-15 53.6	21 10.2	-10 1.0
18	87 14.8	-20 4.3	29 47.5	65 28.0	-15 51.5	51 11.4	- 9 59.5
20	117 14.5	-20 3.2	59 52.5	95 26.8	-15 49.5	81 12.7	- 9 58.0
22	147 14.1	-20 2.1	89 57.4	125 25.6	-15 47.5	111 14.0	- 9 56.5
Δ	-2	5		-6	10	6	7

UT	MESEC				JUPITER		SATURN	
	$S_\leftmoon$	Δ	$\delta_\leftmoon$	Δ	$S_{\mathrm{♃}}$	$\delta_{\mathrm{♃}}$	$S_{\mathrm{♄}}$	$\delta_{\mathrm{♄}}$
h	° ′		° ′		° ′	° ′	° ′	° ′
0	186 13.2	52	16 44.9	-54	336 26.7	15 42.8	238 6.4	-18 45.3
2	215 1.5	52	16 34.2	-56	6 32.2	15 43.0	268 10.9	-18 45.4
4	243 49.8	52	16 23.0	-58	36 37.7	15 43.2	298 15.4	-18 45.5
6	272 38.2	52	16 11.3	-61	66 43.2	15 43.4	328 19.9	-18 45.6
8	301 26.7	52	15 59.1	-63	96 48.7	15 43.6	358 24.5	-18 45.6
10	330 15.2	53	15 46.5	-65	126 54.3	15 43.8	28 29.0	-18 45.7
12	359 3.7	53	15 33.4	-68	156 59.8	15 44.0	58 33.5	-18 45.8
14	27 52.4	54	15 19.9	-70	187 5.3	15 44.2	88 38.0	-18 45.8
16	56 41.1	54	15 5.9	-72	217 10.8	15 44.4	118 42.5	-18 45.9
18	85 30.0	55	14 51.5	-74	247 16.3	15 44.6	148 47.0	-18 46.0
20	114 18.9	55	14 36.7	-76	277 21.8	15 44.8	178 51.5	-18 46.0
22	143 8.0	56	14 21.4	-78	307 27.3	15 45.0	208 56.0	-18 46.1
Δ					28	1	23	0

φ	SUNCE		TRAJANJE SUMRAKA		MESEC			
	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 40	15 43	0 51	2 34	3 43	3.6	20 9	1.2
55	8 10	16 12	0 42	2 11	4 7	3.3	19 48	1.5
50	7 49	16 34	0 36	1 55	4 25	3.2	19 33	1.6
45	7 32	16 51	0 32	1 43	4 39	3.1	19 21	1.8
40	7 18	17 4	0 29	1 35	4 51	3.0	19 11	1.9
35	7 6	17 16	0 27	1 28	5 1	2.9	19 2	2.0
30	6 56	17 26	0 26	1 23	5 9	2.8	18 54	2.1
20	6 38	17 44	0 23	1 17	5 24	2.7	18 41	2.2
10	6 22	17 60	0 22	1 14	5 37	2.6	18 29	2.3
0	6 7	18 15	0 22	1 13	5 50	2.5	18 18	2.4
10	5 52	18 29	0 22	1 16	6 2	2.4	18 7	2.6
20	5 36	18 45	0 24	1 21	6 15	2.3	17 55	2.7
30	5 18	19 4	0 26	1 32	6 30	2.1	17 41	2.8
35	5 7	19 15	0 28	1 41	6 39	2.1	17 33	2.9
40	4 54	19 27	0 31	1 53	6 48	2.0	17 24	3.0
45	4 39	19 42	0 35	2 13	6 60	1.9	17 13	3.1
50	4 21	20 0	0 40	2 55	7 14	1.8	17 0	3.2
55	3 57	20 24	0 50	: ::	7 31	1.6	16 44	3.4
60	3 23	20 57	1 9	: ::	7 55	1.4	16 21	3.7
S								

SUNCE				MESEC				
UT	e = T_p − UT	Δ/24	r	Prolaz		Δ/24	$\pi_\leftmoon$	r
h	min s	s	′	$T_{\overline{m}}$	h min	min	′	′
00	-10 47.3	-.7	16.3	$T_{\overline{m}}$	12 4	2.5	60.5	16.5
12	-10 56.2	$T_{\overline{m}_\odot}$ 12 h 10.9 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 38	.1	37	-3.1	♄	1 34	.0	217	-2.1
♂	14 35	.1	22	1.0	♃	8 6	.0	119	.8

UT	SUNCE $S_\odot$	SUNCE $\delta_\odot$	PROLEĆ. TAČKA S_Υ	VENERA S_φ	VENERA δ_φ	MARS S_σ	MARS δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	177 13.7	-20 1.0	120 2.3	155 24.4	-15 45.5	141 15.2	- 9 55.0
2	207 13.4	-19 59.9	150 7.2	185 23.2	-15 43.5	171 16.5	- 9 53.5
4	237 13.0	-19 58.8	180 12.2	215 22.0	-15 41.4	201 17.8	- 9 52.0
6	267 12.6	-19 57.7	210 17.1	245 20.8	-15 39.4	231 19.0	- 9 50.5
8	297 12.3	-19 56.6	240 22.0	275 19.6	-15 37.4	261 20.3	- 9 49.0
10	327 11.9	-19 55.5	270 27.0	305 18.4	-15 35.3	291 21.6	- 9 47.5
12	357 11.6	-19 54.4	300 31.9	335 17.2	-15 33.3	321 22.8	- 9 46.0
14	27 11.2	-19 53.3	330 36.8	5 16.0	-15 31.2	351 24.1	- 9 44.5
16	57 10.9	-19 52.2	0 41.7	35 14.8	-15 29.2	21 25.4	- 9 43.0
18	87 10.5	-19 51.1	30 46.7	65 13.6	-15 27.2	51 26.6	- 9 41.5
20	117 10.2	-19 49.9	60 51.6	95 12.4	-15 25.1	81 27.9	- 9 40.0
22	147 9.8	-19 48.8	90 56.5	125 11.2	-15 23.0	111 29.2	- 9 38.5
Δ	-2	6		-6	10	6	8

UT	MESEC $S_\leftmoon$	MESEC Δ	MESEC $\delta_\leftmoon$	MESEC Δ	JUPITER $S_{\jupiter}$	JUPITER $\delta_{\jupiter}$	SATURN $S_{\saturn}$	SATURN $\delta_{\saturn}$
h	° ′		° ′		° ′	° ′	° ′	° ′
0	171 57.1	56	14 5.7	-80	337 32.8	15 45.2	239 .5	-18 46.2
2	200 46.4	57	13 49.7	-82	7 38.3	15 45.4	269 5.0	-18 46.2
4	229 35.8	58	13 33.2	-84	37 43.9	15 45.6	299 9.5	-18 46.3
6	258 25.4	59	13 16.4	-86	67 49.4	15 45.9	329 14.0	-18 46.4
8	287 15.1	59	12 59.1	-88	97 54.9	15 46.1	359 18.5	-18 46.4
10	316 5.0	60	12 41.6	-90	128 .4	15 46.3	29 23.1	-18 46.5
12	344 55.0	61	12 23.6	-91	158 5.9	15 46.5	59 27.6	-18 46.6
14	13 45.1	62	12 5.3	-93	188 11.4	15 46.7	89 32.1	-18 46.6
16	42 35.5	62	11 46.7	-95	218 17.0	15 46.9	119 36.6	-18 46.7
18	71 25.9	63	11 27.8	-96	248 22.5	15 47.1	149 41.1	-18 46.8
20	100 16.6	64	11 8.5	-98	278 28.0	15 47.3	179 45.6	-18 46.8
22	129 7.4	65	10 49.0	-99	308 33.5	15 47.5	209 50.1	-18 46.9
Δ					28	1	23	0

φ	SUNCE IZLAZ	SUNCE ZALAZ	TRAJANJE SUMRAKA GRAĐ.	TRAJANJE SUMRAKA ASTR.	MESEC IZLAZ	MESEC Δ/24	MESEC ZALAZ	MESEC Δ/24
N	h min	h min	h min	h min	h min	min	h min	min
60	8 38	15 45	0 51	2 33	5 9	3.8	20 38	1.0
55	8 9	16 14	0 42	2 10	5 27	3.5	20 23	1.2
50	7 48	16 35	0 36	1 55	5 41	3.3	20 12	1.4
45	7 31	16 52	0 32	1 43	5 52	3.1	20 3	1.6
40	7 17	17 6	0 29	1 35	6 2	3.0	19 56	1.7
35	7 6	17 17	0 27	1 28	6 10	2.9	19 49	1.8
30	6 55	17 27	0 26	1 23	6 17	2.8	19 44	1.9
20	6 38	17 45	0 23	1 17	6 29	2.7	19 34	2.1
10	6 22	18 0	0 22	1 14	6 39	2.5	19 25	2.2
0	6 8	18 15	0 22	1 13	6 49	2.4	19 17	2.4
10	5 53	18 30	0 22	1 15	6 59	2.3	19 8	2.5
20	5 37	18 45	0 24	1 21	7 9	2.1	18 59	2.6
30	5 19	19 4	0 26	1 32	7 21	2.0	18 49	2.8
35	5 8	19 14	0 28	1 40	7 28	1.9	18 43	2.9
40	4 55	19 27	0 31	1 53	7 36	1.8	18 36	3.0
45	4 40	19 41	0 35	2 12	7 45	1.7	18 28	3.2
50	4 22	19 59	0 40	2 52	7 56	1.5	18 18	3.3
55	3 59	20 23	0 49	: ::	8 9	1.3	18 6	3.5
60	3 26	20 55	1 7	: ::	8 27	1.1	17 50	3.8
S								

SUNCE UT	SUNCE $e = T_p - UT$	SUNCE Δ/24	SUNCE r	MESEC Prolaz	MESEC Δ/24	MESEC $\pi_\leftmoon$	MESEC r
h	min s	s	′	h min	min	′	′
00	-11 5.1	-.7	16.3	$T_{\overline{m}}$ 13 3	2.4	60.9	16.6
12	-11 13.6	$T_{\overline{m}_\odot}$ 12 h 11.2 min		Starost .4 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	35	-3.1	♄	1 30	.0	218	-2.1
♂	14 34	.1	21	1.0	♃	8 3	.0	119	.8

UT	SUNCE $S_\odot$	SUNCE $\delta_\odot$	PROLEĆ. TAČKA S_Υ	VENERA S_φ	VENERA δ_φ	MARS S_σ	MARS δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	177 9.5	-19 47.7	121 1.4	155 10.1	-15 21.0	141 30.4	- 9 37.0
2	207 9.1	-19 46.6	151 6.4	185 8.9	-15 18.9	171 31.7	- 9 35.5
4	237 8.8	-19 45.4	181 11.3	215 7.7	-15 16.9	201 33.0	- 9 34.0
6	267 8.4	-19 44.3	211 16.2	245 6.5	-15 14.8	231 34.3	- 9 32.5
8	297 8.1	-19 43.1	241 21.2	275 5.4	-15 12.7	261 35.5	- 9 31.0
10	327 7.8	-19 42.0	271 26.1	305 4.2	-15 10.7	291 36.8	- 9 29.4
12	357 7.4	-19 40.9	301 31.0	335 3.0	-15 8.6	321 38.1	- 9 27.9
14	27 7.1	-19 39.7	331 35.9	5 1.9	-15 6.5	351 39.4	- 9 26.4
16	57 6.7	-19 38.6	1 40.9	35 .7	-15 4.4	21 40.6	- 9 24.9
18	87 6.4	-19 37.4	31 45.8	64 59.6	-15 2.3	51 41.9	- 9 23.4
20	117 6.1	-19 36.3	61 50.7	94 58.4	-15 .3	81 43.2	- 9 21.9
22	147 5.7	-19 35.1	91 55.7	124 57.2	-14 58.2	111 44.5	- 9 20.4
Δ	-2	6		-6	10	6	8

UT	MESEC $S_\leftmoon$	MESEC Δ	MESEC $\delta_\leftmoon$	MESEC Δ	JUPITER $S_{\jupiter}$	JUPITER $\delta_{\jupiter}$	SATURN $S_{\saturn}$	SATURN $\delta_{\saturn}$
h	° ′		° ′		° ′	° ′	° ′	° ′
0	157 58.4	66	10 29.1	-101	338 39.0	15 47.7	239 54.7	-18 47.0
2	186 49.6	67	10 9.0	-102	8 44.6	15 47.9	269 59.2	-18 47.0
4	215 40.9	68	9 48.6	-103	38 50.1	15 48.1	300 3.7	-18 47.1
6	244 32.5	69	9 28.0	-104	68 55.6	15 48.3	330 8.2	-18 47.2
8	273 24.2	69	9 7.1	-106	99 1.1	15 48.5	0 12.7	-18 47.2
10	302 16.1	70	8 46.0	-107	129 6.6	15 48.7	30 17.2	-18 47.3
12	331 8.1	71	8 24.7	-108	159 12.2	15 48.9	60 21.8	-18 47.4
14	0 .4	72	8 3.1	-109	189 17.7	15 49.1	90 26.3	-18 47.4
16	28 52.8	73	7 41.4	-110	219 23.2	15 49.3	120 30.8	-18 47.5
18	57 45.4	74	7 19.5	-110	249 28.7	15 49.5	150 35.3	-18 47.6
20	86 38.2	75	6 57.4	-111	279 34.3	15 49.7	180 39.8	-18 47.6
22	115 31.2	76	6 35.1	-112	309 39.8	15 49.9	210 44.4	-18 47.7
Δ					28	1	23	0

φ	SUNCE IZLAZ	SUNCE ZALAZ	TRAJANJE SUMRAKA GRAĐ.	TRAJANJE SUMRAKA ASTR.	MESEC IZLAZ	MESEC Δ/24	MESEC ZALAZ	MESEC 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	6 39	3.8	21 1	.9
55	8 7	16 16	0 42	2 10	6 51	3.5	20 53	1.1
50	7 47	16 37	0 36	1 54	7 0	3.3	20 47	1.3
45	7 30	16 53	0 32	1 43	7 8	3.1	20 41	1.5
40	7 17	17 7	0 29	1 35	7 14	3.0	20 37	1.6
35	7 5	17 18	0 27	1 28	7 20	2.9	20 33	1.7
30	6 55	17 28	0 26	1 23	7 24	2.8	20 30	1.8
20	6 38	17 46	0 23	1 17	7 33	2.6	20 24	2.0
10	6 22	18 1	0 22	1 14	7 40	2.5	20 18	2.1
0	6 8	18 15	0 22	1 13	7 47	2.3	20 13	2.3
10	5 53	18 30	0 22	1 15	7 53	2.2	20 8	2.4
20	5 38	18 45	0 24	1 21	8 1	2.0	20 3	2.6
30	5 19	19 3	0 26	1 31	8 9	1.9	19 56	2.8
35	5 9	19 14	0 28	1 40	8 13	1.8	19 53	2.9
40	4 56	19 26	0 31	1 52	8 19	1.6	19 48	3.0
45	4 42	19 40	0 35	2 11	8 25	1.5	19 44	3.1
50	4 24	19 58	0 40	2 50	8 32	1.4	19 38	3.3
55	4 1	20 21	0 49	: ::	8 42	1.2	19 30	3.5
60	3 28	20 53	1 6	: ::	8 53	.9	19 21	3.8
S								

SUNCE UT	SUNCE $e = T_p - UT$	SUNCE Δ/24	SUNCE r	MESEC Prolaz	MESEC Δ/24	MESEC $\pi_\leftmoon$	MESEC r
h	min s	s	′	h min	min	′	′
00	-11 22.1	-.7	16.3	$T_{\overline{m}}$ 13 60	2.3	61.0	16.6
12	-11 30.2	$T_{\overline{m}_\odot}$ 12 h 11.5 min		Starost 1.4 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	34	-3.1	♄	1 25	.0	218	-2.1
♂	14 33	.1	20	1.0	♃	7 59	.0	119	.8

UT	SUNCE $S_\odot$	$\delta_\odot$	PROLEĆ. TAČKA S_Υ	VENERA S_φ	δ_φ	MARS S_σ	δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	177 5.4	-19 34.0	122 .6	154 56.1	-14 56.1	141 45.7	- 9 18.9
2	207 5.1	-19 32.8	152 5.5	184 54.9	-14 54.0	171 47.0	- 9 17.4
4	237 4.8	-19 31.6	182 10.4	214 53.8	-14 51.9	201 48.3	- 9 15.8
6	267 4.4	-19 30.5	212 15.4	244 52.6	-14 49.8	231 49.6	- 9 14.3
8	297 4.1	-19 29.3	242 20.3	274 51.5	-14 47.7	261 50.9	- 9 12.8
10	327 3.8	-19 28.1	272 25.2	304 50.4	-14 45.6	291 52.1	- 9 11.3
12	357 3.5	-19 27.0	302 30.2	334 49.2	-14 43.5	321 53.4	- 9 9.8
14	27 3.1	-19 25.8	332 35.1	4 48.1	-14 41.4	351 54.7	- 9 8.3
16	57 2.8	-19 24.6	2 40.0	34 46.9	-14 39.2	21 56.0	- 9 6.8
18	87 2.5	-19 23.4	32 44.9	64 45.8	-14 37.1	51 57.3	- 9 5.2
20	117 2.2	-19 22.3	62 49.9	94 44.7	-14 35.0	81 58.6	- 9 3.7
22	147 1.9	-19 21.1	92 54.8	124 43.6	-14 32.9	111 59.8	- 9 2.2
Δ	-2	6		-6	11	6	8

UT	MESEC $S_\leftmoon$	Δ	$\delta_\leftmoon$	Δ	JUPITER $S_\jupiter$	$\delta_\jupiter$	SATURN $S_\saturn$	$\delta_\saturn$
h	° ′		° ′		° ′	° ′	° ′	° ′
0	144 24.3	77	6 12.7	-113	339 45.3	15 50.1	240 48.9	-18 47.8
2	173 17.7	77	5 50.2	-113	9 50.9	15 50.4	270 53.4	-18 47.8
4	202 11.1	78	5 27.5	-114	39 56.4	15 50.6	300 57.9	-18 47.9
6	231 4.8	79	5 4.8	-114	70 1.9	15 50.8	331 2.4	-18 48.0
8	259 58.7	80	4 41.9	-115	100 7.4	15 51.0	1 7.0	-18 48.0
10	288 52.7	81	4 18.9	-115	130 13.0	15 51.2	31 11.5	-18 48.1
12	317 46.8	82	3 55.9	-116	160 18.5	15 51.4	61 16.0	-18 48.2
14	346 41.2	82	3 32.8	-116	190 24.0	15 51.6	91 20.5	-18 48.2
16	15 35.6	83	3 9.6	-116	220 29.6	15 51.8	121 25.1	-18 48.3
18	44 30.3	84	2 46.4	-116	250 35.1	15 52.0	151 29.6	-18 48.3
20	73 25.1	85	2 23.2	-116	280 40.6	15 52.2	181 34.1	-18 48.4
22	102 20.0	85	1 59.9	-116	310 46.2	15 52.4	211 38.6	-18 48.5
Δ					28	1	23	0

φ	SUNCE IZLAZ	ZALAZ	TRAJANJE SUMRAKA GRAĐ.	ASTR.	MESEC IZLAZ	Δ/24	ZALAZ	Δ/24
N	h min	h min	h min	h min	h min	min	h min	min
60	8 34	15 50	0 50	2 32	8 9	3.6	21 22	2.4
55	8 6	16 18	0 42	2 10	8 15	3.3	21 20	2.4
50	7 45	16 39	0 36	1 54	8 20	3.2	21 18	2.3
45	7 29	16 55	0 32	1 43	8 23	3.0	21 17	2.3
40	7 16	17 8	0 29	1 34	8 26	2.9	21 15	2.3
35	7 5	17 19	0 27	1 28	8 29	2.8	21 14	2.3
30	6 55	17 29	0 25	1 23	8 31	2.7	21 13	2.3
20	6 38	17 46	0 23	1 17	8 35	2.5	21 11	2.3
10	6 22	18 1	0 22	1 13	8 39	2.4	21 10	2.2
0	6 8	18 15	0 22	1 13	8 42	2.2	21 8	2.2
10	5 54	18 30	0 22	1 15	8 46	2.1	21 7	2.2
20	5 38	18 45	0 24	1 21	8 49	2.0	21 5	2.2
30	5 20	19 3	0 26	1 31	8 53	1.8	21 3	2.2
35	5 10	19 13	0 28	1 39	8 56	1.7	21 2	2.2
40	4 58	19 25	0 31	1 52	8 58	1.6	21 0	2.2
45	4 43	19 40	0 34	2 10	9 1	1.5	20 59	2.2
50	4 26	19 57	0 40	2 47	9 5	1.4	20 57	2.1
55	4 3	20 20	0 48	: ::	9 10	1.2	20 54	2.1
60	3 31	20 51	1 5	: ::	9 15	1.0	20 51	2.1
S								

SUNCE UT	e = Tp − UT	Δ/24	r	MESEC Prolaz		Δ/24	$\pi_\leftmoon$	r
h	min s	s	′		h min	min	′	′
00	-11 38.3	-.6	16.3	$T_{\overline{m}}$	14 55	2.2	60.8	16.6
12	-11 46.1	$T_{\overline{m}_\odot}$	12 h 11.8 min	Starost	2.4 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	33	-3.1	♄	1 21	.0	218	-2.1
♂	14 32	.1	20	1.0	♃	7 56	.0	119	.8

UT	SUNCE $S_\odot$	$\delta_\odot$	PROLEĆ. TAČKA S_Υ	VENERA S_φ	δ_φ	MARS S_σ	δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	177 1.5	-19 19.9	122 59.7	154 42.4	-14 30.8	142 1.1	- 9 .7
2	207 1.2	-19 18.7	153 4.7	184 41.3	-14 28.6	172 2.4	- 8 59.2
4	237 .9	-19 17.5	183 9.6	214 40.2	-14 26.5	202 3.7	- 8 57.6
6	267 .6	-19 16.3	213 14.5	244 39.1	-14 24.4	232 5.0	- 8 56.1
8	297 .3	-19 15.1	243 19.4	274 37.9	-14 22.2	262 6.3	- 8 54.6
10	327 .0	-19 13.9	273 24.4	304 36.8	-14 20.1	292 7.6	- 8 53.1
12	356 59.7	-19 12.7	303 29.3	334 35.7	-14 18.0	322 8.9	- 8 51.6
14	26 59.4	-19 11.5	333 34.2	4 34.6	-14 15.8	352 10.1	- 8 50.0
16	56 59.1	-19 10.3	3 39.2	34 33.5	-14 13.7	22 11.4	- 8 48.5
18	86 58.8	-19 9.1	33 44.1	64 32.4	-14 11.5	52 12.7	- 8 47.0
20	116 58.5	-19 7.9	63 49.0	94 31.3	-14 9.4	82 14.0	- 8 45.5
22	146 58.2	-19 6.7	93 53.9	124 30.2	-14 7.2	112 15.3	- 8 43.9
Δ	-2	6		-6	11	6	8

UT	MESEC $S_\leftmoon$	Δ	$\delta_\leftmoon$	Δ	JUPITER $S_\jupiter$	$\delta_\jupiter$	SATURN $S_\saturn$	$\delta_\saturn$
h	° ′		° ′		° ′	° ′	° ′	° ′
0	131 15.1	86	1 36.7	-116	340 51.7	15 52.6	241 43.2	-18 48.5
2	160 10.4	87	1 13.4	-116	10 57.2	15 52.8	271 47.7	-18 48.6
4	189 5.7	88	0 50.1	-116	41 2.8	15 53.0	301 52.2	-18 48.7
6	218 1.2	88	0 26.9	-116	71 8.3	15 53.2	331 56.8	-18 48.7
8	246 56.9	89	0 3.7	79	101 13.9	15 53.5	2 1.3	-18 48.8
10	275 52.6	89	0 19.5	116	131 19.4	15 53.7	32 5.8	-18 48.9
12	304 48.5	90	0 42.6	115	161 24.9	15 53.9	62 10.4	-18 48.9
14	333 44.5	91	1 5.6	115	191 30.5	15 54.1	92 14.9	-18 49.0
16	2 40.7	91	1 28.6	114	221 36.0	15 54.3	122 19.4	-18 49.0
18	31 36.9	92	1 51.5	114	251 41.5	15 54.5	152 23.9	-18 49.1
20	60 33.2	92	2 14.3	114	281 47.1	15 54.7	182 28.5	-18 49.2
22	89 29.7	93	2 37.0	113	311 52.6	15 54.9	212 33.0	-18 49.2
Δ					28	1	23	0

φ	SUNCE IZLAZ	ZALAZ	TRAJANJE SUMRAKA GRAĐ.	ASTR.	MESEC IZLAZ	Δ/24	ZALAZ	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 32	9 35	.8	22 20	3.6
55	8 5	16 20	0 41	2 9	9 35	1.1	22 17	3.3
50	7 44	16 40	0 36	1 54	9 36	1.2	22 14	3.1
45	7 28	16 56	0 32	1 43	9 36	1.4	22 12	3.0
40	7 15	17 9	0 29	1 34	9 36	1.5	22 10	2.8
35	7 4	17 20	0 27	1 28	9 36	1.6	22 9	2.7
30	6 54	17 30	0 25	1 23	9 36	1.7	22 8	2.6
20	6 37	17 47	0 23	1 17	9 36	1.9	22 5	2.5
10	6 23	18 2	0 22	1 13	9 36	2.1	22 3	2.3
0	6 8	18 16	0 22	1 13	9 36	2.2	22 1	2.2
10	5 54	18 30	0 22	1 15	9 36	2.3	21 59	2.0
20	5 39	18 45	0 24	1 20	9 37	2.5	21 57	1.9
30	5 21	19 2	0 26	1 31	9 37	2.7	21 55	1.7
35	5 11	19 13	0 28	1 39	9 37	2.8	21 54	1.6
40	4 59	19 25	0 31	1 51	9 37	2.9	21 52	1.5
45	4 45	19 39	0 34	2 9	9 38	3.0	21 50	1.4
50	4 27	19 56	0 40	2 45	9 38	3.2	21 48	1.2
55	4 5	20 18	0 48	: ::	9 38	3.4	21 46	1.1
60	3 34	20 49	1 4	: ::	9 39	3.6	21 42	.8
S								

SUNCE UT	e = Tp − UT	Δ/24	r	MESEC Prolaz		Δ/24	$\pi_\leftmoon$	r
h	min s	s	′		h min	min	′	′
00	-11 53.8	-.6	16.3	$T_{\overline{m}}$	15 49	2.2	60.3	16.4
12	-12 1.1	$T_{\overline{m}_\odot}$	12 h 12.0 min	Starost	3.4 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	32	-3.1	♄	1 16	.0	218	-2.1
♂	14 31	.1	19	1.0	♃	7 52	.0	119	.8

UT	SUNCE		PROLEĆ. TAČKA	VENERA		MARS	
	$S_\odot$	$\delta_\odot$	S_Υ	S_φ	δ_φ	S_σ	δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	176 57.9	-19 5.5	123 58.9	154 29.1	-14 5.1	142 16.6	- 8 42.4
2	206 57.6	-19 4.2	154 3.8	184 28.0	-14 2.9	172 17.9	- 8 40.9
4	236 57.3	-19 3.0	184 8.7	214 26.9	-14 .7	202 19.2	- 8 39.4
6	266 57.0	-19 1.8	214 13.7	244 25.8	-13 58.6	232 20.5	- 8 37.8
8	296 56.7	-19 .6	244 18.6	274 24.7	-13 56.4	262 21.8	- 8 36.3
10	326 56.4	-18 59.3	274 23.5	304 23.6	-13 54.2	292 23.1	- 8 34.8
12	356 56.1	-18 58.1	304 28.4	334 22.5	-13 52.1	322 24.4	- 8 33.3
14	26 55.8	-18 56.9	334 33.4	4 21.4	-13 49.9	352 25.7	- 8 31.7
16	56 55.6	-18 55.6	4 38.3	34 20.4	-13 47.7	22 27.0	- 8 30.2
18	86 55.3	-18 54.4	34 43.2	64 19.3	-13 45.5	52 28.3	- 8 28.7
20	116 55.0	-18 53.2	64 48.1	94 18.2	-13 43.4	82 29.6	- 8 27.2
22	146 54.7	-18 51.9	94 53.1	124 17.1	-13 41.2	112 30.9	- 8 25.6
Δ	-1	6		-5	11	6	8

UT	MESEC				JUPITER		SATURN	
	$S_\leftmoon$	Δ	$\delta_\leftmoon$	Δ	S_{4}	δ_{4}	S_{5}	δ_{5}
h	° ′		° ′		° ′	° ′	° ′	° ′
0	118 26.2	93	2 59.6	112	341 58.2	15 55.1	242 37.5	-18 49.3
2	147 22.8	94	3 22.1	112	12 3.7	15 55.3	272 42.1	-18 49.3
4	176 19.5	94	3 44.5	111	42 9.3	15 55.5	302 46.6	-18 49.4
6	205 16.4	94	4 6.7	110	72 14.8	15 55.8	332 51.2	-18 49.5
8	234 13.2	95	4 28.8	110	102 20.3	15 56.0	2 55.7	-18 49.5
10	263 10.2	95	4 50.7	109	132 25.9	15 56.2	33 .2	-18 49.6
12	292 7.2	96	5 12.4	108	162 31.4	15 56.4	63 4.8	-18 49.7
14	321 4.3	96	5 34.0	107	192 37.0	15 56.6	93 9.3	-18 49.7
16	350 1.5	96	5 55.5	106	222 42.5	15 56.8	123 13.8	-18 49.8
18	18 58.7	96	6 16.7	105	252 48.1	15 57.0	153 18.4	-18 49.8
20	47 56.0	97	6 37.7	104	282 53.6	15 57.2	183 22.9	-18 49.9
22	76 53.4	97	6 58.6	103	312 59.2	15 57.4	213 27.5	-18 50.0
Δ					28	1	23	0

φ	SUNCE		TRAJANJE SUMRAKA		MESEC			
	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 30	15 55	0 50	2 31	9 55	.9	23 46	3.4
55	8 3	16 22	0 41	2 9	10 1	1.1	23 36	3.2
50	7 43	16 42	0 36	1 53	10 5	1.3	23 29	3.0
45	7 28	16 57	0 32	1 42	10 9	1.4	23 23	2.9
40	7 15	17 10	0 29	1 34	10 12	1.5	23 19	2.8
35	7 4	17 21	0 27	1 28	10 15	1.6	23 14	2.7
30	6 54	17 31	0 25	1 23	10 17	1.7	23 11	2.6
20	6 37	17 47	0 23	1 16	10 22	1.9	23 4	2.4
10	6 23	18 2	0 22	1 13	10 25	2.0	22 59	2.3
0	6 9	18 16	0 22	1 13	10 29	2.2	22 54	2.2
10	5 55	18 30	0 22	1 15	10 33	2.3	22 48	2.0
20	5 40	18 45	0 24	1 20	10 37	2.4	22 43	1.9
30	5 22	19 2	0 26	1 31	10 41	2.6	22 36	1.7
35	5 12	19 12	0 28	1 39	10 44	2.7	22 33	1.7
40	5 0	19 24	0 31	1 50	10 47	2.8	22 29	1.6
45	4 46	19 38	0 34	2 9	10 50	2.9	22 24	1.4
50	4 29	19 55	0 39	2 43	10 54	3.1	22 18	1.3
55	4 7	20 16	0 48	: ::	10 59	3.3	22 11	1.1
60	3 36	20 47	1 3	: ::	11 6	3.5	22 2	.9
S								

SUNCE				MESEC				
UT	$e = T_p - UT$	Δ/24	r	Prolaz		Δ/24	$\pi_\leftmoon$	r
h	min s	s	′		h min	min	′	′
00	-12 8.5	-.6	16.3	$T_{\overline{m}}$	16 41	2.2	59.7	16.3
12	-12 15.4	$T_{\overline{m}_\odot}$ 12 h 12.3 min		Starost 4.4 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	30	-3.1	♃	1 12	.0	218	-2.1
♂	14 30	.1	18	1.0	♄	7 48	.0	119	.8

UT	SUNCE		PROLEĆ. TAČKA	VENERA		MARS	
	$S_\odot$	$\delta_\odot$	S_Υ	S_φ	δ_φ	S_σ	δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	176 54.4	-18 50.7	124 58.0	154 16.0	-13 39.0	142 32.2	- 8 24.1
2	206 54.1	-18 49.4	155 2.9	184 15.0	-13 36.8	172 33.5	- 8 22.6
4	236 53.9	-18 48.2	185 7.9	214 13.9	-13 34.6	202 34.8	- 8 21.0
6	266 53.6	-18 46.9	215 12.8	244 12.8	-13 32.4	232 36.1	- 8 19.5
8	296 53.3	-18 45.7	245 17.7	274 11.8	-13 30.2	262 37.4	- 8 18.0
10	326 53.0	-18 44.4	275 22.6	304 10.7	-13 28.0	292 38.7	- 8 16.4
12	356 52.8	-18 43.1	305 27.6	334 9.6	-13 25.8	322 40.0	- 8 14.9
14	26 52.5	-18 41.9	335 32.5	4 8.6	-13 23.6	352 41.3	- 8 13.4
16	56 52.2	-18 40.6	5 37.4	34 7.5	-13 21.4	22 42.6	- 8 11.8
18	86 52.0	-18 39.4	35 42.4	64 6.5	-13 19.2	52 43.9	- 8 10.3
20	116 51.7	-18 38.1	65 47.3	94 5.4	-13 17.0	82 45.2	- 8 8.8
22	146 51.4	-18 36.8	95 52.2	124 4.4	-13 14.8	112 46.5	- 8 7.2
Δ	-1	6		-5	11	7	8

UT	MESEC				JUPITER		SATURN	
	$S_\leftmoon$	Δ	$\delta_\leftmoon$	Δ	S_{4}	δ_{4}	S_{5}	δ_{5}
h	° ′		° ′		° ′	° ′	° ′	° ′
0	105 50.8	97	7 19.2	102	343 4.7	15 57.6	243 32.0	-18 50.0
2	134 48.2	97	7 39.6	101	13 10.3	15 57.8	273 36.5	-18 50.1
4	163 45.7	98	7 59.8	100	43 15.8	15 58.1	303 41.1	-18 50.1
6	192 43.2	98	8 19.8	99	73 21.4	15 58.3	333 45.6	-18 50.2
8	221 40.8	98	8 39.5	97	103 26.9	15 58.5	3 50.2	-18 50.3
10	250 38.4	98	8 59.0	96	133 32.5	15 58.7	33 54.7	-18 50.3
12	279 36.0	98	9 18.3	95	163 38.0	15 58.9	63 59.3	-18 50.4
14	308 33.7	98	9 37.3	94	193 43.6	15 59.1	94 3.8	-18 50.4
16	337 31.4	99	9 56.0	92	223 49.1	15 59.3	124 8.3	-18 50.5
18	6 29.1	99	10 14.5	91	253 54.7	15 59.5	154 12.9	-18 50.6
20	35 26.8	99	10 32.7	90	284 .2	15 59.7	184 17.4	-18 50.6
22	64 24.5	99	10 50.6	88	314 5.8	15 60.0	214 22.0	-18 50.7
Δ					28	1	23	0

φ	SUNCE		TRAJANJE SUMRAKA		MESEC			
	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 58	0 49	2 30	10 15	1.0	. ..	.0
55	8 2	16 24	0 41	2 8	10 27	1.2	. ..	.0
50	7 42	16 43	0 36	1 53	10 36	1.4	. ..	.0
45	7 27	16 59	0 32	1 42	10 43	1.5	. ..	.0
40	7 14	17 11	0 29	1 34	10 49	1.6	. ..	.0
35	7 3	17 22	0 27	1 28	10 54	1.7	. ..	.0
30	6 54	17 32	0 25	1 23	10 59	1.8	. ..	.0
20	6 37	17 48	0 23	1 16	11 7	1.9	. ..	.0
10	6 23	18 2	0 22	1 13	11 14	2.0	23 54	2.3
0	6 9	18 16	0 22	1 13	11 21	2.1	23 45	2.1
10	5 55	18 30	0 22	1 15	11 28	2.3	23 37	2.0
20	5 40	18 45	0 24	1 20	11 35	2.4	23 28	1.9
30	5 23	19 2	0 26	1 30	11 43	2.5	23 18	1.8
35	5 13	19 12	0 28	1 38	11 48	2.6	23 13	1.7
40	5 1	19 23	0 31	1 50	11 54	2.7	23 6	1.6
45	4 48	19 37	0 34	2 8	12 0	2.8	22 59	1.5
50	4 31	19 53	0 39	2 40	12 8	2.9	22 50	1.4
55	4 9	20 15	0 47	: ::	12 18	3.1	22 38	1.3
60	3 39	20 44	1 2	: ::	12 30	3.4	22 24	1.1
S								

SUNCE				MESEC				
UT	$e = T_p - UT$	Δ/24	r	Prolaz		Δ/24	$\pi_\leftmoon$	r
h	min s	s	′		h min	min	′	′
00	-12 22.3	-.5	16.3	$T_{\overline{m}}$	17 33	2.2	59.0	16.1
12	-12 28.8	$T_{\overline{m}_\odot}$ 12 h 12.5 min		Starost 5.4 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	29	-3.1	♃	1 7	.0	218	-2.1
♂	14 29	.1	18	1.0	♄	7 45	.0	119	.8

UT	SUNCE		PROLEĆ. TAČKA	VENERA		MARS	
	$S_\odot$	$\delta_\odot$	S_Υ	S_φ	δ_φ	S_σ	δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	176 51.2	-18 35.5	125 57.1	154 3.3	-13 12.5	142 47.8	- 8 5.7
2	206 50.9	-18 34.3	156 2.1	184 2.3	-13 10.3	172 49.1	- 8 4.2
4	236 50.6	-18 33.0	186 7.0	214 1.2	-13 8.1	202 50.4	- 8 2.6
6	266 50.4	-18 31.7	216 11.9	244 .2	-13 5.9	232 51.7	- 8 1.1
8	296 50.1	-18 30.4	246 16.9	273 59.1	-13 3.7	262 53.0	- 7 59.6
10	326 49.9	-18 29.1	276 21.8	303 58.1	-13 1.4	292 54.3	- 7 58.0
12	356 49.6	-18 27.9	306 26.7	333 57.1	-12 59.2	322 55.7	- 7 56.5
14	26 49.4	-18 26.6	336 31.6	3 56.0	-12 57.0	352 57.0	- 7 54.9
16	56 49.1	-18 25.3	6 36.6	33 55.0	-12 54.7	22 58.3	- 7 53.4
18	86 48.9	-18 24.0	36 41.5	63 54.0	-12 52.5	52 59.6	- 7 51.9
20	116 48.6	-18 22.7	66 46.4	93 52.9	-12 50.2	83 .9	- 7 50.3
22	146 48.4	-18 21.4	96 51.4	123 51.9	-12 48.0	113 2.2	- 7 48.8
Δ	-1	6		-5	11	7	8

UT	MESEC				JUPITER		SATURN	
	$S_\leftmoon$	Δ	$\delta_\leftmoon$	Δ	$S_{\text{♃}}$	$\delta_{\text{♃}}$	$S_{\text{♄}}$	$\delta_{\text{♄}}$
h	° ′		° ′		° ′	° ′	° ′	° ′
0	93 22.3	99	11 8.2	87	344 11.3	16 .2	244 26.5	-18 50.7
2	122 20.1	99	11 25.6	85	14 16.9	16 .4	274 31.1	-18 50.8
4	151 17.8	99	11 42.6	84	44 22.4	16 .6	304 35.6	-18 50.8
6	180 15.6	99	11 59.4	82	74 28.0	16 .8	334 40.2	-18 50.9
8	209 13.4	99	12 15.9	81	104 33.5	16 1.0	4 44.7	-18 51.0
10	238 11.2	99	12 32.0	79	134 39.1	16 1.2	34 49.3	-18 51.0
12	267 9.1	99	12 47.9	78	164 44.7	16 1.4	64 53.8	-18 51.1
14	296 6.9	99	13 3.4	76	194 50.2	16 1.6	94 58.4	-18 51.1
16	325 4.7	99	13 18.6	74	224 55.8	16 1.9	125 2.9	-18 51.2
18	354 2.5	99	13 33.5	73	255 1.3	16 2.1	155 7.5	-18 51.3
20	23 .4	99	13 48.0	71	285 6.9	16 2.3	185 12.0	-18 51.3
22	51 58.2	99	14 2.2	69	315 12.4	16 2.5	215 16.6	-18 51.4
Δ					28	1	23	0

φ	SUNCE		TRAJANJE SUMRAKA		MESEC			
	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	16 0	0 49	2 30	10 39	1.1	1 9	3.3
55	7 60	16 26	0 41	2 8	10 55	1.4	0 54	3.0
50	7 41	16 45	0 36	1 53	11 8	1.5	0 42	2.9
45	7 26	17 0	0 32	1 42	11 19	1.6	0 33	2.8
40	7 13	17 13	0 29	1 34	11 27	1.7	0 25	2.7
35	7 2	17 23	0 27	1 27	11 35	1.8	0 18	2.6
30	6 53	17 33	0 25	1 23	11 41	1.8	0 12	2.5
20	6 37	17 49	0 23	1 16	11 53	2.0	0 2	2.4
10	6 23	18 3	0 22	1 13	12 3	2.1	. . ..	.0
0	6 9	18 16	0 22	1 13	12 12	2.1	. . ..	.0
10	5 56	18 30	0 22	1 15	12 22	2.2	. . ..	.0
20	5 41	18 44	0 24	1 20	12 32	2.3	. . ..	.0
30	5 24	19 1	0 26	1 30	12 44	2.4	. . ..	.0
35	5 14	19 11	0 28	1 38	12 51	2.5	23 54	1.8
40	5 2	19 22	0 30	1 49	12 59	2.6	23 46	1.8
45	4 49	19 36	0 34	2 7	13 8	2.7	23 36	1.7
50	4 32	19 52	0 39	2 38	13 19	2.8	23 24	1.6
55	4 11	20 13	0 47	: ::	13 33	2.9	23 9	1.5
60	3 42	20 42	1 1	: ::	13 51	3.1	22 49	1.3
S								

SUNCE				MESEC			
UT	e = T_p − UT	Δ/24	r	Prolaz		Δ/24	$\pi_\leftmoon$	r
h	min s	s	′		h min	min	′	′
00	-12 35.3	-.5	16.3	$T_{\overline{m}}$	18 25	2.1	58.2	15.9
12	-12 41.4	$T_{\overline{m}_\odot}$	12 h 12.7 min	Starost	6.4 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	28	-3.1	♃	1 3	.0	218	-2.1
♂	14 28	.1	17	1.0	♄	7 41	.0	118	.8

UT	SUNCE		PROLEĆ. TAČKA	VENERA		MARS	
	$S_\odot$	$\delta_\odot$	S_Υ	S_φ	δ_φ	S_σ	δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	176 48.1	-18 20.1	126 56.3	153 50.9	-12 45.8	143 3.5	- 7 47.2
2	206 47.9	-18 18.8	157 1.2	183 49.8	-12 43.5	173 4.8	- 7 45.7
4	236 47.6	-18 17.5	187 6.1	213 48.8	-12 41.3	203 6.2	- 7 44.2
6	266 47.4	-18 16.2	217 11.1	243 47.8	-12 39.0	233 7.5	- 7 42.6
8	296 47.1	-18 14.8	247 16.0	273 46.8	-12 36.8	263 8.8	- 7 41.1
10	326 46.9	-18 13.5	277 20.9	303 45.8	-12 34.5	293 10.1	- 7 39.5
12	356 46.7	-18 12.2	307 25.9	333 44.8	-12 32.2	323 11.4	- 7 38.0
14	26 46.4	-18 10.9	337 30.8	3 43.7	-12 30.0	353 12.7	- 7 36.4
16	56 46.2	-18 9.6	7 35.7	33 42.7	-12 27.7	23 14.0	- 7 34.9
18	86 46.0	-18 8.3	37 40.6	63 41.7	-12 25.4	53 15.4	- 7 33.4
20	116 45.7	-18 6.9	67 45.6	93 40.7	-12 23.2	83 16.7	- 7 31.8
22	146 45.5	-18 5.6	97 50.5	123 39.7	-12 20.9	113 18.0	- 7 30.3
Δ	-1	7		-5	11	7	8

UT	MESEC				JUPITER		SATURN	
	$S_\leftmoon$	Δ	$\delta_\leftmoon$	Δ	$S_{\text{♃}}$	$\delta_{\text{♃}}$	$S_{\text{♄}}$	$\delta_{\text{♄}}$
h	° ′		° ′		° ′	° ′	° ′	° ′
0	80 56.0	99	14 16.1	68	345 18.0	16 2.7	245 21.1	-18 51.4
2	109 53.8	99	14 29.7	66	15 23.6	16 2.9	275 25.7	-18 51.5
4	138 51.7	99	14 42.9	64	45 29.1	16 3.1	305 30.3	-18 51.5
6	167 49.5	99	14 55.7	62	75 34.7	16 3.3	335 34.8	-18 51.6
8	196 47.4	99	15 8.2	61	105 40.2	16 3.5	5 39.4	-18 51.7
10	225 45.2	99	15 20.3	59	135 45.8	16 3.8	35 43.9	-18 51.7
12	254 43.1	99	15 32.1	57	165 51.4	16 4.0	65 48.5	-18 51.8
14	283 40.9	99	15 43.6	55	195 56.9	16 4.2	95 53.0	-18 51.8
16	312 38.8	99	15 54.6	53	226 2.5	16 4.4	125 57.6	-18 51.9
18	341 36.6	99	16 5.3	52	256 8.0	16 4.6	156 2.2	-18 51.9
20	10 34.5	99	16 15.7	50	286 13.6	16 4.8	186 6.7	-18 52.0
22	39 32.4	99	16 25.6	48	316 19.2	16 5.0	216 11.3	-18 52.0
Δ					28	1	23	0

φ	SUNCE		TRAJANJE SUMRAKA		MESEC			
	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 24	16 3	0 49	2 29	11 6	1.4	2 27	3.0
55	7 58	16 28	0 41	2 8	11 28	1.6	2 6	2.8
50	7 40	16 47	0 35	1 53	11 44	1.7	1 51	2.7
45	7 25	17 2	0 32	1 42	11 57	1.8	1 39	2.6
40	7 12	17 14	0 29	1 34	12 8	1.8	1 29	2.5
35	7 2	17 24	0 27	1 27	12 17	1.9	1 20	2.5
30	6 53	17 33	0 25	1 22	12 26	1.9	1 12	2.4
20	6 37	17 49	0 23	1 16	12 40	2.0	0 59	2.3
10	6 23	18 3	0 22	1 13	12 52	2.1	0 48	2.2
0	6 9	18 16	0 22	1 12	13 4	2.1	0 37	2.1
10	5 56	18 30	0 22	1 14	13 16	2.2	0 26	2.1
20	5 41	18 44	0 24	1 20	13 28	2.3	0 15	2.0
30	5 25	19 1	0 26	1 30	13 43	2.3	0 2	1.9
35	5 15	19 10	0 28	1 38	13 51	2.4	. . ..	.0
40	5 4	19 21	0 30	1 49	14 1	2.4	. . ..	.0
45	4 50	19 35	0 34	2 6	14 12	2.5	. . ..	.0
50	4 34	19 51	0 39	2 36	14 26	2.6	. . ..	.0
55	4 13	20 11	0 46	: ::	14 43	2.7	23 44	1.7
60	3 44	20 40	1 1	: ::	15 6	2.8	23 19	1.6
S								

SUNCE				MESEC			
UT	e = T_p − UT	Δ/24	r	Prolaz		Δ/24	$\pi_\leftmoon$	r
h	min s	s	′		h min	min	′	′
00	-12 47.5	-.5	16.3	$T_{\overline{m}}$	19 16	2.2	57.4	15.7
12	-12 53.2	$T_{\overline{m}_\odot}$	12 h 12.9 min	Starost	7.4 d	Faza	◐	

PLANETE								
Pl.	$T_{\overline{m}}$	π	360−α	Vel.	Pl.	$T_{\overline{m}}$	π	360−α	Vel.
	h min	′	°			h min	′	°	
♀	13 45	.1	27	-3.1	♃	0 59	.0	218	-2.1
♂	14 27	.1	16	1.0	♄	7 37	.0	118	.8

UT	SUNCE		PROLEĆ. TAČKA	VENERA		MARS	
	$S_\odot$	$\delta_\odot$	S_Υ	S_φ	δ_φ	S_σ	δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	176 45.3	-18 4.3	127 55.4	153 38.7	-12 18.6	143 19.3	- 7 28.7
2	206 45.0	-18 3.0	158 .3	183 37.7	-12 16.4	173 20.6	- 7 27.2
4	236 44.8	-18 1.6	188 5.3	213 36.7	-12 14.1	203 22.0	- 7 25.6
6	266 44.6	-18 .3	218 10.2	243 35.7	-12 11.8	233 23.3	- 7 24.1
8	296 44.4	-17 58.9	248 15.1	273 34.7	-12 9.5	263 24.6	- 7 22.5
10	326 44.1	-17 57.6	278 20.1	303 33.7	-12 7.2	293 25.9	- 7 21.0
12	356 43.9	-17 56.3	308 25.0	333 32.8	-12 4.9	323 27.3	- 7 19.4
14	26 43.7	-17 54.9	338 29.9	3 31.8	-12 2.7	353 28.6	- 7 17.9
16	56 43.5	-17 53.6	8 34.8	33 30.8	-12 .4	23 29.9	- 7 16.3
18	86 43.3	-17 52.2	38 39.8	63 29.8	-11 58.1	53 31.2	- 7 14.8
20	116 43.1	-17 50.9	68 44.7	93 28.8	-11 55.8	83 32.6	- 7 13.2
22	146 42.8	-17 49.5	98 49.6	123 27.8	-11 53.5	113 33.9	- 7 11.7
Δ	-1	7		-5	11	7	8

UT	MESEC				JUPITER		SATURN	
	$S_\leftmoon$	Δ	$\delta_\leftmoon$	Δ	$S_{\text{♃}}$	$\delta_{\text{♃}}$	$S_{\text{♄}}$	$\delta_{\text{♄}}$
h	° ′		° ′		° ′	° ′	° ′	° ′
0	68 30.3	100	16 35.2	46	346 24.7	16 5.2	246 15.8	-18 52.1
2	97 28.2	100	16 44.4	44	16 30.3	16 5.5	276 20.4	-18 52.2
4	126 26.1	100	16 53.3	42	46 35.9	16 5.7	306 25.0	-18 52.2
6	155 24.0	100	17 1.7	40	76 41.4	16 5.9	336 29.5	-18 52.3
8	184 22.0	100	17 9.8	39	106 47.0	16 6.1	6 34.1	-18 52.3
10	213 19.9	100	17 17.5	37	136 52.6	16 6.3	36 38.7	-18 52.4
12	242 17.9	100	17 24.8	35	166 58.1	16 6.5	66 43.2	-18 52.4
14	271 16.0	100	17 31.8	33	197 3.7	16 6.7	96 47.8	-18 52.5
16	300 14.0	100	17 38.3	31	227 9.3	16 6.9	126 52.3	-18 52.5
18	329 12.1	101	17 44.5	29	257 14.8	16 7.2	156 56.9	-18 52.6
20	358 10.2	101	17 50.3	27	287 20.4	16 7.4	187 1.5	-18 52.6
22	27 8.4	101	17 55.7	25	317 26.0	16 7.6	217 6.0	-18 52.7
Δ					28	1	23	0

φ	SUNCE		TRAJANJE SUMRAKA		MESEC			
	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 21	16 5	0 48	2 29	11 40	1.7	3 39	2.7
55	7 57	16 30	0 40	2 7	12 6	1.8	3 14	2.5
50	7 38	16 49	0 35	1 52	12 25	1.9	2 56	2.5
45	7 24	17 3	0 32	1 42	12 40	1.9	2 41	2.4
40	7 12	17 15	0 29	1 33	12 52	2.0	2 29	2.4
35	7 1	17 25	0 27	1 27	13 3	2.0	2 19	2.3
30	6 52	17 34	0 25	1 22	13 12	2.0	2 10	2.3
20	6 36	17 50	0 23	1 16	13 28	2.1	1 55	2.2
10	6 23	18 4	0 22	1 13	13 42	2.1	1 41	2.2
0	6 10	18 17	0 22	1 12	13 55	2.1	1 29	2.1
10	5 56	18 30	0 22	1 14	14 9	2.2	1 16	2.1
20	5 42	18 44	0 23	1 20	14 23	2.2	1 3	2.0
30	5 26	19 0	0 26	1 29	14 39	2.2	0 47	2.0
35	5 16	19 10	0 28	1 37	14 48	2.2	0 38	1.9
40	5 5	19 21	0 30	1 48	14 59	2.3	0 28	1.9
45	4 52	19 34	0 34	2 5	15 12	2.3	0 16	1.9
50	4 36	19 49	0 38	2 34	15 28	2.3	0 2	1.8
55	4 15	20 10	0 46	: ::	15 48	2.4	.. ..	.0
60	3 47	20 37	0 60	: ::	16 15	2.5	23 57	1.9
S								

UT	SUNCE				MESEC				
	e = Tp − UT		Δ/24	r	Prolaz		Δ/24	$\pi_\leftmoon$	r
h	min	s	s	′		h min	min	′	′
00	-12	58.9	-.4	16.3	$T_{\overline{m}}$	20 8	2.1	56.8	15.5
12	-13	4.2	$T_{\overline{m}_\odot}$	12 h 13.1 min	Starost	8.4 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	26	-3.1	♃	0 54	.0	218	-2.1
♂	14 26	.1	15	1.0	♄	7 34	.0	118	.8

UT	SUNCE		PROLEĆ. TAČKA	VENERA		MARS	
	$S_\odot$	$\delta_\odot$	S_Υ	S_φ	δ_φ	S_σ	δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	176 42.6	-17 48.2	128 54.6	153 26.9	-11 51.2	143 35.2	- 7 10.1
2	206 42.4	-17 46.8	158 59.5	183 25.9	-11 48.9	173 36.5	- 7 8.6
4	236 42.2	-17 45.4	189 4.4	213 24.9	-11 46.6	203 37.9	- 7 7.0
6	266 42.0	-17 44.1	219 9.3	243 23.9	-11 44.3	233 39.2	- 7 5.5
8	296 41.8	-17 42.7	249 14.3	273 23.0	-11 42.0	263 40.5	- 7 3.9
10	326 41.6	-17 41.4	279 19.2	303 22.0	-11 39.7	293 41.8	- 7 2.4
12	356 41.4	-17 40.0	309 24.1	333 21.0	-11 37.3	323 43.2	- 7 .8
14	26 41.2	-17 38.6	339 29.1	3 20.1	-11 35.0	353 44.5	- 6 59.3
16	56 41.0	-17 37.2	9 34.0	33 19.1	-11 32.7	23 45.8	- 6 57.7
18	86 40.8	-17 35.9	39 38.9	63 18.1	-11 30.4	53 47.2	- 6 56.2
20	116 40.6	-17 34.5	69 43.8	93 17.2	-11 28.1	83 48.5	- 6 54.6
22	146 40.4	-17 33.1	99 48.8	123 16.2	-11 25.7	113 49.8	- 6 53.1
Δ	-1	7		-5	12	7	8

UT	MESEC				JUPITER		SATURN	
	$S_\leftmoon$	Δ	$\delta_\leftmoon$	Δ	$S_{\text{♃}}$	$\delta_{\text{♃}}$	$S_{\text{♄}}$	$\delta_{\text{♄}}$
h	° ′		° ′		° ′	° ′	° ′	° ′
0	56 6.6	101	18 .7	23	347 31.5	16 7.8	247 10.6	-18 52.8
2	85 4.8	101	18 5.3	21	17 37.1	16 8.0	277 15.2	-18 52.8
4	114 3.1	102	18 9.5	19	47 42.7	16 8.2	307 19.7	-18 52.9
6	143 1.5	102	18 13.4	17	77 48.2	16 8.4	337 24.3	-18 52.9
8	171 59.8	102	18 16.8	15	107 53.8	16 8.7	7 28.9	-18 53.0
10	200 58.3	103	18 19.9	13	137 59.4	16 8.9	37 33.5	-18 53.0
12	229 56.8	103	18 22.6	11	168 4.9	16 9.1	67 38.0	-18 53.1
14	258 55.4	103	18 24.9	10	198 10.5	16 9.3	97 42.6	-18 53.1
16	287 54.0	104	18 26.8	8	228 16.1	16 9.5	127 47.2	-18 53.2
18	316 52.7	104	18 28.3	6	258 21.6	16 9.7	157 51.7	-18 53.2
20	345 51.5	104	18 29.5	4	288 27.2	16 9.9	187 56.3	-18 53.3
22	14 50.4	105	18 30.2	2	318 32.8	16 10.1	218 .9	-18 53.3
Δ					28	1	23	0

φ	SUNCE		TRAJANJE SUMRAKA		MESEC			
	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 19	16 8	0 48	2 28	12 22	2.1	4 43	2.2
55	7 55	16 32	0 40	2 7	12 49	2.1	4 15	2.2
50	7 37	16 50	0 35	1 52	13 10	2.1	3 55	2.2
45	7 23	17 4	0 31	1 41	13 26	2.1	3 39	2.2
40	7 11	17 16	0 29	1 33	13 39	2.1	3 26	2.2
35	7 1	17 26	0 27	1 27	13 51	2.1	3 15	2.2
30	6 52	17 35	0 25	1 22	14 1	2.1	3 5	2.2
20	6 36	17 51	0 23	1 16	14 18	2.1	2 48	2.1
10	6 23	18 4	0 22	1 13	14 32	2.1	2 34	2.1
0	6 10	18 17	0 22	1 12	14 46	2.1	2 20	2.1
10	5 57	18 30	0 22	1 14	15 0	2.1	2 6	2.1
20	5 43	18 44	0 23	1 19	15 15	2.1	1 52	2.1
30	5 27	18 60	0 26	1 29	15 32	2.1	1 35	2.1
35	5 17	19 9	0 28	1 37	15 42	2.1	1 25	2.1
40	5 6	19 20	0 30	1 48	15 54	2.1	1 14	2.0
45	4 53	19 32	0 33	2 4	16 7	2.1	1 1	2.0
50	4 38	19 48	0 38	2 32	16 24	2.1	0 45	2.0
55	4 17	20 8	0 46	: ::	16 45	2.0	0 25	2.0
60	3 50	20 35	0 59	: ::	17 13	2.0	.. ..	.0
S								

UT	SUNCE				MESEC				
	e = Tp − UT		Δ/24	r	Prolaz		Δ/24	$\pi_\leftmoon$	r
h	min	s	s	′		h min	min	′	′
00	-13	9.5	-.4	16.3	$T_{\overline{m}}$	20 59	2.1	56.1	15.3
12	-13	14.3	$T_{\overline{m}_\odot}$	12 h 13.2 min	Starost	9.4 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	25	-3.1	♃	0 50	.0	219	-2.1
♂	14 25	.1	15	1.0	♄	7 30	.0	118	.8

UT	SUNCE		PROLEĆ. TAČKA	VENERA		MARS	
	$S_\odot$	$\delta_\odot$	S_Υ	S_φ	δ_φ	S_σ	δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	176 40.2	-17 31.7	129 53.7	153 15.3	-11 23.4	143 51.2	- 6 51.5
2	206 40.0	-17 30.3	159 58.6	183 14.3	-11 21.1	173 52.5	- 6 50.0
4	236 39.8	-17 29.0	190 3.6	213 13.4	-11 18.8	203 53.8	- 6 48.4
6	266 39.6	-17 27.6	220 8.5	243 12.4	-11 16.4	233 55.2	- 6 46.9
8	296 39.4	-17 26.2	250 13.4	273 11.5	-11 14.1	263 56.5	- 6 45.3
10	326 39.2	-17 24.8	280 18.3	303 10.5	-11 11.8	293 57.8	- 6 43.7
12	356 39.1	-17 23.4	310 23.3	333 9.6	-11 9.4	323 59.2	- 6 42.2
14	26 38.9	-17 22.0	340 28.2	3 8.6	-11 7.1	354 .5	- 6 40.6
16	56 38.7	-17 20.6	10 33.1	33 7.7	-11 4.7	24 1.8	- 6 39.1
18	86 38.5	-17 19.2	40 38.1	63 6.8	-11 2.4	54 3.2	- 6 37.5
20	116 38.3	-17 17.8	70 43.0	93 5.8	-11 .1	84 4.5	- 6 36.0
22	146 38.2	-17 16.4	100 47.9	123 4.9	-10 57.7	114 5.9	- 6 34.4
Δ		-1 7			-5 12		7 8

UT	MESEC				JUPITER		SATURN	
	$S_\leftmoon$	Δ	$\delta_\leftmoon$	Δ	S_{4}	δ_{4}	S_η	δ_η
h	° ′		° ′		° ′	° ′	° ′	° ′
0	43 49.3	105	18 30.6	0	348 38.4	16 10.4	248 5.5	-18 53.4
2	72 48.3	106	18 30.6	-2	18 43.9	16 10.6	278 10.0	-18 53.4
4	101 47.4	106	18 30.2	-4	48 49.5	16 10.8	308 14.6	-18 53.5
6	130 46.6	106	18 29.5	-6	78 55.1	16 11.0	338 19.2	-18 53.6
8	159 45.9	107	18 28.4	-8	109 .6	16 11.2	8 23.8	-18 53.6
10	188 45.3	107	18 26.9	-9	139 6.2	16 11.4	38 28.3	-18 53.7
12	217 44.8	108	18 25.0	-11	169 11.8	16 11.6	68 32.9	-18 53.7
14	246 44.4	109	18 22.8	-13	199 17.4	16 11.9	98 37.5	-18 53.8
16	275 44.1	109	18 20.1	-15	229 22.9	16 12.1	128 42.1	-18 53.8
18	304 43.9	110	18 17.2	-17	259 28.5	16 12.3	158 46.7	-18 53.9
20	333 43.9	110	18 13.8	-18	289 34.1	16 12.5	188 51.2	-18 53.9
22	2 43.9	111	18 10.1	-20	319 39.7	16 12.7	218 55.8	-18 54.0
Δ					28	1	23	0

φ	SUNCE		TRAJANJE SUMRAKA		MESEC			
	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 17	16 11	0 48	2 27	13 12	2.4	5 37	1.8
55	7 53	16 34	0 40	2 7	13 40	2.3	5 8	1.9
50	7 35	16 52	0 35	1 52	14 1	2.3	4 48	1.9
45	7 21	17 6	0 31	1 41	14 17	2.2	4 31	2.0
40	7 10	17 17	0 29	1 33	14 30	2.2	4 18	2.0
35	6 60	17 27	0 27	1 27	14 41	2.2	4 7	2.0
30	6 51	17 36	0 25	1 22	14 51	2.2	3 57	2.0
20	6 36	17 51	0 23	1 16	15 8	2.1	3 40	2.0
10	6 23	18 4	0 22	1 13	15 23	2.1	3 25	2.1
0	6 10	18 17	0 22	1 12	15 37	2.0	3 11	2.1
10	5 57	18 30	0 22	1 14	15 51	2.0	2 57	2.1
20	5 43	18 43	0 23	1 19	16 5	2.0	2 42	2.1
30	5 27	18 59	0 26	1 29	16 22	1.9	2 24	2.1
35	5 18	19 8	0 28	1 36	16 32	1.9	2 14	2.2
40	5 7	19 19	0 30	1 47	16 44	1.9	2 3	2.2
45	4 55	19 31	0 33	2 3	16 57	1.8	1 50	2.2
50	4 39	19 46	0 38	2 31	17 13	1.8	1 33	2.2
55	4 20	20 6	0 45	: ::	17 34	1.7	1 12	2.2
60	3 53	20 32	0 58	: ::	18 2	1.6	0 43	2.3
S								

SUNCE				MESEC			
UT	e = T_p − UT	Δ/24	r	Prolaz		Δ/24	$\pi_\leftmoon$	r
h	min s	s	′		h min	min	′	′
00	-13 19.2	-.4	16.3	$T_{\overline{m}}$	21 49	2.0	55.6	15.1
12	-13 23.6	$T_{\overline{m}_\odot}$ 12 h 13.4 min		Starost 10.4 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	23	-3.1	♃	0 45	.0	219	-2.1
♂	14 24	.1	14	1.1	♄	7 26	.0	118	.8

UT	SUNCE		PROLEĆ. TAČKA	VENERA		MARS	
	$S_\odot$	$\delta_\odot$	S_Υ	S_φ	δ_φ	S_σ	δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	176 38.0	-17 15.0	130 52.8	153 4.0	-10 55.4	144 7.2	- 6 32.8
2	206 37.8	-17 13.6	160 57.8	183 3.0	-10 53.0	174 8.5	- 6 31.3
4	236 37.6	-17 12.2	191 2.7	213 2.1	-10 50.7	204 9.9	- 6 29.7
6	266 37.5	-17 10.8	221 7.6	243 1.2	-10 48.3	234 11.2	- 6 28.2
8	296 37.3	-17 9.3	251 12.6	273 .2	-10 45.9	264 12.6	- 6 26.6
10	326 37.1	-17 7.9	281 17.5	302 59.3	-10 43.6	294 13.9	- 6 25.0
12	356 36.9	-17 6.5	311 22.4	332 58.4	-10 41.2	324 15.2	- 6 23.5
14	26 36.8	-17 5.1	341 27.3	2 57.5	-10 38.9	354 16.6	- 6 21.9
16	56 36.6	-17 3.7	11 32.3	32 56.6	-10 36.5	24 17.9	- 6 20.4
18	86 36.4	-17 2.2	41 37.2	62 55.6	-10 34.1	54 19.3	- 6 18.8
20	116 36.3	-17 .8	71 42.1	92 54.7	-10 31.8	84 20.6	- 6 17.2
22	146 36.1	-16 59.4	101 47.0	122 53.8	-10 29.4	114 22.0	- 6 15.7
Δ		-1 7			-5 12		7 8

UT	MESEC				JUPITER		SATURN	
	$S_\leftmoon$	Δ	$\delta_\leftmoon$	Δ	S_{4}	δ_{4}	S_η	δ_η
h	° ′		° ′		° ′	° ′	° ′	° ′
0	31 44.1	111	18 6.1	-22	349 45.2	16 12.9	249 .4	-18 54.0
2	60 44.4	112	18 1.7	-24	19 50.8	16 13.1	279 5.0	-18 54.1
4	89 44.8	113	17 56.9	-26	49 56.4	16 13.4	309 9.6	-18 54.1
6	118 45.4	113	17 51.8	-27	80 2.0	16 13.6	339 14.2	-18 54.2
8	147 46.1	114	17 46.4	-29	110 7.5	16 13.8	9 18.7	-18 54.2
10	176 46.9	115	17 40.6	-31	140 13.1	16 14.0	39 23.3	-18 54.3
12	205 47.8	115	17 34.5	-32	170 18.7	16 14.2	69 27.9	-18 54.3
14	234 48.9	116	17 28.0	-34	200 24.3	16 14.4	99 32.5	-18 54.4
16	263 50.1	117	17 21.2	-36	230 29.8	16 14.6	129 37.1	-18 54.4
18	292 51.5	118	17 14.1	-37	260 35.4	16 14.8	159 41.7	-18 54.5
20	321 53.0	118	17 6.7	-39	290 41.0	16 15.1	189 46.3	-18 54.5
22	350 54.7	119	16 58.9	-40	320 46.6	16 15.3	219 50.8	-18 54.6
Δ					28	1	23	0

φ	SUNCE		TRAJANJE SUMRAKA		MESEC			
	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 15	16 13	0 47	2 27	14 10	2.7	6 20	1.4
55	7 51	16 36	0 40	2 6	14 36	2.5	5 54	1.6
50	7 34	16 54	0 35	1 52	14 55	2.4	5 34	1.7
45	7 20	17 7	0 31	1 41	15 11	2.3	5 18	1.7
40	7 9	17 19	0 29	1 33	15 23	2.3	5 6	1.8
35	6 59	17 28	0 27	1 27	15 34	2.2	4 55	1.8
30	6 51	17 37	0 25	1 22	15 43	2.2	4 45	1.9
20	6 36	17 52	0 23	1 16	15 59	2.1	4 29	1.9
10	6 22	18 5	0 22	1 13	16 13	2.0	4 14	2.0
0	6 10	18 17	0 22	1 12	16 26	2.0	4 1	2.0
10	5 57	18 30	0 22	1 14	16 39	1.9	3 47	2.1
20	5 44	18 43	0 23	1 19	16 53	1.9	3 33	2.1
30	5 28	18 58	0 26	1 29	17 9	1.8	3 16	2.2
35	5 19	19 7	0 28	1 36	17 18	1.7	3 6	2.2
40	5 9	19 18	0 30	1 47	17 29	1.7	2 55	2.3
45	4 56	19 30	0 33	2 2	17 41	1.6	2 42	2.3
50	4 41	19 45	0 38	2 29	17 56	1.5	2 26	2.4
55	4 22	20 4	0 45	: ::	18 15	1.4	2 6	2.4
60	3 55	20 30	0 57	: ::	18 41	1.3	1 38	2.6
S								

SUNCE				MESEC			
UT	e = T_p − UT	Δ/24	r	Prolaz		Δ/24	$\pi_\leftmoon$	r
h	min s	s	′		h min	min	′	′
00	-13 28.1	-.3	16.3	$T_{\overline{m}}$	22 38	2.0	55.1	15.0
12	-13 32.1	$T_{\overline{m}_\odot}$ 12 h 13.5 min		Starost 11.4 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	22	-3.1	♃	0 41	.0	219	-2.1
♂	14 23	.1	13	1.1	♄	7 23	.0	118	.8

UT	SUNCE		PROLEĆ. TAČKA	VENERA		MARS	
	$S_\odot$	$\delta_\odot$	S_Υ	S_φ	δ_φ	S_σ	δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	176 36.0	-16 57.9	131 52.0	152 52.9	-10 27.0	144 23.3	- 6 14.1
2	206 35.8	-16 56.5	161 56.9	182 52.0	-10 24.7	174 24.6	- 6 12.6
4	236 35.6	-16 55.1	192 1.8	212 51.1	-10 22.3	204 26.0	- 6 11.0
6	266 35.5	-16 53.6	222 6.8	242 50.2	-10 19.9	234 27.3	- 6 9.4
8	296 35.3	-16 52.2	252 11.7	272 49.3	-10 17.5	264 28.7	- 6 7.9
10	326 35.2	-16 50.7	282 16.6	302 48.4	-10 15.1	294 30.0	- 6 6.3
12	356 35.0	-16 49.3	312 21.5	332 47.5	-10 12.8	324 31.4	- 6 4.7
14	26 34.9	-16 47.9	342 26.5	2 46.6	-10 10.4	354 32.7	- 6 3.2
16	56 34.7	-16 46.4	12 31.4	32 45.7	-10 8.0	24 34.1	- 6 1.6
18	86 34.6	-16 45.0	42 36.3	62 44.8	-10 5.6	54 35.4	- 6 .0
20	116 34.4	-16 43.5	72 41.3	92 43.9	-10 3.2	84 36.8	- 5 58.5
22	146 34.3	-16 42.0	102 46.2	122 43.0	-10 .8	114 38.1	- 5 56.9
Δ	-1	7		-4	12	7	8

UT	MESEC				JUPITER		SATURN	
	$S_\leftmoon$	Δ	$\delta_\leftmoon$	Δ	S_{4}	δ_{4}	S_η	δ_η
h	° ′		° ′		° ′	° ′	° ′	° ′
0	19 56.5	120	16 50.9	-42	350 52.1	16 15.5	249 55.4	-18 54.6
2	48 58.5	121	16 42.5	-43	20 57.7	16 15.7	280 .0	-18 54.7
4	78 .6	121	16 33.8	-45	51 3.3	16 15.9	310 4.6	-18 54.7
6	107 2.8	122	16 24.8	-46	81 8.9	16 16.1	340 9.2	-18 54.8
8	136 5.2	123	16 15.5	-48	111 14.5	16 16.3	10 13.8	-18 54.8
10	165 7.8	124	16 5.9	-49	141 20.0	16 16.6	40 18.4	-18 54.9
12	194 10.5	124	15 56.0	-51	171 25.6	16 16.8	70 23.0	-18 54.9
14	223 13.4	125	15 45.9	-52	201 31.2	16 17.0	100 27.6	-18 55.0
16	252 16.4	126	15 35.4	-54	231 36.8	16 17.2	130 32.2	-18 55.0
18	281 19.6	127	15 24.7	-55	261 42.4	16 17.4	160 36.8	-18 55.1
20	310 23.0	128	15 13.7	-56	291 47.9	16 17.6	190 41.4	-18 55.1
22	339 26.5	128	15 2.4	-58	321 53.5	16 17.8	220 45.9	-18 55.2
Δ					28	1	23	0

φ	SUNCE		TRAJANJE SUMRAKA		MESEC			
	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 12	16 16	0 47	2 26	15 14	2.8	6 55	1.1
55	7 50	16 38	0 40	2 6	15 37	2.6	6 31	1.3
50	7 33	16 55	0 35	1 51	15 54	2.5	6 14	1.4
45	7 19	17 9	0 31	1 41	16 7	2.4	5 60	1.5
40	7 8	17 20	0 29	1 33	16 18	2.3	5 48	1.6
35	6 58	17 29	0 27	1 27	16 27	2.3	5 38	1.7
30	6 50	17 38	0 25	1 22	16 36	2.2	5 30	1.7
20	6 35	17 52	0 23	1 16	16 50	2.1	5 15	1.8
10	6 22	18 5	0 22	1 12	17 2	2.0	5 1	1.9
0	6 10	18 17	0 22	1 12	17 14	1.9	4 49	2.0
10	5 58	18 29	0 22	1 14	17 25	1.8	4 37	2.0
20	5 45	18 43	0 23	1 19	17 37	1.7	4 23	2.1
30	5 29	18 58	0 26	1 28	17 52	1.6	4 8	2.2
35	5 20	19 7	0 27	1 36	17 60	1.6	3 59	2.2
40	5 10	19 17	0 30	1 46	18 9	1.5	3 49	2.3
45	4 58	19 29	0 33	2 1	18 20	1.4	3 37	2.4
50	4 43	19 43	0 38	2 27	18 33	1.3	3 23	2.5
55	4 24	20 2	0 45	3 40	18 49	1.2	3 4	2.6
60	3 58	20 27	0 57	: ::	19 11	1.0	2 40	2.8
S								

SUNCE				MESEC			
UT	e = T_p − UT	Δ/24	r	Prolaz		Δ/24	$\pi_\leftmoon$	r
h	min s	s	′	$T_{\overline{m}}$	h min	min	′	′
00	-13 36.2	-.3	16.3	$T_{\overline{m}}$	23 25	1.9	54.8	14.9
12	-13 39.8	$T_{\overline{m}_\odot}$	12 h 13.7 min	Starost 12.4 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	21	-3.1	♃	0 36	.0	219	-2.1
♂	14 22	.1	13	1.1	♄	7 19	.0	118	.8

UT	SUNCE		PROLEĆ. TAČKA	VENERA		MARS	
	$S_\odot$	$\delta_\odot$	S_Υ	S_φ	δ_φ	S_σ	δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	176 34.1	-16 40.6	132 51.1	152 42.1	- 9 58.4	144 39.5	- 5 55.4
2	206 34.0	-16 39.1	162 56.0	182 41.2	- 9 56.0	174 40.8	- 5 53.8
4	236 33.9	-16 37.7	193 1.0	212 40.3	- 9 53.6	204 42.2	- 5 52.2
6	266 33.7	-16 36.2	223 5.9	242 39.4	- 9 51.2	234 43.5	- 5 50.7
8	296 33.6	-16 34.7	253 10.8	272 38.6	- 9 48.8	264 44.9	- 5 49.1
10	326 33.5	-16 33.3	283 15.8	302 37.7	- 9 46.4	294 46.2	- 5 47.5
12	356 33.3	-16 31.8	313 20.7	332 36.8	- 9 44.0	324 47.6	- 5 46.0
14	26 33.2	-16 30.3	343 25.6	2 35.9	- 9 41.6	354 48.9	- 5 44.4
16	56 33.1	-16 28.9	13 30.5	32 35.0	- 9 39.2	24 50.3	- 5 42.8
18	86 32.9	-16 27.4	43 35.5	62 34.2	- 9 36.8	54 51.7	- 5 41.3
20	116 32.8	-16 25.9	73 40.4	92 33.3	- 9 34.4	84 53.0	- 5 39.7
22	146 32.7	-16 24.4	103 45.3	122 32.4	- 9 32.0	114 54.4	- 5 38.1
Δ	-1	7		-4	12	7	8

UT	MESEC				JUPITER		SATURN	
	$S_\leftmoon$	Δ	$\delta_\leftmoon$	Δ	S_{4}	δ_{4}	S_η	δ_η
h	° ′		° ′		° ′	° ′	° ′	° ′
0	8 30.1	129	14 50.9	-59	351 59.1	16 18.1	250 50.5	-18 55.2
2	37 34.0	130	14 39.1	-60	22 4.7	16 18.3	280 55.1	-18 55.2
4	66 37.9	131	14 27.0	-61	52 10.3	16 18.5	310 59.7	-18 55.3
6	95 42.1	131	14 14.7	-63	82 15.8	16 18.7	341 4.3	-18 55.3
8	124 46.3	132	14 2.2	-64	112 21.4	16 18.9	11 8.9	-18 55.4
10	153 50.8	133	13 49.4	-65	142 27.0	16 19.1	41 13.5	-18 55.4
12	182 55.4	134	13 36.4	-66	172 32.6	16 19.3	71 18.1	-18 55.5
14	212 .1	134	13 23.2	-67	202 38.2	16 19.6	101 22.7	-18 55.5
16	241 5.0	135	13 9.7	-68	232 43.7	16 19.8	131 27.3	-18 55.6
18	270 10.0	136	12 56.0	-70	262 49.3	16 20.0	161 31.9	-18 55.6
20	299 15.2	137	12 42.1	-71	292 54.9	16 20.2	191 36.5	-18 55.7
22	328 20.6	137	12 27.9	-72	323 .5	16 20.4	221 41.1	-18 55.7
Δ					28	1	23	0

φ	SUNCE		TRAJANJE SUMRAKA		MESEC			
	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 10	16 19	0 47	2 26	16 22	2.9	7 22	.9
55	7 48	16 41	0 40	2 6	16 40	2.7	7 3	1.1
50	7 31	16 57	0 35	1 51	16 54	2.5	6 48	1.3
45	7 18	17 10	0 31	1 41	17 5	2.4	6 36	1.4
40	7 7	17 21	0 29	1 33	17 14	2.3	6 27	1.4
35	6 58	17 30	0 27	1 26	17 21	2.2	6 18	1.5
30	6 49	17 39	0 25	1 22	17 28	2.2	6 11	1.6
20	6 35	17 53	0 23	1 15	17 40	2.1	5 58	1.7
10	6 22	18 5	0 22	1 12	17 50	2.0	5 47	1.8
0	6 10	18 17	0 22	1 12	17 60	1.9	5 36	1.9
10	5 58	18 29	0 22	1 14	18 9	1.8	5 25	2.0
20	5 45	18 42	0 23	1 19	18 19	1.7	5 14	2.1
30	5 30	18 57	0 26	1 28	18 31	1.5	5 1	2.2
35	5 21	19 6	0 27	1 35	18 38	1.5	4 53	2.3
40	5 11	19 16	0 30	1 46	18 45	1.4	4 45	2.3
45	4 59	19 28	0 33	2 1	18 54	1.3	4 35	2.4
50	4 45	19 42	0 37	2 26	19 5	1.2	4 22	2.5
55	4 26	20 0	0 44	3 30	19 18	1.0	4 7	2.7
60	4 1	20 25	0 56	: ::	19 35	.8	3 46	2.9
S								

SUNCE				MESEC			
UT	e = T_p − UT	Δ/24	r	Prolaz		Δ/24	$\pi_\leftmoon$	r
h	min s	s	′	$T_{\overline{m}}$	h min	min	′	′
00	-13 43.4	-.3	16.3	$T_{\overline{m}}$	. . .	1.0	54.5	14.8
12	-13 46.6	$T_{\overline{m}_\odot}$	12 h 13.8 min	Starost 13.4 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	.1	20	-3.2	♃	0 32	.0	219	-2.1
♂	14 21	.1	12	1.1	♄	7 16	.0	118	.8

UT	SUNCE		PROLEĆ. TAČKA	VENERA		MARS	
	$S_\odot$	$\delta_\odot$	S_Υ	S_φ	δ_φ	S_σ	δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	176 32.5	-16 23.0	133 50.3	152 31.5	- 9 29.5	144 55.7	- 5 36.5
2	206 32.4	-16 21.5	163 55.2	182 30.7	- 9 27.1	174 57.1	- 5 35.0
4	236 32.3	-16 20.0	194 .1	212 29.8	- 9 24.7	204 58.4	- 5 33.4
6	266 32.2	-16 18.5	224 5.0	242 28.9	- 9 22.3	234 59.8	- 5 31.8
8	296 32.1	-16 17.0	254 10.0	272 28.1	- 9 19.9	265 1.2	- 5 30.3
10	326 31.9	-16 15.5	284 14.9	302 27.2	- 9 17.4	295 2.5	- 5 28.7
12	356 31.8	-16 14.0	314 19.8	332 26.4	- 9 15.0	325 3.9	- 5 27.1
14	26 31.7	-16 12.5	344 24.8	2 25.5	- 9 12.6	355 5.2	- 5 25.6
16	56 31.6	-16 11.0	14 29.7	32 24.6	- 9 10.2	25 6.6	- 5 24.0
18	86 31.5	-16 9.5	44 34.6	62 23.8	- 9 7.7	55 8.0	- 5 22.4
20	116 31.4	-16 8.0	74 39.5	92 22.9	- 9 5.3	85 9.3	- 5 20.8
22	146 31.3	-16 6.5	104 44.5	122 22.1	- 9 2.9	115 10.7	- 5 19.3
Δ	-1	7		-4	12	7	8

UT	MESEC				JUPITER		SATURN	
	$S_\leftmoon$	Δ	$\delta_\leftmoon$	Δ	$S_{\mathrm{♃}}$	$\delta_{\mathrm{♃}}$	$S_{\mathrm{♄}}$	$\delta_{\mathrm{♄}}$
h	° ′		° ′		° ′	° ′	° ′	° ′
0	357 26.1	138	12 13.6	-73	353 6.1	16 20.6	251 45.7	-18 55.8
2	26 31.7	139	11 59.1	-74	23 11.6	16 20.8	281 50.3	-18 55.8
4	55 37.5	140	11 44.4	-75	53 17.2	16 21.0	311 55.0	-18 55.9
6	84 43.4	140	11 29.4	-76	83 22.8	16 21.3	341 59.6	-18 55.9
8	113 49.4	141	11 14.3	-76	113 28.4	16 21.5	12 4.2	-18 55.9
10	142 55.6	142	10 59.0	-77	143 34.0	16 21.7	42 8.8	-18 56.0
12	172 1.9	142	10 43.6	-78	173 39.6	16 21.9	72 13.4	-18 56.0
14	201 8.4	143	10 27.9	-79	203 45.1	16 22.1	102 18.0	-18 56.1
16	230 14.9	143	10 12.1	-80	233 50.7	16 22.3	132 22.6	-18 56.1
18	259 21.6	144	9 56.1	-81	263 56.3	16 22.5	162 27.2	-18 56.2
20	288 28.5	145	9 40.0	-81	294 1.9	16 22.8	192 31.8	-18 56.2
22	317 35.4	145	9 23.7	-82	324 7.5	16 23.0	222 36.4	-18 56.3
Δ					28	1	23	0

φ	SUNCE		TRAJANJE SUMRAKA		MESEC			
	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 7	16 21	0 47	2 25	17 31	2.9	7 44	.8
55	7 46	16 43	0 39	2 5	17 45	2.7	7 30	1.0
50	7 30	16 59	0 35	1 51	17 55	2.6	7 18	1.1
45	7 17	17 12	0 31	1 40	18 3	2.4	7 9	1.2
40	7 6	17 22	0 28	1 32	18 10	2.3	7 1	1.3
35	6 57	17 31	0 26	1 26	18 15	2.2	6 55	1.4
30	6 49	17 39	0 25	1 22	18 20	2.2	6 49	1.5
20	6 35	17 53	0 23	1 15	18 29	2.0	6 39	1.6
10	6 22	18 6	0 22	1 12	18 37	1.9	6 30	1.7
0	6 10	18 17	0 22	1 12	18 44	1.8	6 21	1.8
10	5 58	18 29	0 22	1 14	18 51	1.7	6 13	1.9
20	5 46	18 42	0 23	1 18	18 59	1.6	6 4	2.0
30	5 31	18 56	0 26	1 28	19 8	1.4	5 53	2.2
35	5 22	19 5	0 27	1 35	19 13	1.4	5 47	2.2
40	5 12	19 15	0 30	1 45	19 19	1.3	5 41	2.3
45	5 1	19 26	0 33	1 60	19 25	1.2	5 33	2.4
50	4 46	19 40	0 37	2 24	19 33	1.1	5 23	2.6
55	4 28	19 58	0 44	3 22	19 43	.9	5 11	2.7
60	4 4	20 22	0 55	: ::	19 55	.7	4 55	2.9
S								

SUNCE				MESEC				
UT	$e = T_p - UT$	Δ/24	r	Prolaz		Δ/24	$\pi_\leftmoon$	r
h	min s	s	′	$T_{\overline{m}}$	h min	min	′	′
00	-13 49.8	-.2	16.3		0 11	1.8	54.2	14.8
12	-13 52.6	$T_{\overline{m}_\odot}$ 12 h 13.9 min		Starost 14.4 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	.1	19	-3.2	♃	0 28	.0	219	-2.1
♂	14 20	.1	11	1.1	♄	7 12	.0	118	.7

UT	SUNCE		PROLEĆ. TAČKA	VENERA		MARS	
	$S_\odot$	$\delta_\odot$	S_Υ	S_φ	δ_φ	S_σ	δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	176 31.1	-16 5.0	134 49.4	152 21.2	- 9 .4	145 12.0	- 5 17.7
2	206 31.0	-16 3.5	164 54.3	182 20.4	- 8 58.0	175 13.4	- 5 16.1
4	236 30.9	-16 2.0	194 59.2	212 19.5	- 8 55.6	205 14.8	- 5 14.6
6	266 30.8	-16 .5	225 4.2	242 18.7	- 8 53.1	235 16.1	- 5 13.0
8	296 30.7	-15 59.0	255 9.1	272 17.8	- 8 50.7	265 17.5	- 5 11.4
10	326 30.6	-15 57.5	285 14.0	302 17.0	- 8 48.2	295 18.9	- 5 9.8
12	356 30.5	-15 56.0	315 19.0	332 16.2	- 8 45.8	325 20.2	- 5 8.3
14	26 30.4	-15 54.5	345 23.9	2 15.3	- 8 43.3	355 21.6	- 5 6.7
16	56 30.3	-15 52.9	15 28.8	32 14.5	- 8 40.9	25 22.9	- 5 5.1
18	86 30.2	-15 51.4	45 33.7	62 13.6	- 8 38.4	55 24.3	- 5 3.6
20	116 30.1	-15 49.9	75 38.7	92 12.8	- 8 36.0	85 25.7	- 5 2.0
22	146 30.0	-15 48.4	105 43.6	122 12.0	- 8 33.5	115 27.0	- 5 .4
Δ	0	8		-4	12	7	8

UT	MESEC				JUPITER		SATURN	
	$S_\leftmoon$	Δ	$\delta_\leftmoon$	Δ	$S_{\mathrm{♃}}$	$\delta_{\mathrm{♃}}$	$S_{\mathrm{♄}}$	$\delta_{\mathrm{♄}}$
h	° ′		° ′		° ′	° ′	° ′	° ′
0	346 42.5	146	9 7.3	-83	354 13.1	16 23.2	252 41.0	-18 56.3
2	15 49.6	146	8 50.7	-84	24 18.6	16 23.4	282 45.6	-18 56.4
4	44 56.9	147	8 34.0	-84	54 24.2	16 23.6	312 50.3	-18 56.4
6	74 4.3	147	8 17.1	-85	84 29.8	16 23.8	342 54.9	-18 56.4
8	103 11.8	148	8 .2	-86	114 35.4	16 24.0	12 59.5	-18 56.5
10	132 19.4	148	7 43.1	-86	144 41.0	16 24.2	43 4.1	-18 56.5
12	161 27.1	149	7 25.8	-87	174 46.6	16 24.5	73 8.7	-18 56.6
14	190 34.9	149	7 8.5	-87	204 52.1	16 24.7	103 13.3	-18 56.6
16	219 42.7	150	6 51.1	-88	234 57.7	16 24.9	133 17.9	-18 56.7
18	248 50.7	150	6 33.5	-88	265 3.3	16 25.1	163 22.6	-18 56.7
20	277 58.7	151	6 15.9	-89	295 8.9	16 25.3	193 27.2	-18 56.7
22	307 6.9	151	5 58.1	-89	325 14.5	16 25.5	223 31.8	-18 56.8
Δ					28	1	23	0

φ	SUNCE		TRAJANJE SUMRAKA		MESEC			
	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 5	16 24	0 46	2 25	18 41	2.9	8 3	.7
55	7 44	16 45	0 39	2 5	18 50	2.7	7 53	.9
50	7 28	17 0	0 34	1 51	18 56	2.6	7 45	1.0
45	7 15	17 13	0 31	1 40	19 1	2.4	7 39	1.2
40	7 5	17 23	0 28	1 32	19 5	2.3	7 33	1.3
35	6 56	17 32	0 26	1 26	19 9	2.2	7 29	1.3
30	6 48	17 40	0 25	1 22	19 12	2.1	7 25	1.4
20	6 34	17 54	0 23	1 15	19 18	2.0	7 17	1.6
10	6 22	18 6	0 22	1 12	19 23	1.9	7 11	1.7
0	6 10	18 17	0 21	1 11	19 28	1.8	7 5	1.8
10	5 59	18 29	0 22	1 13	19 32	1.7	6 59	1.9
20	5 46	18 41	0 23	1 18	19 37	1.5	6 53	2.0
30	5 32	18 56	0 25	1 27	19 43	1.4	6 46	2.2
35	5 23	19 4	0 27	1 35	19 46	1.3	6 41	2.2
40	5 14	19 14	0 30	1 45	19 49	1.2	6 37	2.3
45	5 2	19 25	0 33	1 59	19 54	1.1	6 31	2.4
50	4 48	19 39	0 37	2 23	19 59	1.0	6 24	2.6
55	4 30	19 56	0 44	3 16	20 5	.9	6 16	2.7
60	4 6	20 20	0 55	: ::	20 13	.7	6 5	2.9
S								

SUNCE				MESEC				
UT	$e = T_p - UT$	Δ/24	r	Prolaz		Δ/24	$\pi_\leftmoon$	r
h	min s	s	′	$T_{\overline{m}}$	h min	min	′	′
00	-13 55.4	-.2	16.3		0 55	1.8	54.1	14.7
12	-13 57.8	$T_{\overline{m}_\odot}$ 12 h 14.0 min		Starost 15.4 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	18	-3.2	♃	0 23	.0	219	-2.1
♂	14 19	.1	10	1.1	♄	7 8	.0	118	.7

UT	SUNCE		PROLEĆ. TAČKA	VENERA		MARS	
	$S_\odot$	$\delta_\odot$	S_Υ	S_φ	δ_φ	S_σ	δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	176 29.9	-15 46.8	135 48.5	152 11.1	- 8 31.1	145 28.4	- 4 58.8
2	206 29.9	-15 45.3	165 53.5	182 10.3	- 8 28.6	175 29.8	- 4 57.3
4	236 29.8	-15 43.8	195 58.4	212 9.5	- 8 26.2	205 31.2	- 4 55.7
6	266 29.7	-15 42.2	226 3.3	242 8.7	- 8 23.7	235 32.5	- 4 54.1
8	296 29.6	-15 40.7	256 8.2	272 7.8	- 8 21.3	265 33.9	- 4 52.5
10	326 29.5	-15 39.2	286 13.2	302 7.0	- 8 18.8	295 35.3	- 4 51.0
12	356 29.4	-15 37.6	316 18.1	332 6.2	- 8 16.3	325 36.6	- 4 49.4
14	26 29.3	-15 36.1	346 23.0	2 5.4	- 8 13.9	355 38.0	- 4 47.8
16	56 29.3	-15 34.6	16 28.0	32 4.5	- 8 11.4	25 39.4	- 4 46.2
18	86 29.2	-15 33.0	46 32.9	62 3.7	- 8 8.9	55 40.7	- 4 44.7
20	116 29.1	-15 31.5	76 37.8	92 2.9	- 8 6.5	85 42.1	- 4 43.1
22	146 29.0	-15 29.9	106 42.7	122 2.1	- 8 4.0	115 43.5	- 4 41.5
Δ	0	8		-4	12	7	8

UT	MESEC				JUPITER		SATURN	
	$S_\leftmoon$	Δ	$\delta_\leftmoon$	Δ	S_{4}	δ_{4}	S_{5}	δ_{5}
h	° ′		° ′		° ′	° ′	° ′	° ′
0	336 15.1	151	5 40.3	-90	355 20.1	16 25.7	253 36.4	-18 56.8
2	5 23.3	152	5 22.3	-90	25 25.7	16 25.9	283 41.0	-18 56.9
4	34 31.7	152	5 4.3	-90	55 31.2	16 26.2	313 45.6	-18 56.9
6	63 40.0	152	4 46.2	-91	85 36.8	16 26.4	343 50.3	-18 57.0
8	92 48.5	153	4 28.1	-91	115 42.4	16 26.6	13 54.9	-18 57.0
10	121 57.0	153	4 9.9	-91	145 48.0	16 26.8	43 59.5	-18 57.1
12	151 5.6	153	3 51.6	-92	175 53.6	16 27.0	74 4.1	-18 57.1
14	180 14.1	153	3 33.2	-92	205 59.2	16 27.2	104 8.7	-18 57.1
16	209 22.8	153	3 14.8	-92	236 4.7	16 27.4	134 13.4	-18 57.2
18	238 31.5	154	2 56.4	-93	266 10.3	16 27.6	164 18.0	-18 57.2
20	267 40.2	154	2 37.9	-93	296 15.9	16 27.9	194 22.6	-18 57.3
22	296 48.9	154	2 19.3	-93	326 21.5	16 28.1	224 27.2	-18 57.3
Δ					28	1	23	0

φ	SUNCE		TRAJANJE SUMRAKA		MESEC			
	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 3	16 26	0 46	2 24	19 51	2.2	8 19	.6
55	7 42	16 47	0 39	2 5	19 55	2.1	8 14	.8
50	7 27	17 2	0 34	1 50	19 57	2.0	8 10	1.0
45	7 14	17 14	0 31	1 40	19 59	2.0	8 6	1.1
40	7 4	17 25	0 28	1 32	20 1	2.0	8 3	1.2
35	6 55	17 33	0 26	1 26	20 2	1.9	8 1	1.3
30	6 47	17 41	0 25	1 21	20 4	1.9	7 59	1.4
20	6 34	17 54	0 23	1 15	20 6	1.8	7 55	1.5
10	6 22	18 6	0 22	1 12	20 8	1.8	7 51	1.6
0	6 11	18 18	0 21	1 11	20 10	1.8	7 48	1.8
10	5 59	18 29	0 22	1 13	20 12	1.7	7 45	1.9
20	5 47	18 41	0 23	1 18	20 14	1.7	7 41	2.0
30	5 33	18 55	0 25	1 27	20 16	1.6	7 37	2.1
35	5 24	19 3	0 27	1 34	20 17	1.6	7 35	2.2
40	5 15	19 13	0 29	1 44	20 19	1.6	7 32	2.3
45	5 4	19 24	0 33	1 58	20 21	1.5	7 29	2.4
50	4 50	19 37	0 37	2 21	20 23	1.5	7 25	2.6
55	4 33	19 54	0 43	3 11	20 25	1.4	7 21	2.7
60	4 9	20 17	0 54	: ::	20 28	1.4	7 15	2.9
S								

SUNCE				MESEC			
UT	e = T_p − UT	Δ/24	r	Prolaz	Δ/24	$\pi_\leftmoon$	r
h	min s	s	′	h min	min	′	′
00	-14 .2	-.2	16.2	$T_{\overline{m}}$ 1 38	1.7	54.0	14.7
12	-14 2.2	$T_{\overline{m}_\odot}$ 12 h 14.0 min		Starost 16.4 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	16	-3.2	♃	0 19	.0	220	-2.1
♂	14 17	.1	10	1.1	♄	7 4	.0	118	.7

UT	SUNCE		PROLEĆ. TAČKA	VENERA		MARS	
	$S_\odot$	$\delta_\odot$	S_Υ	S_φ	δ_φ	S_σ	δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	176 28.9	-15 28.4	136 47.7	152 1.3	- 8 1.5	145 44.9	- 4 39.9
2	206 28.9	-15 26.8	166 52.6	182 .5	- 7 59.0	175 46.2	- 4 38.3
4	236 28.8	-15 25.3	196 57.5	211 59.7	- 7 56.6	205 47.6	- 4 36.8
6	266 28.7	-15 23.7	227 2.5	241 58.8	- 7 54.1	235 49.0	- 4 35.2
8	296 28.7	-15 22.1	257 7.4	271 58.0	- 7 51.6	265 50.3	- 4 33.6
10	326 28.6	-15 20.6	287 12.3	301 57.2	- 7 49.1	295 51.7	- 4 32.0
12	356 28.5	-15 19.0	317 17.2	331 56.4	- 7 46.7	325 53.1	- 4 30.5
14	26 28.5	-15 17.5	347 22.2	1 55.6	- 7 44.2	355 54.5	- 4 28.9
16	56 28.4	-15 15.9	17 27.1	31 54.8	- 7 41.7	25 55.8	- 4 27.3
18	86 28.3	-15 14.3	47 32.0	61 54.0	- 7 39.2	55 57.2	- 4 25.7
20	116 28.3	-15 12.8	77 37.0	91 53.2	- 7 36.7	85 58.6	- 4 24.2
22	146 28.2	-15 11.2	107 41.9	121 52.4	- 7 34.2	115 60.0	- 4 22.6
Δ	0	8		-4	12	7	8

UT	MESEC				JUPITER		SATURN	
	$S_\leftmoon$	Δ	$\delta_\leftmoon$	Δ	S_{4}	δ_{4}	S_{5}	δ_{5}
h	° ′		° ′		° ′	° ′	° ′	° ′
0	325 57.6	154	2 .7	-93	356 27.1	16 28.3	254 31.9	-18 57.3
2	355 6.4	154	1 42.1	-93	26 32.7	16 28.5	284 36.5	-18 57.4
4	24 15.2	154	1 23.5	-93	56 38.3	16 28.7	314 41.1	-18 57.4
6	53 24.0	154	1 4.8	-93	86 43.8	16 28.9	344 45.7	-18 57.5
8	82 32.8	154	0 46.1	-93	116 49.4	16 29.1	14 50.4	-18 57.5
10	111 41.5	154	0 27.4	-94	146 55.0	16 29.3	44 55.0	-18 57.5
12	140 50.3	154	0 8.7	6	177 .6	16 29.6	74 59.6	-18 57.6
14	169 59.1	154	0 10.0	94	207 6.2	16 29.8	105 4.3	-18 57.6
16	199 7.8	154	0 28.7	94	237 11.8	16 30.0	135 8.9	-18 57.7
18	228 16.6	153	0 47.4	94	267 17.4	16 30.2	165 13.5	-18 57.7
20	257 25.3	153	1 6.1	93	297 22.9	16 30.4	195 18.2	-18 57.8
22	286 33.9	153	1 24.8	93	327 28.5	16 30.6	225 22.8	-18 57.8
Δ					28	1	23	0

φ	SUNCE		TRAJANJE SUMRAKA		MESEC			
	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 0	16 29	0 46	2 24	20 44	.7	8 35	2.5
55	7 40	16 49	0 39	2 4	20 45	.8	8 34	2.4
50	7 25	17 4	0 34	1 50	20 46	1.0	8 34	2.3
45	7 13	17 16	0 31	1 40	20 47	1.1	8 33	2.2
40	7 3	17 26	0 28	1 32	20 48	1.2	8 33	2.1
35	6 54	17 34	0 26	1 26	20 49	1.3	8 32	2.1
30	6 47	17 42	0 25	1 21	20 49	1.4	8 32	2.0
20	6 33	17 55	0 23	1 15	20 50	1.5	8 31	1.9
10	6 22	18 7	0 22	1 12	20 51	1.7	8 31	1.8
0	6 11	18 18	0 21	1 11	20 52	1.8	8 30	1.8
10	5 59	18 29	0 22	1 13	20 53	1.9	8 30	1.7
20	5 47	18 41	0 23	1 18	20 54	2.0	8 29	1.6
30	5 33	18 54	0 25	1 27	20 55	2.2	8 29	1.5
35	5 25	19 2	0 27	1 34	20 56	2.2	8 28	1.5
40	5 16	19 12	0 29	1 44	20 57	2.3	8 28	1.4
45	5 5	19 22	0 32	1 57	20 57	2.4	8 27	1.3
50	4 52	19 35	0 37	2 20	20 58	2.6	8 27	1.3
55	4 35	19 52	0 43	3 6	20 60	2.7	8 26	1.2
60	4 12	20 14	0 53	: ::	21 1	2.9	8 25	1.1
S								

SUNCE				MESEC			
UT	e = T_p − UT	Δ/24	r	Prolaz	Δ/24	$\pi_\leftmoon$	r
h	min s	s	′	h min	min	′	′
00	-14 4.2	-.1	16.2	$T_{\overline{m}}$ 2 20	1.8	54.0	14.7
12	-14 5.8	$T_{\overline{m}_\odot}$ 12 h 14.1 min		Starost 17.4 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	15	-3.2	♃	0 14	.0	220	-2.1
♂	14 16	.1	9	1.1	♄	7 1	.0	118	.7

UT	SUNCE		PROLEĆ. TAČKA	VENERA		MARS	
	$S_\odot$	$\delta_\odot$	S_Υ	S_φ	δ_φ	S_σ	δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	176 28.1	−15 9.6	137 46.8	151 51.6	− 7 31.7	146 1.4	− 4 21.0
2	206 28.1	−15 8.1	167 51.7	181 50.8	− 7 29.3	176 2.7	− 4 19.4
4	236 28.0	−15 6.5	197 56.7	211 50.0	− 7 26.8	206 4.1	− 4 17.8
6	266 28.0	−15 4.9	228 1.6	241 49.2	− 7 24.3	236 5.5	− 4 16.3
8	296 27.9	−15 3.3	258 6.5	271 48.4	− 7 21.8	266 6.9	− 4 14.7
10	326 27.9	−15 1.7	288 11.5	301 47.7	− 7 19.3	296 8.2	− 4 13.1
12	356 27.8	−15 .2	318 16.4	331 46.9	− 7 16.8	326 9.6	− 4 11.5
14	26 27.8	−14 58.6	348 21.3	1 46.1	− 7 14.3	356 11.0	− 4 9.9
16	56 27.7	−14 57.0	18 26.2	31 45.3	− 7 11.8	26 12.4	− 4 8.4
18	86 27.7	−14 55.4	48 31.2	61 44.5	− 7 9.3	56 13.8	− 4 6.8
20	116 27.6	−14 53.8	78 36.1	91 43.7	− 7 6.8	86 15.1	− 4 5.2
22	146 27.6	−14 52.2	108 41.0	121 42.9	− 7 4.3	116 16.5	− 4 3.6
Δ	0	8		−4	12	7	8

UT	MESEC				JUPITER		SATURN	
	$S_\leftmoon$	Δ	$\delta_\leftmoon$	Δ	$S_{\text{♃}}$	$\delta_{\text{♃}}$	$S_{\text{♄}}$	$\delta_{\text{♄}}$
h	° ′		° ′		° ′	° ′	° ′	° ′
0	315 42.6	153	1 43.5	93	357 34.1	16 30.8	255 27.4	−18 57.8
2	344 51.2	153	2 2.1	93	27 39.7	16 31.0	285 32.1	−18 57.9
4	13 59.7	152	2 20.8	93	57 45.3	16 31.2	315 36.7	−18 57.9
6	43 8.2	152	2 39.4	93	87 50.9	16 31.5	345 41.3	−18 58.0
8	72 16.6	152	2 57.9	93	117 56.5	16 31.7	15 46.0	−18 58.0
10	101 25.0	151	3 16.5	92	148 2.0	16 31.9	45 50.6	−18 58.0
12	130 33.3	151	3 34.9	92	178 7.6	16 32.1	75 55.2	−18 58.1
14	159 41.5	151	3 53.4	92	208 13.2	16 32.3	105 59.9	−18 58.1
16	188 49.6	150	4 11.8	92	238 18.8	16 32.5	136 4.5	−18 58.1
18	217 57.7	150	4 30.1	91	268 24.4	16 32.7	166 9.1	−18 58.2
20	247 5.6	149	4 48.4	91	298 30.0	16 32.9	196 13.8	−18 58.2
22	276 13.5	149	5 6.6	91	328 35.5	16 33.1	226 18.4	−18 58.3
Δ					28	1	23	0

φ	SUNCE		TRAJANJE SUMRAKA		MESEC			
	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 57	16 32	0 46	2 24	20 59	.7	9 35	2.9
55	7 38	16 51	0 39	2 4	21 5	.9	9 31	2.7
50	7 23	17 6	0 34	1 50	21 10	1.1	9 28	2.6
45	7 12	17 17	0 31	1 40	21 14	1.2	9 26	2.4
40	7 2	17 27	0 28	1 32	21 17	1.3	9 24	2.3
35	6 53	17 35	0 26	1 26	21 20	1.4	9 22	2.2
30	6 46	17 43	0 25	1 21	21 23	1.5	9 20	2.2
20	6 33	17 56	0 23	1 15	21 27	1.6	9 17	2.0
10	6 22	18 7	0 22	1 12	21 31	1.7	9 15	1.9
0	6 11	18 18	0 21	1 11	21 35	1.8	9 13	1.8
10	5 60	18 28	0 22	1 13	21 38	1.9	9 10	1.7
20	5 48	18 40	0 23	1 18	21 42	2.0	9 8	1.6
30	5 34	18 54	0 25	1 27	21 47	2.2	9 5	1.4
35	5 26	19 1	0 27	1 34	21 49	2.3	9 4	1.3
40	5 17	19 10	0 29	1 43	21 52	2.4	9 2	1.3
45	5 6	19 21	0 32	1 57	21 56	2.5	8 60	1.1
50	4 53	19 34	0 36	2 18	22 0	2.6	8 57	1.0
55	4 37	19 50	0 43	3 2	22 5	2.8	8 54	.9
60	4 15	20 12	0 53	: ::	22 12	3.0	8 50	.7
S								

SUNCE				MESEC				
UT	e = T_p − UT	Δ/24	r	Prolaz		Δ/24	$\pi_\leftmoon$	r
h	min s	s	′		h min	min	′	′
00	−14 7.4	−.1	16.2	$T_{\overline{m}}$	3 2	1.8	54.1	14.8
12	−14 8.7	$T_{\overline{m}_\odot}$	12 h 14.1 min	Starost 18.4 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	14	−3.2	♃	0 10	.0	220	−2.1
♂	14 15	.1	8	1.1	♄	6 57	.0	118	.7

UT	SUNCE		PROLEĆ. TAČKA	VENERA		MARS	
	$S_\odot$	$\delta_\odot$	S_Υ	S_φ	δ_φ	S_σ	δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	176 27.5	−14 50.6	138 45.9	151 42.2	− 7 1.8	146 17.9	− 4 2.0
2	206 27.5	−14 49.0	168 50.9	181 41.4	− 6 59.3	176 19.3	− 4 .5
4	236 27.5	−14 47.4	198 55.8	211 40.6	− 6 56.8	206 20.7	− 3 58.9
6	266 27.4	−14 45.8	229 .7	241 39.8	− 6 54.3	236 22.1	− 3 57.3
8	296 27.4	−14 44.3	259 5.7	271 39.1	− 6 51.7	266 23.4	− 3 55.7
10	326 27.3	−14 42.6	289 10.6	301 38.3	− 6 49.2	296 24.8	− 3 54.1
12	356 27.3	−14 41.0	319 15.5	331 37.5	− 6 46.7	326 26.2	− 3 52.6
14	26 27.3	−14 39.4	349 20.4	1 36.7	− 6 44.2	356 27.6	− 3 51.0
16	56 27.2	−14 37.8	19 25.4	31 36.0	− 6 41.7	26 29.0	− 3 49.4
18	86 27.2	−14 36.2	49 30.3	61 35.2	− 6 39.2	56 30.4	− 3 47.8
20	116 27.2	−14 34.6	79 35.2	91 34.4	− 6 36.7	86 31.8	− 3 46.2
22	146 27.1	−14 33.0	109 40.2	121 33.7	− 6 34.1	116 33.1	− 3 44.6
Δ	0	8		−4	13	7	8

UT	MESEC				JUPITER		SATURN	
	$S_\leftmoon$	Δ	$\delta_\leftmoon$	Δ	$S_{\text{♃}}$	$\delta_{\text{♃}}$	$S_{\text{♄}}$	$\delta_{\text{♄}}$
h	° ′		° ′		° ′	° ′	° ′	° ′
0	305 21.3	148	5 24.7	90	358 41.1	16 33.4	256 23.1	−18 58.3
2	334 29.0	148	5 42.7	90	28 46.7	16 33.6	286 27.7	−18 58.3
4	3 36.5	147	6 .7	89	58 52.3	16 33.8	316 32.3	−18 58.4
6	32 43.9	147	6 18.6	89	88 57.9	16 34.0	346 37.0	−18 58.4
8	61 51.3	146	6 36.4	89	119 3.5	16 34.2	16 41.6	−18 58.5
10	90 58.5	145	6 54.1	88	149 9.1	16 34.4	46 46.3	−18 58.5
12	120 5.5	145	7 11.7	88	179 14.6	16 34.6	76 50.9	−18 58.5
14	149 12.4	144	7 29.2	87	209 20.2	16 34.8	106 55.6	−18 58.6
16	178 19.2	143	7 46.6	86	239 25.8	16 35.0	137 .2	−18 58.6
18	207 25.8	142	8 3.9	86	269 31.4	16 35.2	167 4.9	−18 58.6
20	236 32.3	142	8 21.1	85	299 37.0	16 35.5	197 9.5	−18 58.7
22	265 38.6	141	8 38.1	85	329 42.6	16 35.7	227 14.2	−18 58.7
Δ					28	1	23	0

φ	SUNCE		TRAJANJE SUMRAKA		MESEC			
	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 55	16 34	0 45	2 23	21 16	.8	10 46	3.0
55	7 36	16 53	0 39	2 4	21 27	1.0	10 37	2.8
50	7 22	17 7	0 34	1 50	21 36	1.2	10 30	2.6
45	7 10	17 19	0 31	1 40	21 43	1.3	10 24	2.5
40	7 1	17 28	0 28	1 32	21 48	1.4	10 20	2.4
35	6 52	17 36	0 26	1 26	21 53	1.5	10 16	2.3
30	6 45	17 44	0 25	1 21	21 58	1.5	10 12	2.2
20	6 32	17 56	0 23	1 15	22 5	1.7	10 6	2.1
10	6 21	18 7	0 22	1 12	22 12	1.8	10 1	2.0
0	6 11	18 18	0 21	1 11	22 18	1.9	9 56	1.8
10	6 0	18 28	0 22	1 13	22 25	2.0	9 51	1.7
20	5 48	18 40	0 23	1 18	22 32	2.1	9 45	1.6
30	5 35	18 53	0 25	1 26	22 39	2.2	9 39	1.5
35	5 27	19 0	0 27	1 33	22 44	2.3	9 36	1.4
40	5 18	19 9	0 29	1 43	22 49	2.4	9 32	1.3
45	5 8	19 20	0 32	1 56	22 55	2.5	9 27	1.2
50	4 55	19 32	0 36	2 17	23 2	2.6	9 22	1.1
55	4 39	19 48	0 42	2 58	23 11	1.9	9 15	1.0
60	4 18	20 9	0 52	: ::	23 23	1.9	9 6	.8
S								

SUNCE				MESEC				
UT	e = T_p − UT	Δ/24	r	Prolaz		Δ/24	$\pi_\leftmoon$	r
h	min s	s	′		h min	min	′	′
00	−14 9.9	−.1	16.2	$T_{\overline{m}}$	3 45	1.8	54.4	14.8
12	−14 10.7	$T_{\overline{m}_\odot}$	12 h 14.2 min	Starost 19.4 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	13	−3.2	♃	0 5	.0	220	−2.1
♂	14 14	.1	8	1.1	♄	6 53	.0	118	.7

UT	SUNCE		PROLEĆ. TAČKA	VENERA		MARS	
	$S_\odot$	$\delta_\odot$	S_Υ	S_φ	δ_φ	S_σ	δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	176 27.1	-14 31.4	139 45.1	151 32.9	- 6 31.6	146 34.5	- 3 43.1
2	206 27.1	-14 29.8	169 50.0	181 32.1	- 6 29.1	176 35.9	- 3 41.5
4	236 27.1	-14 28.2	199 54.9	211 31.4	- 6 26.6	206 37.3	- 3 39.9
6	266 27.0	-14 26.5	229 59.9	241 30.6	- 6 24.1	236 38.7	- 3 38.3
8	296 27.0	-14 24.9	260 4.8	271 29.9	- 6 21.5	266 40.1	- 3 36.7
10	326 27.0	-14 23.3	290 9.7	301 29.1	- 6 19.0	296 41.5	- 3 35.2
12	356 27.0	-14 21.7	320 14.7	331 28.3	- 6 16.5	326 42.8	- 3 33.6
14	26 27.0	-14 20.1	350 19.6	1 27.6	- 6 14.0	356 44.2	- 3 32.0
16	56 26.9	-14 18.4	20 24.5	31 26.8	- 6 11.4	26 45.6	- 3 30.4
18	86 26.9	-14 16.8	50 29.4	61 26.1	- 6 8.9	56 47.0	- 3 28.8
20	116 26.9	-14 15.2	80 34.4	91 25.3	- 6 6.4	86 48.4	- 3 27.2
22	146 26.9	-14 13.5	110 39.3	121 24.6	- 6 3.8	116 49.8	- 3 25.7
Δ	0	8		-4	13	7	8

UT	MESEC				JUPITER		SATURN	
	$S_\leftmoon$	Δ	$\delta_\leftmoon$	Δ	S_{4}	δ_{4}	S_{h}	δ_{h}
h	° ′		° ′		° ′	° ′	° ′	° ′
0	294 44.8	140	8 55.0	84	359 48.1	16 35.9	257 18.8	-18 58.8
2	323 50.8	139	9 11.8	83	29 53.7	16 36.1	287 23.5	-18 58.8
4	352 56.6	138	9 28.5	83	59 59.3	16 36.3	317 28.1	-18 58.8
6	22 2.2	137	9 45.0	82	90 4.9	16 36.5	347 32.8	-18 58.9
8	51 7.7	136	10 1.3	81	120 10.5	16 36.7	17 37.4	-18 58.9
10	80 12.9	135	10 17.5	80	150 16.1	16 36.9	47 42.1	-18 58.9
12	109 18.0	134	10 33.6	79	180 21.6	16 37.1	77 46.7	-18 59.0
14	138 22.9	133	10 49.5	79	210 27.2	16 37.3	107 51.4	-18 59.0
16	167 27.5	132	11 5.2	78	240 32.8	16 37.5	137 56.0	-18 59.0
18	196 32.0	131	11 20.7	77	270 38.4	16 37.7	168 .7	-18 59.1
20	225 36.3	130	11 36.1	76	300 44.0	16 38.0	198 5.3	-18 59.1
22	254 40.3	129	11 51.2	75	330 49.6	16 38.2	228 10.0	-18 59.1
Δ					28	1	23	0

φ	SUNCE		TRAJANJE SUMRAKA		MESEC			
	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 52	16 37	0 45	2 23	21 36	1.0	11 57	3.0
55	7 34	16 55	0 39	2 3	21 52	1.2	11 43	2.8
50	7 20	17 9	0 34	1 50	22 4	1.3	11 32	2.6
45	7 9	17 20	0 31	1 39	22 14	1.5	11 24	2.5
40	6 59	17 29	0 28	1 32	22 22	1.5	11 17	2.4
35	6 51	17 37	0 26	1 26	22 29	1.6	11 10	2.3
30	6 44	17 44	0 25	1 21	22 35	1.7	11 5	2.3
20	6 32	17 57	0 23	1 15	22 45	1.8	10 56	2.1
10	6 21	18 7	0 22	1 12	22 55	1.9	10 48	2.0
0	6 11	18 18	0 21	1 11	23 4	2.0	10 40	1.9
10	6 0	18 28	0 22	1 13	23 13	2.0	10 32	1.8
20	5 49	18 39	0 23	1 17	23 22	2.0	10 24	1.7
30	5 36	18 52	0 25	1 26	23 33	2.0	10 15	1.6
35	5 28	18 60	0 27	1 33	23 39	2.0	10 10	1.5
40	5 20	19 8	0 29	1 42	23 46	2.0	10 4	1.5
45	5 9	19 18	0 32	1 55	23 55	2.0	9 57	1.4
50	4 57	19 30	0 36	2 16	. . . .	.0	9 48	1.2
55	4 41	19 46	0 42	2 55	23 58	2.9	9 38	1.1
60	4 20	20 6	0 52	: : :	. . . .	.0	9 25	.9
S								

SUNCE				MESEC			
UT	$e = T_p - UT$	Δ/24	r	Prolaz		Δ/24	$\pi_\leftmoon$	r
h	min s	s	′		h min	min	′	′
00	-14 11.5	.0	16.2	$T_{\overline{m}}$	4 29	1.9	54.8	14.9
12	-14 12.0	$T_{\overline{m}_\odot}$	12 h 14.2 min	Starost 20.4 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	12	-3.2	♃	0 1	.0	220	-2.1
♂	14 13	.1	7	1.1	♄	6 50	.0	118	.7

UT	SUNCE		PROLEĆ. TAČKA	VENERA		MARS	
	$S_\odot$	$\delta_\odot$	S_Υ	S_φ	δ_φ	S_σ	δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	176 26.9	-14 11.9	140 44.2	151 23.8	- 6 1.3	146 51.2	- 3 24.1
2	206 26.9	-14 10.3	170 49.2	181 23.1	- 5 58.8	176 52.6	- 3 22.5
4	236 26.9	-14 8.6	200 54.1	211 22.3	- 5 56.2	206 54.0	- 3 20.9
6	266 26.9	-14 7.0	230 59.0	241 21.6	- 5 53.7	236 55.4	- 3 19.3
8	296 26.9	-14 5.4	261 3.9	271 20.8	- 5 51.2	266 56.8	- 3 17.7
10	326 26.9	-14 3.7	291 8.9	301 20.1	- 5 48.6	296 58.1	- 3 16.1
12	356 26.9	-14 2.1	321 13.8	331 19.3	- 5 46.1	326 59.5	- 3 14.6
14	26 26.9	-14 .4	351 18.7	1 18.6	- 5 43.5	357 .9	- 3 13.0
16	56 26.8	-13 58.8	21 23.7	31 17.8	- 5 41.0	27 2.3	- 3 11.4
18	86 26.8	-13 57.1	51 28.6	61 17.1	- 5 38.5	57 3.7	- 3 9.8
20	116 26.9	-13 55.5	81 33.5	91 16.4	- 5 35.9	87 5.1	- 3 8.2
22	146 26.9	-13 53.8	111 38.4	121 15.6	- 5 33.4	117 6.5	- 3 6.6
Δ	0	8		-4	13	7	8

UT	MESEC				JUPITER		SATURN	
	$S_\leftmoon$	Δ	$\delta_\leftmoon$	Δ	S_{4}	δ_{4}	S_{h}	δ_{h}
h	° ′		° ′		° ′	° ′	° ′	° ′
0	283 44.1	128	12 6.2	74	0 55.1	16 38.4	258 14.6	-18 59.2
2	312 47.7	127	12 21.0	73	31 .7	16 38.6	288 19.3	-18 59.2
4	341 51.0	126	12 35.6	72	61 6.3	16 38.8	318 23.9	-18 59.3
6	10 54.2	124	12 50.0	71	91 11.9	16 39.0	348 28.6	-18 59.3
8	39 57.1	123	13 4.1	70	121 17.5	16 39.2	18 33.3	-18 59.3
10	68 59.7	122	13 18.1	69	151 23.1	16 39.4	48 37.9	-18 59.4
12	98 2.1	121	13 31.8	67	181 28.6	16 39.6	78 42.6	-18 59.4
14	127 4.3	120	13 45.3	66	211 34.2	16 39.8	108 47.2	-18 59.4
16	156 6.2	118	13 58.5	65	241 39.8	16 40.0	138 51.9	-18 59.5
18	185 7.8	117	14 11.5	64	271 45.4	16 40.2	168 56.6	-18 59.5
20	214 9.2	116	14 24.2	62	301 51.0	16 40.4	199 1.2	-18 59.5
22	243 10.4	114	14 36.7	61	331 56.5	16 40.6	229 5.9	-18 59.6
Δ					28	1	23	0

φ	SUNCE		TRAJANJE SUMRAKA		MESEC			
	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 50	16 40	0 45	2 22	22 1	1.3	13 9	2.9
55	7 32	16 57	0 38	2 3	22 21	1.5	12 50	2.8
50	7 18	17 11	0 34	1 49	22 36	1.6	12 35	2.6
45	7 7	17 22	0 31	1 39	22 49	1.7	12 24	2.5
40	6 58	17 31	0 28	1 31	22 59	1.8	12 14	2.4
35	6 50	17 38	0 26	1 25	23 8	1.8	12 6	2.4
30	6 44	17 45	0 25	1 21	23 15	2.1	11 59	2.3
20	6 32	17 57	0 23	1 15	23 29	2.1	11 47	2.2
10	6 21	18 8	0 22	1 11	23 40	2.1	11 36	2.1
0	6 11	18 18	0 21	1 11	23 51	2.1	11 26	2.0
10	6 1	18 28	0 22	1 13	. . . .	.0	11 16	2.0
20	5 50	18 39	0 23	1 17	. . . .	.0	11 6	1.9
30	5 37	18 51	0 25	1 26	. . . .	.0	10 54	1.8
35	5 29	18 59	0 27	1 33	. . . .	.0	10 47	1.7
40	5 21	19 7	0 29	1 42	. . . .	.0	10 39	1.6
45	5 11	19 17	0 32	1 55	. . . .	.0	10 29	1.6
50	4 59	19 29	0 36	2 14	0 5	2.6	10 18	1.5
55	4 43	19 44	0 42	2 52	. . . .	.0	10 4	1.3
60	4 23	20 4	0 51	: : :	0 35	3.0	9 46	1.1
S								

SUNCE				MESEC			
UT	$e = T_p - UT$	Δ/24	r	Prolaz		Δ/24	$\pi_\leftmoon$	r
h	min s	s	′		h min	min	′	′
00	-14 12.4	.0	16.2	$T_{\overline{m}}$	5 15	2.0	55.4	15.1
12	-14 12.5	$T_{\overline{m}_\odot}$	12 h 14.2 min	Starost 21.4 d		Faza ◑		

PLANETE								
Pl.	$T_{\overline{m}}$	π	360−α	Vel.	Pl.	$T_{\overline{m}}$	π	360−α	Vel.
	h min	′	°			h min	′	°	
♀	13 55	.1	11	-3.2	♃	23 52	.0	220	-2.1
♂	14 12	.1	6	1.1	♄	6 46	.0	117	.7

UT	SUNCE		PROLEĆ. TAČKA	VENERA		MARS	
	$S_\odot$	$\delta_\odot$	S_Υ	S_φ	δ_φ	S_σ	δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	176 26.9	-13 52.2	141 43.4	151 14.9	- 5 30.8	147 7.9	- 3 5.1
2	206 26.9	-13 50.5	171 48.3	181 14.2	- 5 28.3	177 9.3	- 3 3.5
4	236 26.9	-13 48.9	201 53.2	211 13.4	- 5 25.7	207 10.7	- 3 1.9
6	266 26.9	-13 47.2	231 58.1	241 12.7	- 5 23.2	237 12.1	- 3 .3
8	296 26.9	-13 45.6	262 3.1	271 12.0	- 5 20.6	267 13.5	- 2 58.7
10	326 26.9	-13 43.9	292 8.0	301 11.2	- 5 18.1	297 14.9	- 2 57.1
12	356 26.9	-13 42.2	322 12.9	331 10.5	- 5 15.5	327 16.3	- 2 55.6
14	26 26.9	-13 40.6	352 17.9	1 9.8	- 5 13.0	357 17.7	- 2 54.0
16	56 26.9	-13 38.9	22 22.8	31 9.0	- 5 10.4	27 19.1	- 2 52.4
18	86 27.0	-13 37.2	52 27.7	61 8.3	- 5 7.9	57 20.5	- 2 50.8
20	116 27.0	-13 35.6	82 32.6	91 7.6	- 5 5.3	87 21.9	- 2 49.2
22	146 27.0	-13 33.9	112 37.6	121 6.9	- 5 2.8	117 23.3	- 2 47.6
Δ	0	8		-4	13	7	8

UT	MESEC				JUPITER		SATURN	
	$S_\leftmoon$	Δ	$\delta_\leftmoon$	Δ	S_{4}	δ_{4}	S_{5}	δ_{5}
h	° ′		° ′		° ′	° ′	° ′	° ′
0	272 11.2	113	14 49.0	60	2 2.1	16 40.9	259 10.6	-18 59.6
2	301 11.8	112	15 .9	58	32 7.7	16 41.1	289 15.2	-18 59.6
4	330 12.2	110	15 12.6	57	62 13.3	16 41.3	319 19.9	-18 59.7
6	359 12.2	109	15 24.0	56	92 18.9	16 41.5	349 24.5	-18 59.7
8	28 12.0	108	15 35.1	54	122 24.4	16 41.7	19 29.2	-18 59.7
10	57 11.5	106	15 45.9	53	152 30.0	16 41.9	49 33.9	-18 59.8
12	86 10.8	105	15 56.5	51	182 35.6	16 42.1	79 38.5	-18 59.8
14	115 9.8	103	16 6.7	50	212 41.2	16 42.3	109 43.2	-18 59.8
16	144 8.4	102	16 16.6	48	242 46.8	16 42.5	139 47.9	-18 59.9
18	173 6.9	101	16 26.2	46	272 52.3	16 42.7	169 52.6	-18 59.9
20	202 5.0	99	16 35.4	45	302 57.9	16 42.9	199 57.2	-18 59.9
22	231 2.8	98	16 44.3	43	333 3.5	16 43.1	230 1.9	-18 60.0
Δ					28	1	23	0

φ	SUNCE		TRAJANJE SUMRAKA		MESEC			
	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 47	16 42	0 45	2 22	22 32	1.7	14 19	2.8
55	7 30	16 59	0 38	2 3	22 56	1.8	13 56	2.7
50	7 17	17 13	0 34	1 49	23 15	2.2	13 38	2.6
45	7 6	17 23	0 30	1 39	23 29	2.2	13 24	2.5
40	6 57	17 32	0 28	1 31	23 41	2.2	13 13	2.4
35	6 49	17 39	0 26	1 25	23 51	2.2	13 3	2.4
30	6 43	17 46	0 25	1 21	. . . .	.0	12 55	2.4
20	6 31	17 58	0 23	1 15	. . . .	.0	12 40	2.3
10	6 21	18 8	0 22	1 11	. . . .	.0	12 27	2.2
0	6 11	18 18	0 21	1 11	. . . .	.0	12 15	2.2
10	6 1	18 27	0 22	1 12	0 3	2.2	12 3	2.1
20	5 50	18 38	0 23	1 17	0 14	2.3	11 51	2.0
30	5 38	18 50	0 25	1 26	0 28	2.3	11 36	2.0
35	5 30	18 57	0 27	1 32	0 36	2.4	11 28	1.9
40	5 22	19 6	0 29	1 41	0 45	2.4	11 18	1.9
45	5 12	19 15	0 32	1 54	0 56	2.5	11 7	1.8
50	5 1	19 27	0 36	2 13	1 8	2.6	10 53	1.7
55	4 46	19 41	0 41	2 49	1 25	2.7	10 36	1.6
60	4 26	20 1	0 51	: ::	1 46	2.9	10 13	1.5
S								

SUNCE				MESEC				
UT	e = T_p − UT	Δ/24	r	Prolaz		Δ/24	$\pi_\leftmoon$	r
h	min s	s	′		h min	min	′	′
00	-14 12.6	.0	16.2	$T_{\overline{m}}$	6 3	2.1	56.1	15.3
12	-14 12.3	$T_{\overline{m}_\odot}$	12 h 14.2 min	Starost 22.4 d		Faza ◑		

PLANETE								
Pl.	$T_{\overline{m}}$	π	360 − α	Vel.	Pl.	$T_{\overline{m}}$	π	360 − α	Vel.
	h min	′	°			h min	′	°	
♀	13 55	.1	10	-3.2	♃	23 47	.0	220	-2.1
♂	14 11	.1	5	1.1	♄	6 42	.0	117	.7

UT	SUNCE		PROLEĆ. TAČKA	VENERA		MARS	
	$S_\odot$	$\delta_\odot$	S_Υ	S_φ	δ_φ	S_σ	δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	176 27.0	-13 32.2	142 42.5	151 6.1	- 5 .2	147 24.7	- 2 46.0
2	206 27.0	-13 30.6	172 47.4	181 5.4	- 4 57.7	177 26.1	- 2 44.5
4	236 27.0	-13 28.9	202 52.4	211 4.7	- 4 55.1	207 27.5	- 2 42.9
6	266 27.1	-13 27.2	232 57.3	241 4.0	- 4 52.5	237 28.9	- 2 41.3
8	296 27.1	-13 25.5	263 2.2	271 3.3	- 4 50.0	267 30.3	- 2 39.7
10	326 27.1	-13 23.8	293 7.1	301 2.5	- 4 47.4	297 31.7	- 2 38.1
12	356 27.1	-13 22.2	323 12.1	331 1.8	- 4 44.9	327 33.1	- 2 36.5
14	26 27.2	-13 20.5	353 17.0	1 1.1	- 4 42.3	357 34.5	- 2 34.9
16	56 27.2	-13 18.8	23 21.9	31 .4	- 4 39.7	27 35.9	- 2 33.4
18	86 27.2	-13 17.1	53 26.9	60 59.7	- 4 37.2	57 37.3	- 2 31.8
20	116 27.3	-13 15.4	83 31.8	90 59.0	- 4 34.6	87 38.7	- 2 30.2
22	146 27.3	-13 13.7	113 36.7	120 58.2	- 4 32.0	117 40.1	- 2 28.6
Δ	0	8		-4	13	7	8

UT	MESEC				JUPITER		SATURN	
	$S_\leftmoon$	Δ	$\delta_\leftmoon$	Δ	S_{4}	δ_{4}	S_{5}	δ_{5}
h	° ′		° ′		° ′	° ′	° ′	° ′
0	260 .4	96	16 52.9	41	3 9.1	16 43.3	260 6.6	-18 60.0
2	288 57.7	95	17 1.2	39	33 14.7	16 43.5	290 11.2	-19 .0
4	317 54.7	94	17 9.0	38	63 20.2	16 43.7	320 15.9	-19 .1
6	346 51.5	92	17 16.6	36	93 25.8	16 43.9	350 20.6	-19 .1
8	15 47.9	91	17 23.7	34	123 31.4	16 44.1	20 25.3	-19 .1
10	44 44.1	90	17 30.5	32	153 37.0	16 44.3	50 29.9	-19 .2
12	73 40.0	88	17 36.9	30	183 42.5	16 44.5	80 34.6	-19 .2
14	102 35.6	87	17 43.0	28	213 48.1	16 44.8	110 39.3	-19 .2
16	131 31.0	85	17 48.6	26	243 53.7	16 45.0	140 44.0	-19 .2
18	160 26.1	84	17 53.8	24	273 59.3	16 45.2	170 48.6	-19 .3
20	189 20.9	83	17 58.7	22	304 4.8	16 45.4	200 53.3	-19 .3
22	218 15.5	82	18 3.1	20	334 10.4	16 45.6	230 58.0	-19 .3
Δ					28	1	23	0

φ	SUNCE		TRAJANJE SUMRAKA		MESEC			
	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 44	16 45	0 44	2 22	23 13	2.3	15 26	2.5
55	7 28	17 2	0 38	2 3	23 40	2.3	14 60	2.5
50	7 15	17 14	0 34	1 49	. . . .	.0	14 40	2.4
45	7 5	17 24	0 30	1 39	. . . .	.0	14 24	2.4
40	6 56	17 33	0 28	1 31	. . . .	.0	14 12	2.4
35	6 48	17 40	0 26	1 25	. . . .	.0	14 1	2.4
30	6 42	17 47	0 25	1 21	0 0	2.1	13 51	2.4
20	6 31	17 58	0 23	1 14	0 16	2.1	13 35	2.3
10	6 20	18 8	0 22	1 11	0 29	2.2	13 21	2.3
0	6 11	18 18	0 21	1 11	0 42	2.2	13 7	2.3
10	6 1	18 27	0 22	1 12	0 55	2.3	12 54	2.3
20	5 51	18 38	0 23	1 17	1 8	2.3	12 40	2.2
30	5 38	18 49	0 25	1 25	1 24	2.4	12 23	2.2
35	5 31	18 56	0 27	1 32	1 33	2.4	12 14	2.2
40	5 23	19 4	0 29	1 41	1 44	2.4	12 3	2.1
45	5 14	19 14	0 32	1 53	1 56	2.5	11 50	2.1
50	5 2	19 25	0 36	2 12	2 11	2.5	11 35	2.1
55	4 48	19 39	0 41	2 46	2 30	2.6	11 15	2.0
60	4 29	19 58	0 50	: ::	2 56	2.7	10 49	1.9
S								

SUNCE				MESEC				
UT	e = T_p − UT	Δ/24	r	Prolaz		Δ/24	$\pi_\leftmoon$	r
h	min s	s	′		h min	min	′	′
00	-14 12.0	.1	16.2	$T_{\overline{m}}$	6 54	2.3	56.9	15.5
12	-14 11.3	$T_{\overline{m}_\odot}$	12 h 14.2 min	Starost 23.4 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	8	-3.2	♃	23 43	.0	220	-2.1
♂	14 10	.1	5	1.1	♄	6 39	.0	117	.7

UT	SUNCE		PROLEĆ. TAČKA	VENERA		MARS	
	$S_\odot$	$\delta_\odot$	S_Υ	S_φ	δ_φ	S_σ	δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	176 27.3	-13 12.0	143 41.6	150 57.5	- 4 29.5	147 41.5	- 2 27.0
2	206 27.4	-13 10.4	173 46.6	180 56.8	- 4 26.9	177 42.9	- 2 25.4
4	236 27.4	-13 8.7	203 51.5	210 56.1	- 4 24.3	207 44.3	- 2 23.8
6	266 27.4	-13 7.0	233 56.4	240 55.4	- 4 21.8	237 45.7	- 2 22.3
8	296 27.5	-13 5.3	264 1.4	270 54.7	- 4 19.2	267 47.1	- 2 20.7
10	326 27.5	-13 3.6	294 6.3	300 54.0	- 4 16.6	297 48.5	- 2 19.1
12	356 27.6	-13 1.9	324 11.2	330 53.3	- 4 14.0	327 49.9	- 2 17.5
14	26 27.6	-13 .2	354 16.1	0 52.6	- 4 11.5	357 51.3	- 2 15.9
16	56 27.7	-12 58.5	24 21.1	30 51.9	- 4 8.9	27 52.7	- 2 14.3
18	86 27.7	-12 56.8	54 26.0	60 51.2	- 4 6.3	57 54.1	- 2 12.7
20	116 27.8	-12 55.1	84 30.9	90 50.5	- 4 3.7	87 55.5	- 2 11.1
22	146 27.8	-12 53.4	114 35.9	120 49.8	- 4 1.2	117 56.9	- 2 9.6
Δ	0	8		-4	13	7	8

UT	MESEC				JUPITER		SATURN	
	$S_\leftmoon$	Δ	$\delta_\leftmoon$	Δ	$S_{\mathrm{♃}}$	$\delta_{\mathrm{♃}}$	$S_{\mathrm{♄}}$	$\delta_{\mathrm{♄}}$
h	° ′		° ′		° ′	° ′	° ′	° ′
0	247 9.8	80	18 7.1	18	4 16.0	16 45.8	261 2.7	-19 .4
2	276 3.8	79	18 10.8	16	34 21.6	16 46.0	291 7.4	-19 .4
4	304 57.7	78	18 13.9	14	64 27.1	16 46.2	321 12.0	-19 .4
6	333 51.2	77	18 16.7	12	94 32.7	16 46.4	351 16.7	-19 .5
8	2 44.5	75	18 19.0	9	124 38.3	16 46.6	21 21.4	-19 .5
10	31 37.6	74	18 20.9	7	154 43.9	16 46.8	51 26.1	-19 .5
12	60 30.4	73	18 22.3	5	184 49.4	16 47.0	81 30.8	-19 .5
14	89 23.0	72	18 23.3	3	214 55.0	16 47.2	111 35.5	-19 .6
16	118 15.4	71	18 23.8	0	245 .6	16 47.4	141 40.1	-19 .6
18	147 7.6	70	18 23.9	-2	275 6.2	16 47.6	171 44.8	-19 .6
20	175 59.6	69	18 23.5	-4	305 11.7	16 47.8	201 49.5	-19 .7
22	204 51.3	68	18 22.6	-7	335 17.3	16 48.0	231 54.2	-19 .7
Δ					28	1	23	0

φ	SUNCE		TRAJANJE SUMRAKA		MESEC			
	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 42	16 48	0 44	2 21	. . . .	.0	16 27	2.2
55	7 25	17 4	0 38	2 2	. . . .	.0	15 59	2.2
50	7 13	17 16	0 34	1 49	0 1	2.3	15 39	2.3
45	7 3	17 26	0 30	1 39	0 16	2.3	15 22	2.3
40	6 55	17 34	0 28	1 31	0 29	2.3	15 9	2.3
35	6 47	17 41	0 26	1 25	0 40	2.3	14 58	2.3
30	6 41	17 48	0 25	1 21	0 50	2.3	14 48	2.3
20	6 30	17 59	0 23	1 14	1 7	2.3	14 31	2.3
10	6 20	18 8	0 22	1 11	1 22	2.3	14 16	2.4
0	6 11	18 18	0 21	1 11	1 35	2.3	14 2	2.4
10	6 1	18 27	0 22	1 12	1 49	2.3	13 48	2.4
20	5 51	18 37	0 23	1 17	2 4	2.3	13 33	2.4
30	5 39	18 49	0 25	1 25	2 21	2.4	13 16	2.4
35	5 32	18 55	0 27	1 32	2 31	2.4	13 6	2.4
40	5 24	19 3	0 29	1 40	2 42	2.4	12 54	2.4
45	5 15	19 12	0 32	1 52	2 55	2.4	12 41	2.5
50	5 4	19 23	0 35	2 11	3 12	2.4	12 25	2.5
55	4 50	19 37	0 41	2 43	3 32	2.4	12 4	2.5
60	4 31	19 55	0 50	: ::	4 1	2.4	11 35	2.5
S								

SUNCE				MESEC			
UT	e = T_p − UT	Δ/24	r	Prolaz	Δ/24	$\pi_\leftmoon$	r
h	min s	s	′	h min	min	′	′
00	-14 10.7	.1	16.2	$T_{\overline{m}}$ 7 49	2.3	57.8	15.8
12	-14 9.6	$T_{\overline{m}_\odot}$ 12 h 14.2 min		Starost 24.4 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	7	-3.2	♄	23 39	.0	221	-2.1
♂	14 9	.1	4	1.1	♃	6 35	.0	117	.7

UT	SUNCE		PROLEĆ. TAČKA	VENERA		MARS	
	$S_\odot$	$\delta_\odot$	S_Υ	S_φ	δ_φ	S_σ	δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	176 27.8	-12 51.7	144 40.8	150 49.1	- 3 58.6	147 58.3	- 2 8.0
2	206 27.9	-12 49.9	174 45.7	180 48.4	- 3 56.0	177 59.7	- 2 6.4
4	236 28.0	-12 48.2	204 50.6	210 47.7	- 3 53.4	208 1.1	- 2 4.8
6	266 28.0	-12 46.5	234 55.6	240 47.0	- 3 50.9	238 2.5	- 2 3.2
8	296 28.1	-12 44.8	265 .5	270 46.3	- 3 48.3	268 3.9	- 2 1.6
10	326 28.1	-12 43.1	295 5.4	300 45.6	- 3 45.7	298 5.3	- 2 .0
12	356 28.2	-12 41.4	325 10.4	330 44.9	- 3 43.1	328 6.8	- 1 58.5
14	26 28.2	-12 39.7	355 15.3	0 44.2	- 3 40.5	358 8.2	- 1 56.9
16	56 28.3	-12 37.9	25 20.2	30 43.5	- 3 38.0	28 9.6	- 1 55.3
18	86 28.3	-12 36.2	55 25.1	60 42.8	- 3 35.4	58 11.0	- 1 53.7
20	116 28.4	-12 34.5	85 30.1	90 42.1	- 3 32.8	88 12.4	- 1 52.1
22	146 28.5	-12 32.8	115 35.0	120 41.4	- 3 30.2	118 13.8	- 1 50.5
Δ	0	9		-3	13	7	8

UT	MESEC				JUPITER		SATURN	
	$S_\leftmoon$	Δ	$\delta_\leftmoon$	Δ	$S_{\mathrm{♃}}$	$\delta_{\mathrm{♃}}$	$S_{\mathrm{♄}}$	$\delta_{\mathrm{♄}}$
h	° ′		° ′		° ′	° ′	° ′	° ′
0	233 42.9	67	18 21.3	-9	5 22.9	16 48.2	261 58.9	-19 .7
2	262 34.3	66	18 19.5	-11	35 28.4	16 48.4	292 3.6	-19 .8
4	291 25.5	65	18 17.2	-14	65 34.0	16 48.6	322 8.3	-19 .8
6	320 16.5	64	18 14.5	-16	95 39.6	16 48.8	352 13.0	-19 .8
8	349 7.3	63	18 11.2	-19	125 45.2	16 49.0	22 17.6	-19 .8
10	17 58.0	63	18 7.5	-21	155 50.7	16 49.2	52 22.3	-19 .9
12	46 48.6	62	18 3.3	-23	185 56.3	16 49.4	82 27.0	-19 .9
14	75 39.0	61	17 58.6	-26	216 1.9	16 49.6	112 31.7	-19 .9
16	104 29.2	61	17 53.4	-28	246 7.4	16 49.8	142 36.4	-19 1.0
18	133 19.3	60	17 47.7	-31	276 13.0	16 50.0	172 41.1	-19 1.0
20	162 9.3	59	17 41.6	-33	306 18.6	16 50.2	202 45.8	-19 1.0
22	190 59.2	59	17 34.9	-36	336 24.1	16 50.4	232 50.5	-19 1.0
Δ					28	1	23	0

φ	SUNCE		TRAJANJE SUMRAKA		MESEC			
	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 39	16 50	0 44	2 21	0 7	2.8	17 19	1.7
55	7 23	17 6	0 38	2 2	0 35	2.7	16 52	1.9
50	7 11	17 18	0 33	1 49	0 55	2.7	16 33	2.0
45	7 2	17 27	0 30	1 39	1 11	2.6	16 17	2.1
40	6 53	17 35	0 28	1 31	1 25	2.6	16 4	2.2
35	6 46	17 42	0 26	1 25	1 36	2.6	15 53	2.2
30	6 40	17 48	0 24	1 20	1 46	2.5	15 44	2.2
20	6 29	17 59	0 23	1 14	2 3	2.5	15 27	2.3
10	6 20	18 9	0 21	1 11	2 18	2.5	15 13	2.4
0	6 11	18 18	0 21	1 10	2 32	2.4	14 59	2.4
10	6 1	18 27	0 22	1 12	2 45	2.4	14 45	2.5
20	5 52	18 36	0 23	1 17	3 0	2.3	14 31	2.6
30	5 40	18 48	0 25	1 25	3 17	2.3	14 14	2.6
35	5 33	18 54	0 27	1 31	3 27	2.3	14 4	2.7
40	5 26	19 2	0 29	1 40	3 39	2.2	13 53	2.7
45	5 17	19 11	0 31	1 52	3 52	2.2	13 40	2.8
50	5 6	19 21	0 35	2 10	4 8	2.1	13 24	2.8
55	4 52	19 35	0 41	2 41	4 29	2.1	13 3	2.9
60	4 34	19 53	0 49	: ::	4 57	2.0	12 35	3.1
S								

SUNCE				MESEC			
UT	e = T_p − UT	Δ/24	r	Prolaz	Δ/24	$\pi_\leftmoon$	r
h	min s	s	′	h min	min	′	′
00	-14 8.6	.1	16.2	$T_{\overline{m}}$ 8 45	2.5	58.8	16.0
12	-14 7.2	$T_{\overline{m}_\odot}$ 12 h 14.1 min		Starost 25.4 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	6	-3.2	♄	23 34	.0	221	-2.1
♂	14 7	.1	3	1.1	♃	6 31	.0	117	.7

UT	SUNCE		PROLEĆ. TAČKA	VENERA		MARS	
	$S_\odot$	$\delta_\odot$	S_Υ	S_φ	δ_φ	S_σ	δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	176 28.5	-12 31.0	145 39.9	150 40.7	- 3 27.6	148 15.2	- 1 48.9
2	206 28.6	-12 29.3	175 44.8	180 40.0	- 3 25.0	178 16.6	- 1 47.3
4	236 28.7	-12 27.6	205 49.8	210 39.3	- 3 22.4	208 18.0	- 1 45.8
6	266 28.7	-12 25.9	235 54.7	240 38.7	- 3 19.9	238 19.4	- 1 44.2
8	296 28.8	-12 24.1	265 59.6	270 38.0	- 3 17.3	268 20.8	- 1 42.6
10	326 28.9	-12 22.4	296 4.6	300 37.3	- 3 14.7	298 22.3	- 1 41.0
12	356 28.9	-12 20.7	326 9.5	330 36.6	- 3 12.1	328 23.7	- 1 39.4
14	26 29.0	-12 18.9	356 14.4	0 35.9	- 3 9.5	358 25.1	- 1 37.8
16	56 29.1	-12 17.2	26 19.3	30 35.2	- 3 6.9	28 26.5	- 1 36.2
18	86 29.2	-12 15.5	56 24.3	60 34.6	- 3 4.3	58 27.9	- 1 34.7
20	116 29.2	-12 13.7	86 29.2	90 33.9	- 3 1.7	88 29.3	- 1 33.1
22	146 29.3	-12 12.0	116 34.1	120 33.2	- 2 59.1	118 30.7	- 1 31.5
Δ	0	9		-3	13	7	8

UT	MESEC				JUPITER		SATURN	
	$S_\leftmoon$	Δ	$\delta_\leftmoon$	Δ	S_{4}	δ_{4}	S_{5}	δ_{5}
h	° ′		° ′		° ′	° ′	° ′	° ′
0	219 49.0	58	17 27.8	-38	6 29.7	16 50.6	262 55.2	-19 1.1
2	248 38.7	58	17 20.2	-41	36 35.3	16 50.8	292 59.9	-19 1.1
4	277 28.3	58	17 12.1	-43	66 40.9	16 51.0	323 4.6	-19 1.1
6	306 17.8	57	17 3.5	-45	96 46.4	16 51.2	353 9.3	-19 1.1
8	335 7.3	57	16 54.4	-48	126 52.0	16 51.4	23 14.0	-19 1.2
10	3 56.7	57	16 44.8	-50	156 57.6	16 51.6	53 18.7	-19 1.2
12	32 46.0	56	16 34.7	-53	187 3.1	16 51.8	83 23.4	-19 1.2
14	61 35.3	56	16 24.2	-55	217 8.7	16 52.0	113 28.1	-19 1.3
16	90 24.6	56	16 13.2	-57	247 14.3	16 52.2	143 32.8	-19 1.3
18	119 13.8	56	16 1.7	-60	277 19.8	16 52.4	173 37.5	-19 1.3
20	148 3.0	56	15 49.8	-62	307 25.4	16 52.6	203 42.2	-19 1.3
22	176 52.2	56	15 37.4	-64	337 30.9	16 52.8	233 46.9	-19 1.4
Δ					28	1	24	0

φ	SUNCE		TRAJANJE SUMRAKA		MESEC			
	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 36	16 53	0 44	2 21	1 14	3.3	18 1	1.4
55	7 21	17 8	0 38	2 2	1 40	3.1	17 38	1.6
50	7 9	17 19	0 33	1 49	1 59	3.0	17 21	1.8
45	7 0	17 29	0 30	1 39	2 14	2.9	17 7	1.9
40	6 52	17 37	0 28	1 31	2 27	2.8	16 56	2.0
35	6 45	17 43	0 26	1 25	2 37	2.8	16 46	2.1
30	6 39	17 49	0 24	1 20	2 47	2.7	16 38	2.1
20	6 29	17 60	0 22	1 14	3 3	2.6	16 23	2.3
10	6 20	18 9	0 21	1 11	3 17	2.5	16 10	2.4
0	6 11	18 17	0 21	1 10	3 30	2.5	15 58	2.5
10	6 2	18 26	0 22	1 12	3 43	2.4	15 45	2.5
20	5 52	18 36	0 23	1 16	3 57	2.3	15 32	2.7
30	5 41	18 47	0 25	1 25	4 13	2.2	15 17	2.8
35	5 34	18 53	0 26	1 31	4 22	2.1	15 8	2.8
40	5 27	19 1	0 29	1 39	4 32	2.1	14 58	2.9
45	5 18	19 9	0 31	1 51	4 45	2.0	14 46	3.0
50	5 8	19 19	0 35	2 9	4 60	1.9	14 32	3.1
55	4 54	19 33	0 40	2 39	5 19	1.8	14 14	3.3
60	4 37	19 50	0 49	: ::	5 44	1.6	13 49	3.5
S								

SUNCE				MESEC			
UT	e = Tp − UT	Δ/24	r	Prolaz	Δ/24	$\pi_\leftmoon$	r
h	min s	s	′	h min	min	′	′
00	-14 5.9	.1	16.2	$T_{\overline{m}}$ 9 44	2.5	59.7	16.3
12	-14 4.1	$T_{\overline{m}_\odot}$ 12 h 14.1 min		Starost 26.4 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	5	-3.2	♄	23 30	.0	221	-2.1
♂	14 6	.1	3	1.1	♃	6 27	.0	117	.7

UT	SUNCE		PROLEĆ. TAČKA	VENERA		MARS	
	$S_\odot$	$\delta_\odot$	S_Υ	S_φ	δ_φ	S_σ	δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	176 29.4	-12 10.2	146 39.1	150 32.5	- 2 56.5	148 32.1	- 1 29.9
2	206 29.5	-12 8.5	176 44.0	180 31.8	- 2 53.9	178 33.5	- 1 28.3
4	236 29.6	-12 6.8	206 48.9	210 31.1	- 2 51.4	208 35.0	- 1 26.7
6	266 29.6	-12 5.0	236 53.8	240 30.5	- 2 48.8	238 36.4	- 1 25.1
8	296 29.7	-12 3.3	266 58.8	270 29.8	- 2 46.2	268 37.8	- 1 23.6
10	326 29.8	-12 1.5	297 3.7	300 29.1	- 2 43.6	298 39.2	- 1 22.0
12	356 29.9	-11 59.8	327 8.6	330 28.4	- 2 41.0	328 40.6	- 1 20.4
14	26 30.0	-11 58.0	357 13.6	0 27.8	- 2 38.4	358 42.0	- 1 18.8
16	56 30.1	-11 56.3	27 18.5	30 27.1	- 2 35.8	28 43.4	- 1 17.2
18	86 30.2	-11 54.5	57 23.4	60 26.4	- 2 33.2	58 44.9	- 1 15.6
20	116 30.3	-11 52.8	87 28.3	90 25.7	- 2 30.6	88 46.3	- 1 14.0
22	146 30.3	-11 51.0	117 33.3	120 25.1	- 2 28.0	118 47.7	- 1 12.5
Δ	0	9		-3	13	7	8

UT	MESEC				JUPITER		SATURN	
	$S_\leftmoon$	Δ	$\delta_\leftmoon$	Δ	S_{4}	δ_{4}	S_{5}	δ_{5}
h	° ′		° ′		° ′	° ′	° ′	° ′
0	205 41.4	56	15 24.5	-67	7 36.5	16 53.0	263 51.6	-19 1.4
2	234 30.5	56	15 11.2	-69	37 42.1	16 53.2	293 56.3	-19 1.4
4	263 19.7	56	14 57.4	-71	67 47.6	16 53.4	324 1.0	-19 1.4
6	292 9.0	56	14 43.2	-73	97 53.2	16 53.6	354 5.7	-19 1.5
8	320 58.2	56	14 28.6	-75	127 58.8	16 53.8	24 10.4	-19 1.5
10	349 47.5	57	14 13.5	-77	158 4.3	16 54.0	54 15.1	-19 1.5
12	18 36.8	57	13 58.0	-80	188 9.9	16 54.2	84 19.8	-19 1.5
14	47 26.1	57	13 42.1	-82	218 15.4	16 54.3	114 24.5	-19 1.6
16	76 15.5	57	13 25.8	-84	248 21.0	16 54.5	144 29.2	-19 1.6
18	105 5.0	58	13 9.0	-86	278 26.6	16 54.7	174 34.0	-19 1.6
20	133 54.5	58	12 51.9	-87	308 32.1	16 54.9	204 38.7	-19 1.6
22	162 44.1	58	12 34.4	-89	338 37.7	16 55.1	234 43.4	-19 1.7
Δ					28	1	24	0

φ	SUNCE		TRAJANJE SUMRAKA		MESEC			
	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 34	16 55	0 44	2 20	2 33	3.7	18 34	1.1
55	7 19	17 10	0 38	2 2	2 55	3.4	18 17	1.4
50	7 8	17 21	0 33	1 48	3 11	3.2	18 3	1.6
45	6 58	17 30	0 30	1 38	3 24	3.1	17 52	1.7
40	6 51	17 38	0 28	1 31	3 35	3.0	17 43	1.8
35	6 44	17 44	0 26	1 25	3 44	2.9	17 36	1.9
30	6 38	17 50	0 24	1 20	3 52	2.8	17 29	2.0
20	6 28	18 0	0 22	1 14	4 5	2.7	17 17	2.2
10	6 19	18 9	0 21	1 11	4 17	2.6	17 6	2.3
0	6 11	18 17	0 21	1 10	4 28	2.4	16 56	2.4
10	6 2	18 26	0 22	1 12	4 40	2.3	16 47	2.6
20	5 53	18 35	0 23	1 16	4 52	2.2	16 36	2.7
30	5 42	18 46	0 25	1 24	5 5	2.1	16 24	2.8
35	5 35	18 52	0 26	1 31	5 13	2.0	16 16	2.9
40	5 28	18 59	0 28	1 39	5 22	1.9	16 8	3.0
45	5 20	19 8	0 31	1 51	5 33	1.8	15 59	3.2
50	5 9	19 18	0 35	2 8	5 45	1.7	15 47	3.3
55	4 56	19 30	0 40	2 37	6 1	1.5	15 32	3.5
60	4 39	19 47	0 48	4 2	6 22	1.2	15 13	3.8
S								

SUNCE				MESEC			
UT	e = Tp − UT	Δ/24	r	Prolaz	Δ/24	$\pi_\leftmoon$	r
h	min s	s	′	h min	min	′	′
00	-14 2.4	.2	16.2	$T_{\overline{m}}$ 10 43	2.4	60.5	16.5
12	-14 .3	$T_{\overline{m}_\odot}$ 12 h 14.0 min		Starost 27.4 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	4	-3.2	♄	23 25	.0	221	-2.1
♂	14 5	.1	2	1.1	♃	6 24	.0	117	.7

UT	SUNCE $S_\odot$	SUNCE $\delta_\odot$	PROLEĆ. TAČKA S_Υ	VENERA S_φ	VENERA δ_φ	MARS S_σ	MARS δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	176 30.4	-11 49.2	147 38.2	150 24.4	- 2 25.4	148 49.1	- 1 10.9
2	206 30.5	-11 47.5	177 43.1	180 23.7	- 2 22.8	178 50.5	- 1 9.3
4	236 30.6	-11 45.7	207 48.1	210 23.1	- 2 20.2	208 51.9	- 1 7.7
6	266 30.7	-11 44.0	237 53.0	240 22.4	- 2 17.6	238 53.4	- 1 6.1
8	296 30.8	-11 42.2	267 57.9	270 21.7	- 2 15.0	268 54.8	- 1 4.5
10	326 30.9	-11 40.4	298 2.8	300 21.1	- 2 12.4	298 56.2	- 1 2.9
12	356 31.0	-11 38.7	328 7.8	330 20.4	- 2 9.8	328 57.6	- 1 1.4
14	26 31.1	-11 36.9	358 12.7	0 19.7	- 2 7.2	358 59.0	- 0 59.8
16	56 31.2	-11 35.1	28 17.6	30 19.1	- 2 4.6	29 .4	- 0 58.2
18	86 31.3	-11 33.4	58 22.6	60 18.4	- 2 2.0	59 1.9	- 0 56.6
20	116 31.4	-11 31.6	88 27.5	90 17.7	- 1 59.4	89 3.3	- 0 55.0
22	146 31.5	-11 29.8	118 32.4	120 17.1	- 1 56.8	119 4.7	- 0 53.4
Δ	1	9		-3	13	7	8

UT	MESEC $S_\leftmoon$	MESEC Δ	MESEC $\delta_\leftmoon$	MESEC Δ	JUPITER S_{4}	JUPITER δ_{4}	SATURN S_{5}	SATURN δ_{5}
h	° ′		° ′		° ′	° ′	° ′	° ′
0	191 33.7	59	12 16.6	-91	8 43.2	16 55.3	264 48.1	-19 1.7
2	220 23.5	59	11 58.3	-93	38 48.8	16 55.5	294 52.8	-19 1.7
4	249 13.3	59	11 39.8	-95	68 54.4	16 55.7	324 57.5	-19 1.7
6	278 3.2	60	11 20.8	-96	98 59.9	16 55.9	355 2.2	-19 1.8
8	306 53.2	60	11 1.6	-98	129 5.5	16 56.1	25 6.9	-19 1.8
10	335 43.2	61	10 42.0	-99	159 11.0	16 56.3	55 11.7	-19 1.8
12	4 33.4	61	10 22.1	-101	189 16.6	16 56.5	85 16.4	-19 1.8
14	33 23.7	62	10 1.9	-102	219 22.2	16 56.7	115 21.1	-19 1.9
16	62 14.1	62	9 41.4	-104	249 27.7	16 56.9	145 25.8	-19 1.9
18	91 4.6	63	9 20.7	-105	279 33.3	16 57.1	175 30.5	-19 1.9
20	119 55.2	64	8 59.6	-106	309 38.8	16 57.3	205 35.3	-19 1.9
22	148 45.9	64	8 38.3	-108	339 44.4	16 57.5	235 40.0	-19 1.9
Δ					28	1	24	0

φ	SUNCE IZLAZ	SUNCE ZALAZ	TRAJANJE SUMRAKA GRAĐ.	TRAJANJE SUMRAKA ASTR.	MESEC IZLAZ	MESEC Δ/24	MESEC ZALAZ	MESEC Δ/24
N	h min	h min	h min	h min	h min	min	h min	min
60	7 31	16 58	0 43	2 20	4 1	3.8	19 1	1.0
55	7 17	17 12	0 37	2 2	4 17	3.6	18 50	1.2
50	7 6	17 23	0 33	1 48	4 29	3.4	18 41	1.4
45	6 57	17 32	0 30	1 38	4 38	3.2	18 33	1.6
40	6 50	17 39	0 28	1 31	4 46	3.1	18 27	1.7
35	6 43	17 45	0 26	1 25	4 53	3.0	18 22	1.8
30	6 38	17 51	0 24	1 20	4 59	2.9	18 17	1.9
20	6 28	18 0	0 22	1 14	5 10	2.7	18 9	2.1
10	6 19	18 9	0 21	1 11	5 19	2.5	18 2	2.2
0	6 11	18 17	0 21	1 10	5 27	2.4	17 55	2.4
10	6 2	18 26	0 21	1 12	5 36	2.3	17 48	2.5
20	5 53	18 35	0 23	1 16	5 45	2.1	17 40	2.7
30	5 42	18 45	0 25	1 24	5 55	2.0	17 32	2.9
35	5 36	18 51	0 26	1 30	6 1	1.9	17 27	3.0
40	5 29	18 58	0 28	1 39	6 8	1.8	17 21	3.1
45	5 21	19 6	0 31	1 50	6 16	1.6	17 14	3.2
50	5 11	19 16	0 35	2 7	6 25	1.5	17 6	3.4
55	4 59	19 28	0 40	2 35	6 37	1.3	16 56	3.6
60	4 42	19 44	0 48	3 47	6 52	1.0	16 43	3.9
S								

SUNCE UT	SUNCE $e = T_p - UT$	SUNCE Δ/24	SUNCE r	MESEC Prolaz	MESEC Δ/24	MESEC $\pi_\leftmoon$	MESEC r
h	min s	s	′	h min	min	′	′
00	-13 58.2	.2	16.2	$T_{\overline{m}}$ 11 41	2.4	61.1	16.7
12	-13 55.8	$T_{\overline{m}_\odot}$ 12 h 13.9 min		Starost 28.4 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	.1	3	-3.2	♃	23 21	.0	221	-2.1
♂	14 4	.1	1	1.2	♄	6 20	.0	117	.7

UT	SUNCE $S_\odot$	SUNCE $\delta_\odot$	PROLEĆ. TAČKA S_Υ	VENERA S_φ	VENERA δ_φ	MARS S_σ	MARS δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	176 31.7	-11 28.1	148 37.3	150 16.4	- 1 54.2	149 6.1	- 0 51.8
2	206 31.8	-11 26.3	178 42.3	180 15.7	- 1 51.6	179 7.5	- 0 50.3
4	236 31.9	-11 24.5	208 47.2	210 15.1	- 1 49.0	209 8.9	- 0 48.7
6	266 32.0	-11 22.7	238 52.1	240 14.4	- 1 46.4	239 10.4	- 0 47.1
8	296 32.1	-11 21.0	268 57.0	270 13.7	- 1 43.7	269 11.8	- 0 45.5
10	326 32.2	-11 19.2	299 2.0	300 13.1	- 1 41.1	299 13.2	- 0 43.9
12	356 32.3	-11 17.4	329 6.9	330 12.4	- 1 38.5	329 14.6	- 0 42.3
14	26 32.4	-11 15.6	359 11.8	0 11.8	- 1 35.9	359 16.0	- 0 40.8
16	56 32.6	-11 13.8	29 16.8	30 11.1	- 1 33.3	29 17.5	- 0 39.2
18	86 32.7	-11 12.0	59 21.7	60 10.5	- 1 30.7	59 18.9	- 0 37.6
20	116 32.8	-11 10.3	89 26.6	90 9.8	- 1 28.1	89 20.3	- 0 36.0
22	146 32.9	-11 8.5	119 31.5	120 9.1	- 1 25.5	119 21.7	- 0 34.4
Δ	1	9		-3	13	7	8

UT	MESEC $S_\leftmoon$	MESEC Δ	MESEC $\delta_\leftmoon$	MESEC Δ	JUPITER S_{4}	JUPITER δ_{4}	SATURN S_{5}	SATURN δ_{5}
h	° ′		° ′		° ′	° ′	° ′	° ′
0	177 36.7	65	8 16.8	-109	9 49.9	16 57.6	265 44.7	-19 2.0
2	206 27.6	65	7 55.0	-110	39 55.5	16 57.8	295 49.4	-19 2.0
4	235 18.7	66	7 33.0	-111	70 1.0	16 58.0	325 54.1	-19 2.0
6	264 9.8	66	7 10.8	-112	100 6.6	16 58.2	355 58.9	-19 2.0
8	293 1.1	67	6 48.4	-113	130 12.1	16 58.4	26 3.6	-19 2.1
10	321 52.5	68	6 25.9	-114	160 17.7	16 58.6	56 8.3	-19 2.1
12	350 44.0	68	6 3.1	-115	190 23.2	16 58.8	86 13.0	-19 2.1
14	19 35.7	69	5 40.2	-115	220 28.8	16 59.0	116 17.8	-19 2.1
16	48 27.4	69	5 17.2	-116	250 34.3	16 59.2	146 22.5	-19 2.1
18	77 19.3	70	4 54.0	-117	280 39.9	16 59.4	176 27.2	-19 2.2
20	106 11.3	71	4 30.7	-117	310 45.4	16 59.6	206 31.9	-19 2.2
22	135 3.4	71	4 7.3	-118	340 51.0	16 59.8	236 36.7	-19 2.2
Δ					28	1	24	0

φ	SUNCE IZLAZ	SUNCE ZALAZ	TRAJANJE SUMRAKA GRAĐ.	TRAJANJE SUMRAKA ASTR.	MESEC IZLAZ	MESEC Δ/24	MESEC ZALAZ	MESEC 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	5 33	3.9	19 24	1.0
55	7 14	17 14	0 37	2 2	5 42	3.6	19 19	1.2
50	7 4	17 25	0 33	1 48	5 49	3.4	19 15	1.4
45	6 55	17 33	0 30	1 38	5 55	3.2	19 11	1.6
40	6 48	17 40	0 28	1 31	6 0	3.1	19 8	1.7
35	6 42	17 46	0 26	1 25	6 4	3.0	19 5	1.8
30	6 37	17 52	0 24	1 20	6 8	2.8	19 3	1.9
20	6 27	18 1	0 22	1 14	6 14	2.7	18 59	2.0
10	6 19	18 9	0 21	1 11	6 20	2.5	18 55	2.2
0	6 10	18 17	0 21	1 10	6 25	2.4	18 52	2.3
10	6 2	18 25	0 21	1 12	6 30	2.2	18 48	2.5
20	5 53	18 34	0 23	1 16	6 36	2.1	18 45	2.6
30	5 43	18 44	0 25	1 24	6 42	1.9	18 40	2.8
35	5 37	18 50	0 26	1 30	6 46	1.8	18 38	2.9
40	5 30	18 57	0 28	1 38	6 50	1.7	18 35	3.0
45	5 22	19 4	0 31	1 49	6 55	1.5	18 32	3.1
50	5 13	19 14	0 35	2 6	7 0	1.4	18 28	3.3
55	5 1	19 26	0 40	2 33	7 8	1.2	18 22	3.5
60	4 45	19 41	0 47	3 37	7 17	.9	18 16	3.8
S								

SUNCE UT	SUNCE $e = T_p - UT$	SUNCE Δ/24	SUNCE r	MESEC Prolaz	MESEC Δ/24	MESEC $\pi_\leftmoon$	MESEC r
h	min s	s	′	h min	min	′	′
00	-13 53.4	.2	16.2	$T_{\overline{m}}$ 12 39	2.3	61.4	16.7
12	-13 50.6	$T_{\overline{m}_\odot}$ 12 h 13.8 min		Starost .0 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	.1	2	-3.3	♃	23 16	.0	221	-2.1
♂	14 3	.1	0	1.2	♄	6 16	.0	117	.7

UT	SUNCE		PROLEĆ. TAČKA	VENERA		MARS	
	$S_\odot$	$\delta_\odot$	S_Υ	S_φ	δ_φ	S_σ	δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	176 33.0	-11 6.7	149 36.5	150 8.5	- 1 22.9	149 23.1	- 0 32.8
2	206 33.2	-11 4.9	179 41.4	180 7.8	- 1 20.3	179 24.6	- 0 31.2
4	236 33.3	-11 3.1	209 46.3	210 7.2	- 1 17.7	209 26.0	- 0 29.7
6	266 33.4	-11 1.3	239 51.3	240 6.5	- 1 15.1	239 27.4	- 0 28.1
8	296 33.5	-10 59.5	269 56.2	270 5.9	- 1 12.5	269 28.8	- 0 26.5
10	326 33.7	-10 57.7	300 1.1	300 5.2	- 1 9.8	299 30.3	- 0 24.9
12	356 33.8	-10 55.9	330 6.0	330 4.6	- 1 7.2	329 31.7	- 0 23.3
14	26 33.9	-10 54.1	0 11.0	0 3.9	- 1 4.6	359 33.1	- 0 21.7
16	56 34.1	-10 52.3	30 15.9	30 3.3	- 1 2.0	29 34.5	- 0 20.2
18	86 34.2	-10 50.6	60 20.8	60 2.6	- 0 59.4	59 35.9	- 0 18.6
20	116 34.3	-10 48.8	90 25.8	90 1.9	- 0 56.8	89 37.4	- 0 17.0
22	146 34.5	-10 47.0	120 30.7	120 1.3	- 0 54.2	119 38.8	- 0 15.4
Δ	1	9		-3	13	7	8

UT	MESEC				JUPITER		SATURN	
	$S_\leftmoon$	Δ	$\delta_\leftmoon$	Δ	$S_{\mathrm{♃}}$	$\delta_{\mathrm{♃}}$	$S_{\mathrm{♄}}$	$\delta_{\mathrm{♄}}$
h	° ′		° ′		° ′	° ′	° ′	° ′
0	163 55.6	72	3 43.8	-118	10 56.5	16 59.9	266 41.4	-19 2.2
2	192 47.9	72	3 20.2	-118	41 2.1	17 .1	296 46.1	-19 2.3
4	221 40.4	73	2 56.5	-119	71 7.6	17 .3	326 50.9	-19 2.3
6	250 32.9	73	2 32.8	-119	101 13.2	17 .5	356 55.6	-19 2.3
8	279 25.6	74	2 9.1	-119	131 18.7	17 .7	27 .3	-19 2.3
10	308 18.4	74	1 45.3	-119	161 24.3	17 .9	57 5.1	-19 2.3
12	337 11.3	75	1 21.5	-119	191 29.8	17 1.1	87 9.8	-19 2.4
14	6 4.3	76	0 57.6	-119	221 35.4	17 1.3	117 14.5	-19 2.4
16	34 57.4	76	0 33.8	-119	251 40.9	17 1.5	147 19.3	-19 2.4
18	63 50.6	77	0 10.0	18	281 46.5	17 1.6	177 24.0	-19 2.4
20	92 43.9	77	0 13.7	119	311 52.0	17 1.8	207 28.7	-19 2.4
22	121 37.4	78	0 37.4	118	341 57.5	17 2.0	237 33.5	-19 2.5
Δ					28	1	24	0

φ	SUNCE		TRAJANJE SUMRAKA		MESEC			
	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 25	17 3	0 43	2 20	7 6	2.2	19 49	3.8
55	7 12	17 16	0 37	2 1	7 8	2.2	19 49	3.5
50	7 2	17 26	0 33	1 48	7 11	2.2	19 49	3.3
45	6 54	17 34	0 30	1 38	7 12	2.3	19 48	3.1
40	6 47	17 41	0 28	1 30	7 14	2.3	19 48	3.0
35	6 41	17 47	0 26	1 25	7 15	2.3	19 48	2.9
30	6 36	17 52	0 24	1 20	7 16	2.3	19 48	2.8
20	6 26	18 1	0 22	1 14	7 18	2.3	19 48	2.6
10	6 18	18 9	0 21	1 11	7 20	2.3	19 48	2.4
0	6 10	18 17	0 21	1 10	7 22	2.3	19 48	2.3
10	6 2	18 25	0 21	1 12	7 23	2.3	19 48	2.1
20	5 54	18 33	0 23	1 16	7 25	2.3	19 48	2.0
30	5 44	18 43	0 25	1 24	7 27	2.3	19 47	1.8
35	5 38	18 49	0 26	1 30	7 28	2.4	19 47	1.7
40	5 32	18 55	0 28	1 38	7 30	2.4	19 47	1.6
45	5 24	19 3	0 31	1 49	7 31	2.4	19 47	1.5
50	5 15	19 12	0 34	2 5	7 33	2.4	19 47	1.3
55	5 3	19 23	0 40	2 31	7 35	2.4	19 46	1.1
60	4 48	19 38	0 47	3 29	7 38	2.4	19 46	.8
S								

SUNCE				MESEC			
UT	e = T_p − UT	Δ/24	r	Prolaz	Δ/24	$\pi_\leftmoon$	r
h	min s	s	′	h min	min	′	′
00	-13 47.9	.3	16.2	$T_{\overline{m}}$ 13 35	2.3	61.3	16.7
12	-13 44.8	$T_{\overline{m}_\odot}$ 12 h 13.7 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	′	°	
♀	13 60	.1	1	-3.3	♃	23 12	.0	221	-2.1
♂	14 2	.1	360	1.2	♄	6 12	.0	117	.7

UT	SUNCE		PROLEĆ. TAČKA	VENERA		MARS	
	$S_\odot$	$\delta_\odot$	S_Υ	S_φ	δ_φ	S_σ	δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	176 34.6	-10 45.1	150 35.6	150 .6	- 0 51.6	149 40.2	- 0 13.8
2	206 34.7	-10 43.3	180 40.5	179 60.0	- 0 49.0	179 41.6	- 0 12.2
4	236 34.9	-10 41.5	210 45.5	209 59.3	- 0 46.3	209 43.1	- 0 10.7
6	266 35.0	-10 39.7	240 50.4	239 58.7	- 0 43.7	239 44.5	- 0 9.1
8	296 35.1	-10 37.9	270 55.3	269 58.1	- 0 41.1	269 45.9	- 0 7.5
10	326 35.3	-10 36.1	301 .3	299 57.4	- 0 38.5	299 47.3	- 0 5.9
12	356 35.4	-10 34.3	331 5.2	329 56.8	- 0 35.9	329 48.8	- 0 4.3
14	26 35.6	-10 32.5	1 10.1	359 56.1	- 0 33.3	359 50.2	- 0 2.8
16	56 35.7	-10 30.7	31 15.0	29 55.5	- 0 30.7	29 51.6	- 0 1.2
18	86 35.9	-10 28.9	61 20.0	59 54.8	- 0 28.1	59 53.0	0 .4
20	116 36.0	-10 27.1	91 24.9	89 54.2	- 0 25.4	89 54.5	0 2.0
22	146 36.2	-10 25.3	121 29.8	119 53.5	- 0 22.8	119 55.9	0 3.6
Δ	1	9		-3	13	7	8

UT	MESEC				JUPITER		SATURN	
	$S_\leftmoon$	Δ	$\delta_\leftmoon$	Δ	$S_{\mathrm{♃}}$	$\delta_{\mathrm{♃}}$	$S_{\mathrm{♄}}$	$\delta_{\mathrm{♄}}$
h	° ′		° ′		° ′	° ′	° ′	° ′
0	150 30.9	78	1 1.1	118	12 3.1	17 2.2	267 38.2	-19 2.5
2	179 24.5	79	1 24.7	118	42 8.6	17 2.4	297 42.9	-19 2.5
4	208 18.2	79	1 48.2	117	72 14.2	17 2.6	327 47.7	-19 2.5
6	237 12.0	79	2 11.7	117	102 19.7	17 2.8	357 52.4	-19 2.5
8	266 5.9	80	2 35.0	116	132 25.2	17 3.0	27 57.2	-19 2.6
10	294 59.8	80	2 58.2	116	162 30.8	17 3.1	58 1.9	-19 2.6
12	323 53.9	81	3 21.3	115	192 36.3	17 3.3	88 6.6	-19 2.6
14	352 48.0	81	3 44.3	114	222 41.9	17 3.5	118 11.4	-19 2.6
16	21 42.2	81	4 7.2	113	252 47.4	17 3.7	148 16.1	-19 2.6
18	50 36.5	82	4 29.8	113	282 52.9	17 3.9	178 20.9	-19 2.6
20	79 30.9	82	4 52.4	112	312 58.5	17 4.1	208 25.6	-19 2.7
22	108 25.3	83	5 14.7	111	343 4.0	17 4.2	238 30.4	-19 2.7
Δ					28	1	24	0

φ	SUNCE		TRAJANJE SUMRAKA		MESEC			
	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 22	17 6	0 43	2 20	7 59	.9	21 19	3.6
55	7 10	17 18	0 37	2 1	8 2	1.1	21 12	3.4
50	7 0	17 28	0 33	1 48	8 5	1.3	21 8	3.2
45	6 52	17 36	0 30	1 38	8 6	1.5	21 4	3.0
40	6 46	17 42	0 28	1 30	8 8	1.6	21 0	2.9
35	6 40	17 48	0 26	1 25	8 9	1.7	20 57	2.8
30	6 35	17 53	0 24	1 20	8 11	1.8	20 55	2.7
20	6 26	18 2	0 22	1 14	8 13	2.0	20 50	2.5
10	6 18	18 10	0 21	1 11	8 15	2.1	20 46	2.4
0	6 10	18 17	0 21	1 10	8 17	2.3	20 43	2.3
10	6 3	18 25	0 21	1 11	8 19	2.4	20 39	2.1
20	5 54	18 33	0 23	1 16	8 21	2.6	20 35	2.0
30	5 45	18 42	0 25	1 24	8 23	2.7	20 31	1.8
35	5 39	18 48	0 26	1 29	8 25	2.8	20 28	1.7
40	5 33	18 54	0 28	1 37	8 26	3.0	20 25	1.6
45	5 25	19 1	0 31	1 48	8 28	3.1	20 22	1.5
50	5 16	19 10	0 34	2 4	8 31	3.2	20 18	1.3
55	5 5	19 21	0 39	2 29	8 34	3.4	20 13	1.2
60	4 50	19 35	0 47	3 23	8 37	3.7	20 6	.9
S								

SUNCE				MESEC			
UT	e = T_p − UT	Δ/24	r	Prolaz	Δ/24	$\pi_\leftmoon$	r
h	min s	s	′	h min	min	′	′
00	-13 41.7	.3	16.2	$T_{\overline{m}}$ 14 30	2.2	60.9	16.6
12	-13 38.2	$T_{\overline{m}_\odot}$ 12 h 13.6 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 0	.1	359	-3.3	♃	23 8	.0	221	-2.1
♂	14 1	.1	359	1.2	♄	6 8	.0	117	.7

UT	SUNCE		PROLEĆ. TAČKA	VENERA		MARS	
	$S_\odot$	$\delta_\odot$	S_Υ	S_φ	δ_φ	S_σ	δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	176 36.3	-10 23.4	151 34.8	149 52.9	- 0 20.2	149 57.3	0 5.2
2	206 36.5	-10 21.6	181 39.7	179 52.2	- 0 17.6	179 58.7	0 6.7
4	236 36.6	-10 19.8	211 44.6	209 51.6	- 0 15.0	210 .2	0 8.3
6	266 36.8	-10 18.0	241 49.5	239 51.0	- 0 12.4	240 1.6	0 9.9
8	296 36.9	-10 16.2	271 54.5	269 50.3	- 0 9.8	270 3.0	0 11.5
10	326 37.1	-10 14.4	301 59.4	299 49.7	- 0 7.2	300 4.5	0 13.1
12	356 37.2	-10 12.5	332 4.3	329 49.0	- 0 4.5	330 5.9	0 14.6
14	26 37.4	-10 10.7	2 9.3	359 48.4	- 0 1.9	0 7.3	0 16.2
16	56 37.5	-10 8.9	32 14.2	29 47.7	0 .7	30 8.7	0 17.8
18	86 37.7	-10 7.1	62 19.1	59 47.1	0 3.3	60 10.2	0 19.4
20	116 37.9	-10 5.2	92 24.0	89 46.5	0 5.9	90 11.6	0 21.0
22	146 38.0	-10 3.4	122 29.0	119 45.8	0 8.5	120 13.0	0 22.5
Δ	1	9		-3	13	7	8

UT	MESEC				JUPITER		SATURN	
	$S_\leftmoon$	Δ	$\delta_\leftmoon$	Δ	S_{4}	δ_{4}	S_η	δ_η
h	° ′		° ′		° ′	° ′	° ′	° ′
0	137 19.8	83	5 36.9	110	13 9.5	17 4.4	268 35.1	-19 2.7
2	166 14.4	83	5 58.9	109	43 15.1	17 4.6	298 39.8	-19 2.7
4	195 9.1	84	6 20.6	108	73 20.6	17 4.8	328 44.6	-19 2.7
6	224 3.8	84	6 42.2	107	103 26.1	17 5.0	358 49.3	-19 2.8
8	252 58.6	84	7 3.6	106	133 31.7	17 5.2	28 54.1	-19 2.8
10	281 53.4	85	7 24.7	104	163 37.2	17 5.4	58 58.8	-19 2.8
12	310 48.3	85	7 45.6	103	193 42.7	17 5.5	89 3.6	-19 2.8
14	339 43.3	85	8 6.2	102	223 48.3	17 5.7	119 8.3	-19 2.8
16	8 38.3	85	8 26.6	101	253 53.8	17 5.9	149 13.1	-19 2.8
18	37 33.3	86	8 46.8	99	283 59.3	17 6.1	179 17.8	-19 2.9
20	66 28.5	86	9 6.6	98	314 4.9	17 6.3	209 22.6	-19 2.9
22	95 23.7	86	9 26.2	97	344 10.4	17 6.4	239 27.4	-19 2.9
Δ					28	1	24	0

φ	SUNCE		TRAJANJE SUMRAKA		MESEC			
	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 20	17 8	0 43	2 20	8 20	1.0	22 46	3.5
55	7 8	17 20	0 37	2 1	8 29	1.2	22 34	3.2
50	6 58	17 30	0 33	1 48	8 36	1.4	22 24	3.0
45	6 51	17 37	0 30	1 38	8 42	1.5	22 16	2.9
40	6 44	17 43	0 27	1 30	8 46	1.6	22 10	2.8
35	6 39	17 49	0 26	1 24	8 50	1.7	22 4	2.7
30	6 34	17 54	0 24	1 20	8 54	1.8	21 60	2.6
20	6 25	18 2	0 22	1 14	9 0	2.0	21 51	2.5
10	6 17	18 10	0 21	1 11	9 6	2.1	21 44	2.3
0	6 10	18 17	0 21	1 10	9 11	2.2	21 37	2.2
10	6 3	18 24	0 21	1 11	9 17	2.4	21 30	2.1
20	5 55	18 32	0 22	1 16	9 22	2.5	21 23	2.0
30	5 46	18 41	0 25	1 23	9 29	2.7	21 14	1.9
35	5 40	18 46	0 26	1 29	9 33	2.7	21 9	1.8
40	5 34	18 52	0 28	1 37	9 37	2.9	21 4	1.7
45	5 27	18 59	0 31	1 48	9 42	3.0	20 58	1.6
50	5 18	19 8	0 34	2 3	9 49	3.1	20 50	1.4
55	5 7	19 19	0 39	2 28	9 56	3.3	20 41	1.3
60	4 53	19 32	0 46	3 18	10 6	3.6	20 28	1.0
S								

SUNCE				MESEC				
UT	$e = T_p - UT$	Δ/24	r	Prolaz		Δ/24	$\pi_\leftmoon$	r
h	min s	s	′		h min	min	′	′
00	-13 34.8	.3	16.2	$T_{\overline{m}}$	15 24	2.2	60.3	16.4
12	-13 31.0	$T_{\overline{m}_\odot}$	12 h 13.5 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 1	.1	358	-3.3	♃	23 3	.0	222	-2.1
♂	13 60	.1	358	1.2	♄	6 5	.0	117	.7

UT	SUNCE		PROLEĆ. TAČKA	VENERA		MARS	
	$S_\odot$	$\delta_\odot$	S_Υ	S_φ	δ_φ	S_σ	δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	176 38.2	-10 1.6	152 33.9	149 45.2	0 11.1	150 14.5	0 24.1
2	206 38.3	- 9 59.7	182 38.8	179 44.5	0 13.8	180 15.9	0 25.7
4	236 38.5	- 9 57.9	212 43.7	209 43.9	0 16.4	210 17.3	0 27.3
6	266 38.7	- 9 56.1	242 48.7	239 43.3	0 19.0	240 18.7	0 28.9
8	296 38.8	- 9 54.3	272 53.6	269 42.6	0 21.6	270 20.2	0 30.4
10	326 39.0	- 9 52.4	302 58.5	299 42.0	0 24.2	300 21.6	0 32.0
12	356 39.2	- 9 50.6	333 3.5	329 41.4	0 26.8	330 23.0	0 33.6
14	26 39.3	- 9 48.8	3 8.4	359 40.7	0 29.5	0 24.5	0 35.2
16	56 39.5	- 9 46.9	33 13.3	29 40.1	0 32.1	30 25.9	0 36.7
18	86 39.7	- 9 45.1	63 18.2	59 39.4	0 34.7	60 27.3	0 38.3
20	116 39.9	- 9 43.2	93 23.2	89 38.8	0 37.3	90 28.8	0 39.9
22	146 40.0	- 9 41.4	123 28.1	119 38.2	0 39.9	120 30.2	0 41.5
Δ	1	9		-3	13	7	8

UT	MESEC				JUPITER		SATURN	
	$S_\leftmoon$	Δ	$\delta_\leftmoon$	Δ	S_{4}	δ_{4}	S_η	δ_η
h	° ′		° ′		° ′	° ′	° ′	° ′
0	124 18.9	86	9 45.5	95	14 15.9	17 6.6	269 32.1	-19 2.9
2	153 14.2	87	10 4.6	94	44 21.4	17 6.8	299 36.9	-19 2.9
4	182 9.5	87	10 23.3	92	74 27.0	17 7.0	329 41.6	-19 2.9
6	211 4.9	87	10 41.7	91	104 32.5	17 7.2	359 46.4	-19 3.0
8	240 .3	87	10 59.9	89	134 38.0	17 7.4	29 51.1	-19 3.0
10	268 55.8	88	11 17.7	87	164 43.6	17 7.5	59 55.9	-19 3.0
12	297 51.3	88	11 35.2	86	194 49.1	17 7.7	90 .7	-19 3.0
14	326 46.8	88	11 52.4	84	224 54.6	17 7.9	120 5.4	-19 3.0
16	355 42.5	88	12 9.2	83	255 .1	17 8.1	150 10.2	-19 3.0
18	24 38.1	89	12 25.7	81	285 5.6	17 8.2	180 14.9	-19 3.0
20	53 33.8	89	12 41.9	79	315 11.2	17 8.4	210 19.7	-19 3.1
22	82 29.6	89	12 57.7	77	345 16.7	17 8.6	240 24.5	-19 3.1
Δ					28	1	24	0

φ	SUNCE		TRAJANJE SUMRAKA		MESEC			
	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 17	17 11	0 43	2 19	8 43	1.1	. . . .	.0
55	7 5	17 23	0 37	2 1	8 58	1.3	23 51	3.0
50	6 56	17 31	0 33	1 48	9 9	1.5	23 37	2.8
45	6 49	17 39	0 30	1 38	9 18	1.6	23 26	2.7
40	6 43	17 45	0 27	1 30	9 26	1.7	23 17	2.6
35	6 37	17 50	0 26	1 24	9 32	1.8	23 9	2.6
30	6 33	17 54	0 24	1 20	9 38	1.9	23 2	2.5
20	6 24	18 3	0 22	1 14	9 48	2.0	22 51	2.4
10	6 17	18 10	0 21	1 10	9 57	2.1	22 40	2.3
0	6 10	18 17	0 21	1 10	10 5	2.2	22 30	2.2
10	6 3	18 24	0 21	1 11	10 14	2.3	22 21	2.1
20	5 55	18 31	0 22	1 15	10 23	2.4	22 10	2.0
30	5 46	18 40	0 25	1 23	10 33	2.6	21 59	1.9
35	5 41	18 45	0 26	1 29	10 39	2.6	21 52	1.8
40	5 35	18 51	0 28	1 37	10 46	2.7	21 44	1.8
45	5 28	18 58	0 31	1 47	10 54	2.8	21 35	1.7
50	5 20	19 6	0 34	2 2	11 3	2.9	21 24	1.6
55	5 9	19 16	0 39	2 26	11 16	3.1	21 11	1.4
60	4 56	19 30	0 46	3 13	11 32	3.3	20 53	1.2
S								

SUNCE				MESEC				
UT	$e = T_p - UT$	Δ/24	r	Prolaz		Δ/24	$\pi_\leftmoon$	r
h	min s	s	′		h min	min	′	′
00	-13 27.3	.3	16.2	$T_{\overline{m}}$	16 18	2.2	59.5	16.2
12	-13 23.2	$T_{\overline{m}_\odot}$	12 h 13.4 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 1	.1	357	-3.3	♃	22 59	.0	222	-2.1
♂	13 58	.1	358	1.2	♄	6 1	.0	117	.7

UT	SUNCE		PROLEĆ. TAČKA	VENERA		MARS	
	$S_\odot$	$\delta_\odot$	S_Υ	S_φ	δ_φ	S_σ	δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	176 40.2	- 9 39.6	153 33.0	149 37.5	0 42.5	150 31.6	0 43.1
2	206 40.4	- 9 37.7	183 38.0	179 36.9	0 45.1	180 33.0	0 44.6
4	236 40.6	- 9 35.9	213 42.9	209 36.3	0 47.8	210 34.5	0 46.2
6	266 40.7	- 9 34.0	243 47.8	239 35.6	0 50.4	240 35.9	0 47.8
8	296 40.9	- 9 32.2	273 52.7	269 35.0	0 53.0	270 37.3	0 49.4
10	326 41.1	- 9 30.3	303 57.7	299 34.4	0 55.6	300 38.8	0 50.9
12	356 41.3	- 9 28.5	334 2.6	329 33.7	0 58.2	330 40.2	0 52.5
14	26 41.5	- 9 26.6	4 7.5	359 33.1	1 .8	0 41.6	0 54.1
16	56 41.7	- 9 24.8	34 12.5	29 32.5	1 3.4	30 43.1	0 55.7
18	86 41.8	- 9 23.0	64 17.4	59 31.8	1 6.1	60 44.5	0 57.2
20	116 42.0	- 9 21.1	94 22.3	89 31.2	1 8.7	90 45.9	0 58.8
22	146 42.2	- 9 19.3	124 27.2	119 30.6	1 11.3	120 47.4	1 .4
Δ	1	9		-3	13	7	8

UT	MESEC				JUPITER		SATURN	
	$S_\leftmoon$	Δ	$\delta_\leftmoon$	Δ	S_{4}	δ_{4}	S_η	δ_η
h	° ′		° ′		° ′	° ′	° ′	° ′
0	111 25.4	89	13 13.2	76	15 22.2	17 8.8	270 29.2	-19 3.1
2	140 21.2	89	13 28.4	74	45 27.7	17 9.0	300 34.0	-19 3.1
4	169 17.1	90	13 43.1	72	75 33.3	17 9.1	330 38.7	-19 3.1
6	198 13.0	90	13 57.5	70	105 38.8	17 9.3	0 43.5	-19 3.1
8	227 9.0	90	14 11.6	68	135 44.3	17 9.5	30 48.3	-19 3.1
10	256 5.0	90	14 25.3	67	165 49.8	17 9.7	60 53.0	-19 3.2
12	285 1.1	91	14 38.6	65	195 55.3	17 9.9	90 57.8	-19 3.2
14	313 57.2	91	14 51.5	63	226 .8	17 10.0	121 2.6	-19 3.2
16	342 53.4	91	15 4.1	61	256 6.4	17 10.2	151 7.3	-19 3.2
18	11 49.6	91	15 16.3	59	286 11.9	17 10.4	181 12.1	-19 3.2
20	40 45.9	92	15 28.1	57	316 17.4	17 10.6	211 16.9	-19 3.2
22	69 42.3	92	15 39.5	55	346 22.9	17 10.7	241 21.7	-19 3.2
Δ					28	1	24	0

φ	SUNCE		TRAJANJE SUMRAKA		MESEC			
	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	17 14	0 43	2 19	9 10	1.3	0 10	3.2
55	7 3	17 25	0 37	2 1	9 30	1.5	. . .	.0
50	6 54	17 33	0 33	1 48	9 45	1.7	. . .	.0
45	6 47	17 40	0 30	1 38	9 57	1.8	. . .	.0
40	6 41	17 46	0 27	1 30	10 7	1.8	. . .	.0
35	6 36	17 51	0 26	1 24	10 15	1.9	. . .	.0
30	6 32	17 55	0 24	1 20	10 23	1.9	. . .	.0
20	6 24	18 3	0 22	1 14	10 36	2.0	23 48	2.3
10	6 17	18 10	0 21	1 10	10 47	2.1	23 35	2.2
0	6 10	18 17	0 21	1 10	10 58	2.2	23 24	2.2
10	6 3	18 23	0 21	1 11	11 9	2.3	23 12	2.1
20	5 56	18 31	0 22	1 15	11 21	2.3	22 59	2.1
30	5 47	18 39	0 24	1 23	11 34	2.4	22 45	2.0
35	5 42	18 44	0 26	1 29	11 42	2.5	22 36	1.9
40	5 36	18 50	0 28	1 36	11 51	2.6	22 27	1.9
45	5 30	18 56	0 31	1 47	12 1	2.6	22 16	1.8
50	5 22	19 4	0 34	2 2	12 14	2.7	22 2	1.8
55	5 11	19 14	0 39	2 25	12 30	2.8	21 45	1.6
60	4 58	19 27	0 46	3 9	12 51	3.0	21 23	1.5
S								

SUNCE				MESEC			
UT	e = T_p − UT	Δ/24	r	Prolaz		Δ/24	$\pi_\leftmoon$	r
h	min s	s	′		h min	min	′	′
00	-13 19.1	.4	16.2	$T_{\overline{m}}$	17 11	2.2	58.5	15.9
12	-13 14.8	$T_{\overline{m}_\odot}$	12 h 13.2 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 2	.1	356	-3.3	♃	22 54	.0	222	-2.1
♂	13 57	.1	357	1.2	♄	5 57	.0	117	.7

UT	SUNCE		PROLEĆ. TAČKA	VENERA		MARS	
	$S_\odot$	$\delta_\odot$	S_Υ	S_φ	δ_φ	S_σ	δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	176 42.4	- 9 17.4	154 32.2	149 29.9	1 13.9	150 48.8	1 2.0
2	206 42.6	- 9 15.5	184 37.1	179 29.3	1 16.5	180 50.2	1 3.5
4	236 42.8	- 9 13.7	214 42.0	209 28.7	1 19.1	210 51.7	1 5.1
6	266 43.0	- 9 11.8	244 47.0	239 28.0	1 21.7	240 53.1	1 6.7
8	296 43.2	- 9 10.0	274 51.9	269 27.4	1 24.3	270 54.5	1 8.3
10	326 43.4	- 9 8.1	304 56.8	299 26.8	1 27.0	300 56.0	1 9.8
12	356 43.6	- 9 6.3	335 1.7	329 26.2	1 29.6	330 57.4	1 11.4
14	26 43.8	- 9 4.4	5 6.7	359 25.5	1 32.2	0 58.8	1 13.0
16	56 44.0	- 9 2.5	35 11.6	29 24.9	1 34.8	31 .3	1 14.6
18	86 44.1	- 9 .7	65 16.5	59 24.3	1 37.4	61 1.7	1 16.1
20	116 44.3	- 8 58.8	95 21.5	89 23.6	1 40.0	91 3.1	1 17.7
22	146 44.5	- 8 57.0	125 26.4	119 23.0	1 42.6	121 4.6	1 19.3
Δ	1	9		-3	13	7	8

UT	MESEC				JUPITER		SATURN	
	$S_\leftmoon$	Δ	$\delta_\leftmoon$	Δ	S_{4}	δ_{4}	S_η	δ_η
h	° ′		° ′		° ′	° ′	° ′	° ′
0	98 38.7	92	15 50.6	53	16 28.4	17 10.9	271 26.4	-19 3.3
2	127 35.1	93	16 1.2	51	46 33.9	17 11.1	301 31.2	-19 3.3
4	156 31.6	93	16 11.5	49	76 39.4	17 11.3	331 36.0	-19 3.3
6	185 28.2	93	16 21.3	47	106 44.9	17 11.4	1 40.7	-19 3.3
8	214 24.9	94	16 30.8	45	136 50.4	17 11.6	31 45.5	-19 3.3
10	243 21.6	94	16 39.9	43	166 56.0	17 11.8	61 50.3	-19 3.3
12	272 18.4	94	16 48.6	41	197 1.5	17 12.0	91 55.1	-19 3.3
14	301 15.2	95	16 56.9	40	227 7.0	17 12.1	121 59.8	-19 3.3
16	330 12.1	95	17 4.8	38	257 12.5	17 12.3	152 4.6	-19 3.4
18	359 9.1	95	17 12.3	36	287 18.0	17 12.5	182 9.4	-19 3.4
20	28 6.2	96	17 19.4	34	317 23.5	17 12.6	212 14.2	-19 3.4
22	57 3.4	96	17 26.1	32	347 29.0	17 12.8	242 19.0	-19 3.4
Δ					28	1	24	0

φ	SUNCE		TRAJANJE SUMRAKA		MESEC			
	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 11	17 16	0 42	2 19	9 43	1.6	1 26	2.8
55	7 0	17 27	0 37	2 1	10 7	1.8	1 3	2.7
50	6 52	17 35	0 33	1 48	10 25	1.8	0 46	2.6
45	6 46	17 41	0 30	1 38	10 39	1.9	0 32	2.5
40	6 40	17 47	0 27	1 30	10 51	2.0	0 21	2.5
35	6 35	17 52	0 26	1 24	11 1	2.0	0 11	2.4
30	6 31	17 56	0 24	1 20	11 10	2.0	0 3	2.4
20	6 23	18 3	0 22	1 14	11 25	2.1	. . .	.0
10	6 16	18 10	0 21	1 10	11 38	2.1	. . .	.0
0	6 10	18 16	0 21	1 10	11 51	2.2	. . .	.0
10	6 3	18 23	0 21	1 11	12 4	2.2	. . .	.0
20	5 56	18 30	0 22	1 15	12 17	2.2	23 49	2.1
30	5 48	18 38	0 24	1 23	12 33	2.3	23 32	2.1
35	5 43	18 43	0 26	1 28	12 42	2.3	23 23	2.0
40	5 37	18 48	0 28	1 36	12 52	2.4	23 12	2.0
45	5 31	18 54	0 30	1 46	13 5	2.4	22 60	2.0
50	5 23	19 2	0 34	2 1	13 19	2.5	22 44	2.0
55	5 14	19 11	0 39	2 23	13 38	2.5	22 25	1.9
60	5 1	19 24	0 45	3 5	14 4	2.6	21 59	1.8
S								

SUNCE				MESEC			
UT	e = T_p − UT	Δ/24	r	Prolaz		Δ/24	$\pi_\leftmoon$	r
h	min s	s	′		h min	min	′	′
00	-13 10.4	.4	16.2	$T_{\overline{m}}$	18 4	2.1	57.6	15.7
12	-13 5.7	$T_{\overline{m}_\odot}$	12 h 13.1 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 2	.1	355	-3.3	♃	22 50	.0	222	-2.1
♂	13 56	.1	356	1.2	♄	5 53	.0	117	.7

UT	SUNCE		PROLEĆ. TAČKA	VENERA		MARS	
	$S_\odot$	$\delta_\odot$	S_Υ	S_φ	δ_φ	S_σ	δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	176 44.7	- 8 55.1	155 31.3	149 22.4	1 45.2	151 6.0	1 20.9
2	206 45.0	- 8 53.2	185 36.2	179 21.7	1 47.9	181 7.4	1 22.4
4	236 45.2	- 8 51.4	215 41.2	209 21.1	1 50.5	211 8.9	1 24.0
6	266 45.4	- 8 49.5	245 46.1	239 20.5	1 53.1	241 10.3	1 25.6
8	296 45.6	- 8 47.6	275 51.0	269 19.9	1 55.7	271 11.8	1 27.1
10	326 45.8	- 8 45.8	305 55.9	299 19.2	1 58.3	301 13.2	1 28.7
12	356 46.0	- 8 43.9	336 .9	329 18.6	2 .9	331 14.6	1 30.3
14	26 46.2	- 8 42.0	6 5.8	359 18.0	2 3.5	1 16.1	1 31.9
16	56 46.4	- 8 40.2	36 10.7	29 17.3	2 6.1	31 17.5	1 33.4
18	86 46.6	- 8 38.3	66 15.7	59 16.7	2 8.7	61 18.9	1 35.0
20	116 46.8	- 8 36.4	96 20.6	89 16.1	2 11.4	91 20.4	1 36.6
22	146 47.0	- 8 34.5	126 25.5	119 15.5	2 14.0	121 21.8	1 38.1
Δ	1	9		-3	13	7	8

UT	MESEC				JUPITER		SATURN	
	$S_\leftmoon$	Δ	$\delta_\leftmoon$	Δ	S_{4}	δ_{4}	S_η	δ_η
h	° ′		° ′		° ′	° ′	° ′	° ′
0	86 .6	97	17 32.4	30	17 34.5	17 13.0	272 23.7	-19 3.4
2	114 57.9	97	17 38.3	28	47 40.0	17 13.2	302 28.5	-19 3.4
4	143 55.3	97	17 43.9	26	77 45.5	17 13.3	332 33.3	-19 3.4
6	172 52.8	98	17 49.0	24	107 51.0	17 13.5	2 38.1	-19 3.4
8	201 50.4	98	17 53.7	22	137 56.5	17 13.7	32 42.9	-19 3.5
10	230 48.1	99	17 58.1	20	168 2.0	17 13.8	62 47.6	-19 3.5
12	259 45.9	99	18 2.0	18	198 7.5	17 14.0	92 52.4	-19 3.5
14	288 43.8	100	18 5.5	16	228 13.0	17 14.2	122 57.2	-19 3.5
16	317 41.8	100	18 8.7	14	258 18.5	17 14.4	153 2.0	-19 3.5
18	346 39.9	101	18 11.4	12	288 24.0	17 14.5	183 6.8	-19 3.5
20	15 38.1	102	18 13.8	10	318 29.5	17 14.7	213 11.6	-19 3.5
22	44 36.4	102	18 15.8	8	348 35.0	17 14.9	243 16.4	-19 3.5
Δ					27	1	24	0

φ	SUNCE		TRAJANJE SUMRAKA		MESEC			
	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 8	17 19	0 42	2 19	10 22	2.0	2 34	2.4
55	6 58	17 29	0 37	2 1	10 49	2.0	2 7	2.4
50	6 50	17 36	0 33	1 48	11 9	2.0	1 48	2.3
45	6 44	17 43	0 30	1 38	11 25	2.1	1 32	2.3
40	6 38	17 48	0 27	1 30	11 37	2.1	1 20	2.3
35	6 34	17 53	0 26	1 24	11 48	2.1	1 9	2.2
30	6 30	17 57	0 24	1 20	11 58	2.1	0 60	2.2
20	6 22	18 4	0 22	1 14	12 15	2.1	0 43	2.2
10	6 16	18 10	0 21	1 10	12 29	2.1	0 29	2.2
0	6 10	18 16	0 21	1 9	12 43	2.1	0 16	2.1
10	6 3	18 22	0 21	1 11	12 57	2.1	0 3	2.1
20	5 56	18 29	0 22	1 15	13 11	2.1	. . .	.0
30	5 48	18 37	0 24	1 23	13 28	2.1	. . .	.0
35	5 44	18 41	0 26	1 28	13 38	2.1	. . .	.0
40	5 39	18 47	0 28	1 36	13 49	2.1	. . .	.0
45	5 32	18 53	0 30	1 46	14 2	2.2	23 47	2.1
50	5 25	18 60	0 34	2 0	14 18	2.2	23 31	2.1
55	5 16	19 9	0 38	2 22	14 39	2.2	23 10	2.2
60	5 3	19 21	0 45	3 2	15 7	2.2	22 42	2.2
S								

SUNCE				MESEC			
UT	e = T_p − UT	Δ/24	r	Prolaz	Δ/24	$\pi_\leftmoon$	r
h	min s	s	′	h min	min	′	′
00	-13 1.0	.4	16.2	$T_{\overline{m}}$ 18 55	2.1	56.8	15.5
12	-12 56.0	$T_{\overline{m}_\odot}$ 12 h 12.9 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 3	.1	354	-3.3	♃	22 46	.0	222	-2.1
♂	13 55	.1	356	1.2	♄	5 49	.0	117	.7

UT	SUNCE		PROLEĆ. TAČKA	VENERA		MARS	
	$S_\odot$	$\delta_\odot$	S_Υ	S_φ	δ_φ	S_σ	δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	176 47.2	- 8 32.7	156 30.4	149 14.8	2 16.6	151 23.2	1 39.7
2	206 47.5	- 8 30.8	186 35.4	179 14.2	2 19.2	181 24.7	1 41.3
4	236 47.7	- 8 28.9	216 40.3	209 13.6	2 21.8	211 26.1	1 42.8
6	266 47.9	- 8 27.0	246 45.2	239 12.9	2 24.4	241 27.6	1 44.4
8	296 48.1	- 8 25.2	276 50.2	269 12.3	2 27.0	271 29.0	1 46.0
10	326 48.3	- 8 23.3	306 55.1	299 11.7	2 29.6	301 30.4	1 47.6
12	356 48.5	- 8 21.4	337 .0	329 11.1	2 32.2	331 31.9	1 49.1
14	26 48.8	- 8 19.5	7 4.9	359 10.4	2 34.8	1 33.3	1 50.7
16	56 49.0	- 8 17.6	37 9.9	29 9.8	2 37.4	31 34.7	1 52.3
18	86 49.2	- 8 15.8	67 14.8	59 9.2	2 40.0	61 36.2	1 53.8
20	116 49.4	- 8 13.9	97 19.7	89 8.5	2 42.6	91 37.6	1 55.4
22	146 49.6	- 8 12.0	127 24.7	119 7.9	2 45.2	121 39.1	1 57.0
Δ	1	9		-3	13	7	8

UT	MESEC				JUPITER		SATURN	
	$S_\leftmoon$	Δ	$\delta_\leftmoon$	Δ	S_{4}	δ_{4}	S_η	δ_η
h	° ′		° ′		° ′	° ′	° ′	° ′
0	73 34.8	103	18 17.4	6	18 40.5	17 15.0	273 21.2	-19 3.5
2	102 33.3	103	18 18.6	4	48 46.0	17 15.2	303 25.9	-19 3.6
4	131 32.0	104	18 19.4	2	78 51.5	17 15.4	333 30.7	-19 3.6
6	160 30.7	104	18 19.9	0	108 57.0	17 15.5	3 35.5	-19 3.6
8	189 29.6	105	18 19.9	-2	139 2.5	17 15.7	33 40.3	-19 3.6
10	218 28.6	106	18 19.6	-3	169 8.0	17 15.9	63 45.1	-19 3.6
12	247 27.8	106	18 18.9	-5	199 13.4	17 16.0	93 49.9	-19 3.6
14	276 27.1	107	18 17.9	-7	229 18.9	17 16.2	123 54.7	-19 3.6
16	305 26.5	108	18 16.4	-9	259 24.4	17 16.4	153 59.5	-19 3.6
18	334 26.0	108	18 14.7	-11	289 29.9	17 16.5	184 4.3	-19 3.6
20	3 25.7	109	18 12.5	-13	319 35.4	17 16.7	214 9.1	-19 3.6
22	32 25.5	110	18 10.0	-14	349 40.9	17 16.9	244 13.9	-19 3.6
Δ					27	1	24	0

φ	SUNCE		TRAJANJE SUMRAKA		MESEC			
	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 5	17 21	0 42	2 19	11 10	2.3	3 32	2.0
55	6 56	17 31	0 37	2 1	11 37	2.3	3 4	2.0
50	6 48	17 38	0 33	1 48	11 58	2.2	2 43	2.0
45	6 42	17 44	0 30	1 38	12 14	2.2	2 27	2.0
40	6 37	17 49	0 27	1 30	12 27	2.2	2 14	2.0
35	6 33	17 53	0 25	1 24	12 38	2.2	2 3	2.1
30	6 29	17 57	0 24	1 20	12 48	2.1	1 53	2.1
20	6 22	18 4	0 22	1 13	13 5	2.1	1 36	2.1
10	6 15	18 10	0 21	1 10	13 20	2.1	1 21	2.1
0	6 9	18 16	0 21	1 9	13 34	2.1	1 8	2.1
10	6 3	18 22	0 21	1 11	13 48	2.0	0 54	2.1
20	5 57	18 28	0 22	1 15	14 2	2.0	0 39	2.1
30	5 49	18 36	0 24	1 22	14 19	2.0	0 22	2.1
35	5 45	18 40	0 26	1 28	14 29	2.0	0 12	2.1
40	5 40	18 45	0 28	1 35	14 41	1.9	0 1	2.1
45	5 34	18 51	0 30	1 45	14 54	1.9	. . .	.0
50	5 27	18 58	0 34	1 59	15 10	1.9	. . .	.0
55	5 18	19 7	0 38	2 21	15 31	1.8	. . .	.0
60	5 6	19 18	0 45	2 58	15 59	1.7	23 34	2.5
S								

SUNCE				MESEC			
UT	e = T_p − UT	Δ/24	r	Prolaz	Δ/24	$\pi_\leftmoon$	r
h	min s	s	′	h min	min	′	′
00	-12 51.1	.4	16.2	$T_{\overline{m}}$ 19 46	2.0	56.0	15.3
12	-12 45.8	$T_{\overline{m}_\odot}$ 12 h 12.8 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 3	.1	353	-3.3	♃	22 41	.0	222	-2.1
♂	13 54	.1	355	1.2	♄	5 46	.0	117	.7

UT	SUNCE		PROLEĆ. TAČKA	VENERA		MARS	
	$S_\odot$	$\delta_\odot$	S_Υ	S_φ	δ_φ	S_σ	δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	176 49.9	− 8 10.1	157 29.6	149 7.3	2 47.8	151 40.5	1 58.5
2	206 50.1	− 8 8.2	187 34.5	179 6.7	2 50.5	181 41.9	2 .1
4	236 50.3	− 8 6.3	217 39.4	209 6.0	2 53.1	211 43.4	2 1.7
6	266 50.5	− 8 4.5	247 44.4	239 5.4	2 55.7	241 44.8	2 3.2
8	296 50.8	− 8 2.6	277 49.3	269 4.8	2 58.3	271 46.3	2 4.8
10	326 51.0	− 8 .7	307 54.2	299 4.2	3 .9	301 47.7	2 6.4
12	356 51.2	− 7 58.8	337 59.2	329 3.5	3 3.5	331 49.1	2 7.9
14	26 51.5	− 7 56.9	8 4.1	359 2.9	3 6.1	1 50.6	2 9.5
16	56 51.7	− 7 55.0	38 9.0	29 2.3	3 8.7	31 52.0	2 11.1
18	86 51.9	− 7 53.1	68 13.9	59 1.6	3 11.3	61 53.5	2 12.6
20	116 52.2	− 7 51.2	98 18.9	89 1.0	3 13.9	91 54.9	2 14.2
22	146 52.4	− 7 49.3	128 23.8	119 .4	3 16.5	121 56.3	2 15.7
Δ	1	9		−3	13	7	8

UT	MESEC				JUPITER		SATURN	
	$S_\leftmoon$	Δ	$\delta_\leftmoon$	Δ	S_{4}	δ_{4}	S_{5}	δ_{5}
h	° ′		° ′		° ′	° ′	° ′	° ′
0	61 25.4	110	18 7.1	−16	19 46.4	17 17.0	274 18.7	−19 3.7
2	90 25.5	111	18 3.8	−18	49 51.9	17 17.2	304 23.5	−19 3.7
4	119 25.7	112	18 .2	−20	79 57.3	17 17.4	334 28.3	−19 3.7
6	148 26.1	113	17 56.3	−21	110 2.8	17 17.5	4 33.1	−19 3.7
8	177 26.6	113	17 52.0	−23	140 8.3	17 17.7	34 37.9	−19 3.7
10	206 27.3	114	17 47.3	−25	170 13.8	17 17.9	64 42.7	−19 3.7
12	235 28.1	115	17 42.4	−27	200 19.3	17 18.0	94 47.5	−19 3.7
14	264 29.1	116	17 37.0	−28	230 24.8	17 18.2	124 52.3	−19 3.7
16	293 30.2	116	17 31.4	−30	260 30.2	17 18.4	154 57.1	−19 3.7
18	322 31.5	117	17 25.4	−32	290 35.7	17 18.5	185 1.9	−19 3.7
20	351 32.9	118	17 19.1	−33	320 41.2	17 18.7	215 6.7	−19 3.7
22	20 34.5	119	17 12.5	−35	350 46.7	17 18.8	245 11.5	−19 3.7
Δ					27	1	24	0

φ	SUNCE		TRAJANJE SUMRAKA		MESEC			
	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 2	17 24	0 42	2 19	12 5	2.6	4 19	1.6
55	6 53	17 33	0 37	2 1	12 32	2.4	3 52	1.7
50	6 46	17 40	0 33	1 48	12 51	2.4	3 32	1.7
45	6 40	17 45	0 30	1 38	13 7	2.3	3 16	1.8
40	6 36	17 50	0 27	1 30	13 19	2.2	3 3	1.8
35	6 31	17 54	0 25	1 24	13 30	2.2	2 52	1.9
30	6 28	17 58	0 24	1 20	13 40	2.2	2 43	1.9
20	6 21	18 5	0 22	1 13	13 56	2.1	2 26	2.0
10	6 15	18 10	0 21	1 10	14 10	2.0	2 11	2.0
0	6 9	18 16	0 21	1 9	14 23	2.0	1 58	2.0
10	6 3	18 22	0 21	1 11	14 37	1.9	1 44	2.1
20	5 57	18 28	0 22	1 15	14 51	1.9	1 30	2.1
30	5 50	18 35	0 24	1 22	15 7	1.8	1 13	2.2
35	5 46	18 39	0 26	1 28	15 16	1.8	1 3	2.2
40	5 41	18 44	0 28	1 35	15 27	1.7	0 52	2.2
45	5 35	18 49	0 30	1 45	15 40	1.7	0 39	2.3
50	5 28	18 56	0 34	1 59	15 55	1.6	0 23	2.3
55	5 20	19 4	0 38	2 19	16 14	1.5	0 2	2.4
60	5 9	19 15	0 45	2 56	16 41	1.4	. . ..	.0
S								

SUNCE				MESEC			
UT	e = T_p − UT	Δ/24	r	Prolaz		Δ/24	$\pi_\leftmoon$	r
h	min s	s	′		h min	min	′	′
00	−12 40.5	.5	16.2	$T_{\overline{m}}$	20 35	2.0	55.4	15.1
12	−12 35.0	$T_{\overline{m}_\odot}$	12 h 12.6 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 4	.1	352	−3.3	♃	22 37	.0	222	−2.1
♂	13 53	.1	354	1.2	♄	5 42	.0	117	.7

UT	SUNCE		PROLEĆ. TAČKA	VENERA		MARS	
	$S_\odot$	$\delta_\odot$	S_Υ	S_φ	δ_φ	S_σ	δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	176 52.6	− 7 47.4	158 28.7	148 59.8	3 19.1	151 57.8	2 17.3
2	206 52.9	− 7 45.5	188 33.7	178 59.1	3 21.7	181 59.2	2 18.9
4	236 53.1	− 7 43.6	218 38.6	208 58.5	3 24.3	212 .7	2 20.4
6	266 53.4	− 7 41.7	248 43.5	238 57.9	3 26.9	242 2.1	2 22.0
8	296 53.6	− 7 39.8	278 48.4	268 57.3	3 29.5	272 3.5	2 23.6
10	326 53.8	− 7 38.0	308 53.4	298 56.6	3 32.1	302 5.0	2 25.1
12	356 54.1	− 7 36.1	338 58.3	328 56.0	3 34.7	332 6.4	2 26.7
14	26 54.3	− 7 34.2	9 3.2	358 55.4	3 37.3	2 7.9	2 28.2
16	56 54.6	− 7 32.3	39 8.2	28 54.7	3 39.8	32 9.3	2 29.8
18	86 54.8	− 7 30.4	69 13.1	58 54.1	3 42.4	62 10.7	2 31.4
20	116 55.0	− 7 28.5	99 18.0	88 53.5	3 45.0	92 12.2	2 32.9
22	146 55.3	− 7 26.5	129 22.9	118 52.9	3 47.6	122 13.6	2 34.5
Δ	1	9		−3	13	7	8

UT	MESEC				JUPITER		SATURN	
	$S_\leftmoon$	Δ	$\delta_\leftmoon$	Δ	S_{4}	δ_{4}	S_{5}	δ_{5}
h	° ′		° ′		° ′	° ′	° ′	° ′
0	49 36.2	119	17 5.5	−36	20 52.1	17 19.0	275 16.3	−19 3.7
2	78 38.1	120	16 58.2	−38	50 57.6	17 19.2	305 21.1	−19 3.8
4	107 40.1	121	16 50.6	−39	81 3.1	17 19.3	335 25.9	−19 3.8
6	136 42.3	122	16 42.7	−41	111 8.6	17 19.5	5 30.7	−19 3.8
8	165 44.6	123	16 34.5	−43	141 14.0	17 19.7	35 35.5	−19 3.8
10	194 47.2	123	16 26.0	−44	171 19.5	17 19.8	65 40.3	−19 3.8
12	223 49.8	124	16 17.2	−45	201 25.0	17 20.0	95 45.1	−19 3.8
14	252 52.6	125	16 8.2	−47	231 30.5	17 20.1	125 50.0	−19 3.8
16	281 55.6	126	15 58.8	−48	261 35.9	17 20.3	155 54.8	−19 3.8
18	310 58.7	126	15 49.1	−50	291 41.4	17 20.5	185 59.6	−19 3.8
20	340 2.0	127	15 39.2	−51	321 46.9	17 20.6	216 4.4	−19 3.8
22	9 5.5	128	15 28.9	−52	351 52.3	17 20.8	246 9.2	−19 3.8
Δ					27	1	24	0

φ	SUNCE		TRAJANJE SUMRAKA		MESEC			
	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 60	17 26	0 42	2 19	13 7	2.7	4 56	1.2
55	6 51	17 35	0 36	2 1	13 30	2.6	4 32	1.4
50	6 44	17 41	0 32	1 48	13 48	2.5	4 14	1.5
45	6 39	17 47	0 30	1 38	14 2	2.4	3 59	1.6
40	6 34	17 51	0 27	1 30	14 13	2.3	3 47	1.6
35	6 30	17 55	0 25	1 24	14 23	2.2	3 37	1.7
30	6 26	17 59	0 24	1 20	14 32	2.2	3 28	1.7
20	6 20	18 5	0 22	1 13	14 46	2.1	3 13	1.8
10	6 14	18 10	0 21	1 10	14 59	2.0	2 59	1.9
0	6 9	18 16	0 21	1 9	15 11	1.9	2 47	2.0
10	6 4	18 21	0 21	1 11	15 23	1.9	2 34	2.0
20	5 58	18 27	0 22	1 15	15 36	1.8	2 20	2.1
30	5 51	18 34	0 24	1 22	15 51	1.7	2 5	2.2
35	5 47	18 38	0 26	1 27	15 59	1.6	1 55	2.2
40	5 42	18 42	0 28	1 35	16 9	1.6	1 45	2.3
45	5 37	18 47	0 30	1 44	16 20	1.5	1 33	2.3
50	5 30	18 54	0 33	1 58	16 34	1.4	1 18	2.4
55	5 22	19 2	0 38	2 18	16 51	1.3	0 59	2.5
60	5 11	19 12	0 44	2 53	17 14	1.1	0 33	2.7
S								

SUNCE				MESEC			
UT	e = T_p − UT	Δ/24	r	Prolaz		Δ/24	$\pi_\leftmoon$	r
h	min s	s	′		h min	min	′	′
00	−12 29.5	.5	16.2	$T_{\overline{m}}$	21 22	1.9	54.8	14.9
12	−12 23.6	$T_{\overline{m}_\odot}$	12 h 12.4 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 4	.1	351	−3.3	♃	22 32	.0	222	−2.1
♂	13 51	.1	353	1.2	♄	5 38	.0	117	.7

UT	SUNCE		PROLEĆ. TAČKA	VENERA		MARS	
	$S_\odot$	$\delta_\odot$	S_Υ	S_φ	δ_φ	S_σ	δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	176 55.5	- 7 24.6	159 27.9	148 52.2	3 50.2	152 15.1	2 36.0
2	206 55.8	- 7 22.7	189 32.8	178 51.6	3 52.8	182 16.5	2 37.6
4	236 56.0	- 7 20.8	219 37.7	208 51.0	3 55.4	212 18.0	2 39.2
6	266 56.3	- 7 18.9	249 42.6	238 50.3	3 58.0	242 19.4	2 40.7
8	296 56.5	- 7 17.0	279 47.6	268 49.7	4 .6	272 20.8	2 42.3
10	326 56.8	- 7 15.1	309 52.5	298 49.1	4 3.2	302 22.3	2 43.8
12	356 57.0	- 7 13.2	339 57.4	328 48.5	4 5.8	332 23.7	2 45.4
14	26 57.3	- 7 11.3	10 2.4	358 47.8	4 8.4	2 25.2	2 47.0
16	56 57.5	- 7 9.4	40 7.3	28 47.2	4 11.0	32 26.6	2 48.5
18	86 57.8	- 7 7.5	70 12.2	58 46.6	4 13.5	62 28.0	2 50.1
20	116 58.1	- 7 5.6	100 17.1	88 45.9	4 16.1	92 29.5	2 51.6
22	146 58.3	- 7 3.7	130 22.1	118 45.3	4 18.7	122 30.9	2 53.2
Δ	1	10		-3	13	7	8

UT	MESEC				JUPITER		SATURN	
	$S_\leftmoon$	Δ	$\delta_\leftmoon$	Δ	S_4	δ_4	S_η	δ_η
h	° ′		° ′		° ′	° ′	° ′	° ′
0	38 9.1	129	15 18.4	-54	21 57.8	17 20.9	276 14.0	-19 3.8
2	67 12.8	130	15 7.7	-55	52 3.3	17 21.1	306 18.8	-19 3.8
4	96 16.7	130	14 56.6	-56	82 8.7	17 21.2	336 23.7	-19 3.8
6	125 20.8	131	14 45.3	-58	112 14.2	17 21.4	6 28.5	-19 3.8
8	154 25.0	132	14 33.8	-59	142 19.7	17 21.6	36 33.3	-19 3.8
10	183 29.3	133	14 22.0	-60	172 25.1	17 21.7	66 38.1	-19 3.9
12	212 33.8	133	14 10.0	-61	202 30.6	17 21.9	96 42.9	-19 3.9
14	241 38.5	134	13 57.7	-63	232 36.0	17 22.0	126 47.7	-19 3.9
16	270 43.3	135	13 45.1	-64	262 41.5	17 22.2	156 52.6	-19 3.9
18	299 48.2	135	13 32.4	-65	292 47.0	17 22.3	186 57.4	-19 3.9
20	328 53.3	136	13 19.4	-66	322 52.4	17 22.5	217 2.2	-19 3.9
22	357 58.5	137	13 6.2	-67	352 57.9	17 22.7	247 7.0	-19 3.9
Δ					27	1	24	0

φ	SUNCE		TRAJANJE SUMRAKA		MESEC			
	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 57	17 29	0 42	2 19	14 13	2.8	5 26	1.0
55	6 48	17 37	0 36	2 1	14 32	2.7	5 5	1.2
50	6 42	17 43	0 32	1 48	14 47	2.5	4 50	1.3
45	6 37	17 48	0 29	1 38	14 59	2.4	4 37	1.4
40	6 33	17 52	0 27	1 30	15 8	2.3	4 27	1.5
35	6 29	17 56	0 25	1 24	15 17	2.2	4 18	1.6
30	6 25	17 59	0 24	1 20	15 24	2.2	4 10	1.6
20	6 19	18 5	0 22	1 13	15 36	2.1	3 57	1.7
10	6 14	18 11	0 21	1 10	15 47	2.0	3 45	1.8
0	6 9	18 16	0 21	1 9	15 57	1.9	3 34	1.9
10	6 4	18 21	0 21	1 11	16 8	1.8	3 22	2.0
20	5 58	18 26	0 22	1 15	16 18	1.7	3 11	2.1
30	5 51	18 33	0 24	1 22	16 31	1.6	2 57	2.2
35	5 47	18 36	0 26	1 27	16 38	1.5	2 49	2.2
40	5 43	18 41	0 28	1 34	16 46	1.4	2 40	2.3
45	5 38	18 46	0 30	1 44	16 56	1.3	2 29	2.4
50	5 32	18 52	0 33	1 57	17 7	1.2	2 16	2.5
55	5 24	18 59	0 38	2 17	17 21	1.1	1 60	2.6
60	5 14	19 9	0 44	2 51	17 40	.9	1 38	2.8
S								

SUNCE				MESEC			
UT	$e = T_p - UT$	Δ/24	r	Prolaz	Δ/24	$\pi_\leftmoon$	r
h	min s	s	′	h min	min	′	′
00	-12 17.8	.5	16.2	$T_{\overline{m}}$ 22 8	1.9	54.5	14.8
12	-12 11.8	$T_{\overline{m}_\odot}$ 12 h 12.2 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 5	.1	349	-3.3	♃	22 28	.0	222	-2.1
♂	13 50	.1	353	1.2	♄	5 34	.0	117	.7

UT	SUNCE		PROLEĆ. TAČKA	VENERA		MARS	
	$S_\odot$	$\delta_\odot$	S_Υ	S_φ	δ_φ	S_σ	δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	176 58.6	- 7 1.8	160 27.0	148 44.7	4 21.3	152 32.4	2 54.7
2	206 58.8	- 6 59.8	190 31.9	178 44.1	4 23.9	182 33.8	2 56.3
4	236 59.1	- 6 57.9	220 36.9	208 43.4	4 26.5	212 35.3	2 57.9
6	266 59.3	- 6 56.0	250 41.8	238 42.8	4 29.1	242 36.7	2 59.4
8	296 59.6	- 6 54.1	280 46.7	268 42.2	4 31.6	272 38.1	3 1.0
10	326 59.9	- 6 52.2	310 51.6	298 41.5	4 34.2	302 39.6	3 2.5
12	357 .1	- 6 50.3	340 56.6	328 40.9	4 36.8	332 41.0	3 4.1
14	27 .4	- 6 48.4	11 1.5	358 40.3	4 39.4	2 42.5	3 5.6
16	57 .7	- 6 46.4	41 6.4	28 39.6	4 42.0	32 43.9	3 7.2
18	87 .9	- 6 44.5	71 11.4	58 39.0	4 44.6	62 45.4	3 8.7
20	117 1.2	- 6 42.6	101 16.3	88 38.4	4 47.1	92 46.8	3 10.3
22	147 1.5	- 6 40.7	131 21.2	118 37.7	4 49.7	122 48.3	3 11.8
Δ	1	10		-3	13	7	8

UT	MESEC				JUPITER		SATURN	
	$S_\leftmoon$	Δ	$\delta_\leftmoon$	Δ	S_4	δ_4	S_η	δ_η
h	° ′		° ′		° ′	° ′	° ′	° ′
0	27 3.9	138	12 52.7	-68	23 3.3	17 22.8	277 11.9	-19 3.9
2	56 9.4	138	12 39.1	-69	53 8.8	17 23.0	307 16.7	-19 3.9
4	85 15.0	139	12 25.2	-70	83 14.2	17 23.1	337 21.5	-19 3.9
6	114 20.8	139	12 11.2	-71	113 19.7	17 23.3	7 26.3	-19 3.9
8	143 26.7	140	11 56.9	-72	143 25.2	17 23.4	37 31.2	-19 3.9
10	172 32.7	141	11 42.4	-73	173 30.6	17 23.6	67 36.0	-19 3.9
12	201 38.9	141	11 27.8	-74	203 36.1	17 23.7	97 40.8	-19 3.9
14	230 45.2	142	11 12.9	-75	233 41.5	17 23.9	127 45.6	-19 3.9
16	259 51.6	143	10 57.9	-76	263 47.0	17 24.0	157 50.5	-19 3.9
18	288 58.1	143	10 42.7	-77	293 52.4	17 24.2	187 55.3	-19 3.9
20	318 4.7	144	10 27.3	-78	323 57.9	17 24.3	218 .1	-19 3.9
22	347 11.4	144	10 11.7	-79	354 3.3	17 24.5	248 5.0	-19 3.9
Δ					27	1	24	0

φ	SUNCE		TRAJANJE SUMRAKA		MESEC			
	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 54	17 31	0 42	2 19	15 21	2.9	5 50	.8
55	6 46	17 39	0 36	2 1	15 36	2.7	5 33	1.0
50	6 40	17 45	0 32	1 48	15 47	2.5	5 21	1.2
45	6 35	17 50	0 29	1 38	15 56	2.4	5 11	1.3
40	6 31	17 54	0 27	1 30	16 4	2.3	5 3	1.4
35	6 27	17 57	0 25	1 24	16 10	2.2	4 55	1.4
30	6 24	18 0	0 24	1 19	16 16	2.2	4 49	1.5
20	6 19	18 6	0 22	1 13	16 26	2.0	4 38	1.6
10	6 14	18 11	0 21	1 10	16 34	1.9	4 28	1.7
0	6 9	18 15	0 21	1 9	16 42	1.8	4 19	1.8
10	6 4	18 20	0 21	1 11	16 50	1.7	4 10	1.9
20	5 58	18 25	0 22	1 14	16 59	1.6	4 0	2.0
30	5 52	18 31	0 24	1 22	17 8	1.5	3 49	2.2
35	5 48	18 35	0 26	1 27	17 14	1.4	3 42	2.2
40	5 44	18 39	0 28	1 34	17 20	1.3	3 35	2.3
45	5 39	18 44	0 30	1 44	17 28	1.2	3 26	2.4
50	5 33	18 50	0 33	1 57	17 36	1.1	3 16	2.5
55	5 26	18 57	0 38	2 16	17 47	1.0	3 3	2.7
60	5 16	19 6	0 44	2 48	18 1	.8	2 45	2.9
S								

SUNCE				MESEC			
UT	$e = T_p - UT$	Δ/24	r	Prolaz	Δ/24	$\pi_\leftmoon$	r
h	min s	s	′	h min	min	′	′
00	-12 5.7	.5	16.2	$T_{\overline{m}}$ 22 53	1.8	54.2	14.8
12	-11 59.4	$T_{\overline{m}_\odot}$ 12 h 12.0 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 5	.1	348	-3.3	♃	22 24	.0	223	-2.1
♂	13 49	.1	352	1.2	♄	5 30	.0	117	.7

UT	SUNCE		PROLEĆ. TAČKA	VENERA		MARS	
	$S_\odot$	$\delta_\odot$	S_Υ	S_φ	δ_φ	S_σ	δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	177 1.7	- 6 38.8	161 26.1	148 37.1	4 52.3	152 49.7	3 13.4
2	207 2.0	- 6 36.8	191 31.1	178 36.5	4 54.9	182 51.1	3 14.9
4	237 2.3	- 6 34.9	221 36.0	208 35.8	4 57.4	212 52.6	3 16.5
6	267 2.5	- 6 33.0	251 40.9	238 35.2	5 .0	242 54.0	3 18.0
8	297 2.8	- 6 31.1	281 45.9	268 34.6	5 2.6	272 55.5	3 19.6
10	327 3.1	- 6 29.2	311 50.8	298 33.9	5 5.2	302 56.9	3 21.1
12	357 3.3	- 6 27.2	341 55.7	328 33.3	5 7.7	332 58.4	3 22.7
14	27 3.6	- 6 25.3	12 .6	358 32.7	5 10.3	2 59.8	3 24.2
16	57 3.9	- 6 23.4	42 5.6	28 32.0	5 12.9	33 1.3	3 25.8
18	87 4.2	- 6 21.5	72 10.5	58 31.4	5 15.5	63 2.7	3 27.3
20	117 4.4	- 6 19.5	102 15.4	88 30.8	5 18.0	93 4.1	3 28.9
22	147 4.7	- 6 17.6	132 20.4	118 30.1	5 20.6	123 5.6	3 30.4
Δ	1	10		-3	13	7	8

UT	MESEC				JUPITER		SATURN	
	$S_\leftmoon$	Δ	$\delta_\leftmoon$	Δ	$S_{\mathrm{♃}}$	$\delta_{\mathrm{♃}}$	$S_{\mathrm{♄}}$	$\delta_{\mathrm{♄}}$
h	° ′		° ′		° ′	° ′	° ′	° ′
0	16 18.3	145	9 56.0	-79	24 8.7	17 24.6	278 9.8	-19 3.9
2	45 25.3	145	9 40.1	-80	54 14.2	17 24.8	308 14.6	-19 3.9
4	74 32.3	146	9 24.0	-81	84 19.6	17 24.9	338 19.5	-19 3.9
6	103 39.5	146	9 7.8	-82	114 25.1	17 25.1	8 24.3	-19 3.9
8	132 46.8	147	8 51.5	-82	144 30.5	17 25.2	38 29.1	-19 3.9
10	161 54.2	147	8 35.0	-83	174 36.0	17 25.4	68 34.0	-19 3.9
12	191 1.6	148	8 18.4	-84	204 41.4	17 25.5	98 38.8	-19 3.9
14	220 9.2	148	8 1.6	-84	234 46.8	17 25.7	128 43.6	-19 3.9
16	249 16.8	149	7 44.7	-85	264 52.3	17 25.8	158 48.5	-19 3.9
18	278 24.5	149	7 27.7	-86	294 57.7	17 26.0	188 53.3	-19 3.9
20	307 32.3	149	7 10.6	-86	325 3.2	17 26.1	218 58.2	-19 3.9
22	336 40.2	150	6 53.3	-87	355 8.6	17 26.3	249 3.0	-19 3.9
Δ					27	1	24	0

φ	SUNCE		TRAJANJE SUMRAKA		MESEC			
	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 51	17 34	0 42	2 20	16 30	2.9	6 9	.7
55	6 44	17 41	0 36	2 1	16 40	2.7	5 58	.9
50	6 38	17 46	0 32	1 48	16 48	2.5	5 49	1.1
45	6 33	17 51	0 29	1 38	16 54	2.4	5 42	1.2
40	6 30	17 55	0 27	1 30	16 59	2.3	5 35	1.3
35	6 26	17 58	0 25	1 24	17 4	2.2	5 30	1.4
30	6 23	18 1	0 24	1 19	17 8	2.1	5 25	1.4
20	6 18	18 6	0 22	1 13	17 14	2.0	5 17	1.6
10	6 13	18 11	0 21	1 10	17 20	1.9	5 10	1.7
0	6 8	18 15	0 21	1 9	17 26	1.8	5 3	1.8
10	6 4	18 20	0 21	1 10	17 31	1.7	4 57	1.9
20	5 59	18 25	0 22	1 14	17 37	1.6	4 49	2.0
30	5 53	18 30	0 24	1 21	17 44	1.4	4 41	2.2
35	5 49	18 34	0 26	1 27	17 48	1.3	4 36	2.2
40	5 45	18 38	0 27	1 34	17 52	1.3	4 31	2.3
45	5 41	18 42	0 30	1 43	17 57	1.2	4 24	2.4
50	5 35	18 47	0 33	1 56	18 3	1.0	4 16	2.5
55	5 28	18 54	0 37	2 15	18 10	.9	4 7	2.7
60	5 19	19 3	0 44	2 46	18 20	.7	3 54	2.9
S								

SUNCE				MESEC				
UT	e = T_p − UT	Δ/24	r	Prolaz		Δ/24	$\pi_\leftmoon$	r
h	min s	s	′	$T_{\overline{m}}$	h min	min	′	′
00	-11 53.1	.5	16.2	$T_{\overline{m}}$	23 36	1.8	54.0	14.7
12	-11 46.6	$T_{\overline{m}_\odot}$	12 h 11.8 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 6	.1	347	-3.3	♄	22 19	.0	223	-2.0
♂	13 48	.1	351	1.2	♃	5 26	.0	117	.7

UT	SUNCE		PROLEĆ. TAČKA	VENERA		MARS	
	$S_\odot$	$\delta_\odot$	S_Υ	S_φ	δ_φ	S_σ	δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	177 5.0	- 6 15.7	162 25.3	148 29.5	5 23.2	153 7.0	3 32.0
2	207 5.3	- 6 13.8	192 30.2	178 28.9	5 25.7	183 8.5	3 33.5
4	237 5.5	- 6 11.8	222 35.1	208 28.2	5 28.3	213 9.9	3 35.1
6	267 5.8	- 6 9.9	252 40.1	238 27.6	5 30.9	243 11.4	3 36.6
8	297 6.1	- 6 8.0	282 45.0	268 26.9	5 33.4	273 12.8	3 38.2
10	327 6.4	- 6 6.0	312 49.9	298 26.3	5 36.0	303 14.3	3 39.7
12	357 6.7	- 6 4.1	342 54.9	328 25.7	5 38.6	333 15.7	3 41.3
14	27 7.0	- 6 2.2	12 59.8	358 25.0	5 41.1	3 17.1	3 42.8
16	57 7.2	- 6 .2	43 4.7	28 24.4	5 43.7	33 18.6	3 44.4
18	87 7.5	- 5 58.3	73 9.6	58 23.8	5 46.3	63 20.0	3 45.9
20	117 7.8	- 5 56.4	103 14.6	88 23.1	5 48.8	93 21.5	3 47.5
22	147 8.1	- 5 54.4	133 19.5	118 22.5	5 51.4	123 22.9	3 49.0
Δ	1	10		-3	13	7	8

UT	MESEC				JUPITER		SATURN	
	$S_\leftmoon$	Δ	$\delta_\leftmoon$	Δ	$S_{\mathrm{♃}}$	$\delta_{\mathrm{♃}}$	$S_{\mathrm{♄}}$	$\delta_{\mathrm{♄}}$
h	° ′		° ′		° ′	° ′	° ′	° ′
0	5 48.1	150	6 35.9	-87	25 14.0	17 26.4	279 7.8	-19 3.9
2	34 56.1	150	6 18.5	-88	55 19.5	17 26.6	309 12.7	-19 3.9
4	64 4.2	151	6 .9	-88	85 24.9	17 26.7	339 17.5	-19 3.9
6	93 12.3	151	5 43.2	-89	115 30.3	17 26.9	9 22.4	-19 3.9
8	122 20.5	151	5 25.5	-89	145 35.8	17 27.0	39 27.2	-19 3.9
10	151 28.8	151	5 7.6	-90	175 41.2	17 27.2	69 32.0	-19 4.0
12	180 37.1	152	4 49.7	-90	205 46.6	17 27.3	99 36.9	-19 4.0
14	209 45.4	152	4 31.7	-90	235 52.0	17 27.5	129 41.7	-19 4.0
16	238 53.8	152	4 13.6	-91	265 57.5	17 27.6	159 46.6	-19 4.0
18	268 2.2	152	3 55.4	-91	296 2.9	17 27.7	189 51.4	-19 4.0
20	297 10.7	152	3 37.2	-91	326 8.3	17 27.9	219 56.3	-19 4.0
22	326 19.2	153	3 18.9	-92	356 13.8	17 28.0	250 1.1	-19 4.0
Δ					27	1	24	0

φ	SUNCE		TRAJANJE SUMRAKA		MESEC			
	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 48	17 36	0 42	2 20	17 40	2.9	6 27	.7
55	6 41	17 43	0 36	2 1	17 45	2.7	6 20	.9
50	6 36	17 48	0 32	1 48	17 49	2.5	6 14	1.0
45	6 32	17 52	0 29	1 38	17 52	2.4	6 10	1.1
40	6 28	17 56	0 27	1 30	17 55	2.3	6 6	1.2
35	6 25	17 59	0 25	1 24	17 57	2.2	6 3	1.3
30	6 22	18 2	0 24	1 19	17 59	2.1	6 0	1.4
20	6 17	18 6	0 22	1 13	18 3	2.0	5 55	1.5
10	6 13	18 11	0 21	1 10	18 6	1.9	5 51	1.7
0	6 8	18 15	0 21	1 9	18 8	1.8	5 46	1.8
10	6 4	18 19	0 21	1 10	18 11	1.7	5 42	1.9
20	5 59	18 24	0 22	1 14	18 14	1.5	5 38	2.0
30	5 53	18 29	0 24	1 21	18 18	1.4	5 33	2.1
35	5 50	18 32	0 26	1 27	18 20	1.3	5 30	2.2
40	5 46	18 36	0 27	1 34	18 22	1.2	5 26	2.3
45	5 42	18 40	0 30	1 43	18 24	1.1	5 22	2.4
50	5 37	18 45	0 33	1 56	18 28	1.0	5 18	2.6
55	5 30	18 52	0 37	2 14	18 31	.9	5 12	2.7
60	5 22	18 60	0 43	2 44	18 36	.7	5 4	2.9
S								

SUNCE				MESEC				
UT	e = T_p − UT	Δ/24	r	Prolaz		Δ/24	$\pi_\leftmoon$	r
h	min s	s	′	$T_{\overline{m}}$	h min	min	′	′
00	-11 40.0	.6	16.2	$T_{\overline{m}}$	. . .	1.0	54.0	14.7
12	-11 33.3	$T_{\overline{m}_\odot}$	12 h 11.6 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 6	.1	346	-3.4	♄	22 15	.0	223	-2.0
♂	13 47	.1	351	1.2	♃	5 23	.0	117	.7

UT	SUNCE		PROLEĆ. TAČKA	VENERA		MARS	
	$S_\odot$	$\delta_\odot$	S_Υ	S_φ	δ_φ	S_σ	δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	177 8.4	- 5 52.5	163 24.4	148 21.8	5 53.9	153 24.4	3 50.5
2	207 8.7	- 5 50.6	193 29.3	178 21.2	5 56.5	183 25.8	3 52.1
4	237 8.9	- 5 48.6	223 34.3	208 20.6	5 59.0	213 27.3	3 53.6
6	267 9.2	- 5 46.7	253 39.2	238 19.9	6 1.6	243 28.7	3 55.2
8	297 9.5	- 5 44.8	283 44.1	268 19.3	6 4.2	273 30.2	3 56.7
10	327 9.8	- 5 42.8	313 49.1	298 18.6	6 6.7	303 31.6	3 58.3
12	357 10.1	- 5 40.9	343 54.0	328 18.0	6 9.3	333 33.0	3 59.8
14	27 10.4	- 5 39.0	13 58.9	358 17.3	6 11.8	3 34.5	4 1.3
16	57 10.7	- 5 37.0	44 3.8	28 16.7	6 14.4	33 35.9	4 2.9
18	87 11.0	- 5 35.1	74 8.8	58 16.1	6 16.9	63 37.4	4 4.4
20	117 11.3	- 5 33.1	104 13.7	88 15.4	6 19.5	93 38.8	4 6.0
22	147 11.6	- 5 31.2	134 18.6	118 14.8	6 22.0	123 40.3	4 7.5
Δ	1	10		-3	13	7	8

UT	MESEC				JUPITER		SATURN	
	$S_\leftmoon$	Δ	$\delta_\leftmoon$	Δ	S_{4}	δ_{4}	S_{5}	δ_{5}
h	° ′		° ′		° ′	° ′	° ′	° ′
0	355 27.7	153	3 .6	-92	26 19.2	17 28.2	280 6.0	-19 4.0
2	24 36.2	153	2 42.2	-92	56 24.6	17 28.3	310 10.8	-19 3.9
4	53 44.8	153	2 23.8	-92	86 30.0	17 28.5	340 15.7	-19 3.9
6	82 53.3	153	2 5.3	-93	116 35.4	17 28.6	10 20.5	-19 3.9
8	112 1.9	153	1 46.8	-93	146 40.9	17 28.7	40 25.4	-19 3.9
10	141 10.5	153	1 28.2	-93	176 46.3	17 28.9	70 30.2	-19 3.9
12	170 19.1	153	1 9.7	-93	206 51.7	17 29.0	100 35.1	-19 3.9
14	199 27.6	153	0 51.1	-93	236 57.1	17 29.2	130 39.9	-19 3.9
16	228 36.2	153	0 32.5	-93	267 2.5	17 29.3	160 44.8	-19 3.9
18	257 44.8	153	0 13.8	-45	297 7.9	17 29.5	190 49.7	-19 3.9
20	286 53.3	153	0 4.8	93	327 13.4	17 29.6	220 54.5	-19 3.9
22	316 1.9	153	0 23.4	93	357 18.8	17 29.7	250 59.4	-19 3.9
Δ					27	1	24	0

φ	SUNCE		TRAJANJE SUMRAKA		MESEC			
	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 45	17 39	0 42	2 20	18 50	.7	6 43	1.7
55	6 39	17 45	0 36	2 1	18 50	.9	6 40	1.7
50	6 34	17 50	0 32	1 48	18 50	1.0	6 39	1.7
45	6 30	17 54	0 29	1 38	18 50	1.2	6 37	1.7
40	6 26	17 57	0 27	1 30	18 50	1.3	6 36	1.7
35	6 24	17 60	0 25	1 24	18 51	1.3	6 35	1.7
30	6 21	18 2	0 24	1 19	18 51	1.4	6 34	1.7
20	6 16	18 7	0 22	1 13	18 51	1.5	6 32	1.8
10	6 12	18 11	0 21	1 10	18 51	1.7	6 30	1.8
0	6 8	18 15	0 21	1 9	18 51	1.8	6 29	1.8
10	6 4	18 19	0 21	1 10	18 51	1.9	6 27	1.8
20	5 59	18 23	0 22	1 14	18 51	2.0	6 26	1.8
30	5 54	18 28	0 24	1 21	18 51	2.1	6 24	1.8
35	5 51	18 31	0 26	1 26	18 51	2.2	6 23	1.8
40	5 48	18 34	0 27	1 33	18 51	2.3	6 22	1.8
45	5 43	18 38	0 30	1 43	18 51	2.4	6 20	1.8
50	5 38	18 43	0 33	1 55	18 52	2.5	6 19	1.8
55	5 32	18 49	0 37	2 13	18 52	2.7	6 17	1.8
60	5 24	18 57	0 43	2 42	18 52	2.9	6 14	1.8
S								

SUNCE				MESEC			
UT	e = T_p − UT	Δ/24	r	Prolaz	Δ/24	$\pi_\leftmoon$	r
h	min s	s	′	h min	min	′	′
00	-11 26.5	.6	16.2	$T_{\overline{m}}$ 0 19	1.8	54.0	14.7
12	-11 19.5	$T_{\overline{m}_\odot}$ 12 h 11.3 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 7	.1	345	-3.4	♃	22 11	.0	223	-2.0
♂	13 46	.1	350	1.2	♄	5 19	.0	117	.7

UT	SUNCE		PROLEĆ. TAČKA	VENERA		MARS	
	$S_\odot$	$\delta_\odot$	S_Υ	S_φ	δ_φ	S_σ	δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	177 11.9	- 5 29.3	164 23.6	148 14.1	6 24.6	153 41.7	4 9.0
2	207 12.2	- 5 27.3	194 28.5	178 13.5	6 27.1	183 43.2	4 10.6
4	237 12.5	- 5 25.4	224 33.4	208 12.8	6 29.7	213 44.6	4 12.1
6	267 12.7	- 5 23.4	254 38.3	238 12.2	6 32.2	243 46.1	4 13.6
8	297 13.0	- 5 21.5	284 43.3	268 11.5	6 34.8	273 47.5	4 15.2
10	327 13.3	- 5 19.5	314 48.2	298 10.9	6 37.3	303 48.9	4 16.7
12	357 13.6	- 5 17.6	344 53.1	328 10.2	6 39.8	333 50.4	4 18.3
14	27 13.9	- 5 15.7	14 58.1	358 9.6	6 42.4	3 51.8	4 19.8
16	57 14.2	- 5 13.7	45 3.0	28 8.9	6 44.9	33 53.3	4 21.3
18	87 14.5	- 5 11.8	75 7.9	58 8.3	6 47.5	63 54.7	4 22.9
20	117 14.8	- 5 9.8	105 12.8	88 7.7	6 50.0	93 56.2	4 24.4
22	147 15.1	- 5 7.9	135 17.8	118 7.0	6 52.5	123 57.6	4 25.9
Δ	1	10		-3	13	7	8

UT	MESEC				JUPITER		SATURN	
	$S_\leftmoon$	Δ	$\delta_\leftmoon$	Δ	S_{4}	δ_{4}	S_{5}	δ_{5}
h	° ′		° ′		° ′	° ′	° ′	° ′
0	345 10.4	152	0 42.1	93	27 24.2	17 29.9	281 4.2	-19 3.9
2	14 18.8	152	1 .7	93	57 29.6	17 30.0	311 9.1	-19 3.9
4	43 27.3	152	1 19.3	93	87 35.0	17 30.2	341 13.9	-19 3.9
6	72 35.7	152	1 37.9	93	117 40.4	17 30.3	11 18.8	-19 3.9
8	101 44.1	152	1 56.5	93	147 45.8	17 30.4	41 23.7	-19 3.9
10	130 52.4	151	2 15.1	93	177 51.2	17 30.6	71 28.5	-19 3.9
12	160 .7	151	2 33.6	92	207 56.6	17 30.7	101 33.4	-19 3.9
14	189 8.9	151	2 52.1	92	238 2.0	17 30.8	131 38.3	-19 3.9
16	218 17.0	150	3 10.6	92	268 7.5	17 31.0	161 43.1	-19 3.9
18	247 25.1	150	3 29.0	92	298 12.9	17 31.1	191 48.0	-19 3.9
20	276 33.2	150	3 47.4	92	328 18.3	17 31.3	221 52.9	-19 3.9
22	305 41.1	149	4 5.7	91	358 23.7	17 31.4	251 57.7	-19 3.9
Δ					27	1	24	0

φ	SUNCE		TRAJANJE SUMRAKA		MESEC			
	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 42	17 41	0 42	2 20	19 7	.7	7 24	2.9
55	6 36	17 47	0 36	2 1	19 12	.9	7 22	2.7
50	6 32	17 51	0 32	1 48	19 15	1.0	7 20	2.6
45	6 28	17 55	0 29	1 38	19 18	1.2	7 19	2.4
40	6 25	17 58	0 27	1 30	19 21	1.3	7 18	2.3
35	6 22	18 1	0 25	1 24	19 23	1.4	7 17	2.2
30	6 20	18 3	0 24	1 19	19 25	1.4	7 16	2.2
20	6 15	18 7	0 22	1 13	19 28	1.6	7 14	2.0
10	6 12	18 11	0 21	1 10	19 31	1.7	7 13	1.9
0	6 8	18 14	0 21	1 9	19 33	1.8	7 11	1.8
10	6 4	18 18	0 21	1 10	19 36	1.9	7 10	1.7
20	5 60	18 22	0 22	1 14	19 39	2.0	7 9	1.5
30	5 55	18 27	0 24	1 21	19 42	2.2	7 7	1.4
35	5 52	18 30	0 26	1 26	19 44	2.3	7 6	1.3
40	5 49	18 33	0 27	1 33	19 46	2.3	7 5	1.2
45	5 45	18 37	0 30	1 42	19 49	2.5	7 4	1.1
50	5 40	18 41	0 33	1 55	19 52	2.6	7 2	1.0
55	5 34	18 47	0 37	2 12	19 56	2.7	7 1	.9
60	5 27	18 54	0 43	2 41	20 1	3.0	6 58	.7
S								

SUNCE				MESEC			
UT	e = T_p − UT	Δ/24	r	Prolaz	Δ/24	$\pi_\leftmoon$	r
h	min s	s	′	h min	min	′	′
00	-11 12.6	.6	16.1	$T_{\overline{m}}$ 1 1	1.8	54.1	14.7
12	-11 5.4	$T_{\overline{m}_\odot}$ 12 h 11.1 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 7	.1	344	-3.4	♃	22 6	.0	223	-2.0
♂	13 45	.1	349	1.3	♄	5 15	.0	117	.6

UT	SUNCE		PROLEĆ. TAČKA	VENERA		MARS	
	$S_\odot$	$\delta_\odot$	S_Υ	S_φ	δ_φ	S_σ	δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	177 15.4	- 5 5.9	165 22.7	148 6.3	6 55.1	153 59.1	4 27.5
2	207 15.8	- 5 4.0	195 27.6	178 5.7	6 57.6	184 .5	4 29.0
4	237 16.1	- 5 2.0	225 32.6	208 5.0	7 .1	214 2.0	4 30.5
6	267 16.4	- 5 .1	255 37.5	238 4.4	7 2.7	244 3.4	4 32.1
8	297 16.7	- 4 58.1	285 42.4	268 3.7	7 5.2	274 4.9	4 33.6
10	327 17.0	- 4 56.2	315 47.3	298 3.1	7 7.7	304 6.3	4 35.1
12	357 17.3	- 4 54.2	345 52.3	328 2.4	7 10.3	334 7.7	4 36.7
14	27 17.6	- 4 52.3	15 57.2	358 1.8	7 12.8	4 9.2	4 38.2
16	57 17.9	- 4 50.3	46 2.1	28 1.1	7 15.3	34 10.6	4 39.7
18	87 18.2	- 4 48.4	76 7.1	58 .5	7 17.8	64 12.1	4 41.3
20	117 18.5	- 4 46.4	106 12.0	87 59.8	7 20.4	94 13.5	4 42.8
22	147 18.8	- 4 44.5	136 16.9	117 59.2	7 22.9	124 15.0	4 44.3
Δ	2	10		-3	13	7	8

UT	MESEC				JUPITER		SATURN	
	$S_\leftmoon$	Δ	$\delta_\leftmoon$	Δ	$S_{\jupiter}$	$\delta_{\jupiter}$	$S_{\saturn}$	$\delta_{\saturn}$
h	° ′		° ′		° ′	° ′	° ′	° ′
0	334 49.0	149	4 23.9	91	28 29.1	17 31.5	282 2.6	-19 3.9
2	3 56.8	149	4 42.1	91	58 34.5	17 31.7	312 7.5	-19 3.9
4	33 4.5	148	5 .3	90	88 39.9	17 31.8	342 12.3	-19 3.9
6	62 12.2	148	5 18.3	90	118 45.3	17 31.9	12 17.2	-19 3.9
8	91 19.7	147	5 36.3	89	148 50.7	17 32.1	42 22.1	-19 3.9
10	120 27.1	147	5 54.2	89	178 56.0	17 32.2	72 26.9	-19 3.9
12	149 34.5	146	6 12.0	89	209 1.4	17 32.3	102 31.8	-19 3.9
14	178 41.7	146	6 29.7	88	239 6.8	17 32.5	132 36.7	-19 3.9
16	207 48.8	145	6 47.3	88	269 12.2	17 32.6	162 41.6	-19 3.9
18	236 55.8	144	7 4.9	87	299 17.6	17 32.7	192 46.4	-19 3.9
20	266 2.7	144	7 22.3	87	329 23.0	17 32.9	222 51.3	-19 3.9
22	295 9.5	143	7 39.6	86	359 28.4	17 33.0	252 56.2	-19 3.9
Δ					27	1	24	0

φ	SUNCE		TRAJANJE SUMRAKA		MESEC			
	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 39	17 44	0 42	2 20	19 24	.8	8 35	3.0
55	6 34	17 49	0 36	2 1	19 33	1.0	8 28	2.7
50	6 30	17 53	0 32	1 48	19 41	1.1	8 22	2.6
45	6 26	17 56	0 29	1 38	19 46	1.3	8 17	2.5
40	6 23	17 59	0 27	1 30	19 51	1.4	8 14	2.4
35	6 21	18 1	0 25	1 24	19 55	1.4	8 10	2.3
30	6 19	18 4	0 24	1 19	19 59	1.5	8 8	2.2
20	6 15	18 7	0 22	1 13	20 6	1.6	8 3	2.1
10	6 11	18 11	0 21	1 10	20 11	1.8	7 58	1.9
0	6 8	18 14	0 21	1 9	20 17	1.9	7 54	1.8
10	6 4	18 18	0 21	1 10	20 22	2.0	7 50	1.7
20	6 0	18 21	0 22	1 14	20 28	2.1	7 46	1.6
30	5 55	18 26	0 24	1 21	20 35	2.2	7 41	1.5
35	5 53	18 28	0 25	1 26	20 38	2.3	7 38	1.4
40	5 50	18 31	0 27	1 33	20 43	2.4	7 35	1.3
45	5 46	18 35	0 30	1 42	20 48	2.5	7 31	1.2
50	5 42	18 39	0 33	1 54	20 54	2.6	7 27	1.1
55	5 36	18 44	0 37	2 12	21 2	2.8	7 21	.9
60	5 29	18 51	0 43	2 39	21 12	3.0	7 14	.7
S								

SUNCE				MESEC			
UT	e = T_p − UT	Δ/24	r	Prolaz	Δ/24	$\pi_\leftmoon$	r
h	min s	s	′	h min	min	′	′
00	-10 58.2	.6	16.1	$T_{\overline{m}}$ 1 44	1.8	54.3	14.8
12	-10 50.8	$T_{\overline{m}_\odot}$ 12 h 10.8 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 8	.1	343	-3.4	♄	22 2	.0	223	-2.0
♂	13 43	.1	349	1.3	♃	5 11	.0	117	.6

UT	SUNCE		PROLEĆ. TAČKA	VENERA		MARS	
	$S_\odot$	$\delta_\odot$	S_Υ	S_φ	δ_φ	S_σ	δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	177 19.1	- 4 42.5	166 21.8	147 58.5	7 25.4	154 16.4	4 45.8
2	207 19.4	- 4 40.6	196 26.8	177 57.8	7 27.9	184 17.9	4 47.4
4	237 19.8	- 4 38.6	226 31.7	207 57.2	7 30.5	214 19.3	4 48.9
6	267 20.1	- 4 36.7	256 36.6	237 56.5	7 33.0	244 20.8	4 50.4
8	297 20.4	- 4 34.7	286 41.5	267 55.9	7 35.5	274 22.2	4 52.0
10	327 20.7	- 4 32.8	316 46.5	297 55.2	7 38.0	304 23.7	4 53.5
12	357 21.0	- 4 30.8	346 51.4	327 54.5	7 40.5	334 25.1	4 55.0
14	27 21.3	- 4 28.9	16 56.3	357 53.9	7 43.0	4 26.5	4 56.5
16	57 21.6	- 4 26.9	47 1.3	27 53.2	7 45.6	34 28.0	4 58.1
18	87 22.0	- 4 25.0	77 6.2	57 52.6	7 48.1	64 29.4	4 59.6
20	117 22.3	- 4 23.0	107 11.1	87 51.9	7 50.6	94 30.9	5 1.1
22	147 22.6	- 4 21.0	137 16.0	117 51.2	7 53.1	124 32.3	5 2.6
Δ	2	10		-3	13	7	8

UT	MESEC				JUPITER		SATURN	
	$S_\leftmoon$	Δ	$\delta_\leftmoon$	Δ	$S_{\jupiter}$	$\delta_{\jupiter}$	$S_{\saturn}$	$\delta_{\saturn}$
h	° ′		° ′		° ′	° ′	° ′	° ′
0	324 16.1	143	7 56.8	85	29 33.8	17 33.1	283 1.1	-19 3.9
2	353 22.6	142	8 13.8	85	59 39.2	17 33.3	313 5.9	-19 3.8
4	22 29.0	141	8 30.8	84	89 44.6	17 33.4	343 10.8	-19 3.8
6	51 35.3	140	8 47.6	83	119 49.9	17 33.5	13 15.7	-19 3.8
8	80 41.4	140	9 4.2	83	149 55.3	17 33.6	43 20.6	-19 3.8
10	109 47.3	139	9 20.8	82	180 .7	17 33.8	73 25.4	-19 3.8
12	138 53.1	138	9 37.2	81	210 6.1	17 33.9	103 30.3	-19 3.8
14	167 58.8	137	9 53.4	80	240 11.5	17 34.0	133 35.2	-19 3.8
16	197 4.2	137	10 9.4	80	270 16.9	17 34.2	163 40.1	-19 3.8
18	226 9.6	136	10 25.4	79	300 22.2	17 34.3	193 45.0	-19 3.8
20	255 14.7	135	10 41.1	78	330 27.6	17 34.4	223 49.9	-19 3.8
22	284 19.7	134	10 56.7	77	0 33.0	17 34.5	253 54.7	-19 3.8
Δ					27	1	24	0

φ	SUNCE		TRAJANJE SUMRAKA		MESEC			
	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 36	17 46	0 42	2 21	19 43	.9	9 46	3.0
55	6 31	17 51	0 36	2 2	19 57	1.1	9 33	2.7
50	6 27	17 55	0 32	1 48	20 8	1.3	9 24	2.6
45	6 24	17 58	0 29	1 38	20 16	1.4	9 16	2.5
40	6 22	18 0	0 27	1 30	20 24	1.5	9 10	2.4
35	6 20	18 2	0 25	1 24	20 30	1.6	9 5	2.3
30	6 17	18 4	0 24	1 19	20 35	1.6	9 0	2.2
20	6 14	18 8	0 22	1 13	20 45	1.7	8 52	2.1
10	6 11	18 11	0 21	1 10	20 53	1.8	8 45	2.0
0	6 7	18 14	0 21	1 9	21 1	1.9	8 38	1.9
10	6 4	18 17	0 21	1 10	21 9	2.0	8 31	1.8
20	6 0	18 21	0 22	1 14	21 18	2.1	8 24	1.7
30	5 56	18 25	0 24	1 21	21 28	2.2	8 16	1.6
35	5 54	18 27	0 25	1 26	21 33	2.3	8 11	1.5
40	5 51	18 30	0 27	1 33	21 40	2.4	8 6	1.4
45	5 47	18 33	0 30	1 42	21 47	2.5	7 60	1.3
50	5 43	18 37	0 33	1 54	21 56	2.6	7 53	1.2
55	5 38	18 42	0 37	2 11	22 8	2.7	7 44	1.0
60	5 32	18 48	0 43	2 38	22 23	2.9	7 32	.8
S								

SUNCE				MESEC			
UT	e = T_p − UT	Δ/24	r	Prolaz	Δ/24	$\pi_\leftmoon$	r
h	min s	s	′	h min	min	′	′
00	-10 43.5	.6	16.1	$T_{\overline{m}}$ 2 27	1.9	54.5	14.9
12	-10 35.9	$T_{\overline{m}_\odot}$ 12 h 10.6 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 8	.1	342	-3.4	♄	21 58	.0	223	-2.0
♂	13 42	.1	348	1.3	♃	5 7	.0	117	.6

UT	SUNCE $S_\odot$	SUNCE $\delta_\odot$	PROLEĆ. TAČKA S_Υ	VENERA S_φ	VENERA δ_φ	MARS S_σ	MARS δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	177 22.9	− 4 19.1	167 21.0	147 50.6	7 55.6	154 33.8	5 4.2
2	207 23.2	− 4 17.1	197 25.9	177 49.9	7 58.1	184 35.2	5 5.7
4	237 23.5	− 4 15.2	227 30.8	207 49.2	8 .6	214 36.7	5 7.2
6	267 23.9	− 4 13.2	257 35.8	237 48.6	8 3.1	244 38.1	5 8.7
8	297 24.2	− 4 11.3	287 40.7	267 47.9	8 5.6	274 39.6	5 10.2
10	327 24.5	− 4 9.3	317 45.6	297 47.2	8 8.1	304 41.0	5 11.8
12	357 24.8	− 4 7.3	347 50.5	327 46.6	8 10.6	334 42.5	5 13.3
14	27 25.1	− 4 5.4	17 55.5	357 45.9	8 13.1	4 43.9	5 14.8
16	57 25.5	− 4 3.4	48 .4	27 45.2	8 15.6	34 45.3	5 16.3
18	87 25.8	− 4 1.5	78 5.3	57 44.5	8 18.1	64 46.8	5 17.8
20	117 26.1	− 3 59.5	108 10.3	87 43.9	8 20.6	94 48.2	5 19.4
22	147 26.4	− 3 57.5	138 15.2	117 43.2	8 23.1	124 49.7	5 20.9
Δ	2	10		−3	13	7	8

UT	MESEC $S_\leftmoon$	MESEC Δ	MESEC $\delta_\leftmoon$	MESEC Δ	JUPITER $S_{\jupiter}$	JUPITER $\delta_{\jupiter}$	SATURN $S_{\saturn}$	SATURN $\delta_{\saturn}$
h	° ′		° ′		° ′	° ′	° ′	° ′
0	313 24.5	133	11 12.0	76	30 38.4	17 34.7	283 59.6	−19 3.8
2	342 29.2	132	11 27.2	75	60 43.7	17 34.8	314 4.5	−19 3.8
4	11 33.7	131	11 42.3	74	90 49.1	17 34.9	344 9.4	−19 3.8
6	40 37.9	130	11 57.1	73	120 54.5	17 35.1	14 14.3	−19 3.8
8	69 42.0	130	12 11.7	72	150 59.9	17 35.2	44 19.2	−19 3.8
10	98 45.9	129	12 26.1	71	181 5.2	17 35.3	74 24.1	−19 3.7
12	127 49.7	128	12 40.3	70	211 10.6	17 35.4	104 28.9	−19 3.7
14	156 53.2	127	12 54.3	69	241 16.0	17 35.6	134 33.8	−19 3.7
16	185 56.5	126	13 8.1	68	271 21.3	17 35.7	164 38.7	−19 3.7
18	214 59.6	125	13 21.6	67	301 26.7	17 35.8	194 43.6	−19 3.7
20	244 2.6	124	13 34.9	65	331 32.1	17 35.9	224 48.5	−19 3.7
22	273 5.3	123	13 48.0	64	1 37.4	17 36.1	254 53.4	−19 3.7
Δ					27	1	24	0

φ	SUNCE IZLAZ	SUNCE ZALAZ	TRAJANJE SUMRAKA GRAĐ.	TRAJANJE SUMRAKA ASTR.	MESEC IZLAZ	MESEC Δ/24	MESEC ZALAZ	MESEC Δ/24
N	h min	h min	h min	h min	h min	min	h min	min
60	6 33	17 49	0 41	2 21	20 6	1.2	10 57	2.9
55	6 29	17 53	0 36	2 2	20 24	1.3	10 39	2.7
50	6 25	17 56	0 32	1 48	20 38	1.5	10 26	2.6
45	6 23	17 59	0 29	1 38	20 50	1.6	10 16	2.5
40	6 20	18 1	0 27	1 30	20 59	1.6	10 7	2.4
35	6 18	18 3	0 25	1 24	21 7	1.7	9 60	2.3
30	6 16	18 5	0 24	1 19	21 14	1.8	9 53	2.3
20	6 13	18 8	0 22	1 13	21 27	1.9	9 42	2.2
10	6 10	18 11	0 21	1 10	21 37	1.9	9 33	2.1
0	6 7	18 14	0 21	1 9	21 48	2.0	9 23	2.0
10	6 4	18 17	0 21	1 10	21 58	2.1	9 14	1.9
20	6 1	18 20	0 22	1 14	22 9	2.2	9 5	1.8
30	5 57	18 23	0 24	1 21	22 22	2.3	8 53	1.7
35	5 54	18 26	0 25	1 26	22 29	2.3	8 47	1.6
40	5 52	18 28	0 27	1 32	22 37	2.4	8 40	1.6
45	5 49	18 31	0 30	1 41	22 47	2.5	8 31	1.5
50	5 45	18 35	0 33	1 53	22 59	2.6	8 21	1.4
55	5 40	18 39	0 37	2 10	23 14	2.1	8 9	1.2
60	5 34	18 45	0 43	2 36	23 33	2.1	7 52	1.0
S								

SUNCE UT	SUNCE $e = T_p - UT$	SUNCE Δ/24	SUNCE r	MESEC Prolaz	MESEC Δ/24	MESEC $\pi_\leftmoon$	MESEC r
h	min s	s	′	h min	min	′	′
00	−10 28.4	.6	16.1	$T_{\overline{m}}$ 3 12	2.0	54.9	15.0
12	−10 20.7	$T_{\overline{m}_\odot}$ 12 h 10.3 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 9	.1	340	−3.4	♃	21 54	.0	223	−2.0
♂	13 41	.1	347	1.3	♄	5 3	.0	117	.6

UT	SUNCE $S_\odot$	SUNCE $\delta_\odot$	PROLEĆ. TAČKA S_Υ	VENERA S_φ	VENERA δ_φ	MARS S_σ	MARS δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	177 26.8	− 3 55.6	168 20.1	147 42.5	8 25.6	154 51.1	5 22.4
2	207 27.1	− 3 53.6	198 25.0	177 41.9	8 28.1	184 52.6	5 23.9
4	237 27.4	− 3 51.7	228 30.0	207 41.2	8 30.6	214 54.0	5 25.4
6	267 27.7	− 3 49.7	258 34.9	237 40.5	8 33.1	244 55.5	5 27.0
8	297 28.1	− 3 47.7	288 39.8	267 39.8	8 35.6	274 56.9	5 28.5
10	327 28.4	− 3 45.8	318 44.8	297 39.1	8 38.1	304 58.4	5 30.0
12	357 28.7	− 3 43.8	348 49.7	327 38.5	8 40.6	334 59.8	5 31.5
14	27 29.0	− 3 41.8	18 54.6	357 37.8	8 43.0	5 1.2	5 33.0
16	57 29.4	− 3 39.9	48 59.5	27 37.1	8 45.5	35 2.7	5 34.5
18	87 29.7	− 3 37.9	79 4.5	57 36.4	8 48.0	65 4.1	5 36.0
20	117 30.0	− 3 35.9	109 9.4	87 35.8	8 50.5	95 5.6	5 37.6
22	147 30.4	− 3 34.0	139 14.3	117 35.1	8 53.0	125 7.0	5 39.1
Δ	2	10		−3	12	7	8

UT	MESEC $S_\leftmoon$	MESEC Δ	MESEC $\delta_\leftmoon$	MESEC Δ	JUPITER $S_{\jupiter}$	JUPITER $\delta_{\jupiter}$	SATURN $S_{\saturn}$	SATURN $\delta_{\saturn}$
h	° ′		° ′		° ′	° ′	° ′	° ′
0	302 7.8	122	14 .8	63	31 42.8	17 36.2	284 58.3	−19 3.7
2	331 10.1	120	14 13.4	62	61 48.2	17 36.3	315 3.2	−19 3.7
4	0 12.2	119	14 25.7	60	91 53.5	17 36.4	345 8.1	−19 3.7
6	29 14.1	118	14 37.8	59	121 58.9	17 36.5	15 13.0	−19 3.7
8	58 15.7	117	14 49.6	58	152 4.2	17 36.7	45 17.9	−19 3.7
10	87 17.2	116	15 1.1	56	182 9.6	17 36.8	75 22.8	−19 3.7
12	116 18.4	115	15 12.4	55	212 15.0	17 36.9	105 27.7	−19 3.6
14	145 19.4	114	15 23.4	53	242 20.3	17 37.0	135 32.6	−19 3.6
16	174 20.2	113	15 34.1	52	272 25.7	17 37.2	165 37.5	−19 3.6
18	203 20.8	112	15 44.4	50	302 31.0	17 37.3	195 42.4	−19 3.6
20	232 21.1	111	15 54.5	49	332 36.4	17 37.4	225 47.3	−19 3.6
22	261 21.3	109	16 4.3	47	2 41.7	17 37.5	255 52.2	−19 3.6
Δ					27	1	24	0

φ	SUNCE IZLAZ	SUNCE ZALAZ	TRAJANJE SUMRAKA GRAĐ.	TRAJANJE SUMRAKA ASTR.	MESEC IZLAZ	MESEC Δ/24	MESEC ZALAZ	MESEC Δ/24
N	h min	h min	h min	h min	h min	min	h min	min
60	6 30	17 51	0 41	2 21	20 34	1.5	12 6	2.8
55	6 26	17 55	0 36	2 2	20 57	1.6	11 45	2.6
50	6 23	17 58	0 32	1 48	21 14	1.7	11 28	2.5
45	6 21	18 0	0 29	1 38	21 27	1.8	11 15	2.5
40	6 19	18 2	0 27	1 30	21 39	1.9	11 5	2.4
35	6 17	18 4	0 25	1 24	21 48	1.9	10 56	2.3
30	6 15	18 5	0 24	1 19	21 57	1.9	10 48	2.3
20	6 12	18 8	0 22	1 13	22 11	2.0	10 34	2.2
10	6 9	18 11	0 21	1 10	22 24	2.1	10 22	2.1
0	6 7	18 13	0 21	1 9	22 36	2.1	10 11	2.1
10	6 4	18 16	0 21	1 10	22 48	2.2	9 60	2.0
20	6 1	18 19	0 22	1 14	23 1	2.2	9 48	1.9
30	5 57	18 22	0 24	1 21	23 16	2.1	9 34	1.9
35	5 55	18 24	0 25	1 26	23 25	2.1	9 26	1.8
40	5 53	18 27	0 27	1 32	23 35	2.1	9 17	1.7
45	5 50	18 29	0 30	1 41	23 46	2.1	9 7	1.7
50	5 47	18 33	0 33	1 53	. . .	.0	8 54	1.6
55	5 42	18 37	0 37	2 9	. . .	.0	8 38	1.5
60	5 37	18 42	0 42	2 35	. . .	.0	8 17	1.3
S								

SUNCE UT	SUNCE $e = T_p - UT$	SUNCE Δ/24	SUNCE r	MESEC Prolaz	MESEC Δ/24	MESEC $\pi_\leftmoon$	MESEC r
h	min s	s	′	h min	min	′	′
00	−10 13.0	.7	16.1	$T_{\overline{m}}$ 3 59	2.0	55.4	15.1
12	−10 5.1	$T_{\overline{m}_\odot}$ 12 h 10.1 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 9	.1	339	−3.4	♃	21 49	.0	223	−2.0
♂	13 40	.1	347	1.3	♄	4 59	.0	117	.6

UT	SUNCE		PROLEĆ. TAČKA	VENERA		MARS	
	$S_\odot$	$\delta_\odot$	S_Υ	S_φ	δ_φ	S_σ	δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	177 30.7	− 3 32.0	169 19.3	147 34.4	8 55.4	155 8.5	5 40.6
2	207 31.0	− 3 30.1	199 24.2	177 33.7	8 57.9	185 9.9	5 42.1
4	237 31.3	− 3 28.1	229 29.1	207 33.0	9 .4	215 11.4	5 43.6
6	267 31.7	− 3 26.1	259 34.0	237 32.3	9 2.9	245 12.8	5 45.1
8	297 32.0	− 3 24.2	289 39.0	267 31.7	9 5.3	275 14.2	5 46.6
10	327 32.3	− 3 22.2	319 43.9	297 31.0	9 7.8	305 15.7	5 48.1
12	357 32.7	− 3 20.2	349 48.8	327 30.3	9 10.3	335 17.1	5 49.7
14	27 33.0	− 3 18.3	19 53.8	357 29.6	9 12.7	5 18.6	5 51.2
16	57 33.3	− 3 16.3	49 58.7	27 28.9	9 15.2	35 20.0	5 52.7
18	87 33.7	− 3 14.3	80 3.6	57 28.2	9 17.7	65 21.5	5 54.2
20	117 34.0	− 3 12.3	110 8.5	87 27.5	9 20.1	95 22.9	5 55.7
22	147 34.4	− 3 10.4	140 13.5	117 26.8	9 22.6	125 24.4	5 57.2
Δ	2	10		−3	12	7	8

UT	MESEC				JUPITER		SATURN	
	$S_\leftmoon$	Δ	$\delta_\leftmoon$	Δ	$S_{\mathrm{♃}}$	$\delta_{\mathrm{♃}}$	$S_{\mathrm{♄}}$	$\delta_{\mathrm{♄}}$
h	° ′		° ′		° ′	° ′	° ′	° ′
0	290 21.1	108	16 13.8	46	32 47.1	17 37.6	285 57.1	−19 3.6
2	319 20.8	107	16 23.0	44	62 52.4	17 37.8	316 2.0	−19 3.6
4	348 20.3	106	16 31.9	43	92 57.8	17 37.9	346 6.9	−19 3.6
6	17 19.5	105	16 40.4	41	123 3.1	17 38.0	16 11.8	−19 3.6
8	46 18.5	104	16 48.6	39	153 8.5	17 38.1	46 16.7	−19 3.6
10	75 17.3	103	16 56.4	38	183 13.8	17 38.2	76 21.6	−19 3.5
12	104 15.8	102	17 4.0	36	213 19.2	17 38.3	106 26.5	−19 3.5
14	133 14.1	101	17 11.1	34	243 24.5	17 38.5	136 31.4	−19 3.5
16	162 12.2	99	17 18.0	32	273 29.8	17 38.6	166 36.3	−19 3.5
18	191 10.1	98	17 24.4	31	303 35.2	17 38.7	196 41.2	−19 3.5
20	220 7.8	97	17 30.5	29	333 40.5	17 38.8	226 46.1	−19 3.5
22	249 5.2	96	17 36.3	27	3 45.9	17 38.9	256 51.0	−19 3.5
Δ					27	1	25	0

φ	SUNCE		TRAJANJE SUMRAKA		MESEC			
	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 27	17 54	0 41	2 22	21 10	1.9	13 13	2.6
55	6 24	17 57	0 36	2 2	21 36	2.0	12 48	2.5
50	6 21	17 59	0 32	1 48	21 55	2.1	12 29	2.4
45	6 19	18 2	0 29	1 38	22 11	2.1	12 14	2.4
40	6 17	18 3	0 27	1 30	22 23	2.1	12 2	2.3
35	6 15	18 5	0 25	1 24	22 34	2.1	11 52	2.3
30	6 14	18 6	0 24	1 19	22 43	2.1	11 43	2.3
20	6 11	18 9	0 22	1 13	22 60	2.2	11 27	2.2
10	6 9	18 11	0 21	1 10	23 14	2.2	11 13	2.2
0	6 7	18 13	0 21	1 9	23 27	2.2	11 0	2.2
10	6 4	18 15	0 21	1 10	23 41	2.2	10 48	2.1
20	6 1	18 18	0 22	1 14	23 55	2.2	10 34	2.1
30	5 58	18 21	0 24	1 20	. . . .	.0	10 18	2.0
35	5 56	18 23	0 25	1 25	. . . .	.0	10 9	2.0
40	5 54	18 25	0 27	1 32	. . . .	.0	9 59	2.0
45	5 51	18 27	0 29	1 41	. . . .	.0	9 47	1.9
50	5 48	18 30	0 33	1 52	0 1	2.5	9 32	1.9
55	5 44	18 34	0 37	2 9	0 19	2.6	9 14	1.8
60	5 39	18 39	0 42	2 34	0 43	2.7	8 49	1.7
S								

SUNCE				MESEC			
UT	e = T_p − UT	Δ/24	r	Prolaz		Δ/24	$\pi_\leftmoon$	r
h	min s	s	′		h min	min	′	′
00	− 9 57.3	.7	16.1	$T_{\overline{m}}$	4 48	2.2	56.0	15.3
12	− 9 49.2	$T_{\overline{m}_\odot}$	12 h 9.8 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 10	.1	338	−3.4	♄	21 45	.0	223	−2.0
♂	13 39	.1	346	1.3	♇	4 55	.0	117	.6

UT	SUNCE		PROLEĆ. TAČKA	VENERA		MARS	
	$S_\odot$	$\delta_\odot$	S_Υ	S_φ	δ_φ	S_σ	δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	177 34.7	− 3 8.4	170 18.4	147 26.1	9 25.1	155 25.8	5 58.7
2	207 35.0	− 3 6.4	200 23.3	177 25.4	9 27.5	185 27.3	6 .2
4	237 35.4	− 3 4.5	230 28.2	207 24.8	9 30.0	215 28.7	6 1.7
6	267 35.7	− 3 2.5	260 33.2	237 24.1	9 32.4	245 30.1	6 3.2
8	297 36.0	− 3 .5	290 38.1	267 23.4	9 34.9	275 31.6	6 4.7
10	327 36.4	− 2 58.6	320 43.0	297 22.7	9 37.3	305 33.0	6 6.2
12	357 36.7	− 2 56.6	350 48.0	327 22.0	9 39.8	335 34.5	6 7.7
14	27 37.1	− 2 54.6	20 52.9	357 21.3	9 42.2	5 35.9	6 9.2
16	57 37.4	− 2 52.7	50 57.8	27 20.6	9 44.7	35 37.4	6 10.7
18	87 37.7	− 2 50.7	81 2.7	57 19.9	9 47.1	65 38.8	6 12.2
20	117 38.1	− 2 48.7	111 7.7	87 19.2	9 49.6	95 40.2	6 13.7
22	147 38.4	− 2 46.7	141 12.6	117 18.5	9 52.0	125 41.7	6 15.2
Δ	2	10		−3	12	7	8

UT	MESEC				JUPITER		SATURN	
	$S_\leftmoon$	Δ	$\delta_\leftmoon$	Δ	$S_{\mathrm{♃}}$	$\delta_{\mathrm{♃}}$	$S_{\mathrm{♄}}$	$\delta_{\mathrm{♄}}$
h	° ′		° ′		° ′	° ′	° ′	° ′
0	278 2.4	95	17 41.6	25	33 51.2	17 39.0	286 56.0	−19 3.5
2	306 59.4	94	17 46.6	23	63 56.5	17 39.1	317 .9	−19 3.5
4	335 56.2	93	17 51.3	21	94 1.9	17 39.3	347 5.8	−19 3.4
6	4 52.8	92	17 55.5	19	124 7.2	17 39.4	17 10.7	−19 3.4
8	33 49.2	91	17 59.3	17	154 12.5	17 39.5	47 15.6	−19 3.4
10	62 45.4	90	18 2.8	15	184 17.9	17 39.6	77 20.5	−19 3.4
12	91 41.3	89	18 5.8	13	214 23.2	17 39.7	107 25.4	−19 3.4
14	120 37.1	88	18 8.4	11	244 28.5	17 39.8	137 30.4	−19 3.4
16	149 32.7	87	18 10.7	9	274 33.9	17 39.9	167 35.3	−19 3.4
18	178 28.0	86	18 12.5	7	304 39.2	17 40.1	197 40.2	−19 3.4
20	207 23.2	85	18 13.9	5	334 44.5	17 40.2	227 45.1	−19 3.4
22	236 18.2	84	18 14.9	3	4 49.8	17 40.3	257 50.0	−19 3.3
Δ					27	1	25	0

φ	SUNCE		TRAJANJE SUMRAKA		MESEC			
	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 24	17 56	0 41	2 22	21 57	2.5	14 15	2.2
55	6 21	17 59	0 36	2 2	22 24	2.4	13 48	2.3
50	6 19	18 1	0 32	1 48	22 45	2.4	13 27	2.3
45	6 17	18 3	0 29	1 38	23 1	2.4	13 11	2.3
40	6 15	18 4	0 27	1 30	23 14	2.3	12 58	2.3
35	6 14	18 6	0 25	1 24	23 25	2.3	12 47	2.3
30	6 13	18 7	0 24	1 19	23 35	2.3	12 38	2.3
20	6 10	18 9	0 22	1 13	23 52	2.3	12 21	2.3
10	6 8	18 11	0 21	1 10	. . . .	.0	12 6	2.3
0	6 6	18 13	0 21	1 9	. . . .	.0	11 52	2.3
10	6 4	18 15	0 21	1 10	. . . .	.0	11 39	2.3
20	6 2	18 17	0 22	1 14	. . . .	.0	11 24	2.2
30	5 59	18 20	0 24	1 20	0 11	2.3	11 7	2.2
35	5 57	18 22	0 25	1 25	0 21	2.3	10 58	2.2
40	5 55	18 23	0 27	1 32	0 32	2.3	10 46	2.2
45	5 53	18 26	0 29	1 40	0 45	2.3	10 33	2.2
50	5 50	18 28	0 32	1 52	1 0	2.4	10 17	2.2
55	5 46	18 32	0 37	2 8	1 20	2.4	9 57	2.2
60	5 42	18 36	0 42	2 32	1 48	2.4	9 29	2.2
S								

SUNCE				MESEC			
UT	e = T_p − UT	Δ/24	r	Prolaz		Δ/24	$\pi_\leftmoon$	r
h	min s	s	′		h min	min	′	′
00	− 9 41.2	.7	16.1	$T_{\overline{m}}$	5 40	2.2	56.7	15.5
12	− 9 33.1	$T_{\overline{m}_\odot}$	12 h 9.6 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 11	.1	337	−3.4	♄	21 41	.0	224	−2.0
♂	13 38	.1	345	1.3	♇	4 51	.0	117	.6

14. MART 2015. SUBOTA

UT	SUNCE $S_\odot$	SUNCE $\delta_\odot$	PROLEĆ. TAČKA S_Υ	VENERA S_φ	VENERA δ_φ	MARS S_σ	MARS δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	177 38.8	- 2 44.8	171 17.5	147 17.8	9 54.5	155 43.1	6 16.7
2	207 39.1	- 2 42.8	201 22.5	177 17.1	9 56.9	185 44.6	6 18.2
4	237 39.4	- 2 40.8	231 27.4	207 16.4	9 59.4	215 46.0	6 19.7
6	267 39.8	- 2 38.9	261 32.3	237 15.7	10 1.8	245 47.5	6 21.2
8	297 40.1	- 2 36.9	291 37.2	267 14.9	10 4.2	275 48.9	6 22.7
10	327 40.5	- 2 34.9	321 42.2	297 14.2	10 6.7	305 50.3	6 24.2
12	357 40.8	- 2 32.9	351 47.1	327 13.5	10 9.1	335 51.8	6 25.7
14	27 41.2	- 2 31.0	21 52.0	357 12.8	10 11.5	5 53.2	6 27.2
16	57 41.5	- 2 29.0	51 57.0	27 12.1	10 14.0	35 54.7	6 28.7
18	87 41.8	- 2 27.0	82 1.9	57 11.4	10 16.4	65 56.1	6 30.2
20	117 42.2	- 2 25.0	112 6.8	87 10.7	10 18.8	95 57.6	6 31.7
22	147 42.5	- 2 23.1	142 11.7	117 10.0	10 21.2	125 59.0	6 33.2
Δ	2	10		-4	12	7	7

UT	MESEC $S_\leftmoon$	MESEC Δ	MESEC $\delta_\leftmoon$	MESEC Δ	JUPITER S_{4}	JUPITER δ_{4}	SATURN S_{5}	SATURN δ_{5}
h	° ′		° ′		° ′	° ′	° ′	° ′
0	265 13.0	83	18 15.5	1	34 55.2	17 40.4	287 54.9	-19 3.3
2	294 7.7	82	18 15.6	-1	65 .5	17 40.5	317 59.9	-19 3.3
4	323 2.1	81	18 15.3	-4	95 5.8	17 40.6	348 4.8	-19 3.3
6	351 56.4	81	18 14.6	-6	125 11.1	17 40.7	18 9.7	-19 3.3
8	20 50.5	80	18 13.5	-8	155 16.4	17 40.8	48 14.6	-19 3.3
10	49 44.5	79	18 11.9	-10	185 21.8	17 40.9	78 19.6	-19 3.3
12	78 38.3	78	18 9.8	-12	215 27.1	17 41.0	108 24.5	-19 3.3
14	107 31.9	77	18 7.4	-15	245 32.4	17 41.1	138 29.4	-19 3.2
16	136 25.4	77	18 4.4	-17	275 37.7	17 41.3	168 34.3	-19 3.2
18	165 18.8	76	18 1.1	-19	305 43.0	17 41.4	198 39.3	-19 3.2
20	194 12.0	75	17 57.3	-21	335 48.3	17 41.5	228 44.2	-19 3.2
22	223 5.1	75	17 53.0	-24	5 53.7	17 41.6	258 49.1	-19 3.2
Δ					27	1	25	0

φ	SUNCE IZLAZ	SUNCE ZALAZ	TRAJANJE SUMRAKA GRAĐ.	TRAJANJE SUMRAKA ASTR.	MESEC IZLAZ	MESEC Δ/24	MESEC ZALAZ	MESEC Δ/24
N	h min	h min	h min	h min	h min	min	h min	min
60	6 21	17 59	0 41	2 23	22 55	3.0	15 9	1.9
55	6 19	18 1	0 36	2 3	23 22	2.4	14 42	2.0
50	6 17	18 3	0 32	1 49	23 42	2.4	14 22	2.0
45	6 15	18 4	0 29	1 38	23 58	2.4	14 6	2.1
40	6 14	18 5	0 27	1 30	. . . .	.0	13 53	2.1
35	6 13	18 6	0 25	1 24	. . . .	.0	13 42	2.2
30	6 12	18 7	0 24	1 20	. . . .	.0	13 32	2.2
20	6 10	18 9	0 22	1 13	. . . .	.0	13 15	2.2
10	6 8	18 11	0 21	1 10	0 7	2.3	13 0	2.3
0	6 6	18 13	0 21	1 9	0 20	2.3	12 47	2.3
10	6 4	18 14	0 21	1 10	0 34	2.3	12 33	2.4
20	6 2	18 16	0 22	1 13	0 49	2.3	12 18	2.4
30	5 59	18 19	0 24	1 20	1 6	2.2	12 1	2.4
35	5 58	18 20	0 25	1 25	1 16	2.2	11 51	2.5
40	5 56	18 22	0 27	1 32	1 27	2.2	11 40	2.5
45	5 54	18 24	0 29	1 40	1 41	2.2	11 27	2.5
50	5 52	18 26	0 32	1 52	1 57	2.2	11 11	2.6
55	5 48	18 29	0 36	2 7	2 18	2.1	10 50	2.6
60	5 44	18 33	0 42	2 31	2 46	2.1	10 22	2.7
S								

SUNCE UT	SUNCE e = T_p − UT	SUNCE Δ/24	SUNCE r	MESEC Prolaz	MESEC Δ/24	MESEC $\pi_\leftmoon$	MESEC r
h	min s	s	′	h min	min	′	′
00	- 9 25.0	.7	16.1	$T_{\overline{m}}$ 6 33	2.3	57.6	15.7
12	- 9 16.7	$T_{\overline{m}_\odot}$ 12 h	9.3 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 11	.1	336	-3.4	♄	21 36	.0	224	-2.0
♂	13 36	.1	344	1.3	♃	4 48	.0	117	.6

15. MART NEDELJA

UT	SUNCE $S_\odot$	SUNCE $\delta_\odot$	PROLEĆ. TAČKA S_Υ	VENERA S_φ	VENERA δ_φ	MARS S_σ	MARS δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	177 42.9	- 2 21.1	172 16.7	147 9.3	10 23.7	156 .4	6 34.7
2	207 43.2	- 2 19.1	202 21.6	177 8.6	10 26.1	186 1.9	6 36.2
4	237 43.6	- 2 17.2	232 26.5	207 7.8	10 28.5	216 3.3	6 37.7
6	267 43.9	- 2 15.2	262 31.5	237 7.1	10 30.9	246 4.8	6 39.2
8	297 44.3	- 2 13.2	292 36.4	267 6.4	10 33.3	276 6.2	6 40.7
10	327 44.6	- 2 11.2	322 41.3	297 5.7	10 35.8	306 7.7	6 42.2
12	357 45.0	- 2 9.3	352 46.2	327 5.0	10 38.2	336 9.1	6 43.7
14	27 45.3	- 2 7.3	22 51.2	357 4.2	10 40.6	6 10.5	6 45.1
16	57 45.7	- 2 5.3	52 56.1	27 3.5	10 43.0	36 12.0	6 46.6
18	87 46.0	- 2 3.3	83 1.0	57 2.8	10 45.4	66 13.4	6 48.1
20	117 46.4	- 2 1.4	113 6.0	87 2.1	10 47.8	96 14.9	6 49.6
22	147 46.7	- 1 59.4	143 10.9	117 1.4	10 50.2	126 16.3	6 51.1
Δ	2	10		-4	12	7	7

UT	MESEC $S_\leftmoon$	MESEC Δ	MESEC $\delta_\leftmoon$	MESEC Δ	JUPITER S_{4}	JUPITER δ_{4}	SATURN S_{5}	SATURN δ_{5}
h	° ′		° ′		° ′	° ′	° ′	° ′
0	251 58.0	74	17 48.3	-26	35 59.0	17 41.7	288 54.0	-19 3.2
2	280 50.9	74	17 43.1	-28	66 4.3	17 41.8	318 59.0	-19 3.2
4	309 43.6	73	17 37.5	-30	96 9.6	17 41.9	349 3.9	-19 3.1
6	338 36.2	73	17 31.4	-33	126 14.9	17 42.0	19 8.8	-19 3.1
8	7 28.7	72	17 24.9	-35	156 20.2	17 42.1	49 13.8	-19 3.1
10	36 21.1	72	17 17.9	-37	186 25.5	17 42.2	79 18.7	-19 3.1
12	65 13.4	71	17 10.5	-39	216 30.8	17 42.3	109 23.6	-19 3.1
14	94 5.6	71	17 2.6	-42	246 36.1	17 42.4	139 28.6	-19 3.1
16	122 57.8	70	16 54.2	-44	276 41.4	17 42.5	169 33.5	-19 3.1
18	151 49.8	70	16 45.4	-46	306 46.7	17 42.6	199 38.4	-19 3.0
20	180 41.8	70	16 36.2	-48	336 52.0	17 42.7	229 43.4	-19 3.0
22	209 33.7	69	16 26.5	-51	6 57.3	17 42.8	259 48.3	-19 3.0
Δ					27	1	25	0

φ	SUNCE IZLAZ	SUNCE ZALAZ	TRAJANJE SUMRAKA GRAĐ.	TRAJANJE SUMRAKA ASTR.	MESEC IZLAZ	MESEC Δ/24	MESEC ZALAZ	MESEC Δ/24
N	h min	h min	h min	h min	h min	min	h min	min
60	6 18	18 1	0 41	2 23	. . . .	.0	15 54	1.5
55	6 16	18 3	0 36	2 3	. . . .	.0	15 29	1.7
50	6 15	18 4	0 32	1 49	. . . .	.0	15 11	1.8
45	6 13	18 5	0 29	1 38	. . . .	.0	14 56	1.9
40	6 12	18 6	0 27	1 30	0 11	2.6	14 44	2.0
35	6 11	18 7	0 25	1 24	0 22	2.6	14 34	2.1
30	6 10	18 8	0 24	1 20	0 31	2.5	14 25	2.1
20	6 9	18 9	0 22	1 13	0 48	2.5	14 9	2.2
10	6 7	18 11	0 21	1 10	1 2	2.4	13 55	2.3
0	6 6	18 12	0 21	1 9	1 16	2.3	13 42	2.4
10	6 4	18 14	0 21	1 10	1 29	2.3	13 29	2.4
20	6 2	18 15	0 22	1 13	1 43	2.2	13 16	2.5
30	6 0	18 18	0 24	1 20	1 60	2.2	12 60	2.6
35	5 59	18 19	0 25	1 25	2 9	2.1	12 50	2.7
40	5 57	18 20	0 27	1 31	2 20	2.1	12 40	2.7
45	5 55	18 22	0 29	1 40	2 33	2.0	12 27	2.8
50	5 53	18 24	0 32	1 51	2 49	1.9	12 12	2.9
55	5 50	18 26	0 36	2 7	3 9	1.8	11 53	3.0
60	5 47	18 30	0 42	2 30	3 35	1.7	11 27	3.2
S								

SUNCE UT	SUNCE e = T_p − UT	SUNCE Δ/24	SUNCE r	MESEC Prolaz	MESEC Δ/24	MESEC $\pi_\leftmoon$	MESEC r
h	min s	s	′	h min	min	′	′
00	- 9 8.4	.7	16.1	$T_{\overline{m}}$ 7 29	2.3	58.4	15.9
12	- 9 .1	$T_{\overline{m}_\odot}$ 12 h	9.0 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 12	.1	335	-3.4	♄	21 32	.0	224	-2.0
♂	13 35	.1	344	1.3	♃	4 44	.0	117	.6

UT	SUNCE $S_\odot$	SUNCE $\delta_\odot$	PROLEĆ. TAČKA S_Υ	VENERA S_φ	VENERA δ_φ	MARS S_σ	MARS δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	177 47.1	- 1 57.4	173 15.8	147 .6	10 52.6	156 17.8	6 52.6
2	207 47.4	- 1 55.4	203 20.7	176 59.9	10 55.0	186 19.2	6 54.1
4	237 47.8	- 1 53.5	233 25.7	206 59.2	10 57.4	216 20.6	6 55.6
6	267 48.1	- 1 51.5	263 30.6	236 58.4	10 59.8	246 22.1	6 57.0
8	297 48.5	- 1 49.5	293 35.5	266 57.7	11 2.2	276 23.5	6 58.5
10	327 48.8	- 1 47.5	323 40.4	296 57.0	11 4.6	306 25.0	7 .0
12	357 49.2	- 1 45.6	353 45.4	326 56.3	11 7.0	336 26.4	7 1.5
14	27 49.5	- 1 43.6	23 50.3	356 55.5	11 9.4	6 27.8	7 3.0
16	57 49.9	- 1 41.6	53 55.2	26 54.8	11 11.8	36 29.3	7 4.5
18	87 50.2	- 1 39.6	84 .2	56 54.1	11 14.2	66 30.7	7 5.9
20	117 50.6	- 1 37.6	114 5.1	86 53.3	11 16.6	96 32.2	7 7.4
22	147 51.0	- 1 35.7	144 10.0	116 52.6	11 19.0	126 33.6	7 8.9
Δ	2	10		-4	12	7	7

UT	MESEC $S_\leftmoon$	MESEC Δ	MESEC $\delta_\leftmoon$	MESEC Δ	JUPITER S_{4}	JUPITER δ_{4}	SATURN S_{5}	SATURN δ_{5}
h	° ′		° ′		° ′	° ′	° ′	° ′
0	238 25.5	69	16 16.4	-53	37 2.6	17 42.9	289 53.2	-19 3.0
2	267 17.3	69	16 5.8	-55	67 7.9	17 43.0	319 58.2	-19 3.0
4	296 9.1	68	15 54.8	-57	97 13.2	17 43.1	350 3.1	-19 3.0
6	325 .8	68	15 43.3	-59	127 18.5	17 43.2	20 8.1	-19 3.0
8	353 52.4	68	15 31.4	-62	157 23.8	17 43.3	50 13.0	-19 2.9
10	22 44.0	68	15 19.1	-64	187 29.1	17 43.4	80 17.9	-19 2.9
12	51 35.6	68	15 6.3	-66	217 34.4	17 43.5	110 22.9	-19 2.9
14	80 27.1	68	14 53.1	-68	247 39.6	17 43.6	140 27.8	-19 2.9
16	109 18.7	68	14 39.5	-70	277 44.9	17 43.7	170 32.8	-19 2.9
18	138 10.2	67	14 25.5	-72	307 50.2	17 43.8	200 37.7	-19 2.9
20	167 1.7	67	14 11.1	-74	337 55.5	17 43.9	230 42.7	-19 2.8
22	195 53.1	67	13 56.2	-76	8 .8	17 44.0	260 47.6	-19 2.8
Δ					26	0	25	0

φ	SUNCE IZLAZ	SUNCE ZALAZ	TRAJANJE SUMRAKA GRAĐ.	TRAJANJE SUMRAKA ASTR.	MESEC IZLAZ	MESEC Δ/24	MESEC ZALAZ	MESEC Δ/24
N	h min	h min	h min	h min	h min	min	h min	min
60	6 15	18 4	0 42	2 24	0 7	3.4	16 30	1.2
55	6 14	18 5	0 36	2 3	0 30	3.2	16 10	1.5
50	6 12	18 6	0 32	1 49	0 48	3.0	15 54	1.6
45	6 11	18 7	0 29	1 38	1 2	2.9	15 42	1.7
40	6 11	18 7	0 27	1 30	1 14	2.8	15 32	1.9
35	6 10	18 8	0 25	1 24	1 23	2.7	15 23	1.9
30	6 9	18 9	0 24	1 20	1 32	2.7	15 15	2.0
20	6 8	18 10	0 22	1 13	1 47	2.6	15 2	2.2
10	6 7	18 11	0 21	1 10	1 60	2.5	14 50	2.3
0	6 5	18 12	0 21	1 9	2 12	2.4	14 39	2.4
10	6 4	18 13	0 21	1 10	2 24	2.3	14 28	2.5
20	6 3	18 15	0 22	1 13	2 37	2.2	14 16	2.6
30	6 1	18 16	0 24	1 20	2 52	2.1	14 2	2.7
35	5 60	18 17	0 25	1 25	3 0	2.0	13 54	2.8
40	5 58	18 19	0 27	1 31	3 10	1.9	13 45	2.9
45	5 57	18 20	0 29	1 40	3 21	1.8	13 34	3.0
50	5 55	18 22	0 32	1 51	3 35	1.7	13 21	3.1
55	5 52	18 24	0 36	2 6	3 53	1.6	13 5	3.3
60	5 49	18 27	0 42	2 29	4 16	1.4	12 43	3.5
S								

SUNCE UT	SUNCE $e = T_p - UT$	SUNCE Δ/24	SUNCE r	MESEC Prolaz	MESEC Δ/24	MESEC $\pi_\leftmoon$	MESEC r
h	min s	s	′	h min	min	′	′
00	- 8 51.7	.7	16.1	$T_{\overline{m}}$ 8 25	2.4	59.3	16.2
12	- 8 43.2	$T_{\overline{m}_\odot}$ 12 h 8.7 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 12	.1	334	-3.4	♃	21 28	.0	224	-2.0
♂	13 34	.1	343	1.3	♄	4 40	.0	117	.6

UT	SUNCE $S_\odot$	SUNCE $\delta_\odot$	PROLEĆ. TAČKA S_Υ	VENERA S_φ	VENERA δ_φ	MARS S_σ	MARS δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	177 51.3	- 1 33.7	174 14.9	146 51.8	11 21.3	156 35.0	7 10.4
2	207 51.7	- 1 31.7	204 19.9	176 51.1	11 23.7	186 36.5	7 11.9
4	237 52.0	- 1 29.7	234 24.8	206 50.4	11 26.1	216 37.9	7 13.4
6	267 52.4	- 1 27.8	264 29.7	236 49.6	11 28.5	246 39.4	7 14.8
8	297 52.7	- 1 25.8	294 34.7	266 48.9	11 30.8	276 40.8	7 16.3
10	327 53.1	- 1 23.8	324 39.6	296 48.1	11 33.2	306 42.2	7 17.8
12	357 53.4	- 1 21.8	354 44.5	326 47.4	11 35.6	336 43.7	7 19.3
14	27 53.8	- 1 19.9	24 49.4	356 46.7	11 38.0	6 45.1	7 20.7
16	57 54.2	- 1 17.9	54 54.4	26 45.9	11 40.3	36 46.6	7 22.2
18	87 54.5	- 1 15.9	84 59.3	56 45.2	11 42.7	66 48.0	7 23.7
20	117 54.9	- 1 13.9	115 4.2	86 44.4	11 45.1	96 49.4	7 25.2
22	147 55.2	- 1 11.9	145 9.2	116 43.7	11 47.4	126 50.9	7 26.6
Δ	2	10		-4	12	7	7

UT	MESEC $S_\leftmoon$	MESEC Δ	MESEC $\delta_\leftmoon$	MESEC Δ	JUPITER S_{4}	JUPITER δ_{4}	SATURN S_{5}	SATURN δ_{5}
h	° ′		° ′		° ′	° ′	° ′	° ′
0	224 44.6	67	13 41.0	-78	38 6.1	17 44.1	290 52.5	-19 2.8
2	253 36.1	67	13 25.4	-80	68 11.3	17 44.2	320 57.5	-19 2.8
4	282 27.6	67	13 9.3	-82	98 16.6	17 44.3	351 2.4	-19 2.8
6	311 19.0	67	12 52.9	-84	128 21.9	17 44.4	21 7.4	-19 2.8
8	340 10.5	67	12 36.2	-86	158 27.2	17 44.5	51 12.3	-19 2.7
10	9 2.0	68	12 19.0	-88	188 32.5	17 44.6	81 17.3	-19 2.7
12	37 53.5	68	12 1.5	-89	218 37.7	17 44.7	111 22.2	-19 2.7
14	66 45.0	68	11 43.6	-91	248 43.0	17 44.8	141 27.2	-19 2.7
16	95 36.6	68	11 25.4	-93	278 48.3	17 44.9	171 32.1	-19 2.7
18	124 28.2	68	11 6.9	-94	308 53.6	17 45.0	201 37.1	-19 2.7
20	153 19.7	68	10 48.0	-96	338 58.8	17 45.1	231 42.1	-19 2.6
22	182 11.4	68	10 28.8	-98	9 4.1	17 45.2	261 47.0	-19 2.6
Δ					26	0	25	0

φ	SUNCE IZLAZ	SUNCE ZALAZ	TRAJANJE SUMRAKA GRAĐ.	TRAJANJE SUMRAKA ASTR.	MESEC IZLAZ	MESEC Δ/24	MESEC ZALAZ	MESEC Δ/24
N	h min	h min	h min	h min	h min	min	h min	min
60	6 12	18 6	0 42	2 24	1 28	3.7	16 59	1.0
55	6 11	18 7	0 36	2 4	1 47	3.4	16 44	1.3
50	6 10	18 8	0 32	1 49	2 1	3.2	16 33	1.5
45	6 10	18 8	0 29	1 39	2 12	3.1	16 24	1.6
40	6 9	18 8	0 27	1 31	2 21	3.0	16 16	1.7
35	6 9	18 9	0 25	1 24	2 29	2.9	16 10	1.8
30	6 8	18 9	0 24	1 20	2 36	2.8	16 4	1.9
20	6 7	18 10	0 22	1 13	2 48	2.6	15 53	2.1
10	6 6	18 11	0 21	1 10	2 59	2.5	15 44	2.2
0	6 5	18 12	0 21	1 9	3 9	2.4	15 36	2.4
10	6 4	18 13	0 21	1 10	3 19	2.3	15 27	2.5
20	6 3	18 14	0 22	1 13	3 29	2.1	15 18	2.6
30	6 1	18 15	0 24	1 20	3 41	2.0	15 8	2.8
35	6 0	18 16	0 25	1 25	3 48	1.9	15 2	2.9
40	5 59	18 17	0 27	1 31	3 56	1.8	14 55	3.0
45	5 58	18 18	0 29	1 39	4 5	1.7	14 46	3.1
50	5 56	18 20	0 32	1 50	4 16	1.5	14 36	3.3
55	5 54	18 21	0 36	2 6	4 30	1.4	14 24	3.5
60	5 52	18 24	0 42	2 28	4 48	1.1	14 8	3.7
S								

SUNCE UT	SUNCE $e = T_p - UT$	SUNCE Δ/24	SUNCE r	MESEC Prolaz	MESEC Δ/24	MESEC $\pi_\leftmoon$	MESEC r
h	min s	s	′	h min	min	′	′
00	- 8 34.8	.7	16.1	$T_{\overline{m}}$ 9 22	2.4	60.1	16.4
12	- 8 26.2	$T_{\overline{m}_\odot}$ 12 h 8.4 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 13	.1	333	-3.5	♃	21 24	.0	224	-2.0
♂	13 33	.1	342	1.3	♄	4 36	.0	117	.6

UT	SUNCE		PROLEĆ. TAČKA	VENERA		MARS	
	$S_\odot$	$\delta_\odot$	S_Υ	S_φ	δ_φ	S_σ	δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	177 55.6	- 1 10.0	175 14.1	146 42.9	11 49.8	156 52.3	7 28.1
2	207 56.0	- 1 8.0	205 19.0	176 42.2	11 52.1	186 53.7	7 29.6
4	237 56.3	- 1 6.0	235 23.9	206 41.4	11 54.5	216 55.2	7 31.1
6	267 56.7	- 1 4.0	265 28.9	236 40.7	11 56.9	246 56.6	7 32.5
8	297 57.0	- 1 2.1	295 33.8	266 39.9	11 59.2	276 58.1	7 34.0
10	327 57.4	- 1 .1	325 38.7	296 39.1	12 1.6	306 59.5	7 35.5
12	357 57.8	- 0 58.1	355 43.7	326 38.4	12 3.9	337 .9	7 36.9
14	27 58.1	- 0 56.1	25 48.6	356 37.6	12 6.3	7 2.4	7 38.4
16	57 58.5	- 0 54.1	55 53.5	26 36.9	12 8.6	37 3.8	7 39.9
18	87 58.8	- 0 52.2	85 58.4	56 36.1	12 10.9	67 5.3	7 41.3
20	117 59.2	- 0 50.2	116 3.4	86 35.3	12 13.3	97 6.7	7 42.8
22	147 59.6	- 0 48.2	146 8.3	116 34.6	12 15.6	127 8.1	7 44.3
Δ	2	10		-4	12	7	7

UT	MESEC				JUPITER		SATURN	
	$S_\leftmoon$	Δ	$\delta_\leftmoon$	Δ	$S_{\text{♃}}$	$\delta_{\text{♃}}$	$S_{\text{♄}}$	$\delta_{\text{♄}}$
h	° ′		° ′		° ′	° ′	° ′	° ′
0	211 3.0	68	10 9.3	-99	39 9.4	17 45.3	291 52.0	-19 2.6
2	239 54.7	69	9 49.5	-101	69 14.6	17 45.4	321 56.9	-19 2.6
4	268 46.4	69	9 29.4	-102	99 19.9	17 45.5	352 1.9	-19 2.6
6	297 38.1	69	9 9.0	-103	129 25.2	17 45.5	22 6.8	-19 2.6
8	326 29.9	69	8 48.3	-105	159 30.4	17 45.6	52 11.8	-19 2.5
10	355 21.7	69	8 27.4	-106	189 35.7	17 45.7	82 16.7	-19 2.5
12	24 13.6	69	8 6.2	-107	219 40.9	17 45.8	112 21.7	-19 2.5
14	53 5.5	70	7 44.8	-108	249 46.2	17 45.9	142 26.7	-19 2.5
16	81 57.4	70	7 23.1	-109	279 51.5	17 46.0	172 31.6	-19 2.5
18	110 49.3	70	7 1.2	-110	309 56.7	17 46.1	202 36.6	-19 2.4
20	139 41.3	70	6 39.1	-111	340 2.0	17 46.2	232 41.6	-19 2.4
22	168 33.4	70	6 16.9	-112	10 7.2	17 46.3	262 46.5	-19 2.4
Δ					26	0	25	0

φ	SUNCE		TRAJANJE SUMRAKA		MESEC			
	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 9	18 9	0 42	2 25	2 55	3.8	17 24	.9
55	6 8	18 9	0 36	2 4	3 8	3.5	17 15	1.2
50	6 8	18 9	0 32	1 49	3 18	3.3	17 8	1.4
45	6 8	18 9	0 29	1 39	3 26	3.2	17 3	1.5
40	6 7	18 10	0 27	1 31	3 32	3.0	16 58	1.7
35	6 7	18 10	0 25	1 24	3 38	2.9	16 54	1.8
30	6 7	18 10	0 24	1 20	3 43	2.8	16 50	1.9
20	6 6	18 10	0 22	1 13	3 51	2.6	16 44	2.0
10	6 6	18 11	0 21	1 10	3 59	2.5	16 38	2.2
0	6 5	18 11	0 21	1 9	4 6	2.4	16 33	2.3
10	6 4	18 12	0 21	1 10	4 13	2.2	16 27	2.5
20	6 3	18 13	0 22	1 13	4 20	2.1	16 22	2.7
30	6 2	18 14	0 24	1 20	4 29	1.9	16 15	2.8
35	6 1	18 15	0 25	1 25	4 34	1.8	16 11	2.9
40	6 0	18 15	0 27	1 31	4 39	1.7	16 7	3.1
45	5 59	18 16	0 29	1 39	4 46	1.6	16 1	3.2
50	5 58	18 17	0 32	1 50	4 53	1.4	15 55	3.4
55	5 56	18 19	0 36	2 5	5 3	1.2	15 48	3.6
60	5 54	18 21	0 42	2 27	5 15	1.0	15 37	3.8
S								

SUNCE				MESEC			
UT	$e = T_p - UT$	Δ/24	r	Prolaz	Δ/24	$\pi_\leftmoon$	r
h	min s	s	′	h min	min	′	′
00	- 8 17.6	.7	16.1	$T_{\overline{m}}$ 10 19	2.4	60.8	16.6
12	- 8 8.9	$T_{\overline{m}_\odot}$ 12 h 8.1 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 13	.1	331	-3.5	♃	21 20	.0	224	-2.0
♂	13 32	.1	342	1.3	♄	4 32	.0	117	.6

UT	SUNCE		PROLEĆ. TAČKA	VENERA		MARS	
	$S_\odot$	$\delta_\odot$	S_Υ	S_φ	δ_φ	S_σ	δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	177 59.9	- 0 46.2	176 13.2	146 33.8	12 18.0	157 9.6	7 45.7
2	208 .3	- 0 44.3	206 18.2	176 33.1	12 20.3	187 11.0	7 47.2
4	238 .7	- 0 42.3	236 23.1	206 32.3	12 22.6	217 12.4	7 48.7
6	268 1.0	- 0 40.3	266 28.0	236 31.5	12 25.0	247 13.9	7 50.1
8	298 1.4	- 0 38.3	296 32.9	266 30.7	12 27.3	277 15.3	7 51.6
10	328 1.7	- 0 36.3	326 37.9	296 30.0	12 29.6	307 16.8	7 53.1
12	358 2.1	- 0 34.4	356 42.8	326 29.2	12 31.9	337 18.2	7 54.5
14	28 2.5	- 0 32.4	26 47.7	356 28.4	12 34.3	7 19.6	7 56.0
16	58 2.8	- 0 30.4	56 52.7	26 27.7	12 36.6	37 21.1	7 57.5
18	88 3.2	- 0 28.4	86 57.6	56 26.9	12 38.9	67 22.5	7 58.9
20	118 3.6	- 0 26.5	117 2.5	86 26.1	12 41.2	97 23.9	8 .4
22	148 3.9	- 0 24.5	147 7.4	116 25.3	12 43.5	127 25.4	8 1.8
Δ	2	10		-4	12	7	7

UT	MESEC				JUPITER		SATURN	
	$S_\leftmoon$	Δ	$\delta_\leftmoon$	Δ	$S_{\text{♃}}$	$\delta_{\text{♃}}$	$S_{\text{♄}}$	$\delta_{\text{♄}}$
h	° ′		° ′		° ′	° ′	° ′	° ′
0	197 25.5	71	5 54.4	-113	40 12.5	17 46.4	292 51.5	-19 2.4
2	226 17.6	71	5 31.7	-114	70 17.7	17 46.4	322 56.4	-19 2.4
4	255 9.7	71	5 8.9	-115	100 23.0	17 46.5	353 1.4	-19 2.3
6	284 1.9	71	4 45.9	-116	130 28.2	17 46.6	23 6.4	-19 2.3
8	312 54.2	71	4 22.8	-116	160 33.5	17 46.7	53 11.3	-19 2.3
10	341 46.4	72	3 59.6	-117	190 38.7	17 46.8	83 16.3	-19 2.3
12	10 38.8	72	3 36.2	-117	220 44.0	17 46.9	113 21.3	-19 2.3
14	39 31.1	72	3 12.8	-118	250 49.2	17 47.0	143 26.3	-19 2.2
16	68 23.5	72	2 49.2	-118	280 54.5	17 47.1	173 31.2	-19 2.2
18	97 15.9	72	2 25.6	-118	310 59.7	17 47.1	203 36.2	-19 2.2
20	126 8.4	72	2 1.9	-119	341 5.0	17 47.2	233 41.2	-19 2.2
22	155 .8	73	1 38.2	-119	11 10.2	17 47.3	263 46.1	-19 2.2
Δ					26	0	25	0

φ	SUNCE		TRAJANJE SUMRAKA		MESEC			
	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 6	18 11	0 42	2 26	4 27	3.8	17 46	2.3
55	6 6	18 11	0 36	2 4	4 33	3.6	17 43	2.3
50	6 6	18 11	0 32	1 50	4 38	3.4	17 41	2.3
45	6 6	18 11	0 29	1 39	4 42	3.2	17 39	2.3
40	6 6	18 11	0 27	1 31	4 45	3.1	17 38	2.3
35	6 6	18 11	0 25	1 25	4 48	2.9	17 36	2.3
30	6 6	18 11	0 24	1 20	4 51	2.8	17 35	2.3
20	6 5	18 11	0 22	1 13	4 55	2.7	17 33	2.3
10	6 5	18 11	0 21	1 10	4 59	2.5	17 31	2.3
0	6 5	18 11	0 21	1 9	5 2	2.3	17 29	2.3
10	6 4	18 12	0 21	1 10	5 6	2.2	17 27	2.3
20	6 3	18 12	0 22	1 13	5 10	2.0	17 25	2.3
30	6 3	18 13	0 24	1 20	5 14	1.9	17 23	2.3
35	6 2	18 13	0 25	1 25	5 17	1.7	17 21	2.4
40	6 1	18 14	0 27	1 31	5 20	1.6	17 20	2.4
45	6 1	18 14	0 29	1 39	5 23	1.5	17 18	2.4
50	5 60	18 15	0 32	1 50	5 27	1.3	17 16	2.4
55	5 58	18 16	0 36	2 5	5 32	1.1	17 13	2.4
60	5 57	18 18	0 42	2 27	5 38	.9	17 9	2.4
S								

SUNCE				MESEC			
UT	$e = T_p - UT$	Δ/24	r	Prolaz	Δ/24	$\pi_\leftmoon$	r
h	min s	s	′	h min	min	′	′
00	- 8 .3	.7	16.1	$T_{\overline{m}}$ 11 16	2.3	61.2	16.7
12	- 7 51.6	$T_{\overline{m}_\odot}$ 12 h 7.9 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 14	.1	330	-3.5	♃	21 15	.0	224	-2.0
♂	13 31	.1	341	1.3	♄	4 28	.0	117	.6

UT	SUNCE				PROLEĆ. TAČKA		VENERA				MARS			
	$S_\odot$		$\delta_\odot$		S_Υ		S_φ		δ_φ		S_σ		δ_σ	
h	°	′	°	′	°	′	°	′	°	′	°	′	°	′
0	178	4.3	- 0	22.5	177	12.4	146	24.6	12	45.9	157	26.8	8	3.3
2	208	4.7	- 0	20.5	207	17.3	176	23.8	12	48.2	187	28.2	8	4.8
4	238	5.0	- 0	18.6	237	22.2	206	23.0	12	50.5	217	29.7	8	6.2
6	268	5.4	- 0	16.6	267	27.1	236	22.2	12	52.8	247	31.1	8	7.7
8	298	5.8	- 0	14.6	297	32.1	266	21.4	12	55.1	277	32.5	8	9.1
10	328	6.1	- 0	12.6	327	37.0	296	20.6	12	57.4	307	34.0	8	10.6
12	358	6.5	- 0	10.6	357	41.9	326	19.9	12	59.7	337	35.4	8	12.0
14	28	6.9	- 0	8.7	27	46.9	356	19.1	13	2.0	7	36.8	8	13.5
16	58	7.2	- 0	6.7	57	51.8	26	18.3	13	4.3	37	38.3	8	14.9
18	88	7.6	- 0	4.7	87	56.7	56	17.5	13	6.6	67	39.7	8	16.4
20	118	8.0	- 0	2.7	118	1.6	86	16.7	13	8.9	97	41.2	8	17.8
22	148	8.3	- 0	.8	148	6.6	116	15.9	13	11.2	127	42.6	8	19.3
Δ		2		10				-4		12		7		7

UT	MESEC						JUPITER				SATURN			
	$S_\leftmoon$		Δ	$\delta_\leftmoon$		Δ	S_{4}		δ_{4}		S_{5}		δ_{5}	
h	°	′		°	′		°	′	°	′	°	′	°	′
0	183	53.4	73	1	14.4	-119	41	15.4	17	47.4	293	51.1	-19	2.1
2	212	45.9	73	0	50.6	-119	71	20.7	17	47.5	323	56.1	-19	2.1
4	241	38.5	73	0	26.7	-119	101	25.9	17	47.6	354	1.1	-19	2.1
6	270	31.1	73	0	2.9	90	131	31.1	17	47.6	24	6.0	-19	2.1
8	299	23.7	73	0	21.0	119	161	36.4	17	47.7	54	11.0	-19	2.1
10	328	16.4	73	0	44.8	119	191	41.6	17	47.8	84	16.0	-19	2.0
12	357	9.1	74	1	8.6	119	221	46.8	17	47.9	114	21.0	-19	2.0
14	26	1.8	74	1	32.3	118	251	52.1	17	48.0	144	25.9	-19	2.0
16	54	54.6	74	1	56.0	118	281	57.3	17	48.0	174	30.9	-19	2.0
18	83	47.3	74	2	19.6	118	312	2.5	17	48.1	204	35.9	-19	1.9
20	112	40.1	74	2	43.1	117	342	7.8	17	48.2	234	40.9	-19	1.9
22	141	32.9	74	3	6.5	117	12	13.0	17	48.3	264	45.9	-19	1.9
Δ								26		0		25		0

φ	SUNCE		TRAJANJE SUMRAKA		MESEC			
	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	18 14	0 42	2 26	5 59	.9	18 42	3.8
55	6 3	18 13	0 36	2 5	5 59	1.2	18 39	3.5
50	6 4	18 12	0 32	1 50	5 59	1.4	18 37	3.3
45	6 4	18 12	0 29	1 39	5 59	1.5	18 35	3.2
40	6 4	18 12	0 27	1 31	5 59	1.6	18 33	3.0
35	6 4	18 11	0 25	1 25	5 59	1.8	18 32	2.9
30	6 4	18 11	0 24	1 20	5 59	1.9	18 31	2.8
20	6 4	18 11	0 22	1 13	5 59	2.0	18 29	2.6
10	6 4	18 11	0 21	1 10	5 59	2.2	18 27	2.5
0	6 4	18 11	0 21	1 9	5 59	2.3	18 25	2.3
10	6 4	18 11	0 21	1 10	5 59	2.5	18 23	2.2
20	6 4	18 11	0 22	1 13	5 59	2.6	18 21	2.0
30	6 3	18 12	0 24	1 20	5 59	2.8	18 19	1.9
35	6 3	18 12	0 25	1 25	5 59	2.9	18 18	1.8
40	6 2	18 12	0 27	1 31	5 59	3.0	18 17	1.6
45	6 2	18 13	0 29	1 39	5 59	3.2	18 15	1.5
50	6 1	18 13	0 32	1 50	5 59	3.3	18 13	1.4
55	6 0	18 14	0 36	2 4	5 59	3.5	18 10	1.2
60	5 59	18 15	0 42	2 26	5 60	3.8	18 7	.9
S								

SUNCE				MESEC				
UT	e = Tp − UT	Δ/24	r	Prolaz		Δ/24	$\pi_\leftmoon$	r
h	min s	s	′		h min	min	′	′
00	- 7 42.8	.7	16.1	$T_{\overline{m}}$	12 12	2.3	61.3	16.7
12	- 7 34.0	$T_{\overline{m}_\odot}$	12 h 7.6 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 15	.1	329	-3.5	♃	21 11	.0	224	-2.0
♂	13 30	.1	340	1.3	♄	4 24	.0	117	.6

UT	SUNCE				PROLEĆ. TAČKA		VENERA				MARS			
	$S_\odot$		$\delta_\odot$		S_Υ		S_φ		δ_φ		S_σ		δ_σ	
h	°	′	°	′	°	′	°	′	°	′	°	′	°	′
0	178	8.7	0	1.2	178	11.5	146	15.1	13	13.5	157	44.0	8	20.8
2	208	9.1	0	3.2	208	16.4	176	14.3	13	15.7	187	45.5	8	22.2
4	238	9.4	0	5.2	238	21.4	206	13.5	13	18.0	217	46.9	8	23.7
6	268	9.8	0	7.1	268	26.3	236	12.7	13	20.3	247	48.3	8	25.1
8	298	10.2	0	9.1	298	31.2	266	11.9	13	22.6	277	49.8	8	26.5
10	328	10.5	0	11.1	328	36.1	296	11.1	13	24.9	307	51.2	8	28.0
12	358	10.9	0	13.1	358	41.1	326	10.3	13	27.1	337	52.6	8	29.4
14	28	11.3	0	15.0	28	46.0	356	9.5	13	29.4	7	54.1	8	30.9
16	58	11.7	0	17.0	58	50.9	26	8.7	13	31.7	37	55.5	8	32.3
18	88	12.0	0	19.0	88	55.9	56	7.9	13	34.0	67	56.9	8	33.8
20	118	12.4	0	21.0	119	.8	86	7.1	13	36.2	97	58.4	8	35.2
22	148	12.8	0	22.9	149	5.7	116	6.3	13	38.5	127	59.8	8	36.7
Δ		2		10				-4		11		7		7

UT	MESEC						JUPITER				SATURN			
	$S_\leftmoon$		Δ	$\delta_\leftmoon$		Δ	S_{4}		δ_{4}		S_{5}		δ_{5}	
h	°	′		°	′		°	′	°	′	°	′	°	′
0	170	25.7	74	3	29.8	116	42	18.2	17	48.4	294	50.8	-19	1.9
2	199	18.6	74	3	53.1	115	72	23.4	17	48.4	324	55.8	-19	1.9
4	228	11.5	74	4	16.1	115	102	28.7	17	48.5	355	.8	-19	1.8
6	257	4.3	74	4	39.1	114	132	33.9	17	48.6	25	5.8	-19	1.8
8	285	57.2	75	5	1.9	113	162	39.1	17	48.7	55	10.8	-19	1.8
10	314	50.2	75	5	24.5	112	192	44.3	17	48.8	85	15.8	-19	1.8
12	343	43.1	75	5	46.9	111	222	49.5	17	48.8	115	20.7	-19	1.7
14	12	36.0	75	6	9.2	110	252	54.7	17	48.9	145	25.7	-19	1.7
16	41	29.0	75	6	31.2	109	282	60.0	17	49.0	175	30.7	-19	1.7
18	70	22.0	75	6	53.1	108	313	5.2	17	49.1	205	35.7	-19	1.7
20	99	15.0	75	7	14.7	107	343	10.4	17	49.1	235	40.7	-19	1.7
22	128	8.0	75	7	36.1	106	13	15.6	17	49.2	265	45.7	-19	1.6
Δ								26		0		25		0

φ	SUNCE		TRAJANJE SUMRAKA		MESEC			
	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 60	18 16	0 42	2 27	6 21	.9	20 13	3.7
55	6 1	18 15	0 36	2 5	6 27	1.2	20 4	3.4
50	6 2	18 14	0 32	1 50	6 31	1.4	19 56	3.2
45	6 2	18 13	0 29	1 39	6 35	1.5	19 51	3.1
40	6 3	18 13	0 27	1 31	6 38	1.7	19 46	2.9
35	6 3	18 12	0 25	1 25	6 41	1.8	19 42	2.8
30	6 3	18 12	0 24	1 20	6 43	1.9	19 38	2.7
20	6 4	18 11	0 22	1 13	6 47	2.0	19 32	2.6
10	6 4	18 11	0 21	1 10	6 51	2.2	19 26	2.4
0	6 4	18 11	0 21	1 9	6 54	2.3	19 21	2.3
10	6 4	18 10	0 21	1 10	6 58	2.5	19 16	2.2
20	6 4	18 10	0 22	1 13	7 2	2.6	19 10	2.0
30	6 4	18 10	0 24	1 20	7 6	2.8	19 4	1.9
35	6 4	18 10	0 25	1 24	7 9	2.9	18 60	1.8
40	6 3	18 10	0 27	1 31	7 12	3.0	18 56	1.7
45	6 3	18 11	0 29	1 39	7 15	3.1	18 51	1.6
50	6 3	18 11	0 32	1 49	7 19	3.3	18 45	1.4
55	6 2	18 11	0 36	2 4	7 24	3.5	18 38	1.2
60	6 2	18 12	0 41	2 25	7 31	3.7	18 29	1.0
S								

SUNCE				MESEC				
UT	e = Tp − UT	Δ/24	r	Prolaz		Δ/24	$\pi_\leftmoon$	r
h	min s	s	′		h min	min	′	′
00	- 7 25.2	.7	16.1	$T_{\overline{m}}$	13 8	2.3	61.1	16.6
12	- 7 16.3	$T_{\overline{m}_\odot}$	12 h 7.3 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 15	.1	328	-3.5	♃	21 7	.0	224	-2.0
♂	13 28	.1	340	1.3	♄	4 20	.0	117	.6

UT	SUNCE		PROLEĆ. TAČKA	VENERA		MARS	
	$S_\odot$	$\delta_\odot$	S_Υ	S_φ	δ_φ	S_σ	δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	178 13.1	0 24.9	179 10.6	146 5.5	13 40.8	158 1.2	8 38.1
2	208 13.5	0 26.9	209 15.6	176 4.7	13 43.0	188 2.6	8 39.6
4	238 13.9	0 28.9	239 20.5	206 3.9	13 45.3	218 4.1	8 41.0
6	268 14.2	0 30.8	269 25.4	236 3.1	13 47.5	248 5.5	8 42.4
8	298 14.6	0 32.8	299 30.4	266 2.3	13 49.8	278 6.9	8 43.9
10	328 15.0	0 34.8	329 35.3	296 1.5	13 52.0	308 8.4	8 45.3
12	358 15.4	0 36.8	359 40.2	326 .6	13 54.3	338 9.8	8 46.8
14	28 15.7	0 38.7	29 45.1	355 59.8	13 56.5	8 11.2	8 48.2
16	58 16.1	0 40.7	59 50.1	25 59.0	13 58.8	38 12.7	8 49.6
18	88 16.5	0 42.7	89 55.0	55 58.2	14 1.0	68 14.1	8 51.1
20	118 16.9	0 44.7	119 59.9	85 57.4	14 3.3	98 15.5	8 52.5
22	148 17.2	0 46.6	150 4.9	115 56.6	14 5.5	128 17.0	8 53.9
Δ	2	10		-4	11	7	7

UT	MESEC				JUPITER		SATURN	
	$S_\leftmoon$	Δ	$\delta_\leftmoon$	Δ	$S_{\mathrm{♃}}$	$\delta_{\mathrm{♃}}$	$S_{\mathrm{♄}}$	$\delta_{\mathrm{♄}}$
h	° ′		° ′		° ′	° ′	° ′	° ′
0	157 1.0	75	7 57.3	105	43 20.8	17 49.3	295 50.7	-19 1.6
2	185 54.0	75	8 18.2	103	73 26.0	17 49.4	325 55.7	-19 1.6
4	214 47.1	75	8 38.9	102	103 31.2	17 49.4	356 .7	-19 1.6
6	243 40.2	75	8 59.3	101	133 36.4	17 49.5	26 5.7	-19 1.5
8	272 33.3	76	9 19.5	99	163 41.6	17 49.6	56 10.6	-19 1.5
10	301 26.4	76	9 39.3	98	193 46.8	17 49.7	86 15.6	-19 1.5
12	330 19.5	76	9 58.9	96	223 52.0	17 49.7	116 20.6	-19 1.5
14	359 12.6	76	10 18.1	95	253 57.2	17 49.8	146 25.6	-19 1.4
16	28 5.8	76	10 37.1	93	284 2.4	17 49.9	176 30.6	-19 1.4
18	56 59.0	76	10 55.7	92	314 7.6	17 50.0	206 35.6	-19 1.4
20	85 52.2	76	11 14.0	90	344 12.8	17 50.0	236 40.6	-19 1.4
22	114 45.4	76	11 32.0	88	14 18.0	17 50.1	266 45.6	-19 1.3
Δ					26	0	25	0

φ	SUNCE		TRAJANJE SUMRAKA		MESEC			
	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 57	18 19	0 42	2 28	6 44	1.1	21 41	3.4
55	5 58	18 17	0 36	2 6	6 56	1.3	21 26	3.2
50	5 59	18 15	0 32	1 50	7 4	1.5	21 14	3.1
45	6 0	18 14	0 29	1 39	7 12	1.6	21 4	2.9
40	6 1	18 14	0 27	1 31	7 18	1.7	20 57	2.8
35	6 2	18 13	0 25	1 25	7 23	1.8	20 50	2.7
30	6 2	18 12	0 24	1 20	7 28	1.9	20 44	2.7
20	6 3	18 11	0 22	1 13	7 36	2.1	20 34	2.5
10	6 3	18 11	0 21	1 10	7 43	2.2	20 25	2.4
0	6 4	18 10	0 21	1 9	7 50	2.3	20 16	2.3
10	6 4	18 10	0 21	1 10	7 57	2.4	20 8	2.2
20	6 4	18 9	0 22	1 13	8 4	2.6	19 59	2.1
30	6 4	18 9	0 24	1 20	8 13	2.7	19 49	2.0
35	6 4	18 9	0 25	1 24	8 18	2.8	19 43	1.9
40	6 4	18 9	0 27	1 30	8 23	2.9	19 37	1.8
45	6 4	18 9	0 29	1 38	8 30	3.0	19 29	1.7
50	6 4	18 9	0 32	1 49	8 38	3.1	19 20	1.6
55	6 4	18 9	0 36	2 4	8 48	3.3	19 8	1.4
60	6 4	18 9	0 41	2 24	9 1	3.6	18 53	1.2
S								

SUNCE				MESEC			
UT	e = T_p − UT	Δ/24	r	Prolaz	Δ/24	$\pi_\leftmoon$	r
h	min s	s	′	h min	min	′	′
00	− 7 7.5	.7	16.1	$T_{\overline{m}}$ 14 3	2.3	60.6	16.5
12	− 6 58.5	$T_{\overline{m}_\odot}$ 12 h 7.0 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 16	.1	327	-3.5	♃	21 3	.0	224	-2.0
♂	13 27	.1	339	1.3	♄	4 16	.0	117	.6

UT	SUNCE		PROLEĆ. TAČKA	VENERA		MARS	
	$S_\odot$	$\delta_\odot$	S_Υ	S_φ	δ_φ	S_σ	δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	178 17.6	0 48.6	180 9.8	145 55.7	14 7.7	158 18.4	8 55.4
2	208 18.0	0 50.6	210 14.7	175 54.9	14 10.0	188 19.8	8 56.8
4	238 18.3	0 52.6	240 19.6	205 54.1	14 12.2	218 21.2	8 58.2
6	268 18.7	0 54.5	270 24.6	235 53.3	14 14.4	248 22.7	8 59.7
8	298 19.1	0 56.5	300 29.5	265 52.4	14 16.6	278 24.1	9 1.1
10	328 19.5	0 58.5	330 34.4	295 51.6	14 18.9	308 25.5	9 2.5
12	358 19.8	1 .4	0 39.3	325 50.8	14 21.1	338 27.0	9 4.0
14	28 20.2	1 2.4	30 44.3	355 49.9	14 23.3	8 28.4	9 5.4
16	58 20.6	1 4.4	60 49.2	25 49.1	14 25.5	38 29.8	9 6.8
18	88 21.0	1 6.4	90 54.1	55 48.3	14 27.7	68 31.3	9 8.3
20	118 21.3	1 8.3	120 59.1	85 47.4	14 30.0	98 32.7	9 9.7
22	148 21.7	1 10.3	151 4.0	115 46.6	14 32.2	128 34.1	9 11.1
Δ	2	10		-4	11	7	7

UT	MESEC				JUPITER		SATURN	
	$S_\leftmoon$	Δ	$\delta_\leftmoon$	Δ	$S_{\mathrm{♃}}$	$\delta_{\mathrm{♃}}$	$S_{\mathrm{♄}}$	$\delta_{\mathrm{♄}}$
h	° ′		° ′		° ′	° ′	° ′	° ′
0	143 38.7	76	11 49.6	86	44 23.2	17 50.2	296 50.6	-19 1.3
2	172 32.0	77	12 6.9	85	74 28.4	17 50.2	326 55.6	-19 1.3
4	201 25.3	77	12 23.9	83	104 33.6	17 50.3	357 .6	-19 1.3
6	230 18.7	77	12 40.4	81	134 38.8	17 50.4	27 5.6	-19 1.2
8	259 12.1	77	12 56.7	79	164 44.0	17 50.4	57 10.6	-19 1.2
10	288 5.5	77	13 12.5	77	194 49.2	17 50.5	87 15.6	-19 1.2
12	316 59.0	78	13 28.0	76	224 54.3	17 50.6	117 20.6	-19 1.2
14	345 52.5	78	13 43.1	74	254 59.5	17 50.6	147 25.6	-19 1.1
16	14 46.0	78	13 57.9	72	285 4.7	17 50.7	177 30.6	-19 1.1
18	43 39.6	78	14 12.2	70	315 9.9	17 50.8	207 35.6	-19 1.1
20	72 33.3	79	14 26.1	68	345 15.1	17 50.8	237 40.6	-19 1.1
22	101 27.0	79	14 39.7	66	15 20.3	17 50.9	267 45.7	-19 1.0
Δ					26	0	25	0

φ	SUNCE		TRAJANJE SUMRAKA		MESEC			
	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 54	18 21	0 42	2 29	7 10	1.3	23 4	3.1
55	5 56	18 19	0 36	2 6	7 27	1.5	22 43	2.9
50	5 57	18 17	0 32	1 51	7 40	1.6	22 27	2.8
45	5 58	18 16	0 29	1 40	7 51	1.8	22 15	2.7
40	5 59	18 15	0 27	1 31	7 60	1.8	22 4	2.6
35	6 0	18 14	0 25	1 25	8 7	1.9	21 55	2.6
30	6 1	18 13	0 24	1 20	8 14	2.0	21 48	2.5
20	6 2	18 12	0 22	1 13	8 26	2.1	21 34	2.4
10	6 3	18 11	0 21	1 10	8 36	2.2	21 23	2.4
0	6 3	18 10	0 21	1 9	8 46	2.3	21 12	2.3
10	6 4	18 9	0 21	1 10	8 55	2.4	21 1	2.2
20	6 5	18 9	0 22	1 13	9 6	2.5	20 49	2.1
30	6 5	18 8	0 24	1 20	9 18	2.6	20 36	2.0
35	6 5	18 8	0 25	1 24	9 25	2.7	20 28	2.0
40	6 5	18 7	0 27	1 30	9 33	2.7	20 20	1.9
45	6 6	18 7	0 29	1 38	9 42	2.8	20 9	1.8
50	6 6	18 7	0 32	1 49	9 53	2.9	19 57	1.7
55	6 6	18 6	0 36	2 3	10 8	3.1	19 42	1.6
60	6 6	18 6	0 41	2 24	10 26	3.3	19 21	1.4
S								

SUNCE				MESEC			
UT	e = T_p − UT	Δ/24	r	Prolaz	Δ/24	$\pi_\leftmoon$	r
h	min s	s	′	h min	min	′	′
00	− 6 49.6	.7	16.1	$T_{\overline{m}}$ 14 59	2.3	59.8	16.3
12	− 6 40.6	$T_{\overline{m}_\odot}$ 12 h 6.7 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 17	.1	326	-3.5	♃	20 59	.0	224	-2.0
♂	13 26	.1	338	1.3	♄	4 12	.0	117	.6

UT	SUNCE $S_\odot$	SUNCE $\delta_\odot$	PROLEĆ. TAČKA S_Υ	VENERA S_φ	VENERA δ_φ	MARS S_σ	MARS δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	178 22.1	1 12.3	181 8.9	145 45.8	14 34.4	158 35.5	9 12.5
2	208 22.5	1 14.2	211 13.8	175 44.9	14 36.6	188 37.0	9 14.0
4	238 22.8	1 16.2	241 18.8	205 44.1	14 38.8	218 38.4	9 15.4
6	268 23.2	1 18.2	271 23.7	235 43.2	14 41.0	248 39.8	9 16.8
8	298 23.6	1 20.2	301 28.6	265 42.4	14 43.2	278 41.2	9 18.2
10	328 24.0	1 22.1	331 33.6	295 41.5	14 45.4	308 42.7	9 19.7
12	358 24.3	1 24.1	1 38.5	325 40.7	14 47.6	338 44.1	9 21.1
14	28 24.7	1 26.1	31 43.4	355 39.9	14 49.8	8 45.5	9 22.5
16	58 25.1	1 28.0	61 48.3	25 39.0	14 51.9	38 47.0	9 23.9
18	88 25.5	1 30.0	91 53.3	55 38.2	14 54.1	68 48.4	9 25.4
20	118 25.8	1 32.0	121 58.2	85 37.3	14 56.3	98 49.8	9 26.8
22	148 26.2	1 33.9	152 3.1	115 36.4	14 58.5	128 51.2	9 28.2
Δ	2	10		-4	11	7	7

UT	MESEC $S_\leftmoon$	MESEC Δ	MESEC $\delta_\leftmoon$	MESEC Δ	JUPITER $S_{\mathrm{♃}}$	JUPITER $\delta_{\mathrm{♃}}$	SATURN $S_{\mathrm{♄}}$	SATURN $\delta_{\mathrm{♄}}$
h	° ′		° ′		° ′	° ′	° ′	° ′
0	130 20.8	79	14 52.8	64	45 25.4	17 51.0	297 50.7	-19 1.0
2	159 14.6	79	15 5.6	62	75 30.6	17 51.0	327 55.7	-19 1.0
4	188 8.5	80	15 17.9	60	105 35.8	17 51.1	358 .7	-19 1.0
6	217 2.5	80	15 29.9	58	135 41.0	17 51.2	28 5.7	-19 .9
8	245 56.5	81	15 41.4	56	165 46.1	17 51.2	58 10.7	-19 .9
10	274 50.6	81	15 52.5	53	195 51.3	17 51.3	88 15.7	-19 .9
12	303 44.8	81	16 3.2	51	225 56.5	17 51.4	118 20.7	-19 .8
14	332 39.1	82	16 13.5	49	256 1.6	17 51.4	148 25.7	-19 .8
16	1 33.4	82	16 23.3	47	286 6.8	17 51.5	178 30.7	-19 .8
18	30 27.9	83	16 32.8	45	316 12.0	17 51.5	208 35.8	-19 .8
20	59 22.4	83	16 41.8	43	346 17.1	17 51.6	238 40.8	-19 .7
22	88 17.0	84	16 50.4	41	16 22.3	17 51.7	268 45.8	-19 .7
Δ					26	0	25	0

φ	SUNCE IZLAZ	SUNCE ZALAZ	TRAJANJE SUMRAKA GRAĐ.	TRAJANJE SUMRAKA ASTR.	MESEC IZLAZ	MESEC Δ/24	MESEC ZALAZ	MESEC Δ/24
N	h min	h min	h min	h min	h min	min	h min	min
60	5 51	18 23	0 42	2 30	7 41	1.6	.. ..	.0
55	5 53	18 21	0 36	2 7	8 3	1.7	23 53	2.6
50	5 55	18 19	0 32	1 51	8 20	1.8	23 34	2.5
45	5 57	18 17	0 29	1 40	8 33	1.9	23 20	2.5
40	5 58	18 16	0 27	1 31	8 44	2.0	23 8	2.4
35	5 59	18 15	0 25	1 25	8 53	2.0	22 57	2.4
30	5 60	18 14	0 24	1 20	9 2	2.1	22 48	2.4
20	6 1	18 12	0 22	1 13	9 16	2.1	22 33	2.3
10	6 2	18 11	0 21	1 10	9 29	2.2	22 19	2.3
0	6 3	18 10	0 21	1 9	9 41	2.3	22 6	2.2
10	6 4	18 9	0 21	1 10	9 52	2.3	21 54	2.2
20	6 5	18 8	0 22	1 13	10 5	2.4	21 40	2.2
30	6 6	18 7	0 24	1 19	10 20	2.4	21 25	2.1
35	6 6	18 6	0 25	1 24	10 29	2.5	21 16	2.1
40	6 6	18 6	0 27	1 30	10 38	2.5	21 5	2.0
45	6 7	18 5	0 29	1 38	10 50	2.6	20 53	2.0
50	6 7	18 4	0 32	1 49	11 4	2.7	20 39	1.9
55	6 8	18 4	0 36	2 3	11 21	2.8	20 20	1.9
60	6 9	18 3	0 41	2 23	11 45	2.9	19 56	1.7
S								

SUNCE UT	SUNCE e = T_p − UT	SUNCE Δ/24	SUNCE r	MESEC Prolaz	MESEC Δ/24	MESEC $\pi_\leftmoon$	MESEC r
h	min s	s	′	h min	min	′	′
00	- 6 31.7	.8	16.1	$T_{\overline{m}}$ 15 54	2.2	58.9	16.0
12	- 6 22.7	$T_{\overline{m}_\odot}$ 12 h 6.4 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 17	.1	325	-3.5	♄	20 55	.0	224	-1.9
♂	13 25	.1	337	1.3	♃	4 8	.0	117	.6

UT	SUNCE $S_\odot$	SUNCE $\delta_\odot$	PROLEĆ. TAČKA S_Υ	VENERA S_φ	VENERA δ_φ	MARS S_σ	MARS δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	178 26.6	1 35.9	182 8.1	145 35.6	15 .7	158 52.7	9 29.6
2	208 27.0	1 37.9	212 13.0	175 34.7	15 2.8	188 54.1	9 31.0
4	238 27.3	1 39.8	242 17.9	205 33.9	15 5.0	218 55.5	9 32.4
6	268 27.7	1 41.8	272 22.8	235 33.0	15 7.2	248 56.9	9 33.9
8	298 28.1	1 43.8	302 27.8	265 32.2	15 9.4	278 58.4	9 35.3
10	328 28.5	1 45.7	332 32.7	295 31.3	15 11.5	308 59.8	9 36.7
12	358 28.8	1 47.7	2 37.6	325 30.4	15 13.7	339 1.2	9 38.1
14	28 29.2	1 49.7	32 42.6	355 29.6	15 15.9	9 2.6	9 39.5
16	58 29.6	1 51.6	62 47.5	25 28.7	15 18.0	39 4.1	9 40.9
18	88 30.0	1 53.6	92 52.4	55 27.8	15 20.2	69 5.5	9 42.3
20	118 30.3	1 55.6	122 57.3	85 27.0	15 22.3	99 6.9	9 43.8
22	148 30.7	1 57.5	153 2.3	115 26.1	15 24.5	129 8.3	9 45.2
Δ	2	10		-4	11	7	7

UT	MESEC $S_\leftmoon$	MESEC Δ	MESEC $\delta_\leftmoon$	MESEC Δ	JUPITER $S_{\mathrm{♃}}$	JUPITER $\delta_{\mathrm{♃}}$	SATURN $S_{\mathrm{♄}}$	SATURN $\delta_{\mathrm{♄}}$
h	° ′		° ′		° ′	° ′	° ′	° ′
0	117 11.8	84	16 58.6	39	46 27.5	17 51.7	298 50.8	-19 .7
2	146 6.6	85	17 6.3	37	76 32.6	17 51.8	328 55.8	-19 .7
4	175 1.5	85	17 13.7	35	106 37.8	17 51.9	359 .8	-19 .6
6	203 56.6	86	17 20.6	32	136 43.0	17 51.9	29 5.9	-19 .6
8	232 51.8	86	17 27.0	30	166 48.1	17 52.0	59 10.9	-19 .6
10	261 47.1	87	17 33.1	28	196 53.3	17 52.0	89 15.9	-19 .5
12	290 42.5	88	17 38.7	26	226 58.4	17 52.1	119 20.9	-19 .5
14	319 38.1	88	17 44.0	24	257 3.6	17 52.2	149 25.9	-19 .5
16	348 33.7	89	17 48.8	22	287 8.7	17 52.2	179 31.0	-19 .5
18	17 29.5	90	17 53.1	20	317 13.9	17 52.3	209 36.0	-19 .4
20	46 25.5	90	17 57.1	18	347 19.0	17 52.3	239 41.0	-19 .4
22	75 21.6	91	18 .7	16	17 24.2	17 52.4	269 46.0	-19 .4
Δ					26	0	25	0

φ	SUNCE IZLAZ	SUNCE ZALAZ	TRAJANJE SUMRAKA GRAĐ.	TRAJANJE SUMRAKA ASTR.	MESEC IZLAZ	MESEC Δ/24	MESEC ZALAZ	MESEC Δ/24
N	h min	h min	h min	h min	h min	min	h min	min
60	5 48	18 26	0 42	2 31	8 18	1.9	0 18	2.7
55	5 51	18 23	0 36	2 7	8 44	2.0	.. ..	.0
50	5 53	18 20	0 32	1 51	9 3	2.0	.. ..	.0
45	5 55	18 18	0 29	1 40	9 19	2.1	.. ..	.0
40	5 56	18 17	0 27	1 32	9 31	2.1	.. ..	.0
35	5 57	18 15	0 25	1 25	9 42	2.1	23 55	2.2
30	5 58	18 14	0 24	1 20	9 51	2.1	23 45	2.2
20	6 0	18 12	0 22	1 13	10 7	2.2	23 28	2.2
10	6 2	18 11	0 21	1 10	10 21	2.2	23 14	2.2
0	6 3	18 9	0 21	1 9	10 35	2.2	23 0	2.2
10	6 4	18 8	0 21	1 10	10 48	2.2	22 46	2.2
20	6 5	18 7	0 22	1 13	11 2	2.2	22 32	2.2
30	6 6	18 5	0 24	1 19	11 19	2.3	22 15	2.2
35	6 7	18 5	0 25	1 24	11 28	2.3	22 5	2.2
40	6 8	18 4	0 27	1 30	11 39	2.3	21 54	2.1
45	6 8	18 3	0 29	1 38	11 52	2.3	21 41	2.1
50	6 9	18 2	0 32	1 48	12 8	2.3	21 25	2.1
55	6 10	18 1	0 36	2 3	12 27	2.4	21 5	2.1
60	6 11	17 60	0 41	2 23	12 55	2.4	20 38	2.1
S								

SUNCE UT	SUNCE e = T_p − UT	SUNCE Δ/24	SUNCE r	MESEC Prolaz	MESEC Δ/24	MESEC $\pi_\leftmoon$	MESEC r
h	min s	s	′	h min	min	′	′
00	- 6 13.7	.8	16.1	$T_{\overline{m}}$ 16 47	2.2	57.9	15.8
12	- 6 4.6	$T_{\overline{m}_\odot}$ 12 h 6.1 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 18	.1	323	-3.5	♄	20 51	.0	224	-1.9
♂	13 24	.1	337	1.4	♃	4 4	.0	117	.6

UT	SUNCE		PROLEĆ. TAČKA	VENERA		MARS	
	$S_\odot$	$\delta_\odot$	S_Υ	S_φ	δ_φ	S_σ	δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	178 31.1	1 59.5	183 7.2	145 25.2	15 26.6	159 9.8	9 46.6
2	208 31.5	2 1.5	213 12.1	175 24.4	15 28.8	189 11.2	9 48.0
4	238 31.9	2 3.4	243 17.1	205 23.5	15 30.9	219 12.6	9 49.4
6	268 32.2	2 5.4	273 22.0	235 22.6	15 33.0	249 14.0	9 50.8
8	298 32.6	2 7.3	303 26.9	265 21.7	15 35.2	279 15.5	9 52.2
10	328 33.0	2 9.3	333 31.8	295 20.9	15 37.3	309 16.9	9 53.6
12	358 33.4	2 11.3	3 36.8	325 20.0	15 39.5	339 18.3	9 55.0
14	28 33.7	2 13.2	33 41.7	355 19.1	15 41.6	9 19.7	9 56.4
16	58 34.1	2 15.2	63 46.6	25 18.2	15 43.7	39 21.1	9 57.8
18	88 34.5	2 17.2	93 51.6	55 17.3	15 45.8	69 22.6	9 59.2
20	118 34.9	2 19.1	123 56.5	85 16.5	15 48.0	99 24.0	10 .6
22	148 35.3	2 21.1	154 1.4	115 15.6	15 50.1	129 25.4	10 2.0
Δ	2	10		−4	11	7	7

UT	MESEC				JUPITER		SATURN	
	$S_\leftmoon$	Δ	$\delta_\leftmoon$	Δ	S_{4}	δ_{4}	S_η	δ_η
h	° ′		° ′		° ′	° ′	° ′	° ′
0	104 17.8	92	18 3.8	14	47 29.3	17 52.4	299 51.1	−19 .3
2	133 14.2	93	18 6.5	12	77 34.5	17 52.5	329 56.1	−19 .3
4	162 10.8	93	18 8.8	10	107 39.6	17 52.5	0 1.1	−19 .3
6	191 7.4	94	18 10.7	8	137 44.8	17 52.6	30 6.1	−19 .2
8	220 4.3	95	18 12.2	5	167 49.9	17 52.7	60 11.2	−19 .2
10	249 1.3	96	18 13.3	3	197 55.0	17 52.7	90 16.2	−19 .2
12	277 58.5	97	18 14.0	2	228 .2	17 52.8	120 21.2	−19 .2
14	306 55.8	98	18 14.3	0	258 5.3	17 52.8	150 26.2	−19 .1
16	335 53.4	98	18 14.2	−2	288 10.5	17 52.9	180 31.3	−19 .1
18	4 51.0	99	18 13.8	−4	318 15.6	17 52.9	210 36.3	−19 .1
20	33 48.9	100	18 12.9	−6	348 20.7	17 53.0	240 41.3	−19 .0
22	62 46.9	101	18 11.6	−8	18 25.9	17 53.0	270 46.4	−19 .0
Δ					26	0	25	0

φ	SUNCE		TRAJANJE SUMRAKA		MESEC			
	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 45	18 28	0 42	2 32	9 4	2.2	1 22	2.2
55	5 48	18 25	0 37	2 8	9 32	2.2	0 55	2.2
50	5 51	18 22	0 33	1 52	9 52	2.2	0 35	2.2
45	5 53	18 20	0 29	1 40	10 8	2.2	0 19	2.2
40	5 54	18 18	0 27	1 32	10 21	2.2	0 6	2.2
35	5 56	18 16	0 25	1 25	10 32	2.2	.. ..	.0
30	5 57	18 15	0 24	1 20	10 42	2.2	.. ..	.0
20	5 59	18 13	0 22	1 14	10 59	2.2	.. ..	.0
10	6 1	18 11	0 21	1 10	11 14	2.1	.. ..	.0
0	6 3	18 9	0 21	1 9	11 27	2.1	23 52	2.1
10	6 4	18 7	0 21	1 10	11 41	2.1	23 38	2.1
20	6 5	18 6	0 22	1 13	11 56	2.1	23 24	2.1
30	6 7	18 4	0 24	1 19	12 13	2.1	23 7	2.2
35	6 8	18 3	0 25	1 24	12 23	2.1	22 57	2.2
40	6 9	18 2	0 27	1 30	12 34	2.1	22 46	2.2
45	6 10	18 1	0 29	1 38	12 47	2.0	22 32	2.3
50	6 11	17 60	0 32	1 48	13 4	2.0	22 16	2.3
55	6 12	17 58	0 36	2 2	13 24	2.0	21 56	2.3
60	6 14	17 57	0 41	2 22	13 53	1.9	21 28	2.4
S								

SUNCE				MESEC			
UT	e = T_p − UT	Δ/24	r	Prolaz		Δ/24	$\pi_\leftmoon$	r
h	min s	s	′		h min	min	′	′
00	− 5 55.6	.8	16.1	$T_{\overline{m}}$	17 40	2.1	57.0	15.5
12	− 5 46.5	$T_{\overline{m}_\odot}$	12 h 5.8 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 19	.1	322	−3.5	♃	20 46	.0	224	−1.9
♂	13 23	.1	336	1.4	♄	3 60	.0	117	.6

UT	SUNCE		PROLEĆ. TAČKA	VENERA		MARS	
	$S_\odot$	$\delta_\odot$	S_Υ	S_φ	δ_φ	S_σ	δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	178 35.6	2 23.0	184 6.3	145 14.7	15 52.2	159 26.8	10 3.4
2	208 36.0	2 25.0	214 11.3	175 13.8	15 54.3	189 28.3	10 4.8
4	238 36.4	2 27.0	244 16.2	205 12.9	15 56.4	219 29.7	10 6.2
6	268 36.8	2 28.9	274 21.1	235 12.0	15 58.5	249 31.1	10 7.6
8	298 37.1	2 30.9	304 26.0	265 11.1	16 .6	279 32.5	10 9.0
10	328 37.5	2 32.8	334 31.0	295 10.2	16 2.7	309 33.9	10 10.4
12	358 37.9	2 34.8	4 35.9	325 9.3	16 4.8	339 35.4	10 11.8
14	28 38.3	2 36.7	34 40.8	355 8.4	16 6.9	9 36.8	10 13.2
16	58 38.6	2 38.7	64 45.8	25 7.5	16 9.0	39 38.2	10 14.6
18	88 39.0	2 40.7	94 50.7	55 6.6	16 11.1	69 39.6	10 16.0
20	118 39.4	2 42.6	124 55.6	85 5.7	16 13.2	99 41.0	10 17.4
22	148 39.8	2 44.6	155 .5	115 4.8	16 15.3	129 42.5	10 18.8
Δ	2	10		−4	10	7	7

UT	MESEC				JUPITER		SATURN	
	$S_\leftmoon$	Δ	$\delta_\leftmoon$	Δ	S_{4}	δ_{4}	S_η	δ_η
h	° ′		° ′		° ′	° ′	° ′	° ′
0	91 45.2	102	18 10.0	−10	48 31.0	17 53.1	300 51.4	−18 60.0
2	120 43.5	103	18 8.0	−12	78 36.1	17 53.1	330 56.4	−18 59.9
4	149 42.1	104	18 5.6	−14	108 41.3	17 53.2	1 1.5	−18 59.9
6	178 40.9	105	18 2.8	−16	138 46.4	17 53.2	31 6.5	−18 59.9
8	207 39.8	106	17 59.7	−17	168 51.5	17 53.3	61 11.5	−18 59.9
10	236 39.0	107	17 56.2	−19	198 56.6	17 53.3	91 16.6	−18 59.8
12	265 38.3	108	17 52.3	−21	229 1.8	17 53.4	121 21.6	−18 59.8
14	294 37.8	109	17 48.1	−23	259 6.9	17 53.4	151 26.6	−18 59.8
16	323 37.5	109	17 43.6	−25	289 12.0	17 53.5	181 31.7	−18 59.7
18	352 37.4	110	17 38.7	−26	319 17.1	17 53.5	211 36.7	−18 59.7
20	21 37.5	111	17 33.4	−28	349 22.2	17 53.6	241 41.8	−18 59.7
22	50 37.8	112	17 27.8	−30	19 27.4	17 53.6	271 46.8	−18 59.6
Δ					26	0	25	0

φ	SUNCE		TRAJANJE SUMRAKA		MESEC			
	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 42	18 31	0 42	2 33	9 58	2.5	2 15	1.7
55	5 46	18 27	0 37	2 8	10 25	2.4	1 47	1.8
50	5 49	18 23	0 33	1 52	10 45	2.3	1 27	1.9
45	5 51	18 21	0 30	1 41	11 1	2.3	1 11	1.9
40	5 53	18 19	0 27	1 32	11 14	2.3	0 58	1.9
35	5 55	18 17	0 25	1 25	11 25	2.2	0 47	2.0
30	5 56	18 15	0 24	1 20	11 34	2.2	0 37	2.0
20	5 58	18 13	0 22	1 14	11 51	2.1	0 21	2.0
10	6 0	18 11	0 21	1 10	12 5	2.1	0 6	2.1
0	6 2	18 9	0 21	1 9	12 19	2.0	.. ..	.0
10	6 4	18 7	0 21	1 10	12 32	2.0	.. ..	.0
20	6 6	18 5	0 22	1 13	12 46	2.0	.. ..	.0
30	6 7	18 3	0 24	1 19	13 3	1.9	23 59	2.2
35	6 8	18 2	0 25	1 24	13 13	1.9	23 50	2.2
40	6 10	18 1	0 27	1 30	13 24	1.8	23 39	2.3
45	6 11	17 59	0 29	1 38	13 36	1.8	23 27	2.3
50	6 12	17 58	0 32	1 48	13 52	1.7	23 11	2.4
55	6 14	17 56	0 36	2 2	14 12	1.6	22 52	2.5
60	6 16	17 54	0 41	2 22	14 39	1.5	22 25	2.6
S								

SUNCE				MESEC			
UT	e = T_p − UT	Δ/24	r	Prolaz		Δ/24	$\pi_\leftmoon$	r
h	min s	s	′		h min	min	′	′
00	− 5 37.5	.8	16.1	$T_{\overline{m}}$	18 31	2.0	56.1	15.3
12	− 5 28.4	$T_{\overline{m}_\odot}$	12 h 5.5 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 19	.1	321	−3.6	♃	20 42	.0	224	−1.9
♂	13 22	.1	335	1.4	♄	3 56	.0	117	.5

UT	SUNCE		PROLEĆ. TAČKA	VENERA		MARS	
	$S_\odot$	$\delta_\odot$	S_Υ	S_φ	δ_φ	S_σ	δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	178 40.2	2 46.5	185 5.5	145 3.9	16 17.4	159 43.9	10 20.2
2	208 40.5	2 48.5	215 10.4	175 3.0	16 19.5	189 45.3	10 21.6
4	238 40.9	2 50.4	245 15.3	205 2.1	16 21.6	219 46.7	10 23.0
6	268 41.3	2 52.4	275 20.3	235 1.2	16 23.6	249 48.1	10 24.3
8	298 41.7	2 54.3	305 25.2	265 .3	16 25.7	279 49.6	10 25.7
10	328 42.0	2 56.3	335 30.1	294 59.4	16 27.8	309 51.0	10 27.1
12	358 42.4	2 58.3	5 35.0	324 58.5	16 29.8	339 52.4	10 28.5
14	28 42.8	3 .2	35 40.0	354 57.6	16 31.9	9 53.8	10 29.9
16	58 43.2	3 2.2	65 44.9	24 56.7	16 34.0	39 55.2	10 31.3
18	88 43.6	3 4.1	95 49.8	54 55.7	16 36.0	69 56.6	10 32.7
20	118 43.9	3 6.1	125 54.8	84 54.8	16 38.1	99 58.1	10 34.0
22	148 44.3	3 8.0	155 59.7	114 53.9	16 40.1	129 59.5	10 35.4
Δ	2	10		−5	10	7	7

UT	MESEC				JUPITER		SATURN	
	$S_\leftmoon$	Δ	$\delta_\leftmoon$	Δ	$S_{\text{♃}}$	$\delta_{\text{♃}}$	$S_{\text{♄}}$	$\delta_{\text{♄}}$
h	° ′		° ′		° ′	° ′	° ′	° ′
0	79 38.3	113	17 21.9	−31	49 32.5	17 53.7	301 51.8	−18 59.6
2	108 38.9	114	17 15.6	−33	79 37.6	17 53.7	331 56.9	−18 59.6
4	137 39.8	115	17 9.0	−35	109 42.7	17 53.8	2 1.9	−18 59.5
6	166 40.9	116	17 2.1	−36	139 47.8	17 53.8	32 7.0	−18 59.5
8	195 42.1	117	16 54.9	−38	169 52.9	17 53.9	62 12.0	−18 59.5
10	224 43.6	118	16 47.4	−39	199 58.0	17 53.9	92 17.1	−18 59.4
12	253 45.2	119	16 39.5	−41	230 3.1	17 54.0	122 22.1	−18 59.4
14	282 47.0	120	16 31.3	−42	260 8.2	17 54.0	152 27.2	−18 59.4
16	311 49.0	121	16 22.9	−44	290 13.4	17 54.0	182 32.2	−18 59.4
18	340 51.3	122	16 14.1	−45	320 18.5	17 54.1	212 37.2	−18 59.3
20	9 53.7	123	16 5.1	−47	350 23.6	17 54.1	242 42.3	−18 59.3
22	38 56.2	124	15 55.7	−48	20 28.7	17 54.2	272 47.3	−18 59.3
Δ					26	0	25	0

φ	SUNCE		TRAJANJE SUMRAKA		MESEC			
	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 39	18 33	0 42	2 34	10 59	2.7	2 56	1.4
55	5 43	18 29	0 37	2 9	11 23	2.6	2 31	1.5
50	5 46	18 25	0 33	1 52	11 41	2.4	2 12	1.6
45	5 49	18 22	0 30	1 41	11 56	2.4	1 57	1.7
40	5 51	18 20	0 27	1 32	12 8	2.3	1 45	1.7
35	5 53	18 18	0 25	1 26	12 18	2.2	1 34	1.8
30	5 55	18 16	0 24	1 20	12 27	2.2	1 25	1.8
20	5 58	18 13	0 22	1 14	12 42	2.1	1 9	1.9
10	5 60	18 11	0 21	1 10	12 55	2.0	0 55	1.9
0	6 2	18 8	0 21	1 9	13 8	2.0	0 42	2.0
10	6 4	18 6	0 21	1 10	13 20	1.9	0 29	2.1
20	6 6	18 4	0 22	1 13	13 33	1.8	0 15	2.1
30	6 8	18 2	0 24	1 19	13 48	1.7	. . ..	.0
35	6 9	18 1	0 25	1 24	13 57	1.7	. . ..	.0
40	6 11	17 59	0 27	1 30	14 7	1.6	. . ..	.0
45	6 12	17 58	0 29	1 38	14 19	1.6	. . ..	.0
50	6 14	17 56	0 32	1 48	14 33	1.5	. . ..	.0
55	6 16	17 53	0 36	2 2	14 51	1.4	23 52	2.6
60	6 19	17 51	0 41	2 21	15 15	1.2	23 28	2.8
S								

SUNCE				MESEC			
UT	e = T_p − UT	Δ/24	r	Prolaz	Δ/24	$\pi_\leftmoon$	r
h	min s	s	′	h min	min	′	′
00	− 5 19.4	.8	16.1	$T_{\overline{m}}$ 19 19	2.0	55.4	15.1
12	− 5 10.3	$T_{\overline{m}_\odot}$ 12 h 5.2 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 20	.1	320	−3.6	♄	20 38	.0	224	−1.9
♂	13 20	.1	335	1.4	♃	3 52	.0	117	.5

UT	SUNCE		PROLEĆ. TAČKA	VENERA		MARS	
	$S_\odot$	$\delta_\odot$	S_Υ	S_φ	δ_φ	S_σ	δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	178 44.7	3 10.0	186 4.6	144 53.0	16 42.2	160 .9	10 36.8
2	208 45.1	3 11.9	216 9.5	174 52.1	16 44.2	190 2.3	10 38.2
4	238 45.4	3 13.9	246 14.5	204 51.1	16 46.3	220 3.7	10 39.6
6	268 45.8	3 15.8	276 19.4	234 50.2	16 48.3	250 5.1	10 40.9
8	298 46.2	3 17.8	306 24.3	264 49.3	16 50.4	280 6.6	10 42.3
10	328 46.6	3 19.7	336 29.3	294 48.4	16 52.4	310 8.0	10 43.7
12	358 47.0	3 21.7	6 34.2	324 47.4	16 54.4	340 9.4	10 45.1
14	28 47.3	3 23.6	36 39.1	354 46.5	16 56.5	10 10.8	10 46.5
16	58 47.7	3 25.6	66 44.0	24 45.6	16 58.5	40 12.2	10 47.8
18	88 48.1	3 27.5	96 49.0	54 44.6	17 .5	70 13.6	10 49.2
20	118 48.5	3 29.4	126 53.9	84 43.7	17 2.6	100 15.1	10 50.6
22	148 48.8	3 31.4	156 58.8	114 42.8	17 4.6	130 16.5	10 52.0
Δ	2	10		−5	10	7	7

UT	MESEC				JUPITER		SATURN	
	$S_\leftmoon$	Δ	$\delta_\leftmoon$	Δ	$S_{\text{♃}}$	$\delta_{\text{♃}}$	$S_{\text{♄}}$	$\delta_{\text{♄}}$
h	° ′		° ′		° ′	° ′	° ′	° ′
0	67 59.0	125	15 46.1	−50	50 33.8	17 54.2	302 52.4	−18 59.2
2	97 2.0	126	15 36.2	−51	80 38.9	17 54.3	332 57.4	−18 59.2
4	126 5.1	127	15 26.0	−52	110 44.0	17 54.3	3 2.5	−18 59.2
6	155 8.5	128	15 15.6	−54	140 49.1	17 54.3	33 7.5	−18 59.1
8	184 12.0	128	15 4.9	−55	170 54.1	17 54.4	63 12.6	−18 59.1
10	213 15.6	129	14 53.9	−56	200 59.2	17 54.4	93 17.7	−18 59.1
12	242 19.5	130	14 42.6	−57	231 4.3	17 54.5	123 22.7	−18 59.0
14	271 23.6	131	14 31.2	−59	261 9.4	17 54.5	153 27.8	−18 59.0
16	300 27.8	132	14 19.4	−60	291 14.5	17 54.5	183 32.8	−18 59.0
18	329 32.1	133	14 7.4	−61	321 19.6	17 54.6	213 37.9	−18 58.9
20	358 36.7	134	13 55.2	−62	351 24.7	17 54.6	243 42.9	−18 58.9
22	27 41.4	134	13 42.8	−63	21 29.8	17 54.7	273 48.0	−18 58.8
Δ					25	0	25	0

φ	SUNCE		TRAJANJE SUMRAKA		MESEC			
	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 36	18 36	0 43	2 35	12 4	2.8	3 28	1.1
55	5 40	18 30	0 37	2 10	12 24	2.6	3 7	1.2
50	5 44	18 27	0 33	1 53	12 40	2.5	2 50	1.4
45	5 47	18 23	0 30	1 41	12 52	2.4	2 37	1.5
40	5 50	18 21	0 27	1 32	13 3	2.3	2 26	1.5
35	5 52	18 19	0 25	1 26	13 11	2.2	2 17	1.6
30	5 54	18 17	0 24	1 21	13 19	2.2	2 9	1.7
20	5 57	18 13	0 22	1 14	13 32	2.1	1 55	1.8
10	5 59	18 11	0 21	1 10	13 44	2.0	1 42	1.8
0	6 2	18 8	0 21	1 9	13 55	1.9	1 31	1.9
10	6 4	18 6	0 21	1 10	14 5	1.8	1 19	2.0
20	6 6	18 3	0 22	1 13	14 17	1.7	1 6	2.1
30	6 9	18 1	0 24	1 19	14 30	1.6	0 52	2.2
35	6 10	17 59	0 25	1 24	14 38	1.5	0 44	2.2
40	6 12	17 58	0 27	1 30	14 46	1.5	0 34	2.3
45	6 13	17 56	0 29	1 38	14 56	1.4	0 23	2.4
50	6 15	17 53	0 32	1 48	15 9	1.3	0 9	2.5
55	6 18	17 51	0 36	2 2	15 24	1.1	. . ..	.0
60	6 21	17 48	0 41	2 21	15 44	1.0	. . ..	.0
S								

SUNCE				MESEC			
UT	e = T_p − UT	Δ/24	r	Prolaz	Δ/24	$\pi_\leftmoon$	r
h	min s	s	′	h min	min	′	′
00	− 5 1.2	.8	16.0	$T_{\overline{m}}$ 20 6	1.9	54.8	14.9
12	− 4 52.2	$T_{\overline{m}_\odot}$ 12 h 4.9 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 21	.1	319	−3.6	♄	20 34	.0	224	−1.9
♂	13 19	.1	334	1.4	♃	3 48	.0	117	.5

UT	SUNCE		PROLEĆ. TAČKA	VENERA		MARS	
	$S_\odot$	$\delta_\odot$	S_Υ	S_φ	δ_φ	S_σ	δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	178 49.2	3 33.3	187 3.8	144 41.8	17 6.6	160 17.9	10 53.3
2	208 49.6	3 35.3	217 8.7	174 40.9	17 8.6	190 19.3	10 54.7
4	238 50.0	3 37.2	247 13.6	204 40.0	17 10.6	220 20.7	10 56.1
6	268 50.3	3 39.2	277 18.5	234 39.0	17 12.6	250 22.1	10 57.4
8	298 50.7	3 41.1	307 23.5	264 38.1	17 14.6	280 23.5	10 58.8
10	328 51.1	3 43.1	337 28.4	294 37.1	17 16.6	310 25.0	11 .2
12	358 51.5	3 45.0	7 33.3	324 36.2	17 18.6	340 26.4	11 1.5
14	28 51.9	3 46.9	37 38.2	354 35.2	17 20.6	10 27.8	11 2.9
16	58 52.2	3 48.9	67 43.2	24 34.3	17 22.6	40 29.2	11 4.3
18	88 52.6	3 50.8	97 48.1	54 33.3	17 24.6	70 30.6	11 5.6
20	118 53.0	3 52.8	127 53.0	84 32.4	17 26.6	100 32.0	11 7.0
22	148 53.4	3 54.7	157 58.0	114 31.4	17 28.6	130 33.4	11 8.4
Δ	2	10		−5	10	7	7

UT	MESEC				JUPITER		SATURN	
	$S_\leftmoon$	Δ	$\delta_\leftmoon$	Δ	$S_{\mathrm{♃}}$	$\delta_{\mathrm{♃}}$	$S_{\mathrm{♄}}$	$\delta_{\mathrm{♄}}$
h	° ′		° ′		° ′	° ′	° ′	° ′
0	56 46.3	135	13 30.1	−65	51 34.9	17 54.7	303 53.0	−18 58.8
2	85 51.3	136	13 17.2	−66	81 39.9	17 54.7	333 58.1	−18 58.8
4	114 56.5	137	13 4.1	−67	111 45.0	17 54.8	4 3.2	−18 58.7
6	144 1.9	138	12 50.7	−68	141 50.1	17 54.8	34 8.2	−18 58.7
8	173 7.4	138	12 37.1	−69	171 55.2	17 54.8	64 13.3	−18 58.7
10	202 13.0	139	12 23.4	−70	202 .3	17 54.9	94 18.3	−18 58.6
12	231 18.8	140	12 9.4	−71	232 5.3	17 54.9	124 23.4	−18 58.6
14	260 24.8	140	11 55.2	−72	262 10.4	17 55.0	154 28.5	−18 58.6
16	289 30.9	141	11 40.9	−73	292 15.5	17 55.0	184 33.5	−18 58.5
18	318 37.1	142	11 26.3	−74	322 20.6	17 55.0	214 38.6	−18 58.5
20	347 43.4	142	11 11.5	−75	352 25.6	17 55.1	244 43.7	−18 58.5
22	16 49.9	143	10 56.6	−76	22 30.7	17 55.1	274 48.7	−18 58.4
Δ					25	0	25	0

φ	SUNCE		TRAJANJE SUMRAKA		MESEC			
	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 33	18 38	0 43	2 36	13 11	2.9	3 54	.9
55	5 38	18 32	0 37	2 10	13 27	2.7	3 37	1.1
50	5 42	18 28	0 33	1 53	13 40	2.5	3 23	1.2
45	5 45	18 25	0 30	1 41	13 50	2.4	3 12	1.3
40	5 48	18 22	0 27	1 33	13 58	2.3	3 3	1.4
35	5 50	18 19	0 25	1 26	14 5	2.2	2 56	1.5
30	5 52	18 17	0 24	1 21	14 11	2.2	2 49	1.5
20	5 56	18 14	0 22	1 14	14 22	2.0	2 37	1.7
10	5 59	18 11	0 21	1 10	14 31	1.9	2 27	1.8
0	6 1	18 8	0 21	1 9	14 40	1.8	2 17	1.9
10	6 4	18 5	0 21	1 10	14 49	1.7	2 7	1.9
20	6 6	18 2	0 22	1 13	14 58	1.6	1 56	2.0
30	6 9	17 59	0 24	1 19	15 9	1.5	1 44	2.2
35	6 11	17 58	0 25	1 24	15 15	1.4	1 37	2.2
40	6 13	17 56	0 27	1 30	15 22	1.3	1 29	2.3
45	6 15	17 54	0 29	1 38	15 30	1.3	1 20	2.4
50	6 17	17 51	0 32	1 48	15 39	1.1	1 9	2.5
55	6 20	17 48	0 36	2 1	15 51	1.0	0 54	2.7
60	6 23	17 45	0 41	2 20	16 7	.8	0 36	2.9
S								

SUNCE				MESEC				
UT	$e = T_p - UT$	Δ/24	r	Prolaz		Δ/24	$\pi_\leftmoon$	r
h	min s	s	′	$T_{\overline{m}}$	h min	min	′	′
00	− 4 43.1	.8	16.0	$T_{\overline{m}}$	20 51	1.8	54.4	14.8
12	− 4 34.1	$T_{\overline{m}_\odot}$ 12 h	4.6 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 22	.1	318	−3.6	♄	20 30	.0	225	−1.9
♂	13 18	.1	333	1.4	♃	3 44	.0	117	.5

UT	SUNCE		PROLEĆ. TAČKA	VENERA		MARS	
	$S_\odot$	$\delta_\odot$	S_Υ	S_φ	δ_φ	S_σ	δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	178 53.7	3 56.6	188 2.9	144 30.5	17 30.6	160 34.8	11 9.7
2	208 54.1	3 58.6	218 7.8	174 29.5	17 32.6	190 36.2	11 11.1
4	238 54.5	4 .5	248 12.7	204 28.6	17 34.5	220 37.7	11 12.5
6	268 54.9	4 2.5	278 17.7	234 27.6	17 36.5	250 39.1	11 13.8
8	298 55.2	4 4.4	308 22.6	264 26.7	17 38.5	280 40.5	11 15.2
10	328 55.6	4 6.3	338 27.5	294 25.7	17 40.5	310 41.9	11 16.5
12	358 56.0	4 8.3	8 32.5	324 24.7	17 42.4	340 43.3	11 17.9
14	28 56.4	4 10.2	38 37.4	354 23.8	17 44.4	10 44.7	11 19.2
16	58 56.7	4 12.1	68 42.3	24 22.8	17 46.3	40 46.1	11 20.6
18	88 57.1	4 14.1	98 47.2	54 21.8	17 48.3	70 47.5	11 22.0
20	118 57.5	4 16.0	128 52.2	84 20.9	17 50.3	100 48.9	11 23.3
22	148 57.9	4 17.9	158 57.1	114 19.9	17 52.2	130 50.4	11 24.7
Δ	2	10		−5	10	7	7

UT	MESEC				JUPITER		SATURN	
	$S_\leftmoon$	Δ	$\delta_\leftmoon$	Δ	$S_{\mathrm{♃}}$	$\delta_{\mathrm{♃}}$	$S_{\mathrm{♄}}$	$\delta_{\mathrm{♄}}$
h	° ′		° ′		° ′	° ′	° ′	° ′
0	45 56.5	144	10 41.5	−76	52 35.8	17 55.1	304 53.8	−18 58.4
2	75 3.2	144	10 26.2	−77	82 40.8	17 55.2	334 58.9	−18 58.4
4	104 10.0	145	10 10.8	−78	112 45.9	17 55.2	5 3.9	−18 58.3
6	133 17.0	145	9 55.2	−79	142 51.0	17 55.2	35 9.0	−18 58.3
8	162 24.1	146	9 39.4	−80	172 56.0	17 55.3	65 14.1	−18 58.3
10	191 31.2	146	9 23.5	−80	203 1.1	17 55.3	95 19.1	−18 58.2
12	220 38.5	147	9 7.4	−81	233 6.2	17 55.3	125 24.2	−18 58.2
14	249 45.9	147	8 51.1	−82	263 11.2	17 55.3	155 29.3	−18 58.1
16	278 53.4	148	8 34.8	−83	293 16.3	17 55.4	185 34.3	−18 58.1
18	308 .9	148	8 18.2	−83	323 21.3	17 55.4	215 39.4	−18 58.1
20	337 8.6	149	8 1.6	−84	353 26.4	17 55.4	245 44.5	−18 58.0
22	6 16.3	149	7 44.8	−85	23 31.4	17 55.5	275 49.6	−18 58.0
Δ					25	0	25	0

φ	SUNCE		TRAJANJE SUMRAKA		MESEC			
	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 30	18 40	0 43	2 38	14 20	2.9	4 15	.8
55	5 35	18 34	0 37	2 11	14 32	2.7	4 2	.9
50	5 40	18 30	0 33	1 54	14 40	2.5	3 52	1.1
45	5 43	18 26	0 30	1 42	14 47	2.4	3 44	1.2
40	5 46	18 23	0 27	1 33	14 53	2.3	3 37	1.3
35	5 49	18 20	0 25	1 26	14 58	2.2	3 31	1.4
30	5 51	18 18	0 24	1 21	15 3	2.1	3 26	1.5
20	5 55	18 14	0 22	1 14	15 11	2.0	3 17	1.6
10	5 58	18 11	0 21	1 10	15 17	1.9	3 9	1.7
0	6 1	18 8	0 21	1 9	15 24	1.8	3 1	1.8
10	6 4	18 5	0 21	1 10	15 30	1.7	2 54	1.9
20	6 7	18 2	0 22	1 13	15 37	1.6	2 46	2.0
30	6 10	17 58	0 24	1 19	15 44	1.4	2 36	2.2
35	6 12	17 56	0 25	1 24	15 49	1.4	2 31	2.2
40	6 14	17 54	0 27	1 30	15 54	1.3	2 25	2.3
45	6 16	17 52	0 29	1 38	15 60	1.2	2 18	2.4
50	6 18	17 49	0 32	1 48	16 7	1.1	2 9	2.5
55	6 22	17 46	0 36	2 1	16 15	.9	1 58	2.7
60	6 26	17 41	0 41	2 20	16 26	.7	1 44	2.9
S								

SUNCE				MESEC				
UT	$e = T_p - UT$	Δ/24	r	Prolaz		Δ/24	$\pi_\leftmoon$	r
h	min s	s	′	$T_{\overline{m}}$	h min	min	′	′
00	− 4 25.1	.7	16.0	$T_{\overline{m}}$	21 34	1.8	54.1	14.8
12	− 4 16.1	$T_{\overline{m}_\odot}$ 12 h	4.3 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 22	.1	316	−3.6	♄	20 26	.0	225	−1.9
♂	13 17	.1	333	1.4	♃	3 40	.0	117	.5

UT	SUNCE		PROLEĆ. TAČKA	VENERA		MARS	
	$S_\odot$	$\delta_\odot$	S_Υ	S_φ	δ_φ	S_σ	δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	178 58.2	4 19.9	189 2.0	144 18.9	17 54.1	160 51.8	11 26.0
2	208 58.6	4 21.8	219 7.0	174 17.9	17 56.1	190 53.2	11 27.4
4	238 59.0	4 23.7	249 11.9	204 17.0	17 58.0	220 54.6	11 28.7
6	268 59.4	4 25.7	279 16.8	234 16.0	17 60.0	250 56.0	11 30.1
8	298 59.7	4 27.6	309 21.7	264 15.0	18 1.9	280 57.4	11 31.4
10	329 .1	4 29.5	339 26.7	294 14.0	18 3.8	310 58.8	11 32.8
12	359 .5	4 31.5	9 31.6	324 13.1	18 5.8	341 .2	11 34.1
14	29 .8	4 33.4	39 36.5	354 12.1	18 7.7	11 1.6	11 35.5
16	59 1.2	4 35.3	69 41.5	24 11.1	18 9.6	41 3.0	11 36.8
18	89 1.6	4 37.3	99 46.4	54 10.1	18 11.5	71 4.4	11 38.2
20	119 2.0	4 39.2	129 51.3	84 9.1	18 13.4	101 5.8	11 39.5
22	149 2.3	4 41.1	159 56.2	114 8.1	18 15.4	131 7.2	11 40.8
Δ	2	10		−5	10	7	7

UT	MESEC				JUPITER		SATURN	
	$S_\leftmoon$	Δ	$\delta_\leftmoon$	Δ	$S_{\text{♃}}$	$\delta_{\text{♃}}$	$S_{\text{♄}}$	$\delta_{\text{♄}}$
h	° ′		° ′		° ′	° ′	° ′	° ′
0	35 24.1	149	7 27.9	−85	53 36.5	17 55.5	305 54.6	−18 58.0
2	64 32.0	150	7 10.9	−86	83 41.6	17 55.5	335 59.7	−18 57.9
4	93 40.0	150	6 53.7	−86	113 46.6	17 55.6	6 4.8	−18 57.9
6	122 48.0	150	6 36.5	−87	143 51.7	17 55.6	36 9.9	−18 57.9
8	151 56.1	151	6 19.1	−87	173 56.7	17 55.6	66 14.9	−18 57.8
10	181 4.2	151	6 1.6	−88	204 1.7	17 55.6	96 20.0	−18 57.8
12	210 12.4	151	5 44.1	−88	234 6.8	17 55.7	126 25.1	−18 57.7
14	239 20.7	151	5 26.4	−89	264 11.8	17 55.7	156 30.2	−18 57.7
16	268 29.0	152	5 8.6	−89	294 16.9	17 55.7	186 35.2	−18 57.7
18	297 37.3	152	4 50.8	−90	324 21.9	17 55.7	216 40.3	−18 57.6
20	326 45.7	152	4 32.9	−90	354 27.0	17 55.8	246 45.4	−18 57.6
22	355 54.1	152	4 14.9	−90	24 32.0	17 55.8	276 50.5	−18 57.6
Δ					25	0	25	0

φ	SUNCE		TRAJANJE SUMRAKA		MESEC			
	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 27	18 43	0 43	2 39	15 29	2.9	4 34	.7
55	5 33	18 36	0 37	2 12	15 36	2.7	4 25	.9
50	5 38	18 31	0 33	1 54	15 41	2.5	4 18	1.0
45	5 42	18 27	0 30	1 42	15 45	2.4	4 13	1.1
40	5 45	18 24	0 27	1 33	15 49	2.3	4 8	1.2
35	5 48	18 21	0 26	1 26	15 52	2.2	4 4	1.3
30	5 50	18 18	0 24	1 21	15 54	2.1	4 1	1.4
20	5 54	18 14	0 22	1 14	15 59	2.0	3 55	1.5
10	5 58	18 11	0 21	1 10	16 3	1.9	3 50	1.7
0	6 1	18 7	0 21	1 9	16 7	1.8	3 45	1.8
10	6 4	18 4	0 21	1 10	16 10	1.7	3 39	1.9
20	6 7	18 1	0 22	1 13	16 14	1.5	3 34	2.0
30	6 10	17 57	0 24	1 19	16 19	1.4	3 28	2.1
35	6 12	17 55	0 25	1 24	16 21	1.3	3 24	2.2
40	6 15	17 53	0 27	1 30	16 24	1.2	3 20	2.3
45	6 17	17 50	0 29	1 37	16 28	1.1	3 15	2.4
50	6 20	17 47	0 32	1 48	16 32	1.0	3 10	2.5
55	6 24	17 43	0 36	2 1	16 37	.9	3 3	2.7
60	6 28	17 39	0 41	2 20	16 43	.7	2 53	2.9
S								

SUNCE				MESEC				
UT	e = T_p − UT	Δ/24	r	Prolaz		Δ/24	$\pi_\leftmoon$	r
h	min s	s	′	$T_{\overline{m}}$	h min	min	′	′
00	− 4 7.1	.7	16.0		22 17	1.8	54.0	14.7
12	− 3 58.1	$T_{\overline{m}_\odot}$ 12 h	4.0 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 23	.1	315	−3.6	♃	20 22	.0	225	−1.9
♂	13 16	.1	332	1.4	♄	3 36	.0	117	.5

UT	SUNCE		PROLEĆ. TAČKA	VENERA		MARS	
	$S_\odot$	$\delta_\odot$	S_Υ	S_φ	δ_φ	S_σ	δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	179 2.7	4 43.0	190 1.2	144 7.2	18 17.3	161 8.7	11 42.2
2	209 3.1	4 45.0	220 6.1	174 6.2	18 19.2	191 10.1	11 43.5
4	239 3.5	4 46.9	250 11.0	204 5.2	18 21.1	221 11.5	11 44.9
6	269 3.8	4 48.8	280 16.0	234 4.2	18 23.0	251 12.9	11 46.2
8	299 4.2	4 50.7	310 20.9	264 3.2	18 24.9	281 14.3	11 47.5
10	329 4.6	4 52.7	340 25.8	294 2.2	18 26.8	311 15.7	11 48.9
12	359 4.9	4 54.6	10 30.7	324 1.2	18 28.7	341 17.1	11 50.2
14	29 5.3	4 56.5	40 35.7	354 .2	18 30.6	11 18.5	11 51.6
16	59 5.7	4 58.4	70 40.6	23 59.2	18 32.4	41 19.9	11 52.9
18	89 6.1	5 .3	100 45.5	53 58.2	18 34.3	71 21.3	11 54.2
20	119 6.4	5 2.3	130 50.5	83 57.2	18 36.2	101 22.7	11 55.6
22	149 6.8	5 4.2	160 55.4	113 56.2	18 38.1	131 24.1	11 56.9
Δ	2	10		−5	9	7	7

UT	MESEC				JUPITER		SATURN	
	$S_\leftmoon$	Δ	$\delta_\leftmoon$	Δ	$S_{\text{♃}}$	$\delta_{\text{♃}}$	$S_{\text{♄}}$	$\delta_{\text{♄}}$
h	° ′		° ′		° ′	° ′	° ′	° ′
0	25 2.5	152	3 56.8	−91	54 37.0	17 55.8	306 55.6	−18 57.5
2	54 11.0	152	3 38.6	−91	84 42.1	17 55.8	337 .7	−18 57.5
4	83 19.4	152	3 20.4	−91	114 47.1	17 55.9	7 5.7	−18 57.4
6	112 27.9	153	3 2.2	−92	144 52.1	17 55.9	37 10.8	−18 57.4
8	141 36.4	153	2 43.8	−92	174 57.2	17 55.9	67 15.9	−18 57.4
10	170 45.0	153	2 25.4	−92	205 2.2	17 55.9	97 21.0	−18 57.3
12	199 53.5	153	2 7.0	−92	235 7.2	17 56.0	127 26.1	−18 57.3
14	229 2.0	153	1 48.5	−93	265 12.3	17 56.0	157 31.2	−18 57.2
16	258 10.5	152	1 30.0	−93	295 17.3	17 56.0	187 36.2	−18 57.2
18	287 19.0	152	1 11.5	−93	325 22.3	17 56.0	217 41.3	−18 57.2
20	316 27.5	152	0 52.9	−93	355 27.3	17 56.0	247 46.4	−18 57.1
22	345 35.9	152	0 34.3	−93	25 32.4	17 56.1	277 51.5	−18 57.1
Δ					25	0	25	0

φ	SUNCE		TRAJANJE SUMRAKA		MESEC			
	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 45	0 43	2 41	16 39	1.5	4 50	1.0
55	5 30	18 38	0 37	2 13	16 41	1.5	4 46	1.1
50	5 35	18 33	0 33	1 55	16 42	1.6	4 43	1.2
45	5 40	18 28	0 30	1 42	16 43	1.6	4 40	1.3
40	5 43	18 25	0 27	1 33	16 44	1.6	4 38	1.4
35	5 46	18 22	0 26	1 26	16 45	1.6	4 36	1.4
30	5 49	18 19	0 24	1 21	16 46	1.7	4 35	1.5
20	5 53	18 14	0 22	1 14	16 47	1.7	4 32	1.6
10	5 57	18 11	0 21	1 10	16 48	1.7	4 29	1.7
0	6 0	18 7	0 21	1 9	16 49	1.8	4 27	1.8
10	6 4	18 3	0 21	1 10	16 50	1.8	4 25	1.9
20	6 7	17 60	0 22	1 13	16 51	1.8	4 22	1.9
30	6 11	17 56	0 24	1 19	16 52	1.9	4 19	2.0
35	6 13	17 54	0 25	1 24	16 53	1.9	4 18	2.1
40	6 16	17 51	0 27	1 30	16 54	1.9	4 16	2.2
45	6 18	17 48	0 29	1 37	16 55	2.0	4 13	2.2
50	6 22	17 45	0 32	1 47	16 56	2.0	4 11	2.3
55	6 26	17 41	0 36	2 1	16 57	2.1	4 7	2.5
60	6 31	17 36	0 41	2 20	16 59	2.1	4 3	2.6
S								

SUNCE				MESEC				
UT	e = T_p − UT	Δ/24	r	Prolaz		Δ/24	$\pi_\leftmoon$	r
h	min s	s	′	$T_{\overline{m}}$	h min	min	′	′
00	− 3 49.2	.7	16.0		22 59	1.8	54.0	14.7
12	− 3 40.3	$T_{\overline{m}_\odot}$ 12 h	3.7 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 24	.1	314	−3.6	♃	20 18	.0	225	−1.9
♂	13 15	.1	331	1.4	♄	3 32	.0	117	.5

UT	SUNCE		PROLEĆ. TAČKA	VENERA		MARS	
	$S_\odot$	$\delta_\odot$	S_Υ	S_φ	δ_φ	S_σ	δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	179 7.2	5 6.1	191 .3	143 55.2	18 39.9	161 25.5	11 58.2
2	209 7.5	5 8.0	221 5.2	173 54.2	18 41.8	191 26.9	11 59.6
4	239 7.9	5 9.9	251 10.2	203 53.2	18 43.7	221 28.3	12 .9
6	269 8.3	5 11.9	281 15.1	233 52.2	18 45.5	251 29.7	12 2.2
8	299 8.6	5 13.8	311 20.0	263 51.1	18 47.4	281 31.1	12 3.5
10	329 9.0	5 15.7	341 24.9	293 50.1	18 49.3	311 32.5	12 4.9
12	359 9.4	5 17.6	11 29.9	323 49.1	18 51.1	341 33.9	12 6.2
14	29 9.7	5 19.5	41 34.8	353 48.1	18 53.0	11 35.3	12 7.5
16	59 10.1	5 21.4	71 39.7	23 47.1	18 54.8	41 36.7	12 8.8
18	89 10.5	5 23.3	101 44.7	53 46.1	18 56.7	71 38.1	12 10.2
20	119 10.8	5 25.3	131 49.6	83 45.0	18 58.5	101 39.5	12 11.5
22	149 11.2	5 27.2	161 54.5	113 44.0	19 .3	131 40.9	12 12.8
Δ	2	10		−5	9	7	7

UT	MESEC				JUPITER		SATURN	
	$S_\leftmoon$	Δ	$\delta_\leftmoon$	Δ	S_4	δ_4	S_η	δ_η
h	° ′		° ′		° ′	° ′	° ′	° ′
0	14 44.4	152	0 15.7	−64	55 37.4	17 56.1	307 56.6	−18 57.0
2	43 52.8	152	0 2.9	93	85 42.4	17 56.1	338 1.7	−18 57.0
4	73 1.1	152	0 21.5	93	115 47.4	17 56.1	8 6.8	−18 57.0
6	102 9.5	151	0 40.2	93	145 52.4	17 56.1	38 11.9	−18 56.9
8	131 17.8	151	0 58.8	93	175 57.4	17 56.2	68 17.0	−18 56.9
10	160 26.0	151	1 17.5	93	206 2.5	17 56.2	98 22.1	−18 56.9
12	189 34.2	151	1 36.1	93	236 7.5	17 56.2	128 27.2	−18 56.8
14	218 42.4	150	1 54.7	93	266 12.5	17 56.2	158 32.2	−18 56.8
16	247 50.5	150	2 13.3	93	296 17.5	17 56.2	188 37.3	−18 56.7
18	276 58.5	150	2 31.9	93	326 22.5	17 56.2	218 42.4	−18 56.7
20	306 6.5	149	2 50.4	93	356 27.5	17 56.3	248 47.5	−18 56.7
22	335 14.4	149	3 8.9	92	26 32.5	17 56.3	278 52.6	−18 56.6
Δ					25	0	25	0

φ	SUNCE		TRAJANJE SUMRAKA		MESEC			
	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 20	18 48	0 43	2 43	17 15	.7	5 13	2.9
55	5 28	18 40	0 37	2 14	17 18	.9	5 13	2.7
50	5 33	18 34	0 33	1 55	17 20	1.0	5 12	2.6
45	5 38	18 30	0 30	1 43	17 22	1.2	5 12	2.4
40	5 42	18 26	0 27	1 33	17 23	1.3	5 11	2.3
35	5 45	18 23	0 26	1 27	17 25	1.4	5 11	2.2
30	5 48	18 20	0 24	1 21	17 26	1.4	5 11	2.2
20	5 52	18 15	0 22	1 14	17 28	1.6	5 10	2.0
10	5 56	18 11	0 21	1 10	17 30	1.7	5 10	1.9
0	6 0	18 7	0 21	1 9	17 32	1.8	5 10	1.8
10	6 4	18 3	0 21	1 10	17 33	1.9	5 9	1.7
20	6 7	17 59	0 22	1 13	17 35	2.0	5 9	1.5
30	6 12	17 55	0 24	1 19	17 38	2.2	5 8	1.4
35	6 14	17 52	0 25	1 24	17 39	2.3	5 8	1.3
40	6 17	17 50	0 27	1 30	17 40	2.4	5 8	1.2
45	6 20	17 46	0 29	1 37	17 42	2.5	5 7	1.1
50	6 23	17 43	0 32	1 47	17 44	2.6	5 7	1.0
55	6 27	17 38	0 36	2 1	17 47	2.8	5 6	.9
60	6 33	17 33	0 41	2 19	17 50	3.0	5 6	.7
S								

SUNCE				MESEC			
UT	e = Tp − UT	Δ/24	r	Prolaz	Δ/24	$\pi_\leftmoon$	r
h	min s	s	′	h min	min	′	′
00	− 3 31.4	.7	16.0	$T_{\overline{m}}$ 23 42	1.8	54.1	14.7
12	− 3 22.5	$T_{\overline{m}_\odot}$ 12 h	3.4 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 25	.1	313	−3.6	♃	20 14	.0	225	−1.9
♂	13 14	.1	330	1.4	♄	3 28	.0	117	.5

UT	SUNCE		PROLEĆ. TAČKA	VENERA		MARS	
	$S_\odot$	$\delta_\odot$	S_Υ	S_φ	δ_φ	S_σ	δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	179 11.6	5 29.1	191 59.4	143 43.0	19 2.2	161 42.3	12 14.1
2	209 11.9	5 31.0	222 4.4	173 42.0	19 4.0	191 43.7	12 15.5
4	239 12.3	5 32.9	252 9.3	203 40.9	19 5.8	221 45.1	12 16.8
6	269 12.7	5 34.8	282 14.2	233 39.9	19 7.6	251 46.5	12 18.1
8	299 13.0	5 36.7	312 19.2	263 38.9	19 9.5	281 47.9	12 19.4
10	329 13.4	5 38.6	342 24.1	293 37.9	19 11.3	311 49.3	12 20.7
12	359 13.8	5 40.5	12 29.0	323 36.8	19 13.1	341 50.7	12 22.0
14	29 14.1	5 42.4	42 33.9	353 35.8	19 14.9	11 52.1	12 23.4
16	59 14.5	5 44.3	72 38.9	23 34.8	19 16.7	41 53.5	12 24.7
18	89 14.9	5 46.2	102 43.8	53 33.7	19 18.5	71 54.9	12 26.0
20	119 15.2	5 48.1	132 48.7	83 32.7	19 20.3	101 56.3	12 27.3
22	149 15.6	5 50.1	162 53.7	113 31.6	19 22.1	131 57.7	12 28.6
Δ	2	10		−5	9	7	7

UT	MESEC				JUPITER		SATURN	
	$S_\leftmoon$	Δ	$\delta_\leftmoon$	Δ	S_4	δ_4	S_η	δ_η
h	° ′		° ′		° ′	° ′	° ′	° ′
0	4 22.2	149	3 27.4	92	56 37.5	17 56.3	308 57.7	−18 56.6
2	33 29.9	148	3 45.8	92	86 42.5	17 56.3	339 2.8	−18 56.5
4	62 37.6	148	4 4.2	92	116 47.5	17 56.3	9 7.9	−18 56.5
6	91 45.1	147	4 22.5	91	146 52.5	17 56.3	39 13.0	−18 56.4
8	120 52.6	147	4 40.8	91	176 57.5	17 56.3	69 18.1	−18 56.4
10	150 .0	146	4 59.0	91	207 2.5	17 56.4	99 23.2	−18 56.4
12	179 7.2	146	5 17.1	90	237 7.5	17 56.4	129 28.3	−18 56.3
14	208 14.4	145	5 35.2	90	267 12.5	17 56.4	159 33.4	−18 56.3
16	237 21.5	145	5 53.2	89	297 17.5	17 56.4	189 38.5	−18 56.2
18	266 28.5	144	6 11.1	89	327 22.5	17 56.4	219 43.6	−18 56.2
20	295 35.3	144	6 28.9	89	357 27.5	17 56.4	249 48.7	−18 56.2
22	324 42.0	143	6 46.6	88	27 32.5	17 56.4	279 53.8	−18 56.1
Δ					25	0	26	0

φ	SUNCE		TRAJANJE SUMRAKA		MESEC			
	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 17	18 50	0 44	2 45	17 31	.8	6 24	3.0
55	5 25	18 42	0 37	2 14	17 39	1.0	6 18	2.8
50	5 31	18 36	0 33	1 56	17 45	1.1	6 14	2.6
45	5 36	18 31	0 30	1 43	17 50	1.2	6 10	2.5
40	5 40	18 27	0 27	1 34	17 54	1.3	6 8	2.4
35	5 43	18 23	0 26	1 27	17 57	1.4	6 5	2.3
30	5 46	18 20	0 24	1 21	18 0	1.5	6 3	2.2
20	5 51	18 15	0 22	1 14	18 6	1.6	5 59	2.1
10	5 56	18 10	0 21	1 10	18 10	1.7	5 56	1.9
0	5 60	18 6	0 21	1 9	18 15	1.9	5 52	1.8
10	6 4	18 2	0 21	1 10	18 19	2.0	5 49	1.7
20	6 8	17 58	0 22	1 13	18 24	2.1	5 46	1.6
30	6 12	17 54	0 24	1 19	18 30	2.2	5 42	1.5
35	6 15	17 51	0 25	1 24	18 33	2.3	5 40	1.4
40	6 18	17 48	0 27	1 30	18 37	2.4	5 37	1.3
45	6 21	17 45	0 29	1 37	18 41	2.5	5 34	1.2
50	6 25	17 41	0 32	1 47	18 46	2.6	5 31	1.1
55	6 29	17 36	0 36	2 1	18 53	2.8	5 27	.9
60	6 35	17 30	0 41	2 19	19 1	3.0	5 21	.7
S								

SUNCE				MESEC			
UT	e = Tp − UT	Δ/24	r	Prolaz	Δ/24	$\pi_\leftmoon$	r
h	min s	s	′	h min	min	′	′
00	− 3 13.7	.7	16.0	$T_{\overline{m}}$ . . .	1.0	54.3	14.8
12	− 3 4.9	$T_{\overline{m}_\odot}$ 12 h	3.1 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 26	.1	312	−3.6	♃	20 10	.0	225	−1.9
♂	13 13	.1	330	1.4	♄	3 24	.0	117	.5

UT	SUNCE $S_\odot$	SUNCE $\delta_\odot$	PROLEĆ. TAČKA S_Υ	VENERA S_φ	VENERA δ_φ	MARS S_σ	MARS δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	179 16.0	5 52.0	192 58.6	143 30.6	19 23.9	161 59.1	12 29.9
2	209 16.3	5 53.9	223 3.5	173 29.6	19 25.7	192 .5	12 31.2
4	239 16.7	5 55.8	253 8.4	203 28.5	19 27.5	222 1.9	12 32.5
6	269 17.0	5 57.7	283 13.4	233 27.5	19 29.3	252 3.3	12 33.9
8	299 17.4	5 59.6	313 18.3	263 26.4	19 31.1	282 4.7	12 35.2
10	329 17.8	6 1.5	343 23.2	293 25.4	19 32.8	312 6.1	12 36.5
12	359 18.1	6 3.4	13 28.2	323 24.3	19 34.6	342 7.5	12 37.8
14	29 18.5	6 5.3	43 33.1	353 23.3	19 36.4	12 8.9	12 39.1
16	59 18.9	6 7.2	73 38.0	23 22.2	19 38.1	42 10.3	12 40.4
18	89 19.2	6 9.0	103 42.9	53 21.2	19 39.9	72 11.7	12 41.7
20	119 19.6	6 10.9	133 47.9	83 20.1	19 41.7	102 13.1	12 43.0
22	149 19.9	6 12.8	163 52.8	113 19.1	19 43.4	132 14.5	12 44.3
Δ	2	9		−5	9	7	7

UT	MESEC $S_\leftmoon$	MESEC Δ	MESEC $\delta_\leftmoon$	MESEC Δ	JUPITER $S_{\jupiter}$	JUPITER $\delta_{\jupiter}$	SATURN $S_{\saturn}$	SATURN $\delta_{\saturn}$
h	° ′		° ′		° ′	° ′	° ′	° ′
0	353 48.6	142	7 4.2	88	57 37.5	17 56.4	309 59.0	−18 56.1
2	22 55.1	142	7 21.7	87	87 42.5	17 56.4	340 4.1	−18 56.0
4	52 1.4	141	7 39.1	86	117 47.5	17 56.5	10 9.2	−18 56.0
6	81 7.7	140	7 56.4	86	147 52.5	17 56.5	40 14.3	−18 56.0
8	110 13.7	140	8 13.6	85	177 57.4	17 56.5	70 19.4	−18 55.9
10	139 19.7	139	8 30.6	85	208 2.4	17 56.5	100 24.5	−18 55.9
12	168 25.5	138	8 47.5	84	238 7.4	17 56.5	130 29.6	−18 55.8
14	197 31.1	137	9 4.2	83	268 12.4	17 56.5	160 34.7	−18 55.8
16	226 36.6	137	9 20.9	82	298 17.4	17 56.5	190 39.8	−18 55.7
18	255 42.0	136	9 37.3	82	328 22.3	17 56.5	220 44.9	−18 55.7
20	284 47.2	135	9 53.7	81	358 27.3	17 56.5	250 50.0	−18 55.7
22	313 52.2	134	10 9.8	80	28 32.3	17 56.5	280 55.2	−18 55.6
Δ					25	0	26	0

φ	SUNCE IZLAZ	SUNCE ZALAZ	TRAJANJE SUMRAKA GRAĐ.	TRAJANJE SUMRAKA ASTR.	MESEC IZLAZ	MESEC Δ/24	MESEC ZALAZ	MESEC 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 46	17 49	.9	7 35	3.0
55	5 23	18 44	0 38	2 15	18 2	1.1	7 25	2.8
50	5 29	18 38	0 33	1 56	18 11	1.2	7 16	2.6
45	5 34	18 32	0 30	1 43	18 19	1.4	7 10	2.5
40	5 38	18 28	0 28	1 34	18 26	1.4	7 4	2.4
35	5 42	18 24	0 26	1 27	18 31	1.5	6 60	2.3
30	5 45	18 21	0 24	1 22	18 36	1.6	6 56	2.2
20	5 51	18 15	0 22	1 14	18 45	1.7	6 48	2.1
10	5 55	18 10	0 21	1 10	18 52	1.8	6 42	2.0
0	5 60	18 6	0 21	1 9	18 59	1.9	6 36	1.9
10	6 4	18 2	0 21	1 10	19 7	2.0	6 30	1.8
20	6 8	17 57	0 22	1 13	19 14	2.1	6 24	1.7
30	6 13	17 52	0 24	1 19	19 23	2.3	6 17	1.5
35	6 16	17 50	0 25	1 24	19 28	2.3	6 13	1.5
40	6 19	17 46	0 27	1 30	19 34	2.4	6 8	1.4
45	6 22	17 43	0 29	1 37	19 41	2.5	6 3	1.3
50	6 26	17 38	0 32	1 47	19 49	2.6	5 57	1.2
55	6 31	17 33	0 36	2 1	19 59	2.8	5 49	1.0
60	6 38	17 27	0 42	2 19	20 12	3.0	5 39	.8
S								

SUNCE UT	SUNCE $e = T_p - UT$	SUNCE Δ/24	SUNCE r	MESEC Prolaz	MESEC Δ/24	MESEC $\pi_\leftmoon$	MESEC r
h	min s	s	′	h min	min	′	′
00	− 2 56.2	.7	16.0	$T_{\overline{m}}$ 0 26	1.8	54.6	14.9
12	− 2 47.5	$T_{\overline{m}_\odot}$ 12 h	2.8 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 26	.1	311	−3.6	♃	20 6	.0	225	−1.9
♂	13 11	.1	329	1.4	♄	3 20	.0	117	.5

UT	SUNCE $S_\odot$	SUNCE $\delta_\odot$	PROLEĆ. TAČKA S_Υ	VENERA S_φ	VENERA δ_φ	MARS S_σ	MARS δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	179 20.3	6 14.7	193 57.7	143 18.0	19 45.2	162 15.9	12 45.6
2	209 20.7	6 16.6	224 2.7	173 17.0	19 46.9	192 17.2	12 46.9
4	239 21.0	6 18.5	254 7.6	203 15.9	19 48.7	222 18.6	12 48.2
6	269 21.4	6 20.4	284 12.5	233 14.8	19 50.4	252 20.0	12 49.5
8	299 21.7	6 22.3	314 17.4	263 13.8	19 52.2	282 21.4	12 50.8
10	329 22.1	6 24.2	344 22.4	293 12.7	19 53.9	312 22.8	12 52.1
12	359 22.4	6 26.1	14 27.3	323 11.6	19 55.6	342 24.2	12 53.4
14	29 22.8	6 28.0	44 32.2	353 10.6	19 57.4	12 25.6	12 54.7
16	59 23.2	6 29.9	74 37.1	23 9.5	19 59.1	42 27.0	12 55.9
18	89 23.5	6 31.7	104 42.1	53 8.4	20 .8	72 28.4	12 57.2
20	119 23.9	6 33.6	134 47.0	83 7.4	20 2.5	102 29.8	12 58.5
22	149 24.2	6 35.5	164 51.9	113 6.3	20 4.2	132 31.2	12 59.8
Δ	2	9		−5	9	7	6

UT	MESEC $S_\leftmoon$	MESEC Δ	MESEC $\delta_\leftmoon$	MESEC Δ	JUPITER $S_{\jupiter}$	JUPITER $\delta_{\jupiter}$	SATURN $S_{\saturn}$	SATURN $\delta_{\saturn}$
h	° ′		° ′		° ′	° ′	° ′	° ′
0	342 57.1	134	10 25.8	79	58 37.3	17 56.5	311 .3	−18 55.6
2	12 1.8	133	10 41.6	78	88 42.2	17 56.5	341 5.4	−18 55.5
4	41 6.3	132	10 57.3	77	118 47.2	17 56.5	11 10.5	−18 55.5
6	70 10.7	131	11 12.7	76	148 52.2	17 56.5	41 15.6	−18 55.4
8	99 14.9	130	11 28.0	75	178 57.2	17 56.6	71 20.7	−18 55.4
10	128 18.9	129	11 43.1	74	209 2.1	17 56.6	101 25.8	−18 55.4
12	157 22.8	128	11 58.0	73	239 7.1	17 56.6	131 31.0	−18 55.3
14	186 26.4	127	12 12.6	72	269 12.0	17 56.6	161 36.1	−18 55.3
16	215 29.9	127	12 27.1	71	299 17.0	17 56.6	191 41.2	−18 55.2
18	244 33.2	126	12 41.4	70	329 22.0	17 56.6	221 46.3	−18 55.2
20	273 36.4	125	12 55.4	69	359 26.9	17 56.6	251 51.4	−18 55.1
22	302 39.3	124	13 9.2	68	29 31.9	17 56.6	281 56.6	−18 55.1
Δ					25	0	26	0

φ	SUNCE IZLAZ	SUNCE ZALAZ	TRAJANJE SUMRAKA GRAĐ.	TRAJANJE SUMRAKA ASTR.	MESEC IZLAZ	MESEC Δ/24	MESEC ZALAZ	MESEC Δ/24
N	h min	h min	h min	h min	h min	min	h min	min
60	5 11	18 55	0 44	2 48	18 11	1.1	8 47	2.9
55	5 20	18 46	0 38	2 16	18 28	1.3	8 31	2.8
50	5 27	18 39	0 33	1 57	18 41	1.4	8 19	2.6
45	5 32	18 34	0 30	1 44	18 51	1.5	8 10	2.5
40	5 37	18 29	0 28	1 34	19 0	1.6	8 2	2.4
35	5 41	18 25	0 26	1 27	19 8	1.7	7 55	2.3
30	5 44	18 21	0 24	1 22	19 14	1.7	7 49	2.3
20	5 50	18 16	0 22	1 14	19 26	1.8	7 39	2.2
10	5 55	18 10	0 21	1 11	19 36	1.9	7 30	2.1
0	5 59	18 6	0 21	1 9	19 46	2.0	7 21	2.0
10	6 4	18 1	0 21	1 10	19 55	2.1	7 13	1.9
20	6 8	17 56	0 22	1 13	20 5	2.2	7 4	1.8
30	6 13	17 51	0 24	1 19	20 17	2.3	6 54	1.7
35	6 16	17 48	0 25	1 24	20 24	2.3	6 48	1.6
40	6 20	17 45	0 27	1 30	20 32	2.4	6 41	1.5
45	6 23	17 41	0 29	1 37	20 41	2.5	6 34	1.4
50	6 28	17 36	0 32	1 47	20 52	2.6	6 25	1.3
55	6 33	17 31	0 36	2 1	21 6	2.7	6 13	1.2
60	6 40	17 24	0 42	2 19	21 24	2.9	5 58	1.0
S								

SUNCE UT	SUNCE $e = T_p - UT$	SUNCE Δ/24	SUNCE r	MESEC Prolaz	MESEC Δ/24	MESEC $\pi_\leftmoon$	MESEC r
h	min s	s	′	h min	min	′	′
00	− 2 38.8	.7	16.0	$T_{\overline{m}}$ 1 10	2.0	54.9	15.0
12	− 2 30.2	$T_{\overline{m}_\odot}$ 12 h	2.5 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 27	.1	309	−3.7	♃	20 2	.0	225	−1.9
♂	13 10	.1	328	1.4	♄	3 15	.0	117	.5

UT	SUNCE $S_\odot$	SUNCE $\delta_\odot$	PROLEĆ. TAČKA S_Υ	VENERA S_φ	VENERA δ_φ	MARS S_σ	MARS δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	179 24.6	6 37.4	194 56.9	143 5.2	20 5.9	162 32.6	13 1.1
2	209 24.9	6 39.3	225 1.8	173 4.1	20 7.7	192 33.9	13 2.4
4	239 25.3	6 41.2	255 6.7	203 3.1	20 9.4	222 35.3	13 3.7
6	269 25.6	6 43.1	285 11.6	233 2.0	20 11.1	252 36.7	13 5.0
8	299 26.0	6 44.9	315 16.6	263 .9	20 12.8	282 38.1	13 6.3
10	329 26.4	6 46.8	345 21.5	292 59.8	20 14.5	312 39.5	13 7.5
12	359 26.7	6 48.7	15 26.4	322 58.7	20 16.1	342 40.9	13 8.8
14	29 27.1	6 50.6	45 31.4	352 57.6	20 17.8	12 42.3	13 10.1
16	59 27.4	6 52.5	75 36.3	22 56.6	20 19.5	42 43.7	13 11.4
18	89 27.8	6 54.3	105 41.2	52 55.5	20 21.2	72 45.0	13 12.7
20	119 28.1	6 56.2	135 46.1	82 54.4	20 22.9	102 46.4	13 13.9
22	149 28.5	6 58.1	165 51.1	112 53.3	20 24.6	132 47.8	13 15.2
Δ	2	9		−5	8	7	6

UT	MESEC $S_\leftmoon$	MESEC Δ	MESEC $\delta_\leftmoon$	MESEC Δ	JUPITER $S_{\mathrm{♃}}$	JUPITER $\delta_{\mathrm{♃}}$	SATURN $S_{\mathrm{♄}}$	SATURN $\delta_{\mathrm{♄}}$
h	° ′		° ′		° ′	° ′	° ′	° ′
0	331 42.1	123	13 22.8	67	59 36.9	17 56.6	312 1.7	−18 55.0
2	0 44.6	122	13 36.1	65	89 41.8	17 56.6	342 6.8	−18 55.0
4	29 47.0	121	13 49.2	64	119 46.8	17 56.6	12 11.9	−18 55.0
6	58 49.2	120	14 2.0	63	149 51.7	17 56.6	42 17.0	−18 54.9
8	87 51.2	119	14 14.6	62	179 56.7	17 56.6	72 22.2	−18 54.9
10	116 53.0	118	14 26.9	60	210 1.6	17 56.6	102 27.3	−18 54.8
12	145 54.6	117	14 39.0	59	240 6.6	17 56.6	132 32.4	−18 54.8
14	174 56.1	116	14 50.8	58	270 11.5	17 56.6	162 37.5	−18 54.7
16	203 57.3	115	15 2.3	56	300 16.5	17 56.6	192 42.7	−18 54.7
18	232 58.3	114	15 13.5	55	330 21.4	17 56.6	222 47.8	−18 54.6
20	261 59.2	113	15 24.5	53	0 26.4	17 56.6	252 52.9	−18 54.6
22	290 59.8	112	15 35.1	52	30 31.3	17 56.6	282 58.0	−18 54.6
Δ					25	0	26	0

φ	SUNCE IZLAZ	SUNCE ZALAZ	TRAJANJE SUMRAKA GRAĐ.	TRAJANJE SUMRAKA ASTR.	MESEC IZLAZ	MESEC Δ/24	MESEC ZALAZ	MESEC 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	18 37	1.4	9 57	2.8
55	5 18	18 48	0 38	2 17	18 59	1.5	9 37	2.7
50	5 25	18 41	0 33	1 58	19 15	1.6	9 22	2.6
45	5 30	18 35	0 30	1 44	19 28	1.7	9 10	2.5
40	5 35	18 30	0 28	1 34	19 39	1.8	8 60	2.4
35	5 39	18 26	0 26	1 27	19 48	1.8	8 51	2.3
30	5 43	18 22	0 24	1 22	19 56	1.9	8 43	2.3
20	5 49	18 16	0 22	1 15	20 10	2.0	8 30	2.2
10	5 54	18 10	0 21	1 11	20 22	2.0	8 19	2.1
0	5 59	18 6	0 21	1 9	20 34	2.1	8 8	2.0
10	6 4	18 1	0 21	1 10	20 45	2.1	7 58	2.0
20	6 9	17 56	0 22	1 13	20 58	2.2	7 47	1.9
30	6 14	17 50	0 24	1 19	21 12	2.3	7 34	1.8
35	6 17	17 47	0 25	1 24	21 20	2.3	7 26	1.7
40	6 21	17 43	0 27	1 30	21 30	2.4	7 18	1.7
45	6 25	17 39	0 29	1 37	21 41	2.4	7 8	1.6
50	6 29	17 34	0 32	1 47	21 54	2.5	6 56	1.5
55	6 35	17 28	0 36	2 0	22 11	2.6	6 41	1.4
60	6 43	17 21	0 42	2 19	22 34	2.8	6 22	1.2
S								

SUNCE UT	SUNCE $e = T_p - UT$	SUNCE Δ/24	SUNCE r	MESEC Prolaz	MESEC Δ/24	MESEC $\pi_\leftmoon$	MESEC r
h	min s	s	′	h min	min	′	′
00	− 2 21.7	.7	16.0	$T_{\overline{m}}$ 1 57	2.0	55.3	15.1
12	− 2 13.2	$T_{\overline{m}_\odot}$ 12 h	2.2 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 28	.1	308	−3.7	♄	19 58	.0	225	−1.9
♂	13 9	.1	328	1.4	♃	3 11	.0	117	.5

UT	SUNCE $S_\odot$	SUNCE $\delta_\odot$	PROLEĆ. TAČKA S_Υ	VENERA S_φ	VENERA δ_φ	MARS S_σ	MARS δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	179 28.8	7 .0	195 56.0	142 52.2	20 26.2	162 49.2	13 16.5
2	209 29.2	7 1.8	226 .9	172 51.1	20 27.9	192 50.6	13 17.8
4	239 29.5	7 3.7	256 5.9	202 50.0	20 29.5	222 52.0	13 19.1
6	269 29.9	7 5.6	286 10.8	232 48.9	20 31.2	252 53.4	13 20.3
8	299 30.2	7 7.5	316 15.7	262 47.8	20 32.9	282 54.8	13 21.6
10	329 30.6	7 9.3	346 20.6	292 46.7	20 34.5	312 56.1	13 22.9
12	359 30.9	7 11.2	16 25.6	322 45.6	20 36.2	342 57.5	13 24.1
14	29 31.3	7 13.1	46 30.5	352 44.5	20 37.8	12 58.9	13 25.4
16	59 31.6	7 14.9	76 35.4	22 43.4	20 39.5	43 .3	13 26.7
18	89 31.9	7 16.8	106 40.4	52 42.3	20 41.1	73 1.7	13 28.0
20	119 32.3	7 18.7	136 45.3	82 41.2	20 42.7	103 3.1	13 29.2
22	149 32.6	7 20.5	166 50.2	112 40.1	20 44.4	133 4.4	13 30.5
Δ	2	9		−6	8	7	6

UT	MESEC $S_\leftmoon$	MESEC Δ	MESEC $\delta_\leftmoon$	MESEC Δ	JUPITER $S_{\mathrm{♃}}$	JUPITER $\delta_{\mathrm{♃}}$	SATURN $S_{\mathrm{♄}}$	SATURN $\delta_{\mathrm{♄}}$
h	° ′		° ′		° ′	° ′	° ′	° ′
0	320 .3	111	15 45.5	50	60 36.2	17 56.6	313 3.2	−18 54.5
2	349 .5	110	15 55.5	49	90 41.2	17 56.6	343 8.3	−18 54.5
4	18 .6	109	16 5.3	47	120 46.1	17 56.6	13 13.4	−18 54.4
6	47 .5	108	16 14.7	46	150 51.1	17 56.5	43 18.6	−18 54.4
8	76 .1	107	16 23.8	44	180 56.0	17 56.5	73 23.7	−18 54.3
10	104 59.6	107	16 32.6	42	211 .9	17 56.5	103 28.8	−18 54.3
12	133 58.9	106	16 41.0	41	241 5.9	17 56.5	133 34.0	−18 54.2
14	162 58.1	105	16 49.1	39	271 10.8	17 56.5	163 39.1	−18 54.2
16	191 57.0	104	16 56.9	37	301 15.7	17 56.5	193 44.2	−18 54.1
18	220 55.7	103	17 4.4	35	331 20.7	17 56.5	223 49.3	−18 54.1
20	249 54.3	102	17 11.5	34	1 25.6	17 56.5	253 54.5	−18 54.1
22	278 52.7	101	17 18.2	32	31 30.5	17 56.5	283 59.6	−18 54.0
Δ					25	0	26	0

φ	SUNCE IZLAZ	SUNCE ZALAZ	TRAJANJE SUMRAKA GRAĐ.	TRAJANJE SUMRAKA ASTR.	MESEC IZLAZ	MESEC Δ/24	MESEC ZALAZ	MESEC Δ/24
N	h min	h min	h min	h min	h min	min	h min	min
60	5 5	19 0	0 44	2 53	19 11	1.8	11 6	2.6
55	5 15	18 50	0 38	2 18	19 36	1.9	10 41	2.5
50	5 23	18 42	0 33	1 58	19 54	1.9	10 23	2.5
45	5 29	18 36	0 30	1 45	20 9	2.0	10 9	2.4
40	5 34	18 31	0 28	1 35	20 21	2.0	9 57	2.3
35	5 38	18 27	0 26	1 27	20 32	2.0	9 47	2.3
30	5 42	18 23	0 24	1 22	20 41	2.1	9 38	2.3
20	5 48	18 16	0 22	1 15	20 57	2.1	9 23	2.2
10	5 54	18 10	0 21	1 11	21 11	2.1	9 10	2.2
0	5 59	18 5	0 21	1 9	21 24	2.2	8 57	2.1
10	6 4	18 0	0 21	1 10	21 37	2.2	8 45	2.1
20	6 9	17 55	0 22	1 13	21 51	2.2	8 32	2.0
30	6 15	17 49	0 24	1 19	22 7	2.3	8 17	2.0
35	6 18	17 45	0 25	1 24	22 16	2.3	8 8	1.9
40	6 22	17 42	0 27	1 30	22 27	2.3	7 58	1.9
45	6 26	17 37	0 29	1 37	22 39	2.3	7 46	1.8
50	6 31	17 32	0 32	1 47	22 55	2.4	7 32	1.8
55	6 37	17 26	0 36	2 0	23 14	2.2	7 15	1.7
60	6 45	17 18	0 42	2 19	23 40	2.2	6 51	1.6
S								

SUNCE UT	SUNCE $e = T_p - UT$	SUNCE Δ/24	SUNCE r	MESEC Prolaz	MESEC Δ/24	MESEC $\pi_\leftmoon$	MESEC r
h	min s	s	′	h min	min	′	′
00	− 2 4.8	.7	16.0	$T_{\overline{m}}$ 2 45	2.1	55.8	15.2
12	− 1 56.4	$T_{\overline{m}_\odot}$ 12 h	1.9 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 29	.1	307	−3.7	♄	19 54	.0	225	−1.9
♂	13 8	.1	327	1.4	♃	3 7	.0	117	.5

UT	SUNCE		PROLEĆ. TAČKA	VENERA		MARS	
	$S_\odot$	$\delta_\odot$	S_Υ	S_φ	δ_φ	S_σ	δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	179 33.0	7 22.4	196 55.1	142 39.0	20 46.0	163 5.8	13 31.8
2	209 33.3	7 24.3	227 .1	172 37.9	20 47.6	193 7.2	13 33.0
4	239 33.7	7 26.1	257 5.0	202 36.8	20 49.2	223 8.6	13 34.3
6	269 34.0	7 28.0	287 9.9	232 35.7	20 50.8	253 10.0	13 35.6
8	299 34.4	7 29.9	317 14.9	262 34.6	20 52.5	283 11.3	13 36.8
10	329 34.7	7 31.7	347 19.8	292 33.4	20 54.1	313 12.7	13 38.1
12	359 35.0	7 33.6	17 24.7	322 32.3	20 55.7	343 14.1	13 39.3
14	29 35.4	7 35.4	47 29.6	352 31.2	20 57.3	13 15.5	13 40.6
16	59 35.7	7 37.3	77 34.6	22 30.1	20 58.9	43 16.9	13 41.9
18	89 36.1	7 39.2	107 39.5	52 29.0	21 .5	73 18.3	13 43.1
20	119 36.4	7 41.0	137 44.4	82 27.8	21 2.0	103 19.6	13 44.4
22	149 36.7	7 42.9	167 49.4	112 26.7	21 3.6	133 21.0	13 45.6
Δ	2	9		-6	8	7	6

UT	MESEC				JUPITER		SATURN	
	$S_\leftmoon$	Δ	$\delta_\leftmoon$	Δ	$S_{\mathrm{♃}}$	$\delta_{\mathrm{♃}}$	$S_{\mathrm{♄}}$	$\delta_{\mathrm{♄}}$
h	° ′		° ′		° ′	° ′	° ′	° ′
0	307 50.9	100	17 24.6	30	61 35.4	17 56.5	314 4.8	-18 54.0
2	336 48.9	99	17 30.6	28	91 40.4	17 56.5	344 9.9	-18 53.9
4	5 46.8	98	17 36.3	26	121 45.3	17 56.5	14 15.0	-18 53.9
6	34 44.5	98	17 41.5	25	151 50.2	17 56.5	44 20.2	-18 53.8
8	63 42.0	97	17 46.5	23	181 55.1	17 56.5	74 25.3	-18 53.8
10	92 39.4	96	17 51.0	21	212 .1	17 56.5	104 30.4	-18 53.7
12	121 36.6	95	17 55.1	19	242 5.0	17 56.4	134 35.6	-18 53.7
14	150 33.6	94	17 58.9	17	272 9.9	17 56.4	164 40.7	-18 53.6
16	179 30.5	94	18 2.3	15	302 14.8	17 56.4	194 45.9	-18 53.6
18	208 27.2	93	18 5.3	13	332 19.7	17 56.4	224 51.0	-18 53.5
20	237 23.8	92	18 7.9	11	2 24.6	17 56.4	254 56.1	-18 53.5
22	266 20.2	91	18 10.1	9	32 29.5	17 56.4	285 1.3	-18 53.4
Δ					25	0	26	0

φ	SUNCE		TRAJANJE SUMRAKA		MESEC			
	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 2	19 2	0 45	2 56	19 53	2.2	12 9	2.3
55	5 13	18 52	0 38	2 19	20 21	2.2	11 42	2.3
50	5 21	18 44	0 34	1 59	20 41	2.2	11 22	2.3
45	5 27	18 37	0 30	1 45	20 57	2.2	11 6	2.3
40	5 32	18 32	0 28	1 35	21 10	2.2	10 53	2.3
35	5 37	18 27	0 26	1 28	21 21	2.2	10 42	2.2
30	5 40	18 23	0 24	1 22	21 31	2.2	10 33	2.2
20	5 47	18 16	0 22	1 15	21 47	2.2	10 16	2.2
10	5 53	18 10	0 21	1 11	22 2	2.2	10 2	2.2
0	5 58	18 5	0 21	1 9	22 16	2.2	9 48	2.2
10	6 4	17 60	0 21	1 10	22 29	2.2	9 35	2.2
20	6 9	17 54	0 22	1 13	22 44	2.2	9 21	2.2
30	6 15	17 48	0 24	1 19	23 1	2.2	9 4	2.1
35	6 19	17 44	0 25	1 24	23 11	2.2	8 54	2.1
40	6 23	17 40	0 27	1 30	23 22	2.2	8 44	2.1
45	6 27	17 36	0 29	1 37	23 36	2.2	8 31	2.1
50	6 32	17 30	0 32	1 47	23 52	2.2	8 15	2.1
55	6 39	17 23	0 36	2 0	. . . .	.0	7 55	2.0
60	6 47	17 15	0 42	2 19	. . . .	.0	7 28	2.0
S								

SUNCE				MESEC			
UT	e = T_p − UT	Δ/24	r	Prolaz		Δ/24	$\pi_\leftmoon$	r
h	min s	s	′	$T_{\overline{m}}$	h min	min	′	′
00	− 1 48.1	.7	16.0		3 36	2.2	56.3	15.3
12	− 1 39.9	$T_{\overline{m}_\odot}$ 12 h	1.7 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	′	°	
♀	14 30	.1	306	-3.7	♃	19 50	.0	225	-1.8
♂	13 7	.1	326	1.4	♄	3 3	.0	117	.5

UT	SUNCE		PROLEĆ. TAČKA	VENERA		MARS	
	$S_\odot$	$\delta_\odot$	S_Υ	S_φ	δ_φ	S_σ	δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	179 37.1	7 44.7	197 54.3	142 25.6	21 5.2	163 22.4	13 46.9
2	209 37.4	7 46.6	227 59.2	172 24.5	21 6.8	193 23.8	13 48.1
4	239 37.8	7 48.4	258 4.1	202 23.3	21 8.4	223 25.1	13 49.4
6	269 38.1	7 50.3	288 9.1	232 22.2	21 9.9	253 26.5	13 50.6
8	299 38.4	7 52.1	318 14.0	262 21.1	21 11.5	283 27.9	13 51.9
10	329 38.8	7 54.0	348 18.9	292 20.0	21 13.1	313 29.3	13 53.1
12	359 39.1	7 55.8	18 23.8	322 18.8	21 14.6	343 30.7	13 54.4
14	29 39.5	7 57.7	48 28.8	352 17.7	21 16.2	13 32.0	13 55.6
16	59 39.8	7 59.5	78 33.7	22 16.6	21 17.7	43 33.4	13 56.9
18	89 40.1	8 1.4	108 38.6	52 15.4	21 19.3	73 34.8	13 58.1
20	119 40.5	8 3.2	138 43.6	82 14.3	21 20.8	103 36.2	13 59.4
22	149 40.8	8 5.1	168 48.5	112 13.1	21 22.4	133 37.5	14 .6
Δ	2	9		-6	8	7	6

UT	MESEC				JUPITER		SATURN	
	$S_\leftmoon$	Δ	$\delta_\leftmoon$	Δ	$S_{\mathrm{♃}}$	$\delta_{\mathrm{♃}}$	$S_{\mathrm{♄}}$	$\delta_{\mathrm{♄}}$
h	° ′		° ′		° ′	° ′	° ′	° ′
0	295 16.5	91	18 11.9	7	62 34.5	17 56.4	315 6.4	-18 53.4
2	324 12.7	90	18 13.2	5	92 39.4	17 56.4	345 11.6	-18 53.4
4	353 8.7	89	18 14.2	3	122 44.3	17 56.3	15 16.7	-18 53.3
6	22 4.6	89	18 14.8	1	152 49.2	17 56.3	45 21.9	-18 53.3
8	51 .4	88	18 14.9	-1	182 54.1	17 56.3	75 27.0	-18 53.2
10	79 56.0	88	18 14.7	-3	212 59.0	17 56.3	105 32.1	-18 53.2
12	108 51.5	87	18 14.0	-5	243 3.9	17 56.3	135 37.3	-18 53.1
14	137 47.0	87	18 12.9	-8	273 8.8	17 56.3	165 42.4	-18 53.1
16	166 42.3	86	18 11.4	-10	303 13.7	17 56.3	195 47.6	-18 53.0
18	195 37.5	86	18 9.5	-12	333 18.6	17 56.2	225 52.7	-18 53.0
20	224 32.6	85	18 7.1	-14	3 23.5	17 56.2	255 57.9	-18 52.9
22	253 27.6	85	18 4.3	-16	33 28.4	17 56.2	286 3.0	-18 52.9
Δ					25	0	26	0

φ	SUNCE		TRAJANJE SUMRAKA		MESEC			
	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 59	19 5	0 45	2 58	20 47	2.7	13 5	1.9
55	5 10	18 54	0 38	2 21	21 14	2.6	12 37	2.0
50	5 18	18 45	0 34	1 59	21 35	2.5	12 17	2.1
45	5 25	18 39	0 30	1 45	21 50	2.5	12 1	2.1
40	5 31	18 33	0 28	1 35	22 3	2.5	11 48	2.1
35	5 35	18 28	0 26	1 28	22 15	2.4	11 36	2.2
30	5 39	18 24	0 24	1 22	22 24	2.4	11 27	2.2
20	5 46	18 17	0 22	1 15	22 41	2.4	11 10	2.2
10	5 52	18 10	0 21	1 11	22 56	2.3	10 55	2.2
0	5 58	18 5	0 21	1 9	23 9	2.3	10 41	2.2
10	6 4	17 59	0 21	1 10	23 23	2.3	10 27	2.3
20	6 9	17 53	0 22	1 13	23 37	2.3	10 13	2.3
30	6 16	17 47	0 24	1 20	23 54	2.3	9 56	2.3
35	6 19	17 43	0 25	1 24	. . . .	.0	9 46	2.3
40	6 24	17 39	0 27	1 30	. . . .	.0	9 34	2.4
45	6 28	17 34	0 29	1 37	. . . .	.0	9 21	2.4
50	6 34	17 28	0 32	1 47	. . . .	.0	9 5	2.4
55	6 41	17 21	0 36	2 0	0 12	2.2	8 44	2.4
60	6 50	17 12	0 42	2 19	0 41	2.1	8 16	2.5
S								

SUNCE				MESEC			
UT	e = T_p − UT	Δ/24	r	Prolaz		Δ/24	$\pi_\leftmoon$	r
h	min s	s	′	$T_{\overline{m}}$	h min	min	′	′
00	− 1 31.6	.7	16.0		4 28	2.3	56.9	15.5
12	− 1 23.6	$T_{\overline{m}_\odot}$ 12 h	1.4 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	′	°	
♀	14 31	.1	305	-3.7	♃	19 46	.0	225	-1.8
♂	13 6	.1	325	1.4	♄	2 59	.0	117	.5

UT	SUNCE		PROLEĆ. TAČKA	VENERA		MARS	
	$S_\odot$	$\delta_\odot$	S_Υ	S_φ	δ_φ	S_σ	δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	179 41.1	8 6.9	198 53.4	142 12.0	21 23.9	163 38.9	14 1.9
2	209 41.5	8 8.7	228 58.3	172 10.9	21 25.5	193 40.3	14 3.1
4	239 41.8	8 10.6	259 3.3	202 9.7	21 27.0	223 41.7	14 4.3
6	269 42.1	8 12.4	289 8.2	232 8.6	21 28.5	253 43.0	14 5.6
8	299 42.5	8 14.3	319 13.1	262 7.4	21 30.0	283 44.4	14 6.8
10	329 42.8	8 16.1	349 18.1	292 6.3	21 31.6	313 45.8	14 8.1
12	359 43.1	8 17.9	19 23.0	322 5.1	21 33.1	343 47.2	14 9.3
14	29 43.4	8 19.8	49 27.9	352 4.0	21 34.6	13 48.5	14 10.5
16	59 43.8	8 21.6	79 32.8	22 2.8	21 36.1	43 49.9	14 11.8
18	89 44.1	8 23.5	109 37.8	52 1.7	21 37.6	73 51.3	14 13.0
20	119 44.4	8 25.3	139 42.7	82 .5	21 39.1	103 52.6	14 14.2
22	149 44.8	8 27.1	169 47.6	111 59.4	21 40.6	133 54.0	14 15.5
Δ	2	9		−6	8	7	6

UT	MESEC				JUPITER		SATURN	
	$S_\leftmoon$	Δ	$\delta_\leftmoon$	Δ	S_{4}	δ_{4}	S_{5}	δ_{5}
h	° ′		° ′		° ′	° ′	° ′	° ′
0	282 22.5	84	18 1.1	−18	63 33.3	17 56.2	316 8.2	−18 52.8
2	311 17.4	84	17 57.5	−20	93 38.2	17 56.2	346 13.3	−18 52.8
4	340 12.1	83	17 53.4	−22	123 43.1	17 56.2	16 18.5	−18 52.7
6	9 6.8	83	17 49.0	−25	153 48.0	17 56.1	46 23.6	−18 52.7
8	38 1.4	83	17 44.0	−27	183 52.8	17 56.1	76 28.8	−18 52.6
10	66 55.9	82	17 38.7	−29	213 57.7	17 56.1	106 33.9	−18 52.6
12	95 50.4	82	17 32.9	−31	244 2.6	17 56.1	136 39.1	−18 52.5
14	124 44.8	82	17 26.7	−33	274 7.5	17 56.1	166 44.2	−18 52.5
16	153 39.2	82	17 20.1	−35	304 12.4	17 56.1	196 49.4	−18 52.4
18	182 33.5	81	17 13.1	−37	334 17.3	17 56.0	226 54.6	−18 52.4
20	211 27.7	81	17 5.6	−39	4 22.2	17 56.0	256 59.7	−18 52.3
22	240 22.0	81	16 57.7	−42	34 27.0	17 56.0	287 4.9	−18 52.3
Δ					24	0	26	0

φ	SUNCE		TRAJANJE SUMRAKA		MESEC			
	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 56	19 7	0 45	3 1	21 52	3.1	13 51	1.6
55	5 8	18 56	0 38	2 22	22 17	2.9	13 26	1.7
50	5 16	18 47	0 34	2 0	22 36	2.8	13 6	1.8
45	5 23	18 40	0 30	1 46	22 50	2.7	12 51	1.9
40	5 29	18 34	0 28	1 36	23 3	2.3	12 39	2.0
35	5 34	18 29	0 26	1 28	23 13	2.3	12 28	2.0
30	5 38	18 25	0 24	1 23	23 22	2.3	12 19	2.1
20	5 46	18 17	0 22	1 15	23 37	2.3	12 3	2.2
10	5 52	18 10	0 21	1 11	23 51	2.3	11 48	2.2
0	5 58	18 4	0 21	1 9	. . .	.0	11 35	2.3
10	6 4	17 59	0 21	1 10	. . .	.0	11 22	2.3
20	6 10	17 52	0 22	1 13	. . .	.0	11 8	2.4
30	6 16	17 45	0 24	1 20	. . .	.0	10 51	2.5
35	6 20	17 41	0 25	1 24	0 4	2.1	10 42	2.5
40	6 25	17 37	0 27	1 30	0 15	2.1	10 31	2.6
45	6 30	17 32	0 30	1 37	0 28	2.0	10 18	2.6
50	6 36	17 26	0 33	1 47	0 44	2.0	10 2	2.7
55	6 43	17 18	0 37	2 0	1 4	1.9	9 42	2.8
60	6 52	17 9	0 42	2 19	1 32	1.8	9 15	2.9
S								

SUNCE				MESEC			
UT	e = T_p − UT	Δ/24	r	Prolaz		Δ/24	$\pi_\leftmoon$	r
h	min s	s	′		h min	min	′	′
00	− 1 15.5	.7	16.0	$T_{\overline{m}}$	5 22	2.3	57.5	15.7
12	− 1 7.6	$T_{\overline{m}_\odot}$	12 h 1.1 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	′	°	
♀	14 32	.1	303	−3.7	♄	19 43	.0	225	−1.8
♂	13 5	.1	325	1.4	♃	2 55	.0	117	.5

UT	SUNCE		PROLEĆ. TAČKA	VENERA		MARS	
	$S_\odot$	$\delta_\odot$	S_Υ	S_φ	δ_φ	S_σ	δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	179 45.1	8 29.0	199 52.6	141 58.2	21 42.1	163 55.4	14 16.7
2	209 45.4	8 30.8	229 57.5	171 57.1	21 43.6	193 56.8	14 17.9
4	239 45.7	8 32.6	260 2.4	201 55.9	21 45.1	223 58.1	14 19.2
6	269 46.1	8 34.4	290 7.3	231 54.7	21 46.5	253 59.5	14 20.4
8	299 46.4	8 36.3	320 12.3	261 53.6	21 48.0	284 .9	14 21.6
10	329 46.7	8 38.1	350 17.2	291 52.4	21 49.5	314 2.2	14 22.8
12	359 47.0	8 39.9	20 22.1	321 51.3	21 51.0	344 3.6	14 24.1
14	29 47.4	8 41.8	50 27.1	351 50.1	21 52.4	14 5.0	14 25.3
16	59 47.7	8 43.6	80 32.0	21 48.9	21 53.9	44 6.3	14 26.5
18	89 48.0	8 45.4	110 36.9	51 47.8	21 55.4	74 7.7	14 27.7
20	119 48.3	8 47.2	140 41.8	81 46.6	21 56.8	104 9.1	14 29.0
22	149 48.6	8 49.0	170 46.8	111 45.4	21 58.3	134 10.4	14 30.2
Δ	2	9		−6	7	7	6

UT	MESEC				JUPITER		SATURN	
	$S_\leftmoon$	Δ	$\delta_\leftmoon$	Δ	S_{4}	δ_{4}	S_{5}	δ_{5}
h	° ′		° ′		° ′	° ′	° ′	° ′
0	269 16.1	81	16 49.4	−44	64 31.9	17 56.0	317 10.0	−18 52.2
2	298 10.3	81	16 40.6	−46	94 36.8	17 55.9	347 15.2	−18 52.2
4	327 4.4	80	16 31.5	−48	124 41.7	17 55.9	17 20.3	−18 52.1
6	355 58.5	80	16 21.9	−50	154 46.5	17 55.9	47 25.5	−18 52.1
8	24 52.5	80	16 11.9	−52	184 51.4	17 55.9	77 30.7	−18 52.0
10	53 46.6	80	16 1.5	−54	214 56.3	17 55.9	107 35.8	−18 52.0
12	82 40.6	80	15 50.7	−56	245 1.2	17 55.8	137 41.0	−18 51.9
14	111 34.6	80	15 39.5	−58	275 6.0	17 55.8	167 46.1	−18 51.9
16	140 28.6	80	15 27.9	−60	305 10.9	17 55.8	197 51.3	−18 51.8
18	169 22.6	80	15 15.8	−62	335 15.8	17 55.8	227 56.5	−18 51.8
20	198 16.6	80	15 3.4	−64	5 20.6	17 55.7	258 1.6	−18 51.7
22	227 10.5	80	14 50.6	−66	35 25.5	17 55.7	288 6.8	−18 51.7
Δ					24	0	26	0

φ	SUNCE		TRAJANJE SUMRAKA		MESEC			
	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 53	19 10	0 45	3 5	23 7	2.3	14 29	1.3
55	5 5	18 58	0 39	2 23	23 28	2.3	14 7	1.5
50	5 14	18 49	0 34	2 1	23 43	2.3	13 51	1.6
45	5 21	18 41	0 30	1 46	23 56	2.3	13 37	1.7
40	5 27	18 35	0 28	1 36	23 58	2.7	13 26	1.8
35	5 33	18 30	0 26	1 28	. . .	.0	13 17	1.9
30	5 37	18 25	0 24	1 23	. . .	.0	13 9	2.0
20	5 45	18 17	0 22	1 15	. . .	.0	12 54	2.1
10	5 51	18 10	0 21	1 11	. . .	.0	12 42	2.2
0	5 58	18 4	0 21	1 9	0 4	2.3	12 30	2.3
10	6 4	17 58	0 21	1 10	0 16	2.2	12 18	2.4
20	6 10	17 52	0 22	1 13	0 30	2.1	12 5	2.5
30	6 17	17 44	0 24	1 20	0 45	2.0	11 51	2.6
35	6 21	17 40	0 25	1 24	0 54	2.0	11 42	2.7
40	6 26	17 36	0 27	1 30	1 5	1.9	11 32	2.7
45	6 31	17 30	0 30	1 37	1 17	1.8	11 21	2.8
50	6 37	17 24	0 33	1 47	1 31	1.7	11 7	2.9
55	6 45	17 16	0 37	2 1	1 50	1.6	10 49	3.1
60	6 55	17 6	0 42	2 19	2 14	1.4	10 26	3.3
S								

SUNCE				MESEC			
UT	e = T_p − UT	Δ/24	r	Prolaz		Δ/24	$\pi_\leftmoon$	r
h	min s	s	′		h min	min	′	′
00	− 0 59.7	.6	16.0	$T_{\overline{m}}$	6 17	2.3	58.2	15.9
12	− 0 51.9	$T_{\overline{m}_\odot}$	12 h .9 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	′	°	
♀	14 33	.1	302	−3.7	♄	19 39	.0	225	−1.8
♂	13 4	.1	324	1.4	♃	2 51	.0	117	.5

UT	SUNCE		PROLEĆ. TAČKA	VENERA		MARS	
	$S_\odot$	$\delta_\odot$	S_Υ	S_φ	δ_φ	S_σ	δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	179 49.0	8 50.9	200 51.7	141 44.3	21 59.7	164 11.8	14 31.4
2	209 49.3	8 52.7	230 56.6	171 43.1	22 1.1	194 13.2	14 32.6
4	239 49.6	8 54.5	261 1.6	201 41.9	22 2.6	224 14.5	14 33.8
6	269 49.9	8 56.3	291 6.5	231 40.7	22 4.0	254 15.9	14 35.0
8	299 50.2	8 58.1	321 11.4	261 39.6	22 5.4	284 17.3	14 36.3
10	329 50.6	9 .0	351 16.3	291 38.4	22 6.9	314 18.6	14 37.5
12	359 50.9	9 1.8	21 21.3	321 37.2	22 8.3	344 20.0	14 38.7
14	29 51.2	9 3.6	51 26.2	351 36.0	22 9.7	14 21.4	14 39.9
16	59 51.5	9 5.4	81 31.1	21 34.8	22 11.1	44 22.7	14 41.1
18	89 51.8	9 7.2	111 36.0	51 33.7	22 12.5	74 24.1	14 42.3
20	119 52.1	9 9.0	141 41.0	81 32.5	22 14.0	104 25.5	14 43.5
22	149 52.5	9 10.8	171 45.9	111 31.3	22 15.4	134 26.8	14 44.7
Δ	2	9		−6	7	7	6

UT	MESEC				JUPITER		SATURN	
	$S_\leftmoon$	Δ	$\delta_\leftmoon$	Δ	$S_{\mathrm{♃}}$	$\delta_{\mathrm{♃}}$	$S_{\mathrm{♄}}$	$\delta_{\mathrm{♄}}$
h	° ′		° ′		° ′	° ′	° ′	° ′
0	256 4.5	80	14 37.4	−68	65 30.4	17 55.7	318 12.0	−18 51.6
2	284 58.5	80	14 23.8	−70	95 35.2	17 55.7	348 17.1	−18 51.6
4	313 52.5	80	14 9.9	−72	125 40.1	17 55.6	18 22.3	−18 51.5
6	342 46.5	80	13 55.5	−74	155 44.9	17 55.6	48 27.5	−18 51.5
8	11 40.5	80	13 40.8	−75	185 49.8	17 55.6	78 32.6	−18 51.4
10	40 34.5	80	13 25.7	−77	215 54.7	17 55.6	108 37.8	−18 51.4
12	69 28.5	80	13 10.3	−79	245 59.5	17 55.5	138 43.0	−18 51.3
14	98 22.5	80	12 54.5	−81	276 4.4	17 55.5	168 48.1	−18 51.3
16	127 16.5	80	12 38.4	−82	306 9.2	17 55.5	198 53.3	−18 51.2
18	156 10.6	80	12 21.9	−84	336 14.1	17 55.4	228 58.5	−18 51.2
20	185 4.7	80	12 5.1	−86	6 18.9	17 55.4	259 3.6	−18 51.1
22	213 58.8	81	11 47.9	−87	36 23.8	17 55.4	289 8.8	−18 51.1
Δ					24	0	26	0

φ	SUNCE		TRAJANJE SUMRAKA		MESEC			
	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 51	19 12	0 46	3 8	. . . .	.0	14 60	1.1
55	5 3	18 60	0 39	2 25	. . . .	.0	14 43	1.3
50	5 12	18 50	0 34	2 2	. . . .	.0	14 30	1.5
45	5 20	18 42	0 31	1 47	. . . .	.0	14 19	1.6
40	5 26	18 36	0 28	1 36	. . . .	.0	14 10	1.7
35	5 31	18 31	0 26	1 29	0 15	2.7	14 3	1.8
30	5 36	18 26	0 24	1 23	0 23	2.6	13 56	1.9
20	5 44	18 18	0 22	1 15	0 36	2.5	13 44	2.0
10	5 51	18 10	0 21	1 11	0 48	2.4	13 34	2.2
0	5 57	18 4	0 21	1 10	0 58	2.3	13 25	2.3
10	6 4	17 57	0 21	1 10	1 9	2.2	13 15	2.4
20	6 10	17 51	0 22	1 14	1 21	2.1	13 4	2.5
30	6 18	17 43	0 24	1 20	1 34	1.9	12 53	2.7
35	6 22	17 39	0 26	1 24	1 42	1.9	12 46	2.8
40	6 27	17 34	0 27	1 30	1 50	1.8	12 38	2.8
45	6 32	17 28	0 30	1 38	2 1	1.7	12 28	3.0
50	6 39	17 22	0 33	1 47	2 13	1.5	12 17	3.1
55	6 47	17 14	0 37	2 1	2 28	1.4	12 3	3.3
60	6 57	17 3	0 42	2 19	2 48	1.2	11 44	3.5
S								

SUNCE				MESEC			
UT	e = T_p − UT	Δ/24	r	Prolaz	Δ/24	$\pi_\leftmoon$	r
h	min s	s	′	h min	min	′	′
00	− 0 44.1	.6	16.0	$T_{\overline{m}}$ 7 12	2.3	58.9	16.1
12	− 0 36.5	$T_{\overline{m}_\odot}$ 12 h .6 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	′	°	
♀	14 34	.1	301	−3.7	♃	19 35	.0	225	−1.8
♂	13 3	.1	323	1.5	♄	2 47	.0	117	.5

UT	SUNCE		PROLEĆ. TAČKA	VENERA		MARS	
	$S_\odot$	$\delta_\odot$	S_Υ	S_φ	δ_φ	S_σ	δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	179 52.8	9 12.6	201 50.8	141 30.1	22 16.8	164 28.2	14 45.9
2	209 53.1	9 14.4	231 55.8	171 28.9	22 18.2	194 29.6	14 47.1
4	239 53.4	9 16.2	262 .7	201 27.7	22 19.5	224 30.9	14 48.4
6	269 53.7	9 18.1	292 5.6	231 26.5	22 20.9	254 32.3	14 49.6
8	299 54.0	9 19.9	322 10.5	261 25.4	22 22.3	284 33.6	14 50.8
10	329 54.3	9 21.7	352 15.5	291 24.2	22 23.7	314 35.0	14 52.0
12	359 54.6	9 23.5	22 20.4	321 23.0	22 25.1	344 36.4	14 53.2
14	29 54.9	9 25.3	52 25.3	351 21.8	22 26.4	14 37.7	14 54.4
16	59 55.3	9 27.1	82 30.3	21 20.6	22 27.8	44 39.1	14 55.6
18	89 55.6	9 28.9	112 35.2	51 19.4	22 29.2	74 40.5	14 56.8
20	119 55.9	9 30.7	142 40.1	81 18.2	22 30.5	104 41.8	14 57.9
22	149 56.2	9 32.5	172 45.0	111 17.0	22 31.9	134 43.2	14 59.1
Δ	2	9		−6	7	7	6

UT	MESEC				JUPITER		SATURN	
	$S_\leftmoon$	Δ	$\delta_\leftmoon$	Δ	$S_{\mathrm{♃}}$	$\delta_{\mathrm{♃}}$	$S_{\mathrm{♄}}$	$\delta_{\mathrm{♄}}$
h	° ′		° ′		° ′	° ′	° ′	° ′
0	242 52.9	81	11 30.4	−89	66 28.6	17 55.4	319 14.0	−18 51.0
2	271 47.0	81	11 12.6	−91	96 33.5	17 55.3	349 19.1	−18 51.0
4	300 41.1	81	10 54.5	−92	126 38.3	17 55.3	19 24.3	−18 50.9
6	329 35.3	81	10 36.1	−94	156 43.2	17 55.3	49 29.5	−18 50.9
8	358 29.4	81	10 17.4	−95	186 48.0	17 55.2	79 34.7	−18 50.8
10	27 23.6	81	9 58.4	−96	216 52.8	17 55.2	109 39.8	−18 50.8
12	56 17.8	81	9 39.1	−98	246 57.7	17 55.2	139 45.0	−18 50.7
14	85 12.0	81	9 19.6	−99	277 2.5	17 55.1	169 50.2	−18 50.7
16	114 6.2	81	8 59.7	−100	307 7.4	17 55.1	199 55.4	−18 50.6
18	143 .5	81	8 39.7	−102	337 12.2	17 55.1	230 .5	−18 50.6
20	171 54.7	81	8 19.3	−103	7 17.0	17 55.0	260 5.7	−18 50.5
22	200 49.0	81	7 58.8	−104	37 21.9	17 55.0	290 10.9	−18 50.5
Δ					24	0	26	0

φ	SUNCE		TRAJANJE SUMRAKA		MESEC			
	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 48	19 15	0 46	3 12	0 29	3.6	15 25	.9
55	5 0	19 2	0 39	2 26	0 44	3.4	15 14	1.2
50	5 10	18 52	0 34	2 2	0 56	3.2	15 5	1.4
45	5 18	18 44	0 31	1 47	1 6	3.0	14 58	1.5
40	5 24	18 37	0 28	1 37	1 13	2.9	14 51	1.6
35	5 30	18 31	0 26	1 29	1 20	2.8	14 46	1.7
30	5 35	18 26	0 25	1 23	1 26	2.7	14 41	1.8
20	5 43	18 18	0 22	1 15	1 36	2.5	14 33	2.0
10	5 50	18 10	0 21	1 11	1 45	2.4	14 26	2.1
0	5 57	18 4	0 21	1 10	1 53	2.3	14 19	2.3
10	6 4	17 57	0 21	1 10	2 2	2.1	14 12	2.4
20	6 10	17 50	0 22	1 14	2 10	2.0	14 5	2.6
30	6 18	17 42	0 24	1 20	2 21	1.9	13 57	2.7
35	6 23	17 38	0 26	1 24	2 26	1.8	13 52	2.8
40	6 28	17 33	0 27	1 30	2 33	1.7	13 46	2.9
45	6 33	17 27	0 30	1 38	2 41	1.5	13 39	3.1
50	6 40	17 20	0 33	1 47	2 50	1.4	13 32	3.2
55	6 49	17 11	0 37	2 1	3 1	1.2	13 22	3.4
60	6 59	17 0	0 42	2 19	3 16	1.0	13 9	3.7
S								

SUNCE				MESEC			
UT	e = T_p − UT	Δ/24	r	Prolaz	Δ/24	$\pi_\leftmoon$	r
h	min s	s	′	h min	min	′	′
00	− 0 28.9	.6	16.0	$T_{\overline{m}}$ 8 6	2.3	59.6	16.2
12	− 0 21.5	$T_{\overline{m}_\odot}$ 12 h .4 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	′	°	
♀	14 35	.1	300	−3.8	♃	19 31	.0	225	−1.8
♂	13 2	.1	323	1.5	♄	2 43	.0	117	.4

UT	SUNCE		PROLEĆ. TAČKA	VENERA		MARS	
	$S_\odot$	$\delta_\odot$	S_Υ	S_φ	δ_φ	S_σ	δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	179 56.5	9 34.2	202 50.0	141 15.8	22 33.2	164 44.5	15 .3
2	209 56.8	9 36.0	232 54.9	171 14.6	22 34.6	194 45.9	15 1.5
4	239 57.1	9 37.8	262 59.8	201 13.4	22 35.9	224 47.2	15 2.7
6	269 57.4	9 39.6	293 4.8	231 12.2	22 37.3	254 48.6	15 3.9
8	299 57.7	9 41.4	323 9.7	261 11.0	22 38.6	284 50.0	15 5.1
10	329 58.0	9 43.2	353 14.6	291 9.8	22 39.9	314 51.3	15 6.3
12	359 58.3	9 45.0	23 19.5	321 8.6	22 41.3	344 52.7	15 7.5
14	29 58.6	9 46.8	53 24.5	351 7.4	22 42.6	14 54.0	15 8.7
16	59 58.9	9 48.6	83 29.4	21 6.2	22 43.9	44 55.4	15 9.9
18	89 59.2	9 50.4	113 34.3	51 5.0	22 45.2	74 56.7	15 11.0
20	119 59.5	9 52.1	143 39.3	81 3.7	22 46.5	104 58.1	15 12.2
22	149 59.8	9 53.9	173 44.2	111 2.5	22 47.8	134 59.5	15 13.4
Δ	2	9		-6	7	7	6

UT	MESEC				JUPITER		SATURN	
	$S_\leftmoon$	Δ	$\delta_\leftmoon$	Δ	$S_{\text{♃}}$	$\delta_{\text{♃}}$	$S_{\text{♄}}$	$\delta_{\text{♄}}$
h	° ′		° ′		° ′	° ′	° ′	° ′
0	229 43.3	81	7 38.0	-105	67 26.7	17 55.0	320 16.1	-18 50.4
2	258 37.6	81	7 16.9	-106	97 31.5	17 54.9	350 21.2	-18 50.3
4	287 31.9	81	6 55.7	-107	127 36.4	17 54.9	20 26.4	-18 50.3
6	316 26.2	82	6 34.3	-108	157 41.2	17 54.9	50 31.6	-18 50.2
8	345 20.5	82	6 12.6	-109	187 46.0	17 54.8	80 36.8	-18 50.2
10	14 14.8	82	5 50.8	-110	217 50.8	17 54.8	110 42.0	-18 50.1
12	43 9.1	82	5 28.8	-111	247 55.7	17 54.7	140 47.1	-18 50.1
14	72 3.4	81	5 6.6	-112	278 .5	17 54.7	170 52.3	-18 50.0
16	100 57.7	81	4 44.3	-112	308 5.3	17 54.7	200 57.5	-18 50.0
18	129 52.0	81	4 21.8	-113	338 10.1	17 54.6	231 2.7	-18 49.9
20	158 46.2	81	3 59.2	-114	8 14.9	17 54.6	261 7.9	-18 49.9
22	187 40.5	81	3 36.5	-114	38 19.8	17 54.6	291 13.1	-18 49.8
Δ					24	0	26	0

φ	SUNCE		TRAJANJE SUMRAKA		MESEC			
	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 45	19 17	0 46	3 16	1 56	3.7	15 48	.9
55	4 58	19 4	0 39	2 27	2 5	3.5	15 42	1.1
50	5 8	18 53	0 34	2 3	2 12	3.3	15 37	1.3
45	5 16	18 45	0 31	1 48	2 18	3.1	15 34	1.5
40	5 23	18 38	0 28	1 37	2 23	3.0	15 30	1.6
35	5 29	18 32	0 26	1 29	2 27	2.8	15 28	1.7
30	5 34	18 27	0 25	1 23	2 31	2.7	15 25	1.8
20	5 42	18 18	0 22	1 15	2 37	2.6	15 21	2.0
10	5 50	18 10	0 21	1 11	2 43	2.4	15 17	2.1
0	5 57	18 3	0 21	1 10	2 48	2.3	15 14	2.3
10	6 4	17 56	0 21	1 10	2 53	2.1	15 10	2.4
20	6 11	17 49	0 22	1 14	2 59	2.0	15 6	2.6
30	6 19	17 41	0 24	1 20	3 5	1.8	15 2	2.8
35	6 23	17 36	0 26	1 24	3 9	1.7	14 59	2.9
40	6 29	17 31	0 27	1 30	3 13	1.6	14 56	3.0
45	6 35	17 25	0 30	1 38	3 18	1.5	14 53	3.1
50	6 42	17 18	0 33	1 48	3 24	1.3	14 49	3.3
55	6 50	17 9	0 37	2 1	3 31	1.1	14 44	3.5
60	7 2	16 57	0 43	2 19	3 40	.9	14 37	3.7
S								

SUNCE				MESEC			
UT	e = T_p − UT	Δ/24	r	Prolaz		Δ/24	$\pi_\leftmoon$	r
h	min s	s	′		h min	min	′	′
00	− 0 14.1	.6	16.0	$T_{\overline{m}}$	9 1	2.3	60.2	16.4
12	− 0 6.8	$T_{\overline{m}_\odot}$	12 h .1 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	′	°	
♀	14 36	.1	298	-3.8	♃	19 27	.0	225	-1.8
♂	13 0	.1	322	1.5	♄	2 38	.0	117	.4

UT	SUNCE		PROLEĆ. TAČKA	VENERA		MARS	
	$S_\odot$	$\delta_\odot$	S_Υ	S_φ	δ_φ	S_σ	δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	180 .1	9 55.7	203 49.1	141 1.3	22 49.2	165 .8	15 14.6
2	210 .4	9 57.5	233 54.0	171 .1	22 50.5	195 2.2	15 15.8
4	240 .7	9 59.3	263 59.0	200 58.9	22 51.7	225 3.5	15 16.9
6	270 1.0	10 1.0	294 3.9	230 57.7	22 53.0	255 4.9	15 18.1
8	300 1.3	10 2.8	324 8.8	260 56.5	22 54.3	285 6.2	15 19.3
10	330 1.6	10 4.6	354 13.8	290 55.2	22 55.6	315 7.6	15 20.5
12	0 1.9	10 6.4	24 18.7	320 54.0	22 56.9	345 8.9	15 21.7
14	30 2.2	10 8.1	54 23.6	350 52.8	22 58.2	15 10.3	15 22.8
16	60 2.5	10 9.9	84 28.5	20 51.6	22 59.4	45 11.6	15 24.0
18	90 2.8	10 11.7	114 33.5	50 50.4	23 .7	75 13.0	15 25.2
20	120 3.1	10 13.5	144 38.4	80 49.1	23 2.0	105 14.3	15 26.3
22	150 3.3	10 15.2	174 43.3	110 47.9	23 3.2	135 15.7	15 27.5
Δ	1	9		-6	6	7	6

UT	MESEC				JUPITER		SATURN	
	$S_\leftmoon$	Δ	$\delta_\leftmoon$	Δ	$S_{\text{♃}}$	$\delta_{\text{♃}}$	$S_{\text{♄}}$	$\delta_{\text{♄}}$
h	° ′		° ′		° ′	° ′	° ′	° ′
0	216 34.8	81	3 13.7	-115	68 24.6	17 54.5	321 18.2	-18 49.8
2	245 29.0	81	2 50.7	-115	98 29.4	17 54.5	351 23.4	-18 49.7
4	274 23.3	81	2 27.7	-116	128 34.2	17 54.4	21 28.6	-18 49.7
6	303 17.5	81	2 4.6	-116	158 39.0	17 54.4	51 33.8	-18 49.6
8	332 11.7	81	1 41.4	-116	188 43.8	17 54.4	81 39.0	-18 49.5
10	1 5.8	81	1 18.1	-117	218 48.6	17 54.3	111 44.2	-18 49.5
12	30 .0	81	0 54.8	-117	248 53.5	17 54.3	141 49.4	-18 49.4
14	58 54.1	80	0 31.5	-117	278 58.3	17 54.2	171 54.6	-18 49.4
16	87 48.2	80	0 8.1	36	309 3.1	17 54.2	201 59.7	-18 49.3
18	116 42.3	80	0 15.3	117	339 7.9	17 54.2	232 4.9	-18 49.3
20	145 36.3	80	0 38.6	117	9 12.7	17 54.1	262 10.1	-18 49.2
22	174 30.3	80	1 2.0	117	39 17.5	17 54.1	292 15.3	-18 49.2
Δ					24	0	26	0

φ	SUNCE		TRAJANJE SUMRAKA		MESEC			
	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 42	19 20	0 47	3 21	3 25	2.4	16 9	3.7
55	4 55	19 6	0 39	2 29	3 28	2.3	16 9	3.4
50	5 6	18 55	0 34	2 4	3 30	2.3	16 9	3.3
45	5 14	18 46	0 31	1 48	3 32	2.3	16 9	3.1
40	5 21	18 39	0 28	1 37	3 34	2.3	16 9	3.0
35	5 27	18 33	0 26	1 29	3 35	2.3	16 9	2.9
30	5 33	18 28	0 25	1 23	3 37	2.3	16 9	2.8
20	5 42	18 18	0 23	1 16	3 39	2.3	16 9	2.6
10	5 49	18 11	0 21	1 11	3 41	2.3	16 9	2.4
0	5 57	18 3	0 21	1 10	3 42	2.3	16 8	2.3
10	6 4	17 56	0 21	1 11	3 44	2.3	16 8	2.1
20	6 11	17 48	0 22	1 14	3 46	2.3	16 8	2.0
30	6 19	17 40	0 24	1 20	3 49	2.3	16 8	1.8
35	6 24	17 35	0 26	1 24	3 50	2.3	16 8	1.7
40	6 30	17 30	0 27	1 30	3 51	2.3	16 8	1.6
45	6 36	17 23	0 30	1 38	3 53	2.3	16 8	1.5
50	6 43	17 16	0 33	1 48	3 55	2.3	16 7	1.4
55	6 52	17 6	0 37	2 1	3 58	2.3	16 7	1.2
60	7 4	16 54	0 43	2 19	4 1	2.3	16 7	.9
S								

SUNCE				MESEC			
UT	e = T_p − UT	Δ/24	r	Prolaz		Δ/24	$\pi_\leftmoon$	r
h	min s	s	′		h min	min	′	′
00	0 .4	.6	16.0	$T_{\overline{m}}$	9 55	2.3	60.6	16.5
12	0 7.5	$T_{\overline{m}_\odot}$	11 h 59.9 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	′	°	
♀	14 37	.1	297	-3.8	♃	19 23	.0	225	-1.8
♂	12 59	.1	321	1.5	♄	2 34	.0	117	.4

UT	SUNCE		PROLEĆ. TAČKA	VENERA		MARS	
	$S_\odot$	$\delta_\odot$	S_Υ	S_φ	δ_φ	S_σ	δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	180 3.6	10 17.0	204 48.3	140 46.7	23 4.5	165 17.0	15 28.7
2	210 3.9	10 18.8	234 53.2	170 45.5	23 5.7	195 18.4	15 29.9
4	240 4.2	10 20.5	264 58.1	200 44.2	23 7.0	225 19.7	15 31.0
6	270 4.5	10 22.3	295 3.0	230 43.0	23 8.2	255 21.1	15 32.2
8	300 4.8	10 24.1	325 8.0	260 41.8	23 9.5	285 22.4	15 33.3
10	330 5.1	10 25.8	355 12.9	290 40.6	23 10.7	315 23.8	15 34.5
12	0 5.4	10 27.6	25 17.8	320 39.3	23 11.9	345 25.1	15 35.7
14	30 5.7	10 29.3	55 22.7	350 38.1	23 13.1	15 26.5	15 36.8
16	60 5.9	10 31.1	85 27.7	20 36.9	23 14.4	45 27.8	15 38.0
18	90 6.2	10 32.9	115 32.6	50 35.6	23 15.6	75 29.2	15 39.2
20	120 6.5	10 34.6	145 37.5	80 34.4	23 16.8	105 30.5	15 40.3
22	150 6.8	10 36.4	175 42.5	110 33.2	23 18.0	135 31.9	15 41.5
Δ	1	9		-6	6	7	6

UT	MESEC				JUPITER		SATURN	
	$S_\leftmoon$	Δ	$\delta_\leftmoon$	Δ	$S_{\text{♃}}$	$\delta_{\text{♃}}$	$S_{\text{♄}}$	$\delta_{\text{♄}}$
h	° ′		° ′		° ′	° ′	° ′	° ′
0	203 24.2	80	1 25.4	117	69 22.3	17 54.0	322 20.5	-18 49.1
2	232 18.1	79	1 48.7	116	99 27.1	17 54.0	352 25.7	-18 49.1
4	261 12.0	79	2 12.0	116	129 31.9	17 53.9	22 30.9	-18 49.0
6	290 5.8	79	2 35.2	116	159 36.7	17 53.9	52 36.1	-18 48.9
8	318 59.6	79	2 58.4	115	189 41.5	17 53.8	82 41.3	-18 48.9
10	347 53.3	78	3 21.5	115	219 46.3	17 53.8	112 46.5	-18 48.8
12	16 47.0	78	3 44.5	115	249 51.1	17 53.8	142 51.7	-18 48.8
14	45 40.7	78	4 7.4	114	279 55.8	17 53.7	172 56.9	-18 48.7
16	74 34.2	78	4 30.2	113	310 .6	17 53.7	203 2.0	-18 48.7
18	103 27.8	77	4 52.8	113	340 5.4	17 53.6	233 7.2	-18 48.6
20	132 21.3	77	5 15.4	112	10 10.2	17 53.6	263 12.4	-18 48.6
22	161 14.7	77	5 37.7	111	40 15.0	17 53.5	293 17.6	-18 48.5
Δ					24	0	26	0

φ	SUNCE		TRAJANJE SUMRAKA		MESEC			
	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 39	19 22	0 47	3 27	4 22	.9	17 37	3.7
55	4 53	19 8	0 40	2 31	4 24	1.1	17 31	3.5
50	5 4	18 56	0 34	2 5	4 26	1.3	17 27	3.3
45	5 13	18 47	0 31	1 49	4 28	1.5	17 23	3.1
40	5 20	18 40	0 28	1 38	4 30	1.6	17 20	3.0
35	5 26	18 34	0 26	1 30	4 31	1.7	17 17	2.9
30	5 32	18 28	0 25	1 24	4 32	1.8	17 15	2.8
20	5 41	18 19	0 23	1 16	4 34	2.0	17 10	2.6
10	5 49	18 11	0 21	1 11	4 36	2.2	17 7	2.5
0	5 56	18 3	0 21	1 10	4 37	2.3	17 3	2.3
10	6 4	17 56	0 21	1 11	4 39	2.4	16 60	2.2
20	6 11	17 48	0 22	1 14	4 41	2.6	16 56	2.0
30	6 20	17 39	0 24	1 20	4 43	2.8	16 52	1.9
35	6 25	17 34	0 26	1 24	4 44	2.9	16 50	1.8
40	6 31	17 28	0 27	1 30	4 46	3.0	16 47	1.7
45	6 37	17 22	0 30	1 38	4 47	3.1	16 44	1.5
50	6 45	17 14	0 33	1 48	4 49	3.3	16 40	1.4
55	6 54	17 4	0 37	2 1	4 52	3.5	16 35	1.2
60	7 7	16 52	0 43	2 19	4 55	3.8	16 29	.9
S								

SUNCE				MESEC			
UT	$e = T_p - UT$	Δ/24	r	Prolaz		Δ/24	$\pi_\leftmoon$	r
h	min s	s	′		h min	min	′	′
00	0 14.6	.6	16.0	$T_{\overline{m}}$	10 50	2.3	60.7	16.5
12	0 21.4	$T_{\overline{m}_\odot}$	11 h 59.6 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	′	°	
♀	14 37	.1	296	-3.8	♃	19 19	.0	225	-1.8
♂	12 58	.1	320	1.5	♄	2 30	.0	118	.4

UT	SUNCE		PROLEĆ. TAČKA	VENERA		MARS	
	$S_\odot$	$\delta_\odot$	S_Υ	S_φ	δ_φ	S_σ	δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	180 7.1	10 38.1	205 47.4	140 31.9	23 19.2	165 33.2	15 42.6
2	210 7.4	10 39.9	235 52.3	170 30.7	23 20.4	195 34.6	15 43.8
4	240 7.6	10 41.6	265 57.2	200 29.4	23 21.6	225 35.9	15 44.9
6	270 7.9	10 43.4	296 2.2	230 28.2	23 22.8	255 37.3	15 46.1
8	300 8.2	10 45.1	326 7.1	260 27.0	23 24.0	285 38.6	15 47.2
10	330 8.5	10 46.9	356 12.0	290 25.7	23 25.2	315 40.0	15 48.4
12	0 8.8	10 48.6	26 17.0	320 24.5	23 26.3	345 41.3	15 49.5
14	30 9.0	10 50.4	56 21.9	350 23.2	23 27.5	15 42.6	15 50.7
16	60 9.3	10 52.1	86 26.8	20 22.0	23 28.7	45 44.0	15 51.8
18	90 9.6	10 53.8	116 31.7	50 20.8	23 29.9	75 45.3	15 53.0
20	120 9.9	10 55.6	146 36.7	80 19.5	23 31.0	105 46.7	15 54.1
22	150 10.1	10 57.3	176 41.6	110 18.3	23 32.2	135 48.0	15 55.3
Δ	1	9		-6	6	7	6

UT	MESEC				JUPITER		SATURN	
	$S_\leftmoon$	Δ	$\delta_\leftmoon$	Δ	$S_{\text{♃}}$	$\delta_{\text{♃}}$	$S_{\text{♄}}$	$\delta_{\text{♄}}$
h	° ′		° ′		° ′	° ′	° ′	° ′
0	190 8.1	77	6 .0	110	70 19.8	17 53.5	323 22.8	-18 48.5
2	219 1.4	76	6 22.0	109	100 24.6	17 53.4	353 28.0	-18 48.4
4	247 54.6	76	6 43.9	108	130 29.4	17 53.4	23 33.2	-18 48.3
6	276 47.9	76	7 5.6	107	160 34.1	17 53.3	53 38.4	-18 48.3
8	305 41.0	75	7 27.1	106	190 38.9	17 53.3	83 43.6	-18 48.2
10	334 34.1	75	7 48.4	105	220 43.7	17 53.2	113 48.8	-18 48.2
12	3 27.1	75	8 9.5	104	250 48.5	17 53.2	143 54.0	-18 48.1
14	32 20.1	75	8 30.3	103	280 53.3	17 53.1	173 59.2	-18 48.1
16	61 13.1	74	8 50.9	102	310 58.0	17 53.1	204 4.4	-18 48.0
18	90 6.0	74	9 11.2	100	341 2.8	17 53.0	234 9.6	-18 47.9
20	118 58.8	74	9 31.3	99	11 7.6	17 53.0	264 14.8	-18 47.9
22	147 51.6	74	9 51.1	98	41 12.3	17 52.9	294 20.0	-18 47.8
Δ					24	0	26	0

φ	SUNCE		TRAJANJE SUMRAKA		MESEC			
	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 36	19 25	0 47	3 34	4 43	1.0	19 7	3.6
55	4 51	19 9	0 40	2 32	4 52	1.2	18 55	3.4
50	5 2	18 58	0 35	2 6	4 58	1.4	18 45	3.2
45	5 11	18 49	0 31	1 49	5 4	1.6	18 38	3.0
40	5 18	18 41	0 28	1 38	5 8	1.7	18 31	2.9
35	5 25	18 35	0 26	1 30	5 12	1.8	18 26	2.8
30	5 30	18 29	0 25	1 24	5 16	1.9	18 21	2.7
20	5 40	18 19	0 23	1 16	5 22	2.1	18 13	2.6
10	5 48	18 11	0 21	1 12	5 27	2.2	18 6	2.5
0	5 56	18 3	0 21	1 10	5 32	2.3	17 59	2.3
10	6 4	17 55	0 21	1 11	5 38	2.5	17 52	2.2
20	6 12	17 47	0 22	1 14	5 43	2.6	17 45	2.1
30	6 21	17 38	0 24	1 20	5 50	2.8	17 37	1.9
35	6 26	17 33	0 26	1 24	5 53	2.9	17 32	1.9
40	6 32	17 27	0 27	1 30	5 58	3.0	17 27	1.8
45	6 38	17 20	0 30	1 38	6 3	3.1	17 20	1.6
50	6 46	17 12	0 33	1 48	6 9	3.2	17 13	1.5
55	6 56	17 2	0 37	2 1	6 16	3.4	17 4	1.3
60	7 9	16 49	0 43	2 19	6 26	3.7	16 52	1.1
S								

SUNCE				MESEC			
UT	$e = T_p - UT$	Δ/24	r	Prolaz		Δ/24	$\pi_\leftmoon$	r
h	min s	s	′		h min	min	′	′
00	0 28.3	.6	16.0	$T_{\overline{m}}$	11 46	2.3	60.6	16.5
12	0 35.0	$T_{\overline{m}_\odot}$	11 h 59.4 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	′	°	
♀	14 38	.1	295	-3.8	♃	19 16	.0	225	-1.8
♂	12 57	.1	320	1.5	♄	2 26	.0	118	.4

UT	SUNCE		PROLEĆ. TAČKA	VENERA		MARS	
	$S_\odot$	$\delta_\odot$	S_Υ	S_φ	δ_φ	S_σ	δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	180 10.4	10 59.1	206 46.5	140 17.0	23 33.3	165 49.4	15 56.4
2	210 10.7	11 .8	236 51.5	170 15.8	23 34.5	195 50.7	15 57.6
4	240 11.0	11 2.5	266 56.4	200 14.5	23 35.6	225 52.0	15 58.7
6	270 11.2	11 4.3	297 1.3	230 13.3	23 36.8	255 53.4	15 59.8
8	300 11.5	11 6.0	327 6.2	260 12.0	23 37.9	285 54.7	16 1.0
10	330 11.8	11 7.7	357 11.2	290 10.8	23 39.0	315 56.1	16 2.1
12	0 12.0	11 9.5	27 16.1	320 9.5	23 40.2	345 57.4	16 3.2
14	30 12.3	11 11.2	57 21.0	350 8.3	23 41.3	15 58.8	16 4.4
16	60 12.6	11 12.9	87 26.0	20 7.0	23 42.4	46 .1	16 5.5
18	90 12.8	11 14.7	117 30.9	50 5.7	23 43.5	76 1.4	16 6.6
20	120 13.1	11 16.4	147 35.8	80 4.5	23 44.6	106 2.8	16 7.8
22	150 13.4	11 18.1	177 40.7	110 3.2	23 45.8	136 4.1	16 8.9
Δ	1	9		-6	6	7	6

UT	MESEC				JUPITER		SATURN	
	$S_\leftmoon$	Δ	$\delta_\leftmoon$	Δ	$S_{\text{♃}}$	$\delta_{\text{♃}}$	$S_{\text{♄}}$	$\delta_{\text{♄}}$
h	° ′		° ′		° ′	° ′	° ′	° ′
0	176 44.3	73	10 10.6	96	71 17.1	17 52.9	324 25.2	-18 47.8
2	205 37.0	73	10 29.9	95	101 21.9	17 52.8	354 30.4	-18 47.7
4	234 29.7	73	10 48.8	93	131 26.7	17 52.8	24 35.7	-18 47.7
6	263 22.3	73	11 7.4	92	161 31.4	17 52.7	54 40.9	-18 47.6
8	292 14.8	73	11 25.7	90	191 36.2	17 52.7	84 46.1	-18 47.6
10	321 7.4	72	11 43.7	88	221 41.0	17 52.6	114 51.3	-18 47.5
12	349 59.9	72	12 1.4	87	251 45.7	17 52.6	144 56.5	-18 47.4
14	18 52.3	72	12 18.7	85	281 50.5	17 52.5	175 1.7	-18 47.4
16	47 44.8	72	12 35.7	83	311 55.2	17 52.4	205 6.9	-18 47.3
18	76 37.2	72	12 52.3	81	341 60.0	17 52.4	235 12.1	-18 47.3
20	105 29.6	72	13 8.5	79	12 4.8	17 52.3	265 17.3	-18 47.2
22	134 22.0	72	13 24.4	77	42 9.5	17 52.3	295 22.5	-18 47.2
Δ					24	0	26	0

φ	SUNCE		TRAJANJE SUMRAKA		MESEC			
	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 33	19 27	0 48	3 43	5 8	1.2	20 34	3.4
55	4 48	19 11	0 40	2 34	5 22	1.4	20 15	3.2
50	4 60	18 59	0 35	2 7	5 33	1.6	20 2	3.0
45	5 9	18 50	0 31	1 50	5 42	1.7	19 51	2.9
40	5 17	18 42	0 28	1 38	5 49	1.8	19 41	2.8
35	5 24	18 35	0 26	1 30	5 56	1.9	19 34	2.7
30	5 29	18 29	0 25	1 24	6 1	2.0	19 27	2.7
20	5 39	18 19	0 23	1 16	6 11	2.1	19 15	2.5
10	5 48	18 11	0 21	1 12	6 20	2.2	19 5	2.4
0	5 56	18 3	0 21	1 10	6 28	2.3	18 55	2.3
10	6 4	17 55	0 21	1 11	6 37	2.4	18 45	2.2
20	6 12	17 46	0 22	1 14	6 46	2.6	18 35	2.1
30	6 21	17 37	0 24	1 20	6 56	2.7	18 23	2.0
35	6 27	17 31	0 26	1 25	7 2	2.8	18 16	2.0
40	6 33	17 25	0 28	1 30	7 9	2.9	18 9	1.9
45	6 40	17 18	0 30	1 38	7 17	3.0	17 60	1.8
50	6 48	17 10	0 33	1 48	7 26	3.1	17 49	1.7
55	6 58	16 59	0 37	2 1	7 38	3.3	17 35	1.5
60	7 11	16 46	0 43	2 20	7 54	3.5	17 18	1.3
S								

SUNCE				MESEC			
UT	$e=T_p-UT$	Δ/24	r	Prolaz		Δ/24	$\pi_\leftmoon$	r
h	min s	s	′		h min	min	′	′
00	0 41.6	.5	16.0	$T_{\overline{m}}$	12 42	2.3	60.3	16.4
12	0 48.1	$T_{\overline{m}_\odot}$	11 h 59.2 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 39	.1	293	-3.8	♃	19 12	.0	225	-1.8
♂	12 56	.1	319	1.5	♄	2 22	.0	118	.4

UT	SUNCE		PROLEĆ. TAČKA	VENERA		MARS	
	$S_\odot$	$\delta_\odot$	S_Υ	S_φ	δ_φ	S_σ	δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	180 13.6	11 19.8	207 45.7	140 2.0	23 46.9	166 5.4	16 10.0
2	210 13.9	11 21.6	237 50.6	170 .7	23 48.0	196 6.8	16 11.2
4	240 14.2	11 23.3	267 55.5	199 59.5	23 49.1	226 8.1	16 12.3
6	270 14.4	11 25.0	298 .5	229 58.2	23 50.1	256 9.5	16 13.4
8	300 14.7	11 26.7	328 5.4	259 56.9	23 51.2	286 10.8	16 14.5
10	330 15.0	11 28.4	358 10.3	289 55.7	23 52.3	316 12.1	16 15.7
12	0 15.2	11 30.1	28 15.2	319 54.4	23 53.4	346 13.5	16 16.8
14	30 15.5	11 31.9	58 20.2	349 53.2	23 54.5	16 14.8	16 17.9
16	60 15.7	11 33.6	88 25.1	19 51.9	23 55.5	46 16.1	16 19.0
18	90 16.0	11 35.3	118 30.0	49 50.6	23 56.6	76 17.5	16 20.2
20	120 16.3	11 37.0	148 34.9	79 49.4	23 57.7	106 18.8	16 21.3
22	150 16.5	11 38.7	178 39.9	109 48.1	23 58.7	136 20.1	16 22.4
Δ	1	9		-6	5	7	6

UT	MESEC				JUPITER		SATURN	
	$S_\leftmoon$	Δ	$\delta_\leftmoon$	Δ	$S_{\text{♃}}$	$\delta_{\text{♃}}$	$S_{\text{♄}}$	$\delta_{\text{♄}}$
h	° ′		° ′		° ′	° ′	° ′	° ′
0	163 14.3	72	13 39.9	76	72 14.3	17 52.2	325 27.7	-18 47.1
2	192 6.7	72	13 55.0	74	102 19.0	17 52.2	355 32.9	-18 47.0
4	220 59.0	72	14 9.7	72	132 23.8	17 52.1	25 38.1	-18 47.0
6	249 51.4	72	14 24.1	70	162 28.5	17 52.0	55 43.4	-18 46.9
8	278 43.8	72	14 38.0	68	192 33.3	17 52.0	85 48.6	-18 46.9
10	307 36.1	72	14 51.5	66	222 38.0	17 51.9	115 53.8	-18 46.8
12	336 28.5	72	15 4.7	64	252 42.8	17 51.9	145 59.0	-18 46.8
14	5 20.9	72	15 17.4	61	282 47.5	17 51.8	176 4.2	-18 46.7
16	34 13.4	72	15 29.7	59	312 52.3	17 51.8	206 9.4	-18 46.6
18	63 5.9	73	15 41.5	57	342 57.0	17 51.7	236 14.6	-18 46.6
20	91 58.4	73	15 53.0	55	13 1.7	17 51.6	266 19.8	-18 46.5
22	120 50.9	73	16 4.0	53	43 6.5	17 51.6	296 25.1	-18 46.5
Δ					24	0	26	0

φ	SUNCE		TRAJANJE SUMRAKA		MESEC			
	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 30	19 30	0 48	3 55	5 36	1.5	21 54	3.0
55	4 46	19 13	0 40	2 36	5 56	1.6	21 31	2.8
50	4 58	19 1	0 35	2 7	6 11	1.8	21 14	2.7
45	5 8	18 51	0 31	1 50	6 23	1.9	20 60	2.7
40	5 16	18 43	0 28	1 39	6 33	2.0	20 49	2.6
35	5 22	18 36	0 26	1 31	6 41	2.0	20 39	2.6
30	5 28	18 30	0 25	1 24	6 49	2.1	20 30	2.5
20	5 39	18 20	0 23	1 16	7 2	2.2	20 16	2.4
10	5 47	18 11	0 21	1 12	7 14	2.3	20 3	2.4
0	5 56	18 2	0 21	1 10	7 24	2.3	19 51	2.3
10	6 4	17 54	0 21	1 11	7 35	2.4	19 39	2.3
20	6 12	17 45	0 22	1 14	7 47	2.5	19 26	2.2
30	6 22	17 36	0 24	1 20	8 1	2.6	19 12	2.1
35	6 27	17 30	0 26	1 25	8 8	2.6	19 3	2.1
40	6 34	17 24	0 28	1 31	8 17	2.7	18 54	2.0
45	6 41	17 17	0 30	1 38	8 28	2.8	18 43	2.0
50	6 49	17 8	0 33	1 48	8 41	2.9	18 29	1.9
55	7 0	16 57	0 37	2 1	8 57	3.0	18 12	1.8
60	7 14	16 43	0 43	2 20	9 18	3.2	17 49	1.6
S								

SUNCE				MESEC			
UT	$e=T_p-UT$	Δ/24	r	Prolaz		Δ/24	$\pi_\leftmoon$	r
h	min s	s	′		h min	min	′	′
00	0 54.6	.5	15.9	$T_{\overline{m}}$	13 38	2.3	59.7	16.3
12	1 .8	$T_{\overline{m}_\odot}$	11 h 59.0 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 40	.1	292	-3.8	♃	19 8	.0	224	-1.8
♂	12 55	.1	318	1.5	♄	2 18	.0	118	.4

UT	SUNCE		PROLEĆ. TAČKA	VENERA		MARS	
	$S_\odot$	$\delta_\odot$	S_Υ	S_φ	δ_φ	S_σ	δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	180 16.8	11 40.4	208 44.8	139 46.8	23 59.8	166 21.5	16 23.5
2	210 17.0	11 42.1	238 49.7	169 45.6	24 .8	196 22.8	16 24.6
4	240 17.3	11 43.8	268 54.7	199 44.3	24 1.9	226 24.1	16 25.7
6	270 17.5	11 45.5	298 59.6	229 43.0	24 2.9	256 25.5	16 26.8
8	300 17.8	11 47.2	329 4.5	259 41.8	24 3.9	286 26.8	16 28.0
10	330 18.1	11 48.9	359 9.4	289 40.5	24 5.0	316 28.1	16 29.1
12	0 18.3	11 50.6	29 14.4	319 39.2	24 6.0	346 29.5	16 30.2
14	30 18.6	11 52.3	59 19.3	349 38.0	24 7.0	16 30.8	16 31.3
16	60 18.8	11 54.0	89 24.2	19 36.7	24 8.0	46 32.1	16 32.4
18	90 19.1	11 55.7	119 29.2	49 35.4	24 9.0	76 33.5	16 33.5
20	120 19.3	11 57.4	149 34.1	79 34.1	24 10.0	106 34.8	16 34.6
22	150 19.6	11 59.1	179 39.0	109 32.9	24 11.1	136 36.1	16 35.7
Δ	1	8		-6	5	7	6

UT	MESEC				JUPITER		SATURN	
	$S_\leftmoon$	Δ	$\delta_\leftmoon$	Δ	$S_{\text{♃}}$	$\delta_{\text{♃}}$	$S_{\text{♄}}$	$\delta_{\text{♄}}$
h	° ′		° ′		° ′	° ′	° ′	° ′
0	149 43.5	73	16 14.6	51	73 11.2	17 51.5	326 30.3	-18 46.4
2	178 36.2	74	16 24.7	49	103 16.0	17 51.5	356 35.5	-18 46.3
4	207 28.9	74	16 34.4	46	133 20.7	17 51.4	26 40.7	-18 46.3
6	236 21.7	74	16 43.7	44	163 25.4	17 51.3	56 45.9	-18 46.2
8	265 14.6	75	16 52.5	42	193 30.2	17 51.3	86 51.1	-18 46.2
10	294 7.5	75	17 .9	40	223 34.9	17 51.2	116 56.4	-18 46.1
12	323 .5	76	17 8.9	38	253 39.6	17 51.1	147 1.6	-18 46.1
14	351 53.7	76	17 16.4	35	283 44.4	17 51.1	177 6.8	-18 46.0
16	20 46.9	77	17 23.5	33	313 49.1	17 51.0	207 12.0	-18 45.9
18	49 40.2	77	17 30.1	31	343 53.8	17 51.0	237 17.2	-18 45.9
20	78 33.6	78	17 36.3	29	13 58.5	17 50.9	267 22.5	-18 45.8
22	107 27.2	78	17 42.0	26	44 3.3	17 50.8	297 27.7	-18 45.8
Δ					24	0	26	0

φ	SUNCE		TRAJANJE SUMRAKA		MESEC			
	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 27	19 32	0 49	: ::	6 11	1.8	23 6	2.5
55	4 44	19 15	0 40	2 38	6 35	1.9	22 39	2.4
50	4 56	19 3	0 35	2 8	6 53	2.0	22 19	2.4
45	5 6	18 52	0 31	1 51	7 8	2.0	22 4	2.4
40	5 14	18 44	0 29	1 39	7 20	2.1	21 51	2.4
35	5 21	18 37	0 26	1 31	7 30	2.1	21 40	2.4
30	5 27	18 31	0 25	1 25	7 39	2.2	21 31	2.3
20	5 38	18 20	0 23	1 16	7 54	2.2	21 14	2.3
10	5 47	18 11	0 22	1 12	8 8	2.3	21 0	2.3
0	5 55	18 2	0 21	1 10	8 20	2.3	20 47	2.3
10	6 4	17 54	0 21	1 11	8 33	2.3	20 34	2.2
20	6 13	17 45	0 22	1 14	8 47	2.4	20 19	2.2
30	6 22	17 35	0 24	1 20	9 3	2.4	20 3	2.2
35	6 28	17 29	0 26	1 25	9 12	2.5	19 53	2.2
40	6 35	17 22	0 28	1 31	9 22	2.5	19 43	2.2
45	6 42	17 15	0 30	1 38	9 35	2.5	19 30	2.1
50	6 51	17 6	0 33	1 48	9 50	2.6	19 14	2.1
55	7 2	16 55	0 37	2 1	10 9	2.6	18 55	2.1
60	7 16	16 40	0 43	2 20	10 35	2.7	18 28	2.0
S								

SUNCE				MESEC			
UT	e = T_p − UT	Δ/24	r	Prolaz	Δ/24	$\pi_\leftmoon$	r
h	min s	s	′	h min	min	′	′
00	1 7.1	.5	15.9	$T_{\overline{m}}$ 14 34	2.3	58.9	16.0
12	1 13.2	$T_{\overline{m}_\odot}$ 11 h 58.8 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 41	.1	291	-3.9	♃	19 4	.0	224	-1.8
♂	12 54	.1	318	1.5	♄	2 14	.0	118	.4

UT	SUNCE		PROLEĆ. TAČKA	VENERA		MARS	
	$S_\odot$	$\delta_\odot$	S_Υ	S_φ	δ_φ	S_σ	δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	180 19.8	12 .8	209 43.9	139 31.6	24 12.1	166 37.5	16 36.8
2	210 20.1	12 2.5	239 48.9	169 30.3	24 13.0	196 38.8	16 37.9
4	240 20.3	12 4.2	269 53.8	199 29.0	24 14.0	226 40.1	16 39.0
6	270 20.5	12 5.9	299 58.7	229 27.8	24 15.0	256 41.5	16 40.1
8	300 20.8	12 7.6	330 3.7	259 26.5	24 16.0	286 42.8	16 41.2
10	330 21.0	12 9.2	0 8.6	289 25.2	24 17.0	316 44.1	16 42.3
12	0 21.3	12 10.9	30 13.5	319 23.9	24 18.0	346 45.4	16 43.4
14	30 21.5	12 12.6	60 18.4	349 22.7	24 18.9	16 46.8	16 44.5
16	60 21.8	12 14.3	90 23.4	19 21.4	24 19.9	46 48.1	16 45.6
18	90 22.0	12 16.0	120 28.3	49 20.1	24 20.9	76 49.4	16 46.7
20	120 22.2	12 17.6	150 33.2	79 18.8	24 21.8	106 50.7	16 47.8
22	150 22.5	12 19.3	180 38.2	109 17.6	24 22.8	136 52.1	16 48.9
Δ	1	8		-6	5	7	5

UT	MESEC				JUPITER		SATURN	
	$S_\leftmoon$	Δ	$\delta_\leftmoon$	Δ	$S_{\text{♃}}$	$\delta_{\text{♃}}$	$S_{\text{♄}}$	$\delta_{\text{♄}}$
h	° ′		° ′		° ′	° ′	° ′	° ′
0	136 20.8	79	17 47.3	24	74 8.0	17 50.8	327 32.9	-18 45.7
2	165 14.6	80	17 52.1	22	104 12.7	17 50.7	357 38.1	-18 45.6
4	194 8.6	80	17 56.5	20	134 17.4	17 50.6	27 43.3	-18 45.6
6	223 2.6	81	18 .5	18	164 22.2	17 50.6	57 48.6	-18 45.5
8	251 56.9	82	18 4.0	15	194 26.9	17 50.5	87 53.8	-18 45.5
10	280 51.2	83	18 7.1	13	224 31.6	17 50.4	117 59.0	-18 45.4
12	309 45.8	83	18 9.8	11	254 36.3	17 50.4	148 4.2	-18 45.3
14	338 40.4	84	18 12.0	9	284 41.0	17 50.3	178 9.5	-18 45.3
16	7 35.3	85	18 13.8	7	314 45.7	17 50.2	208 14.7	-18 45.2
18	36 30.3	86	18 15.2	5	344 50.5	17 50.2	238 19.9	-18 45.2
20	65 25.5	87	18 16.1	3	14 55.2	17 50.1	268 25.1	-18 45.1
22	94 20.9	88	18 16.6	1	44 59.9	17 50.0	298 30.4	-18 45.0
Δ					24	0	26	0

φ	SUNCE		TRAJANJE SUMRAKA		MESEC			
	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 24	19 35	0 49	: ::	6 54	2.2	.. ..	.0
55	4 41	19 17	0 41	2 40	7 21	2.2	23 38	2.0
50	4 54	19 4	0 35	2 9	7 41	2.2	23 17	2.1
45	5 4	18 54	0 31	1 52	7 57	2.2	23 1	2.1
40	5 13	18 45	0 29	1 40	8 10	2.2	22 48	2.1
35	5 20	18 38	0 26	1 31	8 21	2.2	22 37	2.1
30	5 26	18 31	0 25	1 25	8 31	2.2	22 27	2.1
20	5 37	18 20	0 23	1 16	8 47	2.2	22 10	2.2
10	5 47	18 11	0 22	1 12	9 2	2.2	21 55	2.2
0	5 55	18 2	0 21	1 10	9 16	2.2	21 41	2.2
10	6 4	17 53	0 21	1 11	9 29	2.2	21 28	2.2
20	6 13	17 44	0 22	1 14	9 44	2.2	21 13	2.2
30	6 23	17 34	0 24	1 20	10 1	2.2	20 56	2.2
35	6 29	17 28	0 26	1 25	10 11	2.2	20 46	2.2
40	6 36	17 21	0 28	1 31	10 22	2.2	20 34	2.3
45	6 43	17 13	0 30	1 38	10 35	2.2	20 21	2.3
50	6 52	17 4	0 33	1 48	10 51	2.2	20 5	2.3
55	7 4	16 53	0 38	2 2	11 12	2.2	19 44	2.3
60	7 19	16 38	0 44	2 20	11 40	2.2	19 16	2.3
S								

SUNCE				MESEC			
UT	e = T_p − UT	Δ/24	r	Prolaz	Δ/24	$\pi_\leftmoon$	r
h	min s	s	′	h min	min	′	′
00	1 19.2	.5	15.9	$T_{\overline{m}}$ 15 29	2.2	58.0	15.8
12	1 25.1	$T_{\overline{m}_\odot}$ 11 h 58.6 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 43	.1	290	-3.9	♃	19 0	.0	224	-1.8
♂	12 53	.1	317	1.5	♄	2 9	.0	118	.4

UT	SUNCE		PROLEĆ. TAČKA	VENERA		MARS	
	$S_\odot$	$\delta_\odot$	S_Υ	S_φ	δ_φ	S_σ	δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	180 22.7	12 21.0	210 43.1	139 16.3	24 23.7	166 53.4	16 50.0
2	210 23.0	12 22.7	240 48.0	169 15.0	24 24.7	196 54.7	16 51.0
4	240 23.2	12 24.3	270 52.9	199 13.7	24 25.6	226 56.1	16 52.1
6	270 23.4	12 26.0	300 57.9	229 12.4	24 26.5	256 57.4	16 53.2
8	300 23.7	12 27.7	331 2.8	259 11.2	24 27.5	286 58.7	16 54.3
10	330 23.9	12 29.3	1 7.7	289 9.9	24 28.4	317 .0	16 55.4
12	0 24.1	12 31.0	31 12.7	319 8.6	24 29.3	347 1.4	16 56.5
14	30 24.4	12 32.7	61 17.6	349 7.3	24 30.2	17 2.7	16 57.5
16	60 24.6	12 34.3	91 22.5	19 6.0	24 31.1	47 4.0	16 58.6
18	90 24.8	12 36.0	121 27.4	49 4.7	24 32.0	77 5.3	16 59.7
20	120 25.1	12 37.7	151 32.4	79 3.5	24 32.9	107 6.6	17 .8
22	150 25.3	12 39.3	181 37.3	109 2.2	24 33.8	137 8.0	17 1.9
Δ	1	8		−6	5	7	5

UT	MESEC				JUPITER		SATURN	
	$S_\leftmoon$	Δ	$\delta_\leftmoon$	Δ	$S_{\text{♃}}$	$\delta_{\text{♃}}$	$S_{\text{♄}}$	$\delta_{\text{♄}}$
h	° ′		° ′		° ′	° ′	° ′	° ′
0	123 16.5	89	18 16.7	−2	75 4.6	17 49.9	328 35.6	−18 45.0
2	152 12.2	90	18 16.4	−4	105 9.3	17 49.9	358 40.8	−18 44.9
4	181 8.2	91	18 15.7	−6	135 14.0	17 49.8	28 46.0	−18 44.9
6	210 4.3	92	18 14.6	−8	165 18.7	17 49.7	58 51.3	−18 44.8
8	239 .7	93	18 13.0	−10	195 23.4	17 49.7	88 56.5	−18 44.7
10	267 57.2	94	18 11.1	−12	225 28.1	17 49.6	119 1.7	−18 44.7
12	296 54.0	95	18 8.8	−14	255 32.8	17 49.5	149 7.0	−18 44.6
14	325 51.0	96	18 6.1	−16	285 37.5	17 49.4	179 12.2	−18 44.6
16	354 48.2	97	18 2.9	−17	315 42.2	17 49.4	209 17.4	−18 44.5
18	23 45.6	98	17 59.5	−19	345 46.9	17 49.3	239 22.7	−18 44.4
20	52 43.2	99	17 55.6	−21	15 51.6	17 49.2	269 27.9	−18 44.4
22	81 41.0	100	17 51.3	−23	45 56.3	17 49.2	299 33.1	−18 44.3
Δ					24	0	26	0

φ	SUNCE		TRAJANJE SUMRAKA		MESEC			
	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 21	19 37	0 49	: ::	7 46	2.5	0 5	2.0
55	4 39	19 19	0 41	2 42	8 13	2.4	. . .	.0
50	4 52	19 6	0 35	2 10	8 34	2.4	. . .	.0
45	5 3	18 55	0 32	1 52	8 50	2.3	23 51	1.8
40	5 11	18 46	0 29	1 40	9 3	2.3	23 38	1.9
35	5 19	18 39	0 27	1 31	9 14	2.3	23 28	1.9
30	5 25	18 32	0 25	1 25	9 24	2.2	23 18	1.9
20	5 36	18 21	0 23	1 17	9 41	2.2	23 2	2.0
10	5 46	18 11	0 22	1 12	9 55	2.2	22 47	2.0
0	5 55	18 2	0 21	1 10	10 9	2.1	22 34	2.1
10	6 4	17 53	0 21	1 11	10 23	2.1	22 20	2.1
20	6 13	17 43	0 22	1 14	10 38	2.1	22 6	2.2
30	6 24	17 33	0 24	1 20	10 54	2.0	21 49	2.2
35	6 30	17 27	0 26	1 25	11 4	2.0	21 40	2.3
40	6 37	17 20	0 28	1 31	11 15	2.0	21 29	2.3
45	6 44	17 12	0 30	1 38	11 29	1.9	21 16	2.4
50	6 54	17 2	0 33	1 48	11 45	1.9	20 60	2.4
55	7 6	16 50	0 38	2 2	12 5	1.8	20 40	2.5
60	7 21	16 35	0 44	2 20	12 33	1.7	20 12	2.6
S								

SUNCE				MESEC			
UT	e = T_p − UT	Δ/24	r	Prolaz		Δ/24	$\pi_\leftmoon$	r
h	min s	s	′	$T_{\overline{m}}$	h min	min	′	′
00	1 30.9	.5	15.9	$T_{\overline{m}}$	16 22	2.1	57.1	15.6
12	1 36.5	$T_{\overline{m}_\odot}$	11 h 58.4 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 44	.1	289	−3.9	♃	18 57	.0	224	−1.7
♂	12 52	.1	316	1.5	♄	2 5	.0	118	.4

UT	SUNCE		PROLEĆ. TAČKA	VENERA		MARS	
	$S_\odot$	$\delta_\odot$	S_Υ	S_φ	δ_φ	S_σ	δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	180 25.5	12 41.0	211 42.2	139 .9	24 34.7	167 9.3	17 2.9
2	210 25.8	12 42.6	241 47.2	168 59.6	24 35.6	197 10.6	17 4.0
4	240 26.0	12 44.3	271 52.1	198 58.3	24 36.5	227 11.9	17 5.1
6	270 26.2	12 45.9	301 57.0	228 57.0	24 37.4	257 13.3	17 6.1
8	300 26.4	12 47.6	332 1.9	258 55.7	24 38.3	287 14.6	17 7.2
10	330 26.7	12 49.2	2 6.9	288 54.5	24 39.1	317 15.9	17 8.3
12	0 26.9	12 50.9	32 11.8	318 53.2	24 40.0	347 17.2	17 9.4
14	30 27.1	12 52.5	62 16.7	348 51.9	24 40.9	17 18.5	17 10.4
16	60 27.3	12 54.2	92 21.6	18 50.6	24 41.7	47 19.9	17 11.5
18	90 27.6	12 55.8	122 26.6	48 49.3	24 42.6	77 21.2	17 12.5
20	120 27.8	12 57.5	152 31.5	78 48.0	24 43.4	107 22.5	17 13.6
22	150 28.0	12 59.1	182 36.4	108 46.7	24 44.3	137 23.8	17 14.7
Δ	1	8		−6	4	7	5

UT	MESEC				JUPITER		SATURN	
	$S_\leftmoon$	Δ	$\delta_\leftmoon$	Δ	$S_{\text{♃}}$	$\delta_{\text{♃}}$	$S_{\text{♄}}$	$\delta_{\text{♄}}$
h	° ′		° ′		° ′	° ′	° ′	° ′
0	110 39.1	101	17 46.7	−25	76 1.0	17 49.1	329 38.3	−18 44.3
2	139 37.4	103	17 41.7	−27	106 5.7	17 49.0	359 43.6	−18 44.2
4	168 35.9	104	17 36.4	−28	136 10.4	17 48.9	29 48.8	−18 44.1
6	197 34.7	105	17 30.7	−30	166 15.1	17 48.9	59 54.0	−18 44.1
8	226 33.6	106	17 24.7	−32	196 19.8	17 48.8	89 59.3	−18 44.0
10	255 32.8	107	17 18.3	−34	226 24.5	17 48.7	120 4.5	−18 44.0
12	284 32.3	108	17 11.5	−35	256 29.2	17 48.6	150 9.8	−18 43.9
14	313 31.9	109	17 4.5	−37	286 33.8	17 48.6	180 15.0	−18 43.8
16	342 31.8	111	16 57.1	−39	316 38.5	17 48.5	210 20.2	−18 43.8
18	11 32.0	112	16 49.4	−40	346 43.2	17 48.4	240 25.5	−18 43.7
20	40 32.3	113	16 41.3	−42	16 47.9	17 48.3	270 30.7	−18 43.7
22	69 32.9	114	16 33.0	−43	46 52.6	17 48.3	300 35.9	−18 43.6
Δ					23	0	26	0

φ	SUNCE		TRAJANJE SUMRAKA		MESEC			
	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 19	19 40	0 50	: ::	8 45	2.7	0 53	1.5
55	4 37	19 21	0 41	2 45	9 11	2.6	0 26	1.7
50	4 50	19 7	0 36	2 12	9 30	2.5	0 7	1.7
45	5 1	18 56	0 32	1 53	9 45	2.4	. . .	.0
40	5 10	18 47	0 29	1 40	9 58	2.3	. . .	.0
35	5 18	18 39	0 27	1 32	10 8	2.3	. . .	.0
30	5 24	18 33	0 25	1 25	10 18	2.2	. . .	.0
20	5 36	18 21	0 23	1 17	10 33	2.2	23 50	1.8
10	5 46	18 11	0 22	1 12	10 47	2.1	23 36	1.9
0	5 55	18 2	0 21	1 11	11 0	2.0	23 24	2.0
10	6 4	17 52	0 21	1 11	11 13	2.0	23 12	2.1
20	6 14	17 43	0 23	1 14	11 27	1.9	22 58	2.1
30	6 24	17 32	0 24	1 20	11 43	1.8	22 43	2.2
35	6 31	17 25	0 26	1 25	11 52	1.8	22 34	2.3
40	6 38	17 18	0 28	1 31	12 3	1.7	22 24	2.3
45	6 46	17 10	0 30	1 39	12 15	1.7	22 12	2.4
50	6 55	17 0	0 33	1 49	12 30	1.6	21 58	2.5
55	7 8	16 48	0 38	2 2	12 49	1.5	21 40	2.6
60	7 23	16 32	0 44	2 21	13 14	1.3	21 15	2.8
S								

SUNCE				MESEC			
UT	e = T_p − UT	Δ/24	r	Prolaz		Δ/24	$\pi_\leftmoon$	r
h	min s	s	′	$T_{\overline{m}}$	h min	min	′	′
00	1 42.1	.4	15.9	$T_{\overline{m}}$	17 12	2.0	56.3	15.3
12	1 47.5	$T_{\overline{m}_\odot}$	11 h 58.2 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 45	.1	287	−3.9	♃	18 53	.0	224	−1.7
♂	12 51	.1	315	1.5	♄	2 1	.0	118	.4

UT	SUNCE		PROLEĆ. TAČKA	VENERA		MARS	
	$S_\odot$	$\delta_\odot$	S_Υ	S_φ	δ_φ	S_σ	δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	180 28.2	13 .8	212 41.4	138 45.4	24 45.1	167 25.1	17 15.7
2	210 28.5	13 2.4	242 46.3	168 44.1	24 46.0	197 26.4	17 16.8
4	240 28.7	13 4.0	272 51.2	198 42.9	24 46.8	227 27.8	17 17.9
6	270 28.9	13 5.7	302 56.1	228 41.6	24 47.6	257 29.1	17 18.9
8	300 29.1	13 7.3	333 1.1	258 40.3	24 48.4	287 30.4	17 20.0
10	330 29.3	13 8.9	3 6.0	288 39.0	24 49.3	317 31.7	17 21.0
12	0 29.5	13 10.6	33 10.9	318 37.7	24 50.1	347 33.0	17 22.1
14	30 29.8	13 12.2	63 15.9	348 36.4	24 50.9	17 34.3	17 23.1
16	60 30.0	13 13.8	93 20.8	18 35.1	24 51.7	47 35.7	17 24.2
18	90 30.2	13 15.4	123 25.7	48 33.8	24 52.5	77 37.0	17 25.2
20	120 30.4	13 17.1	153 30.6	78 32.5	24 53.3	107 38.3	17 26.3
22	150 30.6	13 18.7	183 35.6	108 31.2	24 54.1	137 39.6	17 27.3
Δ	1	8		-6	4	7	5

UT	MESEC				JUPITER		SATURN	
	$S_\leftmoon$	Δ	$\delta_\leftmoon$	Δ	$S_{\text{♃}}$	$\delta_{\text{♃}}$	$S_{\text{♄}}$	$\delta_{\text{♄}}$
h	° ′		° ′		° ′	° ′	° ′	° ′
0	98 33.7	115	16 24.3	-45	76 57.3	17 48.2	330 41.2	-18 43.5
2	127 34.8	116	16 15.3	-46	107 1.9	17 48.1	0 46.4	-18 43.5
4	156 36.1	118	16 6.1	-48	137 6.6	17 48.0	30 51.6	-18 43.4
6	185 37.6	119	15 56.5	-49	167 11.3	17 47.9	60 56.9	-18 43.3
8	214 39.3	120	15 46.7	-51	197 16.0	17 47.9	91 2.1	-18 43.3
10	243 41.3	121	15 36.5	-52	227 20.6	17 47.8	121 7.4	-18 43.2
12	272 43.4	122	15 26.1	-53	257 25.3	17 47.7	151 12.6	-18 43.2
14	301 45.8	123	15 15.4	-55	287 30.0	17 47.6	181 17.8	-18 43.1
16	330 48.5	124	15 4.5	-56	317 34.6	17 47.5	211 23.1	-18 43.0
18	359 51.3	125	14 53.3	-57	347 39.3	17 47.5	241 28.3	-18 43.0
20	28 54.3	126	14 41.8	-59	17 44.0	17 47.4	271 33.6	-18 42.9
22	57 57.6	127	14 30.1	-60	47 48.7	17 47.3	301 38.8	-18 42.9
Δ					23	0	26	0

φ	SUNCE		TRAJANJE SUMRAKA		MESEC			
	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 42	0 50	: ::	9 50	2.8	1 29	1.2
55	4 34	19 23	0 41	2 47	10 13	2.6	1 6	1.4
50	4 48	19 9	0 36	2 13	10 29	2.5	0 48	1.5
45	4 59	18 58	0 32	1 53	10 43	2.4	0 35	1.6
40	5 9	18 48	0 29	1 41	10 54	2.3	0 23	1.6
35	5 16	18 40	0 27	1 32	11 3	2.3	0 13	1.7
30	5 23	18 33	0 25	1 25	11 11	2.2	0 5	1.8
20	5 35	18 21	0 23	1 17	11 25	2.1	. . .	.0
10	5 45	18 11	0 22	1 12	11 38	2.0	. . .	.0
0	5 55	18 1	0 21	1 11	11 49	1.9	. . .	.0
10	6 4	17 52	0 22	1 11	12 1	1.9	. . .	.0
20	6 14	17 42	0 23	1 14	12 13	1.8	23 50	2.1
30	6 25	17 31	0 25	1 21	12 27	1.7	23 37	2.2
35	6 31	17 24	0 26	1 25	12 35	1.6	23 29	2.3
40	6 39	17 17	0 28	1 31	12 44	1.5	23 20	2.3
45	6 47	17 9	0 30	1 39	12 55	1.5	23 10	2.4
50	6 57	16 58	0 34	1 49	13 8	1.4	22 58	2.5
55	7 9	16 46	0 38	2 2	13 25	1.2	22 42	2.7
60	7 26	16 29	0 44	2 21	13 46	1.0	22 22	2.9
S								

SUNCE				MESEC				
UT	e = T_p − UT	Δ/24	r	Prolaz		Δ/24	$\pi_\leftmoon$	r
h	min s	s	′	$T_{\overline{m}}$	h min	min	′	′
00	1 52.9	.4	15.9		18 1	1.9	55.5	15.1
12	1 58.1	$T_{\overline{m}_\odot}$	11 h 58.0 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 46	.1	286	-3.9	♃	18 49	.0	224	-1.7
♂	12 50	.1	315	1.5	♄	1 57	.0	118	.4

UT	SUNCE		PROLEĆ. TAČKA	VENERA		MARS	
	$S_\odot$	$\delta_\odot$	S_Υ	S_φ	δ_φ	S_σ	δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	180 30.8	13 20.3	213 40.5	138 30.0	24 54.9	167 40.9	17 28.4
2	210 31.0	13 21.9	243 45.4	168 28.7	24 55.7	197 42.2	17 29.4
4	240 31.2	13 23.6	273 50.4	198 27.4	24 56.4	227 43.5	17 30.5
6	270 31.4	13 25.2	303 55.3	228 26.1	24 57.2	257 44.9	17 31.5
8	300 31.7	13 26.8	334 .2	258 24.8	24 58.0	287 46.2	17 32.5
10	330 31.9	13 28.4	4 5.1	288 23.5	24 58.7	317 47.5	17 33.6
12	0 32.1	13 30.0	34 10.1	318 22.2	24 59.5	347 48.8	17 34.6
14	30 32.3	13 31.6	64 15.0	348 20.9	25 .3	17 50.1	17 35.7
16	60 32.5	13 33.2	94 19.9	18 19.6	25 1.0	47 51.4	17 36.7
18	90 32.7	13 34.8	124 24.9	48 18.3	25 1.8	77 52.7	17 37.7
20	120 32.9	13 36.4	154 29.8	78 17.0	25 2.5	107 54.0	17 38.8
22	150 33.1	13 38.0	184 34.7	108 15.7	25 3.2	137 55.4	17 39.8
Δ	1	8		-6	4	7	5

UT	MESEC				JUPITER		SATURN	
	$S_\leftmoon$	Δ	$\delta_\leftmoon$	Δ	$S_{\text{♃}}$	$\delta_{\text{♃}}$	$S_{\text{♄}}$	$\delta_{\text{♄}}$
h	° ′		° ′		° ′	° ′	° ′	° ′
0	87 1.1	128	14 18.1	-61	77 53.3	17 47.2	331 44.1	-18 42.8
2	116 4.7	129	14 5.9	-62	107 58.0	17 47.1	1 49.3	-18 42.7
4	145 8.6	130	13 53.4	-63	138 2.6	17 47.0	31 54.5	-18 42.7
6	174 12.7	131	13 40.7	-65	168 7.3	17 47.0	61 59.8	-18 42.6
8	203 17.0	132	13 27.8	-66	198 12.0	17 46.9	92 5.0	-18 42.5
10	232 21.4	133	13 14.7	-67	228 16.6	17 46.8	122 10.3	-18 42.5
12	261 26.1	134	13 1.3	-68	258 21.3	17 46.7	152 15.5	-18 42.4
14	290 30.9	135	12 47.7	-69	288 25.9	17 46.6	182 20.8	-18 42.4
16	319 36.0	136	12 33.9	-70	318 30.6	17 46.5	212 26.0	-18 42.3
18	348 41.2	137	12 19.9	-71	348 35.3	17 46.5	242 31.3	-18 42.2
20	17 46.5	138	12 5.7	-72	18 39.9	17 46.4	272 36.5	-18 42.2
22	46 52.1	139	11 51.4	-73	48 44.6	17 46.3	302 41.8	-18 42.1
Δ					23	0	26	0

φ	SUNCE		TRAJANJE SUMRAKA		MESEC			
	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 13	19 45	0 51	: ::	10 58	2.9	1 58	1.0
55	4 32	19 25	0 42	2 50	11 16	2.7	1 39	1.1
50	4 46	19 10	0 36	2 14	11 30	2.5	1 24	1.3
45	4 58	18 59	0 32	1 54	11 41	2.4	1 12	1.4
40	5 7	18 49	0 29	1 41	11 50	2.3	1 2	1.5
35	5 15	18 41	0 27	1 32	11 57	2.2	0 54	1.5
30	5 22	18 34	0 25	1 26	12 4	2.2	0 47	1.6
20	5 34	18 22	0 23	1 17	12 16	2.1	0 34	1.7
10	5 45	18 11	0 22	1 12	12 26	2.0	0 22	1.8
0	5 54	18 1	0 21	1 11	12 36	1.9	0 12	1.9
10	6 4	17 52	0 22	1 11	12 45	1.8	0 1	2.0
20	6 14	17 41	0 23	1 14	12 56	1.7	. . .	.0
30	6 26	17 30	0 25	1 21	13 7	1.5	. . .	.0
35	6 32	17 23	0 26	1 25	13 14	1.5	. . .	.0
40	6 40	17 16	0 28	1 31	13 22	1.4	. . .	.0
45	6 48	17 7	0 30	1 39	13 30	1.3	. . .	.0
50	6 59	16 57	0 34	1 49	13 41	1.2	23 59	2.5
55	7 11	16 44	0 38	2 3	13 54	1.1	23 46	2.7
60	7 28	16 27	0 44	2 21	14 12	.9	23 30	2.9
S								

SUNCE				MESEC				
UT	e = T_p − UT	Δ/24	r	Prolaz		Δ/24	$\pi_\leftmoon$	r
h	min s	s	′	$T_{\overline{m}}$	h min	min	′	′
00	2 3.3	.4	15.9		18 47	1.8	54.9	15.0
12	2 8.2	$T_{\overline{m}_\odot}$	11 h 57.9 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 47	.1	285	-3.9	♃	18 46	.0	224	-1.7
♂	12 49	.1	314	1.5	♄	1 53	.0	118	.4

UT	SUNCE		PROLEĆ. TAČKA	VENERA		MARS	
	$S_\odot$	$\delta_\odot$	S_Υ	S_φ	δ_φ	S_σ	δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	180 33.3	13 39.7	214 39.6	138 14.5	25 4.0	167 56.7	17 40.8
2	210 33.5	13 41.3	244 44.6	168 13.2	25 4.7	197 58.0	17 41.9
4	240 33.7	13 42.9	274 49.5	198 11.9	25 5.4	227 59.3	17 42.9
6	270 33.9	13 44.5	304 54.4	228 10.6	25 6.1	258 .6	17 43.9
8	300 34.1	13 46.0	334 59.4	258 9.3	25 6.9	288 1.9	17 44.9
10	330 34.3	13 47.6	5 4.3	288 8.0	25 7.6	318 3.2	17 46.0
12	0 34.5	13 49.2	35 9.2	318 6.7	25 8.3	348 4.5	17 47.0
14	30 34.7	13 50.8	65 14.1	348 5.4	25 9.0	18 5.8	17 48.0
16	60 34.9	13 52.4	95 19.1	18 4.1	25 9.7	48 7.1	17 49.0
18	90 35.1	13 54.0	125 24.0	48 2.8	25 10.4	78 8.4	17 50.1
20	120 35.3	13 55.6	155 28.9	78 1.5	25 11.1	108 9.8	17 51.1
22	150 35.4	13 57.2	185 33.8	108 .2	25 11.7	138 11.1	17 52.1
Δ	1	8		-6	4	7	5

UT	MESEC				JUPITER		SATURN	
	$S_\leftmoon$	Δ	$\delta_\leftmoon$	Δ	S_{4}	δ_{4}	S_η	δ_η
h	° ′		° ′		° ′	° ′	° ′	° ′
0	75 57.8	139	11 36.8	-74	78 49.2	17 46.2	332 47.0	-18 42.0
2	105 3.7	140	11 22.0	-75	108 53.9	17 46.1	2 52.2	-18 42.0
4	134 9.7	141	11 7.1	-76	138 58.5	17 46.0	32 57.5	-18 41.9
6	163 15.9	142	10 52.0	-76	169 3.2	17 45.9	63 2.7	-18 41.9
8	192 22.3	142	10 36.7	-77	199 7.8	17 45.9	93 8.0	-18 41.8
10	221 28.7	143	10 21.2	-78	229 12.4	17 45.8	123 13.2	-18 41.7
12	250 35.4	144	10 5.6	-79	259 17.1	17 45.7	153 18.5	-18 41.7
14	279 42.1	144	9 49.8	-80	289 21.7	17 45.6	183 23.7	-18 41.6
16	308 49.0	145	9 33.9	-80	319 26.4	17 45.5	213 29.0	-18 41.5
18	337 56.0	146	9 17.8	-81	349 31.0	17 45.4	243 34.2	-18 41.5
20	7 3.2	146	9 1.5	-82	19 35.7	17 45.3	273 39.5	-18 41.4
22	36 10.5	147	8 45.2	-83	49 40.3	17 45.2	303 44.8	-18 41.3
Δ					23	0	26	0

φ	SUNCE		TRAJANJE SUMRAKA		MESEC			
	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 10	19 47	0 51	: ::	12 7	2.9	2 21	.8
55	4 30	19 27	0 42	2 53	12 20	2.7	2 6	1.0
50	4 44	19 12	0 36	2 15	12 30	2.5	1 55	1.1
45	4 56	19 0	0 32	1 55	12 39	2.4	1 45	1.2
40	5 6	18 50	0 29	1 42	12 45	2.3	1 38	1.3
35	5 14	18 42	0 27	1 33	12 51	2.2	1 31	1.4
30	5 21	18 35	0 25	1 26	12 56	2.2	1 25	1.5
20	5 34	18 22	0 23	1 17	13 5	2.0	1 15	1.6
10	5 44	18 11	0 22	1 13	13 13	1.9	1 6	1.7
0	5 54	18 1	0 21	1 11	13 20	1.8	0 57	1.8
10	6 4	17 51	0 22	1 11	13 28	1.7	0 49	1.9
20	6 15	17 41	0 23	1 15	13 35	1.6	0 40	2.0
30	6 26	17 29	0 25	1 21	13 44	1.5	0 29	2.2
35	6 33	17 22	0 26	1 25	13 49	1.4	0 23	2.2
40	6 41	17 14	0 28	1 31	13 55	1.3	0 17	2.3
45	6 49	17 5	0 30	1 39	14 2	1.2	0 9	2.4
50	7 0	16 55	0 34	1 49	14 10	1.1	. . .	.0
55	7 13	16 41	0 38	2 3	14 19	.9	. . .	.0
60	7 31	16 24	0 45	2 22	14 32	.7	. . .	.0
S								

SUNCE				MESEC			
UT	$e = T_p - UT$	Δ/24	r	Prolaz		Δ/24	$\pi_\leftmoon$	r
h	min s	s	′		h min	min	′	′
00	2 13.1	.4	15.9	$T_{\overline{m}}$	19 31	1.8	54.5	14.8
12	2 17.8	$T_{\overline{m}_\odot}$	11 h 57.7 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 48	.1	284	-3.9	♃	18 42	.0	224	-1.7
♂	12 48	.1	313	1.5	♄	1 49	.0	118	.4

UT	SUNCE		PROLEĆ. TAČKA	VENERA		MARS	
	$S_\odot$	$\delta_\odot$	S_Υ	S_φ	δ_φ	S_σ	δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	180 35.6	13 58.8	215 38.8	137 58.9	25 12.4	168 12.4	17 53.1
2	210 35.8	14 .3	245 43.7	167 57.6	25 13.1	198 13.7	17 54.1
4	240 36.0	14 1.9	275 48.6	197 56.4	25 13.8	228 15.0	17 55.2
6	270 36.2	14 3.5	305 53.6	227 55.1	25 14.4	258 16.3	17 56.2
8	300 36.4	14 5.1	335 58.5	257 53.8	25 15.1	288 17.6	17 57.2
10	330 36.6	14 6.7	6 3.4	287 52.5	25 15.7	318 18.9	17 58.2
12	0 36.8	14 8.2	36 8.3	317 51.2	25 16.4	348 20.2	17 59.2
14	30 36.9	14 9.8	66 13.3	347 49.9	25 17.0	18 21.5	18 .2
16	60 37.1	14 11.4	96 18.2	17 48.6	25 17.7	48 22.8	18 1.2
18	90 37.3	14 12.9	126 23.1	47 47.3	25 18.3	78 24.1	18 2.2
20	120 37.5	14 14.5	156 28.1	77 46.0	25 19.0	108 25.4	18 3.2
22	150 37.7	14 16.1	186 33.0	107 44.7	25 19.6	138 26.7	18 4.2
Δ	1	8		-6	3	7	5

UT	MESEC				JUPITER		SATURN	
	$S_\leftmoon$	Δ	$\delta_\leftmoon$	Δ	S_{4}	δ_{4}	S_η	δ_η
h	° ′		° ′		° ′	° ′	° ′	° ′
0	65 17.8	147	8 28.6	-83	79 44.9	17 45.1	333 50.0	-18 41.3
2	94 25.3	148	8 12.0	-84	109 49.6	17 45.0	3 55.3	-18 41.2
4	123 32.9	148	7 55.2	-85	139 54.2	17 45.0	34 .5	-18 41.2
6	152 40.6	149	7 38.3	-85	169 58.8	17 44.9	64 5.8	-18 41.1
8	181 48.4	149	7 21.3	-86	200 3.5	17 44.8	94 11.0	-18 41.0
10	210 56.2	150	7 4.1	-86	230 8.1	17 44.7	124 16.3	-18 41.0
12	240 4.2	150	6 46.9	-87	260 12.7	17 44.6	154 21.5	-18 40.9
14	269 12.2	150	6 29.5	-87	290 17.4	17 44.5	184 26.8	-18 40.8
16	298 20.3	151	6 12.1	-88	320 22.0	17 44.4	214 32.0	-18 40.8
18	327 28.5	151	5 54.5	-88	350 26.6	17 44.3	244 37.3	-18 40.7
20	356 36.7	151	5 36.9	-89	20 31.2	17 44.2	274 42.6	-18 40.6
22	25 45.0	152	5 19.1	-89	50 35.9	17 44.1	304 47.8	-18 40.6
Δ					23	0	26	0

φ	SUNCE		TRAJANJE SUMRAKA		MESEC			
	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 7	19 50	0 52	: ::	13 16	2.9	2 40	.7
55	4 27	19 29	0 42	2 56	13 25	2.7	2 30	.9
50	4 43	19 14	0 36	2 16	13 31	2.5	2 22	1.0
45	4 55	19 1	0 32	1 55	13 37	2.4	2 15	1.2
40	5 5	18 51	0 29	1 42	13 41	2.3	2 10	1.3
35	5 13	18 43	0 27	1 33	13 45	2.2	2 5	1.3
30	5 20	18 35	0 25	1 26	13 48	2.1	2 1	1.4
20	5 33	18 22	0 23	1 17	13 54	2.0	1 54	1.6
10	5 44	18 11	0 22	1 13	13 59	1.9	1 47	1.7
0	5 54	18 1	0 21	1 11	14 4	1.8	1 41	1.8
10	6 4	17 51	0 22	1 12	14 8	1.7	1 35	1.9
20	6 15	17 40	0 23	1 15	14 13	1.5	1 29	2.0
30	6 27	17 28	0 25	1 21	14 19	1.4	1 21	2.1
35	6 34	17 21	0 26	1 25	14 22	1.3	1 17	2.2
40	6 42	17 13	0 28	1 31	14 26	1.2	1 12	2.3
45	6 51	17 4	0 30	1 39	14 30	1.1	1 7	2.4
50	7 2	16 53	0 34	1 49	14 36	1.0	0 60	2.5
55	7 15	16 39	0 38	2 3	14 42	.9	0 51	2.7
60	7 33	16 21	0 45	2 22	14 50	.7	0 40	2.9
S								

SUNCE				MESEC			
UT	$e = T_p - UT$	Δ/24	r	Prolaz		Δ/24	$\pi_\leftmoon$	r
h	min s	s	′		h min	min	′	′
00	2 22.5	.4	15.9	$T_{\overline{m}}$	20 14	1.7	54.2	14.8
12	2 27.0	$T_{\overline{m}_\odot}$	11 h 57.5 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 49	.1	282	-4.0	♃	18 38	.0	224	-1.7
♂	12 47	.1	313	1.5	♄	1 44	.0	118	.4

UT	SUNCE		PROLEĆ. TAČKA	VENERA		MARS	
	$S_\odot$	$\delta_\odot$	S_Υ	S_φ	δ_φ	S_σ	δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	180 37.9	14 17.6	216 37.9	137 43.4	25 20.2	168 28.0	18 5.2
2	210 38.0	14 19.2	246 42.8	167 42.1	25 20.8	198 29.3	18 6.2
4	240 38.2	14 20.8	276 47.8	197 40.9	25 21.4	228 30.6	18 7.2
6	270 38.4	14 22.3	306 52.7	227 39.6	25 22.1	258 31.9	18 8.2
8	300 38.6	14 23.9	336 57.6	257 38.3	25 22.7	288 33.2	18 9.2
10	330 38.7	14 25.4	7 2.6	287 37.0	25 23.3	318 34.5	18 10.2
12	0 38.9	14 27.0	37 7.5	317 35.7	25 23.9	348 35.8	18 11.2
14	30 39.1	14 28.6	67 12.4	347 34.4	25 24.5	18 37.1	18 12.2
16	60 39.3	14 30.1	97 17.3	17 33.1	25 25.0	48 38.4	18 13.2
18	90 39.4	14 31.7	127 22.3	47 31.8	25 25.6	78 39.7	18 14.2
20	120 39.6	14 33.2	157 27.2	77 30.5	25 26.2	108 41.0	18 15.2
22	150 39.8	14 34.7	187 32.1	107 29.3	25 26.8	138 42.3	18 16.2
Δ	1	8		-6	3	7	5

UT	MESEC				JUPITER		SATURN	
	$S_\leftmoon$	Δ	$\delta_\leftmoon$	Δ	$S_{\text{♃}}$	$\delta_{\text{♃}}$	$S_{\text{♄}}$	$\delta_{\text{♄}}$
h	° ′		° ′		° ′	° ′	° ′	° ′
0	54 53.3	152	5 1.3	-90	80 40.5	17 44.0	334 53.1	-18 40.5
2	84 1.7	152	4 43.3	-90	110 45.1	17 43.9	4 58.3	-18 40.5
4	113 10.1	152	4 25.3	-90	140 49.7	17 43.8	35 3.6	-18 40.4
6	142 18.6	152	4 7.3	-91	170 54.3	17 43.7	65 8.8	-18 40.3
8	171 27.1	153	3 49.1	-91	200 59.0	17 43.6	95 14.1	-18 40.3
10	200 35.6	153	3 30.9	-91	231 3.6	17 43.6	125 19.4	-18 40.2
12	229 44.2	153	3 12.6	-92	261 8.2	17 43.5	155 24.6	-18 40.1
14	258 52.7	153	2 54.3	-92	291 12.8	17 43.4	185 29.9	-18 40.1
16	288 1.3	153	2 35.9	-92	321 17.4	17 43.3	215 35.1	-18 40.0
18	317 9.9	153	2 17.5	-92	351 22.0	17 43.2	245 40.4	-18 39.9
20	346 18.4	153	1 59.0	-93	21 26.6	17 43.1	275 45.7	-18 39.9
22	15 27.0	153	1 40.5	-93	51 31.2	17 43.0	305 50.9	-18 39.8
Δ					23	0	26	0

φ	SUNCE		TRAJANJE SUMRAKA		MESEC			
	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 5	19 52	0 52	: ::	14 26	2.3	2 57	.6
55	4 25	19 31	0 42	2 59	14 30	2.2	2 51	.8
50	4 41	19 15	0 36	2 17	14 32	2.1	2 47	1.0
45	4 53	19 3	0 32	1 56	14 35	2.1	2 43	1.1
40	5 3	18 52	0 29	1 43	14 37	2.0	2 40	1.2
35	5 12	18 43	0 27	1 33	14 38	2.0	2 38	1.3
30	5 19	18 36	0 25	1 26	14 40	1.9	2 35	1.4
20	5 32	18 23	0 23	1 18	14 42	1.9	2 31	1.5
10	5 44	18 11	0 22	1 13	14 44	1.8	2 28	1.7
0	5 54	18 1	0 21	1 11	14 46	1.8	2 24	1.8
10	6 4	17 50	0 22	1 12	14 48	1.7	2 21	1.9
20	6 15	17 39	0 23	1 15	14 50	1.7	2 17	2.0
30	6 27	17 27	0 25	1 21	14 53	1.6	2 13	2.1
35	6 35	17 20	0 26	1 26	14 54	1.6	2 11	2.2
40	6 43	17 12	0 28	1 32	14 56	1.5	2 8	2.3
45	6 52	17 2	0 31	1 39	14 58	1.5	2 5	2.4
50	7 3	16 51	0 34	1 50	14 60	1.4	2 1	2.6
55	7 17	16 37	0 38	2 3	15 3	1.4	1 56	2.7
60	7 35	16 19	0 45	2 22	15 6	1.3	1 50	2.9
S								

SUNCE				MESEC			
UT	e = T_p − UT	Δ/24	r	Prolaz	Δ/24	$\pi_\leftmoon$	r
h	min s	s	′	$T_{\overline{m}}$ h min	min	′	′
00	2 31.4	.4	15.9	20 56	1.8	54.1	14.7
12	2 35.6	$T_{\overline{m}_\odot}$ 11 h 57.4 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 50	.1	281	-4.0	♃	18 34	.0	224	-1.7
♂	12 46	.1	312	1.5	♄	1 40	.0	118	.4

UT	SUNCE		PROLEĆ. TAČKA	VENERA		MARS	
	$S_\odot$	$\delta_\odot$	S_Υ	S_φ	δ_φ	S_σ	δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	180 40.0	14 36.3	217 37.1	137 28.0	25 27.3	168 43.6	18 17.2
2	210 40.1	14 37.8	247 42.0	167 26.7	25 27.9	198 44.9	18 18.2
4	240 40.3	14 39.4	277 46.9	197 25.4	25 28.5	228 46.2	18 19.2
6	270 40.5	14 40.9	307 51.8	227 24.1	25 29.0	258 47.5	18 20.1
8	300 40.6	14 42.5	337 56.8	257 22.8	25 29.6	288 48.8	18 21.1
10	330 40.8	14 44.0	8 1.7	287 21.5	25 30.1	318 50.1	18 22.1
12	0 41.0	14 45.5	38 6.6	317 20.2	25 30.7	348 51.4	18 23.1
14	30 41.1	14 47.1	68 11.6	347 19.0	25 31.2	18 52.7	18 24.1
16	60 41.3	14 48.6	98 16.5	17 17.7	25 31.7	48 54.0	18 25.0
18	90 41.4	14 50.1	128 21.4	47 16.4	25 32.3	78 55.3	18 26.0
20	120 41.6	14 51.6	158 26.3	77 15.1	25 32.8	108 56.6	18 27.0
22	150 41.8	14 53.2	188 31.3	107 13.8	25 33.3	138 57.9	18 28.0
Δ	1	8		-6	3	6	5

UT	MESEC				JUPITER		SATURN	
	$S_\leftmoon$	Δ	$\delta_\leftmoon$	Δ	$S_{\text{♃}}$	$\delta_{\text{♃}}$	$S_{\text{♄}}$	$\delta_{\text{♄}}$
h	° ′		° ′		° ′	° ′	° ′	° ′
0	44 35.6	153	1 21.9	-93	81 35.9	17 42.9	335 56.2	-18 39.7
2	73 44.1	153	1 3.3	-93	111 40.5	17 42.8	6 1.4	-18 39.7
4	102 52.6	152	0 44.7	-93	141 45.1	17 42.7	36 6.7	-18 39.6
6	132 1.1	152	0 26.1	-93	171 49.7	17 42.6	66 12.0	-18 39.5
8	161 9.6	152	0 7.4	19	201 54.3	17 42.5	96 17.2	-18 39.5
10	190 18.0	152	0 11.3	93	231 58.9	17 42.4	126 22.5	-18 39.4
12	219 26.4	152	0 30.0	93	262 3.5	17 42.3	156 27.8	-18 39.4
14	248 34.8	151	0 48.7	93	292 8.1	17 42.2	186 33.0	-18 39.3
16	277 43.1	151	1 7.3	93	322 12.7	17 42.1	216 38.3	-18 39.2
18	306 51.3	151	1 26.0	93	352 17.3	17 42.0	246 43.6	-18 39.2
20	335 59.5	151	1 44.7	93	22 21.9	17 41.9	276 48.8	-18 39.1
22	5 7.6	150	2 3.4	93	52 26.5	17 41.8	306 54.1	-18 39.0
Δ					23	-1	26	0

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

SUNCE				MESEC			
UT	e = T_p − UT	Δ/24	r	Prolaz	Δ/24	$\pi_\leftmoon$	r
h	min s	s	′	$T_{\overline{m}}$ h min	min	′	′
00	2 39.8	.3	15.9	21 39	1.8	54.2	14.8
12	2 43.8	$T_{\overline{m}_\odot}$ 11 h 57.3 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 51	.1	280	-4.0	♃	18 31	.0	224	-1.7
♂	12 45	.1	311	1.5	♄	1 36	.0	118	.4

1. MAJ 2015. PETAK

UT	SUNCE		PROLEĆ. TAČKA	VENERA		MARS	
	$S_\odot$	$\delta_\odot$	S_Υ	S_φ	δ_φ	S_σ	δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	180 41.9	14 54.7	218 36.2	137 12.5	25 33.8	168 59.2	18 28.9
2	210 42.1	14 56.2	248 41.1	167 11.2	25 34.3	199 .5	18 29.9
4	240 42.2	14 57.7	278 46.1	197 10.0	25 34.8	229 1.8	18 30.9
6	270 42.4	14 59.3	308 51.0	227 8.7	25 35.3	259 3.1	18 31.9
8	300 42.6	15 .8	338 55.9	257 7.4	25 35.8	289 4.4	18 32.8
10	330 42.7	15 2.3	9 .8	287 6.1	25 36.3	319 5.6	18 33.8
12	0 42.9	15 3.8	39 5.8	317 4.8	25 36.8	349 6.9	18 34.8
14	30 43.0	15 5.3	69 10.7	347 3.6	25 37.3	19 8.2	18 35.7
16	60 43.2	15 6.8	99 15.6	17 2.3	25 37.8	49 9.5	18 36.7
18	90 43.3	15 8.3	129 20.5	47 1.0	25 38.2	79 10.8	18 37.6
20	120 43.5	15 9.8	159 25.5	76 59.7	25 38.7	109 12.1	18 38.6
22	150 43.6	15 11.3	189 30.4	106 58.4	25 39.2	139 13.4	18 39.6
Δ	1	8		-6	2	6	5

UT	MESEC				JUPITER		SATURN	
	$S_\leftmoon$	Δ	$\delta_\leftmoon$	Δ	$S_{\text{♃}}$	$\delta_{\text{♃}}$	$S_{\text{♄}}$	$\delta_{\text{♄}}$
h	° ′		° ′		° ′	° ′	° ′	° ′
0	34 15.7	150	2 22.1	93	82 31.1	17 41.7	336 59.3	-18 39.0
2	63 23.6	149	2 40.7	93	112 35.7	17 41.6	7 4.6	-18 38.9
4	92 31.5	149	2 59.3	93	142 40.3	17 41.5	37 9.9	-18 38.8
6	121 39.3	149	3 17.9	93	172 44.8	17 41.3	67 15.1	-18 38.8
8	150 47.0	148	3 36.4	92	202 49.4	17 41.2	97 20.4	-18 38.7
10	179 54.6	148	3 54.9	92	232 54.0	17 41.1	127 25.7	-18 38.6
12	209 2.1	147	4 13.4	92	262 58.6	17 41.0	157 31.0	-18 38.6
14	238 9.5	147	4 31.8	92	293 3.2	17 40.9	187 36.2	-18 38.5
16	267 16.9	146	4 50.1	91	323 7.8	17 40.8	217 41.5	-18 38.4
18	296 24.0	145	5 8.4	91	353 12.4	17 40.7	247 46.8	-18 38.4
20	325 31.1	145	5 26.6	91	23 17.0	17 40.6	277 52.0	-18 38.3
22	354 38.1	144	5 44.8	90	53 21.5	17 40.5	307 57.3	-18 38.2
Δ					23	-1	26	0

φ	SUNCE		TRAJANJE SUMRAKA		MESEC			
	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 59	19 57	0 54	: ::	15 38	.7	4 11	3.0
55	4 21	19 35	0 43	3 7	15 43	.9	4 7	2.8
50	4 37	19 18	0 37	2 20	15 48	1.1	4 4	2.6
45	4 50	19 5	0 32	1 58	15 52	1.2	4 1	2.5
40	5 1	18 54	0 29	1 44	15 55	1.3	3 59	2.4
35	5 10	18 45	0 27	1 34	15 58	1.4	3 58	2.3
30	5 18	18 37	0 25	1 27	16 0	1.5	3 56	2.2
20	5 31	18 23	0 23	1 18	16 4	1.6	3 54	2.1
10	5 43	18 12	0 22	1 13	16 8	1.7	3 51	1.9
0	5 54	18 1	0 21	1 11	16 12	1.8	3 49	1.8
10	6 4	17 50	0 22	1 12	16 15	2.0	3 47	1.7
20	6 16	17 38	0 23	1 15	16 19	2.1	3 45	1.6
30	6 29	17 25	0 25	1 21	16 23	2.2	3 42	1.4
35	6 36	17 18	0 26	1 26	16 26	2.3	3 41	1.4
40	6 45	17 9	0 28	1 32	16 29	2.4	3 39	1.3
45	6 54	16 59	0 31	1 40	16 32	2.5	3 37	1.2
50	7 6	16 48	0 34	1 50	16 36	2.6	3 35	1.0
55	7 21	16 33	0 39	2 4	16 41	2.8	3 32	.9
60	7 40	16 13	0 46	2 23	16 47	3.0	3 28	.7
S								

SUNCE				MESEC			
UT	e = T_p − UT	Δ/24	r	Prolaz		Δ/24	$\pi_\leftmoon$	r
h	min s	s	′		h min	min	′	′
00	2 47.7	.3	15.9	$T_{\overline{m}}$	22 22	1.9	54.4	14.8
12	2 51.4	$T_{\overline{m}_\odot}$	11 h 57.1 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 52	.1	279	-4.0	♃	18 27	.0	224	-1.7
♂	12 44	.1	310	1.5	♄	1 32	.0	118	.3

2. MAJ SUBOTA

UT	SUNCE		PROLEĆ. TAČKA	VENERA		MARS	
	$S_\odot$	$\delta_\odot$	S_Υ	S_φ	δ_φ	S_σ	δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	180 43.8	15 12.8	219 35.3	136 57.2	25 39.6	169 14.7	18 40.5
2	210 43.9	15 14.3	249 40.3	166 55.9	25 40.1	199 16.0	18 41.5
4	240 44.1	15 15.8	279 45.2	196 54.6	25 40.5	229 17.3	18 42.4
6	270 44.2	15 17.3	309 50.1	226 53.3	25 41.0	259 18.6	18 43.4
8	300 44.4	15 18.8	339 55.0	256 52.1	25 41.4	289 19.8	18 44.3
10	330 44.5	15 20.3	10 .0	286 50.8	25 41.9	319 21.1	18 45.3
12	0 44.6	15 21.8	40 4.9	316 49.5	25 42.3	349 22.4	18 46.2
14	30 44.8	15 23.3	70 9.8	346 48.2	25 42.7	19 23.7	18 47.2
16	60 44.9	15 24.8	100 14.8	16 47.0	25 43.1	49 25.0	18 48.1
18	90 45.1	15 26.3	130 19.7	46 45.7	25 43.6	79 26.3	18 49.1
20	120 45.2	15 27.8	160 24.6	76 44.4	25 44.0	109 27.6	18 50.0
22	150 45.3	15 29.3	190 29.5	106 43.1	25 44.4	139 28.9	18 51.0
Δ	1	7		-6	2	6	5

UT	MESEC				JUPITER		SATURN	
	$S_\leftmoon$	Δ	$\delta_\leftmoon$	Δ	$S_{\text{♃}}$	$\delta_{\text{♃}}$	$S_{\text{♄}}$	$\delta_{\text{♄}}$
h	° ′		° ′		° ′	° ′	° ′	° ′
0	23 44.9	143	6 2.9	90	83 26.1	17 40.4	338 2.6	-18 38.2
2	52 51.6	143	6 20.8	90	113 30.7	17 40.3	8 7.8	-18 38.1
4	81 58.1	142	6 38.7	89	143 35.3	17 40.2	38 13.1	-18 38.0
6	111 4.5	141	6 56.6	89	173 39.9	17 40.1	68 18.4	-18 38.0
8	140 10.8	141	7 14.3	88	203 44.4	17 40.0	98 23.6	-18 37.9
10	169 16.9	140	7 31.9	88	233 49.0	17 39.9	128 28.9	-18 37.8
12	198 22.9	139	7 49.4	87	263 53.6	17 39.8	158 34.2	-18 37.8
14	227 28.7	138	8 6.8	86	293 58.2	17 39.6	188 39.5	-18 37.7
16	256 34.4	138	8 24.0	86	324 2.7	17 39.5	218 44.7	-18 37.6
18	285 39.9	137	8 41.2	85	354 7.3	17 39.4	248 50.0	-18 37.6
20	314 45.2	136	8 58.2	84	24 11.9	17 39.3	278 55.3	-18 37.5
22	343 50.4	135	9 15.1	84	54 16.4	17 39.2	309 .6	-18 37.4
Δ					23	-1	26	0

φ	SUNCE		TRAJANJE SUMRAKA		MESEC			
	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 56	19 59	0 54	: ::	15 55	.8	5 22	3.0
55	4 19	19 37	0 43	3 11	16 6	1.0	5 13	2.8
50	4 35	19 20	0 37	2 21	16 14	1.2	5 6	2.6
45	4 49	19 6	0 33	1 58	16 21	1.3	5 1	2.5
40	4 59	18 55	0 29	1 44	16 26	1.4	4 56	2.4
35	5 9	18 46	0 27	1 34	16 31	1.5	4 52	2.3
30	5 17	18 38	0 25	1 27	16 35	1.6	4 49	2.2
20	5 31	18 24	0 23	1 18	16 43	1.7	4 43	2.1
10	5 42	18 12	0 22	1 13	16 50	1.8	4 38	2.0
0	5 54	18 0	0 21	1 11	16 56	1.9	4 33	1.9
10	6 5	17 49	0 22	1 12	17 2	2.0	4 28	1.8
20	6 16	17 38	0 23	1 15	17 9	2.1	4 23	1.6
30	6 29	17 24	0 25	1 21	17 16	2.3	4 17	1.5
35	6 37	17 17	0 26	1 26	17 21	2.3	4 13	1.4
40	6 46	17 8	0 28	1 32	17 26	2.4	4 9	1.3
45	6 55	16 58	0 31	1 40	17 32	2.5	4 5	1.2
50	7 8	16 46	0 34	1 50	17 39	2.6	3 60	1.1
55	7 23	16 31	0 39	2 4	17 48	2.8	3 53	1.0
60	7 42	16 11	0 46	2 24	17 59	3.0	3 45	.8
S								

SUNCE				MESEC			
UT	e = T_p − UT	Δ/24	r	Prolaz		Δ/24	$\pi_\leftmoon$	r
h	min s	s	′		h min	min	′	′
00	2 55.1	.3	15.9	$T_{\overline{m}}$	23 7	1.9	54.6	14.9
12	2 58.5	$T_{\overline{m}_\odot}$	11 h 57.0 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 53	.1	277	-4.0	♃	18 23	.0	224	-1.7
♂	12 42	.1	310	1.5	♄	1 28	.0	118	.3

UT	SUNCE		PROLEĆ. TAČKA	VENERA		MARS	
	$S_\odot$	$\delta_\odot$	S_Υ	S_φ	δ_φ	S_σ	δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	180 45.5	15 30.8	220 34.5	136 41.9	25 44.8	169 30.1	18 51.9
2	210 45.6	15 32.2	250 39.4	166 40.6	25 45.2	199 31.4	18 52.9
4	240 45.8	15 33.7	280 44.3	196 39.3	25 45.6	229 32.7	18 53.8
6	270 45.9	15 35.2	310 49.3	226 38.1	25 46.0	259 34.0	18 54.7
8	300 46.0	15 36.7	340 54.2	256 36.8	25 46.4	289 35.3	18 55.7
10	330 46.2	15 38.1	10 59.1	286 35.5	25 46.7	319 36.6	18 56.6
12	0 46.3	15 39.6	41 4.0	316 34.3	25 47.1	349 37.9	18 57.5
14	30 46.4	15 41.1	71 9.0	346 33.0	25 47.5	19 39.1	18 58.5
16	60 46.5	15 42.5	101 13.9	16 31.7	25 47.9	49 40.4	18 59.4
18	90 46.7	15 44.0	131 18.8	46 30.5	25 48.2	79 41.7	19 .3
20	120 46.8	15 45.5	161 23.8	76 29.2	25 48.6	109 43.0	19 1.3
22	150 46.9	15 46.9	191 28.7	106 27.9	25 48.9	139 44.3	19 2.2
Δ	1	7		-6	2	6	5

UT	MESEC				JUPITER		SATURN	
	$S_\leftmoon$	Δ	$\delta_\leftmoon$	Δ	$S_{\mathrm{♃}}$	$\delta_{\mathrm{♃}}$	$S_{\mathrm{♄}}$	$\delta_{\mathrm{♄}}$
h	° ′		° ′		° ′	° ′	° ′	° ′
0	12 55.4	134	9 31.8	83	84 21.0	17 39.1	339 5.8	-18 37.4
2	42 .2	133	9 48.4	82	114 25.6	17 39.0	9 11.1	-18 37.3
4	71 4.9	132	10 4.8	81	144 30.1	17 38.9	39 16.4	-18 37.2
6	100 9.3	131	10 21.1	81	174 34.7	17 38.8	69 21.7	-18 37.2
8	129 13.6	130	10 37.2	80	204 39.3	17 38.7	99 26.9	-18 37.1
10	158 17.7	130	10 53.1	79	234 43.8	17 38.5	129 32.2	-18 37.0
12	187 21.6	129	11 8.9	78	264 48.4	17 38.4	159 37.5	-18 37.0
14	216 25.3	128	11 24.4	77	294 52.9	17 38.3	189 42.8	-18 36.9
16	245 28.8	127	11 39.8	76	324 57.5	17 38.2	219 48.0	-18 36.8
18	274 32.2	126	11 55.0	75	355 2.1	17 38.1	249 53.3	-18 36.8
20	303 35.3	125	12 10.0	74	25 6.6	17 38.0	279 58.6	-18 36.7
22	332 38.2	124	12 24.7	73	55 11.2	17 37.9	310 3.9	-18 36.6
Δ					23	-1	26	0

φ	SUNCE		TRAJANJE SUMRAKA		MESEC			
	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 54	20 2	0 55	: ::	16 15	1.0	6 34	3.0
55	4 17	19 39	0 44	3 16	16 31	1.2	6 20	2.8
50	4 34	19 21	0 37	2 23	16 43	1.4	6 9	2.6
45	4 47	19 8	0 33	1 59	16 52	1.5	6 1	2.5
40	4 58	18 56	0 30	1 45	17 0	1.6	5 54	2.4
35	5 8	18 47	0 27	1 35	17 7	1.6	5 48	2.4
30	5 16	18 38	0 25	1 27	17 13	1.7	5 42	2.3
20	5 30	18 24	0 23	1 18	17 24	1.8	5 33	2.2
10	5 42	18 12	0 22	1 13	17 33	1.9	5 25	2.1
0	5 53	18 0	0 21	1 11	17 42	2.0	5 18	2.0
10	6 5	17 49	0 22	1 12	17 50	2.1	5 10	1.9
20	6 17	17 37	0 23	1 15	17 60	2.2	5 2	1.7
30	6 30	17 24	0 25	1 21	18 11	2.3	4 53	1.6
35	6 38	17 16	0 26	1 26	18 17	2.4	4 48	1.6
40	6 46	17 7	0 28	1 32	18 24	2.4	4 42	1.5
45	6 57	16 57	0 31	1 40	18 32	2.5	4 35	1.4
50	7 9	16 44	0 34	1 50	18 43	2.6	4 27	1.3
55	7 24	16 29	0 39	2 4	18 55	2.8	4 16	1.1
60	7 45	16 8	0 46	2 24	19 12	3.0	4 3	.9
S								

SUNCE				MESEC				
UT	e = T_p − UT	Δ/24	r	Prolaz		Δ/24	$\pi_\leftmoon$	r
h	min s	s	′	$T_{\overline{m}}$	h min	min	′	′
00	3 1.9	.3	15.9	$T_{\overline{m}}$	23 53	2.0	55.0	15.0
12	3 5.1	$T_{\overline{m}_\odot}$	11 h 56.9 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 54	.1	276	-4.0	♃	18 20	.0	224	-1.7
♂	12 41	.1	309	1.5	♄	1 23	.0	119	.3

UT	SUNCE		PROLEĆ. TAČKA	VENERA		MARS	
	$S_\odot$	$\delta_\odot$	S_Υ	S_φ	δ_φ	S_σ	δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	180 47.1	15 48.4	221 33.6	136 26.7	25 49.3	169 45.6	19 3.1
2	210 47.2	15 49.9	251 38.5	166 25.4	25 49.6	199 46.8	19 4.1
4	240 47.3	15 51.3	281 43.5	196 24.1	25 50.0	229 48.1	19 5.0
6	270 47.4	15 52.8	311 48.4	226 22.9	25 50.3	259 49.4	19 5.9
8	300 47.5	15 54.2	341 53.3	256 21.6	25 50.6	289 50.7	19 6.8
10	330 47.7	15 55.7	11 58.3	286 20.4	25 51.0	319 52.0	19 7.8
12	0 47.8	15 57.1	42 3.2	316 19.1	25 51.3	349 53.3	19 8.7
14	30 47.9	15 58.6	72 8.1	346 17.9	25 51.6	19 54.5	19 9.6
16	60 48.0	16 .0	102 13.0	16 16.6	25 51.9	49 55.8	19 10.5
18	90 48.1	16 1.5	132 18.0	46 15.3	25 52.2	79 57.1	19 11.4
20	120 48.3	16 2.9	162 22.9	76 14.1	25 52.5	109 58.4	19 12.3
22	150 48.4	16 4.3	192 27.8	106 12.8	25 52.8	139 59.7	19 13.3
Δ	1	7		-6	2	6	5

UT	MESEC				JUPITER		SATURN	
	$S_\leftmoon$	Δ	$\delta_\leftmoon$	Δ	$S_{\mathrm{♃}}$	$\delta_{\mathrm{♃}}$	$S_{\mathrm{♄}}$	$\delta_{\mathrm{♄}}$
h	° ′		° ′		° ′	° ′	° ′	° ′
0	1 40.9	123	12 39.3	72	85 15.7	17 37.7	340 9.1	-18 36.6
2	30 43.4	122	12 53.6	71	115 20.3	17 37.6	10 14.4	-18 36.5
4	59 45.8	121	13 7.7	69	145 24.8	17 37.5	40 19.7	-18 36.4
6	88 47.9	120	13 21.6	68	175 29.4	17 37.4	70 25.0	-18 36.4
8	117 49.8	118	13 35.2	67	205 33.9	17 37.3	100 30.3	-18 36.3
10	146 51.5	117	13 48.6	66	235 38.5	17 37.2	130 35.5	-18 36.2
12	175 53.0	116	14 1.8	64	265 43.0	17 37.0	160 40.8	-18 36.2
14	204 54.3	115	14 14.6	63	295 47.6	17 36.9	190 46.1	-18 36.1
16	233 55.3	114	14 27.3	62	325 52.1	17 36.8	220 51.4	-18 36.0
18	262 56.2	113	14 39.6	60	355 56.7	17 36.7	250 56.7	-18 36.0
20	291 56.9	112	14 51.7	59	26 1.2	17 36.6	281 1.9	-18 35.9
22	320 57.3	111	15 3.5	58	56 5.7	17 36.5	311 7.2	-18 35.8
Δ					23	-1	26	0

φ	SUNCE		TRAJANJE SUMRAKA		MESEC			
	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 51	20 4	0 55	: ::	16 40	1.3	7 46	2.9
55	4 14	19 40	0 44	3 22	16 60	1.5	7 27	2.8
50	4 32	19 23	0 37	2 24	17 15	1.6	7 13	2.6
45	4 46	19 9	0 33	1 60	17 27	1.7	7 2	2.5
40	4 57	18 57	0 30	1 45	17 38	1.7	6 52	2.4
35	5 7	18 48	0 27	1 35	17 46	1.8	6 44	2.4
30	5 15	18 39	0 26	1 28	17 54	1.9	6 37	2.3
20	5 29	18 25	0 23	1 18	18 7	1.9	6 25	2.2
10	5 42	18 12	0 22	1 13	18 19	2.0	6 14	2.1
0	5 53	18 0	0 22	1 12	18 30	2.1	6 5	2.0
10	6 5	17 49	0 22	1 12	18 41	2.2	5 55	2.0
20	6 17	17 37	0 23	1 15	18 52	2.2	5 44	1.9
30	6 31	17 23	0 25	1 21	19 6	2.3	5 32	1.8
35	6 39	17 15	0 26	1 26	19 14	2.4	5 25	1.7
40	6 47	17 6	0 28	1 32	19 23	2.4	5 17	1.6
45	6 58	16 55	0 31	1 40	19 33	2.5	5 8	1.6
50	7 10	16 43	0 34	1 51	19 46	2.6	4 57	1.5
55	7 26	16 27	0 39	2 5	20 2	2.7	4 43	1.3
60	7 47	16 6	0 46	2 25	20 24	2.9	4 25	1.1
S								

SUNCE				MESEC				
UT	e = T_p − UT	Δ/24	r	Prolaz		Δ/24	$\pi_\leftmoon$	r
h	min s	s	′	$T_{\overline{m}}$	h min	min	′	′
00	3 8.2	.2	15.9	$T_{\overline{m}}$	. . .	1.0	55.4	15.1
12	3 11.1	$T_{\overline{m}_\odot}$	11 h 56.8 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 55	.1	275	-4.1	♃	18 16	.0	224	-1.7
♂	12 40	.1	308	1.6	♄	1 19	.0	119	.3

5. MAJ 2015. UTORAK

UT	SUNCE		PROLEĆ. TAČKA	VENERA		MARS	
	$S_\odot$	$\delta_\odot$	S_Υ	S_φ	δ_φ	S_σ	δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	180 48.5	16 5.8	222 32.7	136 11.6	25 53.1	170 .9	19 14.2
2	210 48.6	16 7.2	252 37.7	166 10.3	25 53.4	200 2.2	19 15.1
4	240 48.7	16 8.7	282 42.6	196 9.1	25 53.7	230 3.5	19 16.0
6	270 48.8	16 10.1	312 47.5	226 7.8	25 54.0	260 4.8	19 16.9
8	300 48.9	16 11.5	342 52.5	256 6.6	25 54.2	290 6.0	19 17.8
10	330 49.0	16 12.9	12 57.4	286 5.3	25 54.5	320 7.3	19 18.7
12	0 49.2	16 14.4	43 2.3	316 4.1	25 54.8	350 8.6	19 19.6
14	30 49.3	16 15.8	73 7.2	346 2.8	25 55.0	20 9.9	19 20.5
16	60 49.4	16 17.2	103 12.2	16 1.6	25 55.3	50 11.2	19 21.4
18	90 49.5	16 18.6	133 17.1	46 .4	25 55.5	80 12.4	19 22.3
20	120 49.6	16 20.1	163 22.0	75 59.1	25 55.8	110 13.7	19 23.2
22	150 49.7	16 21.5	193 27.0	105 57.9	25 56.0	140 15.0	19 24.1
Δ	1	7		-6	1	6	5

UT	MESEC				JUPITER		SATURN	
	$S_\leftmoon$	Δ	$\delta_\leftmoon$	Δ	S_{4}	δ_{4}	S_{5}	δ_{5}
h	° ′		° ′		° ′	° ′	° ′	° ′
0	349 57.6	110	15 15.0	56	86 10.3	17 36.3	341 12.5	-18 35.8
2	18 57.6	109	15 26.2	55	116 14.8	17 36.2	11 17.8	-18 35.7
4	47 57.5	108	15 37.1	53	146 19.4	17 36.1	41 23.1	-18 35.6
6	76 57.1	107	15 47.7	51	176 23.9	17 36.0	71 28.3	-18 35.6
8	105 56.5	106	15 58.0	50	206 28.4	17 35.9	101 33.6	-18 35.5
10	134 55.8	105	16 8.0	48	236 33.0	17 35.7	131 38.9	-18 35.4
12	163 54.8	104	16 17.7	47	266 37.5	17 35.6	161 44.2	-18 35.4
14	192 53.6	103	16 27.0	45	296 42.0	17 35.5	191 49.5	-18 35.3
16	221 52.3	102	16 36.0	43	326 46.6	17 35.4	221 54.8	-18 35.2
18	250 50.7	101	16 44.7	42	356 51.1	17 35.3	252 .0	-18 35.2
20	279 49.0	100	16 53.0	40	26 55.6	17 35.1	282 5.3	-18 35.1
22	308 47.1	99	17 .9	38	57 .2	17 35.0	312 10.6	-18 35.0
Δ					23	-1	26	0

φ	SUNCE		TRAJANJE SUMRAKA		MESEC			
	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 48	20 7	0 56	: ::	17 11	1.7	8 57	2.8
55	4 12	19 42	0 44	3 30	17 35	1.8	8 33	2.6
50	4 30	19 24	0 37	2 26	17 53	1.9	8 16	2.5
45	4 44	19 10	0 33	2 1	18 7	1.9	8 2	2.5
40	4 56	18 58	0 30	1 46	18 19	2.0	7 51	2.4
35	5 6	18 48	0 27	1 35	18 29	2.0	7 41	2.4
30	5 14	18 40	0 26	1 28	18 38	2.0	7 33	2.3
20	5 29	18 25	0 23	1 19	18 54	2.1	7 18	2.2
10	5 41	18 12	0 22	1 14	19 7	2.1	7 5	2.2
0	5 53	18 0	0 22	1 12	19 20	2.2	6 54	2.1
10	6 5	17 48	0 22	1 12	19 33	2.2	6 42	2.1
20	6 17	17 36	0 23	1 15	19 46	2.3	6 29	2.0
30	6 31	17 22	0 25	1 22	20 2	2.3	6 14	1.9
35	6 39	17 14	0 26	1 26	20 11	2.3	6 6	1.9
40	6 48	17 5	0 28	1 32	20 21	2.4	5 57	1.8
45	6 59	16 54	0 31	1 40	20 33	2.4	5 45	1.8
50	7 12	16 41	0 35	1 51	20 48	2.5	5 32	1.7
55	7 28	16 25	0 39	2 5	21 7	2.5	5 15	1.6
60	7 50	16 3	0 47	2 25	21 33	2.6	4 52	1.4
S								

SUNCE				MESEC			
UT	$e = T_p - UT$	Δ/24	r	Prolaz	Δ/24	$\pi_\leftmoon$	r
h	min s	s	′	h min	min	′	′
00	3 13.9	.2	15.9	$T_{\overline{m}}$ 0 42	2.1	55.9	15.2
12	3 16.5	$T_{\overline{m}_\odot}$ 11 h 56.7 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 56	.1	274	-4.1	♃	18 13	.0	224	-1.7
♂	12 39	.1	307	1.6	♄	1 15	.0	119	.3

6. MAJ SREDA

UT	SUNCE		PROLEĆ. TAČKA	VENERA		MARS	
	$S_\odot$	$\delta_\odot$	S_Υ	S_φ	δ_φ	S_σ	δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	180 49.8	16 22.9	223 31.9	135 56.6	25 56.3	170 16.3	19 25.0
2	210 49.9	16 24.3	253 36.8	165 55.4	25 56.5	200 17.5	19 25.9
4	240 50.0	16 25.7	283 41.7	195 54.2	25 56.7	230 18.8	19 26.8
6	270 50.1	16 27.1	313 46.7	225 52.9	25 56.9	260 20.1	19 27.7
8	300 50.2	16 28.5	343 51.6	255 51.7	25 57.2	290 21.3	19 28.6
10	330 50.3	16 30.0	13 56.5	285 50.4	25 57.4	320 22.6	19 29.5
12	0 50.4	16 31.4	44 1.5	315 49.2	25 57.6	350 23.9	19 30.4
14	30 50.5	16 32.8	74 6.4	345 48.0	25 57.8	20 25.2	19 31.2
16	60 50.6	16 34.2	104 11.3	15 46.7	25 58.0	50 26.4	19 32.1
18	90 50.7	16 35.6	134 16.2	45 45.5	25 58.2	80 27.7	19 33.0
20	120 50.7	16 37.0	164 21.2	75 44.3	25 58.4	110 29.0	19 33.9
22	150 50.8	16 38.4	194 26.1	105 43.1	25 58.6	140 30.3	19 34.8
Δ	0	7		-6	1	6	4

UT	MESEC				JUPITER		SATURN	
	$S_\leftmoon$	Δ	$\delta_\leftmoon$	Δ	S_{4}	δ_{4}	S_{5}	δ_{5}
h	° ′		° ′		° ′	° ′	° ′	° ′
0	337 45.0	99	17 8.6	36	87 4.7	17 34.9	342 15.9	-18 35.0
2	6 42.7	98	17 15.8	34	117 9.2	17 34.8	12 21.2	-18 34.9
4	35 40.2	97	17 22.7	33	147 13.7	17 34.6	42 26.5	-18 34.8
6	64 37.6	96	17 29.3	31	177 18.3	17 34.5	72 31.7	-18 34.8
8	93 34.8	95	17 35.4	29	207 22.8	17 34.4	102 37.0	-18 34.7
10	122 31.8	94	17 41.2	27	237 27.3	17 34.3	132 42.3	-18 34.6
12	151 28.6	94	17 46.6	25	267 31.8	17 34.2	162 47.6	-18 34.5
14	180 25.4	93	17 51.6	23	297 36.3	17 34.0	192 52.9	-18 34.5
16	209 21.9	92	17 56.2	21	327 40.9	17 33.9	222 58.2	-18 34.4
18	238 18.3	91	18 .5	19	357 45.4	17 33.8	253 3.5	-18 34.3
20	267 14.6	91	18 4.3	17	27 49.9	17 33.6	283 8.8	-18 34.3
22	296 10.7	90	18 7.8	15	57 54.4	17 33.5	313 14.0	-18 34.2
Δ					23	-1	26	0

φ	SUNCE		TRAJANJE SUMRAKA		MESEC			
	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 46	20 9	0 57	: ::	17 51	2.1	10 3	2.5
55	4 10	19 44	0 45	3 39	18 18	2.1	9 36	2.4
50	4 29	19 26	0 38	2 27	18 38	2.2	9 17	2.4
45	4 43	19 11	0 33	2 1	18 53	2.2	9 1	2.3
40	4 55	18 59	0 30	1 46	19 6	2.2	8 49	2.3
35	5 5	18 49	0 27	1 36	19 17	2.2	8 38	2.3
30	5 13	18 40	0 26	1 28	19 27	2.2	8 28	2.3
20	5 28	18 25	0 23	1 19	19 44	2.2	8 12	2.3
10	5 41	18 12	0 22	1 14	19 58	2.2	7 58	2.2
0	5 53	18 0	0 22	1 12	20 12	2.2	7 45	2.2
10	6 5	17 48	0 22	1 12	20 26	2.2	7 31	2.2
20	6 18	17 35	0 23	1 15	20 40	2.2	7 17	2.1
30	6 32	17 21	0 25	1 22	20 57	2.3	7 1	2.1
35	6 40	17 13	0 26	1 26	21 7	2.3	6 52	2.1
40	6 49	17 3	0 28	1 33	21 18	2.3	6 41	2.1
45	7 0	16 52	0 31	1 40	21 31	2.3	6 28	2.0
50	7 13	16 39	0 35	1 51	21 48	2.3	6 13	2.0
55	7 30	16 23	0 40	2 5	22 8	2.3	5 53	1.9
60	7 52	16 1	0 47	2 26	22 36	2.3	5 27	1.9
S								

SUNCE				MESEC			
UT	$e = T_p - UT$	Δ/24	r	Prolaz	Δ/24	$\pi_\leftmoon$	r
h	min s	s	′	h min	min	′	′
00	3 19.1	.2	15.9	$T_{\overline{m}}$ 1 32	2.2	56.4	15.4
12	3 21.4	$T_{\overline{m}_\odot}$ 11 h 56.6 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 57	.1	272	-4.1	♃	18 9	.0	224	-1.7
♂	12 38	.1	307	1.6	♄	1 11	.0	119	.3

UT	SUNCE		PROLEĆ. TAČKA	VENERA		MARS	
	$S_\odot$	$\delta_\odot$	S_Υ	S_φ	δ_φ	S_σ	δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	180 50.9	16 39.7	224 31.0	135 41.8	25 58.8	170 31.5	19 35.7
2	210 51.0	16 41.1	254 36.0	165 40.6	25 58.9	200 32.8	19 36.5
4	240 51.1	16 42.5	284 40.9	195 39.4	25 59.1	230 34.1	19 37.4
6	270 51.2	16 43.9	314 45.8	225 38.2	25 59.3	260 35.3	19 38.3
8	300 51.3	16 45.3	344 50.7	255 36.9	25 59.4	290 36.6	19 39.2
10	330 51.4	16 46.7	14 55.7	285 35.7	25 59.6	320 37.9	19 40.1
12	0 51.5	16 48.1	45 .6	315 34.5	25 59.8	350 39.1	19 40.9
14	30 51.5	16 49.4	75 5.5	345 33.3	25 59.9	20 40.4	19 41.8
16	60 51.6	16 50.8	105 10.5	15 32.0	26 .1	50 41.7	19 42.7
18	90 51.7	16 52.2	135 15.4	45 30.8	26 .2	80 43.0	19 43.5
20	120 51.8	16 53.6	165 20.3	75 29.6	26 .3	110 44.2	19 44.4
22	150 51.9	16 54.9	195 25.2	105 28.4	26 .5	140 45.5	19 45.3
Δ	0	7		-6	1	6	4

UT	MESEC				JUPITER		SATURN	
	$S_\leftmoon$	Δ	$\delta_\leftmoon$	Δ	$S_{\mathrm{♃}}$	$\delta_{\mathrm{♃}}$	$S_{\mathrm{♄}}$	$\delta_{\mathrm{♄}}$
h	° ′		° ′		° ′	° ′	° ′	° ′
0	325 6.7	89	18 10.8	13	87 58.9	17 33.4	343 19.3	-18 34.1
2	354 2.6	89	18 13.4	11	118 3.4	17 33.3	13 24.6	-18 34.1
4	22 58.3	88	18 15.6	9	148 7.9	17 33.1	43 29.9	-18 34.0
6	51 53.9	88	18 17.4	7	178 12.5	17 33.0	73 35.2	-18 33.9
8	80 49.5	87	18 18.8	5	208 17.0	17 32.9	103 40.5	-18 33.9
10	109 44.9	87	18 19.8	3	238 21.5	17 32.8	133 45.8	-18 33.8
12	138 40.2	86	18 20.4	1	268 26.0	17 32.6	163 51.1	-18 33.7
14	167 35.4	86	18 20.5	-1	298 30.5	17 32.5	193 56.3	-18 33.7
16	196 30.5	85	18 20.2	-4	328 35.0	17 32.4	224 1.6	-18 33.6
18	225 25.5	85	18 19.5	-6	358 39.5	17 32.2	254 6.9	-18 33.5
20	254 20.5	84	18 18.4	-8	28 44.0	17 32.1	284 12.2	-18 33.5
22	283 15.4	84	18 16.9	-10	58 48.5	17 32.0	314 17.5	-18 33.4
Δ					23	-1	26	0

φ	SUNCE		TRAJANJE SUMRAKA		MESEC			
	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 43	20 12	0 57	: ::	18 41	2.6	11 2	2.1
55	4 8	19 46	0 45	3 56	19 9	2.5	10 34	2.1
50	4 27	19 27	0 38	2 29	19 29	2.5	10 14	2.2
45	4 41	19 12	0 33	2 2	19 46	2.4	9 58	2.2
40	4 53	19 0	0 30	1 47	19 59	2.4	9 44	2.2
35	5 4	18 50	0 28	1 36	20 10	2.4	9 33	2.2
30	5 13	18 41	0 26	1 29	20 20	2.4	9 23	2.2
20	5 28	18 26	0 23	1 19	20 37	2.3	9 6	2.2
10	5 41	18 12	0 22	1 14	20 52	2.3	8 51	2.2
0	5 53	18 0	0 22	1 12	21 6	2.3	8 38	2.2
10	6 5	17 48	0 22	1 12	21 19	2.2	8 24	2.3
20	6 18	17 35	0 23	1 16	21 34	2.2	8 9	2.3
30	6 33	17 20	0 25	1 22	21 51	2.2	7 52	2.3
35	6 41	17 12	0 27	1 27	22 1	2.1	7 42	2.3
40	6 50	17 2	0 29	1 33	22 12	2.1	7 30	2.3
45	7 1	16 51	0 31	1 41	22 26	2.1	7 17	2.3
50	7 15	16 38	0 35	1 51	22 42	2.0	7 1	2.3
55	7 32	16 21	0 40	2 6	23 3	2.0	6 40	2.3
60	7 54	15 58	0 47	2 26	23 31	2.3	6 12	2.3
S								

SUNCE				MESEC			
UT	$e = T_p - UT$	Δ/24	r	Prolaz	Δ/24	$\pi_\leftmoon$	r
h	min s	s	′	h min	min	′	′
00	3 23.7	.2	15.9	$T_{\overline{m}}$ 2 25	2.2	56.9	15.5
12	3 25.7	$T_{\overline{m}_\odot}$ 11 h 56.6 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 58	.1	271	-4.1	♃	18 5	.0	223	-1.7
♂	12 37	.1	306	1.6	♄	1 7	.0	119	.3

UT	SUNCE		PROLEĆ. TAČKA	VENERA		MARS	
	$S_\odot$	$\delta_\odot$	S_Υ	S_φ	δ_φ	S_σ	δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	180 51.9	16 56.3	225 30.2	135 27.2	26 .6	170 46.8	19 46.1
2	210 52.0	16 57.7	255 35.1	165 26.0	26 .7	200 48.0	19 47.0
4	240 52.1	16 59.0	285 40.0	195 24.8	26 .8	230 49.3	19 47.9
6	270 52.2	17 .4	315 45.0	225 23.6	26 1.0	260 50.6	19 48.7
8	300 52.2	17 1.8	345 49.9	255 22.4	26 1.1	290 51.8	19 49.6
10	330 52.3	17 3.1	15 54.8	285 21.1	26 1.2	320 53.1	19 50.4
12	0 52.4	17 4.5	45 59.7	315 19.9	26 1.3	350 54.3	19 51.3
14	30 52.5	17 5.8	76 4.7	345 18.7	26 1.4	20 55.6	19 52.2
16	60 52.5	17 7.2	106 9.6	15 17.5	26 1.5	50 56.9	19 53.0
18	90 52.6	17 8.6	136 14.5	45 16.3	26 1.5	80 58.1	19 53.9
20	120 52.7	17 9.9	166 19.4	75 15.1	26 1.6	110 59.4	19 54.7
22	150 52.7	17 11.3	196 24.4	105 13.9	26 1.7	141 .7	19 55.6
Δ	0	7		-6	0	6	4

UT	MESEC				JUPITER		SATURN	
	$S_\leftmoon$	Δ	$\delta_\leftmoon$	Δ	$S_{\mathrm{♃}}$	$\delta_{\mathrm{♃}}$	$S_{\mathrm{♄}}$	$\delta_{\mathrm{♄}}$
h	° ′		° ′		° ′	° ′	° ′	° ′
0	312 10.2	84	18 14.9	-12	88 53.0	17 31.9	344 22.8	-18 33.3
2	341 5.0	84	18 12.5	-14	118 57.5	17 31.7	14 28.1	-18 33.2
4	9 59.7	83	18 9.6	-16	149 2.0	17 31.6	44 33.4	-18 33.2
6	38 54.3	83	18 6.4	-18	179 6.5	17 31.5	74 38.7	-18 33.1
8	67 48.9	83	18 2.7	-21	209 11.0	17 31.3	104 44.0	-18 33.0
10	96 43.5	83	17 58.5	-23	239 15.5	17 31.2	134 49.3	-18 33.0
12	125 38.1	83	17 54.0	-25	269 20.0	17 31.1	164 54.6	-18 32.9
14	154 32.6	82	17 49.0	-27	299 24.5	17 30.9	194 59.8	-18 32.8
16	183 27.1	82	17 43.6	-29	329 29.0	17 30.8	225 5.1	-18 32.8
18	212 21.5	82	17 37.8	-31	359 33.5	17 30.7	255 10.4	-18 32.7
20	241 16.0	82	17 31.5	-33	29 38.0	17 30.5	285 15.7	-18 32.6
22	270 10.5	82	17 24.9	-35	59 42.4	17 30.4	315 21.0	-18 32.6
Δ					22	-1	26	0

φ	SUNCE		TRAJANJE SUMRAKA		MESEC			
	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 40	20 14	0 58	: ::	19 43	3.0	11 52	1.7
55	4 6	19 48	0 45	: ::	20 9	2.8	11 25	1.8
50	4 25	19 29	0 38	2 30	20 29	2.7	11 5	1.9
45	4 40	19 14	0 33	2 3	20 44	2.6	10 50	2.0
40	4 52	19 1	0 30	1 47	20 56	2.6	10 37	2.0
35	5 3	18 51	0 28	1 36	21 7	2.5	10 26	2.1
30	5 12	18 42	0 26	1 29	21 17	2.5	10 16	2.1
20	5 27	18 26	0 23	1 19	21 33	2.4	9 60	2.2
10	5 41	18 13	0 22	1 14	21 47	2.3	9 45	2.2
0	5 53	17 60	0 22	1 12	21 60	2.3	9 32	2.3
10	6 5	17 48	0 22	1 13	22 13	2.2	9 18	2.3
20	6 18	17 34	0 23	1 16	22 27	2.1	9 3	2.4
30	6 33	17 20	0 25	1 22	22 43	2.0	8 46	2.4
35	6 42	17 11	0 27	1 27	22 52	2.0	8 37	2.5
40	6 51	17 1	0 29	1 33	23 3	1.9	8 26	2.5
45	7 3	16 50	0 31	1 41	23 16	2.3	8 12	2.5
50	7 16	16 36	0 35	1 51	23 31	2.3	7 56	2.6
55	7 34	16 19	0 40	2 6	23 50	2.3	7 36	2.7
60	7 57	15 56	0 47	2 27	. . .	.0	7 8	2.8
S								

SUNCE				MESEC			
UT	$e = T_p - UT$	Δ/24	r	Prolaz	Δ/24	$\pi_\leftmoon$	r
h	min s	s	′	h min	min	′	′
00	3 27.8	.1	15.9	$T_{\overline{m}}$ 3 19	2.3	57.4	15.6
12	3 29.5	$T_{\overline{m}_\odot}$ 11 h 56.5 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	.1	270	-4.1	♃	18 2	.0	223	-1.6
♂	12 36	.1	305	1.6	♄	1 2	.0	119	.3

UT	SUNCE		PROLEĆ. TAČKA	VENERA		MARS	
	$S_\odot$	$\delta_\odot$	S_Υ	S_φ	δ_φ	S_σ	δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	180 52.8	17 12.6	226 29.3	135 12.7	26 1.8	171 1.9	19 56.4
2	210 52.9	17 13.9	256 34.2	165 11.5	26 1.8	201 3.2	19 57.3
4	240 52.9	17 15.3	286 39.2	195 10.3	26 1.9	231 4.5	19 58.1
6	270 53.0	17 16.6	316 44.1	225 9.2	26 2.0	261 5.7	19 59.0
8	300 53.1	17 18.0	346 49.0	255 8.0	26 2.0	291 7.0	19 59.8
10	330 53.1	17 19.3	16 53.9	285 6.8	26 2.1	321 8.2	20 .6
12	0 53.2	17 20.6	46 58.9	315 5.6	26 2.1	351 9.5	20 1.5
14	30 53.2	17 22.0	77 3.8	345 4.4	26 2.2	21 10.8	20 2.3
16	60 53.3	17 23.3	107 8.7	15 3.2	26 2.2	51 12.0	20 3.2
18	90 53.3	17 24.6	137 13.7	45 2.0	26 2.2	81 13.3	20 4.0
20	120 53.4	17 26.0	167 18.6	75 .8	26 2.3	111 14.6	20 4.8
22	150 53.5	17 27.3	197 23.5	104 59.7	26 2.3	141 15.8	20 5.7
Δ	0	7		-6	0	6	4

UT	MESEC				JUPITER		SATURN	
	$S_\leftmoon$	Δ	$\delta_\leftmoon$	Δ	$S_{\mathrm{♃}}$	$\delta_{\mathrm{♃}}$	$S_{\mathrm{♄}}$	$\delta_{\mathrm{♄}}$
h	° ′		° ′		° ′	° ′	° ′	° ′
0	299 4.9	82	17 17.8	-38	89 46.9	17 30.3	345 26.3	-18 32.5
2	327 59.4	82	17 10.2	-40	119 51.4	17 30.1	15 31.6	-18 32.4
4	356 53.8	82	17 2.3	-42	149 55.9	17 30.0	45 36.9	-18 32.4
6	25 48.3	82	16 54.0	-44	180 .4	17 29.9	75 42.2	-18 32.3
8	54 42.8	83	16 45.2	-46	210 4.9	17 29.7	105 47.5	-18 32.2
10	83 37.3	83	16 36.0	-48	240 9.4	17 29.6	135 52.8	-18 32.1
12	112 31.9	83	16 26.5	-50	270 13.8	17 29.5	165 58.1	-18 32.1
14	141 26.5	83	16 16.5	-52	300 18.3	17 29.3	196 3.4	-18 32.0
16	170 21.1	83	16 6.1	-54	330 22.8	17 29.2	226 8.7	-18 31.9
18	199 15.7	83	15 55.4	-56	0 27.3	17 29.0	256 14.0	-18 31.9
20	228 10.4	84	15 44.2	-58	30 31.8	17 28.9	286 19.3	-18 31.8
22	257 5.1	84	15 32.6	-60	60 36.2	17 28.8	316 24.6	-18 31.7
Δ					22	-1	26	0

φ	SUNCE		TRAJANJE SUMRAKA		MESEC			
	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 38	20 17	0 59	: ::	20 54	3.3	12 32	1.3
55	4 4	19 50	0 46	: ::	21 17	3.1	12 9	1.5
50	4 24	19 30	0 38	2 32	21 34	2.9	11 51	1.7
45	4 39	19 15	0 33	2 4	21 47	2.8	11 37	1.8
40	4 51	19 2	0 30	1 48	21 58	2.7	11 25	1.9
35	5 2	18 52	0 28	1 37	22 8	2.6	11 15	1.9
30	5 11	18 42	0 26	1 29	22 16	2.6	11 7	2.0
20	5 27	18 26	0 23	1 19	22 30	2.4	10 52	2.1
10	5 40	18 13	0 22	1 14	22 43	2.3	10 38	2.2
0	5 53	17 60	0 22	1 12	22 54	2.2	10 26	2.3
10	6 5	17 47	0 22	1 13	23 6	2.1	10 13	2.3
20	6 19	17 34	0 23	1 16	23 18	2.2	9 60	2.4
30	6 34	17 19	0 25	1 22	23 32	2.2	9 45	2.5
35	6 42	17 10	0 27	1 27	23 40	2.2	9 36	2.6
40	6 52	17 0	0 29	1 33	23 50	2.2	9 25	2.6
45	7 4	16 49	0 31	1 41	. . .	.0	9 13	2.7
50	7 18	16 35	0 35	1 52	. . .	.0	8 59	2.8
55	7 35	16 17	0 40	2 6	. . .	.0	8 40	3.0
60	7 59	15 53	0 48	2 27	0 16	1.5	8 15	3.2
S								

SUNCE				MESEC			
UT	e = T_p − UT	Δ/24	r	Prolaz		Δ/24	$\pi_\leftmoon$	r
h	min s	s	′		h min	min	′	′
00	3 31.2	.1	15.9	$T_{\overline{m}}$	4 13	2.3	57.9	15.8
12	3 32.6	$T_{\overline{m}_\odot}$	11 h 56.5 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 60	.1	269	-4.1	♃	17 58	.0	223	-1.6
♂	12 35	.1	305	1.6	♄	0 58	.0	119	.3

UT	SUNCE		PROLEĆ. TAČKA	VENERA		MARS	
	$S_\odot$	$\delta_\odot$	S_Υ	S_φ	δ_φ	S_σ	δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	180 53.5	17 28.6	227 28.4	134 58.5	26 2.3	171 17.1	20 6.5
2	210 53.6	17 29.9	257 33.4	164 57.3	26 2.3	201 18.3	20 7.3
4	240 53.6	17 31.2	287 38.3	194 56.1	26 2.3	231 19.6	20 8.2
6	270 53.7	17 32.6	317 43.2	224 55.0	26 2.3	261 20.8	20 9.0
8	300 53.7	17 33.9	347 48.2	254 53.8	26 2.3	291 22.1	20 9.8
10	330 53.8	17 35.2	17 53.1	284 52.6	26 2.3	321 23.4	20 10.7
12	0 53.8	17 36.5	47 58.0	314 51.4	26 2.3	351 24.6	20 11.5
14	30 53.9	17 37.8	78 2.9	344 50.3	26 2.3	21 25.9	20 12.3
16	60 53.9	17 39.1	108 7.9	14 49.1	26 2.3	51 27.1	20 13.1
18	90 54.0	17 40.4	138 12.8	44 47.9	26 2.3	81 28.4	20 13.9
20	120 54.0	17 41.7	168 17.7	74 46.8	26 2.2	111 29.6	20 14.8
22	150 54.0	17 43.0	198 22.7	104 45.6	26 2.2	141 30.9	20 15.6
Δ	0	7		-6	0	6	4

UT	MESEC				JUPITER		SATURN	
	$S_\leftmoon$	Δ	$\delta_\leftmoon$	Δ	$S_{\mathrm{♃}}$	$\delta_{\mathrm{♃}}$	$S_{\mathrm{♄}}$	$\delta_{\mathrm{♄}}$
h	° ′		° ′		° ′	° ′	° ′	° ′
0	285 59.9	84	15 20.7	-62	90 40.7	17 28.6	346 29.9	-18 31.7
2	314 54.7	84	15 8.4	-63	120 45.2	17 28.5	16 35.1	-18 31.6
4	343 49.6	85	14 55.7	-65	150 49.7	17 28.4	46 40.4	-18 31.5
6	12 44.5	85	14 42.6	-67	180 54.1	17 28.2	76 45.7	-18 31.5
8	41 39.4	85	14 29.2	-69	210 58.6	17 28.1	106 51.0	-18 31.4
10	70 34.5	85	14 15.4	-71	241 3.1	17 27.9	136 56.3	-18 31.3
12	99 29.6	86	14 1.3	-72	271 7.5	17 27.8	167 1.6	-18 31.2
14	128 24.7	86	13 46.8	-74	301 12.0	17 27.7	197 6.9	-18 31.2
16	157 19.9	86	13 31.9	-76	331 16.5	17 27.5	227 12.2	-18 31.1
18	186 15.2	87	13 16.7	-78	1 21.0	17 27.4	257 17.5	-18 31.0
20	215 10.5	87	13 1.2	-79	31 25.4	17 27.2	287 22.8	-18 31.0
22	244 5.9	87	12 45.4	-81	61 29.9	17 27.1	317 28.1	-18 30.9
Δ					22	-1	26	0

φ	SUNCE		TRAJANJE SUMRAKA		MESEC			
	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 35	20 19	0 60	: ::	22 13	3.5	13 5	1.1
55	4 2	19 52	0 46	: ::	22 31	3.2	12 46	1.3
50	4 22	19 32	0 38	2 34	22 44	3.0	12 31	1.5
45	4 38	19 16	0 34	2 5	22 55	2.9	12 20	1.6
40	4 50	19 3	0 30	1 48	23 3	2.2	12 10	1.7
35	5 1	18 52	0 28	1 37	23 11	2.2	12 2	1.8
30	5 10	18 43	0 26	1 29	23 17	2.2	11 54	1.9
20	5 26	18 27	0 23	1 19	23 29	2.2	11 42	2.0
10	5 40	18 13	0 22	1 14	23 39	2.2	11 31	2.1
0	5 53	17 60	0 22	1 12	23 48	2.2	11 20	2.2
10	6 6	17 47	0 22	1 13	23 57	2.2	11 9	2.3
20	6 19	17 34	0 23	1 16	. . .	.0	10 58	2.5
30	6 34	17 18	0 25	1 22	. . .	.0	10 45	2.6
35	6 43	17 9	0 27	1 27	. . .	.0	10 38	2.7
40	6 53	16 59	0 29	1 33	. . .	.0	10 29	2.8
45	7 5	16 47	0 31	1 41	0 1	1.7	10 19	2.9
50	7 19	16 33	0 35	1 52	0 14	1.6	10 7	3.0
55	7 37	16 15	0 40	2 7	0 30	1.4	9 51	3.2
60	8 1	15 51	0 48	2 28	0 52	1.2	9 30	3.4
S								

SUNCE				MESEC			
UT	e = T_p − UT	Δ/24	r	Prolaz		Δ/24	$\pi_\leftmoon$	r
h	min s	s	′		h min	min	′	′
00	3 34.1	.1	15.9	$T_{\overline{m}}$	5 7	2.3	58.4	15.9
12	3 35.2	$T_{\overline{m}_\odot}$	11 h 56.4 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	′	°	
♀	15 1	.1	267	-4.2	♃	17 55	.0	223	-1.6
♂	12 34	.1	304	1.6	♄	0 54	.0	119	.3

UT	SUNCE		PROLEĆ. TAČKA	VENERA		MARS	
	$S_\odot$	$\delta_\odot$	S_Υ	S_φ	δ_φ	S_σ	δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	180 54.1	17 44.3	228 27.6	134 44.5	26 2.2	171 32.2	20 16.4
2	210 54.1	17 45.6	258 32.5	164 43.3	26 2.1	201 33.4	20 17.2
4	240 54.2	17 46.9	288 37.4	194 42.1	26 2.1	231 34.7	20 18.0
6	270 54.2	17 48.2	318 42.4	224 41.0	26 2.0	261 35.9	20 18.8
8	300 54.2	17 49.5	348 47.3	254 39.8	26 2.0	291 37.2	20 19.7
10	330 54.3	17 50.8	18 52.2	284 38.7	26 1.9	321 38.4	20 20.5
12	0 54.3	17 52.1	48 57.2	314 37.5	26 1.9	351 39.7	20 21.3
14	30 54.3	17 53.3	79 2.1	344 36.4	26 1.8	21 40.9	20 22.1
16	60 54.4	17 54.6	109 7.0	14 35.2	26 1.7	51 42.2	20 22.9
18	90 54.4	17 55.9	139 11.9	44 34.1	26 1.6	81 43.5	20 23.7
20	120 54.4	17 57.2	169 16.9	74 33.0	26 1.6	111 44.7	20 24.5
22	150 54.5	17 58.4	199 21.8	104 31.8	26 1.5	141 46.0	20 25.3
Δ	0	6		-6	0	6	4

UT	MESEC				JUPITER		SATURN	
	$S_\leftmoon$	Δ	$\delta_\leftmoon$	Δ	S_{4}	δ_{4}	S_{5}	δ_{5}
h	° ′		° ′		° ′	° ′	° ′	° ′
0	273 1.3	88	12 29.2	-82	91 34.3	17 27.0	347 33.4	-18 30.8
2	301 56.8	88	12 12.7	-84	121 38.8	17 26.8	17 38.7	-18 30.8
4	330 52.4	88	11 55.9	-85	151 43.3	17 26.7	47 44.0	-18 30.7
6	359 48.0	88	11 38.9	-87	181 47.7	17 26.5	77 49.3	-18 30.6
8	28 43.7	89	11 21.5	-88	211 52.2	17 26.4	107 54.6	-18 30.6
10	57 39.4	89	11 3.8	-90	241 56.6	17 26.2	137 59.9	-18 30.5
12	86 35.3	89	10 45.8	-91	272 1.1	17 26.1	168 5.2	-18 30.4
14	115 31.1	90	10 27.6	-93	302 5.6	17 25.9	198 10.5	-18 30.3
16	144 27.0	90	10 9.1	-94	332 10.0	17 25.8	228 15.8	-18 30.3
18	173 23.0	90	9 50.3	-95	2 14.5	17 25.7	258 21.1	-18 30.2
20	202 19.0	90	9 31.3	-96	32 18.9	17 25.5	288 26.4	-18 30.1
22	231 15.1	91	9 12.0	-98	62 23.4	17 25.4	318 31.7	-18 30.1
Δ					22	-1	27	0

	SUNCE		TRAJANJE SUMRAKA		MESEC			
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	3 33	20 22	1 0	: ::	23 36	2.3	13 31	.9
55	4 0	19 54	0 46	: ::	23 48	2.3	13 17	1.2
50	4 21	19 33	0 39	2 36	23 57	2.2	13 7	1.3
45	4 36	19 17	0 34	2 6	. . ..	.0	12 58	1.5
40	4 49	19 4	0 30	1 49	23 57	2.8	12 51	1.6
35	5 0	18 53	0 28	1 37	. . ..	.0	12 45	1.7
30	5 10	18 44	0 26	1 30	. . ..	.0	12 39	1.8
20	5 26	18 27	0 23	1 20	. . ..	.0	12 30	1.9
10	5 40	18 13	0 22	1 14	. . ..	.0	12 21	2.1
0	5 53	17 60	0 22	1 12	. . ..	.0	12 14	2.2
10	6 6	17 47	0 22	1 13	. . ..	.0	12 6	2.3
20	6 19	17 33	0 23	1 16	0 7	2.0	11 57	2.5
30	6 35	17 17	0 25	1 22	0 19	1.8	11 47	2.6
35	6 44	17 8	0 27	1 27	0 25	1.7	11 42	2.7
40	6 54	16 58	0 29	1 33	0 32	1.7	11 35	2.8
45	7 6	16 46	0 32	1 41	0 41	1.5	11 27	2.9
50	7 21	16 32	0 35	1 52	0 51	1.4	11 18	3.1
55	7 39	16 13	0 40	2 7	1 4	1.2	11 7	3.3
60	8 3	15 49	0 48	2 28	1 21	1.0	10 52	3.5
S								

SUNCE				MESEC			
UT	e = T_p − UT	Δ/24	r	Prolaz	Δ/24	$\pi_\leftmoon$	r
h	min s	s	′	h min	min	′	′
00	3 36.3	.1	15.9	$T_{\overline{m}}$ 6 1	2.2	58.8	16.0
12	3 37.2	$T_{\overline{m}_\odot}$ 11 h 56.4 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	′	°	
♀	15 2	.1	266	-4.2	♃	17 51	.0	223	-1.6
♂	12 33	.1	303	1.6	♄	0 50	.0	119	.3

UT	SUNCE		PROLEĆ. TAČKA	VENERA		MARS	
	$S_\odot$	$\delta_\odot$	S_Υ	S_φ	δ_φ	S_σ	δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	180 54.5	17 59.7	229 26.7	134 30.7	26 1.4	171 47.2	20 26.1
2	210 54.5	18 1.0	259 31.7	164 29.5	26 1.3	201 48.5	20 26.9
4	240 54.6	18 2.3	289 36.6	194 28.4	26 1.2	231 49.7	20 27.7
6	270 54.6	18 3.5	319 41.5	224 27.3	26 1.1	261 51.0	20 28.5
8	300 54.6	18 4.8	349 46.4	254 26.1	26 1.0	291 52.2	20 29.3
10	330 54.6	18 6.1	19 51.4	284 25.0	26 .9	321 53.5	20 30.1
12	0 54.7	18 7.3	49 56.3	314 23.9	26 .7	351 54.7	20 30.9
14	30 54.7	18 8.6	80 1.2	344 22.8	26 .6	21 56.0	20 31.7
16	60 54.7	18 9.8	110 6.1	14 21.6	26 .5	51 57.2	20 32.5
18	90 54.7	18 11.1	140 11.1	44 20.5	26 .4	81 58.5	20 33.3
20	120 54.7	18 12.3	170 16.0	74 19.4	26 .2	111 59.7	20 34.0
22	150 54.8	18 13.6	200 20.9	104 18.3	26 .1	142 1.0	20 34.8
Δ	0	6		-6	-1	6	4

UT	MESEC				JUPITER		SATURN	
	$S_\leftmoon$	Δ	$\delta_\leftmoon$	Δ	S_{4}	δ_{4}	S_{5}	δ_{5}
h	° ′		° ′		° ′	° ′	° ′	° ′
0	260 11.2	91	8 52.5	-99	92 27.8	17 25.2	348 37.0	-18 30.0
2	289 7.4	91	8 32.7	-100	122 32.3	17 25.1	18 42.3	-18 29.9
4	318 3.6	91	8 12.8	-101	152 36.7	17 24.9	48 47.6	-18 29.9
6	346 59.9	91	7 52.6	-102	182 41.2	17 24.8	78 52.9	-18 29.8
8	15 56.1	92	7 32.2	-103	212 45.6	17 24.6	108 58.2	-18 29.7
10	44 52.5	92	7 11.6	-104	242 50.1	17 24.5	139 3.5	-18 29.6
12	73 48.8	92	6 50.8	-105	272 54.5	17 24.3	169 8.8	-18 29.6
14	102 45.2	92	6 29.8	-106	302 59.0	17 24.2	199 14.1	-18 29.5
16	131 41.6	92	6 8.7	-107	333 3.4	17 24.0	229 19.5	-18 29.4
18	160 38.1	92	5 47.4	-107	3 7.8	17 23.9	259 24.8	-18 29.4
20	189 34.5	92	5 25.9	-108	33 12.3	17 23.8	289 30.1	-18 29.3
22	218 31.0	92	5 4.3	-109	63 16.7	17 23.6	319 35.4	-18 29.2
Δ					22	-1	27	0

	SUNCE		TRAJANJE SUMRAKA		MESEC			
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	3 30	20 24	1 1	: ::	. . ..	.0	13 53	.8
55	3 59	19 55	0 47	: ::	. . ..	.0	13 45	1.1
50	4 19	19 35	0 39	2 38	. . ..	.0	13 39	1.3
45	4 35	19 18	0 34	2 6	0 5	3.0	13 34	1.4
40	4 48	19 5	0 30	1 49	. . ..	.0	13 29	1.5
35	4 59	18 54	0 28	1 38	0 16	2.7	13 26	1.6
30	5 9	18 44	0 26	1 30	0 20	2.6	13 22	1.7
20	5 25	18 28	0 24	1 20	0 28	2.5	13 16	1.9
10	5 40	18 13	0 22	1 15	0 35	2.3	13 11	2.1
0	5 53	17 60	0 22	1 12	0 41	2.2	13 6	2.2
10	6 6	17 47	0 22	1 13	0 48	2.1	13 2	2.3
20	6 20	17 33	0 23	1 16	0 55	1.9	12 56	2.5
30	6 36	17 17	0 25	1 22	1 2	1.8	12 50	2.7
35	6 45	17 8	0 27	1 27	1 7	1.7	12 47	2.8
40	6 55	16 57	0 29	1 33	1 12	1.6	12 43	2.9
45	7 7	16 45	0 32	1 42	1 18	1.4	12 38	3.0
50	7 22	16 30	0 35	1 52	1 25	1.3	12 32	3.2
55	7 41	16 11	0 41	2 7	1 34	1.1	12 25	3.3
60	8 6	15 46	0 48	2 29	1 45	.9	12 16	3.6
S								

SUNCE				MESEC			
UT	e = T_p − UT	Δ/24	r	Prolaz	Δ/24	$\pi_\leftmoon$	r
h	min s	s	′	h min	min	′	′
00	3 38.0	.0	15.9	$T_{\overline{m}}$ 6 54	2.2	59.2	16.1
12	3 38.5	$T_{\overline{m}_\odot}$ 11 h 56.4 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	′	°	
♀	15 3	.1	265	-4.2	♃	17 48	.0	223	-1.6
♂	12 32	.1	302	1.6	♄	0 45	.0	119	.3

UT	SUNCE		PROLEĆ. TAČKA	VENERA		MARS	
	$S_\odot$	$\delta_\odot$	S_Υ	S_φ	δ_φ	S_σ	δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	180 54.8	18 14.8	230 25.9	134 17.2	25 60.0	172 2.2	20 35.6
2	210 54.8	18 16.1	260 30.8	164 16.0	25 59.8	202 3.5	20 36.4
4	240 54.8	18 17.3	290 35.7	194 14.9	25 59.7	232 4.7	20 37.2
6	270 54.8	18 18.6	320 40.6	224 13.8	25 59.5	262 6.0	20 38.0
8	300 54.8	18 19.8	350 45.6	254 12.7	25 59.3	292 7.2	20 38.7
10	330 54.8	18 21.0	20 50.5	284 11.6	25 59.2	322 8.5	20 39.5
12	0 54.9	18 22.3	50 55.4	314 10.5	25 59.0	352 9.7	20 40.3
14	30 54.9	18 23.5	81 .4	344 9.4	25 58.8	22 11.0	20 41.1
16	60 54.9	18 24.7	111 5.3	14 8.3	25 58.6	52 12.2	20 41.8
18	90 54.9	18 26.0	141 10.2	44 7.2	25 58.5	82 13.4	20 42.6
20	120 54.9	18 27.2	171 15.1	74 6.1	25 58.3	112 14.7	20 43.4
22	150 54.9	18 28.4	201 20.1	104 5.0	25 58.1	142 15.9	20 44.2
Δ	0	6		-6	-1	6	4

UT	MESEC				JUPITER		SATURN	
	$S_\leftmoon$	Δ	$\delta_\leftmoon$	Δ	$S_{\text{♃}}$	$\delta_{\text{♃}}$	$S_{\text{♄}}$	$\delta_{\text{♄}}$
h	° ′		° ′		° ′	° ′	° ′	° ′
0	247 27.5	92	4 42.5	-109	93 21.2	17 23.5	349 40.7	-18 29.2
2	276 24.0	92	4 20.6	-110	123 25.6	17 23.3	19 46.0	-18 29.1
4	305 20.5	92	3 58.6	-111	153 30.0	17 23.2	49 51.3	-18 29.0
6	334 17.0	92	3 36.5	-111	183 34.5	17 23.0	79 56.6	-18 28.9
8	3 13.5	92	3 14.3	-112	213 38.9	17 22.9	110 1.9	-18 28.9
10	32 10.0	92	2 51.9	-112	243 43.3	17 22.7	140 7.2	-18 28.8
12	61 6.4	92	2 29.5	-112	273 47.8	17 22.6	170 12.5	-18 28.7
14	90 2.9	92	2 7.0	-113	303 52.2	17 22.4	200 17.8	-18 28.7
16	118 59.4	92	1 44.5	-113	333 56.6	17 22.2	230 23.1	-18 28.6
18	147 55.8	92	1 21.9	-113	4 1.1	17 22.1	260 28.4	-18 28.5
20	176 52.2	92	0 59.2	-114	34 5.5	17 21.9	290 33.7	-18 28.5
22	205 48.6	92	0 36.5	-114	64 9.9	17 21.8	320 39.0	-18 28.4
Δ					22	-1	27	0

φ	SUNCE		TRAJANJE SUMRAKA		MESEC			
	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 28	20 26	1 2	: ::	1 2	3.5	14 13	2.4
55	3 57	19 57	0 47	: ::	1 8	3.3	14 11	2.3
50	4 18	19 36	0 39	2 40	1 12	3.1	14 9	2.3
45	4 34	19 20	0 34	2 7	1 16	2.9	14 8	2.3
40	4 47	19 6	0 30	1 50	1 19	2.8	14 6	2.3
35	4 58	18 55	0 28	1 38	1 21	2.7	14 5	2.3
30	5 8	18 45	0 26	1 30	1 24	2.6	14 4	2.3
20	5 25	18 28	0 24	1 20	1 27	2.5	14 2	2.2
10	5 39	18 13	0 22	1 15	1 31	2.3	14 1	2.2
0	5 53	17 60	0 22	1 13	1 34	2.2	13 59	2.2
10	6 6	17 46	0 22	1 13	1 37	2.1	13 58	2.2
20	6 20	17 32	0 23	1 16	1 41	1.9	13 56	2.2
30	6 36	17 16	0 25	1 23	1 45	1.8	13 54	2.2
35	6 46	17 7	0 27	1 27	1 47	1.7	13 53	2.2
40	6 56	16 56	0 29	1 34	1 50	1.6	13 51	2.1
45	7 8	16 44	0 32	1 42	1 53	1.5	13 50	2.1
50	7 23	16 29	0 35	1 53	1 56	1.3	13 48	2.1
55	7 42	16 10	0 41	2 8	2 1	1.2	13 46	2.1
60	8 8	15 44	0 49	2 29	2 6	1.0	13 43	2.1
S								

SUNCE				MESEC			
UT	$e = T_p - UT$	Δ/24	r	Prolaz	Δ/24	$\pi_\leftmoon$	r
h	min s	s	′	h min	min	′	′
00	3 39.1	.0	15.9	$T_{\overline{m}}$ 7 47	2.2	59.6	16.2
12	3 39.3	$T_{\overline{m}_\odot}$ 11 h 56.3 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	′	°	
♀	15 3	.1	264	-4.2	♄	17 44	.0	223	-1.6
♂	12 31	.1	302	1.6	♇	0 41	.0	119	.3

UT	SUNCE		PROLEĆ. TAČKA	VENERA		MARS	
	$S_\odot$	$\delta_\odot$	S_Υ	S_φ	δ_φ	S_σ	δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	180 54.9	18 29.6	231 25.0	134 3.9	25 57.9	172 17.2	20 44.9
2	210 54.9	18 30.9	261 29.9	164 2.8	25 57.7	202 18.4	20 45.7
4	240 54.9	18 32.1	291 34.9	194 1.7	25 57.5	232 19.7	20 46.5
6	270 54.9	18 33.3	321 39.8	224 .6	25 57.3	262 20.9	20 47.2
8	300 54.9	18 34.5	351 44.7	253 59.5	25 57.0	292 22.2	20 48.0
10	330 54.9	18 35.7	21 49.6	283 58.5	25 56.8	322 23.4	20 48.7
12	0 54.9	18 36.9	51 54.6	313 57.4	25 56.6	352 24.6	20 49.5
14	30 54.9	18 38.1	81 59.5	343 56.3	25 56.4	22 25.9	20 50.3
16	60 54.9	18 39.3	112 4.4	13 55.2	25 56.1	52 27.1	20 51.0
18	90 54.9	18 40.5	142 9.4	43 54.2	25 55.9	82 28.4	20 51.8
20	120 54.9	18 41.7	172 14.3	73 53.1	25 55.7	112 29.6	20 52.5
22	150 54.9	18 42.9	202 19.2	103 52.0	25 55.4	142 30.9	20 53.3
Δ	0	6		-5	-1	6	4

UT	MESEC				JUPITER		SATURN	
	$S_\leftmoon$	Δ	$\delta_\leftmoon$	Δ	$S_{\text{♃}}$	$\delta_{\text{♃}}$	$S_{\text{♄}}$	$\delta_{\text{♄}}$
h	° ′		° ′		° ′	° ′	° ′	° ′
0	234 44.9	92	0 13.7	-24	94 14.3	17 21.6	350 44.3	-18 28.3
2	263 41.2	91	0 9.0	114	124 18.8	17 21.5	20 49.6	-18 28.2
4	292 37.5	91	0 31.8	114	154 23.2	17 21.3	50 54.9	-18 28.2
6	321 33.7	91	0 54.5	114	184 27.6	17 21.2	81 .2	-18 28.1
8	350 29.8	91	1 17.3	114	214 32.0	17 21.0	111 5.5	-18 28.0
10	19 26.0	90	1 40.0	114	244 36.5	17 20.9	141 10.9	-18 28.0
12	48 22.0	90	2 2.7	113	274 40.9	17 20.7	171 16.2	-18 27.9
14	77 18.0	90	2 25.4	113	304 45.3	17 20.6	201 21.5	-18 27.8
16	106 14.0	89	2 48.0	113	334 49.7	17 20.4	231 26.8	-18 27.8
18	135 9.8	89	3 10.6	112	4 54.1	17 20.2	261 32.1	-18 27.7
20	164 5.6	89	3 33.1	112	34 58.6	17 20.1	291 37.4	-18 27.6
22	193 1.4	88	3 55.5	112	65 3.0	17 19.9	321 42.7	-18 27.5
Δ					22	-1	27	0

φ	SUNCE		TRAJANJE SUMRAKA		MESEC			
	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 26	20 29	1 3	: ::	2 26	.8	15 10	3.7
55	3 55	19 59	0 47	: ::	2 26	1.1	15 7	3.4
50	4 16	19 37	0 39	2 42	2 26	1.3	15 5	3.2
45	4 33	19 21	0 34	2 8	2 26	1.4	15 3	3.0
40	4 46	19 7	0 31	1 50	2 26	1.5	15 1	2.9
35	4 58	18 56	0 28	1 39	2 26	1.7	14 59	2.8
30	5 8	18 46	0 26	1 30	2 26	1.7	14 58	2.7
20	5 25	18 28	0 24	1 20	2 27	1.9	14 56	2.5
10	5 39	18 14	0 22	1 15	2 27	2.1	14 54	2.4
0	5 53	17 60	0 22	1 13	2 27	2.2	14 52	2.2
10	6 6	17 46	0 22	1 13	2 27	2.4	14 50	2.1
20	6 21	17 32	0 23	1 16	2 27	2.5	14 48	1.9
30	6 37	17 15	0 25	1 23	2 28	2.7	14 46	1.8
35	6 46	17 6	0 27	1 27	2 28	2.8	14 44	1.7
40	6 57	16 55	0 29	1 34	2 28	2.9	14 43	1.6
45	7 10	16 43	0 32	1 42	2 28	3.0	14 41	1.4
50	7 25	16 27	0 36	1 53	2 29	3.2	14 39	1.3
55	7 44	16 8	0 41	2 8	2 29	3.4	14 36	1.1
60	8 10	15 42	0 49	2 30	2 30	3.7	14 33	.9
S								

SUNCE				MESEC			
UT	$e = T_p - UT$	Δ/24	r	Prolaz	Δ/24	$\pi_\leftmoon$	r
h	min s	s	′	h min	min	′	′
00	3 39.6	.0	15.9	$T_{\overline{m}}$ 8 39	2.3	59.8	16.3
12	3 39.5	$T_{\overline{m}_\odot}$ 11 h 56.3 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	′	°	
♀	15 4	.1	263	-4.2	♄	17 40	.0	223	-1.6
♂	12 30	.1	301	1.6	♇	0 37	.0	119	.3

UT	SUNCE $S_\odot$	SUNCE $\delta_\odot$	PROLEĆ. TAČKA S_Υ	VENERA S_φ	VENERA δ_φ	MARS S_σ	MARS δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	180 54.9	18 44.1	232 24.1	133 50.9	25 55.2	172 32.1	20 54.0
2	210 54.9	18 45.3	262 29.1	163 49.9	25 54.9	202 33.3	20 54.8
4	240 54.9	18 46.5	292 34.0	193 48.8	25 54.7	232 34.6	20 55.5
6	270 54.8	18 47.7	322 38.9	223 47.8	25 54.4	262 35.8	20 56.3
8	300 54.8	18 48.9	352 43.9	253 46.7	25 54.1	292 37.1	20 57.0
10	330 54.8	18 50.1	22 48.8	283 45.6	25 53.9	322 38.3	20 57.8
12	0 54.8	18 51.3	52 53.7	313 44.6	25 53.6	352 39.6	20 58.5
14	30 54.8	18 52.4	82 58.6	343 43.5	25 53.3	22 40.8	20 59.3
16	60 54.8	18 53.6	113 3.6	13 42.5	25 53.0	52 42.0	20 60.0
18	90 54.8	18 54.8	143 8.5	43 41.4	25 52.7	82 43.3	21 .7
20	120 54.7	18 56.0	173 13.4	73 40.4	25 52.4	112 44.5	21 1.5
22	150 54.7	18 57.1	203 18.3	103 39.3	25 52.1	142 45.7	21 2.2
Δ	0	6		−5	−1	6	4

UT	MESEC $S_\leftmoon$	MESEC Δ	MESEC $\delta_\leftmoon$	MESEC Δ	JUPITER $S_{\jupiter}$	JUPITER $\delta_{\jupiter}$	SATURN $S_{\saturn}$	SATURN $\delta_{\saturn}$
h	° ′		° ′		° ′	° ′	° ′	° ′
0	221 57.0	88	4 17.8	111	95 7.4	17 19.8	351 48.0	−18 27.5
2	250 52.6	88	4 40.0	111	125 11.8	17 19.6	21 53.3	−18 27.4
4	279 48.1	87	5 2.1	110	155 16.2	17 19.5	51 58.6	−18 27.3
6	308 43.5	87	5 24.1	109	185 20.6	17 19.3	82 3.9	−18 27.3
8	337 38.9	86	5 46.0	109	215 25.0	17 19.1	112 9.2	−18 27.2
10	6 34.1	86	6 7.7	108	245 29.4	17 19.0	142 14.5	−18 27.1
12	35 29.3	85	6 29.2	107	275 33.9	17 18.8	172 19.9	−18 27.1
14	64 24.4	85	6 50.6	106	305 38.3	17 18.7	202 25.2	−18 27.0
16	93 19.3	84	7 11.9	105	335 42.7	17 18.5	232 30.5	−18 26.9
18	122 14.2	84	7 32.9	104	5 47.1	17 18.4	262 35.8	−18 26.8
20	151 9.0	83	7 53.8	103	35 51.5	17 18.2	292 41.1	−18 26.8
22	180 3.7	83	8 14.5	102	65 55.9	17 18.0	322 46.4	−18 26.7
Δ					22	−1	27	0

φ	SUNCE IZLAZ	SUNCE ZALAZ	TRAJANJE SUMRAKA GRAĐ.	TRAJANJE SUMRAKA ASTR.	MESEC IZLAZ	MESEC Δ/24	MESEC ZALAZ	MESEC Δ/24
N	h min	h min	h min	h min	h min	min	h min	min
60	3 23	20 31	1 4	: : :	2 46	.9	16 38	3.6
55	3 53	20 1	0 48	: : :	2 52	1.1	16 29	3.4
50	4 15	19 39	0 39	2 44	2 56	1.3	16 21	3.2
45	4 32	19 22	0 34	2 9	3 0	1.5	16 16	3.0
40	4 45	19 8	0 31	1 51	3 3	1.6	16 11	2.9
35	4 57	18 56	0 28	1 39	3 6	1.7	16 6	2.8
30	5 7	18 46	0 26	1 31	3 8	1.8	16 3	2.7
20	5 24	18 29	0 24	1 20	3 13	2.0	15 56	2.5
10	5 39	18 14	0 22	1 15	3 16	2.1	15 51	2.4
0	5 53	17 60	0 22	1 13	3 20	2.3	15 46	2.3
10	6 7	17 46	0 22	1 13	3 24	2.4	15 40	2.1
20	6 21	17 31	0 23	1 16	3 28	2.5	15 35	2.0
30	6 38	17 15	0 25	1 23	3 32	2.7	15 28	1.8
35	6 47	17 5	0 27	1 28	3 35	2.8	15 25	1.8
40	6 58	16 54	0 29	1 34	3 38	2.9	15 20	1.7
45	7 11	16 42	0 32	1 42	3 41	3.0	15 16	1.5
50	7 26	16 26	0 36	1 53	3 45	3.2	15 10	1.4
55	7 46	16 6	0 41	2 8	3 50	3.4	15 3	1.2
60	8 12	15 40	0 49	2 30	3 57	3.6	14 54	1.0
S								

SUNCE UT	SUNCE $e = T_p - UT$	SUNCE Δ/24	SUNCE r	MESEC Prolaz	MESEC Δ/24	MESEC $\pi_\leftmoon$	MESEC r
h	min s	s	′	h min	min	′	′
00	3 39.5	.0	15.8	$T_{\overline{m}}$ 9 33	2.2	59.9	16.3
12	3 39.2	$T_{\overline{m}_\odot}$ 11 h 56.3 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	′	°	
♀	15 5	.1	261	−4.2	♃	17 37	.0	223	−1.6
♂	12 29	.1	300	1.6	♄	0 33	.0	119	.3

UT	SUNCE $S_\odot$	SUNCE $\delta_\odot$	PROLEĆ. TAČKA S_Υ	VENERA S_φ	VENERA δ_φ	MARS S_σ	MARS δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	180 54.7	18 58.3	233 23.3	133 38.3	25 51.8	172 47.0	21 2.9
2	210 54.7	18 59.5	263 28.2	163 37.3	25 51.5	202 48.2	21 3.7
4	240 54.7	19 .6	293 33.1	193 36.2	25 51.2	232 49.5	21 4.4
6	270 54.6	19 1.8	323 38.1	223 35.2	25 50.9	262 50.7	21 5.1
8	300 54.6	19 3.0	353 43.0	253 34.2	25 50.6	292 51.9	21 5.9
10	330 54.6	19 4.1	23 47.9	283 33.1	25 50.2	322 53.2	21 6.6
12	0 54.6	19 5.3	53 52.8	313 32.1	25 49.9	352 54.4	21 7.3
14	30 54.5	19 6.4	83 57.8	343 31.1	25 49.6	22 55.7	21 8.1
16	60 54.5	19 7.6	114 2.7	13 30.1	25 49.2	52 56.9	21 8.8
18	90 54.5	19 8.7	144 7.6	43 29.0	25 48.9	82 58.1	21 9.5
20	120 54.5	19 9.9	174 12.6	73 28.0	25 48.6	112 59.4	21 10.2
22	150 54.4	19 11.0	204 17.5	103 27.0	25 48.2	143 .6	21 10.9
Δ	0	6		−5	−2	6	4

UT	MESEC $S_\leftmoon$	MESEC Δ	MESEC $\delta_\leftmoon$	MESEC Δ	JUPITER $S_{\jupiter}$	JUPITER $\delta_{\jupiter}$	SATURN $S_{\saturn}$	SATURN $\delta_{\saturn}$
h	° ′		° ′		° ′	° ′	° ′	° ′
0	208 58.3	82	8 34.9	101	96 .3	17 17.9	352 51.7	−18 26.6
2	237 52.8	82	8 55.1	100	126 4.7	17 17.7	22 57.0	−18 26.6
4	266 47.2	82	9 15.1	99	156 9.1	17 17.5	53 2.3	−18 26.5
6	295 41.5	81	9 34.9	98	186 13.5	17 17.4	83 7.6	−18 26.4
8	324 35.7	81	9 54.4	96	216 17.9	17 17.2	113 12.9	−18 26.3
10	353 29.8	80	10 13.7	95	246 22.3	17 17.1	143 18.3	−18 26.3
12	22 23.8	80	10 32.7	94	276 26.7	17 16.9	173 23.6	−18 26.2
14	51 17.7	79	10 51.4	92	306 31.1	17 16.7	203 28.9	−18 26.1
16	80 11.6	79	11 9.8	91	336 35.5	17 16.6	233 34.2	−18 26.1
18	109 5.3	78	11 28.0	89	6 39.9	17 16.4	263 39.5	−18 26.0
20	137 58.9	78	11 45.8	88	36 44.3	17 16.2	293 44.8	−18 25.9
22	166 52.5	77	12 3.3	86	66 48.6	17 16.1	323 50.1	−18 25.9
Δ					22	−1	27	0

φ	SUNCE IZLAZ	SUNCE ZALAZ	TRAJANJE SUMRAKA GRAĐ.	TRAJANJE SUMRAKA ASTR.	MESEC IZLAZ	MESEC Δ/24	MESEC ZALAZ	MESEC Δ/24
N	h min	h min	h min	h min	h min	min	h min	min
60	3 21	20 33	1 5	: : :	3 8	1.1	18 5	3.5
55	3 51	20 3	0 48	: : :	3 20	1.3	17 49	3.2
50	4 13	19 40	0 40	2 46	3 28	1.5	17 37	3.1
45	4 30	19 23	0 34	2 10	3 36	1.6	17 28	2.9
40	4 44	19 9	0 31	1 51	3 42	1.7	17 20	2.8
35	4 56	18 57	0 28	1 39	3 47	1.8	17 13	2.7
30	5 6	18 47	0 26	1 31	3 52	1.9	17 8	2.7
20	5 24	18 29	0 24	1 21	3 60	2.0	16 57	2.5
10	5 39	18 14	0 22	1 15	4 7	2.2	16 48	2.4
0	5 53	17 60	0 22	1 13	4 14	2.3	16 40	2.3
10	6 7	17 46	0 22	1 13	4 21	2.4	16 32	2.2
20	6 21	17 31	0 23	1 16	4 28	2.5	16 23	2.1
30	6 38	17 14	0 25	1 23	4 37	2.7	16 13	2.0
35	6 48	17 5	0 27	1 28	4 42	2.8	16 7	1.9
40	6 59	16 53	0 29	1 34	4 47	2.9	16 0	1.8
45	7 12	16 40	0 32	1 42	4 54	3.0	15 53	1.7
50	7 28	16 25	0 36	1 54	5 2	3.1	15 43	1.6
55	7 48	16 5	0 41	2 9	5 12	3.3	15 32	1.4
60	8 15	15 37	0 50	2 31	5 25	3.6	15 17	1.2
S								

SUNCE UT	SUNCE $e = T_p - UT$	SUNCE Δ/24	SUNCE r	MESEC Prolaz	MESEC Δ/24	MESEC $\pi_\leftmoon$	MESEC r
h	min s	s	′	h min	min	′	′
00	3 38.8	−.1	15.8	$T_{\overline{m}}$ 10 27	2.3	59.8	16.3
12	3 38.2	$T_{\overline{m}_\odot}$ 11 h 56.4 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	′	°	
♀	15 6	.1	260	−4.3	♃	17 33	.0	223	−1.6
♂	12 28	.1	299	1.6	♄	0 28	.0	119	.3

UT	SUNCE		PROLEĆ. TAČKA	VENERA		MARS	
	$S_\odot$	$\delta_\odot$	S_Υ	S_φ	δ_φ	S_σ	δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	180 54.4	19 12.2	234 22.4	133 26.0	25 47.9	173 1.8	21 11.7
2	210 54.4	19 13.3	264 27.3	163 25.0	25 47.5	203 3.1	21 12.4
4	240 54.3	19 14.4	294 32.3	193 24.0	25 47.1	233 4.3	21 13.1
6	270 54.3	19 15.6	324 37.2	223 23.0	25 46.8	263 5.5	21 13.8
8	300 54.3	19 16.7	354 42.1	253 22.0	25 46.4	293 6.8	21 14.5
10	330 54.2	19 17.8	24 47.1	283 21.0	25 46.0	323 8.0	21 15.2
12	0 54.2	19 19.0	54 52.0	313 20.0	25 45.6	353 9.2	21 15.9
14	30 54.1	19 20.1	84 56.9	343 19.0	25 45.3	23 10.5	21 16.7
16	60 54.1	19 21.2	115 1.8	13 18.0	25 44.9	53 11.7	21 17.4
18	90 54.1	19 22.3	145 6.8	43 17.0	25 44.5	83 12.9	21 18.1
20	120 54.0	19 23.5	175 11.7	73 16.0	25 44.1	113 14.2	21 18.8
22	150 54.0	19 24.6	205 16.6	103 15.0	25 43.7	143 15.4	21 19.5
Δ	0	6		−5	−2	6	4

UT	MESEC				JUPITER		SATURN	
	$S_\leftmoon$	Δ	$\delta_\leftmoon$	Δ	S_{4}	δ_{4}	S_η	δ_η
h	° ′		° ′		° ′	° ′	° ′	° ′
0	195 45.9	77	12 20.6	84	96 53.0	17 15.9	353 55.4	−18 25.8
2	224 39.3	76	12 37.4	83	126 57.4	17 15.8	24 .7	−18 25.7
4	253 32.6	76	12 54.0	81	157 1.8	17 15.6	54 6.0	−18 25.6
6	282 25.8	76	13 10.2	79	187 6.2	17 15.4	84 11.4	−18 25.6
8	311 19.0	75	13 26.1	78	217 10.6	17 15.3	114 16.7	−18 25.5
10	340 12.1	75	13 41.6	76	247 15.0	17 15.1	144 22.0	−18 25.4
12	9 5.1	75	13 56.7	74	277 19.4	17 14.9	174 27.3	−18 25.4
14	37 58.0	74	14 11.5	72	307 23.7	17 14.8	204 32.6	−18 25.3
16	66 50.9	74	14 25.9	70	337 28.1	17 14.6	234 37.9	−18 25.2
18	95 43.7	74	14 39.9	68	7 32.5	17 14.4	264 43.2	−18 25.1
20	124 36.5	74	14 53.5	66	37 36.9	17 14.3	294 48.5	−18 25.1
22	153 29.2	73	15 6.7	64	67 41.3	17 14.1	324 53.8	−18 25.0
Δ					22	−1	27	0

φ	SUNCE		TRAJANJE SUMRAKA		MESEC			
	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 19	20 36	1 6	: ::	3 33	1.3	19 28	3.2
55	3 50	20 4	0 49	: ::	3 51	1.5	19 7	3.0
50	4 12	19 42	0 40	2 48	4 4	1.7	18 51	2.9
45	4 29	19 24	0 35	2 11	4 14	1.8	18 39	2.8
40	4 43	19 10	0 31	1 52	4 23	1.9	18 28	2.7
35	4 55	18 58	0 28	1 40	4 31	1.9	18 19	2.6
30	5 6	18 47	0 26	1 31	4 37	2.0	18 12	2.6
20	5 23	18 30	0 24	1 21	4 49	2.1	17 58	2.5
10	5 39	18 14	0 22	1 15	4 59	2.2	17 46	2.4
0	5 53	17 60	0 22	1 13	5 9	2.3	17 36	2.3
10	6 7	17 46	0 22	1 13	5 19	2.4	17 25	2.3
20	6 22	17 31	0 23	1 17	5 29	2.5	17 13	2.2
30	6 39	17 14	0 25	1 23	5 41	2.6	16 60	2.1
35	6 49	17 4	0 27	1 28	5 48	2.7	16 52	2.0
40	6 60	16 53	0 29	1 34	5 56	2.8	16 43	1.9
45	7 13	16 39	0 32	1 43	6 6	2.9	16 33	1.9
50	7 29	16 23	0 36	1 54	6 17	3.0	16 21	1.8
55	7 49	16 3	0 41	2 9	6 31	3.1	16 5	1.6
60	8 17	15 35	0 50	2 32	6 50	3.4	15 45	1.4
S								

SUNCE				MESEC			
UT	e = T_p − UT	Δ/24	r	Prolaz		Δ/24	$\pi_\leftmoon$	r
h	min s	s	′		h min	min	′	′
00	3 37.6	−.1	15.8	$T_{\overline{m}}$	11 22	2.3	59.5	16.2
12	3 36.7	$T_{\overline{m}_\odot}$	11 h 56.4 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	′	°	
♀	15 7	.1	259	−4.3	♃	17 30	.0	223	−1.6
♂	12 27	.1	299	1.6	♄	0 24	.0	120	.3

UT	SUNCE		PROLEĆ. TAČKA	VENERA		MARS	
	$S_\odot$	$\delta_\odot$	S_Υ	S_φ	δ_φ	S_σ	δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	180 53.9	19 25.7	235 21.6	133 14.0	25 43.3	173 16.6	21 20.2
2	210 53.9	19 26.8	265 26.5	163 13.1	25 42.9	203 17.9	21 20.9
4	240 53.8	19 27.9	295 31.4	193 12.1	25 42.4	233 19.1	21 21.6
6	270 53.8	19 29.0	325 36.3	223 11.1	25 42.0	263 20.3	21 22.3
8	300 53.8	19 30.1	355 41.3	253 10.1	25 41.6	293 21.6	21 23.0
10	330 53.7	19 31.2	25 46.2	283 9.2	25 41.2	323 22.8	21 23.7
12	0 53.7	19 32.3	55 51.1	313 8.2	25 40.7	353 24.0	21 24.4
14	30 53.6	19 33.4	85 56.1	343 7.2	25 40.3	23 25.3	21 25.0
16	60 53.6	19 34.5	116 1.0	13 6.3	25 39.9	53 26.5	21 25.7
18	90 53.5	19 35.6	146 5.9	43 5.3	25 39.4	83 27.7	21 26.4
20	120 53.4	19 36.7	176 10.8	73 4.4	25 39.0	113 29.0	21 27.1
22	150 53.4	19 37.8	206 15.8	103 3.4	25 38.5	143 30.2	21 27.8
Δ	0	6		−5	−2	6	3

UT	MESEC				JUPITER		SATURN	
	$S_\leftmoon$	Δ	$\delta_\leftmoon$	Δ	S_{4}	δ_{4}	S_η	δ_η
h	° ′		° ′		° ′	° ′	° ′	° ′
0	182 21.9	73	15 19.5	62	97 45.7	17 13.9	354 59.2	−18 24.9
2	211 14.6	73	15 32.0	60	127 50.0	17 13.8	25 4.5	−18 24.9
4	240 7.2	73	15 44.0	58	157 54.4	17 13.6	55 9.8	−18 24.8
6	268 59.9	73	15 55.6	56	187 58.8	17 13.4	85 15.1	−18 24.7
8	297 52.5	73	16 6.8	54	218 3.2	17 13.3	115 20.4	−18 24.7
10	326 45.1	73	16 17.5	52	248 7.5	17 13.1	145 25.7	−18 24.6
12	355 37.6	73	16 27.8	49	278 11.9	17 12.9	175 31.0	−18 24.5
14	24 30.2	73	16 37.7	47	308 16.3	17 12.7	205 36.3	−18 24.4
16	53 22.8	73	16 47.2	45	338 20.7	17 12.6	235 41.6	−18 24.4
18	82 15.5	73	16 56.2	43	8 25.0	17 12.4	265 47.0	−18 24.3
20	111 8.1	73	17 4.8	41	38 29.4	17 12.2	295 52.3	−18 24.2
22	140 .8	74	17 13.0	39	68 33.8	17 12.1	325 57.6	−18 24.2
Δ					22	−1	27	0

φ	SUNCE		TRAJANJE SUMRAKA		MESEC			
	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 16	20 38	1 7	: ::	4 4	1.6	20 45	2.8
55	3 48	20 6	0 49	: ::	4 27	1.8	20 19	2.7
50	4 11	19 43	0 40	2 51	4 43	1.9	20 0	2.6
45	4 28	19 25	0 35	2 12	4 57	2.0	19 45	2.6
40	4 43	19 11	0 31	1 52	5 8	2.0	19 33	2.5
35	4 55	18 59	0 28	1 40	5 17	2.1	19 23	2.5
30	5 5	18 48	0 26	1 31	5 26	2.1	19 14	2.5
20	5 23	18 30	0 24	1 21	5 40	2.2	18 58	2.4
10	5 39	18 14	0 22	1 15	5 53	2.3	18 44	2.4
0	5 53	17 60	0 22	1 13	6 5	2.3	18 32	2.3
10	6 7	17 46	0 22	1 14	6 17	2.4	18 19	2.3
20	6 22	17 30	0 23	1 17	6 30	2.5	18 5	2.2
30	6 39	17 13	0 26	1 23	6 45	2.5	17 49	2.2
35	6 49	17 3	0 27	1 28	6 53	2.6	17 40	2.1
40	7 1	16 52	0 29	1 34	7 3	2.6	17 30	2.1
45	7 14	16 38	0 32	1 43	7 15	2.7	17 18	2.1
50	7 30	16 22	0 36	1 54	7 29	2.8	17 3	2.0
55	7 51	16 1	0 42	2 10	7 47	2.8	16 44	1.9
60	8 19	15 33	0 50	2 32	8 11	3.0	16 19	1.8
S								

SUNCE				MESEC			
UT	e = T_p − UT	Δ/24	r	Prolaz		Δ/24	$\pi_\leftmoon$	r
h	min s	s	′		h min	min	′	′
00	3 35.7	−.1	15.8	$T_{\overline{m}}$	12 18	2.3	59.1	16.1
12	3 34.5	$T_{\overline{m}_\odot}$	11 h 56.4 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	′	°	
♀	15 8	.1	258	−4.3	♃	17 26	.0	222	−1.6
♂	12 26	.1	298	1.6	♄	0 20	.0	120	.3

UT	SUNCE		PROLEĆ. TAČKA	VENERA		MARS	
	$S_\odot$	$\delta_\odot$	S_Υ	S_φ	δ_φ	S_σ	δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	180 53.3	19 38.9	236 20.7	133 2.5	25 38.1	173 31.4	21 28.5
2	210 53.3	19 40.0	266 25.6	163 1.5	25 37.6	203 32.6	21 29.2
4	240 53.2	19 41.1	296 30.6	193 .6	25 37.1	233 33.9	21 29.9
6	270 53.2	19 42.1	326 35.5	222 59.6	25 36.7	263 35.1	21 30.5
8	300 53.1	19 43.2	356 40.4	252 58.7	25 36.2	293 36.3	21 31.2
10	330 53.0	19 44.3	26 45.3	282 57.7	25 35.7	323 37.6	21 31.9
12	0 53.0	19 45.4	56 50.3	312 56.8	25 35.2	353 38.8	21 32.6
14	30 52.9	19 46.4	86 55.2	342 55.9	25 34.8	23 40.0	21 33.2
16	60 52.9	19 47.5	117 .1	12 54.9	25 34.3	53 41.2	21 33.9
18	90 52.8	19 48.6	147 5.0	42 54.0	25 33.8	83 42.5	21 34.6
20	120 52.7	19 49.6	177 10.0	72 53.1	25 33.3	113 43.7	21 35.3
22	150 52.7	19 50.7	207 14.9	102 52.2	25 32.8	143 44.9	21 35.9
Δ	0	5		−5	−2	6	3

UT	MESEC				JUPITER		SATURN	
	$S_\leftmoon$	Δ	$\delta_\leftmoon$	Δ	$S_{\text{♃}}$	$\delta_{\text{♃}}$	$S_{\text{♄}}$	$\delta_{\text{♄}}$
h	° ′		° ′		° ′	° ′	° ′	° ′
0	168 53.5	74	17 20.7	36	98 38.1	17 11.9	356 2.9	−18 24.1
2	197 46.3	74	17 27.9	34	128 42.5	17 11.7	26 8.2	−18 24.0
4	226 39.1	74	17 34.7	32	158 46.9	17 11.5	56 13.5	−18 24.0
6	255 32.0	75	17 41.1	30	188 51.2	17 11.4	86 18.8	−18 23.9
8	284 24.9	75	17 47.0	27	218 55.6	17 11.2	116 24.1	−18 23.8
10	313 18.0	76	17 52.5	25	248 60.0	17 11.0	146 29.5	−18 23.7
12	342 11.1	76	17 57.5	23	279 4.3	17 10.9	176 34.8	−18 23.7
14	11 4.3	77	18 2.1	21	309 8.7	17 10.7	206 40.1	−18 23.6
16	39 57.6	77	18 6.2	18	339 13.0	17 10.5	236 45.4	−18 23.5
18	68 51.0	78	18 9.9	16	9 17.4	17 10.3	266 50.7	−18 23.5
20	97 44.5	78	18 13.1	14	39 21.8	17 10.2	296 56.0	−18 23.4
22	126 38.2	79	18 15.9	12	69 26.1	17 10.0	327 1.3	−18 23.3
Δ					22	−1	27	0

φ	SUNCE		TRAJANJE SUMRAKA		MESEC			
	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 14	20 40	1 8	: ::	4 43	2.0	21 51	2.3
55	3 46	20 8	0 49	: ::	5 9	2.1	21 23	2.3
50	4 9	19 44	0 40	2 53	5 29	2.1	21 3	2.3
45	4 27	19 26	0 35	2 13	5 44	2.2	20 47	2.3
40	4 42	19 12	0 31	1 53	5 56	2.2	20 34	2.3
35	4 54	18 59	0 28	1 40	6 7	2.2	20 22	2.3
30	5 5	18 49	0 26	1 32	6 17	2.2	20 13	2.3
20	5 23	18 30	0 24	1 21	6 33	2.3	19 56	2.3
10	5 38	18 15	0 22	1 15	6 47	2.3	19 41	2.3
0	5 53	18 0	0 22	1 13	7 1	2.3	19 27	2.3
10	6 7	17 46	0 22	1 14	7 14	2.3	19 13	2.3
20	6 23	17 30	0 23	1 17	7 29	2.3	18 59	2.3
30	6 40	17 13	0 26	1 23	7 45	2.4	18 42	2.3
35	6 50	17 3	0 27	1 28	7 55	2.4	18 32	2.3
40	7 2	16 51	0 29	1 35	8 6	2.4	18 21	2.3
45	7 15	16 37	0 32	1 43	8 19	2.4	18 7	2.2
50	7 32	16 21	0 36	1 54	8 35	2.4	17 51	2.2
55	7 53	15 60	0 42	2 10	8 55	2.5	17 31	2.2
60	8 21	15 31	0 51	2 33	9 22	2.5	17 3	2.2
S								

SUNCE				MESEC				
UT	e = T_p − UT	Δ/24	r	Prolaz		Δ/24	$\pi_\leftmoon$	r
h	min s	s	′		h min	min	′	′
00	3 33.4	−.1	15.8	$T_{\overline{m}}$	13 14	2.3	58.4	15.9
12	3 31.9	$T_{\overline{m}_\odot}$	11 h 56.5 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	′	°	
♀	15 8	.1	257	−4.3	♃	17 23	.0	222	−1.6
♂	12 25	.1	297	1.6	♄	0 16	.0	120	.2

UT	SUNCE		PROLEĆ. TAČKA	VENERA		MARS	
	$S_\odot$	$\delta_\odot$	S_Υ	S_φ	δ_φ	S_σ	δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	180 52.6	19 51.8	237 19.8	132 51.3	25 32.3	173 46.1	21 36.6
2	210 52.5	19 52.8	267 24.8	162 50.3	25 31.8	203 47.4	21 37.3
4	240 52.5	19 53.9	297 29.7	192 49.4	25 31.2	233 48.6	21 37.9
6	270 52.4	19 54.9	327 34.6	222 48.5	25 30.7	263 49.8	21 38.6
8	300 52.3	19 56.0	357 39.5	252 47.6	25 30.2	293 51.1	21 39.3
10	330 52.3	19 57.0	27 44.5	282 46.7	25 29.7	323 52.3	21 39.9
12	0 52.2	19 58.1	57 49.4	312 45.8	25 29.1	353 53.5	21 40.6
14	30 52.1	19 59.1	87 54.3	342 44.9	25 28.6	23 54.7	21 41.2
16	60 52.0	20 .2	117 59.3	12 44.0	25 28.1	53 56.0	21 41.9
18	90 52.0	20 1.2	148 4.2	42 43.1	25 27.5	83 57.2	21 42.5
20	120 51.9	20 2.2	178 9.1	72 42.2	25 27.0	113 58.4	21 43.2
22	150 51.8	20 3.3	208 14.0	102 41.4	25 26.4	143 59.6	21 43.8
Δ	0	5		−4	−3	6	3

UT	MESEC				JUPITER		SATURN	
	$S_\leftmoon$	Δ	$\delta_\leftmoon$	Δ	$S_{\text{♃}}$	$\delta_{\text{♃}}$	$S_{\text{♄}}$	$\delta_{\text{♄}}$
h	° ′		° ′		° ′	° ′	° ′	° ′
0	155 31.9	80	18 18.2	9	99 30.5	17 9.8	357 6.6	−18 23.2
2	184 25.8	80	18 20.1	7	129 34.8	17 9.6	27 12.0	−18 23.2
4	213 19.9	81	18 21.6	5	159 39.2	17 9.5	57 17.3	−18 23.1
6	242 14.1	82	18 22.6	3	189 43.5	17 9.3	87 22.6	−18 23.0
8	271 8.4	83	18 23.2	1	219 47.9	17 9.1	117 27.9	−18 23.0
10	300 2.9	83	18 23.3	−1	249 52.2	17 8.9	147 33.2	−18 22.9
12	328 57.6	84	18 23.1	−4	279 56.6	17 8.7	177 38.5	−18 22.8
14	357 52.4	85	18 22.4	−6	310 .9	17 8.6	207 43.8	−18 22.8
16	26 47.5	86	18 21.2	−8	340 5.3	17 8.4	237 49.2	−18 22.7
18	55 42.7	87	18 19.7	−10	10 9.6	17 8.2	267 54.5	−18 22.6
20	84 38.1	88	18 17.7	−12	40 14.0	17 8.0	297 59.8	−18 22.5
22	113 33.7	89	18 15.3	−14	70 18.3	17 7.9	328 5.1	−18 22.5
Δ					22	−1	27	0

φ	SUNCE		TRAJANJE SUMRAKA		MESEC			
	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 12	20 43	1 9	: ::	5 31	2.4	22 45	1.8
55	3 45	20 9	0 50	: ::	5 59	2.3	22 18	1.9
50	4 8	19 46	0 41	2 56	6 19	2.3	21 57	1.9
45	4 26	19 27	0 35	2 14	6 36	2.3	21 41	2.0
40	4 41	19 13	0 31	1 53	6 49	2.3	21 28	2.0
35	4 53	19 0	0 28	1 41	7 0	2.3	21 17	2.0
30	5 4	18 49	0 26	1 32	7 10	2.3	21 7	2.1
20	5 22	18 31	0 24	1 21	7 27	2.3	20 50	2.1
10	5 38	18 15	0 22	1 16	7 42	2.2	20 36	2.1
0	5 53	18 0	0 22	1 13	7 56	2.2	20 22	2.2
10	6 8	17 45	0 22	1 14	8 10	2.2	20 8	2.2
20	6 23	17 30	0 23	1 17	8 25	2.2	19 53	2.3
30	6 41	17 12	0 26	1 23	8 42	2.2	19 36	2.3
35	6 51	17 2	0 27	1 28	8 52	2.2	19 26	2.3
40	7 2	16 50	0 29	1 35	9 3	2.1	19 15	2.3
45	7 16	16 36	0 32	1 43	9 17	2.1	19 1	2.4
50	7 33	16 20	0 36	1 55	9 33	2.1	18 45	2.4
55	7 54	15 58	0 42	2 10	9 54	2.0	18 24	2.5
60	8 23	15 29	0 51	2 33	10 23	2.0	17 56	2.5
S								

SUNCE				MESEC				
UT	e = T_p − UT	Δ/24	r	Prolaz		Δ/24	$\pi_\leftmoon$	r
h	min s	s	′		h min	min	′	′
00	3 30.4	−.1	15.8	$T_{\overline{m}}$	14 9	2.2	57.7	15.7
12	3 28.7	$T_{\overline{m}_\odot}$	11 h 56.5 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	′	°	
♀	15 9	.1	256	−4.3	♃	17 19	.0	222	−1.6
♂	12 24	.1	296	1.6	♄	0 12	.0	120	.2

UT	SUNCE		PROLEĆ. TAČKA	VENERA		MARS	
	$S_\odot$	$\delta_\odot$	S_Υ	S_φ	δ_φ	S_σ	δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	180 51.7	20 4.3	238 19.0	132 40.5	25 25.9	174 .9	21 44.5
2	210 51.7	20 5.3	268 23.9	162 39.6	25 25.3	204 2.1	21 45.1
4	240 51.6	20 6.3	298 28.8	192 38.7	25 24.7	234 3.3	21 45.8
6	270 51.5	20 7.4	328 33.8	222 37.8	25 24.2	264 4.5	21 46.4
8	300 51.4	20 8.4	358 38.7	252 37.0	25 23.6	294 5.8	21 47.1
10	330 51.3	20 9.4	28 43.6	282 36.1	25 23.0	324 7.0	21 47.7
12	0 51.3	20 10.4	58 48.5	312 35.2	25 22.5	354 8.2	21 48.4
14	30 51.2	20 11.4	88 53.5	342 34.4	25 21.9	24 9.4	21 49.0
16	60 51.1	20 12.5	118 58.4	12 33.5	25 21.3	54 10.6	21 49.7
18	90 51.0	20 13.5	149 3.3	42 32.7	25 20.7	84 11.9	21 50.3
20	120 50.9	20 14.5	179 8.3	72 31.8	25 20.1	114 13.1	21 50.9
22	150 50.8	20 15.5	209 13.2	102 31.0	25 19.5	144 14.3	21 51.6
Δ	0	5		−4	−3	6	3

UT	MESEC				JUPITER		SATURN	
	$S_\leftmoon$	Δ	$\delta_\leftmoon$	Δ	S_{4}	δ_{4}	S_η	δ_η
h	° ′		° ′		° ′	° ′	° ′	° ′
0	142 29.5	90	18 12.6	−16	100 22.7	17 7.7	358 10.4	−18 22.4
2	171 25.5	91	18 9.4	−18	130 27.0	17 7.5	28 15.7	−18 22.3
4	200 21.7	92	18 5.8	−20	160 31.4	17 7.3	58 21.0	−18 22.3
6	229 18.1	93	18 1.8	−22	190 35.7	17 7.1	88 26.3	−18 22.2
8	258 14.7	94	17 57.5	−24	220 40.1	17 7.0	118 31.7	−18 22.1
10	287 11.6	95	17 52.7	−26	250 44.4	17 6.8	148 37.0	−18 22.1
12	316 8.7	97	17 47.6	−28	280 48.7	17 6.6	178 42.3	−18 22.0
14	345 6.0	98	17 42.1	−29	310 53.1	17 6.4	208 47.6	−18 21.9
16	14 3.5	99	17 36.2	−31	340 57.4	17 6.2	238 52.9	−18 21.8
18	43 1.3	100	17 30.0	−33	11 1.7	17 6.1	268 58.2	−18 21.8
20	71 59.3	101	17 23.4	−35	41 6.1	17 5.9	299 3.5	−18 21.7
22	100 57.6	102	17 16.4	−36	71 10.4	17 5.7	329 8.9	−18 21.6
Δ					22	−1	27	0

φ	SUNCE		TRAJANJE SUMRAKA		MESEC			
	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 10	20 45	1 10	: ::	6 28	2.7	23 27	1.4
55	3 43	20 11	0 50	: ::	6 55	2.6	23 2	1.5
50	4 7	19 47	0 41	2 59	7 15	2.5	22 44	1.6
45	4 25	19 29	0 35	2 14	7 31	2.4	22 29	1.7
40	4 40	19 14	0 31	1 54	7 44	2.4	22 16	1.8
35	4 53	19 1	0 29	1 41	7 55	2.3	22 6	1.8
30	5 4	18 50	0 27	1 32	8 5	2.3	21 57	1.9
20	5 22	18 31	0 24	1 21	8 21	2.2	21 41	1.9
10	5 38	18 15	0 23	1 16	8 36	2.2	21 27	2.0
0	5 53	18 0	0 22	1 13	8 49	2.1	21 14	2.1
10	6 8	17 45	0 22	1 14	9 3	2.1	21 1	2.1
20	6 23	17 30	0 23	1 17	9 17	2.0	20 47	2.2
30	6 41	17 12	0 26	1 23	9 34	2.0	20 31	2.3
35	6 52	17 1	0 27	1 28	9 44	1.9	20 22	2.3
40	7 3	16 49	0 29	1 35	9 55	1.9	20 11	2.4
45	7 17	16 36	0 32	1 43	10 8	1.8	19 58	2.4
50	7 34	16 19	0 36	1 55	10 23	1.8	19 43	2.5
55	7 56	15 57	0 42	2 11	10 43	1.7	19 23	2.6
60	8 25	15 27	0 51	2 34	11 10	1.5	18 57	2.8
S								

SUNCE				MESEC			
UT	e = T_p − UT	Δ/24	r	Prolaz		Δ/24	$\pi_\leftmoon$	r
h	min s	s	′		h min	min	′	′
00	3 27.0	−.2	15.8	$T_{\overline{m}}$	15 2	2.1	56.9	15.5
12	3 25.0	$T_{\overline{m}_\odot}$	11 h 56.6 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	′	°	
♀	15 10	.1	254	−4.4	♃	17 16	.0	222	−1.6
♂	12 23	.1	296	1.6	♄	0 7	.0	120	.2

UT	SUNCE		PROLEĆ. TAČKA	VENERA		MARS	
	$S_\odot$	$\delta_\odot$	S_Υ	S_φ	δ_φ	S_σ	δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	180 50.7	20 16.5	239 18.1	132 30.1	25 18.9	174 15.5	21 52.2
2	210 50.7	20 17.5	269 23.0	162 29.3	25 18.3	204 16.8	21 52.8
4	240 50.6	20 18.5	299 28.0	192 28.4	25 17.7	234 18.0	21 53.5
6	270 50.5	20 19.5	329 32.9	222 27.6	25 17.0	264 19.2	21 54.1
8	300 50.4	20 20.5	359 37.8	252 26.8	25 16.4	294 20.4	21 54.7
10	330 50.3	20 21.5	29 42.8	282 25.9	25 15.8	324 21.6	21 55.3
12	0 50.2	20 22.4	59 47.7	312 25.1	25 15.2	354 22.9	21 56.0
14	30 50.1	20 23.4	89 52.6	342 24.3	25 14.5	24 24.1	21 56.6
16	60 50.0	20 24.4	119 57.5	12 23.5	25 13.9	54 25.3	21 57.2
18	90 49.9	20 25.4	150 2.5	42 22.7	25 13.3	84 26.5	21 57.8
20	120 49.8	20 26.4	180 7.4	72 21.8	25 12.6	114 27.8	21 58.5
22	150 49.7	20 27.3	210 12.3	102 21.0	25 12.0	144 29.0	21 59.1
Δ	0	5		−4	−3	6	3

UT	MESEC				JUPITER		SATURN	
	$S_\leftmoon$	Δ	$\delta_\leftmoon$	Δ	S_{4}	δ_{4}	S_η	δ_η
h	° ′		° ′		° ′	° ′	° ′	° ′
0	129 56.0	104	17 9.1	−38	101 14.8	17 5.5	359 14.2	−18 21.6
2	158 54.8	105	17 1.5	−40	131 19.1	17 5.3	29 19.5	−18 21.5
4	187 53.7	106	16 53.5	−42	161 23.4	17 5.1	59 24.8	−18 21.4
6	216 52.9	107	16 45.2	−43	191 27.8	17 5.0	89 30.1	−18 21.3
8	245 52.4	109	16 36.6	−45	221 32.1	17 4.8	119 35.4	−18 21.3
10	274 52.1	110	16 27.6	−46	251 36.4	17 4.6	149 40.7	−18 21.2
12	303 52.0	111	16 18.3	−48	281 40.7	17 4.4	179 46.1	−18 21.1
14	332 52.2	112	16 8.8	−49	311 45.1	17 4.2	209 51.4	−18 21.1
16	1 52.7	113	15 58.9	−51	341 49.4	17 4.0	239 56.7	−18 21.0
18	30 53.3	115	15 48.7	−52	11 53.7	17 3.9	270 2.0	−18 20.9
20	59 54.3	116	15 38.2	−54	41 58.0	17 3.7	300 7.3	−18 20.9
22	88 55.4	117	15 27.5	−55	72 2.4	17 3.5	330 12.6	−18 20.8
Δ					22	−1	27	0

φ	SUNCE		TRAJANJE SUMRAKA		MESEC			
	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 8	20 47	1 11	: ::	7 32	2.8	23 60	1.1
55	3 42	20 13	0 51	: ::	7 56	2.7	23 39	1.2
50	4 6	19 48	0 41	3 2	8 15	2.5	23 22	1.4
45	4 24	19 30	0 35	2 15	8 29	2.5	23 10	1.5
40	4 39	19 14	0 31	1 54	8 41	2.4	22 59	1.6
35	4 52	19 2	0 29	1 41	8 51	2.3	22 50	1.6
30	5 3	18 51	0 27	1 32	8 60	2.3	22 42	1.7
20	5 22	18 32	0 24	1 21	9 15	2.2	22 28	1.8
10	5 38	18 15	0 23	1 16	9 28	2.1	22 15	1.9
0	5 53	18 0	0 22	1 13	9 40	2.0	22 4	2.0
10	6 8	17 45	0 22	1 14	9 53	1.9	21 52	2.1
20	6 24	17 29	0 23	1 17	10 6	1.9	21 40	2.1
30	6 42	17 11	0 26	1 24	10 21	1.8	21 26	2.3
35	6 52	17 1	0 27	1 29	10 30	1.7	21 17	2.3
40	7 4	16 49	0 30	1 35	10 40	1.7	21 8	2.4
45	7 18	16 35	0 32	1 44	10 51	1.6	20 57	2.5
50	7 35	16 18	0 36	1 55	11 6	1.5	20 43	2.6
55	7 57	15 56	0 42	2 11	11 23	1.4	20 26	2.7
60	8 27	15 25	0 52	2 35	11 47	1.2	20 3	2.9
S								

SUNCE				MESEC			
UT	e = T_p − UT	Δ/24	r	Prolaz		Δ/24	$\pi_\leftmoon$	r
h	min s	s	′		h min	min	′	′
00	3 23.0	−.2	15.8	$T_{\overline{m}}$	15 52	2.0	56.2	15.3
12	3 20.7	$T_{\overline{m}_\odot}$	11 h 56.7 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	′	°	
♀	15 10	.1	253	−4.4	♃	17 13	.0	222	−1.6
♂	12 22	.1	295	1.6	♄	0 3	.0	120	.2

UT	SUNCE $S_\odot$	SUNCE $\delta_\odot$	PROLEĆ. TAČKA S_Υ	VENERA S_φ	VENERA δ_φ	MARS S_σ	MARS δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	180 49.6	20 28.3	240 17.2	132 20.2	25 11.3	174 30.2	21 59.7
2	210 49.5	20 29.3	270 22.2	162 19.4	25 10.7	204 31.4	22 .3
4	240 49.4	20 30.3	300 27.1	192 18.6	25 10.0	234 32.6	22 .9
6	270 49.3	20 31.2	330 32.0	222 17.8	25 9.3	264 33.9	22 1.5
8	300 49.2	20 32.2	0 37.0	252 17.0	25 8.7	294 35.1	22 2.1
10	330 49.1	20 33.1	30 41.9	282 16.2	25 8.0	324 36.3	22 2.8
12	0 49.0	20 34.1	60 46.8	312 15.5	25 7.3	354 37.5	22 3.4
14	30 48.9	20 35.1	90 51.7	342 14.7	25 6.6	24 38.7	22 4.0
16	60 48.8	20 36.0	120 56.7	12 13.9	25 6.0	54 39.9	22 4.6
18	90 48.7	20 37.0	151 1.6	42 13.1	25 5.3	84 41.2	22 5.2
20	120 48.6	20 37.9	181 6.5	72 12.3	25 4.6	114 42.4	22 5.8
22	150 48.5	20 38.9	211 11.5	102 11.6	25 3.9	144 43.6	22 6.4
Δ	-1	5		-4	-3	6	3

UT	MESEC $S_\leftmoon$	MESEC Δ	MESEC $\delta_\leftmoon$	MESEC Δ	JUPITER S_{4}	JUPITER δ_{4}	SATURN S_{5}	SATURN δ_{5}
h	° ′		° ′		° ′	° ′	° ′	° ′
0	117 56.8	118	15 16.4	-57	102 6.7	17 3.3	0 17.9	-18 20.7
2	146 58.5	119	15 5.1	-58	132 11.0	17 3.1	30 23.3	-18 20.6
4	176 .4	121	14 53.6	-59	162 15.3	17 2.9	60 28.6	-18 20.6
6	205 2.5	122	14 41.7	-60	192 19.7	17 2.7	90 33.9	-18 20.5
8	234 4.8	123	14 29.6	-62	222 24.0	17 2.6	120 39.2	-18 20.4
10	263 7.4	124	14 17.3	-63	252 28.3	17 2.4	150 44.5	-18 20.4
12	292 10.2	125	14 4.7	-64	282 32.6	17 2.2	180 49.8	-18 20.3
14	321 13.3	126	13 51.9	-65	312 36.9	17 2.0	210 55.1	-18 20.2
16	350 16.5	127	13 38.8	-66	342 41.3	17 1.8	241 .4	-18 20.2
18	19 20.0	129	13 25.5	-68	12 45.6	17 1.6	271 5.8	-18 20.1
20	48 23.7	130	13 12.0	-69	42 49.9	17 1.4	301 11.1	-18 20.0
22	77 27.6	131	12 58.2	-70	72 54.2	17 1.2	331 16.4	-18 19.9
Δ					22	-1	27	0

φ	SUNCE IZLAZ	SUNCE ZALAZ	TRAJANJE SUMRAKA GRAĐ.	TRAJANJE SUMRAKA ASTR.	MESEC IZLAZ	MESEC Δ/24	MESEC ZALAZ	MESEC Δ/24
N	h min	h min	h min	h min	h min	min	h min	min
60	3 6	20 49	1 12	: ::	8 40	2.9	. . .	.0
55	3 40	20 14	0 51	: ::	9 0	2.7	. . .	.0
50	4 5	19 50	0 41	3 5	9 16	2.6	23 56	1.2
45	4 23	19 31	0 35	2 16	9 28	2.5	23 45	1.3
40	4 39	19 15	0 31	1 55	9 38	2.4	23 36	1.4
35	4 51	19 2	0 29	1 42	9 46	2.3	23 29	1.5
30	5 3	18 51	0 27	1 33	9 54	2.2	23 22	1.6
20	5 22	18 32	0 24	1 22	10 7	2.1	23 11	1.7
10	5 38	18 16	0 23	1 16	10 18	2.0	23 1	1.8
0	5 53	18 0	0 22	1 14	10 29	1.9	22 51	1.9
10	6 8	17 45	0 22	1 14	10 39	1.8	22 42	2.0
20	6 24	17 29	0 24	1 17	10 51	1.7	22 32	2.1
30	6 42	17 11	0 26	1 24	11 4	1.6	22 20	2.2
35	6 53	17 0	0 27	1 29	11 11	1.6	22 13	2.3
40	7 5	16 48	0 30	1 35	11 19	1.5	22 5	2.4
45	7 19	16 34	0 33	1 44	11 29	1.4	21 56	2.5
50	7 37	16 16	0 37	1 55	11 41	1.3	21 45	2.6
55	7 59	15 54	0 43	2 11	11 56	1.1	21 31	2.7
60	8 29	15 24	0 52	2 35	12 16	.9	21 13	2.9
S								

SUNCE UT	SUNCE $e = T_p - UT$	SUNCE Δ/24	SUNCE r	MESEC Prolaz	MESEC Δ/24	MESEC $\pi_\leftmoon$	MESEC r
h	min s	s	′	h min	min	′	′
00	3 18.5	-.2	15.8	$T_{\overline{m}}$ 16 40	1.9	55.5	15.1
12	3 16.0	$T_{\overline{m}_\odot}$ 11 h 56.7 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	′	°	
♀	15 11	.1	252	-4.4	♃	17 9	.0	222	-1.6
♂	12 21	.1	294	1.6	♄	23 55	.0	120	.2

UT	SUNCE $S_\odot$	SUNCE $\delta_\odot$	PROLEĆ. TAČKA S_Υ	VENERA S_φ	VENERA δ_φ	MARS S_σ	MARS δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	180 48.4	20 39.8	241 16.4	132 10.8	25 3.2	174 44.8	22 7.0
2	210 48.3	20 40.7	271 21.3	162 10.0	25 2.5	204 46.0	22 7.6
4	240 48.1	20 41.7	301 26.2	192 9.3	25 1.8	234 47.3	22 8.2
6	270 48.0	20 42.6	331 31.2	222 8.5	25 1.1	264 48.5	22 8.8
8	300 47.9	20 43.6	1 36.1	252 7.8	25 .4	294 49.7	22 9.4
10	330 47.8	20 44.5	31 41.0	282 7.0	24 59.6	324 50.9	22 10.0
12	0 47.7	20 45.4	61 46.0	312 6.3	24 58.9	354 52.1	22 10.5
14	30 47.6	20 46.3	91 50.9	342 5.5	24 58.2	24 53.3	22 11.1
16	60 47.5	20 47.3	121 55.8	12 4.8	24 57.5	54 54.6	22 11.7
18	90 47.3	20 48.2	152 .7	42 4.1	24 56.7	84 55.8	22 12.3
20	120 47.2	20 49.1	182 5.7	72 3.3	24 56.0	114 57.0	22 12.9
22	150 47.1	20 50.0	212 10.6	102 2.6	24 55.2	144 58.2	22 13.5
Δ	-1	5		-4	-4	6	3

UT	MESEC $S_\leftmoon$	MESEC Δ	MESEC $\delta_\leftmoon$	MESEC Δ	JUPITER S_{4}	JUPITER δ_{4}	SATURN S_{5}	SATURN δ_{5}
h	° ′		° ′		° ′	° ′	° ′	° ′
0	106 31.8	132	12 44.3	-71	102 58.5	17 1.1	1 21.7	-18 19.9
2	135 36.1	133	12 30.1	-72	133 2.8	17 .9	31 27.0	-18 19.8
4	164 40.7	134	12 15.8	-73	163 7.1	17 .7	61 32.3	-18 19.7
6	193 45.4	135	12 1.2	-74	193 11.5	17 .5	91 37.6	-18 19.7
8	222 50.3	136	11 46.4	-75	223 15.8	17 .3	121 43.0	-18 19.6
10	251 55.5	137	11 31.5	-76	253 20.1	17 .1	151 48.3	-18 19.5
12	281 .8	138	11 16.4	-76	283 24.4	16 59.9	181 53.6	-18 19.5
14	310 6.3	138	11 1.1	-77	313 28.7	16 59.7	211 58.9	-18 19.4
16	339 12.0	139	10 45.6	-78	343 33.0	16 59.5	242 4.2	-18 19.3
18	8 17.8	140	10 30.0	-79	13 37.3	16 59.3	272 9.5	-18 19.3
20	37 23.9	141	10 14.2	-80	43 41.6	16 59.1	302 14.8	-18 19.2
22	66 30.1	142	9 58.2	-81	73 45.9	16 59.0	332 20.2	-18 19.1
Δ					22	-1	27	0

φ	SUNCE IZLAZ	SUNCE ZALAZ	TRAJANJE SUMRAKA GRAĐ.	TRAJANJE SUMRAKA ASTR.	MESEC IZLAZ	MESEC Δ/24	MESEC ZALAZ	MESEC Δ/24
N	h min	h min	h min	h min	h min	min	h min	min
60	3 4	20 51	1 13	: ::	9 50	2.9	0 26	.9
55	3 39	20 16	0 51	: ::	10 6	2.7	0 9	1.1
50	4 4	19 51	0 41	3 8	10 17	2.6	. . .	.0
45	4 23	19 32	0 35	2 17	10 27	2.4	. . .	.0
40	4 38	19 16	0 32	1 55	10 35	2.3	. . .	.0
35	4 51	19 3	0 29	1 42	10 41	2.3	. . .	.0
30	5 2	18 52	0 27	1 33	10 47	2.2	23 60	1.5
20	5 21	18 32	0 24	1 22	10 58	2.1	23 51	1.6
10	5 38	18 16	0 23	1 16	11 7	1.9	23 44	1.7
0	5 53	18 0	0 22	1 14	11 15	1.8	23 36	1.8
10	6 8	17 45	0 22	1 14	11 23	1.7	23 29	1.9
20	6 25	17 29	0 24	1 17	11 32	1.6	23 22	2.0
30	6 43	17 10	0 26	1 24	11 42	1.5	23 13	2.2
35	6 54	16 60	0 27	1 29	11 48	1.4	23 8	2.2
40	7 6	16 47	0 30	1 35	11 55	1.3	23 2	2.3
45	7 20	16 33	0 33	1 44	12 3	1.2	22 55	2.4
50	7 38	16 15	0 37	1 56	12 12	1.1	22 47	2.6
55	8 0	15 53	0 43	2 12	12 23	1.0	22 37	2.7
60	8 31	15 22	0 52	2 36	12 38	.8	22 23	2.9
S								

SUNCE UT	SUNCE $e = T_p - UT$	SUNCE Δ/24	SUNCE r	MESEC Prolaz	MESEC Δ/24	MESEC $\pi_\leftmoon$	MESEC r
h	min s	s	′	h min	min	′	′
00	3 13.5	-.2	15.8	$T_{\overline{m}}$ 17 26	1.8	55.0	15.0
12	3 10.7	$T_{\overline{m}_\odot}$ 11 h 56.8 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	′	°	
♀	15 12	.1	251	-4.4	♃	17 6	.0	222	-1.5
♂	12 21	.1	293	1.6	♄	23 50	.0	120	.2

UT	SUNCE		PROLEĆ. TAČKA	VENERA		MARS	
	$S_\odot$	$\delta_\odot$	S_Υ	S_φ	δ_φ	S_σ	δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	180 47.0	20 50.9	242 15.5	132 1.9	24 54.5	174 59.4	22 14.1
2	210 46.9	20 51.8	272 20.5	162 1.1	24 53.7	205 .6	22 14.6
4	240 46.7	20 52.8	302 25.4	192 .4	24 53.0	235 1.9	22 15.2
6	270 46.6	20 53.7	332 30.3	221 59.7	24 52.2	265 3.1	22 15.8
8	300 46.5	20 54.6	2 35.2	251 59.0	24 51.5	295 4.3	22 16.4
10	330 46.4	20 55.5	32 40.2	281 58.3	24 50.7	325 5.5	22 17.0
12	0 46.3	20 56.4	62 45.1	311 57.6	24 49.9	355 6.7	22 17.5
14	30 46.1	20 57.3	92 50.0	341 56.9	24 49.2	25 7.9	22 18.1
16	60 46.0	20 58.2	122 55.0	11 56.2	24 48.4	55 9.2	22 18.7
18	90 45.9	20 59.0	152 59.9	41 55.5	24 47.6	85 10.4	22 19.2
20	120 45.8	20 59.9	183 4.8	71 54.8	24 46.8	115 11.6	22 19.8
22	150 45.6	21 .8	213 9.7	101 54.1	24 46.0	145 12.8	22 20.4
Δ	-1	4		-4	-4	6	3

UT	MESEC				JUPITER		SATURN	
	$S_\leftmoon$	Δ	$\delta_\leftmoon$	Δ	S_{4}	δ_{4}	S_η	δ_η
h	° ′		° ′		° ′	° ′	° ′	° ′
0	95 36.4	143	9 42.1	-81	103 50.2	16 58.8	2 25.5	-18 19.0
2	124 42.9	143	9 25.9	-82	133 54.5	16 58.6	32 30.8	-18 19.0
4	153 49.6	144	9 9.5	-83	163 58.8	16 58.4	62 36.1	-18 18.9
6	182 56.4	145	8 52.9	-83	194 3.1	16 58.2	92 41.4	-18 18.8
8	212 3.3	145	8 36.2	-84	224 7.4	16 58.0	122 46.7	-18 18.8
10	241 10.4	146	8 19.4	-85	254 11.7	16 57.8	152 52.0	-18 18.7
12	270 17.6	147	8 2.5	-85	284 16.0	16 57.6	182 57.4	-18 18.6
14	299 25.0	147	7 45.4	-86	314 20.3	16 57.4	213 2.7	-18 18.6
16	328 32.4	148	7 28.3	-86	344 24.6	16 57.2	243 8.0	-18 18.5
18	357 40.0	148	7 11.0	-87	14 28.9	16 57.0	273 13.3	-18 18.4
20	26 47.7	149	6 53.6	-87	44 33.2	16 56.8	303 18.6	-18 18.3
22	55 55.4	149	6 36.1	-88	74 37.5	16 56.6	333 23.9	-18 18.3
Δ					21	-1	27	0

φ	SUNCE		TRAJANJE SUMRAKA		MESEC			
	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 2	20 53	1 15	: ::	11 0	2.9	0 46	.7
55	3 37	20 17	0 52	: ::	11 11	2.7	0 34	.9
50	4 2	19 52	0 42	3 11	11 19	2.6	0 25	1.1
45	4 22	19 33	0 36	2 18	11 26	2.4	0 17	1.2
40	4 37	19 17	0 32	1 56	11 31	2.3	0 10	1.3
35	4 50	19 4	0 29	1 42	11 36	2.2	0 5	1.4
30	5 2	18 52	0 27	1 33	11 40	2.2	. . .	.0
20	5 21	18 33	0 24	1 22	11 47	2.0	. . .	.0
10	5 38	18 16	0 23	1 16	11 53	1.9	. . .	.0
0	5 53	18 1	0 22	1 14	11 59	1.8	. . .	.0
10	6 9	17 45	0 22	1 14	12 5	1.7	. . .	.0
20	6 25	17 29	0 24	1 17	12 11	1.6	. . .	.0
30	6 44	17 10	0 26	1 24	12 18	1.4	. . .	.0
35	6 54	16 59	0 27	1 29	12 23	1.3	. . .	.0
40	7 7	16 47	0 30	1 35	12 27	1.3	23 58	2.3
45	7 21	16 32	0 33	1 44	12 32	1.2	23 54	2.4
50	7 39	16 14	0 37	1 56	12 39	1.0	23 48	2.6
55	8 2	15 52	0 43	2 12	12 47	.9	23 42	2.7
60	8 33	15 20	0 53	2 36	12 57	.7	23 33	2.9
S								

SUNCE				MESEC			
UT	e = T_p − UT	Δ/24	r	Prolaz		Δ/24	$\pi_\leftmoon$	r
h	min s	s	′		h min	min	′	′
00	3 8.0	-.2	15.8	$T_{\overline{m}}$	18 10	1.8	54.6	14.9
12	3 5.0	$T_{\overline{m}_\odot}$	11 h 56.9 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	′	°	
♀	15 12	.1	250	-4.4	♃	17 2	.0	222	-1.5
♂	12 20	.1	293	1.6	♄	23 46	.0	120	.2

UT	SUNCE		PROLEĆ. TAČKA	VENERA		MARS	
	$S_\odot$	$\delta_\odot$	S_Υ	S_φ	δ_φ	S_σ	δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	180 45.5	21 1.7	243 14.7	131 53.4	24 45.3	175 14.0	22 20.9
2	210 45.4	21 2.6	273 19.6	161 52.8	24 44.5	205 15.2	22 21.5
4	240 45.2	21 3.5	303 24.5	191 52.1	24 43.7	235 16.4	22 22.1
6	270 45.1	21 4.3	333 29.5	221 51.4	24 42.9	265 17.7	22 22.6
8	300 45.0	21 5.2	3 34.4	251 50.7	24 42.0	295 18.9	22 23.2
10	330 44.8	21 6.1	33 39.3	281 50.1	24 41.2	325 20.1	22 23.7
12	0 44.7	21 7.0	63 44.2	311 49.4	24 40.4	355 21.3	22 24.3
14	30 44.6	21 7.8	93 49.2	341 48.8	24 39.6	25 22.5	22 24.8
16	60 44.4	21 8.7	123 54.1	11 48.1	24 38.8	55 23.7	22 25.4
18	90 44.3	21 9.5	153 59.0	41 47.5	24 38.0	85 24.9	22 25.9
20	120 44.2	21 10.4	184 3.9	71 46.8	24 37.1	115 26.2	22 26.5
22	150 44.0	21 11.3	214 8.9	101 46.2	24 36.3	145 27.4	22 27.0
Δ	-1	4		-3	-4	6	3

UT	MESEC				JUPITER		SATURN	
	$S_\leftmoon$	Δ	$\delta_\leftmoon$	Δ	S_{4}	δ_{4}	S_η	δ_η
h	° ′		° ′		° ′	° ′	° ′	° ′
0	85 3.3	150	6 18.5	-88	104 41.8	16 56.4	3 29.2	-18 18.2
2	114 11.3	150	6 .8	-89	134 46.1	16 56.2	33 34.5	-18 18.1
4	143 19.3	151	5 43.1	-89	164 50.4	16 56.0	63 39.9	-18 18.1
6	172 27.5	151	5 25.2	-90	194 54.6	16 55.8	93 45.2	-18 18.0
8	201 35.7	151	5 7.3	-90	224 58.9	16 55.6	123 50.5	-18 17.9
10	230 44.0	152	4 49.2	-90	255 3.2	16 55.4	153 55.8	-18 17.9
12	259 52.3	152	4 31.1	-91	285 7.5	16 55.2	184 1.1	-18 17.8
14	289 .7	152	4 13.0	-91	315 11.8	16 55.1	214 6.4	-18 17.7
16	318 9.1	152	3 54.7	-91	345 16.1	16 54.9	244 11.7	-18 17.7
18	347 17.6	153	3 36.4	-92	15 20.4	16 54.7	274 17.0	-18 17.6
20	16 26.2	153	3 18.1	-92	45 24.7	16 54.5	304 22.4	-18 17.5
22	45 34.7	153	2 59.7	-92	75 28.9	16 54.3	334 27.7	-18 17.5
Δ					21	-1	27	0

φ	SUNCE		TRAJANJE SUMRAKA		MESEC			
	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	20 55	1 16	: ::	12 10	2.9	1 4	.7
55	3 36	20 19	0 52	: ::	12 16	2.7	0 56	.9
50	4 1	19 53	0 42	3 15	12 20	2.6	0 50	1.0
45	4 21	19 34	0 36	2 19	12 24	2.4	0 46	1.1
40	4 37	19 18	0 32	1 56	12 27	2.3	0 41	1.2
35	4 50	19 5	0 29	1 43	12 29	2.2	0 38	1.3
30	5 1	18 53	0 27	1 33	12 32	2.1	0 35	1.4
20	5 21	18 33	0 24	1 22	12 35	2.0	0 29	1.5
10	5 38	18 16	0 23	1 16	12 39	1.9	0 25	1.7
0	5 53	18 1	0 22	1 14	12 42	1.8	0 20	1.8
10	6 9	17 45	0 22	1 14	12 45	1.6	0 15	1.9
20	6 25	17 28	0 24	1 17	12 49	1.5	0 11	2.0
30	6 44	17 10	0 26	1 24	12 53	1.4	0 5	2.1
35	6 55	16 59	0 28	1 29	12 55	1.3	0 2	2.2
40	7 8	16 46	0 30	1 36	12 57	1.2	. . .	.0
45	7 22	16 31	0 33	1 44	13 0	1.1	. . .	.0
50	7 40	16 13	0 37	1 56	13 4	1.0	. . .	.0
55	8 3	15 50	0 43	2 12	13 8	.8	. . .	.0
60	8 35	15 18	0 53	2 37	13 14	.6	. . .	.0
S								

SUNCE				MESEC			
UT	e = T_p − UT	Δ/24	r	Prolaz		Δ/24	$\pi_\leftmoon$	r
h	min s	s	′		h min	min	′	′
00	3 2.0	-.3	15.8	$T_{\overline{m}}$	18 52	1.8	54.3	14.8
12	2 58.8	$T_{\overline{m}_\odot}$	11 h 57.0 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	′	°	
♀	15 13	.1	249	-4.5	♃	16 59	.0	221	-1.5
♂	12 19	.1	292	1.6	♄	23 42	.0	120	.2

UT	SUNCE		PROLEĆ. TAČKA	VENERA		MARS	
	$S_\odot$	$\delta_\odot$	S_Υ	S_φ	δ_φ	S_σ	δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	180 43.9	21 12.1	244 13.8	131 45.5	24 35.5	175 28.6	22 27.6
2	210 43.7	21 13.0	274 18.7	161 44.9	24 34.6	205 29.8	22 28.1
4	240 43.6	21 13.8	304 23.7	191 44.3	24 33.8	235 31.0	22 28.7
6	270 43.5	21 14.7	334 28.6	221 43.6	24 32.9	265 32.2	22 29.2
8	300 43.3	21 15.5	4 33.5	251 43.0	24 32.1	295 33.4	22 29.8
10	330 43.2	21 16.3	34 38.4	281 42.4	24 31.2	325 34.6	22 30.3
12	0 43.0	21 17.2	64 43.4	311 41.8	24 30.4	355 35.9	22 30.8
14	30 42.9	21 18.0	94 48.3	341 41.2	24 29.5	25 37.1	22 31.4
16	60 42.7	21 18.8	124 53.2	11 40.6	24 28.7	55 38.3	22 31.9
18	90 42.6	21 19.7	154 58.2	41 40.0	24 27.8	85 39.5	22 32.5
20	120 42.5	21 20.5	185 3.1	71 39.4	24 26.9	115 40.7	22 33.0
22	150 42.3	21 21.3	215 8.0	101 38.8	24 26.0	145 41.9	22 33.5
Δ	-1	4		-3	-4	6	3

UT	MESEC				JUPITER		SATURN	
	$S_\leftmoon$	Δ	$\delta_\leftmoon$	Δ	$S_{\mathrm{♃}}$	$\delta_{\mathrm{♃}}$	$S_{\mathrm{♄}}$	$\delta_{\mathrm{♄}}$
h	° ′		° ′		° ′	° ′	° ′	° ′
0	74 43.3	153	2 41.2	-93	105 33.2	16 54.1	4 33.0	-18 17.4
2	103 51.9	153	2 22.7	-93	135 37.5	16 53.9	34 38.3	-18 17.3
4	133 .6	153	2 4.2	-93	165 41.8	16 53.7	64 43.6	-18 17.2
6	162 9.2	153	1 45.6	-93	195 46.1	16 53.5	94 48.9	-18 17.2
8	191 17.9	153	1 27.0	-93	225 50.3	16 53.3	124 54.2	-18 17.1
10	220 26.5	153	1 8.3	-93	255 54.6	16 53.1	154 59.5	-18 17.0
12	249 35.1	153	0 49.6	-93	285 58.9	16 52.9	185 4.9	-18 17.0
14	278 43.8	153	0 31.0	-94	316 3.2	16 52.7	215 10.2	-18 16.9
16	307 52.4	153	0 12.2	-29	346 7.5	16 52.5	245 15.5	-18 16.8
18	337 .9	153	0 6.5	94	16 11.7	16 52.2	275 20.8	-18 16.8
20	6 9.5	153	0 25.2	94	46 16.0	16 52.0	305 26.1	-18 16.7
22	35 18.0	152	0 43.9	94	76 20.3	16 51.8	335 31.4	-18 16.6
Δ					21	-1	27	0

φ	SUNCE		TRAJANJE SUMRAKA		MESEC			
	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	20 58	1 17	: ::	13 20	1.0	1 21	1.4
55	3 35	20 20	0 52	: ::	13 21	1.1	1 18	1.5
50	4 0	19 55	0 42	3 20	13 22	1.2	1 15	1.5
45	4 20	19 35	0 36	2 20	13 22	1.3	1 13	1.5
40	4 36	19 19	0 32	1 57	13 22	1.4	1 11	1.6
35	4 49	19 5	0 29	1 43	13 23	1.5	1 10	1.6
30	5 1	18 54	0 27	1 34	13 23	1.5	1 9	1.6
20	5 21	18 34	0 24	1 22	13 24	1.6	1 6	1.7
10	5 38	18 17	0 23	1 16	13 24	1.7	1 4	1.7
0	5 54	18 1	0 22	1 14	13 24	1.8	1 3	1.8
10	6 9	17 45	0 22	1 14	13 25	1.9	1 1	1.8
20	6 26	17 28	0 24	1 18	13 25	1.9	0 59	1.8
30	6 45	17 9	0 26	1 24	13 26	2.0	0 56	1.9
35	6 56	16 58	0 28	1 29	13 26	2.1	0 55	1.9
40	7 8	16 46	0 30	1 36	13 27	2.2	0 53	2.0
45	7 23	16 31	0 33	1 44	13 27	2.2	0 52	2.0
50	7 41	16 13	0 37	1 56	13 28	2.3	0 49	2.0
55	8 5	15 49	0 43	2 13	13 28	2.4	0 47	2.1
60	8 37	15 17	0 53	2 38	13 29	2.6	0 43	2.2
S								

SUNCE				MESEC				
UT	$e = T_p - UT$	Δ/24	r	Prolaz		Δ/24	$\pi_\leftmoon$	r
h	min s	s	′	$T_{\overline{m}}$	h min	min	′	′
00	2 55.5	-.3	15.8		19 35	1.7	54.2	14.8
12	2 52.1	$T_{\overline{m}_\odot}$	11 h 57.1 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	′	°	
♀	15 13	.1	248	-4.5	♃	16 55	.0	221	-1.5
♂	12 18	.1	291	1.6	♄	23 38	.0	120	.2

UT	SUNCE		PROLEĆ. TAČKA	VENERA		MARS	
	$S_\odot$	$\delta_\odot$	S_Υ	S_φ	δ_φ	S_σ	δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	180 42.2	21 22.2	245 12.9	131 38.2	24 25.2	175 43.1	22 34.0
2	210 42.0	21 23.0	275 17.9	161 37.6	24 24.3	205 44.3	22 34.6
4	240 41.9	21 23.8	305 22.8	191 37.0	24 23.4	235 45.5	22 35.1
6	270 41.7	21 24.6	335 27.7	221 36.4	24 22.5	265 46.8	22 35.6
8	300 41.6	21 25.4	5 32.7	251 35.8	24 21.6	295 48.0	22 36.2
10	330 41.4	21 26.2	35 37.6	281 35.3	24 20.7	325 49.2	22 36.7
12	0 41.3	21 27.0	65 42.5	311 34.7	24 19.8	355 50.4	22 37.2
14	30 41.1	21 27.8	95 47.4	341 34.1	24 18.9	25 51.6	22 37.7
16	60 40.9	21 28.6	125 52.4	11 33.6	24 18.0	55 52.8	22 38.2
18	90 40.8	21 29.4	155 57.3	41 33.0	24 17.1	85 54.0	22 38.7
20	120 40.6	21 30.2	186 2.2	71 32.5	24 16.2	115 55.2	22 39.3
22	150 40.5	21 31.0	216 7.2	101 31.9	24 15.2	145 56.4	22 39.8
Δ	-1	4		-3	-5	6	3

UT	MESEC				JUPITER		SATURN	
	$S_\leftmoon$	Δ	$\delta_\leftmoon$	Δ	$S_{\mathrm{♃}}$	$\delta_{\mathrm{♃}}$	$S_{\mathrm{♄}}$	$\delta_{\mathrm{♄}}$
h	° ′		° ′		° ′	° ′	° ′	° ′
0	64 26.5	152	1 2.7	94	106 24.6	16 51.6	5 36.7	-18 16.6
2	93 34.9	152	1 21.4	94	136 28.8	16 51.4	35 42.0	-18 16.5
4	122 43.2	152	1 40.1	94	166 33.1	16 51.2	65 47.4	-18 16.4
6	151 51.5	151	1 58.9	93	196 37.4	16 51.0	95 52.7	-18 16.4
8	180 59.8	151	2 17.5	93	226 41.6	16 50.8	125 58.0	-18 16.3
10	210 8.0	150	2 36.2	93	256 45.9	16 50.6	156 3.3	-18 16.2
12	239 16.0	150	2 54.9	93	286 50.2	16 50.4	186 8.6	-18 16.1
14	268 24.0	150	3 13.5	93	316 54.4	16 50.2	216 13.9	-18 16.1
16	297 32.0	149	3 32.1	93	346 58.7	16 50.0	246 19.2	-18 16.0
18	326 39.8	149	3 50.6	93	17 3.0	16 49.8	276 24.5	-18 15.9
20	355 47.5	148	4 9.1	92	47 7.2	16 49.6	306 29.8	-18 15.9
22	24 55.1	148	4 27.6	92	77 11.5	16 49.4	336 35.2	-18 15.8
Δ					21	-1	27	0

φ	SUNCE		TRAJANJE SUMRAKA		MESEC			
	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 56	20 59	1 19	: ::	13 45	.7	1 54	3.0
55	3 33	20 22	0 53	: ::	13 48	.9	1 53	2.7
50	3 60	19 56	0 42	3 24	13 51	1.0	1 51	2.6
45	4 19	19 36	0 36	2 21	13 54	1.2	1 50	2.5
40	4 35	19 19	0 32	1 57	13 56	1.3	1 49	2.3
35	4 49	19 6	0 29	1 43	13 58	1.4	1 49	2.3
30	5 1	18 54	0 27	1 34	13 59	1.4	1 48	2.2
20	5 21	18 34	0 24	1 22	14 2	1.6	1 47	2.0
10	5 38	18 17	0 23	1 16	14 5	1.7	1 46	1.9
0	5 54	18 1	0 22	1 14	14 7	1.8	1 45	1.8
10	6 9	17 45	0 23	1 14	14 9	1.9	1 44	1.7
20	6 26	17 28	0 24	1 18	14 12	2.0	1 43	1.5
30	6 45	17 9	0 26	1 24	14 15	2.2	1 42	1.4
35	6 56	16 58	0 28	1 29	14 16	2.3	1 41	1.3
40	7 9	16 45	0 30	1 36	14 18	2.4	1 40	1.2
45	7 24	16 30	0 33	1 45	14 21	2.5	1 39	1.1
50	7 42	16 12	0 37	1 56	14 23	2.6	1 38	1.0
55	8 6	15 48	0 43	2 13	14 27	2.8	1 37	.9
60	8 39	15 15	0 53	2 38	14 31	3.0	1 35	.7
S								

SUNCE				MESEC				
UT	$e = T_p - UT$	Δ/24	r	Prolaz		Δ/24	$\pi_\leftmoon$	r
h	min s	s	′	$T_{\overline{m}}$	h min	min	′	′
00	2 48.6	-.3	15.8		20 17	1.8	54.3	14.8
12	2 45.0	$T_{\overline{m}_\odot}$	11 h 57.2 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	′	°	
♀	15 14	.1	246	-4.5	♃	16 52	.0	221	-1.5
♂	12 17	.1	290	1.6	♄	23 33	.0	120	.2

UT	SUNCE		PROLEĆ. TAČKA	VENERA		MARS	
	$S_\odot$	$\delta_\odot$	S_Υ	S_φ	δ_φ	S_σ	δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	180 40.3	21 31.8	246 12.1	131 31.4	24 14.3	175 57.7	22 40.3
2	210 40.2	21 32.6	276 17.0	161 30.8	24 13.4	205 58.9	22 40.8
4	240 40.0	21 33.4	306 21.9	191 30.3	24 12.5	236 .1	22 41.3
6	270 39.8	21 34.2	336 26.9	221 29.7	24 11.5	266 1.3	22 41.8
8	300 39.7	21 35.0	6 31.8	251 29.2	24 10.6	296 2.5	22 42.3
10	330 39.5	21 35.7	36 36.7	281 28.7	24 9.7	326 3.7	22 42.8
12	0 39.4	21 36.5	66 41.7	311 28.2	24 8.7	356 4.9	22 43.3
14	30 39.2	21 37.3	96 46.6	341 27.7	24 7.8	26 6.1	22 43.8
16	60 39.0	21 38.1	126 51.5	11 27.1	24 6.8	56 7.3	22 44.3
18	90 38.9	21 38.8	156 56.4	41 26.6	24 5.9	86 8.5	22 44.8
20	120 38.7	21 39.6	187 1.4	71 26.1	24 4.9	116 9.8	22 45.3
22	150 38.5	21 40.4	217 6.3	101 25.6	24 4.0	146 11.0	22 45.8
Δ	-1	4		-3	-5	6	3

UT	MESEC				JUPITER		SATURN	
	$S_\leftmoon$	Δ	$\delta_\leftmoon$	Δ	$S_{\text{♃}}$	$\delta_{\text{♃}}$	$S_{\text{♄}}$	$\delta_{\text{♄}}$
h	° ′		° ′		° ′	° ′	° ′	° ′
0	54 2.6	147	4 46.0	92	107 15.8	16 49.2	6 40.5	-18 15.7
2	83 10.0	146	5 4.3	91	137 20.0	16 49.0	36 45.8	-18 15.7
4	112 17.3	146	5 22.6	91	167 24.3	16 48.8	66 51.1	-18 15.6
6	141 24.4	145	5 40.8	91	197 28.5	16 48.6	96 56.4	-18 15.5
8	170 31.4	144	5 59.0	90	227 32.8	16 48.4	127 1.7	-18 15.5
10	199 38.3	144	6 17.0	90	257 37.1	16 48.2	157 7.0	-18 15.4
12	228 45.0	143	6 35.0	89	287 41.3	16 47.9	187 12.3	-18 15.3
14	257 51.6	142	6 52.9	89	317 45.6	16 47.7	217 17.6	-18 15.3
16	286 58.1	141	7 10.7	89	347 49.8	16 47.5	247 22.9	-18 15.2
18	316 4.3	141	7 28.4	88	17 54.1	16 47.3	277 28.3	-18 15.1
20	345 10.4	140	7 46.0	87	47 58.3	16 47.1	307 33.6	-18 15.1
22	14 16.4	139	8 3.5	87	78 2.6	16 46.9	337 38.9	-18 15.0
Δ					21	-1	27	0

φ	SUNCE		TRAJANJE SUMRAKA		MESEC			
	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 55	21 1	1 20	: ::	14 1	.8	3 5	3.0
55	3 32	20 23	0 53	: ::	14 10	1.0	2 58	2.8
50	3 59	19 57	0 42	3 30	14 16	1.1	2 53	2.6
45	4 19	19 37	0 36	2 22	14 22	1.3	2 49	2.5
40	4 35	19 20	0 32	1 58	14 26	1.4	2 46	2.4
35	4 49	19 7	0 29	1 44	14 30	1.4	2 43	2.3
30	5 0	18 55	0 27	1 34	14 34	1.5	2 40	2.2
20	5 20	18 35	0 24	1 22	14 40	1.7	2 36	2.1
10	5 38	18 17	0 23	1 17	14 45	1.8	2 32	2.0
0	5 54	18 1	0 22	1 14	14 50	1.9	2 28	1.8
10	6 10	17 45	0 23	1 14	14 56	2.0	2 24	1.7
20	6 27	17 28	0 24	1 18	15 1	2.1	2 20	1.6
30	6 46	17 9	0 26	1 24	15 7	2.2	2 16	1.5
35	6 57	16 57	0 28	1 29	15 11	2.3	2 13	1.4
40	7 10	16 45	0 30	1 36	15 15	2.4	2 10	1.3
45	7 25	16 29	0 33	1 45	15 20	2.5	2 7	1.2
50	7 44	16 11	0 37	1 57	15 26	2.6	2 3	1.1
55	8 7	15 47	0 44	2 13	15 33	2.8	1 58	.9
60	8 41	15 14	0 54	2 39	15 42	3.0	1 51	.7
S								

SUNCE				MESEC				
UT	e = T_p − UT	Δ/24	r	Prolaz		Δ/24	$\pi_\leftmoon$	r
h	min s	s	′	$T_{\overline{m}}$	h min	min	′	′
00	2 41.3	-.3	15.8	$T_{\overline{m}}$	21 1	1.9	54.6	14.9
12	2 37.4	$T_{\overline{m}_\odot}$	11 h 57.4 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	′	°	
♀	15 14	.1	245	-4.5	♃	16 49	.0	221	-1.5
♂	12 16	.1	290	1.7	♄	23 29	.0	120	.2

UT	SUNCE		PROLEĆ. TAČKA	VENERA		MARS	
	$S_\odot$	$\delta_\odot$	S_Υ	S_φ	δ_φ	S_σ	δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	180 38.4	21 41.1	247 11.2	131 25.1	24 3.0	176 12.2	22 46.3
2	210 38.2	21 41.9	277 16.1	161 24.6	24 2.0	206 13.4	22 46.8
4	240 38.0	21 42.6	307 21.1	191 24.2	24 1.1	236 14.6	22 47.3
6	270 37.9	21 43.4	337 26.0	221 23.7	24 .1	266 15.8	22 47.8
8	300 37.7	21 44.1	7 30.9	251 23.2	23 59.1	296 17.0	22 48.3
10	330 37.5	21 44.9	37 35.9	281 22.7	23 58.1	326 18.2	22 48.8
12	0 37.4	21 45.6	67 40.8	311 22.2	23 57.1	356 19.4	22 49.3
14	30 37.2	21 46.4	97 45.7	341 21.8	23 56.1	26 20.6	22 49.7
16	60 37.0	21 47.1	127 50.6	11 21.3	23 55.2	56 21.8	22 50.2
18	90 36.8	21 47.8	157 55.6	41 20.9	23 54.2	86 23.0	22 50.7
20	120 36.7	21 48.6	188 .5	71 20.4	23 53.2	116 24.3	22 51.2
22	150 36.5	21 49.3	218 5.4	101 19.9	23 52.2	146 25.5	22 51.7
Δ	-1	4		-2	-5	6	2

UT	MESEC				JUPITER		SATURN	
	$S_\leftmoon$	Δ	$\delta_\leftmoon$	Δ	$S_{\text{♃}}$	$\delta_{\text{♃}}$	$S_{\text{♄}}$	$\delta_{\text{♄}}$
h	° ′		° ′		° ′	° ′	° ′	° ′
0	43 22.2	138	8 20.8	86	108 6.9	16 46.7	7 44.2	-18 14.9
2	72 27.7	137	8 38.1	86	138 11.1	16 46.5	37 49.5	-18 14.9
4	101 33.2	136	8 55.2	85	168 15.4	16 46.3	67 54.8	-18 14.8
6	130 38.4	135	9 12.2	84	198 19.6	16 46.1	98 .1	-18 14.7
8	159 43.4	134	9 29.1	84	228 23.9	16 45.9	128 5.4	-18 14.6
10	188 48.3	133	9 45.8	83	258 28.1	16 45.6	158 10.7	-18 14.6
12	217 52.9	132	10 2.4	82	288 32.4	16 45.4	188 16.0	-18 14.5
14	246 57.4	131	10 18.8	81	318 36.6	16 45.2	218 21.3	-18 14.4
16	276 1.6	130	10 35.1	80	348 40.9	16 45.0	248 26.7	-18 14.4
18	305 5.7	129	10 51.2	80	18 45.1	16 44.8	278 32.0	-18 14.3
20	334 9.5	128	11 7.1	79	48 49.3	16 44.6	308 37.3	-18 14.2
22	3 13.1	127	11 22.8	78	78 53.6	16 44.4	338 42.6	-18 14.2
Δ					21	-1	27	0

φ	SUNCE		TRAJANJE SUMRAKA		MESEC			
	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 3	1 21	: ::	14 20	.9	4 17	3.0
55	3 31	20 25	0 54	: ::	14 33	1.1	4 5	2.8
50	3 58	19 58	0 42	3 37	14 44	1.3	3 56	2.7
45	4 18	19 37	0 36	2 22	14 52	1.4	3 49	2.5
40	4 34	19 21	0 32	1 58	14 59	1.5	3 43	2.4
35	4 48	19 7	0 29	1 44	15 5	1.6	3 38	2.3
30	5 0	18 55	0 27	1 34	15 10	1.6	3 33	2.3
20	5 20	18 35	0 24	1 23	15 20	1.8	3 25	2.1
10	5 38	18 17	0 23	1 17	15 28	1.9	3 18	2.0
0	5 54	18 1	0 22	1 14	15 36	2.0	3 12	1.9
10	6 10	17 45	0 23	1 15	15 43	2.1	3 5	1.8
20	6 27	17 28	0 24	1 18	15 52	2.2	2 59	1.7
30	6 46	17 8	0 26	1 24	16 1	2.3	2 51	1.6
35	6 58	16 57	0 28	1 29	16 7	2.4	2 46	1.5
40	7 11	16 44	0 30	1 36	16 13	2.5	2 41	1.4
45	7 26	16 29	0 33	1 45	16 20	2.5	2 35	1.3
50	7 45	16 10	0 37	1 57	16 29	2.7	2 28	1.2
55	8 9	15 46	0 44	2 14	16 40	2.8	2 20	1.0
60	8 43	15 12	0 54	2 39	16 55	3.0	2 9	.8
S								

SUNCE				MESEC				
UT	e = T_p − UT	Δ/24	r	Prolaz		Δ/24	$\pi_\leftmoon$	r
h	min s	s	′	$T_{\overline{m}}$	h min	min	′	′
00	2 33.5	-.3	15.8	$T_{\overline{m}}$	21 47	2.0	55.0	15.0
12	2 29.4	$T_{\overline{m}_\odot}$	11 h 57.5 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	′	°	
♀	15 15	.1	244	-4.6	♃	16 45	.0	221	-1.5
♂	12 15	.1	289	1.7	♄	23 25	.0	121	.2

UT	SUNCE		PROLEĆ. TAČKA	VENERA		MARS	
	$S_\odot$	$\delta_\odot$	S_Υ	S_φ	δ_φ	S_σ	δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	180 36.3	21 50.0	248 10.4	131 19.5	23 51.2	176 26.7	22 52.1
2	210 36.1	21 50.8	278 15.3	161 19.1	23 50.1	206 27.9	22 52.6
4	240 36.0	21 51.5	308 20.2	191 18.6	23 49.1	236 29.1	22 53.1
6	270 35.8	21 52.2	338 25.1	221 18.2	23 48.1	266 30.3	22 53.6
8	300 35.6	21 52.9	8 30.1	251 17.8	23 47.1	296 31.5	22 54.0
10	330 35.4	21 53.6	38 35.0	281 17.3	23 46.1	326 32.7	22 54.5
12	0 35.3	21 54.4	68 39.9	311 16.9	23 45.1	356 33.9	22 55.0
14	30 35.1	21 55.1	98 44.9	341 16.5	23 44.0	26 35.1	22 55.4
16	60 34.9	21 55.8	128 49.8	11 16.1	23 43.0	56 36.3	22 55.9
18	90 34.7	21 56.5	158 54.7	41 15.7	23 42.0	86 37.5	22 56.4
20	120 34.5	21 57.2	188 59.6	71 15.3	23 40.9	116 38.7	22 56.8
22	150 34.4	21 57.9	219 4.6	101 14.9	23 39.9	146 40.0	22 57.3
Δ	−1	4		−2	−5	6	2

UT	MESEC				JUPITER		SATURN	
	$S_\leftmoon$	Δ	$\delta_\leftmoon$	Δ	$S_{\text{♃}}$	$\delta_{\text{♃}}$	$S_{\text{♄}}$	$\delta_{\text{♄}}$
h	° ′		° ′		° ′	° ′	° ′	° ′
0	32 16.5	126	11 38.4	77	108 57.8	16 44.2	8 47.9	−18 14.1
2	61 19.7	125	11 53.7	76	139 2.1	16 43.9	38 53.2	−18 14.0
4	90 22.7	124	12 8.9	75	169 6.3	16 43.7	68 58.5	−18 14.0
6	119 25.4	123	12 23.9	74	199 10.6	16 43.5	99 3.8	−18 13.9
8	148 27.9	121	12 38.6	73	229 14.8	16 43.3	129 9.1	−18 13.8
10	177 30.2	120	12 53.2	72	259 19.0	16 43.1	159 14.4	−18 13.8
12	206 32.2	119	13 7.5	70	289 23.3	16 42.9	189 19.7	−18 13.7
14	235 34.0	118	13 21.6	69	319 27.5	16 42.7	219 25.0	−18 13.6
16	264 35.6	117	13 35.5	68	349 31.8	16 42.5	249 30.3	−18 13.6
18	293 36.9	115	13 49.1	67	19 36.0	16 42.2	279 35.6	−18 13.5
20	322 38.0	114	14 2.4	66	49 40.2	16 42.0	309 41.0	−18 13.4
22	351 38.9	113	14 15.6	64	79 44.5	16 41.8	339 46.3	−18 13.4
Δ					21	−1	27	0

φ	SUNCE		TRAJANJE SUMRAKA		MESEC			
	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 51	21 5	1 23	: ::	14 42	1.2	5 30	3.0
55	3 30	20 26	0 54	: ::	15 0	1.4	5 13	2.8
50	3 57	19 59	0 43	3 50	15 14	1.5	4 60	2.7
45	4 17	19 38	0 36	2 23	15 25	1.6	4 50	2.6
40	4 34	19 22	0 32	1 59	15 35	1.7	4 41	2.5
35	4 48	19 8	0 29	1 44	15 43	1.7	4 34	2.4
30	4 60	18 56	0 27	1 34	15 50	1.8	4 28	2.3
20	5 20	18 35	0 24	1 23	16 2	1.9	4 17	2.2
10	5 38	18 18	0 23	1 17	16 13	2.0	4 7	2.1
0	5 54	18 1	0 22	1 14	16 23	2.1	3 58	2.0
10	6 10	17 45	0 23	1 15	16 33	2.2	3 49	1.9
20	6 27	17 28	0 24	1 18	16 44	2.2	3 39	1.8
30	6 47	17 8	0 26	1 25	16 56	2.3	3 29	1.7
35	6 58	16 57	0 28	1 30	17 4	2.4	3 22	1.6
40	7 11	16 44	0 30	1 36	17 12	2.5	3 15	1.6
45	7 27	16 28	0 33	1 45	17 22	2.6	3 7	1.5
50	7 46	16 9	0 37	1 57	17 33	2.7	2 57	1.4
55	8 10	15 45	0 44	2 14	17 48	2.8	2 45	1.2
60	8 44	15 11	0 54	2 40	18 8	3.0	2 29	1.0
S								

SUNCE				MESEC			
UT	e = T_p − UT	Δ/24	r	Prolaz		Δ/24	$\pi_\leftmoon$	r
h	min s	s	′	$T_{\overline{m}}$	h min	min	′	′
00	2 25.3	−.4	15.8	$T_{\overline{m}}$	22 35	2.1	55.4	15.1
12	2 21.0	$T_{\overline{m}_\odot}$	11 h 57.6 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	′	°	
♀	15 15	.1	243	−4.6	♄	16 42	.0	221	−1.5
♂	12 14	.1	288	1.7	♇	23 21	.0	121	.3

UT	SUNCE		PROLEĆ. TAČKA	VENERA		MARS	
	$S_\odot$	$\delta_\odot$	S_Υ	S_φ	δ_φ	S_σ	δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	180 34.2	21 58.6	249 9.5	131 14.5	23 38.8	176 41.2	22 57.7
2	210 34.0	21 59.3	279 14.4	161 14.1	23 37.8	206 42.4	22 58.2
4	240 33.8	22 .0	309 19.4	191 13.7	23 36.7	236 43.6	22 58.7
6	270 33.6	22 .7	339 24.3	221 13.3	23 35.7	266 44.8	22 59.1
8	300 33.4	22 1.3	9 29.2	251 12.9	23 34.6	296 46.0	22 59.6
10	330 33.2	22 2.0	39 34.1	281 12.6	23 33.6	326 47.2	23 .0
12	0 33.1	22 2.7	69 39.1	311 12.2	23 32.5	356 48.4	23 .5
14	30 32.9	22 3.4	99 44.0	341 11.8	23 31.4	26 49.6	23 .9
16	60 32.7	22 4.1	129 48.9	11 11.5	23 30.4	56 50.8	23 1.4
18	90 32.5	22 4.7	159 53.9	41 11.1	23 29.3	86 52.0	23 1.8
20	120 32.3	22 5.4	189 58.8	71 10.8	23 28.2	116 53.2	23 2.3
22	150 32.1	22 6.1	220 3.7	101 10.4	23 27.1	146 54.4	23 2.7
Δ	−1	3		−2	−5	6	2

UT	MESEC				JUPITER		SATURN	
	$S_\leftmoon$	Δ	$\delta_\leftmoon$	Δ	$S_{\text{♃}}$	$\delta_{\text{♃}}$	$S_{\text{♄}}$	$\delta_{\text{♄}}$
h	° ′		° ′		° ′	° ′	° ′	° ′
0	20 39.5	112	14 28.4	63	109 48.7	16 41.6	9 51.6	−18 13.3
2	49 39.9	111	14 41.0	62	139 52.9	16 41.4	39 56.9	−18 13.2
4	78 40.0	109	14 53.3	60	169 57.2	16 41.2	70 2.2	−18 13.2
6	107 39.9	108	15 5.3	59	200 1.4	16 40.9	100 7.5	−18 13.1
8	136 39.6	107	15 17.1	57	230 5.6	16 40.7	130 12.8	−18 13.0
10	165 39.0	106	15 28.5	56	260 9.9	16 40.5	160 18.1	−18 13.0
12	194 38.2	105	15 39.7	54	290 14.1	16 40.3	190 23.4	−18 12.9
14	223 37.1	104	15 50.5	53	320 18.3	16 40.1	220 28.7	−18 12.8
16	252 35.8	102	16 1.0	51	350 22.5	16 39.9	250 34.0	−18 12.8
18	281 34.3	101	16 11.3	49	20 26.8	16 39.6	280 39.3	−18 12.7
20	310 32.5	100	16 21.1	48	50 31.0	16 39.4	310 44.6	−18 12.6
22	339 30.5	99	16 30.7	46	80 35.2	16 39.2	340 49.9	−18 12.6
Δ					21	−1	27	0

φ	SUNCE		TRAJANJE SUMRAKA		MESEC			
	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 50	21 7	1 24	: ::	15 10	1.5	6 42	2.9
55	3 29	20 27	0 54	: ::	15 33	1.7	6 20	2.7
50	3 56	19 60	0 43	: ::	15 50	1.8	6 4	2.6
45	4 17	19 39	0 36	2 24	16 4	1.8	5 51	2.5
40	4 33	19 22	0 32	1 59	16 15	1.9	5 40	2.5
35	4 47	19 8	0 29	1 44	16 25	1.9	5 31	2.4
30	4 60	18 56	0 27	1 35	16 33	2.0	5 23	2.4
20	5 20	18 36	0 24	1 23	16 48	2.1	5 10	2.3
10	5 38	18 18	0 23	1 17	17 0	2.1	4 58	2.2
0	5 54	18 1	0 22	1 14	17 13	2.2	4 46	2.1
10	6 10	17 45	0 23	1 15	17 25	2.2	4 35	2.1
20	6 28	17 28	0 24	1 18	17 38	2.3	4 23	2.0
30	6 48	17 8	0 26	1 25	17 53	2.4	4 10	1.9
35	6 59	16 56	0 28	1 30	18 1	2.4	4 2	1.8
40	7 12	16 43	0 30	1 36	18 11	2.4	3 53	1.8
45	7 28	16 28	0 33	1 45	18 23	2.5	3 43	1.7
50	7 47	16 9	0 38	1 57	18 37	2.6	3 30	1.6
55	8 11	15 44	0 44	2 14	18 55	2.7	3 14	1.5
60	8 46	15 9	0 55	2 40	19 19	2.8	2 53	1.3
S								

SUNCE				MESEC			
UT	e = T_p − UT	Δ/24	r	Prolaz		Δ/24	$\pi_\leftmoon$	r
h	min s	s	′	$T_{\overline{m}}$	h min	min	′	′
00	2 16.7	−.4	15.8	$T_{\overline{m}}$	23 25	2.2	56.0	15.3
12	2 12.2	$T_{\overline{m}_\odot}$	11 h 57.8 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	′	°	
♀	15 15	.1	242	−4.6	♄	16 38	.0	221	−1.5
♂	12 13	.1	288	1.7	♇	23 16	.0	121	.3

UT	SUNCE $S_\odot$	SUNCE $\delta_\odot$	PROLEĆ. TAČKA S_Υ	VENERA S_φ	VENERA δ_φ	MARS S_σ	MARS δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	180 31.9	22 6.7	250 8.6	131 10.1	23 26.1	176 55.6	23 3.1
2	210 31.7	22 7.4	280 13.6	161 9.7	23 25.0	206 56.8	23 3.6
4	240 31.5	22 8.1	310 18.5	191 9.4	23 23.9	236 58.0	23 4.0
6	270 31.3	22 8.7	340 23.4	221 9.1	23 22.8	266 59.3	23 4.5
8	300 31.1	22 9.4	10 28.4	251 8.8	23 21.7	297 .5	23 4.9
10	330 30.9	22 10.0	40 33.3	281 8.4	23 20.6	327 1.7	23 5.3
12	0 30.7	22 10.7	70 38.2	311 8.1	23 19.5	357 2.9	23 5.8
14	30 30.6	22 11.3	100 43.1	341 7.8	23 18.4	27 4.1	23 6.2
16	60 30.4	22 12.0	130 48.1	11 7.5	23 17.3	57 5.3	23 6.6
18	90 30.2	22 12.6	160 53.0	41 7.2	23 16.2	87 6.5	23 7.0
20	120 30.0	22 13.2	190 57.9	71 6.9	23 15.0	117 7.7	23 7.5
22	150 29.8	22 13.9	221 2.8	101 6.6	23 13.9	147 8.9	23 7.9
Δ	-1	3		-2	-6	6	2

UT	MESEC $S_\leftmoon$	MESEC Δ	MESEC $\delta_\leftmoon$	MESEC Δ	JUPITER $S_{\jupiter}$	JUPITER $\delta_{\jupiter}$	SATURN $S_{\saturn}$	SATURN $\delta_{\saturn}$
h	° ′		° ′		° ′	° ′	° ′	° ′
0	8 28.3	98	16 39.9	44	110 39.5	16 39.0	10 55.2	-18 12.5
2	37 25.9	97	16 48.8	43	140 43.7	16 38.8	41 .5	-18 12.4
4	66 23.2	96	16 57.3	41	170 47.9	16 38.5	71 5.8	-18 12.4
6	95 20.3	95	17 5.5	39	200 52.1	16 38.3	101 11.1	-18 12.3
8	124 17.2	93	17 13.3	37	230 56.3	16 38.1	131 16.4	-18 12.2
10	153 13.9	92	17 20.7	35	261 .6	16 37.9	161 21.7	-18 12.2
12	182 10.4	91	17 27.8	33	291 4.8	16 37.7	191 27.0	-18 12.1
14	211 6.7	90	17 34.4	32	321 9.0	16 37.4	221 32.4	-18 12.0
16	240 2.8	89	17 40.8	30	351 13.2	16 37.2	251 37.7	-18 12.0
18	268 58.6	88	17 46.7	28	21 17.4	16 37.0	281 43.0	-18 11.9
20	297 54.3	88	17 52.2	26	51 21.7	16 36.8	311 48.3	-18 11.8
22	326 49.8	87	17 57.3	24	81 25.9	16 36.5	341 53.6	-18 11.8
Δ					21	-1	27	0

φ	SUNCE IZLAZ	SUNCE ZALAZ	TRAJANJE SUMRAKA GRAĐ.	TRAJANJE SUMRAKA ASTR.	MESEC IZLAZ	MESEC Δ/24	MESEC ZALAZ	MESEC Δ/24
N	h min	h min	h min	h min	h min	min	h min	min
60	2 48	21 9	1 26	: ::	15 47	2.0	7 51	2.7
55	3 28	20 29	0 55	: ::	16 13	2.0	7 26	2.6
50	3 55	20 1	0 43	: ::	16 32	2.1	7 7	2.5
45	4 16	19 40	0 36	2 25	16 48	2.1	6 52	2.4
40	4 33	19 23	0 32	1 59	17 0	2.1	6 39	2.4
35	4 47	19 9	0 29	1 45	17 11	2.2	6 29	2.4
30	4 59	18 57	0 27	1 35	17 21	2.2	6 20	2.3
20	5 20	18 36	0 24	1 23	17 37	2.2	6 4	2.3
10	5 38	18 18	0 23	1 17	17 51	2.2	5 50	2.3
0	5 54	18 2	0 22	1 14	18 5	2.3	5 37	2.2
10	6 11	17 45	0 23	1 15	18 18	2.3	5 24	2.2
20	6 28	17 28	0 24	1 18	18 33	2.3	5 11	2.1
30	6 48	17 8	0 26	1 25	18 49	2.3	4 55	2.1
35	6 60	16 56	0 28	1 30	18 59	2.3	4 46	2.0
40	7 13	16 43	0 30	1 37	19 10	2.4	4 36	2.0
45	7 28	16 27	0 33	1 45	19 23	2.4	4 23	2.0
50	7 48	16 8	0 38	1 58	19 39	2.4	4 9	1.9
55	8 13	15 43	0 44	2 15	19 59	2.4	3 50	1.8
60	8 47	15 8	0 55	2 41	20 26	2.5	3 25	1.7
S								

SUNCE UT	SUNCE $e = T_p - UT$	SUNCE Δ/24	SUNCE r	MESEC Prolaz	MESEC Δ/24	MESEC $\pi_\leftmoon$	MESEC r
h	min s	s	′	h min	min	′	′
00	2 7.7	-.4	15.8	$T_{\overline{m}}$	1.0	56.6	15.4
12	2 2.9	$T_{\overline{m}_\odot}$ 11 h 57.9 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	′	°	
♀	15 15	.1	241	-4.6	♃	16 35	.0	221	-1.5
♂	12 12	.1	287	1.7	♄	23 12	.0	121	.3

UT	SUNCE $S_\odot$	SUNCE $\delta_\odot$	PROLEĆ. TAČKA S_Υ	VENERA S_φ	VENERA δ_φ	MARS S_σ	MARS δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	180 29.6	22 14.5	251 7.8	131 6.3	23 12.8	177 10.1	23 8.3
2	210 29.4	22 15.1	281 12.7	161 6.0	23 11.7	207 11.3	23 8.7
4	240 29.2	22 15.8	311 17.6	191 5.8	23 10.6	237 12.5	23 9.2
6	270 29.0	22 16.4	341 22.6	221 5.5	23 9.4	267 13.7	23 9.6
8	300 28.8	22 17.0	11 27.5	251 5.2	23 8.3	297 14.9	23 10.0
10	330 28.6	22 17.6	41 32.4	281 4.9	23 7.2	327 16.1	23 10.4
12	0 28.3	22 18.2	71 37.3	311 4.7	23 6.0	357 17.3	23 10.8
14	30 28.1	22 18.9	101 42.3	341 4.4	23 4.9	27 18.5	23 11.2
16	60 27.9	22 19.5	131 47.2	11 4.2	23 3.7	57 19.7	23 11.7
18	90 27.7	22 20.1	161 52.1	41 3.9	23 2.6	87 21.0	23 12.1
20	120 27.5	22 20.7	191 57.1	71 3.7	23 1.4	117 22.2	23 12.5
22	150 27.3	22 21.3	222 2.0	101 3.5	23 .3	147 23.4	23 12.9
Δ	-1	3		-1	-6	6	2

UT	MESEC $S_\leftmoon$	MESEC Δ	MESEC $\delta_\leftmoon$	MESEC Δ	JUPITER $S_{\jupiter}$	JUPITER $\delta_{\jupiter}$	SATURN $S_{\saturn}$	SATURN $\delta_{\saturn}$
h	° ′		° ′		° ′	° ′	° ′	° ′
0	355 45.2	86	18 2.0	22	111 30.1	16 36.3	11 58.9	-18 11.7
2	24 40.3	85	18 6.3	20	141 34.3	16 36.1	42 4.2	-18 11.6
4	53 35.3	84	18 10.3	17	171 38.5	16 35.9	72 9.5	-18 11.6
6	82 30.2	83	18 13.7	15	201 42.7	16 35.7	102 14.8	-18 11.5
8	111 24.9	83	18 16.8	13	231 47.0	16 35.4	132 20.1	-18 11.5
10	140 19.4	82	18 19.5	11	261 51.2	16 35.2	162 25.4	-18 11.4
12	169 13.8	81	18 21.7	9	291 55.4	16 35.0	192 30.7	-18 11.3
14	198 8.0	81	18 23.5	7	321 59.6	16 34.8	222 36.0	-18 11.3
16	227 2.2	80	18 24.8	5	352 3.8	16 34.5	252 41.3	-18 11.2
18	255 56.2	79	18 25.8	2	22 8.0	16 34.3	282 46.6	-18 11.1
20	284 50.1	79	18 26.2	0	52 12.2	16 34.1	312 51.9	-18 11.1
22	313 43.9	78	18 26.3	-2	82 16.4	16 33.9	342 57.2	-18 11.0
Δ					21	-1	27	0

φ	SUNCE IZLAZ	SUNCE ZALAZ	TRAJANJE SUMRAKA GRAĐ.	TRAJANJE SUMRAKA ASTR.	MESEC IZLAZ	MESEC Δ/24	MESEC ZALAZ	MESEC Δ/24
N	h min	h min	h min	h min	h min	min	h min	min
60	2 47	21 10	1 27	: ::	16 33	2.5	8 55	2.3
55	3 27	20 30	0 55	: ::	17 2	2.4	8 27	2.3
50	3 55	20 2	0 43	: ::	17 22	2.4	8 6	2.3
45	4 16	19 41	0 37	2 26	17 38	2.4	7 50	2.3
40	4 33	19 24	0 32	1 60	17 52	2.4	7 37	2.3
35	4 47	19 10	0 29	1 45	18 3	2.4	7 26	2.3
30	4 59	18 57	0 27	1 35	18 13	2.4	7 16	2.3
20	5 20	18 36	0 24	1 23	18 30	2.3	6 59	2.3
10	5 38	18 18	0 23	1 17	18 45	2.3	6 44	2.3
0	5 54	18 2	0 22	1 14	18 59	2.3	6 31	2.3
10	6 11	17 45	0 23	1 15	19 13	2.3	6 17	2.3
20	6 28	17 28	0 24	1 18	19 28	2.3	6 2	2.3
30	6 49	17 8	0 26	1 25	19 45	2.3	5 45	2.3
35	7 0	16 56	0 28	1 30	19 55	2.2	5 35	2.3
40	7 14	16 43	0 30	1 37	20 7	2.2	5 24	2.3
45	7 29	16 27	0 33	1 46	20 20	2.2	5 11	2.2
50	7 49	16 7	0 38	1 58	20 37	2.2	4 54	2.2
55	8 14	15 42	0 44	2 15	20 58	2.1	4 34	2.2
60	8 49	15 7	0 55	2 41	21 26	2.1	4 6	2.2
S								

SUNCE UT	SUNCE $e = T_p - UT$	SUNCE Δ/24	SUNCE r	MESEC Prolaz	MESEC Δ/24	MESEC $\pi_\leftmoon$	MESEC r
h	min s	s	′	h min	min	′	′
00	1 58.2	-.4	15.8	$T_{\overline{m}}$ 0 18	2.3	57.2	15.6
12	1 53.3	$T_{\overline{m}_\odot}$ 11 h 58.1 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	′	°	
♀	15 16	.1	240	-4.6	♃	16 32	.0	220	-1.5
♂	12 11	.1	286	1.7	♄	23 8	.0	121	.3

UT	SUNCE		PROLEĆ. TAČKA	VENERA		MARS	
	$S_\odot$	$\delta_\odot$	S_Υ	S_φ	δ_φ	S_σ	δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	180 27.1	22 21.9	252 6.9	131 3.2	22 59.1	177 24.6	23 13.3
2	210 26.9	22 22.5	282 11.8	161 3.0	22 58.0	207 25.8	23 13.7
4	240 26.7	22 23.1	312 16.8	191 2.8	22 56.8	237 27.0	23 14.1
6	270 26.5	22 23.7	342 21.7	221 2.5	22 55.6	267 28.2	23 14.5
8	300 26.3	22 24.3	12 26.6	251 2.3	22 54.5	297 29.4	23 14.9
10	330 26.1	22 24.8	42 31.6	281 2.1	22 53.3	327 30.6	23 15.3
12	0 25.9	22 25.4	72 36.5	311 1.9	22 52.1	357 31.8	23 15.7
14	30 25.6	22 26.0	102 41.4	341 1.7	22 50.9	27 33.0	23 16.1
16	60 25.4	22 26.6	132 46.3	11 1.5	22 49.8	57 34.2	23 16.5
18	90 25.2	22 27.2	162 51.3	41 1.3	22 48.6	87 35.4	23 16.9
20	120 25.0	22 27.7	192 56.2	71 1.1	22 47.4	117 36.6	23 17.3
22	150 24.8	22 28.3	223 1.1	101 1.0	22 46.2	147 37.8	23 17.7
Δ	-1	3		-1	-6	6	2

UT	MESEC				JUPITER		SATURN	
	$S_\leftmoon$	Δ	$\delta_\leftmoon$	Δ	$S_{\text{♃}}$	$\delta_{\text{♃}}$	$S_{\text{♄}}$	$\delta_{\text{♄}}$
h	° ′		° ′		° ′	° ′	° ′	° ′
0	342 37.5	78	18 25.9	-4	112 20.6	16 33.6	13 2.5	-18 10.9
2	11 31.1	78	18 25.1	-6	142 24.8	16 33.4	43 7.8	-18 10.9
4	40 24.7	77	18 23.8	-9	172 29.0	16 33.2	73 13.1	-18 10.8
6	69 18.1	77	18 22.1	-11	202 33.3	16 33.0	103 18.4	-18 10.7
8	98 11.5	77	18 19.9	-13	232 37.5	16 32.7	133 23.7	-18 10.7
10	127 4.8	76	18 17.3	-15	262 41.7	16 32.5	163 29.0	-18 10.6
12	155 58.0	76	18 14.2	-18	292 45.9	16 32.3	193 34.3	-18 10.5
14	184 51.3	76	18 10.7	-20	322 50.1	16 32.1	223 39.6	-18 10.5
16	213 44.4	76	18 6.8	-22	352 54.3	16 31.8	253 44.9	-18 10.4
18	242 37.6	76	18 2.4	-24	22 58.5	16 31.6	283 50.2	-18 10.3
20	271 30.7	76	17 57.5	-26	53 2.7	16 31.4	313 55.5	-18 10.3
22	300 23.8	75	17 52.2	-29	83 6.9	16 31.1	344 .8	-18 10.2
Δ					21	-1	26	0

φ	SUNCE		TRAJANJE SUMRAKA		MESEC			
	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 46	21 12	1 29	: ::	17 32	2.9	9 50	1.9
55	3 26	20 31	0 55	: ::	17 60	2.8	9 22	2.0
50	3 54	20 3	0 43	: ::	18 20	2.7	9 1	2.0
45	4 15	19 42	0 37	2 26	18 36	2.6	8 45	2.1
40	4 32	19 25	0 32	2 0	18 49	2.6	8 32	2.1
35	4 47	19 10	0 29	1 45	18 60	2.5	8 21	2.2
30	4 59	18 58	0 27	1 35	19 10	2.5	8 11	2.2
20	5 20	18 37	0 24	1 23	19 26	2.4	7 54	2.2
10	5 38	18 19	0 23	1 17	19 41	2.4	7 39	2.3
0	5 55	18 2	0 22	1 15	19 54	2.3	7 25	2.3
10	6 11	17 45	0 23	1 15	20 8	2.3	7 11	2.3
20	6 29	17 28	0 24	1 18	20 22	2.2	6 57	2.4
30	6 49	17 7	0 26	1 25	20 39	2.1	6 39	2.4
35	7 1	16 56	0 28	1 30	20 49	2.1	6 29	2.5
40	7 14	16 42	0 30	1 37	20 60	2.0	6 18	2.5
45	7 30	16 26	0 33	1 46	21 13	2.0	6 5	2.5
50	7 50	16 7	0 38	1 58	21 29	1.9	5 48	2.6
55	8 15	15 41	0 44	2 15	21 49	1.8	5 27	2.6
60	8 50	15 6	0 55	2 42	22 16	1.7	4 59	2.7
S								

SUNCE				MESEC			
UT	$e = T_p - UT$	Δ/24	r	Prolaz	Δ/24	$\pi_\leftmoon$	r
h	min s	s	′	h min	min	′	′
00	1 48.5	-.4	15.8	$T_{\overline{m}}$ 1 12	2.3	57.7	15.7
12	1 43.4	$T_{\overline{m}_\odot}$ 11 h 58.3 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	′	°	
♀	15 16	.1	239	-4.7	♆	16 28	.0	220	-1.5
♂	12 10	.1	285	1.7	♇	23 4	.0	121	.3

UT	SUNCE		PROLEĆ. TAČKA	VENERA		MARS	
	$S_\odot$	$\delta_\odot$	S_Υ	S_φ	δ_φ	S_σ	δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	180 24.6	22 28.9	253 6.1	131 .8	22 45.0	177 39.0	23 18.0
2	210 24.4	22 29.4	283 11.0	161 .6	22 43.8	207 40.2	23 18.4
4	240 24.1	22 30.0	313 15.9	191 .4	22 42.6	237 41.4	23 18.8
6	270 23.9	22 30.6	343 20.8	221 .3	22 41.4	267 42.6	23 19.2
8	300 23.7	22 31.1	13 25.8	251 .1	22 40.2	297 43.8	23 19.6
10	330 23.5	22 31.7	43 30.7	280 60.0	22 39.0	327 45.0	23 20.0
12	0 23.3	22 32.2	73 35.6	310 59.8	22 37.8	357 46.2	23 20.3
14	30 23.1	22 32.8	103 40.6	340 59.7	22 36.6	27 47.4	23 20.7
16	60 22.8	22 33.3	133 45.5	10 59.5	22 35.3	57 48.7	23 21.1
18	90 22.6	22 33.9	163 50.4	40 59.4	22 34.1	87 49.9	23 21.5
20	120 22.4	22 34.4	193 55.3	70 59.3	22 32.9	117 51.1	23 21.8
22	150 22.2	22 34.9	224 .3	100 59.2	22 31.7	147 52.3	23 22.2
Δ	-1	3		-1	-6	6	2

UT	MESEC				JUPITER		SATURN	
	$S_\leftmoon$	Δ	$\delta_\leftmoon$	Δ	$S_{\text{♃}}$	$\delta_{\text{♃}}$	$S_{\text{♄}}$	$\delta_{\text{♄}}$
h	° ′		° ′		° ′	° ′	° ′	° ′
0	329 16.9	75	17 46.5	-31	113 11.1	16 30.9	14 6.1	-18 10.2
2	358 10.0	76	17 40.3	-33	143 15.3	16 30.7	44 11.4	-18 10.1
4	27 3.1	76	17 33.7	-35	173 19.5	16 30.5	74 16.7	-18 10.0
6	55 56.2	76	17 26.6	-37	203 23.7	16 30.2	104 22.0	-18 10.0
8	84 49.4	76	17 19.1	-40	233 27.9	16 30.0	134 27.3	-18 9.9
10	113 42.5	76	17 11.2	-42	263 32.1	16 29.8	164 32.5	-18 9.8
12	142 35.7	76	17 2.9	-44	293 36.2	16 29.5	194 37.8	-18 9.8
14	171 29.0	76	16 54.1	-46	323 40.4	16 29.3	224 43.1	-18 9.7
16	200 22.2	77	16 44.9	-48	353 44.6	16 29.1	254 48.4	-18 9.6
18	229 15.6	77	16 35.3	-50	23 48.8	16 28.8	284 53.7	-18 9.6
20	258 9.0	77	16 25.2	-52	53 53.0	16 28.6	314 59.0	-18 9.5
22	287 2.4	78	16 14.8	-54	83 57.2	16 28.4	345 4.3	-18 9.5
Δ					21	-1	26	0

φ	SUNCE		TRAJANJE SUMRAKA		MESEC			
	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 44	21 13	1 30	: ::	18 42	3.2	10 34	1.5
55	3 25	20 32	0 56	: ::	19 6	3.0	10 9	1.7
50	3 54	20 4	0 43	: ::	19 25	2.9	9 50	1.8
45	4 15	19 42	0 37	2 27	19 39	2.8	9 36	1.9
40	4 32	19 25	0 32	2 1	19 50	2.7	9 23	1.9
35	4 46	19 11	0 29	1 45	20 1	2.6	9 13	2.0
30	4 59	18 58	0 27	1 35	20 9	2.6	9 4	2.1
20	5 20	18 37	0 24	1 23	20 24	2.5	8 48	2.2
10	5 38	18 19	0 23	1 17	20 38	2.4	8 34	2.2
0	5 55	18 2	0 22	1 15	20 50	2.3	8 21	2.3
10	6 11	17 45	0 23	1 15	21 2	2.2	8 8	2.4
20	6 29	17 28	0 24	1 18	21 15	2.1	7 54	2.4
30	6 50	17 7	0 26	1 25	21 30	2.0	7 38	2.5
35	7 1	16 55	0 28	1 30	21 39	1.9	7 28	2.6
40	7 15	16 42	0 30	1 37	21 49	1.9	7 18	2.6
45	7 31	16 26	0 33	1 46	22 0	1.8	7 5	2.7
50	7 50	16 6	0 38	1 58	22 14	1.7	6 49	2.8
55	8 16	15 41	0 45	2 16	22 32	1.5	6 30	2.9
60	8 52	15 5	0 56	2 42	22 56	1.3	6 3	3.1
S								

SUNCE				MESEC			
UT	$e = T_p - UT$	Δ/24	r	Prolaz	Δ/24	$\pi_\leftmoon$	r
h	min s	s	′	h min	min	′	′
00	1 38.3	-.4	15.8	$T_{\overline{m}}$ 2 8	2.3	58.2	15.9
12	1 33.1	$T_{\overline{m}_\odot}$ 11 h 58.4 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	′	°	
♀	15 16	.1	238	-4.7	♆	16 25	.0	220	-1.5
♂	12 9	.1	285	1.7	♇	22 60	.0	121	.3

UT	SUNCE		PROLEĆ. TAČKA	VENERA		MARS	
	$S_\odot$	$\delta_\odot$	S_Υ	S_φ	δ_φ	S_σ	δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	180 22.0	22 35.5	254 5.2	130 59.0	22 30.5	177 53.5	23 22.6
2	210 21.7	22 36.0	284 10.1	160 58.9	22 29.2	207 54.7	23 23.0
4	240 21.5	22 36.5	314 15.0	190 58.8	22 28.0	237 55.9	23 23.3
6	270 21.3	22 37.1	344 20.0	220 58.7	22 26.8	267 57.1	23 23.7
8	300 21.1	22 37.6	14 24.9	250 58.6	22 25.5	297 58.3	23 24.1
10	330 20.8	22 38.1	44 29.8	280 58.5	22 24.3	327 59.5	23 24.4
12	0 20.6	22 38.6	74 34.8	310 58.4	22 23.0	358 .7	23 24.8
14	30 20.4	22 39.1	104 39.7	340 58.3	22 21.8	28 1.9	23 25.1
16	60 20.2	22 39.7	134 44.6	10 58.3	22 20.5	58 3.1	23 25.5
18	90 19.9	22 40.2	164 49.5	40 58.2	22 19.3	88 4.3	23 25.9
20	120 19.7	22 40.7	194 54.5	70 58.1	22 18.0	118 5.5	23 26.2
22	150 19.5	22 41.2	224 59.4	100 58.1	22 16.8	148 6.7	23 26.6
Δ	−1	3		0	−6	6	2

UT	MESEC				JUPITER		SATURN	
	$S_\leftmoon$	Δ	$\delta_\leftmoon$	Δ	$S_{♃}$	$\delta_{♃}$	$S_{♄}$	$\delta_{♄}$
h	° ′		° ′		° ′	° ′	° ′	° ′
0	315 55.9	78	16 3.9	−56	114 1.4	16 28.1	15 9.6	−18 9.4
2	344 49.5	78	15 52.7	−58	144 5.6	16 27.9	45 14.9	−18 9.3
4	13 43.1	79	15 41.0	−60	174 9.8	16 27.7	75 20.2	−18 9.3
6	42 36.9	79	15 29.0	−62	204 14.0	16 27.5	105 25.5	−18 9.2
8	71 30.7	80	15 16.5	−64	234 18.2	16 27.2	135 30.8	−18 9.1
10	100 24.6	80	15 3.7	−66	264 22.3	16 27.0	165 36.1	−18 9.1
12	129 18.6	80	14 50.5	−68	294 26.5	16 26.8	195 41.4	−18 9.0
14	158 12.7	81	14 37.0	−70	324 30.7	16 26.5	225 46.7	−18 8.9
16	187 6.9	81	14 23.0	−71	354 34.9	16 26.3	255 52.0	−18 8.9
18	216 1.2	82	14 8.8	−73	24 39.1	16 26.1	285 57.3	−18 8.8
20	244 55.6	82	13 54.1	−75	54 43.3	16 25.8	316 2.6	−18 8.8
22	273 50.1	83	13 39.1	−77	84 47.4	16 25.6	346 7.9	−18 8.7
Δ					21	−1	26	0

φ	SUNCE		TRAJANJE SUMRAKA		MESEC			
	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 43	21 15	1 32	: ::	19 60	3.4	11 10	1.2
55	3 25	20 33	0 56	: ::	20 19	3.2	10 49	1.4
50	3 53	20 5	0 44	: ::	20 34	3.0	10 33	1.6
45	4 14	19 43	0 37	2 28	20 46	2.9	10 21	1.7
40	4 32	19 26	0 32	2 1	20 56	2.8	10 10	1.8
35	4 46	19 11	0 29	1 46	21 4	2.7	10 1	1.9
30	4 59	18 59	0 27	1 35	21 11	2.6	9 53	1.9
20	5 20	18 38	0 24	1 23	21 24	2.5	9 40	2.1
10	5 38	18 19	0 23	1 17	21 34	2.4	9 27	2.2
0	5 55	18 2	0 22	1 15	21 45	2.2	9 16	2.3
10	6 12	17 45	0 23	1 15	21 55	2.1	9 5	2.4
20	6 30	17 28	0 24	1 18	22 6	2.0	8 53	2.5
30	6 50	17 7	0 26	1 25	22 18	1.9	8 39	2.6
35	7 2	16 55	0 28	1 30	22 25	1.8	8 30	2.7
40	7 15	16 42	0 30	1 37	22 33	1.7	8 21	2.8
45	7 32	16 26	0 33	1 46	22 43	1.6	8 10	2.9
50	7 51	16 6	0 38	1 58	22 54	1.5	7 57	3.0
55	8 17	15 40	0 45	2 16	23 8	1.3	7 40	3.1
60	8 53	15 4	0 56	2 43	23 27	2.2	7 18	3.4
S								

SUNCE				MESEC			
UT	e = T_p − UT	Δ/24	r	Prolaz		Δ/24	$\pi_\leftmoon$	r
h	min s	s	′		h min	min	′	′
00	1 27.8	−.5	15.8	$T_{\overline{m}}$	3 3	2.3	58.6	16.0
12	1 22.4	$T_{\overline{m}_\odot}$	11 h 58.6 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	′	°	
♀	15 16	.1	237	−4.7	♃	16 22	.0	220	−1.5
♂	12 8	.1	284	1.7	♄	22 55	.0	121	.3

UT	SUNCE		PROLEĆ. TAČKA	VENERA		MARS	
	$S_\odot$	$\delta_\odot$	S_Υ	S_φ	δ_φ	S_σ	δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	180 19.2	22 41.7	255 4.3	130 58.0	22 15.5	178 7.9	23 26.9
2	210 19.0	22 42.2	285 9.3	160 57.9	22 14.2	208 9.1	23 27.3
4	240 18.8	22 42.7	315 14.2	190 57.9	22 13.0	238 10.3	23 27.6
6	270 18.6	22 43.2	345 19.1	220 57.8	22 11.7	268 11.5	23 28.0
8	300 18.3	22 43.7	15 24.0	250 57.8	22 10.4	298 12.7	23 28.3
10	330 18.1	22 44.1	45 29.0	280 57.8	22 9.2	328 13.9	23 28.7
12	0 17.9	22 44.6	75 33.9	310 57.7	22 7.9	358 15.1	23 29.0
14	30 17.6	22 45.1	105 38.8	340 57.7	22 6.6	28 16.3	23 29.3
16	60 17.4	22 45.6	135 43.8	10 57.7	22 5.3	58 17.5	23 29.7
18	90 17.2	22 46.1	165 48.7	40 57.7	22 4.0	88 18.8	23 30.0
20	120 16.9	22 46.5	195 53.6	70 57.7	22 2.7	118 20.0	23 30.4
22	150 16.7	22 47.0	225 58.5	100 57.7	22 1.5	148 21.2	23 30.7
Δ	−1	2		0	−6	6	2

UT	MESEC				JUPITER		SATURN	
	$S_\leftmoon$	Δ	$\delta_\leftmoon$	Δ	$S_{♃}$	$\delta_{♃}$	$S_{♄}$	$\delta_{♄}$
h	° ′		° ′		° ′	° ′	° ′	° ′
0	302 44.7	84	13 23.8	−78	114 51.6	16 25.3	16 13.1	−18 8.6
2	331 39.4	84	13 8.2	−80	144 55.8	16 25.1	46 18.4	−18 8.6
4	0 34.2	85	12 52.2	−81	174 60.0	16 24.9	76 23.7	−18 8.5
6	29 29.1	85	12 35.9	−83	205 4.2	16 24.6	106 29.0	−18 8.4
8	58 24.2	86	12 19.3	−85	235 8.3	16 24.4	136 34.3	−18 8.4
10	87 19.3	86	12 2.4	−86	265 12.5	16 24.2	166 39.6	−18 8.3
12	116 14.6	87	11 45.1	−87	295 16.7	16 23.9	196 44.9	−18 8.3
14	145 10.0	87	11 27.6	−89	325 20.9	16 23.7	226 50.2	−18 8.2
16	174 5.5	88	11 9.9	−90	355 25.1	16 23.5	256 55.5	−18 8.1
18	203 1.1	89	10 51.8	−92	25 29.2	16 23.2	287 .8	−18 8.1
20	231 56.8	89	10 33.5	−93	55 33.4	16 23.0	317 6.1	−18 8.0
22	260 52.6	90	10 14.9	−94	85 37.6	16 22.7	347 11.3	−18 7.9
Δ					21	−1	26	0

φ	SUNCE		TRAJANJE SUMRAKA		MESEC			
	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 42	21 16	1 33	: ::	21 22	3.5	11 38	1.0
55	3 24	20 34	0 56	: ::	21 36	3.3	11 22	1.2
50	3 53	20 6	0 44	: ::	21 47	3.1	11 10	1.4
45	4 14	19 44	0 37	2 29	21 55	2.9	11 1	1.5
40	4 31	19 26	0 33	2 1	22 2	2.8	10 53	1.6
35	4 46	19 12	0 29	1 46	22 8	2.7	10 46	1.7
30	4 58	18 59	0 27	1 36	22 14	2.6	10 39	1.8
20	5 20	18 38	0 24	1 23	22 23	2.5	10 29	2.0
10	5 38	18 20	0 23	1 17	22 31	2.3	10 19	2.1
0	5 55	18 2	0 22	1 15	22 38	2.2	10 10	2.2
10	6 12	17 46	0 23	1 15	22 46	2.1	10 2	2.3
20	6 30	17 28	0 24	1 18	22 54	1.9	9 52	2.5
30	6 50	17 7	0 26	1 25	23 3	1.8	9 41	2.6
35	7 2	16 55	0 28	1 30	23 8	1.7	9 35	2.7
40	7 16	16 41	0 30	1 37	23 14	1.6	9 27	2.8
45	7 32	16 25	0 34	1 46	23 21	2.2	9 19	2.9
50	7 52	16 5	0 38	1 58	23 29	2.2	9 8	3.1
55	8 18	15 39	0 45	2 16	23 39	2.2	8 55	3.3
60	8 55	15 3	0 56	2 43	.. ..	.0	8 38	3.5
S								

SUNCE				MESEC			
UT	e = T_p − UT	Δ/24	r	Prolaz		Δ/24	$\pi_\leftmoon$	r
h	min s	s	′		h min	min	′	′
00	1 17.0	−.5	15.8	$T_{\overline{m}}$	3 58	2.2	58.9	16.0
12	1 11.4	$T_{\overline{m}_\odot}$	11 h 58.8 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	′	°	
♀	15 16	.1	236	−4.7	♃	16 18	.0	220	−1.5
♂	12 7	.1	283	1.7	♄	22 51	.0	121	.3

UT	SUNCE		PROLEĆ. TAČKA	VENERA		MARS	
	$S_\odot$	$\delta_\odot$	S_Υ	S_φ	δ_φ	S_σ	δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	180 16.5	22 47.5	256 3.5	130 57.7	22 .2	178 22.4	23 31.0
2	210 16.2	22 48.0	286 8.4	160 57.7	21 58.9	208 23.6	23 31.4
4	240 16.0	22 48.4	316 13.3	190 57.7	21 57.6	238 24.8	23 31.7
6	270 15.8	22 48.9	346 18.3	220 57.7	21 56.3	268 26.0	23 32.0
8	300 15.5	22 49.3	16 23.2	250 57.7	21 55.0	298 27.2	23 32.4
10	330 15.3	22 49.8	46 28.1	280 57.7	21 53.7	328 28.4	23 32.7
12	0 15.0	22 50.2	76 33.0	310 57.8	21 52.3	358 29.6	23 33.0
14	30 14.8	22 50.7	106 38.0	340 57.8	21 51.0	28 30.8	23 33.3
16	60 14.6	22 51.1	136 42.9	10 57.8	21 49.7	58 32.0	23 33.7
18	90 14.3	22 51.6	166 47.8	40 57.9	21 48.4	88 33.2	23 34.0
20	120 14.1	22 52.0	196 52.8	70 57.9	21 47.1	118 34.4	23 34.3
22	150 13.8	22 52.5	226 57.7	100 58.0	21 45.8	148 35.6	23 34.6
Δ	−1	2		0	−7	6	2

UT	MESEC				JUPITER		SATURN	
	$S_\leftmoon$	Δ	$\delta_\leftmoon$	Δ	$S_{\mathrm{♃}}$	$\delta_{\mathrm{♃}}$	$S_{\mathrm{♄}}$	$\delta_{\mathrm{♄}}$
h	° ′		° ′		° ′	° ′	° ′	° ′
0	289 48.5	90	9 56.1	−95	115 41.8	16 22.5	17 16.6	−18 7.9
2	318 44.5	91	9 37.0	−97	145 45.9	16 22.3	47 21.9	−18 7.8
4	347 40.6	91	9 17.7	−98	175 50.1	16 22.0	77 27.2	−18 7.8
6	16 36.9	92	8 58.2	−99	205 54.3	16 21.8	107 32.5	−18 7.7
8	45 33.2	92	8 38.4	−100	235 58.4	16 21.6	137 37.8	−18 7.6
10	74 29.6	93	8 18.5	−101	266 2.6	16 21.3	167 43.1	−18 7.6
12	103 26.1	93	7 58.3	−102	296 6.8	16 21.1	197 48.4	−18 7.5
14	132 22.7	93	7 37.9	−103	326 10.9	16 20.8	227 53.7	−18 7.4
16	161 19.4	94	7 17.4	−104	356 15.1	16 20.6	257 58.9	−18 7.4
18	190 16.2	94	6 56.7	−104	26 19.3	16 20.4	288 4.2	−18 7.3
20	219 13.1	95	6 35.8	−105	56 23.5	16 20.1	318 9.5	−18 7.3
22	248 10.0	95	6 14.8	−106	86 27.6	16 19.9	348 14.8	−18 7.2
Δ					21	−1	26	0

φ	SUNCE		TRAJANJE SUMRAKA		MESEC			
	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 41	21 18	1 35	: ::	22 47	3.6	12 1	.9
55	3 23	20 35	0 56	: ::	22 55	2.2	11 51	1.1
50	3 52	20 6	0 44	: ::	23 1	2.2	11 43	1.3
45	4 14	19 45	0 37	2 29	23 6	2.2	11 37	1.4
40	4 31	19 27	0 33	2 1	23 10	2.2	11 32	1.5
35	4 46	19 12	0 30	1 46	23 14	2.2	11 27	1.6
30	4 58	18 60	0 27	1 36	23 17	2.2	11 23	1.7
20	5 20	18 38	0 24	1 24	23 22	2.2	11 16	1.9
10	5 38	18 20	0 23	1 17	23 27	2.2	11 10	2.0
0	5 55	18 3	0 22	1 15	23 31	2.2	11 4	2.2
10	6 12	17 46	0 23	1 15	23 36	2.2	10 58	2.3
20	6 30	17 28	0 24	1 18	23 40	2.2	10 51	2.5
30	6 51	17 7	0 26	1 25	23 45	2.2	10 44	2.6
35	7 3	16 55	0 28	1 30	23 48	2.1	10 40	2.7
40	7 17	16 41	0 30	1 37	23 52	2.1	10 35	2.8
45	7 33	16 25	0 34	1 46	. . .	.0	10 29	3.0
50	7 53	16 5	0 38	1 59	. . .	.0	10 22	3.1
55	8 19	15 39	0 45	2 16	. . .	.0	10 14	3.3
60	8 56	15 2	0 56	2 44	0 −7	.9	10 2	3.6
S								

SUNCE				MESEC			
UT	e = T_p − UT	Δ/24	r	Prolaz		Δ/24	$\pi_\leftmoon$	r
h	min s	s	′	$T_{\overline{m}}$	h min	min	′	′
00	1 5.9	−.5	15.8	$T_{\overline{m}}$	4 51	2.2	59.1	16.1
12	1 .1	$T_{\overline{m}_\odot}$	11 h 59.0 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	′	°	
♀	15 16	.1	235	−4.8	♆	16 15	.0	220	−1.5
♂	12 6	.1	282	1.7	♄	22 47	.0	121	.3

UT	SUNCE		PROLEĆ. TAČKA	VENERA		MARS	
	$S_\odot$	$\delta_\odot$	S_Υ	S_φ	δ_φ	S_σ	δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	180 13.6	22 52.9	257 2.6	130 58.1	21 44.4	178 36.8	23 34.9
2	210 13.4	22 53.3	287 7.5	160 58.1	21 43.1	208 38.0	23 35.2
4	240 13.1	22 53.8	317 12.5	190 58.2	21 41.8	238 39.2	23 35.6
6	270 12.9	22 54.2	347 17.4	220 58.3	21 40.4	268 40.4	23 35.9
8	300 12.6	22 54.6	17 22.3	250 58.4	21 39.1	298 41.6	23 36.2
10	330 12.4	22 55.0	47 27.3	280 58.4	21 37.8	328 42.8	23 36.5
12	0 12.2	22 55.4	77 32.2	310 58.5	21 36.4	358 44.0	23 36.8
14	30 11.9	22 55.9	107 37.1	340 58.6	21 35.1	28 45.2	23 37.1
16	60 11.7	22 56.3	137 42.0	10 58.7	21 33.8	58 46.5	23 37.4
18	90 11.4	22 56.7	167 47.0	40 58.8	21 32.4	88 47.7	23 37.7
20	120 11.2	22 57.1	197 51.9	70 59.0	21 31.1	118 48.9	23 38.0
22	150 10.9	22 57.5	227 56.8	100 59.1	21 29.7	148 50.1	23 38.3
Δ	−1	2		0	−7	6	2

UT	MESEC				JUPITER		SATURN	
	$S_\leftmoon$	Δ	$\delta_\leftmoon$	Δ	$S_{\mathrm{♃}}$	$\delta_{\mathrm{♃}}$	$S_{\mathrm{♄}}$	$\delta_{\mathrm{♄}}$
h	° ′		° ′		° ′	° ′	° ′	° ′
0	277 7.0	95	5 53.6	−107	116 31.8	16 19.6	18 20.1	−18 7.1
2	306 4.1	96	5 32.3	−107	146 35.9	16 19.4	48 25.4	−18 7.1
4	335 1.2	96	5 10.8	−108	176 40.1	16 19.2	78 30.7	−18 7.0
6	3 58.5	96	4 49.2	−109	206 44.3	16 18.9	108 36.0	−18 7.0
8	32 55.7	97	4 27.5	−109	236 48.4	16 18.7	138 41.2	−18 6.9
10	61 53.1	97	4 5.7	−110	266 52.6	16 18.4	168 46.5	−18 6.8
12	90 50.4	97	3 43.8	−110	296 56.8	16 18.2	198 51.8	−18 6.8
14	119 47.9	97	3 21.8	−110	327 .9	16 17.9	228 57.1	−18 6.7
16	148 45.3	98	2 59.7	−111	357 5.1	16 17.7	259 2.4	−18 6.6
18	177 42.8	98	2 37.6	−111	27 9.2	16 17.5	289 7.7	−18 6.6
20	206 40.4	98	2 15.3	−111	57 13.4	16 17.2	319 12.9	−18 6.5
22	235 37.9	98	1 53.1	−112	87 17.6	16 17.0	349 18.2	−18 6.5
Δ					21	−1	26	0

φ	SUNCE		TRAJANJE SUMRAKA		MESEC			
	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 40	21 19	1 36	: ::	. . .	.0	12 22	1.3
55	3 23	20 36	0 57	: ::	23 48	2.9	12 17	1.5
50	3 52	20 7	0 44	: ::	23 54	2.8	12 14	1.6
45	4 14	19 45	0 37	2 30	23 59	2.7	12 11	1.7
40	4 31	19 28	0 33	2 2	. . .	.0	12 9	1.7
35	4 46	19 13	0 30	1 46	. . .	.0	12 7	1.8
30	4 58	19 0	0 27	1 36	. . .	.0	12 5	1.9
20	5 20	18 39	0 24	1 24	. . .	.0	12 1	2.0
10	5 38	18 20	0 23	1 17	. . .	.0	11 59	2.1
0	5 56	18 3	0 22	1 15	. . .	.0	11 56	2.2
10	6 13	17 46	0 23	1 15	. . .	.0	11 53	2.2
20	6 31	17 28	0 24	1 18	. . .	.0	11 50	2.3
30	6 51	17 7	0 26	1 25	. . .	.0	11 47	2.4
35	7 3	16 55	0 28	1 30	. . .	.0	11 45	2.5
40	7 17	16 41	0 30	1 37	. . .	.0	11 43	2.6
45	7 34	16 25	0 34	1 46	0 −4	1.8	11 40	2.7
50	7 54	16 5	0 38	1 59	0 1	1.7	11 37	2.8
55	8 20	15 38	0 45	2 16	0 7	1.6	11 33	2.9
60	8 57	15 1	0 57	2 44	0 15	1.5	11 28	3.1
S								

SUNCE				MESEC			
UT	e = T_p − UT	Δ/24	r	Prolaz		Δ/24	$\pi_\leftmoon$	r
h	min s	s	′	$T_{\overline{m}}$	h min	min	′	′
00	0 54.4	−.5	15.8	$T_{\overline{m}}$	5 44	2.1	59.2	16.1
12	0 48.6	$T_{\overline{m}_\odot}$	11 h 59.2 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	′	°	
♀	15 16	.1	234	−4.8	♆	16 12	.0	219	−1.5
♂	12 5	.1	282	1.7	♄	22 43	.0	121	.3

UT	SUNCE $S_\odot$	SUNCE $\delta_\odot$	PROLEĆ. TAČKA S_Υ	VENERA S_φ	VENERA δ_φ	MARS S_σ	MARS δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	180 10.7	22 57.9	258 1.7	130 59.2	21 28.3	178 51.3	23 38.6
2	210 10.4	22 58.3	288 6.7	160 59.3	21 27.0	208 52.5	23 38.9
4	240 10.2	22 58.7	318 11.6	190 59.5	21 25.6	238 53.7	23 39.2
6	270 9.9	22 59.1	348 16.5	220 59.6	21 24.3	268 54.9	23 39.5
8	300 9.7	22 59.5	18 21.5	250 59.7	21 22.9	298 56.1	23 39.8
10	330 9.4	22 59.9	48 26.4	280 59.9	21 21.5	328 57.3	23 40.1
12	0 9.2	23 .2	78 31.3	311 .1	21 20.2	358 58.5	23 40.4
14	30 8.9	23 .6	108 36.2	341 .2	21 18.8	28 59.7	23 40.7
16	60 8.7	23 1.0	138 41.2	11 .4	21 17.4	59 .9	23 41.0
18	90 8.4	23 1.4	168 46.1	41 .5	21 16.1	89 2.1	23 41.2
20	120 8.2	23 1.8	198 51.0	71 .7	21 14.7	119 3.3	23 41.5
22	150 7.9	23 2.1	228 56.0	101 .9	21 13.3	149 4.5	23 41.8
Δ	-1	2		1	-7	6	1

UT	MESEC $S_\leftmoon$	MESEC Δ	MESEC $\delta_\leftmoon$	MESEC Δ	JUPITER $S_\jupiter$	JUPITER $\delta_\jupiter$	SATURN $S_\saturn$	SATURN $\delta_\saturn$
h	° ′		° ′		° ′	° ′	° ′	° ′
0	264 35.5	98	1 30.8	-112	117 21.7	16 16.7	19 23.5	-18 6.4
2	293 33.1	98	1 8.4	-112	147 25.9	16 16.5	49 28.8	-18 6.3
4	322 30.7	98	0 46.0	-112	177 30.0	16 16.2	79 34.1	-18 6.3
6	351 28.3	98	0 23.6	-112	207 34.2	16 16.0	109 39.4	-18 6.2
8	20 26.0	98	0 1.2	100	237 38.3	16 15.7	139 44.6	-18 6.2
10	49 23.6	98	0 21.2	112	267 42.5	16 15.5	169 49.9	-18 6.1
12	78 21.2	98	0 43.6	112	297 46.6	16 15.3	199 55.2	-18 6.0
14	107 18.8	98	1 6.0	112	327 50.8	16 15.0	230 .5	-18 6.0
16	136 16.4	98	1 28.3	112	357 54.9	16 14.8	260 5.8	-18 5.9
18	165 14.0	98	1 50.6	111	27 59.1	16 14.5	290 11.1	-18 5.9
20	194 11.6	98	2 12.9	111	58 3.3	16 14.3	320 16.3	-18 5.8
22	223 9.1	97	2 35.1	111	88 7.4	16 14.0	350 21.6	-18 5.7
Δ					21	-1	26	0

φ	SUNCE IZLAZ	SUNCE ZALAZ	TRAJANJE SUMRAKA GRAĐ.	TRAJANJE SUMRAKA ASTR.	MESEC IZLAZ	MESEC Δ/24	MESEC ZALAZ	MESEC Δ/24
N	h min	h min	h min	h min	h min	min	h min	min
60	2 39	21 20	1 37	: ::	0 -1	2.3	12 53	3.6
55	3 22	20 37	0 57	: ::	. . . .	.0	12 52	3.3
50	3 51	20 8	0 44	: ::	. . . .	.0	12 52	3.1
45	4 13	19 46	0 37	2 30	. . . .	.0	12 51	3.0
40	4 31	19 28	0 33	2 2	0 11	2.2	12 50	2.8
35	4 46	19 13	0 30	1 46	0 13	2.2	12 50	2.7
30	4 58	19 1	0 27	1 36	0 14	2.2	12 50	2.6
20	5 20	18 39	0 24	1 24	0 18	2.2	12 49	2.5
10	5 38	18 20	0 23	1 17	0 20	2.2	12 48	2.3
0	5 56	18 3	0 22	1 15	0 23	2.2	12 48	2.2
10	6 13	17 46	0 23	1 15	0 26	2.1	12 47	2.0
20	6 31	17 28	0 24	1 18	0 29	2.1	12 46	1.9
30	6 52	17 7	0 26	1 25	0 32	2.1	12 45	1.7
35	7 4	16 55	0 28	1 30	0 34	2.1	12 45	1.6
40	7 18	16 41	0 30	1 37	0 36	2.1	12 44	1.5
45	7 34	16 24	0 34	1 46	0 39	2.1	12 44	1.4
50	7 54	16 4	0 38	1 59	0 42	2.0	12 43	1.2
55	8 21	15 38	0 45	2 17	0 46	2.0	12 42	1.0
60	8 58	15 0	0 57	2 44	0 51	2.0	12 41	.8
S								

SUNCE UT	SUNCE $e = T_p - UT$	SUNCE Δ/24	SUNCE r	MESEC Prolaz	MESEC Δ/24	MESEC $\pi_\leftmoon$	MESEC r
h	min s	s	′	h min	min	′	′
00	0 42.7	-.5	15.8	$T_{\overline{m}}$ 6 35	2.2	59.3	16.2
12	0 36.7	$T_{\overline{m}_\odot}$ 11 h 59.4 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	′	°	
♀	15 16	.1	233	-4.8	♃	16 8	.0	219	-1.5
♂	12 4	.1	281	1.7	♄	22 38	.0	121	.3

UT	SUNCE $S_\odot$	SUNCE $\delta_\odot$	PROLEĆ. TAČKA S_Υ	VENERA S_φ	VENERA δ_φ	MARS S_σ	MARS δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	180 7.7	23 2.5	259 .9	131 1.1	21 11.9	179 5.7	23 42.1
2	210 7.4	23 2.9	289 5.8	161 1.3	21 10.5	209 6.9	23 42.4
4	240 7.2	23 3.2	319 10.7	191 1.5	21 9.1	239 8.1	23 42.6
6	270 6.9	23 3.6	349 15.7	221 1.7	21 7.7	269 9.3	23 42.9
8	300 6.7	23 3.9	19 20.6	251 1.9	21 6.4	299 10.5	23 43.2
10	330 6.4	23 4.3	49 25.5	281 2.1	21 5.0	329 11.8	23 43.5
12	0 6.2	23 4.6	79 30.5	311 2.3	21 3.6	359 13.0	23 43.7
14	30 5.9	23 5.0	109 35.4	341 2.6	21 2.2	29 14.2	23 44.0
16	60 5.7	23 5.3	139 40.3	11 2.8	21 .8	59 15.4	23 44.3
18	90 5.4	23 5.7	169 45.2	41 3.0	20 59.4	89 16.6	23 44.5
20	120 5.1	23 6.0	199 50.2	71 3.3	20 58.0	119 17.8	23 44.8
22	150 4.9	23 6.3	229 55.1	101 3.5	20 56.5	149 19.0	23 45.1
Δ	-1	2		1	-7	6	1

UT	MESEC $S_\leftmoon$	MESEC Δ	MESEC $\delta_\leftmoon$	MESEC Δ	JUPITER $S_\jupiter$	JUPITER $\delta_\jupiter$	SATURN $S_\saturn$	SATURN $\delta_\saturn$
h	° ′		° ′		° ′	° ′	° ′	° ′
0	252 6.6	97	2 57.3	110	118 11.6	16 13.8	20 26.9	-18 5.7
2	281 4.1	97	3 19.4	110	148 15.7	16 13.5	50 32.2	-18 5.6
4	310 1.5	97	3 41.4	110	178 19.8	16 13.3	80 37.5	-18 5.6
6	338 58.9	97	4 3.3	109	208 24.0	16 13.0	110 42.7	-18 5.5
8	7 56.2	96	4 25.2	109	238 28.1	16 12.8	140 48.0	-18 5.4
10	36 53.5	96	4 46.9	108	268 32.3	16 12.5	170 53.3	-18 5.4
12	65 50.7	96	5 8.5	107	298 36.4	16 12.3	200 58.6	-18 5.3
14	94 47.8	95	5 30.0	107	328 40.6	16 12.0	231 3.9	-18 5.3
16	123 44.9	95	5 51.3	106	358 44.7	16 11.8	261 9.1	-18 5.2
18	152 41.9	95	6 12.6	105	28 48.9	16 11.5	291 14.4	-18 5.1
20	181 38.9	94	6 33.6	105	58 53.0	16 11.3	321 19.7	-18 5.1
22	210 35.8	94	6 54.5	104	88 57.2	16 11.0	351 25.0	-18 5.0
Δ					21	-1	26	0

φ	SUNCE IZLAZ	SUNCE ZALAZ	TRAJANJE SUMRAKA GRAĐ.	TRAJANJE SUMRAKA ASTR.	MESEC IZLAZ	MESEC Δ/24	MESEC ZALAZ	MESEC Δ/24
N	h min	h min	h min	h min	h min	min	h min	min
60	2 39	21 21	1 39	: ::	0 53	.8	14 19	3.5
55	3 22	20 38	0 57	: ::	0 57	1.1	14 12	3.3
50	3 51	20 8	0 44	: ::	0 60	1.3	14 7	3.1
45	4 13	19 46	0 37	2 31	1 2	1.4	14 2	2.9
40	4 31	19 29	0 33	2 2	1 4	1.5	13 58	2.8
35	4 46	19 14	0 30	1 46	1 6	1.6	13 55	2.7
30	4 58	19 1	0 27	1 36	1 7	1.7	13 53	2.6
20	5 20	18 39	0 25	1 24	1 10	1.9	13 48	2.5
10	5 39	18 21	0 23	1 17	1 12	2.0	13 43	2.3
0	5 56	18 3	0 22	1 15	1 15	2.2	13 39	2.2
10	6 13	17 46	0 23	1 15	1 17	2.3	13 35	2.1
20	6 31	17 28	0 24	1 19	1 20	2.5	13 31	1.9
30	6 52	17 7	0 26	1 25	1 23	2.6	13 26	1.8
35	7 4	16 55	0 28	1 30	1 24	2.7	13 24	1.7
40	7 18	16 41	0 30	1 37	1 26	2.8	13 20	1.6
45	7 35	16 24	0 34	1 46	1 29	3.0	13 17	1.4
50	7 55	16 4	0 38	1 59	1 31	3.1	13 13	1.3
55	8 22	15 37	0 45	2 17	1 35	3.3	13 7	1.1
60	8 59	14 60	0 57	2 45	1 39	3.6	13 0	.9
S								

SUNCE UT	SUNCE $e = T_p - UT$	SUNCE Δ/24	SUNCE r	MESEC Prolaz	MESEC Δ/24	MESEC $\pi_\leftmoon$	MESEC r
h	min s	s	′	h min	min	′	′
00	0 30.8	-.5	15.8	$T_{\overline{m}}$ 7 27	2.2	59.3	16.2
12	0 24.7	$T_{\overline{m}_\odot}$ 11 h 59.6 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	′	°	
♀	15 16	.1	232	-4.8	♃	16 5	.0	219	-1.4
♂	12 3	.1	280	1.7	♄	22 34	.0	121	.3

UT	SUNCE		PROLEĆ. TAČKA	VENERA		MARS	
	$S_\odot$	$\delta_\odot$	S_Υ	S_φ	δ_φ	S_σ	δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	180 4.6	23 6.7	260 .0	131 3.8	20 55.1	179 20.2	23 45.3
2	210 4.4	23 7.0	290 5.0	161 4.0	20 53.7	209 21.4	23 45.6
4	240 4.1	23 7.3	320 9.9	191 4.3	20 52.3	239 22.6	23 45.9
6	270 3.9	23 7.7	350 14.8	221 4.5	20 50.9	269 23.8	23 46.1
8	300 3.6	23 8.0	20 19.7	251 4.8	20 49.5	299 25.0	23 46.4
10	330 3.3	23 8.3	50 24.7	281 5.1	20 48.0	329 26.2	23 46.6
12	0 3.1	23 8.6	80 29.6	311 5.4	20 46.6	359 27.4	23 46.9
14	30 2.8	23 8.9	110 34.5	341 5.7	20 45.2	29 28.6	23 47.1
16	60 2.6	23 9.2	140 39.5	11 6.0	20 43.8	59 29.8	23 47.4
18	90 2.3	23 9.6	170 44.4	41 6.3	20 42.3	89 31.0	23 47.6
20	120 2.1	23 9.9	200 49.3	71 6.6	20 40.9	119 32.3	23 47.9
22	150 1.8	23 10.2	230 54.2	101 6.9	20 39.5	149 33.5	23 48.1
Δ	-1	2		1	-7	6	1

UT	MESEC				JUPITER		SATURN	
	$S_\leftmoon$	Δ	$\delta_\leftmoon$	Δ	$S_{\mathrm{♃}}$	$\delta_{\mathrm{♃}}$	$S_{\mathrm{♄}}$	$\delta_{\mathrm{♄}}$
h	° ′		° ′		° ′	° ′	° ′	° ′
0	239 32.6	94	7 15.3	103	119 1.3	16 10.8	21 30.2	-18 5.0
2	268 29.3	93	7 35.8	102	149 5.4	16 10.5	51 35.5	-18 4.9
4	297 25.9	93	7 56.2	101	179 9.6	16 10.3	81 40.8	-18 4.9
6	326 22.4	92	8 16.4	100	209 13.7	16 10.0	111 46.1	-18 4.8
8	355 18.9	92	8 36.4	99	239 17.9	16 9.8	141 51.3	-18 4.7
10	24 15.3	91	8 56.2	98	269 22.0	16 9.5	171 56.6	-18 4.7
12	53 11.5	91	9 15.7	97	299 26.1	16 9.3	202 1.9	-18 4.6
14	82 7.7	90	9 35.1	95	329 30.3	16 9.0	232 7.2	-18 4.6
16	111 3.8	90	9 54.2	94	359 34.4	16 8.8	262 12.4	-18 4.5
18	139 59.8	89	10 13.0	93	29 38.5	16 8.5	292 17.7	-18 4.4
20	168 55.7	89	10 31.6	92	59 42.7	16 8.3	322 23.0	-18 4.4
22	197 51.4	88	10 50.0	90	89 46.8	16 8.0	352 28.3	-18 4.3
Δ					21	-1	26	0

φ	SUNCE		TRAJANJE SUMRAKA		MESEC			
	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 40	: ::	1 13	.9	15 44	3.5
55	3 21	20 39	0 57	: ::	1 23	1.2	15 31	3.2
50	3 51	20 9	0 44	: ::	1 30	1.4	15 21	3.0
45	4 13	19 47	0 37	2 31	1 36	1.5	15 13	2.9
40	4 31	19 29	0 33	2 2	1 41	1.6	15 6	2.8
35	4 45	19 14	0 30	1 47	1 45	1.7	15 0	2.7
30	4 58	19 1	0 27	1 36	1 49	1.8	14 55	2.6
20	5 20	18 40	0 25	1 24	1 55	2.0	14 47	2.5
10	5 39	18 21	0 23	1 18	2 1	2.1	14 39	2.3
0	5 56	18 3	0 22	1 15	2 7	2.2	14 32	2.2
10	6 13	17 46	0 23	1 15	2 13	2.3	14 25	2.1
20	6 32	17 28	0 24	1 19	2 19	2.5	14 17	2.0
30	6 53	17 7	0 26	1 25	2 26	2.6	14 9	1.9
35	7 5	16 55	0 28	1 31	2 30	2.7	14 4	1.8
40	7 19	16 41	0 30	1 37	2 34	2.8	13 58	1.7
45	7 35	16 24	0 34	1 47	2 40	2.9	13 52	1.6
50	7 56	16 4	0 38	1 59	2 46	3.1	13 44	1.4
55	8 22	15 37	0 45	2 17	2 54	3.3	13 34	1.3
60	9 0	14 59	0 57	2 45	3 5	3.5	13 22	1.0
S								

SUNCE				MESEC			
UT	e = Tp − UT	Δ/24	r	Prolaz		Δ/24	$\pi_\leftmoon$	r
h	min s	s	′		h min	min	′	′
00	0 18.5	-.5	15.8	$T_{\overline{m}}$	8 19	2.2	59.2	16.1
12	0 12.3	$T_{\overline{m}_\odot}$ 11 h 59.8 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	′	°	
♀	15 16	.1	231	-4.9	♃	16 2	.0	219	-1.4
♂	12 2	.1	279	1.7	♄	22 30	.0	121	.3

UT	SUNCE		PROLEĆ. TAČKA	VENERA		MARS	
	$S_\odot$	$\delta_\odot$	S_Υ	S_φ	δ_φ	S_σ	δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	180 1.5	23 10.5	260 59.2	131 7.2	20 38.0	179 34.7	23 48.4
2	210 1.3	23 10.8	291 4.1	161 7.5	20 36.6	209 35.9	23 48.6
4	240 1.0	23 11.1	321 9.0	191 7.9	20 35.1	239 37.1	23 48.9
6	270 .7	23 11.3	351 13.9	221 8.2	20 33.7	269 38.3	23 49.1
8	300 .5	23 11.6	21 18.9	251 8.5	20 32.3	299 39.5	23 49.4
10	330 .2	23 11.9	51 23.8	281 8.9	20 30.8	329 40.7	23 49.6
12	360 .0	23 12.2	81 28.7	311 9.2	20 29.4	359 41.9	23 49.8
14	29 59.7	23 12.5	111 33.7	341 9.6	20 27.9	29 43.1	23 50.1
16	59 59.4	23 12.8	141 38.6	11 10.0	20 26.5	59 44.3	23 50.3
18	89 59.2	23 13.0	171 43.5	41 10.3	20 25.0	89 45.5	23 50.5
20	119 58.9	23 13.3	201 48.4	71 10.7	20 23.5	119 46.7	23 50.8
22	149 58.6	23 13.6	231 53.4	101 11.1	20 22.1	149 47.9	23 51.0
Δ	-1	1		2	-7	6	1

UT	MESEC				JUPITER		SATURN	
	$S_\leftmoon$	Δ	$\delta_\leftmoon$	Δ	$S_{\mathrm{♃}}$	$\delta_{\mathrm{♃}}$	$S_{\mathrm{♄}}$	$\delta_{\mathrm{♄}}$
h	° ′		° ′		° ′	° ′	° ′	° ′
0	226 47.1	88	11 8.0	89	119 50.9	16 7.8	22 33.5	-18 4.3
2	255 42.7	87	11 25.8	88	149 55.1	16 7.5	52 38.8	-18 4.2
4	284 38.2	87	11 43.4	86	179 59.2	16 7.3	82 44.1	-18 4.2
6	313 33.6	86	12 .6	85	210 3.3	16 7.0	112 49.3	-18 4.1
8	342 28.9	86	12 17.5	83	240 7.5	16 6.8	142 54.6	-18 4.0
10	11 24.1	85	12 34.2	82	270 11.6	16 6.5	172 59.9	-18 4.0
12	40 19.2	85	12 50.5	80	300 15.7	16 6.2	203 5.2	-18 3.9
14	69 14.2	85	13 6.5	78	330 19.9	16 6.0	233 10.4	-18 3.9
16	98 9.1	84	13 22.2	77	0 24.0	16 5.7	263 15.7	-18 3.8
18	127 3.9	84	13 37.5	75	30 28.1	16 5.5	293 21.0	-18 3.8
20	155 58.6	83	13 52.5	73	60 32.2	16 5.2	323 26.2	-18 3.7
22	184 53.3	83	14 7.2	72	90 36.4	16 5.0	353 31.5	-18 3.6
Δ					21	-1	26	0

φ	SUNCE		TRAJANJE SUMRAKA		MESEC			
	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 37	21 23	1 41	: ::	1 36	1.1	17 7	3.3
55	3 21	20 39	0 58	: ::	1 51	1.4	16 48	3.1
50	3 51	20 10	0 44	: ::	2 2	1.5	16 34	2.9
45	4 13	19 47	0 37	2 32	2 12	1.6	16 23	2.8
40	4 31	19 30	0 33	2 3	2 19	1.7	16 13	2.7
35	4 45	19 15	0 30	1 47	2 26	1.8	16 5	2.6
30	4 58	19 2	0 27	1 36	2 32	1.9	15 58	2.6
20	5 20	18 40	0 25	1 24	2 42	2.0	15 46	2.5
10	5 39	18 21	0 23	1 18	2 51	2.1	15 35	2.4
0	5 56	18 4	0 23	1 15	2 60	2.3	15 26	2.3
10	6 14	17 46	0 23	1 15	3 9	2.4	15 16	2.2
20	6 32	17 28	0 24	1 19	3 18	2.5	15 5	2.1
30	6 53	17 7	0 26	1 25	3 28	2.6	14 53	2.0
35	7 5	16 55	0 28	1 31	3 35	2.7	14 46	1.9
40	7 19	16 41	0 30	1 37	3 42	2.8	14 38	1.8
45	7 36	16 24	0 34	1 47	3 50	2.9	14 29	1.7
50	7 56	16 4	0 38	1 59	3 60	3.0	14 18	1.6
55	8 23	15 37	0 45	2 17	4 12	3.1	14 4	1.5
60	9 1	14 59	0 57	2 45	4 29	3.4	13 46	1.3
S								

SUNCE				MESEC			
UT	e = Tp − UT	Δ/24	r	Prolaz		Δ/24	$\pi_\leftmoon$	r
h	min s	s	′		h min	min	′	′
00	0 6.1	-.5	15.8	$T_{\overline{m}}$	9 13	2.3	58.9	16.1
12	- 0 .2	$T_{\overline{m}_\odot}$ 12 h .0 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	′	°	
♀	15 15	.1	230	-4.9	♃	15 58	.0	219	-1.4
♂	12 1	.1	279	1.7	♄	22 26	.0	122	.3

UT	SUNCE		PROLEĆ. TAČKA	VENERA		MARS	
	$S_\odot$	$\delta_\odot$	S_Υ	S_φ	δ_φ	S_σ	δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	179 58.4	23 13.8	261 58.3	131 11.5	20 20.6	179 49.2	23 51.2
2	209 58.1	23 14.1	292 3.2	161 11.9	20 19.2	209 50.4	23 51.4
4	239 57.9	23 14.4	322 8.2	191 12.2	20 17.7	239 51.6	23 51.7
6	269 57.6	23 14.6	352 13.1	221 12.7	20 16.2	269 52.8	23 51.9
8	299 57.3	23 14.9	22 18.0	251 13.1	20 14.8	299 54.0	23 52.1
10	329 57.1	23 15.1	52 22.9	281 13.5	20 13.3	329 55.2	23 52.3
12	359 56.8	23 15.4	82 27.9	311 13.9	20 11.8	359 56.4	23 52.5
14	29 56.5	23 15.6	112 32.8	341 14.3	20 10.3	29 57.6	23 52.8
16	59 56.3	23 15.9	142 37.7	11 14.8	20 8.9	59 58.8	23 53.0
18	89 56.0	23 16.1	172 42.7	41 15.2	20 7.4	90 .0	23 53.2
20	119 55.7	23 16.3	202 47.6	71 15.6	20 5.9	120 1.2	23 53.4
22	149 55.5	23 16.6	232 52.5	101 16.1	20 4.4	150 2.4	23 53.6
Δ	−1	1		2	−7	6	1

UT	MESEC				JUPITER		SATURN	
	$S_\leftmoon$	Δ	$\delta_\leftmoon$	Δ	$S_{♃}$	$\delta_{♃}$	$S_{♄}$	$\delta_{♄}$
h	° ′		° ′		° ′	° ′	° ′	° ′
0	213 47.8	82	14 21.5	70	120 40.5	16 4.7	23 36.8	−18 3.6
2	242 42.3	82	14 35.4	68	150 44.6	16 4.5	53 42.1	−18 3.5
4	271 36.7	82	14 49.0	66	180 48.7	16 4.2	83 47.3	−18 3.5
6	300 31.0	81	15 2.2	64	210 52.9	16 3.9	113 52.6	−18 3.4
8	329 25.2	81	15 15.1	62	240 57.0	16 3.7	143 57.9	−18 3.4
10	358 19.4	81	15 27.5	60	271 1.1	16 3.4	174 3.1	−18 3.3
12	27 13.5	80	15 39.6	58	301 5.2	16 3.2	204 8.4	−18 3.2
14	56 7.5	80	15 51.3	56	331 9.4	16 2.9	234 13.7	−18 3.2
16	85 1.5	80	16 2.5	54	1 13.5	16 2.7	264 18.9	−18 3.1
18	113 55.5	80	16 13.4	52	31 17.6	16 2.4	294 24.2	−18 3.1
20	142 49.4	79	16 23.9	50	61 21.7	16 2.1	324 29.5	−18 3.0
22	171 43.3	79	16 34.0	48	91 25.8	16 1.9	354 34.7	−18 3.0
Δ					21	−1	26	0

φ	SUNCE		TRAJANJE SUMRAKA		MESEC			
	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 37	21 24	1 43	: ::	2 4	1.4	18 25	2.9
55	3 21	20 40	0 58	: ::	2 24	1.6	18 1	2.8
50	3 50	20 10	0 44	: ::	2 39	1.7	17 44	2.7
45	4 13	19 48	0 37	2 32	2 51	1.8	17 30	2.6
40	4 31	19 30	0 33	2 3	3 1	1.9	17 18	2.6
35	4 45	19 15	0 30	1 47	3 10	2.0	17 8	2.5
30	4 58	19 2	0 27	1 36	3 18	2.0	16 60	2.5
20	5 20	18 40	0 25	1 24	3 31	2.1	16 45	2.4
10	5 39	18 21	0 23	1 18	3 43	2.2	16 32	2.3
0	5 57	18 4	0 23	1 15	3 54	2.3	16 20	2.3
10	6 14	17 47	0 23	1 15	4 5	2.4	16 8	2.2
20	6 32	17 28	0 24	1 19	4 17	2.4	15 55	2.2
30	6 53	17 7	0 26	1 25	4 31	2.5	15 40	2.1
35	7 6	16 55	0 28	1 31	4 39	2.6	15 32	2.1
40	7 20	16 41	0 31	1 38	4 48	2.6	15 22	2.0
45	7 36	16 24	0 34	1 47	4 58	2.7	15 11	1.9
50	7 57	16 3	0 38	1 59	5 11	2.8	14 57	1.9
55	8 24	15 37	0 45	2 17	5 28	2.9	14 40	1.7
60	9 2	14 58	0 57	2 45	5 50	3.1	14 17	1.6
S								

SUNCE				MESEC			
UT	e = T_p − UT	Δ/24	r	Prolaz		Δ/24	$\pi_\leftmoon$	r
h	min s	s	′		h min	min	′	′
00	− 0 6.5	−.5	15.8	$T_{\overline{m}}$	10 7	2.3	58.6	16.0
12	− 0 12.9	$T_{\overline{m}_\odot}$	12 h .2 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	′	°	
♀	15 15	.1	229	−4.9	♄	15 55	.0	219	−1.4
♂	12 0	.1	278	1.7	♇	22 22	.0	122	.3

UT	SUNCE		PROLEĆ. TAČKA	VENERA		MARS	
	$S_\odot$	$\delta_\odot$	S_Υ	S_φ	δ_φ	S_σ	δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	179 55.2	23 16.8	262 57.4	131 16.5	20 2.9	180 3.7	23 53.8
2	209 54.9	23 17.0	293 2.4	161 17.0	20 1.4	210 4.9	23 54.0
4	239 54.7	23 17.3	323 7.3	191 17.5	19 59.9	240 6.1	23 54.2
6	269 54.4	23 17.5	353 12.2	221 17.9	19 58.5	270 7.3	23 54.4
8	299 54.1	23 17.7	23 17.2	251 18.4	19 57.0	300 8.5	23 54.6
10	329 53.8	23 17.9	53 22.1	281 18.9	19 55.5	330 9.7	23 54.9
12	359 53.6	23 18.1	83 27.0	311 19.4	19 54.0	0 10.9	23 55.1
14	29 53.3	23 18.4	113 31.9	341 19.9	19 52.5	30 12.1	23 55.2
16	59 53.0	23 18.6	143 36.9	11 20.4	19 51.0	60 13.3	23 55.4
18	89 52.8	23 18.8	173 41.8	41 20.9	19 49.5	90 14.5	23 55.6
20	119 52.5	23 19.0	203 46.7	71 21.4	19 48.0	120 15.7	23 55.8
22	149 52.2	23 19.2	233 51.7	101 21.9	19 46.5	150 17.0	23 56.0
Δ	−1	1		2	−7	6	1

UT	MESEC				JUPITER		SATURN	
	$S_\leftmoon$	Δ	$\delta_\leftmoon$	Δ	$S_{♃}$	$\delta_{♃}$	$S_{♄}$	$\delta_{♄}$
h	° ′		° ′		° ′	° ′	° ′	° ′
0	200 37.1	79	16 43.6	46	121 30.0	16 1.6	24 40.0	−18 2.9
2	229 30.9	79	16 52.9	44	151 34.1	16 1.4	54 45.2	−18 2.8
4	258 24.7	79	17 1.7	42	181 38.2	16 1.1	84 50.5	−18 2.8
6	287 18.4	79	17 10.1	40	211 42.3	16 .8	114 55.8	−18 2.7
8	316 12.2	79	17 18.1	38	241 46.4	16 .6	145 1.0	−18 2.7
10	345 5.9	79	17 25.6	36	271 50.5	16 .3	175 6.3	−18 2.6
12	13 59.7	79	17 32.7	33	301 54.7	16 .1	205 11.6	−18 2.6
14	42 53.5	79	17 39.4	31	331 58.8	15 59.8	235 16.8	−18 2.5
16	71 47.3	79	17 45.7	29	2 2.9	15 59.5	265 22.1	−18 2.5
18	100 41.1	79	17 51.5	27	32 7.0	15 59.3	295 27.3	−18 2.4
20	129 34.9	79	17 56.9	25	62 11.1	15 59.0	325 32.6	−18 2.4
22	158 28.8	80	18 1.8	23	92 15.2	15 58.8	355 37.9	−18 2.3
Δ					21	−1	26	0

φ	SUNCE		TRAJANJE SUMRAKA		MESEC			
	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 36	21 25	1 44	: ::	2 37	1.8	19 36	2.5
55	3 21	20 41	0 58	: ::	3 2	1.9	19 9	2.4
50	3 50	20 11	0 45	: ::	3 21	2.0	18 49	2.4
45	4 13	19 48	0 37	2 33	3 35	2.0	18 33	2.4
40	4 31	19 30	0 33	2 3	3 47	2.1	18 20	2.4
35	4 46	19 15	0 30	1 47	3 57	2.1	18 9	2.4
30	4 58	19 2	0 27	1 36	4 7	2.2	17 59	2.3
20	5 20	18 41	0 25	1 24	4 22	2.2	17 43	2.3
10	5 39	18 22	0 23	1 18	4 36	2.2	17 29	2.3
0	5 57	18 4	0 23	1 15	4 49	2.3	17 15	2.3
10	6 14	17 47	0 23	1 15	5 2	2.3	17 2	2.3
20	6 33	17 28	0 24	1 19	5 16	2.4	16 47	2.2
30	6 54	17 7	0 26	1 25	5 31	2.4	16 31	2.2
35	7 6	16 55	0 28	1 31	5 41	2.4	16 21	2.2
40	7 20	16 41	0 31	1 38	5 51	2.5	16 10	2.2
45	7 37	16 24	0 34	1 47	6 4	2.5	15 57	2.1
50	7 57	16 3	0 38	1 59	6 19	2.6	15 42	2.1
55	8 24	15 36	0 45	2 17	6 38	2.6	15 22	2.1
60	9 3	14 58	0 57	2 46	7 5	2.7	14 55	2.0
S								

SUNCE				MESEC			
UT	e = T_p − UT	Δ/24	r	Prolaz		Δ/24	$\pi_\leftmoon$	r
h	min s	s	′		h min	min	′	′
00	− 0 19.2	−.5	15.8	$T_{\overline{m}}$	11 2	2.3	58.2	15.9
12	− 0 25.7	$T_{\overline{m}_\odot}$	12 h .4 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	′	°	
♀	15 15	.1	228	−5.0	♄	15 52	.0	219	−1.4
♂	11 59	.1	277	1.7	♇	22 17	.0	122	.3

UT	SUNCE		PROLEĆ. TAČKA	VENERA		MARS	
	$S_\odot$	$\delta_\odot$	S_Υ	S_φ	δ_φ	S_σ	δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	179 52.0	23 19.4	263 56.6	131 22.4	19 44.9	180 18.2	23 56.2
2	209 51.7	23 19.6	294 1.5	161 23.0	19 43.4	210 19.4	23 56.4
4	239 51.4	23 19.8	324 6.4	191 23.5	19 41.9	240 20.6	23 56.6
6	269 51.2	23 19.9	354 11.4	221 24.0	19 40.4	270 21.8	23 56.8
8	299 50.9	23 20.1	24 16.3	251 24.6	19 38.9	300 23.0	23 57.0
10	329 50.6	23 20.3	54 21.2	281 25.2	19 37.4	330 24.2	23 57.2
12	359 50.3	23 20.5	84 26.2	311 25.7	19 35.9	0 25.4	23 57.3
14	29 50.1	23 20.7	114 31.1	341 26.3	19 34.3	30 26.6	23 57.5
16	59 49.8	23 20.8	144 36.0	11 26.9	19 32.8	60 27.9	23 57.7
18	89 49.5	23 21.0	174 40.9	41 27.4	19 31.3	90 29.1	23 57.9
20	119 49.3	23 21.2	204 45.9	71 28.0	19 29.8	120 30.3	23 58.1
22	149 49.0	23 21.4	234 50.8	101 28.6	19 28.2	150 31.5	23 58.2
Δ	-1	1		3	-8	6	1

UT	MESEC				JUPITER		SATURN	
	$S_\leftmoon$	Δ	$\delta_\leftmoon$	Δ	$S_{\mathrm{♃}}$	$\delta_{\mathrm{♃}}$	$S_{\mathrm{♄}}$	$\delta_{\mathrm{♄}}$
h	° ′		° ′		° ′	° ′	° ′	° ′
0	187 22.7	80	18 6.3	20	122 19.3	15 58.5	25 43.1	-18 2.2
2	216 16.7	80	18 10.4	18	152 23.4	15 58.2	55 48.4	-18 2.2
4	245 10.8	81	18 14.1	16	182 27.6	15 58.0	85 53.6	-18 2.1
6	274 4.9	81	18 17.2	14	212 31.7	15 57.7	115 58.9	-18 2.1
8	302 59.1	81	18 20.0	12	242 35.8	15 57.4	146 4.2	-18 2.0
10	331 53.3	82	18 22.3	9	272 39.9	15 57.2	176 9.4	-18 2.0
12	0 47.7	82	18 24.2	7	302 44.0	15 56.9	206 14.7	-18 1.9
14	29 42.1	83	18 25.7	5	332 48.1	15 56.7	236 19.9	-18 1.9
16	58 36.7	83	18 26.7	3	2 52.2	15 56.4	266 25.2	-18 1.8
18	87 31.4	84	18 27.3	1	32 56.3	15 56.1	296 30.5	-18 1.8
20	116 26.2	85	18 27.4	-1	63 .4	15 55.9	326 35.7	-18 1.7
22	145 21.1	85	18 27.2	-3	93 4.5	15 55.6	356 41.0	-18 1.6
Δ					21	-1	26	0

φ	SUNCE		TRAJANJE SUMRAKA		MESEC			
	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 36	21 26	1 45	: ::	3 20	2.2	20 35	2.0
55	3 20	20 41	0 58	: ::	3 48	2.2	20 7	2.1
50	3 50	20 11	0 45	: ::	4 8	2.2	19 47	2.1
45	4 13	19 49	0 37	2 33	4 24	2.2	19 30	2.1
40	4 31	19 31	0 33	2 3	4 37	2.2	19 17	2.1
35	4 46	19 16	0 30	1 47	4 48	2.2	19 6	2.2
30	4 59	19 3	0 27	1 36	4 58	2.2	18 56	2.2
20	5 21	18 41	0 25	1 24	5 15	2.2	18 39	2.2
10	5 39	18 22	0 23	1 18	5 30	2.3	18 24	2.2
0	5 57	18 4	0 23	1 15	5 44	2.3	18 10	2.2
10	6 14	17 47	0 23	1 15	5 58	2.3	17 56	2.2
20	6 33	17 28	0 24	1 19	6 12	2.3	17 41	2.3
30	6 54	17 7	0 26	1 25	6 29	2.3	17 23	2.3
35	7 6	16 55	0 28	1 31	6 39	2.3	17 13	2.3
40	7 20	16 41	0 31	1 38	6 51	2.3	17 2	2.3
45	7 37	16 24	0 34	1 47	7 4	2.3	16 49	2.3
50	7 58	16 3	0 38	1 59	7 21	2.3	16 32	2.3
55	8 25	15 36	0 45	2 18	7 41	2.2	16 11	2.4
60	9 3	14 58	0 58	2 46	8 10	2.2	15 42	2.4
S								

SUNCE				MESEC			
UT	e = T_p − UT	Δ/24	r	Prolaz	Δ/24	$\pi_\leftmoon$	r
h	min s	s	′	h min	min	′	′
00	- 0 32.1	-.5	15.8	$T_{\overline{m}}$ 11 57	2.2	57.7	15.7
12	- 0 38.7	$T_{\overline{m}_\odot}$ 12 h .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	′	°	
♀	15 14	.1	227	-5.0	♄	15 49	.0	218	-1.4
♂	11 58	.1	276	1.7	♅	22 13	.0	122	.4

UT	SUNCE		PROLEĆ. TAČKA	VENERA		MARS	
	$S_\odot$	$\delta_\odot$	S_Υ	S_φ	δ_φ	S_σ	δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	179 48.7	23 21.5	264 55.7	131 29.2	19 26.7	180 32.7	23 58.4
2	209 48.4	23 21.7	295 .6	161 29.8	19 25.2	210 33.9	23 58.6
4	239 48.2	23 21.8	325 5.6	191 30.4	19 23.6	240 35.1	23 58.7
6	269 47.9	23 22.0	355 10.5	221 31.0	19 22.1	270 36.3	23 58.9
8	299 47.6	23 22.1	25 15.4	251 31.6	19 20.6	300 37.6	23 59.1
10	329 47.3	23 22.3	55 20.4	281 32.3	19 19.0	330 38.8	23 59.3
12	359 47.1	23 22.4	85 25.3	311 32.9	19 17.5	0 40.0	23 59.4
14	29 46.8	23 22.6	115 30.2	341 33.5	19 16.0	30 41.2	23 59.6
16	59 46.5	23 22.7	145 35.1	11 34.2	19 14.4	60 42.4	23 59.7
18	89 46.3	23 22.9	175 40.1	41 34.8	19 12.9	90 43.6	23 59.9
20	119 46.0	23 23.0	205 45.0	71 35.5	19 11.3	120 44.8	24 .1
22	149 45.7	23 23.1	235 49.9	101 36.2	19 9.8	150 46.0	24 .2
Δ	-1	1		3	-8	6	1

UT	MESEC				JUPITER		SATURN	
	$S_\leftmoon$	Δ	$\delta_\leftmoon$	Δ	$S_{\mathrm{♃}}$	$\delta_{\mathrm{♃}}$	$S_{\mathrm{♄}}$	$\delta_{\mathrm{♄}}$
h	° ′		° ′		° ′	° ′	° ′	° ′
0	174 16.1	86	18 26.5	-6	123 8.6	15 55.3	26 46.2	-18 1.6
2	203 11.3	87	18 25.4	-8	153 12.7	15 55.1	56 51.5	-18 1.5
4	232 6.6	87	18 23.8	-10	183 16.8	15 54.8	86 56.7	-18 1.5
6	261 2.1	88	18 21.9	-12	213 20.9	15 54.5	117 2.0	-18 1.4
8	289 57.7	89	18 19.5	-14	243 25.0	15 54.3	147 7.2	-18 1.4
10	318 53.5	90	18 16.7	-16	273 29.1	15 54.0	177 12.5	-18 1.3
12	347 49.5	91	18 13.6	-18	303 33.2	15 53.7	207 17.8	-18 1.3
14	16 45.6	92	18 10.0	-20	333 37.3	15 53.5	237 23.0	-18 1.2
16	45 41.9	93	18 6.0	-22	3 41.4	15 53.2	267 28.3	-18 1.2
18	74 38.4	93	18 1.6	-24	33 45.5	15 52.9	297 33.5	-18 1.1
20	103 35.1	94	17 56.9	-26	63 49.6	15 52.7	327 38.8	-18 1.1
22	132 32.0	95	17 51.7	-28	93 53.7	15 52.4	357 44.0	-18 1.0
Δ					21	-1	26	0

φ	SUNCE		TRAJANJE SUMRAKA		MESEC			
	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 36	21 26	1 45	: ::	4 13	2.5	21 23	1.5
55	3 20	20 42	0 58	: ::	4 41	2.5	20 57	1.7
50	3 50	20 12	0 45	: ::	5 1	2.4	20 37	1.8
45	4 13	19 49	0 37	2 33	5 18	2.4	20 21	1.8
40	4 31	19 31	0 33	2 3	5 31	2.3	20 8	1.9
35	4 46	19 16	0 30	1 47	5 42	2.3	19 57	1.9
30	4 59	19 3	0 27	1 37	5 52	2.3	19 48	2.0
20	5 21	18 41	0 25	1 24	6 9	2.3	19 31	2.0
10	5 40	18 22	0 23	1 18	6 24	2.2	19 17	2.1
0	5 57	18 5	0 23	1 15	6 38	2.2	19 3	2.1
10	6 15	17 47	0 23	1 15	6 52	2.2	18 50	2.2
20	6 33	17 29	0 24	1 19	7 7	2.1	18 35	2.2
30	6 54	17 7	0 26	1 25	7 24	2.1	18 18	2.3
35	7 7	16 55	0 28	1 31	7 34	2.0	18 8	2.3
40	7 21	16 41	0 31	1 38	7 45	2.0	17 57	2.4
45	7 38	16 24	0 34	1 47	7 58	2.0	17 44	2.4
50	7 58	16 3	0 38	1 59	8 15	1.9	17 28	2.5
55	8 25	15 36	0 46	2 18	8 35	1.9	17 8	2.6
60	9 4	14 58	0 58	2 46	9 4	1.7	16 40	2.7
S								

SUNCE				MESEC			
UT	e = T_p − UT	Δ/24	r	Prolaz	Δ/24	$\pi_\leftmoon$	r
h	min s	s	′	h min	min	′	′
00	- 0 45.2	-.5	15.8	$T_{\overline{m}}$ 12 50	2.2	57.1	15.6
12	- 0 51.7	$T_{\overline{m}_\odot}$ 12 h .9 min		Starost .4 d	Faza ●		

PLANETE

Pl.	$T_{\overline{m}}$	π	360−α	Vel.	Pl.	$T_{\overline{m}}$	π	360−α	Vel.
	h min	′	°			h min	′	°	
♀	15 14	.1	227	-5.0	♄	15 45	.0	218	-1.4
♂	11 57	.1	276	1.7	♅	22 9	.0	122	.4

UT	SUNCE		PROLEĆ. TAČKA	VENERA		MARS	
	$S_\odot$	$\delta_\odot$	S_Υ	S_φ	δ_φ	S_σ	δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	179 45.4	23 23.2	265 54.9	131 36.8	19 8.2	180 47.3	24 .4
2	209 45.2	23 23.4	295 59.8	161 37.5	19 6.7	210 48.5	24 .5
4	239 44.9	23 23.5	326 4.7	191 38.2	19 5.1	240 49.7	24 .7
6	269 44.6	23 23.6	356 9.6	221 38.9	19 3.6	270 50.9	24 .8
8	299 44.3	23 23.7	26 14.6	251 39.6	19 2.0	300 52.1	24 1.0
10	329 44.1	23 23.8	56 19.5	281 40.3	19 .5	330 53.3	24 1.1
12	359 43.8	23 24.0	86 24.4	311 41.0	18 58.9	0 54.6	24 1.3
14	29 43.5	23 24.1	116 29.4	341 41.7	18 57.3	30 55.8	24 1.4
16	59 43.3	23 24.2	146 34.3	11 42.4	18 55.8	60 57.0	24 1.6
18	89 43.0	23 24.3	176 39.2	41 43.2	18 54.2	90 58.2	24 1.7
20	119 42.7	23 24.4	206 44.1	71 43.9	18 52.6	120 59.4	24 1.9
22	149 42.4	23 24.5	236 49.1	101 44.6	18 51.1	151 .6	24 2.0
Δ	-1	1		4	-8	6	1

UT	MESEC				JUPITER		SATURN	
	$S_\leftmoon$	Δ	$\delta_\leftmoon$	Δ	S_{4}	δ_{4}	S_{5}	δ_{5}
h	° ′		° ′		° ′	° ′	° ′	° ′
0	161 29.1	96	17 46.2	-30	123 57.8	15 52.1	27 49.3	-18 1.0
2	190 26.4	97	17 40.3	-31	154 1.9	15 51.9	57 54.5	-18 .9
4	219 23.9	98	17 34.0	-33	184 6.0	15 51.6	87 59.8	-18 .8
6	248 21.6	100	17 27.4	-35	214 10.1	15 51.3	118 5.0	-18 .8
8	277 19.5	101	17 20.4	-37	244 14.2	15 51.1	148 10.3	-18 .7
10	306 17.6	102	17 13.0	-39	274 18.3	15 50.8	178 15.5	-18 .7
12	335 15.9	103	17 5.3	-40	304 22.4	15 50.5	208 20.8	-18 .6
14	4 14.5	104	16 57.3	-42	334 26.5	15 50.3	238 26.0	-18 .6
16	33 13.3	105	16 48.9	-44	4 30.6	15 50.0	268 31.3	-18 .5
18	62 12.3	106	16 40.2	-45	34 34.7	15 49.7	298 36.5	-18 .5
20	91 11.6	107	16 31.1	-47	64 38.8	15 49.5	328 41.8	-18 .4
22	120 11.0	109	16 21.7	-48	94 42.9	15 49.2	358 47.0	-18 .4
Δ					20	-1	26	0

φ	SUNCE		TRAJANJE SUMRAKA		MESEC			
	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 36	21 27	1 46	: ::	5 14	2.8	22 0	1.2
55	3 20	20 42	0 58	: ::	5 40	2.6	21 37	1.4
50	3 50	20 12	0 45	: ::	5 59	2.5	21 19	1.5
45	4 13	19 49	0 37	2 33	6 15	2.5	21 5	1.6
40	4 31	19 31	0 33	2 3	6 27	2.4	20 54	1.7
35	4 46	19 16	0 30	1 47	6 38	2.3	20 44	1.7
30	4 59	19 3	0 27	1 37	6 47	2.3	20 35	1.8
20	5 21	18 41	0 25	1 24	7 3	2.2	20 20	1.9
10	5 40	18 22	0 23	1 18	7 17	2.2	20 7	2.0
0	5 57	18 5	0 23	1 15	7 30	2.1	19 55	2.0
10	6 15	17 47	0 23	1 15	7 43	2.0	19 42	2.1
20	6 33	17 29	0 24	1 19	7 57	2.0	19 29	2.2
30	6 55	17 8	0 26	1 26	8 13	1.9	19 13	2.3
35	7 7	16 55	0 28	1 31	8 23	1.8	19 5	2.3
40	7 21	16 41	0 31	1 38	8 33	1.8	18 54	2.4
45	7 38	16 24	0 34	1 47	8 46	1.7	18 42	2.5
50	7 59	16 3	0 38	1 60	9 1	1.6	18 28	2.6
55	8 26	15 36	0 46	2 18	9 20	1.5	18 9	2.7
60	9 5	14 58	0 58	2 46	9 45	1.3	17 44	2.9
S								

SUNCE				MESEC			
UT	e = T_p − UT	Δ/24	r	Prolaz		Δ/24	$\pi_\leftmoon$	r
h	min s	s	′		h min	min	′	′
00	− 0 58.2	-.5	15.8	$T_{\overline{m}}$	13 42	2.1	56.5	15.4
12	− 1 4.8	$T_{\overline{m}_\odot}$	12 h 1.1 min	Starost	1.4 d	Faza	●	

PLANETE								
Pl.	$T_{\overline{m}}$	π	360 − α	Vel.	Pl.	$T_{\overline{m}}$	π	360 − α	Vel.
	h min	′	°			h min	′	°	
♀	15 13	.1	226	-5.0	♃	15 42	.0	218	-1.4
♂	11 56	.1	275	1.7	♄	22 5	.0	122	.4

UT	SUNCE		PROLEĆ. TAČKA	VENERA		MARS	
	$S_\odot$	$\delta_\odot$	S_Υ	S_φ	δ_φ	S_σ	δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	179 42.2	23 24.6	266 54.0	131 45.4	18 49.5	181 1.8	24 2.1
2	209 41.9	23 24.7	296 58.9	161 46.1	18 47.9	211 3.1	24 2.3
4	239 41.6	23 24.7	327 3.9	191 46.9	18 46.4	241 4.3	24 2.4
6	269 41.3	23 24.8	357 8.8	221 47.6	18 44.8	271 5.5	24 2.5
8	299 41.1	23 24.9	27 13.7	251 48.4	18 43.2	301 6.7	24 2.7
10	329 40.8	23 25.0	57 18.6	281 49.2	18 41.7	331 7.9	24 2.8
12	359 40.5	23 25.1	87 23.6	311 50.0	18 40.1	1 9.1	24 2.9
14	29 40.2	23 25.1	117 28.5	341 50.8	18 38.5	31 10.4	24 3.1
16	59 40.0	23 25.2	147 33.4	11 51.6	18 36.9	61 11.6	24 3.2
18	89 39.7	23 25.3	177 38.4	41 52.4	18 35.3	91 12.8	24 3.3
20	119 39.4	23 25.4	207 43.3	71 53.2	18 33.8	121 14.0	24 3.4
22	149 39.1	23 25.4	237 48.2	101 54.0	18 32.2	151 15.2	24 3.6
Δ	-1	0		4	-8	6	1

UT	MESEC				JUPITER		SATURN	
	$S_\leftmoon$	Δ	$\delta_\leftmoon$	Δ	S_{4}	δ_{4}	S_{5}	δ_{5}
h	° ′		° ′		° ′	° ′	° ′	° ′
0	149 10.7	110	16 12.1	-50	124 46.9	15 48.9	28 52.3	-18 .3
2	178 10.7	111	16 2.1	-51	154 51.0	15 48.6	58 57.5	-18 .3
4	207 10.9	112	15 51.8	-53	184 55.1	15 48.4	89 2.7	-18 .2
6	236 11.3	113	15 41.2	-54	214 59.2	15 48.1	119 8.0	-18 .2
8	265 11.9	114	15 30.3	-56	245 3.3	15 47.8	149 13.2	-18 .1
10	294 12.8	116	15 19.1	-57	275 7.4	15 47.6	179 18.5	-18 .1
12	323 13.9	117	15 7.7	-59	305 11.5	15 47.3	209 23.7	-18 .0
14	352 15.2	118	14 55.9	-60	335 15.6	15 47.0	239 29.0	-17 60.0
16	21 16.8	119	14 43.9	-61	5 19.6	15 46.7	269 34.2	-17 59.9
18	50 18.6	120	14 31.7	-63	35 23.7	15 46.5	299 39.5	-17 59.9
20	79 20.6	121	14 19.1	-64	65 27.8	15 46.2	329 44.7	-17 59.8
22	108 22.8	122	14 6.4	-65	95 31.9	15 45.9	359 49.9	-17 59.8
Δ					20	-1	26	0

φ	SUNCE		TRAJANJE SUMRAKA		MESEC			
	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 36	21 27	1 46	: ::	6 21	2.9	22 29	1.0
55	3 20	20 42	0 58	: ::	6 43	2.7	22 10	1.1
50	3 50	20 12	0 45	: ::	7 0	2.6	21 55	1.3
45	4 13	19 50	0 37	2 33	7 14	2.5	21 44	1.4
40	4 31	19 32	0 33	2 3	7 25	2.4	21 34	1.5
35	4 46	19 17	0 30	1 47	7 34	2.3	21 26	1.6
30	4 59	19 4	0 27	1 37	7 42	2.3	21 18	1.6
20	5 21	18 42	0 25	1 24	7 56	2.2	21 5	1.7
10	5 40	18 23	0 23	1 18	8 9	2.1	20 54	1.8
0	5 58	18 5	0 23	1 15	8 20	2.0	20 44	1.9
10	6 15	17 48	0 23	1 15	8 32	1.9	20 33	2.0
20	6 34	17 29	0 24	1 19	8 44	1.8	20 22	2.1
30	6 55	17 8	0 26	1 26	8 58	1.7	20 8	2.3
35	7 7	16 55	0 28	1 31	9 6	1.6	20 1	2.3
40	7 21	16 41	0 31	1 38	9 16	1.6	19 52	2.4
45	7 38	16 24	0 34	1 47	9 27	1.5	19 42	2.5
50	7 59	16 4	0 39	1 60	9 40	1.4	19 30	2.6
55	8 26	15 36	0 46	2 18	9 56	1.2	19 14	2.8
60	9 5	14 58	0 58	2 46	10 18	1.1	18 53	3.0
S								

SUNCE				MESEC			
UT	e = T_p − UT	Δ/24	r	Prolaz		Δ/24	$\pi_\leftmoon$	r
h	min s	s	′		h min	min	′	′
00	− 1 11.4	-.5	15.8	$T_{\overline{m}}$	14 32	2.0	55.9	15.2
12	− 1 18.0	$T_{\overline{m}_\odot}$	12 h 1.3 min	Starost	2.4 d	Faza	●	

PLANETE								
Pl.	$T_{\overline{m}}$	π	360 − α	Vel.	Pl.	$T_{\overline{m}}$	π	360 − α	Vel.
	h min	′	°			h min	′	°	
♀	15 13	.1	225	-5.1	♃	15 39	.0	218	-1.4
♂	11 55	.1	274	1.7	♄	22 1	.0	122	.4

UT	SUNCE $S_\odot$	$\delta_\odot$	PROLEĆ. TAČKA S_Υ	VENERA S_φ	δ_φ	MARS S_σ	δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	179 38.9	23 25.5	267 53.1	131 54.8	18 30.6	181 16.5	24 3.7
2	209 38.6	23 25.5	297 58.1	161 55.7	18 29.0	211 17.7	24 3.8
4	239 38.3	23 25.6	328 3.0	191 56.5	18 27.4	241 18.9	24 3.9
6	269 38.0	23 25.6	358 7.9	221 57.3	18 25.8	271 20.1	24 4.0
8	299 37.8	23 25.7	28 12.8	251 58.2	18 24.2	301 21.3	24 4.1
10	329 37.5	23 25.7	58 17.8	281 59.0	18 22.6	331 22.6	24 4.3
12	359 37.2	23 25.8	88 22.7	311 59.9	18 21.1	1 23.8	24 4.4
14	29 36.9	23 25.8	118 27.6	342 .8	18 19.5	31 25.0	24 4.5
16	59 36.7	23 25.9	148 32.6	12 1.6	18 17.9	61 26.2	24 4.6
18	89 36.4	23 25.9	178 37.5	42 2.5	18 16.3	91 27.4	24 4.7
20	119 36.1	23 25.9	208 42.4	72 3.4	18 14.7	121 28.7	24 4.8
22	149 35.9	23 25.9	238 47.3	102 4.3	18 13.1	151 29.9	24 4.9
Δ	−1	0		4	−8	6	1

UT	MESEC $S_\leftmoon$	Δ	$\delta_\leftmoon$	Δ	JUPITER $S_{\mathrm{♃}}$	$\delta_{\mathrm{♃}}$	SATURN $S_{\mathrm{♄}}$	$\delta_{\mathrm{♄}}$
h	° ′		° ′		° ′	° ′	° ′	° ′
0	137 25.3	124	13 53.3	−66	125 36.0	15 45.7	29 55.2	−17 59.7
2	166 28.0	125	13 40.1	−67	155 40.1	15 45.4	60 .4	−17 59.7
4	195 31.0	126	13 26.6	−69	185 44.2	15 45.1	90 5.7	−17 59.6
6	224 34.1	127	13 12.9	−70	215 48.2	15 44.8	120 10.9	−17 59.6
8	253 37.5	128	12 58.9	−71	245 52.3	15 44.6	150 16.1	−17 59.5
10	282 41.1	129	12 44.8	−72	275 56.4	15 44.3	180 21.4	−17 59.5
12	311 44.9	130	12 30.4	−73	306 .5	15 44.0	210 26.6	−17 59.4
14	340 48.9	131	12 15.8	−74	336 4.6	15 43.7	240 31.9	−17 59.4
16	9 53.1	132	12 1.1	−75	6 8.6	15 43.5	270 37.1	−17 59.3
18	38 57.5	133	11 46.1	−76	36 12.7	15 43.2	300 42.3	−17 59.3
20	68 2.2	134	11 31.0	−77	66 16.8	15 42.9	330 47.6	−17 59.2
22	97 7.0	135	11 15.6	−78	96 20.9	15 42.6	0 52.8	−17 59.2
Δ					20	−1	26	0

φ	SUNCE IZLAZ	ZALAZ	TRAJANJE SUMRAKA GRAĐ.	ASTR.	MESEC IZLAZ	Δ/24	ZALAZ	Δ/24
N	h min	h min	h min	h min	h min	min	h min	min
60	2 36	21 28	1 47	: ::	7 31	3.0	22 52	.8
55	3 20	20 43	0 58	: ::	7 49	2.7	22 37	1.0
50	3 50	20 13	0 45	: ::	8 3	2.6	22 26	1.1
45	4 13	19 50	0 37	2 33	8 13	2.5	22 17	1.3
40	4 31	19 32	0 33	2 3	8 22	2.4	22 10	1.4
35	4 46	19 17	0 30	1 47	8 30	2.3	22 3	1.4
30	4 59	19 4	0 27	1 37	8 37	2.2	21 57	1.5
20	5 21	18 42	0 25	1 24	8 48	2.1	21 47	1.6
10	5 40	18 23	0 23	1 18	8 59	2.0	21 39	1.8
0	5 58	18 5	0 23	1 15	9 8	1.9	21 30	1.9
10	6 15	17 48	0 23	1 15	9 18	1.8	21 22	2.0
20	6 34	17 29	0 24	1 19	9 28	1.7	21 13	2.1
30	6 55	17 8	0 26	1 26	9 39	1.6	21 3	2.2
35	7 7	16 56	0 28	1 31	9 46	1.5	20 57	2.3
40	7 22	16 41	0 31	1 38	9 53	1.4	20 50	2.4
45	7 39	16 24	0 34	1 47	10 2	1.3	20 42	2.5
50	7 59	16 4	0 39	1 60	10 13	1.2	20 32	2.6
55	8 26	15 37	0 46	2 18	10 26	1.1	20 20	2.7
60	9 5	14 58	0 58	2 46	10 43	.9	20 4	3.0
S								

SUNCE UT	e = T_p − UT	Δ/24	r	MESEC Prolaz		Δ/24	$\pi_\leftmoon$	r
h	min s	s	′	$T_{\overline{m}}$	h min	min	′	′
00	− 1 24.5	−.5	15.8	$T_{\overline{m}}$	15 19	1.9	55.3	15.1
12	− 1 31.1	$T_{\overline{m}_\odot}$ 12 h	1.5 min	Starost	3.4 d	Faza	◑	

PLANETE

Pl.	$T_{\overline{m}}$	π	360 − α	Vel.	Pl.	$T_{\overline{m}}$	π	360 − α	Vel.
	h min	′	°			h min	′	°	
♀	15 12	.1	224	−5.1	♄	15 35	.0	218	−1.4
♂	11 54	.1	273	1.7	♃	21 56	.0	122	.4

UT	SUNCE $S_\odot$	$\delta_\odot$	PROLEĆ. TAČKA S_Υ	VENERA S_φ	δ_φ	MARS S_σ	δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	179 35.6	23 26.0	268 52.3	132 5.2	18 11.5	181 31.1	24 5.0
2	209 35.3	23 26.0	298 57.2	162 6.1	18 9.9	211 32.3	24 5.1
4	239 35.0	23 26.0	329 2.1	192 7.0	18 8.3	241 33.5	24 5.2
6	269 34.8	23 26.0	359 7.1	222 8.0	18 6.7	271 34.8	24 5.3
8	299 34.5	23 26.0	29 12.0	252 8.9	18 5.1	301 36.0	24 5.4
10	329 34.2	23 26.1	59 16.9	282 9.8	18 3.5	331 37.2	24 5.5
12	359 33.9	23 26.1	89 21.8	312 10.8	18 1.9	1 38.4	24 5.6
14	29 33.7	23 26.1	119 26.8	342 11.7	18 .2	31 39.7	24 5.7
16	59 33.4	23 26.1	149 31.7	12 12.7	17 58.6	61 40.9	24 5.8
18	89 33.1	23 26.1	179 36.6	42 13.6	17 57.0	91 42.1	24 5.9
20	119 32.8	23 26.1	209 41.6	72 14.6	17 55.4	121 43.3	24 6.0
22	149 32.6	23 26.1	239 46.5	102 15.6	17 53.8	151 44.6	24 6.0
Δ	−1	0		5	−8	6	0

UT	MESEC $S_\leftmoon$	Δ	$\delta_\leftmoon$	Δ	JUPITER $S_{\mathrm{♃}}$	$\delta_{\mathrm{♃}}$	SATURN $S_{\mathrm{♄}}$	$\delta_{\mathrm{♄}}$
h	° ′		° ′		° ′	° ′	° ′	° ′
0	126 12.0	136	11 .1	−78	126 24.9	15 42.4	30 58.0	−17 59.1
2	155 17.2	137	10 44.4	−79	156 29.0	15 42.1	61 3.3	−17 59.1
4	184 22.6	138	10 28.6	−80	186 33.1	15 41.8	91 8.5	−17 59.0
6	213 28.2	139	10 12.6	−81	216 37.2	15 41.5	121 13.8	−17 59.0
8	242 33.9	140	9 56.4	−82	246 41.3	15 41.3	151 19.0	−17 58.9
10	271 39.9	140	9 40.1	−82	276 45.3	15 41.0	181 24.2	−17 58.9
12	300 46.0	141	9 23.6	−83	306 49.4	15 40.7	211 29.5	−17 58.8
14	329 52.2	142	9 7.0	−84	336 53.5	15 40.4	241 34.7	−17 58.8
16	358 58.6	143	8 50.3	−84	6 57.5	15 40.1	271 39.9	−17 58.7
18	28 5.2	144	8 33.4	−85	37 1.6	15 39.9	301 45.2	−17 58.7
20	57 11.9	144	8 16.4	−86	67 5.7	15 39.6	331 50.4	−17 58.6
22	86 18.8	145	7 59.3	−86	97 9.8	15 39.3	1 55.6	−17 58.6
Δ					20	−1	26	0

φ	SUNCE IZLAZ	ZALAZ	TRAJANJE SUMRAKA GRAĐ.	ASTR.	MESEC IZLAZ	Δ/24	ZALAZ	Δ/24
N	h min	h min	h min	h min	h min	min	h min	min
60	2 36	21 28	1 47	: ::	8 42	2.9	23 11	.7
55	3 21	20 43	0 58	: ::	8 55	2.7	23 1	.9
50	3 51	20 13	0 45	: ::	9 5	2.6	22 53	1.0
45	4 13	19 50	0 37	2 33	9 13	2.5	22 47	1.2
40	4 31	19 32	0 33	2 3	9 19	2.3	22 42	1.3
35	4 46	19 17	0 30	1 47	9 25	2.3	22 38	1.4
30	4 59	19 4	0 27	1 37	9 30	2.2	22 34	1.4
20	5 21	18 42	0 25	1 24	9 39	2.0	22 27	1.6
10	5 40	18 23	0 23	1 18	9 46	1.9	22 21	1.7
0	5 58	18 5	0 23	1 15	9 54	1.8	22 15	1.8
10	6 16	17 48	0 23	1 15	10 1	1.7	22 9	1.9
20	6 34	17 29	0 24	1 19	10 8	1.6	22 3	2.0
30	6 55	17 8	0 26	1 26	10 17	1.5	21 56	2.2
35	7 8	16 56	0 28	1 31	10 22	1.4	21 51	2.2
40	7 22	16 42	0 31	1 38	10 27	1.3	21 47	2.3
45	7 39	16 25	0 34	1 47	10 34	1.2	21 41	2.4
50	7 60	16 4	0 39	1 60	10 42	1.1	21 34	2.6
55	8 27	15 37	0 46	2 18	10 51	.9	21 26	2.7
60	9 6	14 58	0 58	2 46	11 4	.7	21 15	2.9
S								

SUNCE UT	e = T_p − UT	Δ/24	r	MESEC Prolaz		Δ/24	$\pi_\leftmoon$	r
h	min s	s	′	$T_{\overline{m}}$	h min	min	′	′
00	− 1 37.7	−.5	15.8	$T_{\overline{m}}$	16 4	1.8	54.8	14.9
12	− 1 44.2	$T_{\overline{m}_\odot}$ 12 h	1.7 min	Starost	4.4 d	Faza	◑	

PLANETE

Pl.	$T_{\overline{m}}$	π	360 − α	Vel.	Pl.	$T_{\overline{m}}$	π	360 − α	Vel.
	h min	′	°			h min	′	°	
♀	15 11	.1	223	−5.1	♄	15 32	.0	218	−1.4
♂	11 53	.1	273	1.7	♃	21 52	.0	122	.4

UT	SUNCE		PROLEĆ. TAČKA	VENERA		MARS	
	$S_\odot$	$\delta_\odot$	S_Υ	S_φ	δ_φ	S_σ	δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	179 32.3	23 26.1	269 51.4	132 16.6	17 52.2	181 45.8	24 6.1
2	209 32.0	23 26.0	299 56.3	162 17.6	17 50.6	211 47.0	24 6.2
4	239 31.8	23 26.0	330 1.3	192 18.6	17 49.0	241 48.2	24 6.3
6	269 31.5	23 26.0	0 6.2	222 19.6	17 47.3	271 49.5	24 6.4
8	299 31.2	23 26.0	30 11.1	252 20.6	17 45.7	301 50.7	24 6.5
10	329 30.9	23 26.0	60 16.1	282 21.6	17 44.1	331 51.9	24 6.5
12	359 30.7	23 25.9	90 21.0	312 22.6	17 42.5	1 53.1	24 6.6
14	29 30.4	23 25.9	120 25.9	342 23.6	17 40.9	31 54.4	24 6.7
16	59 30.1	23 25.9	150 30.8	12 24.7	17 39.2	61 55.6	24 6.8
18	89 29.9	23 25.8	180 35.8	42 25.7	17 37.6	91 56.8	24 6.8
20	119 29.6	23 25.8	210 40.7	72 26.8	17 36.0	121 58.0	24 6.9
22	149 29.3	23 25.8	240 45.6	102 27.8	17 34.4	151 59.3	24 7.0
Δ	−1	0		5	−8	6	0

UT	MESEC				JUPITER		SATURN	
	$S_\leftmoon$	Δ	$\delta_\leftmoon$	Δ	$S_{\mathrm{♃}}$	$\delta_{\mathrm{♃}}$	$S_{\mathrm{♄}}$	$\delta_{\mathrm{♄}}$
h	° ′		° ′		° ′	° ′	° ′	° ′
0	115 25.8	146	7 42.1	−87	127 13.8	15 39.0	32 .9	−17 58.5
2	144 33.0	146	7 24.7	−87	157 17.9	15 38.8	62 6.1	−17 58.5
4	173 40.2	147	7 7.3	−88	187 22.0	15 38.5	92 11.3	−17 58.4
6	202 47.6	148	6 49.7	−88	217 26.0	15 38.2	122 16.5	−17 58.4
8	231 55.2	148	6 32.0	−89	247 30.1	15 37.9	152 21.8	−17 58.4
10	261 2.8	149	6 14.3	−89	277 34.2	15 37.6	182 27.0	−17 58.3
12	290 10.5	149	5 56.5	−90	307 38.2	15 37.4	212 32.2	−17 58.3
14	319 18.4	150	5 38.5	−90	337 42.3	15 37.1	242 37.5	−17 58.2
16	348 26.3	150	5 20.5	−90	7 46.4	15 36.8	272 42.7	−17 58.2
18	17 34.4	151	5 2.5	−91	37 50.4	15 36.5	302 47.9	−17 58.1
20	46 42.5	151	4 44.3	−91	67 54.5	15 36.2	332 53.1	−17 58.1
22	75 50.7	151	4 26.1	−91	97 58.6	15 36.0	2 58.4	−17 58.0
Δ					20	−1	26	0

φ	SUNCE		TRAJANJE SUMRAKA		MESEC			
	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 36	21 28	1 46	: ::	9 53	2.9	23 27	.6
55	3 21	20 43	0 58	: ::	10 1	2.7	23 22	.8
50	3 51	20 13	0 45	: ::	10 7	2.6	23 18	1.0
45	4 13	19 50	0 37	2 33	10 12	2.4	23 15	1.1
40	4 31	19 32	0 33	2 3	10 16	2.3	23 12	1.2
35	4 47	19 17	0 30	1 47	10 19	2.2	23 10	1.3
30	4 60	19 4	0 27	1 37	10 23	2.2	23 8	1.4
20	5 22	18 42	0 25	1 24	10 28	2.0	23 4	1.5
10	5 41	18 23	0 23	1 18	10 33	1.9	23 1	1.6
0	5 58	18 6	0 23	1 15	10 37	1.8	22 58	1.8
10	6 16	17 48	0 23	1 15	10 42	1.7	22 55	1.9
20	6 34	17 30	0 24	1 19	10 47	1.5	22 51	2.0
30	6 56	17 8	0 26	1 26	10 52	1.4	22 48	2.1
35	7 8	16 56	0 28	1 31	10 55	1.3	22 45	2.2
40	7 22	16 42	0 31	1 38	10 59	1.2	22 43	2.3
45	7 39	16 25	0 34	1 47	11 3	1.1	22 40	2.4
50	7 60	16 4	0 39	1 60	11 8	1.0	22 36	2.6
55	8 27	15 37	0 46	2 18	11 13	.9	22 32	2.7
60	9 6	14 58	0 58	2 46	11 21	.7	22 26	2.9
S								

SUNCE				MESEC			
UT	e = T_p − UT	Δ/24	r	Prolaz		Δ/24	$\pi_\leftmoon$	r
h	min s	s	′	$T_{\overline{m}}$	h min	min	′	′
00	− 1 50.8	−.5	15.8	$T_{\overline{m}}$	16 48	1.8	54.5	14.8
12	− 1 57.3	$T_{\overline{m}_\odot}$	12 h 2.0 min	Starost	5.4 d	Faza	◐	

PLANETE

Pl.	$T_{\overline{m}}$	π	360 − α	Vel.	Pl.	$T_{\overline{m}}$	π	360 − α	Vel.
	h min	′	°			h min	′	°	
♀	15 10	.1	222	−5.2	♄	15 29	.0	217	−1.4
♂	11 52	.1	272	1.7	♅	21 48	.0	122	.4

UT	SUNCE		PROLEĆ. TAČKA	VENERA		MARS	
	$S_\odot$	$\delta_\odot$	S_Υ	S_φ	δ_φ	S_σ	δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	179 29.0	23 25.7	270 50.6	132 28.9	17 32.7	182 .5	24 7.0
2	209 28.8	23 25.7	300 55.5	162 30.0	17 31.1	212 1.7	24 7.1
4	239 28.5	23 25.6	331 .4	192 31.1	17 29.5	242 2.9	24 7.2
6	269 28.2	23 25.6	1 5.3	222 32.1	17 27.8	272 4.2	24 7.2
8	299 28.0	23 25.5	31 10.3	252 33.2	17 26.2	302 5.4	24 7.3
10	329 27.7	23 25.5	61 15.2	282 34.3	17 24.6	332 6.6	24 7.4
12	359 27.4	23 25.4	91 20.1	312 35.4	17 22.9	2 7.9	24 7.4
14	29 27.1	23 25.3	121 25.1	342 36.6	17 21.3	32 9.1	24 7.5
16	59 26.9	23 25.3	151 30.0	12 37.7	17 19.7	62 10.3	24 7.5
18	89 26.6	23 25.2	181 34.9	42 38.8	17 18.0	92 11.5	24 7.6
20	119 26.3	23 25.1	211 39.8	72 39.9	17 16.4	122 12.8	24 7.6
22	149 26.1	23 25.1	241 44.8	102 41.1	17 14.8	152 14.0	24 7.7
Δ	−1	0		6	−8	6	0

UT	MESEC				JUPITER		SATURN	
	$S_\leftmoon$	Δ	$\delta_\leftmoon$	Δ	$S_{\mathrm{♃}}$	$\delta_{\mathrm{♃}}$	$S_{\mathrm{♄}}$	$\delta_{\mathrm{♄}}$
h	° ′		° ′		° ′	° ′	° ′	° ′
0	104 59.0	152	4 7.8	−92	128 2.6	15 35.7	33 3.6	−17 58.0
2	134 7.3	152	3 49.5	−92	158 6.7	15 35.4	63 8.8	−17 57.9
4	163 15.7	152	3 31.1	−92	188 10.8	15 35.1	93 14.0	−17 57.9
6	192 24.2	153	3 12.7	−92	218 14.8	15 34.8	123 19.3	−17 57.8
8	221 32.7	153	2 54.2	−93	248 18.9	15 34.5	153 24.5	−17 57.8
10	250 41.3	153	2 35.7	−93	278 23.0	15 34.3	183 29.7	−17 57.7
12	279 49.9	153	2 17.1	−93	308 27.0	15 34.0	213 34.9	−17 57.7
14	308 58.5	153	1 58.5	−93	338 31.1	15 33.7	243 40.2	−17 57.7
16	338 7.2	153	1 39.9	−93	8 35.1	15 33.4	273 45.4	−17 57.6
18	7 15.9	154	1 21.3	−93	38 39.2	15 33.1	303 50.6	−17 57.6
20	36 24.6	154	1 2.6	−93	68 43.3	15 32.9	333 55.8	−17 57.5
22	65 33.3	154	0 43.9	−93	98 47.3	15 32.6	4 1.1	−17 57.5
Δ					20	−1	26	0

φ	SUNCE		TRAJANJE SUMRAKA		MESEC			
	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 36	21 28	1 46	: ::	11 3	2.1	23 43	2.6
55	3 21	20 43	0 58	: ::	11 6	2.0	23 43	2.5
50	3 51	20 13	0 45	: ::	11 8	2.0	23 42	2.4
45	4 14	19 51	0 37	2 33	11 10	1.9	23 42	2.3
40	4 32	19 33	0 33	2 3	11 12	1.9	23 42	2.2
35	4 47	19 18	0 30	1 47	11 13	1.9	23 41	2.1
30	4 60	19 5	0 27	1 37	11 14	1.9	23 41	2.0
20	5 22	18 42	0 25	1 24	11 16	1.8	23 41	1.9
10	5 41	18 23	0 23	1 18	11 18	1.8	23 41	1.9
0	5 58	18 6	0 23	1 15	11 20	1.8	23 40	1.8
10	6 16	17 48	0 23	1 15	11 22	1.7	23 40	1.7
20	6 35	17 30	0 24	1 19	11 23	1.7	23 40	1.6
30	6 56	17 9	0 26	1 26	11 26	1.7	23 39	1.5
35	7 8	16 56	0 28	1 31	11 27	1.7	23 39	1.4
40	7 22	16 42	0 31	1 38	11 28	1.6	23 38	1.4
45	7 39	16 25	0 34	1 47	11 30	1.6	23 38	1.3
50	7 60	16 4	0 39	1 60	11 32	1.6	23 38	1.2
55	8 27	15 37	0 46	2 18	11 34	1.5	23 37	1.1
60	9 6	14 58	0 58	2 46	11 37	1.5	23 36	.9
S								

SUNCE				MESEC			
UT	e = T_p − UT	Δ/24	r	Prolaz		Δ/24	$\pi_\leftmoon$	r
h	min s	s	′	$T_{\overline{m}}$	h min	min	′	′
00	− 2 3.8	−.5	15.8	$T_{\overline{m}}$	17 30	1.8	54.3	14.8
12	− 2 10.3	$T_{\overline{m}_\odot}$	12 h 2.2 min	Starost	6.4 d	Faza	◐	

PLANETE

Pl.	$T_{\overline{m}}$	π	360 − α	Vel.	Pl.	$T_{\overline{m}}$	π	360 − α	Vel.
	h min	′	°			h min	′	°	
♀	15 10	.1	222	−5.2	♄	15 26	.0	217	−1.4
♂	11 51	.1	271	1.7	♅	21 44	.0	122	.4

UT	SUNCE		PROLEĆ. TAČKA	VENERA		MARS	
	$S_\odot$	$\delta_\odot$	S_Υ	S_φ	δ_φ	S_σ	δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	179 25.8	23 25.0	271 49.7	132 42.2	17 13.1	182 15.2	24 7.7
2	209 25.5	23 24.9	301 54.6	162 43.4	17 11.5	212 16.5	24 7.8
4	239 25.3	23 24.8	331 59.5	192 44.6	17 9.9	242 17.7	24 7.8
6	269 25.0	23 24.7	2 4.5	222 45.7	17 8.2	272 18.9	24 7.9
8	299 24.7	23 24.6	32 9.4	252 46.9	17 6.6	302 20.2	24 7.9
10	329 24.5	23 24.5	62 14.3	282 48.1	17 4.9	332 21.4	24 8.0
12	359 24.2	23 24.5	92 19.3	312 49.3	17 3.3	2 22.6	24 8.0
14	29 23.9	23 24.4	122 24.2	342 50.5	17 1.6	32 23.9	24 8.1
16	59 23.6	23 24.3	152 29.1	12 51.7	16 60.0	62 25.1	24 8.1
18	89 23.4	23 24.2	182 34.0	42 52.9	16 58.4	92 26.3	24 8.1
20	119 23.1	23 24.0	212 39.0	72 54.1	16 56.7	122 27.6	24 8.2
22	149 22.8	23 23.9	242 43.9	102 55.4	16 55.1	152 28.8	24 8.2
Δ	-1	0		6	-8	6	0

UT	MESEC				JUPITER		SATURN	
	$S_\leftmoon$	Δ	$\delta_\leftmoon$	Δ	$S_{\text{♃}}$	$\delta_{\text{♃}}$	$S_{\text{♄}}$	$\delta_{\text{♄}}$
h	° ′		° ′		° ′	° ′	° ′	° ′
0	94 42.0	154	0 25.2	-94	128 51.4	15 32.3	34 6.3	-17 57.4
2	123 50.7	154	0 6.5	28	158 55.4	15 32.0	64 11.5	-17 57.4
4	152 59.4	153	0 12.2	94	188 59.5	15 31.7	94 16.7	-17 57.3
6	182 8.1	153	0 30.9	94	219 3.6	15 31.4	124 21.9	-17 57.3
8	211 16.8	153	0 49.6	94	249 7.6	15 31.1	154 27.2	-17 57.2
10	240 25.5	153	1 8.3	93	279 11.7	15 30.9	184 32.4	-17 57.2
12	269 34.1	153	1 27.0	93	309 15.7	15 30.6	214 37.6	-17 57.2
14	298 42.6	153	1 45.7	93	339 19.8	15 30.3	244 42.8	-17 57.1
16	327 51.2	152	2 4.4	93	9 23.8	15 30.0	274 48.0	-17 57.1
18	356 59.6	152	2 23.0	93	39 27.9	15 29.7	304 53.2	-17 57.0
20	26 8.1	152	2 41.6	93	69 31.9	15 29.4	334 58.5	-17 57.0
22	55 16.4	151	3 .2	93	99 36.0	15 29.1	5 3.7	-17 56.9
Δ					20	-1	26	0

φ	SUNCE		TRAJANJE SUMRAKA		MESEC			
	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 37	21 28	1 46	: ::	11 52	.7	. . .	.0
55	3 21	20 43	0 58	: ::	11 54	.9	. . .	.0
50	3 51	20 13	0 45	: ::	11 55	1.0	. . .	.0
45	4 14	19 51	0 37	2 33	11 56	1.1	. . .	.0
40	4 32	19 33	0 33	2 3	11 57	1.2	. . .	.0
35	4 47	19 18	0 30	1 47	11 58	1.3	. . .	.0
30	5 0	19 5	0 27	1 37	11 59	1.4	. . .	.0
20	5 22	18 43	0 25	1 24	12 0	1.5	. . .	.0
10	5 41	18 24	0 23	1 18	12 1	1.7	. . .	.0
0	5 59	18 6	0 23	1 15	12 2	1.8	. . .	.0
10	6 16	17 49	0 23	1 15	12 3	1.9	. . .	.0
20	6 35	17 30	0 24	1 19	12 4	2.0	. . .	.0
30	6 56	17 9	0 26	1 26	12 6	2.2	. . .	.0
35	7 8	16 57	0 28	1 31	12 6	2.2	. . .	.0
40	7 22	16 42	0 31	1 38	12 7	2.3	. . .	.0
45	7 39	16 26	0 34	1 47	12 8	2.4	. . .	.0
50	8 0	16 5	0 39	1 60	12 10	2.6	. . .	.0
55	8 27	15 38	0 46	2 18	12 11	2.7	. . .	.0
60	9 6	14 59	0 58	2 46	12 13	2.9	23 59	.7
S								

SUNCE				MESEC			
UT	e = T_p − UT	Δ/24	r	Prolaz		Δ/24	$\pi_\leftmoon$	r
h	min s	s	′	$T_{\overline{m}}$	h min	min	′	′
00	− 2 16.8	-.5	15.8	$T_{\overline{m}}$	18 12	1.8	54.3	14.8
12	− 2 23.3	$T_{\overline{m}_\odot}$	12 h 2.4 min	Starost	7.4 d	Faza	◐	

PLANETE

Pl.	$T_{\overline{m}}$	π	360 − α	Vel.	Pl.	$T_{\overline{m}}$	π	360 − α	Vel.
	h min	′	°			h min	′	°	
♀	15 9	.1	221	-5.2	♃	15 22	.0	217	-1.4
♂	11 50	.1	270	1.7	♄	21 40	.0	122	.4

UT	SUNCE		PROLEĆ. TAČKA	VENERA		MARS	
	$S_\odot$	$\delta_\odot$	S_Υ	S_φ	δ_φ	S_σ	δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	179 22.6	23 23.8	272 48.8	132 56.6	16 53.4	182 30.0	24 8.2
2	209 22.3	23 23.7	302 53.8	162 57.9	16 51.8	212 31.3	24 8.3
4	239 22.0	23 23.6	332 58.7	192 59.1	16 50.1	242 32.5	24 8.3
6	269 21.8	23 23.5	3 3.6	223 .4	16 48.5	272 33.7	24 8.3
8	299 21.5	23 23.3	33 8.5	253 1.6	16 46.8	302 35.0	24 8.3
10	329 21.2	23 23.2	63 13.5	283 2.9	16 45.2	332 36.2	24 8.4
12	359 21.0	23 23.1	93 18.4	313 4.2	16 43.5	2 37.4	24 8.4
14	29 20.7	23 23.0	123 23.3	343 5.5	16 41.9	32 38.7	24 8.4
16	59 20.5	23 22.8	153 28.3	13 6.8	16 40.2	62 39.9	24 8.4
18	89 20.2	23 22.7	183 33.2	43 8.1	16 38.5	92 41.1	24 8.5
20	119 19.9	23 22.5	213 38.1	73 9.4	16 36.9	122 42.4	24 8.5
22	149 19.7	23 22.4	243 43.0	103 10.7	16 35.2	152 43.6	24 8.5
Δ	-1	-1		6	-8	6	0

UT	MESEC				JUPITER		SATURN	
	$S_\leftmoon$	Δ	$\delta_\leftmoon$	Δ	$S_{\text{♃}}$	$\delta_{\text{♃}}$	$S_{\text{♄}}$	$\delta_{\text{♄}}$
h	° ′		° ′		° ′	° ′	° ′	° ′
0	84 24.7	151	3 18.7	92	129 40.0	15 28.9	35 8.9	-17 56.9
2	113 32.9	151	3 37.2	92	159 44.1	15 28.6	65 14.1	-17 56.8
4	142 41.0	150	3 55.6	92	189 48.1	15 28.3	95 19.3	-17 56.8
6	171 49.1	150	4 14.1	92	219 52.2	15 28.0	125 24.5	-17 56.8
8	200 57.0	149	4 32.4	91	249 56.2	15 27.7	155 29.7	-17 56.7
10	230 4.9	149	4 50.7	91	280 .3	15 27.4	185 35.0	-17 56.7
12	259 12.6	148	5 8.9	91	310 4.3	15 27.1	215 40.2	-17 56.6
14	288 20.2	148	5 27.1	90	340 8.4	15 26.9	245 45.4	-17 56.6
16	317 27.7	147	5 45.2	90	10 12.4	15 26.6	275 50.6	-17 56.5
18	346 35.1	146	6 3.2	90	40 16.5	15 26.3	305 55.8	-17 56.5
20	15 42.4	146	6 21.1	89	70 20.5	15 26.0	336 1.0	-17 56.5
22	44 49.5	145	6 39.0	89	100 24.6	15 25.7	6 6.2	-17 56.4
Δ					20	-1	26	0

φ	SUNCE		TRAJANJE SUMRAKA		MESEC			
	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 37	21 28	1 45	: ::	12 8	.7	0 47	3.0
55	3 22	20 43	0 58	: ::	12 14	.9	0 43	2.7
50	3 52	20 13	0 45	: ::	12 19	1.1	0 39	2.6
45	4 14	19 51	0 37	2 33	12 23	1.2	0 37	2.5
40	4 32	19 33	0 33	2 3	12 27	1.3	0 34	2.3
35	4 47	19 18	0 30	1 47	12 30	1.4	0 32	2.3
30	5 0	19 5	0 27	1 37	12 32	1.5	0 31	2.2
20	5 22	18 43	0 25	1 24	12 37	1.6	0 28	2.0
10	5 41	18 24	0 23	1 18	12 41	1.7	0 25	1.9
0	5 59	18 6	0 23	1 15	12 45	1.8	0 23	1.8
10	6 16	17 49	0 23	1 15	12 49	1.9	0 20	1.7
20	6 35	17 30	0 24	1 19	12 53	2.1	0 18	1.6
30	6 56	17 9	0 26	1 26	12 58	2.2	0 15	1.4
35	7 8	16 57	0 28	1 31	13 0	2.3	0 13	1.3
40	7 23	16 43	0 31	1 38	13 3	2.4	0 11	1.3
45	7 39	16 26	0 34	1 47	13 7	2.5	0 9	1.2
50	8 0	16 5	0 38	1 59	13 11	2.6	0 6	1.0
55	8 27	15 38	0 46	2 18	13 17	2.8	0 3	.9
60	9 6	14 59	0 58	2 46	13 24	3.0	. . .	.0
S								

SUNCE				MESEC			
UT	e = T_p − UT	Δ/24	r	Prolaz		Δ/24	$\pi_\leftmoon$	r
h	min s	s	′	$T_{\overline{m}}$	h min	min	′	′
00	− 2 29.7	-.5	15.8	$T_{\overline{m}}$	18 55	1.9	54.4	14.8
12	− 2 36.1	$T_{\overline{m}_\odot}$	12 h 2.6 min	Starost	8.4 d	Faza	◐	

PLANETE

Pl.	$T_{\overline{m}}$	π	360 − α	Vel.	Pl.	$T_{\overline{m}}$	π	360 − α	Vel.
	h min	′	°			h min	′	°	
♀	15 8	.1	220	-5.2	♃	15 19	.0	217	-1.4
♂	11 50	.1	270	1.7	♄	21 36	.0	122	.4

UT	SUNCE		PROLEĆ. TAČKA	VENERA		MARS	
	$S_\odot$	$\delta_\odot$	S_Υ	S_φ	δ_φ	S_σ	δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	179 19.4	23 22.3	273 48.0	133 12.1	16 33.6	182 44.9	24 8.5
2	209 19.1	23 22.1	303 52.9	163 13.4	16 31.9	212 46.1	24 8.5
4	239 18.9	23 22.0	333 57.8	193 14.7	16 30.3	242 47.3	24 8.5
6	269 18.6	23 21.8	4 2.8	223 16.1	16 28.6	272 48.6	24 8.5
8	299 18.3	23 21.6	34 7.7	253 17.4	16 27.0	302 49.8	24 8.6
10	329 18.1	23 21.5	64 12.6	283 18.8	16 25.3	332 51.1	24 8.6
12	359 17.8	23 21.3	94 17.5	313 20.2	16 23.6	2 52.3	24 8.6
14	29 17.6	23 21.1	124 22.5	343 21.6	16 22.0	32 53.5	24 8.6
16	59 17.3	23 21.0	154 27.4	13 22.9	16 20.3	62 54.8	24 8.6
18	89 17.0	23 20.8	184 32.3	43 24.3	16 18.7	92 56.0	24 8.6
20	119 16.8	23 20.6	214 37.3	73 25.7	16 17.0	122 57.3	24 8.6
22	149 16.5	23 20.5	244 42.2	103 27.2	16 15.3	152 58.5	24 8.6
Δ	-1	-1		7	-8	6	0

UT	MESEC				JUPITER		SATURN	
	$S_\leftmoon$	Δ	$\delta_\leftmoon$	Δ	S_{4}	δ_{4}	S_η	δ_η
h	° ′		° ′		° ′	° ′	° ′	° ′
0	73 56.5	144	6 56.7	88	130 28.6	15 25.4	36 11.4	-17 56.4
2	103 3.3	143	7 14.4	88	160 32.7	15 25.1	66 16.6	-17 56.3
4	132 10.0	143	7 32.0	87	190 36.7	15 24.8	96 21.8	-17 56.3
6	161 16.5	142	7 49.4	87	220 40.8	15 24.5	126 27.1	-17 56.2
8	190 22.9	141	8 6.8	86	250 44.8	15 24.3	156 32.3	-17 56.2
10	219 29.1	140	8 24.0	86	280 48.9	15 24.0	186 37.5	-17 56.2
12	248 35.1	139	8 41.1	85	310 52.9	15 23.7	216 42.7	-17 56.1
14	277 41.0	138	8 58.1	84	340 56.9	15 23.4	246 47.9	-17 56.1
16	306 46.6	137	9 15.0	84	11 1.0	15 23.1	276 53.1	-17 56.0
18	335 52.1	136	9 31.7	83	41 5.0	15 22.8	306 58.3	-17 56.0
20	4 57.4	135	9 48.3	82	71 9.1	15 22.5	337 3.5	-17 55.9
22	34 2.5	134	10 4.7	81	101 13.1	15 22.2	7 8.7	-17 55.9
Δ					20	-1	26	0

φ	SUNCE		TRAJANJE SUMRAKA		MESEC			
	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 28	1 44	: ::	12 25	.8	1 58	3.0
55	3 22	20 43	0 58	: ::	12 37	1.0	1 49	2.8
50	3 52	20 13	0 45	: ::	12 45	1.2	1 41	2.6
45	4 15	19 51	0 37	2 33	12 52	1.3	1 36	2.5
40	4 33	19 33	0 33	2 3	12 58	1.4	1 31	2.4
35	4 48	19 18	0 30	1 47	13 3	1.5	1 27	2.3
30	5 1	19 5	0 27	1 36	13 8	1.6	1 23	2.2
20	5 23	18 43	0 25	1 24	13 15	1.7	1 17	2.1
10	5 42	18 24	0 23	1 18	13 22	1.8	1 11	2.0
0	5 59	18 6	0 23	1 15	13 29	1.9	1 6	1.9
10	6 17	17 49	0 23	1 15	13 35	2.0	1 1	1.8
20	6 35	17 31	0 24	1 19	13 42	2.1	0 55	1.6
30	6 56	17 9	0 26	1 25	13 50	2.3	0 49	1.5
35	7 9	16 57	0 28	1 31	13 55	2.3	0 45	1.4
40	7 23	16 43	0 31	1 38	14 0	2.4	0 41	1.3
45	7 39	16 26	0 34	1 47	14 6	2.5	0 36	1.2
50	8 0	16 6	0 38	1 59	14 14	2.6	0 31	1.1
55	8 27	15 39	0 45	2 18	14 23	2.8	0 24	1.0
60	9 6	14 60	0 58	2 46	14 35	3.0	0 15	.8
S								

SUNCE				MESEC			
UT	e = T_p − UT	Δ/24	r	Prolaz		Δ/24	$\pi_\leftmoon$	r
h	min s	s	′		h min	min	′	′
00	− 2 42.4	-.5	15.8	$T_{\overline{m}}$	19 40	1.9	54.7	14.9
12	− 2 48.7	$T_{\overline{m}_\odot}$ 12 h	2.8 min	Starost	9.4 d	Faza	◐	

PLANETE								
Pl.	$T_{\overline{m}}$	π	360−α	Vel.	Pl.	$T_{\overline{m}}$	π	360−α	Vel.
	h min	′	°			h min	′	°	
♀	15 7	.1	219	-5.3	♃	15 16	.0	217	-1.4
♂	11 49	.1	269	1.7	♄	21 32	.0	122	.4

UT	SUNCE		PROLEĆ. TAČKA	VENERA		MARS	
	$S_\odot$	$\delta_\odot$	S_Υ	S_φ	δ_φ	S_σ	δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	179 16.2	23 20.3	274 47.1	133 28.6	16 13.7	182 59.7	24 8.6
2	209 16.0	23 20.1	304 52.0	163 30.0	16 12.0	213 1.0	24 8.6
4	239 15.7	23 19.9	334 57.0	193 31.4	16 10.3	243 2.2	24 8.6
6	269 15.5	23 19.7	5 1.9	223 32.9	16 8.7	273 3.5	24 8.6
8	299 15.2	23 19.5	35 6.8	253 34.3	16 7.0	303 4.7	24 8.5
10	329 14.9	23 19.3	65 11.7	283 35.8	16 5.3	333 5.9	24 8.5
12	359 14.7	23 19.1	95 16.7	313 37.2	16 3.7	3 7.2	24 8.5
14	29 14.4	23 18.9	125 21.6	343 38.7	16 2.0	33 8.4	24 8.5
16	59 14.2	23 18.7	155 26.5	13 40.2	16 .3	63 9.7	24 8.5
18	89 13.9	23 18.5	185 31.5	43 41.7	15 58.7	93 10.9	24 8.5
20	119 13.7	23 18.3	215 36.4	73 43.2	15 57.0	123 12.2	24 8.5
22	149 13.4	23 18.1	245 41.3	103 44.7	15 55.3	153 13.4	24 8.5
Δ	-1	-1		7	-8	6	0

UT	MESEC				JUPITER		SATURN	
	$S_\leftmoon$	Δ	$\delta_\leftmoon$	Δ	S_{4}	δ_{4}	S_η	δ_η
h	° ′		° ′		° ′	° ′	° ′	° ′
0	63 7.4	133	10 21.0	81	131 17.2	15 21.9	37 13.9	-17 55.9
2	92 12.0	132	10 37.2	80	161 21.2	15 21.6	67 19.1	-17 55.8
4	121 16.5	131	10 53.1	79	191 25.2	15 21.3	97 24.3	-17 55.8
6	150 20.7	130	11 8.9	78	221 29.3	15 21.0	127 29.5	-17 55.7
8	179 24.8	129	11 24.6	77	251 33.3	15 20.8	157 34.7	-17 55.7
10	208 28.6	128	11 40.0	76	281 37.4	15 20.5	187 39.9	-17 55.7
12	237 32.1	127	11 55.3	75	311 41.4	15 20.2	217 45.1	-17 55.6
14	266 35.5	125	12 10.3	74	341 45.4	15 19.9	247 50.3	-17 55.6
16	295 38.6	124	12 25.2	73	11 49.5	15 19.6	277 55.5	-17 55.5
18	324 41.4	123	12 39.9	72	41 53.5	15 19.3	308 .7	-17 55.5
20	353 44.0	122	12 54.3	71	71 57.5	15 19.0	338 5.9	-17 55.5
22	22 46.4	121	13 8.6	70	102 1.6	15 18.7	8 11.1	-17 55.4
Δ					20	-1	26	0

φ	SUNCE		TRAJANJE SUMRAKA		MESEC			
	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 27	1 43	: ::	12 46	1.0	3 10	3.0
55	3 23	20 43	0 58	: ::	13 2	1.2	2 55	2.8
50	3 53	20 13	0 44	: ::	13 14	1.4	2 44	2.6
45	4 15	19 51	0 37	2 32	13 24	1.5	2 35	2.5
40	4 33	19 33	0 33	2 3	13 32	1.6	2 28	2.4
35	4 48	19 18	0 30	1 47	13 39	1.6	2 22	2.4
30	5 1	19 5	0 27	1 36	13 45	1.7	2 16	2.3
20	5 23	18 43	0 25	1 24	13 56	1.8	2 7	2.2
10	5 42	18 24	0 23	1 18	14 6	1.9	1 58	2.1
0	5 59	18 7	0 23	1 15	14 15	2.0	1 50	2.0
10	6 17	17 49	0 23	1 15	14 24	2.1	1 43	1.9
20	6 35	17 31	0 24	1 19	14 33	2.2	1 34	1.8
30	6 56	17 10	0 26	1 25	14 44	2.3	1 25	1.6
35	7 9	16 57	0 28	1 31	14 51	2.4	1 20	1.6
40	7 23	16 43	0 31	1 38	14 58	2.5	1 13	1.5
45	7 40	16 27	0 34	1 47	15 7	2.5	1 6	1.4
50	8 0	16 6	0 38	1 59	15 17	2.7	0 58	1.3
55	8 27	15 39	0 45	2 17	15 30	2.8	0 47	1.1
60	9 6	15 1	0 58	2 46	15 47	3.0	0 34	.9
S								

SUNCE				MESEC			
UT	e = T_p − UT	Δ/24	r	Prolaz		Δ/24	$\pi_\leftmoon$	r
h	min s	s	′		h min	min	′	′
00	− 2 55.0	-.5	15.8	$T_{\overline{m}}$	20 26	2.0	55.2	15.0
12	− 3 1.2	$T_{\overline{m}_\odot}$ 12 h	3.0 min	Starost	10.4 d	Faza	◐	

PLANETE								
Pl.	$T_{\overline{m}}$	π	360−α	Vel.	Pl.	$T_{\overline{m}}$	π	360−α	Vel.
	h min	′	°			h min	′	°	
♀	15 5	.1	219	-5.3	♃	15 13	.0	216	-1.4
♂	11 48	.1	268	1.7	♄	21 27	.0	122	.4

UT	SUNCE		PROLEĆ. TAČKA	VENERA		MARS	
	$S_\odot$	$\delta_\odot$	S_Υ	S_φ	δ_φ	S_σ	δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	179 13.1	23 17.9	275 46.2	133 46.2	15 53.7	183 14.7	24 8.4
2	209 12.9	23 17.7	305 51.2	163 47.7	15 52.0	213 15.9	24 8.4
4	239 12.6	23 17.4	335 56.1	193 49.3	15 50.3	243 17.1	24 8.4
6	269 12.4	23 17.2	6 1.0	223 50.8	15 48.7	273 18.4	24 8.4
8	299 12.1	23 17.0	36 6.0	253 52.3	15 47.0	303 19.6	24 8.3
10	329 11.9	23 16.8	66 10.9	283 53.9	15 45.3	333 20.9	24 8.3
12	359 11.6	23 16.5	96 15.8	313 55.5	15 43.7	3 22.1	24 8.3
14	29 11.4	23 16.3	126 20.7	343 57.0	15 42.0	33 23.4	24 8.3
16	59 11.1	23 16.1	156 25.7	13 58.6	15 40.3	63 24.6	24 8.2
18	89 10.8	23 15.8	186 30.6	44 .2	15 38.7	93 25.9	24 8.2
20	119 10.6	23 15.6	216 35.5	74 1.8	15 37.0	123 27.1	24 8.2
22	149 10.3	23 15.3	246 40.5	104 3.4	15 35.3	153 28.4	24 8.1
Δ	-1	-1		8	-8	6	0

UT	MESEC				JUPITER		SATURN	
	$S_\leftmoon$	Δ	$\delta_\leftmoon$	Δ	$S_{\text{♃}}$	$\delta_{\text{♃}}$	$S_{\text{♄}}$	$\delta_{\text{♄}}$
h	° ′		° ′		° ′	° ′	° ′	° ′
0	51 48.5	119	13 22.6	69	132 5.6	15 18.4	38 16.3	-17 55.4
2	80 50.4	118	13 36.4	68	162 9.6	15 18.1	68 21.5	-17 55.3
4	109 52.0	117	13 49.9	67	192 13.7	15 17.8	98 26.7	-17 55.3
6	138 53.4	116	14 3.2	65	222 17.7	15 17.5	128 31.9	-17 55.3
8	167 54.5	114	14 16.3	64	252 21.7	15 17.2	158 37.1	-17 55.2
10	196 55.3	113	14 29.1	63	282 25.8	15 16.9	188 42.3	-17 55.2
12	225 55.9	112	14 41.6	61	312 29.8	15 16.6	218 47.5	-17 55.1
14	254 56.2	110	14 53.9	60	342 33.8	15 16.3	248 52.7	-17 55.1
16	283 56.3	109	15 5.9	59	12 37.9	15 16.0	278 57.9	-17 55.1
18	312 56.1	108	15 17.6	57	42 41.9	15 15.8	309 3.1	-17 55.0
20	341 55.6	106	15 29.1	56	72 45.9	15 15.5	339 8.2	-17 55.0
22	10 54.8	105	15 40.2	54	102 50.0	15 15.2	9 13.4	-17 54.9
Δ					20	-1	26	0

φ	SUNCE		TRAJANJE SUMRAKA		MESEC			
	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 27	1 42	: ::	13 11	1.3	4 22	3.0
55	3 23	20 43	0 58	: ::	13 31	1.5	4 2	2.8
50	3 53	20 13	0 44	: ::	13 47	1.6	3 48	2.6
45	4 15	19 51	0 37	2 32	13 59	1.7	3 36	2.5
40	4 33	19 33	0 33	2 3	14 10	1.8	3 26	2.5
35	4 48	19 18	0 30	1 47	14 18	1.8	3 18	2.4
30	5 1	19 5	0 27	1 36	14 26	1.9	3 11	2.3
20	5 23	18 43	0 25	1 24	14 40	2.0	2 58	2.2
10	5 42	18 24	0 23	1 18	14 52	2.1	2 48	2.1
0	5 60	18 7	0 23	1 15	15 3	2.1	2 37	2.1
10	6 17	17 50	0 23	1 15	15 14	2.2	2 27	2.0
20	6 35	17 31	0 24	1 19	15 26	2.3	2 16	1.9
30	6 56	17 10	0 26	1 25	15 40	2.4	2 4	1.8
35	7 9	16 58	0 28	1 31	15 48	2.4	1 57	1.7
40	7 23	16 44	0 31	1 38	15 57	2.5	1 49	1.7
45	7 39	16 27	0 34	1 47	16 8	2.5	1 40	1.6
50	8 0	16 6	0 38	1 59	16 21	2.6	1 28	1.5
55	8 27	15 40	0 45	2 17	16 37	2.7	1 14	1.3
60	9 5	15 1	0 57	2 46	16 59	2.9	0 56	1.2
S								

SUNCE				MESEC				
UT	e = T_p − UT	Δ/24	r	Prolaz		Δ/24	$\pi_\leftmoon$	r
h	min s	s	′	$T_{\overline{m}}$	h min	min	′	′
00	− 3 7.4	-.5	15.8		21 15	2.2	55.7	15.2
12	− 3 13.5	$T_{\overline{m}_\odot}$ 12 h 3.2 min		Starost 11.4 d		Faza ◐		

PLANETE

Pl.	$T_{\overline{m}}$	π	360−α	Vel.	Pl.	$T_{\overline{m}}$	π	360−α	Vel.
	h min	′	°			h min	′	°	
♀	15 4	.1	218	-5.3	♄	15 10	.0	216	-1.4
♂	11 47	.1	267	1.7	♇	21 23	.0	122	.4

UT	SUNCE		PROLEĆ. TAČKA	VENERA		MARS	
	$S_\odot$	$\delta_\odot$	S_Υ	S_φ	δ_φ	S_σ	δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	179 10.1	23 15.1	276 45.4	134 5.0	15 33.6	183 29.6	24 8.1
2	209 9.8	23 14.8	306 50.3	164 6.6	15 32.0	213 30.9	24 8.0
4	239 9.6	23 14.6	336 55.2	194 8.2	15 30.3	243 32.1	24 8.0
6	269 9.3	23 14.3	7 .2	224 9.9	15 28.6	273 33.4	24 8.0
8	299 9.1	23 14.1	37 5.1	254 11.5	15 26.9	303 34.6	24 7.9
10	329 8.8	23 13.8	67 10.0	284 13.1	15 25.3	333 35.9	24 7.9
12	359 8.6	23 13.5	97 15.0	314 14.8	15 23.6	3 37.1	24 7.8
14	29 8.3	23 13.3	127 19.9	344 16.5	15 21.9	33 38.4	24 7.8
16	59 8.1	23 13.0	157 24.8	14 18.1	15 20.3	63 39.6	24 7.7
18	89 7.8	23 12.7	187 29.7	44 19.8	15 18.6	93 40.9	24 7.7
20	119 7.6	23 12.4	217 34.7	74 21.5	15 16.9	123 42.1	24 7.6
22	149 7.3	23 12.2	247 39.6	104 23.2	15 15.2	153 43.4	24 7.6
Δ	-1	-1		8	-8	6	0

UT	MESEC				JUPITER		SATURN	
	$S_\leftmoon$	Δ	$\delta_\leftmoon$	Δ	$S_{\text{♃}}$	$\delta_{\text{♃}}$	$S_{\text{♄}}$	$\delta_{\text{♄}}$
h	° ′		° ′		° ′	° ′	° ′	° ′
0	39 53.8	104	15 51.0	53	132 54.0	15 14.9	39 18.6	-17 54.9
2	68 52.6	102	16 1.6	51	162 58.0	15 14.6	69 23.8	-17 54.9
4	97 51.0	101	16 11.8	49	193 2.1	15 14.3	99 29.0	-17 54.8
6	126 49.2	100	16 21.7	48	223 6.1	15 14.0	129 34.2	-17 54.8
8	155 47.1	98	16 31.2	46	253 10.1	15 13.7	159 39.4	-17 54.8
10	184 44.8	97	16 40.4	44	283 14.1	15 13.4	189 44.6	-17 54.7
12	213 42.2	96	16 49.3	43	313 18.2	15 13.1	219 49.8	-17 54.7
14	242 39.4	94	16 57.9	41	343 22.2	15 12.8	249 54.9	-17 54.6
16	271 36.3	93	17 6.1	39	13 26.2	15 12.5	280 .1	-17 54.6
18	300 32.9	92	17 13.9	37	43 30.2	15 12.2	310 5.3	-17 54.6
20	329 29.3	91	17 21.3	35	73 34.3	15 11.9	340 10.5	-17 54.5
22	358 25.5	90	17 28.4	34	103 38.3	15 11.6	10 15.7	-17 54.5
Δ					20	-1	26	0

φ	SUNCE		TRAJANJE SUMRAKA		MESEC			
	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 40	21 26	1 41	: ::	13 43	1.7	5 33	2.8
55	3 24	20 43	0 57	: ::	14 7	1.9	5 9	2.7
50	3 54	20 13	0 44	: ::	14 26	1.9	4 51	2.6
45	4 16	19 51	0 37	2 32	14 40	2.0	4 37	2.5
40	4 34	19 33	0 33	2 3	14 52	2.0	4 25	2.5
35	4 49	19 18	0 30	1 47	15 3	2.1	4 16	2.4
30	5 2	19 5	0 27	1 36	15 12	2.1	4 7	2.4
20	5 23	18 43	0 25	1 24	15 27	2.2	3 52	2.3
10	5 42	18 25	0 23	1 18	15 41	2.2	3 39	2.2
0	5 60	18 7	0 22	1 15	15 54	2.2	3 27	2.2
10	6 17	17 50	0 23	1 15	16 7	2.3	3 15	2.1
20	6 35	17 31	0 24	1 19	16 21	2.3	3 2	2.1
30	6 56	17 10	0 26	1 25	16 36	2.4	2 47	2.0
35	7 9	16 58	0 28	1 31	16 46	2.4	2 39	1.9
40	7 23	16 44	0 31	1 37	16 56	2.4	2 29	1.9
45	7 39	16 28	0 34	1 47	17 9	2.5	2 18	1.8
50	7 60	16 7	0 38	1 59	17 24	2.5	2 4	1.8
55	8 27	15 40	0 45	2 17	17 43	2.6	1 46	1.7
60	9 5	15 2	0 57	2 45	18 9	2.7	1 23	1.5
S								

SUNCE				MESEC				
UT	e = T_p − UT	Δ/24	r	Prolaz		Δ/24	$\pi_\leftmoon$	r
h	min s	s	′	$T_{\overline{m}}$	h min	min	′	′
00	− 3 19.6	-.5	15.8		22 7	2.2	56.4	15.4
12	− 3 25.7	$T_{\overline{m}_\odot}$ 12 h 3.4 min		Starost 12.4 d		Faza ○		

PLANETE

Pl.	$T_{\overline{m}}$	π	360−α	Vel.	Pl.	$T_{\overline{m}}$	π	360−α	Vel.
	h min	′	°			h min	′	°	
♀	15 3	.1	217	-5.4	♄	15 6	.0	216	-1.4
♂	11 46	.1	267	1.7	♇	21 19	.0	123	.4

UT	SUNCE				PROLEĆ. TAČKA	VENERA				MARS			
	$S_\odot$		$\delta_\odot$		S_Υ	S_φ		δ_φ		S_σ		δ_σ	
h	°	′	°	′	° ′	°	′	°	′	°	′	°	′
0	179	7.1	23	11.9	277 44.5	134	24.9	15	13.6	183	44.6	24	7.5
2	209	6.8	23	11.6	307 49.5	164	26.6	15	11.9	213	45.9	24	7.5
4	239	6.6	23	11.3	337 54.4	194	28.4	15	10.2	243	47.1	24	7.4
6	269	6.3	23	11.0	7 59.3	224	30.1	15	8.5	273	48.4	24	7.4
8	299	6.1	23	10.7	38 4.2	254	31.8	15	6.9	303	49.7	24	7.3
10	329	5.9	23	10.4	68 9.2	284	33.6	15	5.2	333	50.9	24	7.2
12	359	5.6	23	10.1	98 14.1	314	35.3	15	3.5	3	52.2	24	7.2
14	29	5.4	23	9.8	128 19.0	344	37.1	15	1.9	33	53.4	24	7.1
16	59	5.1	23	9.5	158 24.0	14	38.9	15	.2	63	54.7	24	7.0
18	89	4.9	23	9.2	188 28.9	44	40.7	14	58.5	93	55.9	24	7.0
20	119	4.6	23	8.9	218 33.8	74	42.5	14	56.8	123	57.2	24	6.9
22	149	4.4	23	8.6	248 38.7	104	44.3	14	55.2	153	58.5	24	6.8
Δ		−1		−2			9		−8		6		0

UT	MESEC				JUPITER				SATURN			
	$S_\leftmoon$		Δ	$\delta_\leftmoon$	Δ	$S_{\text{♃}}$		$\delta_{\text{♃}}$		$S_{\text{♄}}$		$\delta_{\text{♄}}$	
h	°	′		°	′	°	′	°	′	°	′	°	′
0	27	21.4	88	17	35.1	32	133	42.3	15	11.3	40	20.9	−17	54.5
2	56	17.0	87	17	41.5	30	163	46.3	15	11.0	70	26.1	−17	54.4
4	85	12.5	86	17	47.4	28	193	50.4	15	10.7	100	31.2	−17	54.4
6	114	7.7	85	17	52.9	26	223	54.4	15	10.4	130	36.4	−17	54.3
8	143	2.6	84	17	58.1	24	253	58.4	15	10.1	160	41.6	−17	54.3
10	171	57.4	83	18	2.8	22	284	2.4	15	9.8	190	46.8	−17	54.3
12	200	51.9	82	18	7.1	20	314	6.5	15	9.5	220	52.0	−17	54.2
14	229	46.2	81	18	11.0	17	344	10.5	15	9.2	250	57.2	−17	54.2
16	258	40.4	80	18	14.5	15	14	14.5	15	8.9	281	2.3	−17	54.2
18	287	34.3	79	18	17.6	13	44	18.5	15	8.6	311	7.5	−17	54.1
20	316	28.0	78	18	20.2	11	74	22.5	15	8.3	341	12.7	−17	54.1
22	345	21.6	77	18	22.4	9	104	26.6	15	8.0	11	17.9	−17	54.1
Δ							20		−2		26			0

φ	SUNCE		TRAJANJE SUMRAKA		MESEC			
	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 41	21 26	1 39	: ::	14 24	2.2	6 40	2.5
55	3 25	20 42	0 57	: ::	14 52	2.3	6 13	2.5
50	3 54	20 13	0 44	: ::	15 12	2.3	5 53	2.4
45	4 16	19 51	0 37	2 31	15 28	2.3	5 37	2.4
40	4 34	19 33	0 33	2 2	15 41	2.3	5 24	2.4
35	4 49	19 18	0 30	1 46	15 52	2.3	5 13	2.4
30	5 2	19 5	0 27	1 36	16 2	2.3	5 4	2.4
20	5 24	18 43	0 25	1 24	16 19	2.3	4 47	2.3
10	5 43	18 25	0 23	1 18	16 34	2.3	4 33	2.3
0	5 60	18 7	0 22	1 15	16 48	2.3	4 19	2.3
10	6 17	17 50	0 23	1 15	17 1	2.3	4 6	2.3
20	6 36	17 32	0 24	1 19	17 16	2.3	3 51	2.2
30	6 57	17 11	0 26	1 25	17 33	2.3	3 35	2.2
35	7 9	16 59	0 28	1 31	17 43	2.3	3 25	2.2
40	7 23	16 45	0 30	1 37	17 55	2.3	3 14	2.2
45	7 39	16 28	0 34	1 47	18 8	2.3	3 2	2.1
50	7 60	16 8	0 38	1 59	18 24	2.3	2 46	2.1
55	8 26	15 41	0 45	2 17	18 45	2.3	2 26	2.0
60	9 4	15 3	0 57	2 45	19 14	2.3	1 59	2.0
S								

SUNCE				MESEC				
UT	e = Tp − UT	Δ/24	r	Prolaz		Δ/24	$\pi_\leftmoon$	r
h	min s	s	′	$T_{\overline{m}}$	h min	min	′	′
00	− 3 31.7	−.5	15.8		23 1	2.3	57.2	15.6
12	− 3 37.6	$T_{\overline{m}_\odot}$ 12 h	3.6 min	Starost 13.4 d		Faza ○		

PLANETE								
Pl.	$T_{\overline{m}}$	π	360 − α	Vel.	Pl.	$T_{\overline{m}}$	π	360 − α	Vel.
	h min	′	°			h min	′	°	
♀	15 1	.1	217	−5.4	♆	15 3	.0	216	−1.4
♂	11 45	.1	266	1.7	♇	21 15	.0	123	.4

UT	SUNCE				PROLEĆ. TAČKA	VENERA				MARS			
	$S_\odot$		$\delta_\odot$		S_Υ	S_φ		δ_φ		S_σ		δ_σ	
h	°	′	°	′	° ′	°	′	°	′	°	′	°	′
0	179	4.1	23	8.3	278 43.7	134	46.1	14	53.5	183	59.7	24	6.8
2	209	3.9	23	7.9	308 48.6	164	47.9	14	51.8	214	1.0	24	6.7
4	239	3.7	23	7.6	338 53.5	194	49.7	14	50.1	244	2.2	24	6.6
6	269	3.4	23	7.3	8 58.4	224	51.6	14	48.5	274	3.5	24	6.5
8	299	3.2	23	7.0	39 3.4	254	53.4	14	46.8	304	4.7	24	6.5
10	329	2.9	23	6.6	69 8.3	284	55.2	14	45.1	334	6.0	24	6.4
12	359	2.7	23	6.3	99 13.2	314	57.1	14	43.4	4	7.3	24	6.3
14	29	2.5	23	6.0	129 18.2	344	59.0	14	41.8	34	8.5	24	6.2
16	59	2.2	23	5.6	159 23.1	15	.9	14	40.1	64	9.8	24	6.1
18	89	2.0	23	5.3	189 28.0	45	2.7	14	38.4	94	11.0	24	6.1
20	119	1.7	23	4.9	219 32.9	75	4.6	14	36.8	124	12.3	24	6.0
22	149	1.5	23	4.6	249 37.9	105	6.5	14	35.1	154	13.6	24	5.9
Δ		−1		−2			9		−8		6		0

UT	MESEC				JUPITER				SATURN			
	$S_\leftmoon$		Δ	$\delta_\leftmoon$	Δ	$S_{\text{♃}}$		$\delta_{\text{♃}}$		$S_{\text{♄}}$		$\delta_{\text{♄}}$	
h	°	′		°	′	°	′	°	′	°	′	°	′
0	14	15.0	76	18	24.1	7	134	30.6	15	7.7	41	23.1	−17	54.0
2	43	8.2	75	18	25.4	4	164	34.6	15	7.4	71	28.2	−17	54.0
4	72	1.2	74	18	26.3	2	194	38.6	15	7.1	101	33.4	−17	54.0
6	100	54.1	74	18	26.7	0	224	42.6	15	6.8	131	38.6	−17	53.9
8	129	46.8	73	18	26.7	−2	254	46.7	15	6.5	161	43.8	−17	53.9
10	158	39.4	72	18	26.2	−5	284	50.7	15	6.2	191	48.9	−17	53.8
12	187	31.9	72	18	25.2	−7	314	54.7	15	5.9	221	54.1	−17	53.8
14	216	24.2	71	18	23.8	−9	344	58.7	15	5.6	251	59.3	−17	53.8
16	245	16.5	71	18	22.0	−12	15	2.7	15	5.3	282	4.5	−17	53.7
18	274	8.6	70	18	19.6	−14	45	6.7	15	5.0	312	9.6	−17	53.7
20	303	.6	70	18	16.8	−16	75	10.7	15	4.7	342	14.8	−17	53.7
22	331	52.6	69	18	13.6	−19	105	14.8	15	4.4	12	20.0	−17	53.6
Δ							20		−2		26			0

φ	SUNCE		TRAJANJE SUMRAKA		MESEC			
	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 42	21 25	1 38	: ::	15 18	2.8	7 40	2.1
55	3 25	20 42	0 57	: ::	15 46	2.7	7 12	2.2
50	3 55	20 13	0 44	: ::	16 7	2.6	6 51	2.2
45	4 17	19 50	0 37	2 31	16 23	2.6	6 35	2.2
40	4 35	19 33	0 33	2 2	16 36	2.5	6 21	2.3
35	4 50	19 18	0 30	1 46	16 48	2.5	6 10	2.3
30	5 2	19 5	0 27	1 36	16 58	2.5	6 0	2.3
20	5 24	18 43	0 24	1 24	17 15	2.4	5 43	2.3
10	5 43	18 25	0 23	1 17	17 29	2.4	5 28	2.3
0	6 0	18 7	0 22	1 15	17 43	2.4	5 14	2.3
10	6 17	17 50	0 23	1 15	17 57	2.3	5 0	2.4
20	6 36	17 32	0 24	1 19	18 12	2.3	4 45	2.4
30	6 57	17 11	0 26	1 25	18 29	2.2	4 28	2.4
35	7 9	16 59	0 28	1 31	18 39	2.2	4 18	2.4
40	7 23	16 45	0 30	1 37	18 51	2.2	4 6	2.4
45	7 39	16 29	0 34	1 47	19 4	2.1	3 53	2.4
50	7 60	16 8	0 38	1 59	19 20	2.1	3 36	2.5
55	8 26	15 42	0 45	2 17	19 41	2.0	3 15	2.5
60	9 4	15 4	0 57	2 45	20 9	1.9	2 47	2.5
S								

SUNCE				MESEC				
UT	e = Tp − UT	Δ/24	r	Prolaz		Δ/24	$\pi_\leftmoon$	r
h	min s	s	′	$T_{\overline{m}}$	h min	min	′	′
00	− 3 43.4	−.5	15.8		23 57	2.4	57.9	15.8
12	− 3 49.2	$T_{\overline{m}_\odot}$ 12 h	3.8 min	Starost 14.4 d		Faza ○		

PLANETE								
Pl.	$T_{\overline{m}}$	π	360 − α	Vel.	Pl.	$T_{\overline{m}}$	π	360 − α	Vel.
	h min	′	°			h min	′	°	
♀	14 60	.1	216	−5.4	♆	14 60	.0	216	−1.4
♂	11 44	.1	265	1.7	♇	21 11	.0	123	.4

UT	SUNCE		PROLEĆ. TAČKA	VENERA		MARS	
	$S_\odot$	$\delta_\odot$	S_Υ	S_φ	δ_φ	S_σ	δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	179 1.3	23 4.2	279 42.8	135 8.5	14 33.4	184 14.8	24 5.8
2	209 1.0	23 3.9	309 47.7	165 10.4	14 31.7	214 16.1	24 5.7
4	239 .8	23 3.5	339 52.7	195 12.3	14 30.1	244 17.4	24 5.6
6	269 .5	23 3.2	9 57.6	225 14.2	14 28.4	274 18.6	24 5.5
8	299 .3	23 2.8	40 2.5	255 16.2	14 26.7	304 19.9	24 5.4
10	329 .1	23 2.5	70 7.4	285 18.2	14 25.0	334 21.1	24 5.3
12	358 59.8	23 2.1	100 12.4	315 20.1	14 23.4	4 22.4	24 5.2
14	28 59.6	23 1.7	130 17.3	345 22.1	14 21.7	34 23.7	24 5.1
16	58 59.4	23 1.3	160 22.2	15 24.1	14 20.0	64 24.9	24 5.0
18	88 59.1	23 1.0	190 27.2	45 26.1	14 18.4	94 26.2	24 4.9
20	118 58.9	23 .6	220 32.1	75 28.1	14 16.7	124 27.5	24 4.8
22	148 58.7	23 .2	250 37.0	105 30.1	14 15.0	154 28.7	24 4.7
Δ	-1	-2		10	-8	6	0

UT	MESEC				JUPITER		SATURN	
	$S_\leftmoon$	Δ	$\delta_\leftmoon$	Δ	$S_{\mathrm{♃}}$	$\delta_{\mathrm{♃}}$	$S_{\mathrm{♄}}$	$\delta_{\mathrm{♄}}$
h	° ′		° ′		° ′	° ′	° ′	° ′
0	0 44.4	69	18 9.8	-21	135 18.8	15 4.0	42 25.2	-17 53.6
2	29 36.2	69	18 5.7	-23	165 22.8	15 3.7	72 30.3	-17 53.6
4	58 27.9	68	18 1.0	-26	195 26.8	15 3.4	102 35.5	-17 53.5
6	87 19.6	68	17 55.9	-28	225 30.8	15 3.1	132 40.7	-17 53.5
8	116 11.2	68	17 50.3	-30	255 34.8	15 2.8	162 45.8	-17 53.5
10	145 2.8	68	17 44.2	-33	285 38.8	15 2.5	192 51.0	-17 53.4
12	173 54.4	68	17 37.7	-35	315 42.9	15 2.2	222 56.2	-17 53.4
14	202 45.9	68	17 30.8	-37	345 46.9	15 1.9	253 1.3	-17 53.4
16	231 37.5	68	17 23.3	-39	15 50.9	15 1.6	283 6.5	-17 53.3
18	260 29.0	68	17 15.4	-42	45 54.9	15 1.3	313 11.7	-17 53.3
20	289 20.5	68	17 7.1	-44	75 58.9	15 1.0	343 16.8	-17 53.3
22	318 12.1	68	16 58.3	-46	106 2.9	15 .7	13 22.0	-17 53.2
Δ					20	-2	26	0

φ	SUNCE		TRAJANJE SUMRAKA		MESEC			
	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 43	21 24	1 37	: ::	16 25	3.2	8 30	1.7
55	3 26	20 41	0 57	: ::	16 51	3.0	8 4	1.8
50	3 55	20 12	0 44	: ::	17 10	2.9	7 44	1.9
45	4 17	19 50	0 37	2 30	17 25	2.8	7 28	2.0
40	4 35	19 33	0 33	2 2	17 37	2.7	7 16	2.1
35	4 50	19 18	0 30	1 46	17 48	2.7	7 5	2.1
30	5 3	19 5	0 27	1 36	17 57	2.6	6 55	2.2
20	5 24	18 44	0 24	1 24	18 13	2.5	6 39	2.2
10	5 43	18 25	0 23	1 17	18 27	2.4	6 24	2.3
0	6 0	18 8	0 22	1 15	18 40	2.4	6 10	2.4
10	6 17	17 51	0 23	1 15	18 53	2.3	5 57	2.4
20	6 36	17 32	0 24	1 18	19 7	2.2	5 42	2.5
30	6 57	17 12	0 26	1 25	19 23	2.1	5 26	2.6
35	7 9	16 59	0 28	1 30	19 32	2.1	5 16	2.6
40	7 23	16 46	0 30	1 37	19 43	2.0	5 5	2.6
45	7 39	16 29	0 34	1 46	19 55	1.9	4 51	2.7
50	7 59	16 9	0 38	1 59	20 10	1.8	4 35	2.8
55	8 26	15 42	0 45	2 17	20 29	1.7	4 15	2.9
60	9 3	15 5	0 57	2 44	20 54	1.5	3 47	3.0
S								

SUNCE				MESEC			
UT	$e=T_p-UT$	Δ/24	r	Prolaz	Δ/24	$\pi_\leftmoon$	r
h	min s	s	′	h min	min	′	′
00	- 3 55.0	-.5	15.8	$T_{\overline{m}}$ . . .	1.0	58.5	15.9
12	- 4 .6	$T_{\overline{m}_\odot}$ 12 h 4.0 min		Starost 15.4 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	215	-5.5	♃	14 57	.0	216	-1.4
♂	11 43	.1	265	1.7	♄	21 7	.0	123	.5

UT	SUNCE		PROLEĆ. TAČKA	VENERA		MARS	
	$S_\odot$	$\delta_\odot$	S_Υ	S_φ	δ_φ	S_σ	δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	178 58.4	22 59.8	280 41.9	135 32.1	14 13.4	184 30.0	24 4.6
2	208 58.2	22 59.4	310 46.9	165 34.1	14 11.7	214 31.3	24 4.5
4	238 58.0	22 59.1	340 51.8	195 36.2	14 10.0	244 32.5	24 4.4
6	268 57.7	22 58.7	10 56.7	225 38.2	14 8.4	274 33.8	24 4.3
8	298 57.5	22 58.3	41 1.7	255 40.3	14 6.7	304 35.1	24 4.2
10	328 57.3	22 57.9	71 6.6	285 42.3	14 5.0	334 36.3	24 4.1
12	358 57.1	22 57.5	101 11.5	315 44.4	14 3.4	4 37.6	24 4.0
14	28 56.8	22 57.1	131 16.4	345 46.5	14 1.7	34 38.9	24 3.8
16	58 56.6	22 56.7	161 21.4	15 48.6	14 .0	64 40.2	24 3.7
18	88 56.4	22 56.2	191 26.3	45 50.7	13 58.4	94 41.4	24 3.6
20	118 56.2	22 55.8	221 31.2	75 52.8	13 56.7	124 42.7	24 3.5
22	148 55.9	22 55.4	251 36.2	105 54.9	13 55.0	154 44.0	24 3.4
Δ	-1	-2		10	-8	6	-1

UT	MESEC				JUPITER		SATURN	
	$S_\leftmoon$	Δ	$\delta_\leftmoon$	Δ	$S_{\mathrm{♃}}$	$\delta_{\mathrm{♃}}$	$S_{\mathrm{♄}}$	$\delta_{\mathrm{♄}}$
h	° ′		° ′		° ′	° ′	° ′	° ′
0	347 3.6	68	16 49.1	-48	136 6.9	15 .4	43 27.2	-17 53.2
2	15 55.2	68	16 39.4	-51	166 10.9	15 .1	73 32.3	-17 53.2
4	44 46.9	68	16 29.3	-53	196 14.9	14 59.8	103 37.5	-17 53.1
6	73 38.6	69	16 18.7	-55	226 18.9	14 59.5	133 42.7	-17 53.1
8	102 30.3	69	16 7.7	-57	256 22.9	14 59.2	163 47.8	-17 53.1
10	131 22.1	69	15 56.3	-59	286 27.0	14 58.9	193 53.0	-17 53.1
12	160 13.9	70	15 44.5	-61	316 31.0	14 58.5	223 58.2	-17 53.0
14	189 5.8	70	15 32.2	-63	346 35.0	14 58.2	254 3.3	-17 53.0
16	217 57.8	70	15 19.6	-65	16 39.0	14 57.9	284 8.5	-17 53.0
18	246 49.9	71	15 6.5	-67	46 43.0	14 57.6	314 13.6	-17 52.9
20	275 42.1	71	14 53.0	-69	76 47.0	14 57.3	344 18.8	-17 52.9
22	304 34.4	72	14 39.2	-71	106 51.0	14 57.0	14 24.0	-17 52.9
Δ					20	-2	26	0

φ	SUNCE		TRAJANJE SUMRAKA		MESEC			
	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 44	21 24	1 35	: ::	17 41	3.5	9 11	1.3
55	3 27	20 41	0 57	: ::	18 3	3.2	8 48	1.5
50	3 56	20 12	0 44	: ::	18 20	3.1	8 30	1.7
45	4 18	19 50	0 37	2 29	18 32	2.9	8 17	1.8
40	4 36	19 33	0 33	2 2	18 43	2.8	8 5	1.9
35	4 50	19 18	0 30	1 46	18 52	2.8	7 56	2.0
30	5 3	19 5	0 27	1 36	19 0	2.7	7 47	2.0
20	5 25	18 44	0 24	1 24	19 14	2.5	7 33	2.2
10	5 43	18 25	0 23	1 17	19 26	2.4	7 20	2.3
0	6 1	18 8	0 22	1 15	19 37	2.3	7 7	2.3
10	6 18	17 51	0 23	1 15	19 48	2.2	6 55	2.4
20	6 36	17 33	0 24	1 18	20 0	2.1	6 42	2.5
30	6 57	17 12	0 26	1 25	20 14	2.0	6 27	2.7
35	7 9	16 60	0 28	1 30	20 22	1.9	6 18	2.7
40	7 22	16 46	0 30	1 37	20 30	1.8	6 8	2.8
45	7 39	16 30	0 34	1 46	20 41	1.7	5 56	2.9
50	7 59	16 10	0 38	1 59	20 53	1.6	5 42	3.0
55	8 25	15 43	0 45	2 17	21 9	1.4	5 24	3.2
60	9 3	15 6	0 57	2 44	21 30	1.2	4 59	3.4
S								

SUNCE				MESEC			
UT	$e=T_p-UT$	Δ/24	r	Prolaz	Δ/24	$\pi_\leftmoon$	r
h	min s	s	′	h min	min	′	′
00	- 4 6.2	-.5	15.8	$T_{\overline{m}}$ 0 54	2.3	59.1	16.1
12	- 4 11.7	$T_{\overline{m}_\odot}$ 12 h 4.2 min		Starost 16.4 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	215	-5.5	♃	14 54	.0	215	-1.3
♂	11 42	.1	264	1.7	♄	21 3	.0	123	.5

UT	SUNCE $S_\odot$	$\delta_\odot$	PROLEĆ. TAČKA S_Υ	VENERA S_φ	δ_φ	MARS S_σ	δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	178 55.7	22 55.0	281 41.1	135 57.0	13 53.4	184 45.2	24 3.2
2	208 55.5	22 54.6	311 46.0	165 59.2	13 51.7	214 46.5	24 3.1
4	238 55.2	22 54.2	341 50.9	196 1.3	13 50.0	244 47.8	24 3.0
6	268 55.0	22 53.7	11 55.9	226 3.5	13 48.4	274 49.1	24 2.9
8	298 54.8	22 53.3	42 .8	256 5.7	13 46.7	304 50.3	24 2.7
10	328 54.6	22 52.9	72 5.7	286 7.8	13 45.0	334 51.6	24 2.6
12	358 54.4	22 52.4	102 10.6	316 10.0	13 43.4	4 52.9	24 2.5
14	28 54.1	22 52.0	132 15.6	346 12.2	13 41.7	34 54.1	24 2.3
16	58 53.9	22 51.6	162 20.5	16 14.4	13 40.1	64 55.4	24 2.2
18	88 53.7	22 51.1	192 25.4	46 16.6	13 38.4	94 56.7	24 2.1
20	118 53.5	22 50.7	222 30.4	76 18.9	13 36.7	124 58.0	24 1.9
22	148 53.3	22 50.2	252 35.3	106 21.1	13 35.1	154 59.2	24 1.8
Δ	-1	-2		11	-8	6	-1

UT	MESEC $S_\leftmoon$	Δ	$\delta_\leftmoon$	Δ	JUPITER $S_{♃}$	$\delta_{♃}$	SATURN $S_{♄}$	$\delta_{♄}$
h	° ′		° ′		° ′	° ′	° ′	° ′
0	333 26.7	72	14 24.9	-73	136 55.0	14 56.7	44 29.1	-17 52.8
2	2 19.2	73	14 10.3	-75	166 59.0	14 56.4	74 34.3	-17 52.8
4	31 11.8	73	13 55.3	-77	197 3.0	14 56.1	104 39.4	-17 52.8
6	60 4.4	74	13 40.0	-79	227 7.0	14 55.8	134 44.6	-17 52.7
8	88 57.2	75	13 24.3	-80	257 11.0	14 55.5	164 49.8	-17 52.7
10	117 50.1	75	13 8.2	-82	287 15.0	14 55.1	194 54.9	-17 52.7
12	146 43.2	76	12 51.8	-84	317 19.0	14 54.8	225 .1	-17 52.6
14	175 36.3	76	12 35.1	-85	347 23.0	14 54.5	255 5.2	-17 52.6
16	204 29.6	77	12 18.0	-87	17 27.0	14 54.2	285 10.4	-17 52.6
18	233 23.0	78	12 .7	-88	47 31.0	14 53.9	315 15.5	-17 52.6
20	262 16.6	78	11 43.0	-90	77 35.0	14 53.6	345 20.7	-17 52.5
22	291 10.2	79	11 25.0	-91	107 39.0	14 53.3	15 25.8	-17 52.5
Δ					20	-2	26	0

φ	SUNCE IZLAZ	ZALAZ	TRAJANJE SUMRAKA GRAĐ.	ASTR.	MESEC IZLAZ	Δ/24	ZALAZ	Δ/24
N	h min	h min	h min	h min	h min	min	h min	min
60	2 45	21 23	1 34	: ::	19 5	3.6	9 42	1.1
55	3 28	20 40	0 56	: ::	19 21	3.3	9 25	1.3
50	3 57	20 12	0 44	: ::	19 33	3.2	9 11	1.5
45	4 19	19 50	0 37	2 29	19 43	3.0	9 0	1.6
40	4 36	19 32	0 33	2 1	19 51	2.9	8 51	1.7
35	4 51	19 18	0 29	1 46	19 58	2.8	8 43	1.8
30	5 4	19 5	0 27	1 36	20 4	2.7	8 36	1.9
20	5 25	18 44	0 24	1 24	20 15	2.5	8 24	2.1
10	5 44	18 25	0 23	1 17	20 24	2.4	8 14	2.2
0	6 1	18 8	0 22	1 15	20 33	2.3	8 4	2.3
10	6 18	17 51	0 23	1 15	20 41	2.1	7 54	2.4
20	6 36	17 33	0 24	1 18	20 51	2.0	7 43	2.5
30	6 56	17 12	0 26	1 25	21 1	1.8	7 31	2.7
35	7 9	17 0	0 28	1 30	21 7	1.8	7 23	2.8
40	7 22	16 47	0 30	1 37	21 14	1.7	7 15	2.9
45	7 39	16 30	0 34	1 46	21 22	1.5	7 6	3.0
50	7 59	16 10	0 38	1 59	21 31	1.4	6 54	3.1
55	8 25	15 44	0 45	2 16	21 43	1.2	6 39	3.3
60	9 2	15 7	0 56	2 44	21 58	1.0	6 20	3.6
S								

SUNCE UT	e = T_p − UT	Δ/24	r	MESEC Prolaz		Δ/24	$\pi_\leftmoon$	r
h	min s	s	′		h min	min	′	′
00	- 4 17.2	-.4	15.8	$T_{\overline{m}}$	1 50	2.3	59.5	16.2
12	- 4 22.5	$T_{\overline{m}_\odot}$ 12 h	4.4 min	Starost 17.4 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	-5.5	♄	14 50	.0	215	-1.3
♂	11 40	.1	263	1.8	♅	20 58	.0	123	.5

UT	SUNCE $S_\odot$	$\delta_\odot$	PROLEĆ. TAČKA S_Υ	VENERA S_φ	δ_φ	MARS S_σ	δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	178 53.0	22 49.8	282 40.2	136 23.3	13 33.4	185 .5	24 1.7
2	208 52.8	22 49.3	312 45.1	166 25.6	13 31.8	215 1.8	24 1.5
4	238 52.6	22 48.9	342 50.1	196 27.8	13 30.1	245 3.1	24 1.4
6	268 52.4	22 48.4	12 55.0	226 30.1	13 28.5	275 4.4	24 1.2
8	298 52.2	22 48.0	42 59.9	256 32.4	13 26.8	305 5.6	24 1.1
10	328 51.9	22 47.5	73 4.9	286 34.7	13 25.2	335 6.9	24 .9
12	358 51.7	22 47.0	103 9.8	316 37.0	13 23.5	5 8.2	24 .8
14	28 51.5	22 46.6	133 14.7	346 39.3	13 21.8	35 9.5	24 .6
16	58 51.3	22 46.1	163 19.6	16 41.6	13 20.2	65 10.8	24 .5
18	88 51.1	22 45.6	193 24.6	46 43.9	13 18.5	95 12.0	24 .3
20	118 50.9	22 45.1	223 29.5	76 46.3	13 16.9	125 13.3	24 .2
22	148 50.7	22 44.6	253 34.4	106 48.6	13 15.2	155 14.6	24 .0
Δ	-1	-2		12	-8	6	-1

UT	MESEC $S_\leftmoon$	Δ	$\delta_\leftmoon$	Δ	JUPITER $S_{♃}$	$\delta_{♃}$	SATURN $S_{♄}$	$\delta_{♄}$
h	° ′		° ′		° ′	° ′	° ′	° ′
0	320 4.0	80	11 6.8	-93	137 43.0	14 53.0	45 31.0	-17 52.5
2	348 58.0	80	10 48.2	-94	167 47.0	14 52.7	75 36.1	-17 52.4
4	17 52.1	81	10 29.4	-95	197 51.0	14 52.4	105 41.3	-17 52.4
6	46 46.3	82	10 10.3	-97	227 55.0	14 52.0	135 46.4	-17 52.4
8	75 40.6	82	9 51.0	-98	257 59.0	14 51.7	165 51.6	-17 52.4
10	104 35.1	83	9 31.4	-99	288 3.0	14 51.4	195 56.7	-17 52.3
12	133 29.7	84	9 11.6	-100	318 7.0	14 51.1	226 1.9	-17 52.3
14	162 24.4	84	8 51.6	-101	348 11.0	14 50.8	256 7.0	-17 52.3
16	191 19.3	85	8 31.3	-102	18 15.0	14 50.5	286 12.2	-17 52.2
18	220 14.3	86	8 10.9	-103	48 19.0	14 50.2	316 17.3	-17 52.2
20	249 9.4	86	7 50.2	-104	78 23.0	14 49.9	346 22.5	-17 52.2
22	278 4.7	87	7 29.4	-105	108 27.0	14 49.5	16 27.6	-17 52.2
Δ					20	-2	26	0

φ	SUNCE IZLAZ	ZALAZ	TRAJANJE SUMRAKA GRAĐ.	ASTR.	MESEC IZLAZ	Δ/24	ZALAZ	Δ/24
N	h min	h min	h min	h min	h min	min	h min	min
60	2 47	21 22	1 32	: ::	20 31	3.6	10 8	.9
55	3 29	20 40	0 56	: ::	20 41	3.4	9 56	1.1
50	3 58	20 11	0 44	: ::	20 49	3.2	9 47	1.3
45	4 19	19 49	0 37	2 28	20 55	3.0	9 39	1.5
40	4 37	19 32	0 32	2 1	21 0	2.9	9 32	1.6
35	4 51	19 18	0 29	1 46	21 5	2.8	9 27	1.7
30	5 4	19 5	0 27	1 36	21 9	2.7	9 22	1.8
20	5 25	18 44	0 24	1 23	21 16	2.5	9 13	2.0
10	5 44	18 25	0 23	1 17	21 22	2.4	9 6	2.1
0	6 1	18 8	0 22	1 15	21 27	2.2	8 59	2.2
10	6 18	17 51	0 23	1 15	21 33	2.1	8 52	2.4
20	6 36	17 33	0 24	1 18	21 39	1.9	8 44	2.5
30	6 56	17 13	0 26	1 25	21 45	1.8	8 35	2.7
35	7 8	17 1	0 28	1 30	21 49	1.7	8 30	2.8
40	7 22	16 47	0 30	1 37	21 54	1.6	8 24	2.9
45	7 38	16 31	0 34	1 46	21 59	1.4	8 17	3.0
50	7 58	16 11	0 38	1 59	22 5	1.3	8 9	3.2
55	8 24	15 45	0 45	2 16	22 12	1.1	7 59	3.4
60	9 1	15 8	0 56	2 43	22 22	.9	7 45	3.6
S								

SUNCE UT	e = T_p − UT	Δ/24	r	MESEC Prolaz		Δ/24	$\pi_\leftmoon$	r
h	min s	s	′		h min	min	′	′
00	- 4 27.9	-.4	15.8	$T_{\overline{m}}$	2 46	2.3	59.7	16.3
12	- 4 33.1	$T_{\overline{m}_\odot}$ 12 h	4.6 min	Starost 18.4 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	214	-5.6	♄	14 47	.0	215	-1.3
♂	11 39	.1	262	1.8	♅	20 54	.0	123	.5

UT	SUNCE		PROLEĆ. TAČKA	VENERA		MARS	
	$S_\odot$	$\delta_\odot$	S_Υ	S_φ	δ_φ	S_σ	δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	178 50.4	22 44.2	283 39.4	136 51.0	13 13.6	185 15.9	23 59.9
2	208 50.2	22 43.7	313 44.3	166 53.3	13 11.9	215 17.2	23 59.7
4	238 50.0	22 43.2	343 49.2	196 55.7	13 10.3	245 18.4	23 59.6
6	268 49.8	22 42.7	13 54.1	226 58.1	13 8.6	275 19.7	23 59.4
8	298 49.6	22 42.2	43 59.1	257 .5	13 7.0	305 21.0	23 59.2
10	328 49.4	22 41.7	74 4.0	287 2.9	13 5.4	335 22.3	23 59.1
12	358 49.2	22 41.2	104 8.9	317 5.3	13 3.7	5 23.6	23 58.9
14	28 49.0	22 40.7	134 13.9	347 7.7	13 2.1	35 24.9	23 58.7
16	58 48.8	22 40.2	164 18.8	17 10.2	13 .4	65 26.1	23 58.6
18	88 48.6	22 39.7	194 23.7	47 12.6	12 58.8	95 27.4	23 58.4
20	118 48.3	22 39.2	224 28.6	77 15.1	12 57.1	125 28.7	23 58.2
22	148 48.1	22 38.7	254 33.6	107 17.5	12 55.5	155 30.0	23 58.1
Δ	-1	-3		12	-8	6	-1

UT	MESEC				JUPITER		SATURN	
	$S_\leftmoon$	Δ	$\delta_\leftmoon$	Δ	$S_{\mathrm{♃}}$	$\delta_{\mathrm{♃}}$	$S_{\mathrm{♄}}$	$\delta_{\mathrm{♄}}$
h	° ′		° ′		° ′	° ′	° ′	° ′
0	307 .0	87	7 8.4	-106	138 31.0	14 49.2	46 32.8	-17 52.1
2	335 55.5	88	6 47.2	-107	168 35.0	14 48.9	76 37.9	-17 52.1
4	4 51.2	89	6 25.8	-107	198 39.0	14 48.6	106 43.1	-17 52.1
6	33 46.9	89	6 4.4	-108	228 43.0	14 48.3	136 48.2	-17 52.0
8	62 42.7	90	5 42.7	-109	258 47.0	14 48.0	166 53.3	-17 52.0
10	91 38.7	90	5 21.0	-109	288 50.9	14 47.7	196 58.5	-17 52.0
12	120 34.8	91	4 59.1	-110	318 54.9	14 47.3	227 3.6	-17 52.0
14	149 31.0	91	4 37.1	-110	348 58.9	14 47.0	257 8.8	-17 51.9
16	178 27.2	92	4 15.0	-111	19 2.9	14 46.7	287 13.9	-17 51.9
18	207 23.6	92	3 52.9	-111	49 6.9	14 46.4	317 19.1	-17 51.9
20	236 20.1	93	3 30.6	-112	79 10.9	14 46.1	347 24.2	-17 51.9
22	265 16.6	93	3 8.3	-112	109 14.9	14 45.8	17 29.3	-17 51.8
Δ					20	-2	26	0

φ	SUNCE		TRAJANJE SUMRAKA		MESEC			
	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 48	21 21	1 31	: ::	21 58	3.0	10 30	.8
55	3 30	20 39	0 56	: ::	22 2	2.9	10 24	1.1
50	3 58	20 11	0 44	: ::	22 5	2.7	10 18	1.3
45	4 20	19 49	0 37	2 28	22 7	2.6	10 14	1.4
40	4 37	19 32	0 32	2 1	22 10	2.6	10 11	1.5
35	4 52	19 17	0 29	1 45	22 11	2.5	10 8	1.6
30	5 4	19 5	0 27	1 35	22 13	2.4	10 5	1.7
20	5 26	18 44	0 24	1 23	22 16	2.3	10 1	1.9
10	5 44	18 25	0 23	1 17	22 18	2.3	9 56	2.1
0	6 1	18 8	0 22	1 15	22 20	2.2	9 53	2.2
10	6 18	17 52	0 23	1 15	22 22	2.1	9 49	2.3
20	6 36	17 34	0 24	1 18	22 25	2.0	9 44	2.5
30	6 56	17 13	0 26	1 25	22 28	1.9	9 39	2.7
35	7 8	17 1	0 28	1 30	22 29	1.9	9 37	2.8
40	7 22	16 48	0 30	1 37	22 31	1.8	9 33	2.9
45	7 38	16 32	0 33	1 46	22 33	1.7	9 30	3.0
50	7 58	16 12	0 38	1 58	22 35	1.6	9 25	3.2
55	8 24	15 46	0 45	2 16	22 38	1.5	9 19	3.4
60	9 0	15 10	0 56	2 43	22 42	1.4	9 12	3.6
S								

SUNCE				MESEC			
UT	e = Tp − UT	Δ/24	r	Prolaz	Δ/24	$\pi_\leftmoon$	r
h	min s	s	′	h min	min	′	′
00	− 4 38.2	-.4	15.8	$T_{\overline{m}}$ 3 40	2.2	59.7	16.3
12	− 4 43.2	$T_{\overline{m}_\odot}$ 12 h 4.7 min		Starost 19.4 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	213	-5.6	♄	14 44	.0	215	-1.3
♂	11 38	.1	262	1.8	♃	20 50	.0	123	.5

UT	SUNCE		PROLEĆ. TAČKA	VENERA		MARS	
	$S_\odot$	$\delta_\odot$	S_Υ	S_φ	δ_φ	S_σ	δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	178 47.9	22 38.1	284 38.5	137 20.0	12 53.9	185 31.3	23 57.9
2	208 47.7	22 37.6	314 43.4	167 22.5	12 52.2	215 32.6	23 57.7
4	238 47.5	22 37.1	344 48.4	197 25.0	12 50.6	245 33.9	23 57.5
6	268 47.3	22 36.6	14 53.3	227 27.5	12 49.0	275 35.2	23 57.4
8	298 47.1	22 36.1	44 58.2	257 30.0	12 47.3	305 36.4	23 57.2
10	328 46.9	22 35.5	75 3.1	287 32.6	12 45.7	335 37.7	23 57.0
12	358 46.7	22 35.0	105 8.1	317 35.1	12 44.0	5 39.0	23 56.8
14	28 46.5	22 34.5	135 13.0	347 37.6	12 42.4	35 40.3	23 56.6
16	58 46.3	22 33.9	165 17.9	17 40.2	12 40.8	65 41.6	23 56.5
18	88 46.1	22 33.4	195 22.9	47 42.8	12 39.2	95 42.9	23 56.3
20	118 45.9	22 32.8	225 27.8	77 45.3	12 37.5	125 44.2	23 56.1
22	148 45.7	22 32.3	255 32.7	107 47.9	12 35.9	155 45.5	23 55.9
Δ	-1	-3		13	-8	6	-1

UT	MESEC				JUPITER		SATURN	
	$S_\leftmoon$	Δ	$\delta_\leftmoon$	Δ	$S_{\mathrm{♃}}$	$\delta_{\mathrm{♃}}$	$S_{\mathrm{♄}}$	$\delta_{\mathrm{♄}}$
h	° ′		° ′		° ′	° ′	° ′	° ′
0	294 13.3	94	2 45.9	-112	139 18.9	14 45.5	47 34.5	-17 51.8
2	323 10.0	94	2 23.4	-112	169 22.9	14 45.1	77 39.6	-17 51.8
4	352 6.8	94	2 1.0	-113	199 26.9	14 44.8	107 44.7	-17 51.8
6	21 3.7	95	1 38.5	-113	229 30.9	14 44.5	137 49.9	-17 51.7
8	50 .6	95	1 15.9	-113	259 34.8	14 44.2	167 55.0	-17 51.7
10	78 57.6	95	0 53.4	-113	289 38.8	14 43.9	198 .2	-17 51.7
12	107 54.7	96	0 30.8	-113	319 42.8	14 43.6	228 5.3	-17 51.7
14	136 51.8	96	0 8.3	30	349 46.8	14 43.2	258 10.4	-17 51.6
16	165 49.0	96	0 14.3	113	19 50.8	14 42.9	288 15.6	-17 51.6
18	194 46.2	96	0 36.8	112	49 54.8	14 42.6	318 20.7	-17 51.6
20	223 43.5	97	0 59.3	112	79 58.8	14 42.3	348 25.8	-17 51.6
22	252 40.8	97	1 21.7	112	110 2.8	14 42.0	18 31.0	-17 51.5
Δ					20	-2	26	0

φ	SUNCE		TRAJANJE SUMRAKA		MESEC			
	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 49	21 19	1 29	: ::	23 10	.5	10 50	3.1
55	3 31	20 38	0 55	: ::	23 10	.8	10 49	3.0
50	3 59	20 10	0 43	: ::	23 11	1.0	10 48	2.8
45	4 21	19 49	0 37	2 27	23 11	1.2	10 48	2.7
40	4 38	19 32	0 32	2 0	23 11	1.3	10 48	2.6
35	4 52	19 17	0 29	1 45	23 11	1.5	10 47	2.5
30	5 5	19 5	0 27	1 35	23 12	1.6	10 47	2.5
20	5 26	18 44	0 24	1 23	23 12	1.8	10 46	2.4
10	5 44	18 25	0 23	1 17	23 12	2.1	10 46	2.3
0	6 1	18 9	0 22	1 15	23 12	2.2	10 45	2.2
10	6 18	17 52	0 23	1 15	23 13	2.2	10 45	2.1
20	6 36	17 34	0 24	1 18	23 13	2.2	10 44	2.0
30	6 56	17 14	0 26	1 25	23 13	2.3	10 43	1.9
35	7 8	17 2	0 28	1 30	23 14	2.3	10 43	1.8
40	7 22	16 48	0 30	1 37	23 14	2.4	10 42	1.7
45	7 38	16 32	0 33	1 46	23 14	2.4	10 42	1.6
50	7 57	16 13	0 38	1 58	23 15	2.5	10 41	1.5
55	8 23	15 47	0 45	2 16	23 15	2.5	10 40	1.4
60	8 59	15 11	0 56	2 43	23 16	2.6	10 39	1.3
S								

SUNCE				MESEC			
UT	e = Tp − UT	Δ/24	r	Prolaz	Δ/24	$\pi_\leftmoon$	r
h	min s	s	′	h min	min	′	′
00	− 4 48.2	-.4	15.8	$T_{\overline{m}}$ 4 33	2.2	59.6	16.2
12	− 4 53.1	$T_{\overline{m}_\odot}$ 12 h 4.9 min		Starost 20.4 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	213	-5.6	♄	14 41	.0	215	-1.3
♂	11 37	.1	261	1.8	♃	20 46	.0	123	.5

UT	SUNCE $S_\odot$	SUNCE $\delta_\odot$	PROLEĆ. TAČKA S_Υ	VENERA S_φ	VENERA δ_φ	MARS S_σ	MARS δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	178 45.5	22 31.7	285 37.6	137 50.5	12 34.3	185 46.8	23 55.7
2	208 45.3	22 31.2	315 42.6	167 53.1	12 32.6	215 48.1	23 55.5
4	238 45.1	22 30.6	345 47.5	197 55.7	12 31.0	245 49.3	23 55.3
6	268 44.9	22 30.1	15 52.4	227 58.4	12 29.4	275 50.6	23 55.1
8	298 44.7	22 29.5	45 57.3	258 1.0	12 27.8	305 51.9	23 54.9
10	328 44.5	22 29.0	76 2.3	288 3.7	12 26.2	335 53.2	23 54.7
12	358 44.3	22 28.4	106 7.2	318 6.3	12 24.5	5 54.5	23 54.5
14	28 44.2	22 27.8	136 12.1	348 9.0	12 22.9	35 55.8	23 54.3
16	58 44.0	22 27.3	166 17.1	18 11.7	12 21.3	65 57.1	23 54.1
18	88 43.8	22 26.7	196 22.0	48 14.3	12 19.7	95 58.4	23 53.9
20	118 43.6	22 26.1	226 26.9	78 17.0	12 18.1	125 59.7	23 53.7
22	148 43.4	22 25.5	256 31.8	108 19.8	12 16.4	156 1.0	23 53.5
Δ	-1	-3		13	-8	6	-1

UT	MESEC $S_\leftmoon$	MESEC Δ	MESEC $\delta_\leftmoon$	MESEC Δ	JUPITER $S_{\jupiter}$	JUPITER $\delta_{\jupiter}$	SATURN $S_{\saturn}$	SATURN $\delta_{\saturn}$
h	° ′		° ′		° ′	° ′	° ′	° ′
0	281 38.2	97	1 44.1	112	140 6.7	14 41.7	48 36.1	-17 51.5
2	310 35.5	97	2 6.4	111	170 10.7	14 41.3	78 41.2	-17 51.5
4	339 32.9	97	2 28.7	111	200 14.7	14 41.0	108 46.4	-17 51.5
6	8 30.3	97	2 50.9	111	230 18.7	14 40.7	138 51.5	-17 51.4
8	37 27.8	97	3 13.0	110	260 22.7	14 40.4	168 56.6	-17 51.4
10	66 25.2	97	3 35.0	110	290 26.7	14 40.1	199 1.7	-17 51.4
12	95 22.6	97	3 56.9	109	320 30.6	14 39.7	229 6.9	-17 51.4
14	124 20.1	97	4 18.7	108	350 34.6	14 39.4	259 12.0	-17 51.3
16	153 17.5	97	4 40.4	108	20 38.6	14 39.1	289 17.1	-17 51.3
18	182 15.0	97	5 1.9	107	50 42.6	14 38.8	319 22.3	-17 51.3
20	211 12.4	97	5 23.3	106	80 46.6	14 38.5	349 27.4	-17 51.3
22	240 9.8	97	5 44.6	106	110 50.6	14 38.1	19 32.5	-17 51.2
Δ					20	-2	26	0

φ	SUNCE IZLAZ	SUNCE ZALAZ	TRAJANJE SUMRAKA GRAĐ.	TRAJANJE SUMRAKA ASTR.	MESEC IZLAZ	MESEC Δ/24	MESEC ZALAZ	MESEC Δ/24
N	h min	h min	h min	h min	h min	min	h min	min
60	2 51	21 18	1 28	: ::	23 21	.9	12 5	3.5
55	3 32	20 37	0 55	: ::	23 29	2.1	12 0	3.3
50	4 0	20 9	0 43	: ::	23 35	2.2	11 56	3.1
45	4 21	19 48	0 37	2 26	23 39	2.2	11 53	2.9
40	4 39	19 31	0 32	1 60	23 43	2.2	11 51	2.8
35	4 53	19 17	0 29	1 45	23 47	2.2	11 48	2.7
30	5 5	19 5	0 27	1 35	23 50	2.2	11 46	2.6
20	5 26	18 44	0 24	1 23	23 55	2.2	11 43	2.4
10	5 45	18 25	0 23	1 17	. . .	.0	11 40	2.3
0	6 1	18 9	0 22	1 15	. . .	.0	11 37	2.2
10	6 18	17 52	0 23	1 15	. . .	.0	11 34	2.0
20	6 36	17 34	0 24	1 18	. . .	.0	11 31	1.9
30	6 56	17 14	0 26	1 25	. . .	.0	11 28	1.7
35	7 8	17 2	0 28	1 30	. . .	.0	11 26	1.6
40	7 21	16 49	0 30	1 37	. . .	.0	11 24	1.5
45	7 37	16 33	0 33	1 46	. . .	.0	11 21	1.4
50	7 57	16 13	0 38	1 58	. . .	.0	11 18	1.3
55	8 22	15 48	0 44	2 15	. . .	.0	11 14	1.1
60	8 58	15 12	0 56	2 42	. . .	.0	11 9	.8
S								

SUNCE UT	SUNCE e = T_p − UT	SUNCE Δ/24	SUNCE r	MESEC Prolaz	MESEC Δ/24	MESEC $\pi_\leftmoon$	MESEC r
h	min s	s	′	h min	min	′	′
00	- 4 57.9	-.4	15.8	$T_{\overline{m}}$ 5 25	2.2	59.4	16.2
12	- 5 2.6	$T_{\overline{m}_\odot}$ 12 h 5.0 min		Starost 21.4 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	212	-5.7	♃	14 38	.0	214	-1.3
♂	11 36	.1	260	1.8	♄	20 42	.0	123	.5

UT	SUNCE $S_\odot$	SUNCE $\delta_\odot$	PROLEĆ. TAČKA S_Υ	VENERA S_φ	VENERA δ_φ	MARS S_σ	MARS δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	178 43.2	22 24.9	286 36.8	138 22.5	12 14.8	186 2.3	23 53.3
2	208 43.0	22 24.4	316 41.7	168 25.2	12 13.2	216 3.6	23 53.1
4	238 42.8	22 23.8	346 46.6	198 28.0	12 11.6	246 4.9	23 52.9
6	268 42.6	22 23.2	16 51.6	228 30.7	12 10.0	276 6.2	23 52.7
8	298 42.4	22 22.6	46 56.5	258 33.5	12 8.4	306 7.5	23 52.5
10	328 42.3	22 22.0	77 1.4	288 36.2	12 6.8	336 8.8	23 52.3
12	358 42.1	22 21.4	107 6.3	318 39.0	12 5.2	6 10.1	23 52.0
14	28 41.9	22 20.8	137 11.3	348 41.8	12 3.6	36 11.4	23 51.8
16	58 41.7	22 20.2	167 16.2	18 44.6	12 2.0	66 12.7	23 51.6
18	88 41.5	22 19.6	197 21.1	48 47.5	12 .4	96 14.0	23 51.4
20	118 41.3	22 19.0	227 26.1	78 50.3	11 58.8	126 15.3	23 51.2
22	148 41.1	22 18.4	257 31.0	108 53.1	11 57.2	156 16.6	23 51.0
Δ	-1	-3		14	-8	7	-1

UT	MESEC $S_\leftmoon$	MESEC Δ	MESEC $\delta_\leftmoon$	MESEC Δ	JUPITER $S_{\jupiter}$	JUPITER $\delta_{\jupiter}$	SATURN $S_{\saturn}$	SATURN $\delta_{\saturn}$
h	° ′		° ′		° ′	° ′	° ′	° ′
0	269 7.2	97	6 5.7	105	140 54.5	14 37.8	49 37.6	-17 51.2
2	298 4.6	97	6 26.7	104	170 58.5	14 37.5	79 42.8	-17 51.2
4	327 1.9	97	6 47.5	103	201 2.5	14 37.2	109 47.9	-17 51.2
6	355 59.2	96	7 8.1	102	231 6.5	14 36.9	139 53.0	-17 51.1
8	24 56.5	96	7 28.5	101	261 10.5	14 36.5	169 58.1	-17 51.1
10	53 53.7	96	7 48.7	100	291 14.4	14 36.2	200 3.2	-17 51.1
12	82 50.9	96	8 8.8	99	321 18.4	14 35.9	230 8.4	-17 51.1
14	111 48.1	96	8 28.6	98	351 22.4	14 35.6	260 13.5	-17 51.1
16	140 45.2	95	8 48.2	97	21 26.4	14 35.3	290 18.6	-17 51.0
18	169 42.3	95	9 7.6	96	51 30.4	14 34.9	320 23.7	-17 51.0
20	198 39.3	95	9 26.8	95	81 34.3	14 34.6	350 28.8	-17 51.0
22	227 36.2	95	9 45.7	93	111 38.3	14 34.3	20 34.0	-17 51.0
Δ					20	-2	26	0

φ	SUNCE IZLAZ	SUNCE ZALAZ	TRAJANJE SUMRAKA GRAĐ.	TRAJANJE SUMRAKA ASTR.	MESEC IZLAZ	MESEC Δ/24	MESEC ZALAZ	MESEC Δ/24
N	h min	h min	h min	h min	h min	min	h min	min
60	2 52	21 17	1 26	: ::	23 43	2.2	13 30	3.4
55	3 33	20 37	0 55	: ::	. . .	.0	13 19	3.2
50	4 1	20 9	0 43	: ::	. . .	.0	13 10	3.0
45	4 22	19 48	0 37	2 25	. . .	.0	13 4	2.9
40	4 39	19 31	0 32	1 60	. . .	.0	12 58	2.8
35	4 53	19 17	0 29	1 45	. . .	.0	12 53	2.7
30	5 6	19 4	0 27	1 35	. . .	.0	12 49	2.6
20	5 27	18 43	0 24	1 23	. . .	.0	12 42	2.4
10	5 45	18 26	0 23	1 17	0 0	2.0	12 35	2.3
0	6 2	18 9	0 22	1 14	0 4	2.2	12 29	2.2
10	6 18	17 52	0 23	1 15	0 9	2.3	12 23	2.1
20	6 36	17 35	0 24	1 18	0 14	2.4	12 17	1.9
30	6 56	17 15	0 26	1 25	0 19	2.6	12 9	1.8
35	7 8	17 3	0 28	1 30	0 22	2.7	12 5	1.7
40	7 21	16 50	0 30	1 37	0 26	2.8	12 0	1.6
45	7 37	16 34	0 33	1 46	0 30	2.9	11 55	1.5
50	7 56	16 14	0 38	1 58	0 36	3.1	11 48	1.4
55	8 22	15 49	0 44	2 15	0 42	3.2	11 40	1.2
60	8 57	15 14	0 55	2 42	0 50	3.5	11 30	1.0
S								

SUNCE UT	SUNCE e = T_p − UT	SUNCE Δ/24	SUNCE r	MESEC Prolaz	MESEC Δ/24	MESEC $\pi_\leftmoon$	MESEC r
h	min s	s	′	h min	min	′	′
00	- 5 7.2	-.4	15.8	$T_{\overline{m}}$ 6 17	2.2	59.1	16.1
12	- 5 11.7	$T_{\overline{m}_\odot}$ 12 h 5.2 min		Starost 22.4 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	212	-5.7	♃	14 34	.0	214	-1.3
♂	11 35	.1	259	1.8	♄	20 38	.0	123	.5

UT	SUNCE		PROLEĆ. TAČKA	VENERA		MARS	
	$S_\odot$	$\delta_\odot$	S_Υ	S_φ	δ_φ	S_σ	δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	178 41.0	22 17.8	287 35.9	138 56.0	11 55.6	186 17.9	23 50.7
2	208 40.8	22 17.1	317 40.8	168 58.8	11 54.0	216 19.2	23 50.5
4	238 40.6	22 16.5	347 45.8	199 1.7	11 52.4	246 20.5	23 50.3
6	268 40.4	22 15.9	17 50.7	229 4.6	11 50.8	276 21.8	23 50.1
8	298 40.2	22 15.3	47 55.6	259 7.5	11 49.2	306 23.1	23 49.8
10	328 40.1	22 14.6	78 .6	289 10.4	11 47.6	336 24.4	23 49.6
12	358 39.9	22 14.0	108 5.5	319 13.3	11 46.0	6 25.7	23 49.4
14	28 39.7	22 13.4	138 10.4	349 16.2	11 44.4	36 27.0	23 49.1
16	58 39.5	22 12.8	168 15.3	19 19.2	11 42.9	66 28.3	23 48.9
18	88 39.4	22 12.1	198 20.3	49 22.1	11 41.3	96 29.6	23 48.7
20	118 39.2	22 11.5	228 25.2	79 25.1	11 39.7	126 31.0	23 48.4
22	148 39.0	22 10.8	258 30.1	109 28.0	11 38.1	156 32.3	23 48.2
Δ	-1	-3		15	-8	7	-1

UT	MESEC				JUPITER		SATURN	
	$S_\leftmoon$	Δ	$\delta_\leftmoon$	Δ	$S_{\mathrm{♃}}$	$\delta_{\mathrm{♃}}$	$S_{\mathrm{♄}}$	$\delta_{\mathrm{♄}}$
h	° ′		° ′		° ′	° ′	° ′	° ′
0	256 33.2	94	10 4.4	92	141 42.3	14 34.0	50 39.1	-17 51.0
2	285 30.0	94	10 22.8	91	171 46.3	14 33.6	80 44.2	-17 50.9
4	314 26.8	94	10 41.0	90	201 50.2	14 33.3	110 49.3	-17 50.9
6	343 23.5	93	10 58.9	88	231 54.2	14 33.0	140 54.4	-17 50.9
8	12 20.2	93	11 16.5	87	261 58.2	14 32.7	170 59.5	-17 50.9
10	41 16.8	93	11 33.8	85	292 2.2	14 32.3	201 4.7	-17 50.8
12	70 13.3	92	11 50.9	84	322 6.1	14 32.0	231 9.8	-17 50.8
14	99 9.8	92	12 7.7	82	352 10.1	14 31.7	261 14.9	-17 50.8
16	128 6.2	92	12 24.2	81	22 14.1	14 31.4	291 20.0	-17 50.8
18	157 2.5	91	12 40.3	79	52 18.1	14 31.1	321 25.1	-17 50.8
20	185 58.8	91	12 56.2	78	82 22.0	14 30.7	351 30.2	-17 50.7
22	214 55.0	91	13 11.8	76	112 26.0	14 30.4	21 35.3	-17 50.7
Δ					20	-2	26	0

φ	SUNCE		TRAJANJE SUMRAKA		MESEC			
	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 16	1 25	: ::	. . ..	.0	14 52	3.3
55	3 34	20 36	0 54	: ::	0 -4	1.3	14 35	3.1
50	4 2	20 8	0 43	: ::	0 6	1.4	14 23	2.9
45	4 23	19 47	0 36	2 24	0 14	1.6	14 13	2.8
40	4 40	19 30	0 32	1 59	0 21	1.7	14 4	2.7
35	4 54	19 16	0 29	1 44	0 27	1.8	13 57	2.6
30	5 6	19 4	0 27	1 35	0 32	1.8	13 51	2.5
20	5 27	18 43	0 24	1 23	0 41	2.0	13 40	2.4
10	5 45	18 26	0 23	1 17	0 49	2.1	13 30	2.3
0	6 2	18 9	0 22	1 14	0 56	2.2	13 21	2.2
10	6 18	17 53	0 23	1 15	1 4	2.3	13 12	2.1
20	6 36	17 35	0 24	1 18	1 12	2.4	13 3	2.0
30	6 56	17 15	0 26	1 25	1 21	2.6	12 52	1.9
35	7 7	17 4	0 28	1 30	1 27	2.6	12 46	1.8
40	7 21	16 50	0 30	1 37	1 33	2.7	12 39	1.7
45	7 36	16 35	0 33	1 46	1 40	2.8	12 31	1.6
50	7 56	16 15	0 38	1 58	1 49	3.0	12 21	1.5
55	8 21	15 50	0 44	2 15	1 60	3.1	12 8	1.4
60	8 56	15 15	0 55	2 41	2 14	3.4	11 52	1.1
S								

SUNCE				MESEC			
UT	e = Tp − UT	Δ/24	r	Prolaz		Δ/24	$\pi_\leftmoon$	r
h	min s	s	′		h min	min	′	′
00	- 5 16.1	-.4	15.8	$T_{\overline{m}}$	7 9	2.2	58.7	16.0
12	- 5 20.4	$T_{\overline{m}_\odot}$ 12 h 5.3 min		Starost 23.4 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	211	-5.7	♃	14 31	.0	214	-1.3
♂	11 34	.1	259	1.8	♄	20 34	.0	123	.5

UT	SUNCE		PROLEĆ. TAČKA	VENERA		MARS	
	$S_\odot$	$\delta_\odot$	S_Υ	S_φ	δ_φ	S_σ	δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	178 38.8	22 10.2	288 35.1	139 31.0	11 36.5	186 33.6	23 48.0
2	208 38.7	22 9.5	318 40.0	169 34.0	11 35.0	216 34.9	23 47.7
4	238 38.5	22 8.9	348 44.9	199 37.0	11 33.4	246 36.2	23 47.5
6	268 38.3	22 8.2	18 49.8	229 40.0	11 31.8	276 37.5	23 47.2
8	298 38.1	22 7.6	48 54.8	259 43.1	11 30.2	306 38.8	23 47.0
10	328 38.0	22 6.9	78 59.7	289 46.1	11 28.7	336 40.1	23 46.7
12	358 37.8	22 6.3	109 4.6	319 49.1	11 27.1	6 41.4	23 46.5
14	28 37.6	22 5.6	139 9.6	349 52.2	11 25.5	36 42.7	23 46.2
16	58 37.5	22 4.9	169 14.5	19 55.3	11 24.0	66 44.1	23 46.0
18	88 37.3	22 4.3	199 19.4	49 58.4	11 22.4	96 45.4	23 45.7
20	118 37.1	22 3.6	229 24.3	80 1.4	11 20.8	126 46.7	23 45.5
22	148 37.0	22 2.9	259 29.3	110 4.6	11 19.3	156 48.0	23 45.2
Δ	-1	-3		15	-8	7	-1

UT	MESEC				JUPITER		SATURN	
	$S_\leftmoon$	Δ	$\delta_\leftmoon$	Δ	$S_{\mathrm{♃}}$	$\delta_{\mathrm{♃}}$	$S_{\mathrm{♄}}$	$\delta_{\mathrm{♄}}$
h	° ′		° ′		° ′	° ′	° ′	° ′
0	243 51.1	90	13 27.0	74	142 30.0	14 30.1	51 40.4	-17 50.7
2	272 47.2	90	13 41.9	73	172 34.0	14 29.8	81 45.5	-17 50.7
4	301 43.2	90	13 56.4	71	202 37.9	14 29.4	111 50.7	-17 50.7
6	330 39.1	89	14 10.7	69	232 41.9	14 29.1	141 55.8	-17 50.6
8	359 35.0	89	14 24.5	68	262 45.9	14 28.8	172 .9	-17 50.6
10	28 30.8	89	14 38.1	66	292 49.8	14 28.5	202 6.0	-17 50.6
12	57 26.5	88	14 51.2	64	322 53.8	14 28.1	232 11.1	-17 50.6
14	86 22.2	88	15 4.1	62	352 57.8	14 27.8	262 16.2	-17 50.6
16	115 17.9	88	15 16.5	60	23 1.8	14 27.5	292 21.3	-17 50.6
18	144 13.5	88	15 28.6	59	53 5.7	14 27.2	322 26.4	-17 50.5
20	173 9.0	87	15 40.3	57	83 9.7	14 26.8	352 31.5	-17 50.5
22	202 4.5	87	15 51.6	55	113 13.7	14 26.5	22 36.6	-17 50.5
Δ					20	-2	26	0

φ	SUNCE		TRAJANJE SUMRAKA		MESEC			
	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 56	21 14	1 23	: ::	0 8	1.3	16 11	3.0
55	3 35	20 35	0 54	: ::	0 26	1.5	15 49	2.8
50	4 3	20 7	0 43	: ::	0 40	1.6	15 33	2.7
45	4 24	19 47	0 36	2 24	0 52	1.7	15 20	2.6
40	4 41	19 30	0 32	1 59	1 1	1.8	15 9	2.6
35	4 55	19 16	0 29	1 44	1 9	1.9	14 60	2.5
30	5 7	19 4	0 27	1 35	1 16	1.9	14 52	2.5
20	5 28	18 43	0 24	1 23	1 28	2.0	14 38	2.4
10	5 45	18 26	0 23	1 17	1 39	2.1	14 26	2.3
0	6 2	18 9	0 22	1 14	1 49	2.2	14 14	2.2
10	6 18	17 53	0 23	1 15	1 59	2.3	14 3	2.2
20	6 36	17 35	0 24	1 18	2 10	2.4	13 51	2.1
30	6 56	17 16	0 26	1 25	2 23	2.5	13 37	2.0
35	7 7	17 4	0 28	1 30	2 30	2.6	13 29	1.9
40	7 20	16 51	0 30	1 36	2 39	2.6	13 20	1.9
45	7 36	16 35	0 33	1 45	2 48	2.7	13 10	1.8
50	7 55	16 16	0 38	1 57	3 0	2.8	12 57	1.7
55	8 20	15 51	0 44	2 15	3 15	3.0	12 41	1.6
60	8 55	15 17	0 55	2 41	3 35	3.2	12 20	1.4
S								

SUNCE				MESEC			
UT	e = Tp − UT	Δ/24	r	Prolaz		Δ/24	$\pi_\leftmoon$	r
h	min s	s	′		h min	min	′	′
00	- 5 24.7	-.3	15.8	$T_{\overline{m}}$	8 2	2.2	58.3	15.9
12	- 5 28.7	$T_{\overline{m}_\odot}$ 12 h 5.5 min		Starost 24.4 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	211	-5.8	♃	14 28	.0	214	-1.3
♂	11 33	.1	258	1.8	♄	20 30	.0	123	.5

UT	SUNCE		PROLEĆ. TAČKA	VENERA		MARS	
	$S_\odot$	$\delta_\odot$	S_Υ	S_φ	δ_φ	S_σ	δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	178 36.8	22 2.2	289 34.2	140 7.7	11 17.7	186 49.3	23 45.0
2	208 36.6	22 1.6	319 39.1	170 10.8	11 16.2	216 50.6	23 44.7
4	238 36.5	22 .9	349 44.0	200 13.9	11 14.6	246 51.9	23 44.5
6	268 36.3	22 .2	19 49.0	230 17.1	11 13.1	276 53.3	23 44.2
8	298 36.1	21 59.5	49 53.9	260 20.3	11 11.5	306 54.6	23 43.9
10	328 36.0	21 58.8	79 58.8	290 23.4	11 10.0	336 55.9	23 43.7
12	358 35.8	21 58.1	110 3.8	320 26.6	11 8.4	6 57.2	23 43.4
14	28 35.7	21 57.4	140 8.7	350 29.8	11 6.9	36 58.5	23 43.2
16	58 35.5	21 56.7	170 13.6	20 33.0	11 5.3	66 59.8	23 42.9
18	88 35.4	21 56.0	200 18.5	50 36.2	11 3.8	97 1.2	23 42.6
20	118 35.2	21 55.3	230 23.5	80 39.5	11 2.2	127 2.5	23 42.3
22	148 35.0	21 54.6	260 28.4	110 42.7	11 .7	157 3.8	23 42.1
Δ		-1 -3			16 -8		7 -1

UT	MESEC				JUPITER		SATURN	
	$S_\leftmoon$	Δ	$\delta_\leftmoon$	Δ	$S_{\mathrm{♃}}$	$\delta_{\mathrm{♃}}$	$S_{\mathrm{♄}}$	$\delta_{\mathrm{♄}}$
h	° ′		° ′		° ′	° ′	° ′	° ′
0	230 59.9	87	16 2.6	53	143 17.6	14 26.2	52 41.7	-17 50.5
2	259 55.3	87	16 13.2	51	173 21.6	14 25.8	82 46.8	-17 50.5
4	288 50.7	87	16 23.3	49	203 25.6	14 25.5	112 51.9	-17 50.4
6	317 46.0	86	16 33.1	47	233 29.5	14 25.2	142 57.0	-17 50.4
8	346 41.3	86	16 42.5	45	263 33.5	14 24.9	173 2.1	-17 50.4
10	15 36.6	86	16 51.5	43	293 37.5	14 24.5	203 7.2	-17 50.4
12	44 31.8	86	17 .1	41	323 41.4	14 24.2	233 12.3	-17 50.4
14	73 27.1	86	17 8.3	39	353 45.4	14 23.9	263 17.4	-17 50.4
16	102 22.3	86	17 16.1	37	23 49.4	14 23.5	293 22.5	-17 50.3
18	131 17.5	86	17 23.4	35	53 53.3	14 23.2	323 27.6	-17 50.3
20	160 12.7	86	17 30.4	33	83 57.3	14 22.9	353 32.7	-17 50.3
22	189 7.9	86	17 37.0	31	114 1.3	14 22.6	23 37.8	-17 50.3
Δ					20	-2	25	0

φ	SUNCE		TRAJANJE SUMRAKA		MESEC			
	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 57	21 13	1 22	: ::	0 39	1.6	17 23	2.6
55	3 37	20 34	0 54	: ::	1 2	1.7	16 57	2.5
50	4 4	20 7	0 43	3 42	1 19	1.8	16 38	2.5
45	4 25	19 46	0 36	2 23	1 33	1.9	16 23	2.4
40	4 41	19 30	0 32	1 58	1 44	2.0	16 11	2.4
35	4 55	19 16	0 29	1 44	1 54	2.0	16 0	2.4
30	5 7	19 4	0 27	1 34	2 2	2.1	15 51	2.4
20	5 28	18 43	0 24	1 23	2 17	2.1	15 35	2.3
10	5 46	18 26	0 23	1 17	2 30	2.2	15 21	2.3
0	6 2	18 9	0 22	1 14	2 42	2.2	15 8	2.2
10	6 18	17 53	0 23	1 15	2 55	2.3	14 55	2.2
20	6 36	17 36	0 24	1 18	3 8	2.3	14 41	2.2
30	6 55	17 16	0 26	1 25	3 23	2.4	14 25	2.1
35	7 7	17 5	0 28	1 30	3 32	2.5	14 16	2.1
40	7 20	16 52	0 30	1 36	3 42	2.5	14 6	2.1
45	7 35	16 36	0 33	1 45	3 54	2.5	13 53	2.0
50	7 54	16 17	0 37	1 57	4 8	2.6	13 38	2.0
55	8 19	15 53	0 44	2 14	4 26	2.7	13 19	1.9
60	8 53	15 18	0 54	2 40	4 51	2.8	12 54	1.8
S								

SUNCE				MESEC			
UT	e = T_p − UT	Δ/24	r	Prolaz	Δ/24	$\pi_\leftmoon$	r
h	min s	s	′	h min	min	′	′
00	− 5 32.8	-.3	15.8	$T_{\overline{m}}$ 8 55	2.2	57.8	15.8
12	− 5 36.6	$T_{\overline{m}_\odot}$ 12 h 5.6 min		Starost 25.4 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	211	-5.8	♄	14 25	.0	214	-1.3
♂	11 32	.1	257	1.8	♇	20 26	.0	123	.5

UT	SUNCE		PROLEĆ. TAČKA	VENERA		MARS	
	$S_\odot$	$\delta_\odot$	S_Υ	S_φ	δ_φ	S_σ	δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	178 34.9	21 53.9	290 33.3	140 46.0	10 59.2	187 5.1	23 41.8
2	208 34.7	21 53.2	320 38.3	170 49.2	10 57.6	217 6.4	23 41.5
4	238 34.6	21 52.5	350 43.2	200 52.5	10 56.1	247 7.8	23 41.3
6	268 34.4	21 51.8	20 48.1	230 55.8	10 54.6	277 9.1	23 41.0
8	298 34.3	21 51.0	50 53.0	260 59.1	10 53.0	307 10.4	23 40.7
10	328 34.1	21 50.3	80 58.0	291 2.4	10 51.5	337 11.7	23 40.4
12	358 34.0	21 49.6	111 2.9	321 5.8	10 50.0	7 13.1	23 40.1
14	28 33.8	21 48.9	141 7.8	351 9.1	10 48.5	37 14.4	23 39.9
16	58 33.7	21 48.1	171 12.8	21 12.4	10 47.0	67 15.7	23 39.6
18	88 33.5	21 47.4	201 17.7	51 15.8	10 45.4	97 17.0	23 39.3
20	118 33.4	21 46.7	231 22.6	81 19.2	10 43.9	127 18.4	23 39.0
22	148 33.2	21 45.9	261 27.5	111 22.6	10 42.4	157 19.7	23 38.7
Δ		-1 -4			17 -8		7 -1

UT	MESEC				JUPITER		SATURN	
	$S_\leftmoon$	Δ	$\delta_\leftmoon$	Δ	$S_{\mathrm{♃}}$	$\delta_{\mathrm{♃}}$	$S_{\mathrm{♄}}$	$\delta_{\mathrm{♄}}$
h	° ′		° ′		° ′	° ′	° ′	° ′
0	218 3.1	86	17 43.1	29	144 5.2	14 22.2	53 42.9	-17 50.3
2	246 58.3	86	17 48.8	26	174 9.2	14 21.9	83 48.0	-17 50.3
4	275 53.6	86	17 54.1	24	204 13.2	14 21.6	113 53.1	-17 50.2
6	304 48.8	86	17 59.0	22	234 17.1	14 21.2	143 58.2	-17 50.2
8	333 44.1	87	18 3.4	20	264 21.1	14 20.9	174 3.3	-17 50.2
10	2 39.5	87	18 7.5	18	294 25.1	14 20.6	204 8.4	-17 50.2
12	31 34.8	87	18 11.1	16	324 29.0	14 20.3	234 13.5	-17 50.2
14	60 30.2	87	18 14.3	14	354 33.0	14 19.9	264 18.5	-17 50.2
16	89 25.7	88	18 17.1	12	24 36.9	14 19.6	294 23.6	-17 50.2
18	118 21.2	88	18 19.5	10	54 40.9	14 19.3	324 28.7	-17 50.1
20	147 16.8	88	18 21.4	8	84 44.9	14 18.9	354 33.8	-17 50.1
22	176 12.5	89	18 22.9	6	114 48.8	14 18.6	24 38.9	-17 50.1
Δ					20	-2	25	0

φ	SUNCE		TRAJANJE SUMRAKA		MESEC			
	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 59	21 11	1 20	: ::	1 17	2.0	18 26	2.2
55	3 38	20 33	0 53	: ::	1 43	2.0	17 58	2.2
50	4 5	20 6	0 42	3 33	2 3	2.1	17 38	2.2
45	4 25	19 46	0 36	2 22	2 19	2.1	17 22	2.2
40	4 42	19 29	0 32	1 58	2 31	2.1	17 8	2.2
35	4 56	19 15	0 29	1 44	2 42	2.1	16 57	2.2
30	5 8	19 3	0 27	1 34	2 52	2.2	16 47	2.2
20	5 28	18 43	0 24	1 23	3 8	2.2	16 30	2.2
10	5 46	18 26	0 23	1 17	3 23	2.2	16 16	2.2
0	6 2	18 9	0 22	1 14	3 36	2.2	16 2	2.2
10	6 18	17 53	0 23	1 15	3 50	2.2	15 48	2.2
20	6 35	17 36	0 24	1 18	4 4	2.3	15 33	2.2
30	6 55	17 17	0 26	1 24	4 21	2.3	15 16	2.2
35	7 6	17 5	0 28	1 30	4 31	2.3	15 6	2.2
40	7 19	16 52	0 30	1 36	4 42	2.3	14 55	2.2
45	7 35	16 37	0 33	1 45	4 55	2.3	14 42	2.2
50	7 54	16 18	0 37	1 57	5 11	2.3	14 25	2.2
55	8 18	15 54	0 44	2 14	5 31	2.4	14 5	2.2
60	8 52	15 20	0 54	2 40	5 59	2.4	13 37	2.2
S								

SUNCE				MESEC			
UT	e = T_p − UT	Δ/24	r	Prolaz	Δ/24	$\pi_\leftmoon$	r
h	min s	s	′	h min	min	′	′
00	− 5 40.5	-.3	15.8	$T_{\overline{m}}$ 9 49	2.2	57.4	15.6
12	− 5 44.1	$T_{\overline{m}_\odot}$ 12 h 5.7 min		Starost 26.4 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	210	-5.8	♄	14 22	.0	214	-1.3
♂	11 31	.1	257	1.8	♇	20 22	.0	123	.5

UT	SUNCE $S_\odot$	SUNCE $\delta_\odot$	PROLEĆ. TAČKA S_Υ	VENERA S_φ	VENERA δ_φ	MARS S_σ	MARS δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	178 33.1	21 45.2	291 32.5	141 26.0	10 40.9	187 21.0	23 38.4
2	208 32.9	21 44.5	321 37.4	171 29.4	10 39.4	217 22.3	23 38.2
4	238 32.8	21 43.7	351 42.3	201 32.8	10 37.9	247 23.7	23 37.9
6	268 32.6	21 43.0	21 47.3	231 36.2	10 36.4	277 25.0	23 37.6
8	298 32.5	21 42.2	51 52.2	261 39.7	10 34.9	307 26.3	23 37.3
10	328 32.4	21 41.5	81 57.1	291 43.1	10 33.4	337 27.6	23 37.0
12	358 32.2	21 40.7	112 2.0	321 46.6	10 31.9	7 29.0	23 36.7
14	28 32.1	21 39.9	142 7.0	351 50.1	10 30.4	37 30.3	23 36.4
16	58 31.9	21 39.2	172 11.9	21 53.6	10 28.9	67 31.6	23 36.1
18	88 31.8	21 38.4	202 16.8	51 57.1	10 27.4	97 33.0	23 35.8
20	118 31.7	21 37.7	232 21.8	82 .6	10 25.9	127 34.3	23 35.5
22	148 31.5	21 36.9	262 26.7	112 4.2	10 24.4	157 35.6	23 35.2
Δ	-1	-4		17	-7	7	-1

UT	MESEC $S_\leftmoon$	MESEC Δ	MESEC $\delta_\leftmoon$	MESEC Δ	JUPITER $S_\jupiter$	JUPITER $\delta_\jupiter$	SATURN $S_\saturn$	SATURN $\delta_\saturn$
h	° ′		° ′		° ′	° ′	° ′	° ′
0	205 8.2	89	18 24.0	3	144 52.8	14 18.3	54 44.0	-17 50.1
2	234 4.0	90	18 24.7	1	174 56.7	14 17.9	84 49.1	-17 50.1
4	262 59.9	90	18 25.0	-1	205 .7	14 17.6	114 54.2	-17 50.1
6	291 55.9	90	18 24.9	-3	235 4.7	14 17.3	144 59.2	-17 50.0
8	320 52.0	91	18 24.3	-5	265 8.6	14 16.9	175 4.3	-17 50.0
10	349 48.3	92	18 23.4	-7	295 12.6	14 16.6	205 9.4	-17 50.0
12	18 44.6	92	18 22.0	-9	325 16.5	14 16.3	235 14.5	-17 50.0
14	47 41.0	93	18 20.2	-11	355 20.5	14 16.0	265 19.6	-17 50.0
16	76 37.6	93	18 18.1	-13	25 24.5	14 15.6	295 24.7	-17 50.0
18	105 34.2	94	18 15.5	-15	55 28.4	14 15.3	325 29.7	-17 50.0
20	134 31.1	95	18 12.5	-17	85 32.4	14 15.0	355 34.8	-17 50.0
22	163 28.0	95	18 9.2	-19	115 36.3	14 14.6	25 39.9	-17 49.9
Δ					20	-2	25	0

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

SUNCE UT	SUNCE $e = T_p - UT$	SUNCE Δ/24	SUNCE r	MESEC Prolaz	MESEC Δ/24	MESEC $\pi_\leftmoon$	MESEC r
h	min s	s	′	h min	min	′	′
00	- 5 47.7	-.3	15.8	$T_{\overline{m}}$ 10 42	2.2	56.9	15.5
12	- 5 51.1	$T_{\overline{m}_\odot}$ 12 h 5.9 min		Starost 27.4 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	210	-5.9	♃	14 19	.0	213	-1.3
♂	11 30	.1	256	1.8	♄	20 18	.0	123	.5

UT	SUNCE $S_\odot$	SUNCE $\delta_\odot$	PROLEĆ. TAČKA S_Υ	VENERA S_φ	VENERA δ_φ	MARS S_σ	MARS δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	178 31.4	21 36.1	292 31.6	142 7.7	10 22.9	187 37.0	23 34.9
2	208 31.3	21 35.3	322 36.5	172 11.3	10 21.5	217 38.3	23 34.6
4	238 31.1	21 34.6	352 41.5	202 14.8	10 20.0	247 39.6	23 34.3
6	268 31.0	21 33.8	22 46.4	232 18.4	10 18.5	277 41.0	23 34.0
8	298 30.9	21 33.0	52 51.3	262 22.0	10 17.0	307 42.3	23 33.7
10	328 30.7	21 32.2	82 56.2	292 25.6	10 15.6	337 43.6	23 33.4
12	358 30.6	21 31.4	113 1.2	322 29.3	10 14.1	7 45.0	23 33.0
14	28 30.5	21 30.7	143 6.1	352 32.9	10 12.6	37 46.3	23 32.7
16	58 30.3	21 29.9	173 11.0	22 36.5	10 11.2	67 47.7	23 32.4
18	88 30.2	21 29.1	203 16.0	52 40.2	10 9.7	97 49.0	23 32.1
20	118 30.1	21 28.3	233 20.9	82 43.9	10 8.2	127 50.3	23 31.8
22	148 30.0	21 27.5	263 25.8	112 47.6	10 6.8	157 51.7	23 31.5
Δ	-1	-4		18	-7	7	-2

UT	MESEC $S_\leftmoon$	MESEC Δ	MESEC $\delta_\leftmoon$	MESEC Δ	JUPITER $S_\jupiter$	JUPITER $\delta_\jupiter$	SATURN $S_\saturn$	SATURN $\delta_\saturn$
h	° ′		° ′		° ′	° ′	° ′	° ′
0	192 25.1	96	18 5.4	-21	145 40.3	14 14.3	55 45.0	-17 49.9
2	221 22.3	97	18 1.3	-23	175 44.2	14 14.0	85 50.1	-17 49.9
4	250 19.7	98	17 56.7	-25	205 48.2	14 13.6	115 55.1	-17 49.9
6	279 17.3	99	17 51.8	-26	235 52.2	14 13.3	146 .2	-17 49.9
8	308 15.0	99	17 46.6	-28	265 56.1	14 13.0	176 5.3	-17 49.9
10	337 12.9	100	17 40.9	-30	296 .1	14 12.6	206 10.4	-17 49.9
12	6 10.9	101	17 34.9	-32	326 4.0	14 12.3	236 15.5	-17 49.9
14	35 9.2	102	17 28.5	-34	356 8.0	14 12.0	266 20.5	-17 49.8
16	64 7.6	103	17 21.8	-35	26 11.9	14 11.6	296 25.6	-17 49.8
18	93 6.2	104	17 14.7	-37	56 15.9	14 11.3	326 30.7	-17 49.8
20	122 4.9	105	17 7.2	-39	86 19.8	14 10.9	356 35.8	-17 49.8
22	151 3.9	106	16 59.5	-41	116 23.8	14 10.6	26 40.8	-17 49.8
Δ					20	-2	25	0

φ	SUNCE IZLAZ	SUNCE ZALAZ	TRAJANJE SUMRAKA GRAĐ.	TRAJANJE SUMRAKA ASTR.	MESEC IZLAZ	MESEC Δ/24	MESEC ZALAZ	MESEC Δ/24
N	h min	h min	h min	h min	h min	min	h min	min
60	3 3	21 8	1 18	: ::	3 1	2.7	19 59	1.3
55	3 41	20 30	0 53	: ::	3 28	2.6	19 34	1.5
50	4 7	20 4	0 42	3 22	3 48	2.5	19 16	1.6
45	4 27	19 44	0 36	2 20	4 4	2.4	19 1	1.7
40	4 43	19 28	0 32	1 57	4 17	2.4	18 49	1.8
35	4 57	19 15	0 29	1 43	4 28	2.3	18 38	1.8
30	5 9	19 3	0 27	1 34	4 38	2.3	18 29	1.9
20	5 29	18 43	0 24	1 22	4 54	2.2	18 13	1.9
10	5 46	18 26	0 23	1 16	5 9	2.2	17 60	2.0
0	6 2	18 10	0 22	1 14	5 22	2.1	17 47	2.1
10	6 18	17 54	0 23	1 14	5 36	2.1	17 34	2.1
20	6 35	17 37	0 24	1 18	5 50	2.0	17 20	2.2
30	6 54	17 18	0 26	1 24	6 7	1.9	17 4	2.3
35	7 6	17 7	0 28	1 29	6 16	1.9	16 54	2.3
40	7 18	16 54	0 30	1 36	6 27	1.9	16 44	2.4
45	7 34	16 39	0 33	1 45	6 40	1.8	16 31	2.5
50	7 52	16 20	0 37	1 57	6 56	1.7	16 16	2.5
55	8 16	15 57	0 43	2 13	7 16	1.6	15 56	2.6
60	8 49	15 23	0 54	2 38	7 43	1.5	15 30	2.8
S								

SUNCE UT	SUNCE $e = T_p - UT$	SUNCE Δ/24	SUNCE r	MESEC Prolaz	MESEC Δ/24	MESEC $\pi_\leftmoon$	MESEC r
h	min s	s	′	h min	min	′	′
00	- 5 54.4	-.3	15.8	$T_{\overline{m}}$ 11 34	2.1	56.4	15.4
12	- 5 57.6	$T_{\overline{m}_\odot}$ 12 h 6.0 min		Starost 28.4 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	210	-5.9	♃	14 15	.0	213	-1.3
♂	11 29	.1	255	1.8	♄	20 14	.0	123	.5

UT	SUNCE		PROLEĆ. TAČKA	VENERA		MARS	
	$S_\odot$	$\delta_\odot$	S_Υ	S_φ	δ_φ	S_σ	δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	178 29.8	21 26.7	293 30.7	142 51.3	10 5.3	187 53.0	23 31.1
2	208 29.7	21 25.9	323 35.7	172 55.0	10 3.9	217 54.3	23 30.8
4	238 29.6	21 25.1	353 40.6	202 58.7	10 2.4	247 55.7	23 30.5
6	268 29.5	21 24.3	23 45.5	233 2.4	10 1.0	277 57.0	23 30.2
8	298 29.3	21 23.4	53 50.5	263 6.2	9 59.5	307 58.4	23 29.9
10	328 29.2	21 22.6	83 55.4	293 9.9	9 58.1	337 59.7	23 29.5
12	358 29.1	21 21.8	114 .3	323 13.7	9 56.7	8 1.1	23 29.2
14	28 29.0	21 21.0	144 5.2	353 17.5	9 55.2	38 2.4	23 28.9
16	58 28.9	21 20.2	174 10.2	23 21.3	9 53.8	68 3.7	23 28.5
18	88 28.7	21 19.4	204 15.1	53 25.1	9 52.4	98 5.1	23 28.2
20	118 28.6	21 18.5	234 20.0	83 29.0	9 50.9	128 6.4	23 27.9
22	148 28.5	21 17.7	264 25.0	113 32.8	9 49.5	158 7.8	23 27.5
Δ	−1	−4		19	−7	7	−2

UT	MESEC				JUPITER		SATURN	
	$S_\leftmoon$	Δ	$\delta_\leftmoon$	Δ	$S_{\mathrm{♃}}$	$\delta_{\mathrm{♃}}$	$S_{\mathrm{♄}}$	$\delta_{\mathrm{♄}}$
h	° ′		° ′		° ′	° ′	° ′	° ′
0	180 3.0	107	16 51.3	−42	146 27.8	14 10.3	56 45.9	−17 49.8
2	209 2.4	108	16 42.9	−44	176 31.7	14 9.9	86 51.0	−17 49.8
4	238 1.9	109	16 34.1	−46	206 35.7	14 9.6	116 56.0	−17 49.8
6	267 1.6	110	16 25.0	−47	236 39.6	14 9.3	147 1.1	−17 49.8
8	296 1.6	111	16 15.5	−49	266 43.6	14 8.9	177 6.2	−17 49.7
10	325 1.7	112	16 5.8	−50	296 47.5	14 8.6	207 11.3	−17 49.7
12	354 2.0	113	15 55.7	−52	326 51.5	14 8.3	237 16.3	−17 49.7
14	23 2.6	114	15 45.4	−53	356 55.4	14 7.9	267 21.4	−17 49.7
16	52 3.3	115	15 34.7	−55	26 59.4	14 7.6	297 26.5	−17 49.7
18	81 4.2	116	15 23.8	−56	57 3.3	14 7.3	327 31.5	−17 49.7
20	110 5.4	117	15 12.6	−58	87 7.3	14 6.9	357 36.6	−17 49.7
22	139 6.8	118	15 1.0	−59	117 11.2	14 6.6	27 41.7	−17 49.7
Δ					20	−2	25	0

φ	SUNCE		TRAJANJE SUMRAKA		MESEC			
	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 5	21 6	1 16	: ::	4 5	2.9	20 31	1.1
55	3 42	20 29	0 52	: ::	4 29	2.7	20 10	1.2
50	4 8	20 3	0 42	3 17	4 48	2.6	19 54	1.4
45	4 28	19 43	0 36	2 19	5 2	2.5	19 42	1.5
40	4 44	19 27	0 32	1 57	5 13	2.4	19 31	1.6
35	4 58	19 14	0 29	1 43	5 23	2.3	19 22	1.6
30	5 9	19 2	0 27	1 34	5 32	2.3	19 14	1.7
20	5 29	18 43	0 24	1 22	5 47	2.2	19 0	1.8
10	5 47	18 26	0 23	1 16	6 0	2.1	18 48	1.9
0	6 2	18 10	0 22	1 14	6 13	2.0	18 36	2.0
10	6 18	17 54	0 22	1 14	6 25	2.0	18 25	2.1
20	6 35	17 37	0 24	1 18	6 38	1.9	18 13	2.2
30	6 54	17 18	0 26	1 24	6 53	1.8	17 59	2.3
35	7 5	17 7	0 28	1 29	7 2	1.7	17 50	2.3
40	7 18	16 54	0 30	1 36	7 12	1.7	17 41	2.4
45	7 33	16 40	0 33	1 45	7 23	1.6	17 30	2.5
50	7 51	16 21	0 37	1 56	7 37	1.5	17 17	2.6
55	8 15	15 58	0 43	2 13	7 55	1.4	16 60	2.7
60	8 47	15 25	0 53	2 38	8 19	1.2	16 37	2.9
S								

SUNCE				MESEC			
UT	e = T_p − UT	Δ/24	r	Prolaz		Δ/24	$\pi_\leftmoon$	r
h	min s	s	′		h min	min	′	′
00	− 6 .7	−.2	15.8	$T_{\overline{m}}$	12 25	2.0	55.9	15.2
12	− 6 3.6	$T_{\overline{m}_\odot}$ 12 h 6.1 min		Starost 29.4 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	209	−5.9	♄	14 12	.0	213	−1.3
♂	11 28	.1	254	1.8	♇	20 10	.0	123	.5

UT	SUNCE		PROLEĆ. TAČKA	VENERA		MARS	
	$S_\odot$	$\delta_\odot$	S_Υ	S_φ	δ_φ	S_σ	δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	178 28.4	21 16.9	294 29.9	143 36.6	9 48.1	188 9.1	23 27.2
2	208 28.3	21 16.0	324 34.8	173 40.5	9 46.7	218 10.5	23 26.9
4	238 28.2	21 15.2	354 39.7	203 44.4	9 45.3	248 11.8	23 26.5
6	268 28.1	21 14.4	24 44.7	233 48.3	9 43.8	278 13.2	23 26.2
8	298 27.9	21 13.5	54 49.6	263 52.2	9 42.4	308 14.5	23 25.9
10	328 27.8	21 12.7	84 54.5	293 56.1	9 41.0	338 15.9	23 25.5
12	358 27.7	21 11.8	114 59.5	324 .0	9 39.6	8 17.2	23 25.2
14	28 27.6	21 11.0	145 4.4	354 4.0	9 38.2	38 18.6	23 24.8
16	58 27.5	21 10.1	175 9.3	24 8.0	9 36.8	68 19.9	23 24.5
18	88 27.4	21 9.3	205 14.2	54 11.9	9 35.4	98 21.3	23 24.1
20	118 27.3	21 8.4	235 19.2	84 15.9	9 34.0	128 22.6	23 23.8
22	148 27.2	21 7.6	265 24.1	114 19.9	9 32.6	158 24.0	23 23.4
Δ	−1	−4		20	−7	7	−2

UT	MESEC				JUPITER		SATURN	
	$S_\leftmoon$	Δ	$\delta_\leftmoon$	Δ	$S_{\mathrm{♃}}$	$\delta_{\mathrm{♃}}$	$S_{\mathrm{♄}}$	$\delta_{\mathrm{♄}}$
h	° ′		° ′		° ′	° ′	° ′	° ′
0	168 8.3	119	14 49.3	−60	147 15.2	14 6.2	57 46.7	−17 49.7
2	197 10.1	120	14 37.2	−62	177 19.1	14 5.9	87 51.8	−17 49.7
4	226 12.1	121	14 24.9	−63	207 23.1	14 5.6	117 56.8	−17 49.6
6	255 14.3	122	14 12.3	−64	237 27.0	14 5.2	148 1.9	−17 49.6
8	284 16.7	123	13 59.5	−65	267 31.0	14 4.9	178 7.0	−17 49.6
10	313 19.3	124	13 46.4	−67	297 34.9	14 4.6	208 12.0	−17 49.6
12	342 22.1	125	13 33.1	−68	327 38.9	14 4.2	238 17.1	−17 49.6
14	11 25.1	126	13 19.5	−69	357 42.8	14 3.9	268 22.2	−17 49.6
16	40 28.3	127	13 5.8	−70	27 46.8	14 3.5	298 27.2	−17 49.6
18	69 31.7	128	12 51.8	−71	57 50.7	14 3.2	328 32.3	−17 49.6
20	98 35.3	129	12 37.6	−72	87 54.7	14 2.9	358 37.3	−17 49.6
22	127 39.1	130	12 23.1	−73	117 58.6	14 2.5	28 42.4	−17 49.6
Δ					20	−2	25	0

φ	SUNCE		TRAJANJE SUMRAKA		MESEC			
	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 7	21 4	1 15	: ::	5 14	2.9	20 57	.9
55	3 44	20 28	0 52	: ::	5 34	2.7	20 40	1.1
50	4 9	20 2	0 42	3 13	5 49	2.6	20 27	1.2
45	4 29	19 43	0 36	2 18	6 1	2.5	20 17	1.3
40	4 45	19 27	0 32	1 56	6 11	2.4	20 9	1.4
35	4 58	19 14	0 29	1 42	6 19	2.3	20 1	1.5
30	5 10	19 2	0 27	1 33	6 27	2.2	19 55	1.6
20	5 30	18 42	0 24	1 22	6 40	2.1	19 43	1.7
10	5 47	18 25	0 23	1 16	6 51	2.0	19 33	1.8
0	6 3	18 10	0 22	1 14	7 1	1.9	19 24	1.9
10	6 18	17 54	0 22	1 14	7 12	1.8	19 15	2.0
20	6 35	17 38	0 24	1 17	7 23	1.7	19 5	2.1
30	6 54	17 19	0 26	1 24	7 36	1.6	18 53	2.2
35	7 5	17 8	0 28	1 29	7 43	1.6	18 46	2.3
40	7 17	16 55	0 30	1 36	7 52	1.5	18 39	2.4
45	7 32	16 41	0 33	1 44	8 1	1.4	18 30	2.5
50	7 50	16 22	0 37	1 56	8 13	1.3	18 19	2.6
55	8 13	15 59	0 43	2 13	8 28	1.1	18 5	2.8
60	8 46	15 27	0 53	2 37	8 47	.9	17 47	3.0
S								

SUNCE				MESEC			
UT	e = T_p − UT	Δ/24	r	Prolaz		Δ/24	$\pi_\leftmoon$	r
h	min s	s	′		h min	min	′	′
00	− 6 6.4	−.2	15.8	$T_{\overline{m}}$	13 13	1.9	55.4	15.1
12	− 6 9.1	$T_{\overline{m}_\odot}$ 12 h 6.2 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 24	.1	209	−6.0	♄	14 9	.0	213	−1.3
♂	11 27	.1	254	1.8	♇	20 5	.0	123	.6

UT	SUNCE		PROLEĆ. TAČKA	VENERA		MARS	
	$S_\odot$	$\delta_\odot$	S_Υ	S_φ	δ_φ	S_σ	δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	178 27.1	21 6.7	295 29.0	144 23.9	9 31.3	188 25.3	23 23.1
2	208 27.0	21 5.8	325 34.0	174 28.0	9 29.9	218 26.7	23 22.7
4	238 26.9	21 5.0	355 38.9	204 32.0	9 28.5	248 28.0	23 22.4
6	268 26.8	21 4.1	25 43.8	234 36.1	9 27.1	278 29.4	23 22.0
8	298 26.7	21 3.2	55 48.7	264 40.1	9 25.7	308 30.8	23 21.7
10	328 26.6	21 2.4	85 53.7	294 44.2	9 24.4	338 32.1	23 21.3
12	358 26.5	21 1.5	115 58.6	324 48.3	9 23.0	8 33.5	23 21.0
14	28 26.4	21 .6	146 3.5	354 52.4	9 21.6	38 34.8	23 20.6
16	58 26.3	20 59.7	176 8.5	24 56.5	9 20.3	68 36.2	23 20.2
18	88 26.2	20 58.8	206 13.4	55 .7	9 18.9	98 37.5	23 19.9
20	118 26.1	20 57.9	236 18.3	85 4.8	9 17.6	128 38.9	23 19.5
22	148 26.0	20 57.1	266 23.2	115 9.0	9 16.2	158 40.3	23 19.1
Δ	0	−4		21	−7	7	−2

UT	MESEC				JUPITER		SATURN	
	$S_\leftmoon$	Δ	$\delta_\leftmoon$	Δ	$S_{\mathrm{♃}}$	$\delta_{\mathrm{♃}}$	$S_{\mathrm{♄}}$	$\delta_{\mathrm{♄}}$
h	° ′		° ′		° ′	° ′	° ′	° ′
0	156 43.1	131	12 8.5	−74	148 2.6	14 2.2	58 47.4	−17 49.6
2	185 47.3	132	11 53.7	−75	178 6.5	14 1.8	88 52.5	−17 49.6
4	214 51.7	133	11 38.6	−76	208 10.4	14 1.5	118 57.6	−17 49.6
6	243 56.3	134	11 23.4	−77	238 14.4	14 1.2	149 2.6	−17 49.5
8	273 1.1	135	11 8.0	−78	268 18.3	14 .8	179 7.7	−17 49.5
10	302 6.0	136	10 52.4	−79	298 22.3	14 .5	209 12.7	−17 49.5
12	331 11.1	137	10 36.7	−80	328 26.2	14 .1	239 17.8	−17 49.5
14	0 16.4	137	10 20.8	−80	358 30.2	13 59.8	269 22.8	−17 49.5
16	29 21.9	138	10 4.7	−81	28 34.1	13 59.5	299 27.9	−17 49.5
18	58 27.5	139	9 48.4	−82	58 38.1	13 59.1	329 32.9	−17 49.5
20	87 33.4	140	9 32.1	−83	88 42.0	13 58.8	359 38.0	−17 49.5
22	116 39.3	141	9 15.5	−83	118 46.0	13 58.4	29 43.0	−17 49.5
Δ					20	−2	25	0

φ	SUNCE		TRAJANJE SUMRAKA		MESEC			
	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 9	21 2	1 14	: ::	6 25	3.0	21 17	.7
55	3 45	20 26	0 51	: ::	6 40	2.8	21 6	.9
50	4 11	20 1	0 41	3 10	6 52	2.6	20 56	1.1
45	4 30	19 42	0 35	2 18	7 1	2.5	20 49	1.2
40	4 46	19 26	0 32	1 56	7 8	2.4	20 43	1.3
35	4 59	19 13	0 29	1 42	7 15	2.3	20 37	1.4
30	5 11	19 2	0 27	1 33	7 21	2.2	20 32	1.5
20	5 30	18 42	0 24	1 22	7 31	2.1	20 24	1.6
10	5 47	18 25	0 23	1 16	7 40	2.0	20 17	1.7
0	6 3	18 10	0 22	1 14	7 48	1.9	20 10	1.8
10	6 18	17 54	0 22	1 14	7 56	1.8	20 3	1.9
20	6 35	17 38	0 24	1 17	8 5	1.6	19 55	2.1
30	6 53	17 19	0 26	1 24	8 15	1.5	19 47	2.2
35	7 4	17 8	0 28	1 29	8 21	1.4	19 42	2.3
40	7 17	16 56	0 30	1 36	8 27	1.4	19 36	2.4
45	7 31	16 41	0 33	1 44	8 35	1.3	19 29	2.5
50	7 49	16 24	0 37	1 56	8 44	1.1	19 21	2.6
55	8 12	16 1	0 43	2 12	8 55	1.0	19 11	2.7
60	8 44	15 29	0 53	2 37	9 10	.8	18 58	3.0
S								

SUNCE				MESEC			
UT	e = Tp − UT	Δ/24	r	Prolaz	Δ/24	$\pi_\leftmoon$	r
h	min s	s	′	h min	min	′	′
00	− 6 11.7	−.2	15.8	$T_{\overline{m}}$ 13 59	1.8	54.9	15.0
12	− 6 14.0	$T_{\overline{m}_\odot}$ 12 h	6.2 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 20	.1	209	−6.0	♆	14 6	.0	213	−1.3
♂	11 26	.1	253	1.8	♄	20 1	.0	123	.6

UT	SUNCE		PROLEĆ. TAČKA	VENERA		MARS	
	$S_\odot$	$\delta_\odot$	S_Υ	S_φ	δ_φ	S_σ	δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	178 25.9	20 56.2	296 28.2	145 13.2	9 14.9	188 41.6	23 18.8
2	208 25.8	20 55.3	326 33.1	175 17.4	9 13.5	218 43.0	23 18.4
4	238 25.7	20 54.4	356 38.0	205 21.6	9 12.2	248 44.3	23 18.0
6	268 25.6	20 53.5	26 42.9	235 25.8	9 10.8	278 45.7	23 17.7
8	298 25.6	20 52.6	56 47.9	265 30.0	9 9.5	308 47.1	23 17.3
10	328 25.5	20 51.7	86 52.8	295 34.3	9 8.2	338 48.4	23 16.9
12	358 25.4	20 50.8	116 57.7	325 38.5	9 6.8	8 49.8	23 16.6
14	28 25.3	20 49.9	147 2.7	355 42.8	9 5.5	38 51.2	23 16.2
16	58 25.2	20 49.0	177 7.6	25 47.1	9 4.2	68 52.5	23 15.8
18	88 25.1	20 48.0	207 12.5	55 51.4	9 2.9	98 53.9	23 15.4
20	118 25.0	20 47.1	237 17.4	85 55.7	9 1.6	128 55.3	23 15.1
22	148 25.0	20 46.2	267 22.4	116 .0	9 .3	158 56.6	23 14.7
Δ	0	−5		21	−7	7	−2

UT	MESEC				JUPITER		SATURN	
	$S_\leftmoon$	Δ	$\delta_\leftmoon$	Δ	$S_{\mathrm{♃}}$	$\delta_{\mathrm{♃}}$	$S_{\mathrm{♄}}$	$\delta_{\mathrm{♄}}$
h	° ′		° ′		° ′	° ′	° ′	° ′
0	145 45.5	141	8 58.9	−84	148 49.9	13 58.1	59 48.1	−17 49.5
2	174 51.8	142	8 42.1	−85	178 53.8	13 57.8	89 53.1	−17 49.5
4	203 58.2	143	8 25.1	−85	208 57.8	13 57.4	119 58.2	−17 49.5
6	233 4.8	144	8 8.1	−86	239 1.7	13 57.1	150 3.2	−17 49.5
8	262 11.5	144	7 50.9	−86	269 5.7	13 56.7	180 8.3	−17 49.5
10	291 18.4	145	7 33.6	−87	299 9.6	13 56.4	210 13.3	−17 49.5
12	320 25.4	146	7 16.2	−88	329 13.6	13 56.1	240 18.4	−17 49.5
14	349 32.6	146	6 58.7	−88	359 17.5	13 55.7	270 23.4	−17 49.5
16	18 39.8	147	6 41.1	−88	29 21.4	13 55.4	300 28.4	−17 49.4
18	47 47.2	148	6 23.4	−89	59 25.4	13 55.0	330 33.5	−17 49.4
20	76 54.7	148	6 5.6	−89	89 29.3	13 54.7	0 38.5	−17 49.4
22	106 2.3	149	5 47.7	−90	119 33.3	13 54.3	30 43.6	−17 49.4
Δ					20	−2	25	0

φ	SUNCE		TRAJANJE SUMRAKA		MESEC			
	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 11	21 0	1 13	: ::	7 36	2.9	21 35	.7
55	3 47	20 25	0 51	: ::	7 46	2.7	21 28	.9
50	4 12	20 0	0 41	3 6	7 54	2.6	21 22	1.0
45	4 31	19 41	0 35	2 17	8 0	2.4	21 18	1.1
40	4 47	19 26	0 31	1 55	8 5	2.3	21 14	1.2
35	4 60	19 13	0 29	1 42	8 10	2.3	21 11	1.3
30	5 11	19 1	0 27	1 33	8 14	2.2	21 8	1.4
20	5 31	18 42	0 24	1 22	8 21	2.0	21 2	1.5
10	5 47	18 25	0 23	1 16	8 27	1.9	20 58	1.7
0	6 3	18 10	0 22	1 14	8 33	1.8	20 54	1.8
10	6 18	17 55	0 22	1 14	8 38	1.7	20 49	1.9
20	6 34	17 38	0 24	1 17	8 44	1.6	20 44	2.0
30	6 53	17 20	0 26	1 24	8 51	1.4	20 39	2.2
35	7 4	17 9	0 27	1 29	8 55	1.4	20 36	2.2
40	7 16	16 57	0 30	1 35	8 60	1.3	20 32	2.3
45	7 31	16 42	0 33	1 44	9 5	1.2	20 28	2.4
50	7 48	16 25	0 37	1 56	9 11	1.0	20 23	2.6
55	8 11	16 2	0 43	2 12	9 19	.9	20 17	2.7
60	8 42	15 31	0 52	2 36	9 28	.7	20 9	2.9
S								

SUNCE				MESEC			
UT	e = Tp − UT	Δ/24	r	Prolaz	Δ/24	$\pi_\leftmoon$	r
h	min s	s	′	h min	min	′	′
00	− 6 16.3	−.2	15.8	$T_{\overline{m}}$ 14 43	1.8	54.6	14.9
12	− 6 18.4	$T_{\overline{m}_\odot}$ 12 h	6.3 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 17	.1	209	−6.1	♆	14 3	.0	212	−1.3
♂	11 25	.1	252	1.8	♄	19 57	.0	123	.6

UT	SUNCE		PROLEĆ. TAČKA	VENERA		MARS	
	$S_\odot$	$\delta_\odot$	S_Υ	S_φ	δ_φ	S_σ	δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	178 24.9	20 45.3	297 27.3	146 4.4	8 58.9	188 58.0	23 14.3
2	208 24.8	20 44.4	327 32.2	176 8.7	8 57.6	218 59.4	23 13.9
4	238 24.7	20 43.4	357 37.2	206 13.1	8 56.3	249 .7	23 13.5
6	268 24.7	20 42.5	27 42.1	236 17.5	8 55.0	279 2.1	23 13.1
8	298 24.6	20 41.6	57 47.0	266 21.9	8 53.7	309 3.5	23 12.8
10	328 24.5	20 40.7	87 51.9	296 26.3	8 52.5	339 4.8	23 12.4
12	358 24.4	20 39.7	117 56.9	326 30.8	8 51.2	9 6.2	23 12.0
14	28 24.4	20 38.8	148 1.8	356 35.2	8 49.9	39 7.6	23 11.6
16	58 24.3	20 37.8	178 6.7	26 39.7	8 48.6	69 9.0	23 11.2
18	88 24.2	20 36.9	208 11.7	56 44.1	8 47.3	99 10.3	23 10.8
20	118 24.1	20 36.0	238 16.6	86 48.6	8 46.1	129 11.7	23 10.4
22	148 24.1	20 35.0	268 21.5	116 53.1	8 44.8	159 13.1	23 10.0
Δ	0	−5		22	−6	7	−2

UT	MESEC				JUPITER		SATURN	
	$S_\leftmoon$	Δ	$\delta_\leftmoon$	Δ	$S_{\text{♃}}$	$\delta_{\text{♃}}$	$S_{\text{♄}}$	$\delta_{\text{♄}}$
h	° ′		° ′		° ′	° ′	° ′	° ′
0	135 10.1	149	5 29.8	−90	149 37.2	13 54.0	60 48.6	−17 49.4
2	164 17.9	150	5 11.8	−90	179 41.1	13 53.7	90 53.6	−17 49.4
4	193 25.8	150	4 53.7	−91	209 45.1	13 53.3	120 58.7	−17 49.4
6	222 33.8	151	4 35.5	−91	239 49.0	13 53.0	151 3.7	−17 49.4
8	251 41.9	151	4 17.3	−91	269 53.0	13 52.6	181 8.8	−17 49.4
10	280 50.1	151	3 59.0	−92	299 56.9	13 52.3	211 13.8	−17 49.4
12	309 58.4	152	3 40.7	−92	330 .8	13 51.9	241 18.8	−17 49.4
14	339 6.7	152	3 22.3	−92	0 4.8	13 51.6	271 23.9	−17 49.4
16	8 15.1	152	3 3.9	−92	30 8.7	13 51.3	301 28.9	−17 49.4
18	37 23.6	153	2 45.4	−92	60 12.7	13 50.9	331 33.9	−17 49.4
20	66 32.1	153	2 26.9	−93	90 16.6	13 50.6	1 39.0	−17 49.4
22	95 40.7	153	2 8.4	−93	120 20.5	13 50.2	31 44.0	−17 49.4
Δ					20	−2	25	0

φ	SUNCE		TRAJANJE SUMRAKA		MESEC			
	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 13	20 58	1 12	: ::	8 46	2.9	21 51	1.7
55	3 48	20 24	0 51	: ::	8 52	2.7	21 49	1.7
50	4 13	19 59	0 41	3 3	8 56	2.6	21 47	1.7
45	4 32	19 40	0 35	2 16	8 59	2.4	21 45	1.7
40	4 47	19 25	0 31	1 55	9 2	2.3	21 44	1.7
35	5 0	19 12	0 29	1 41	9 4	2.2	21 42	1.7
30	5 12	19 1	0 27	1 33	9 6	2.1	21 41	1.7
20	5 31	18 42	0 24	1 22	9 10	2.0	21 39	1.8
10	5 47	18 25	0 23	1 16	9 13	1.9	21 38	1.8
0	6 3	18 10	0 22	1 14	9 16	1.8	21 36	1.8
10	6 18	17 55	0 22	1 14	9 19	1.6	21 35	1.8
20	6 34	17 39	0 24	1 17	9 22	1.5	21 33	1.8
30	6 53	17 20	0 26	1 24	9 26	1.4	21 31	1.8
35	7 3	17 10	0 27	1 29	9 28	1.3	21 30	1.8
40	7 15	16 58	0 30	1 35	9 30	1.2	21 28	1.8
45	7 30	16 43	0 33	1 44	9 33	1.1	21 27	1.8
50	7 47	16 26	0 37	1 55	9 36	1.0	21 25	1.8
55	8 10	16 4	0 43	2 12	9 40	.8	21 23	1.8
60	8 40	15 33	0 52	2 36	9 45	.6	21 20	1.8
S								

SUNCE				MESEC			
UT	$e = T_p - UT$	Δ/24	r	Prolaz		Δ/24	$\pi_\leftmoon$	r
h	min s	s	′		h min	min	′	′
00	− 6 20.5	−.1	15.8	$T_{\overline{m}}$	15 26	1.7	54.3	14.8
12	− 6 22.2	$T_{\overline{m}_\odot}$ 12 h	6.4 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 14	.1	209	−6.1	♃	13 60	.0	212	−1.3
♂	11 24	.1	252	1.8	♄	19 53	.0	123	.6

UT	SUNCE		PROLEĆ. TAČKA	VENERA		MARS	
	$S_\odot$	$\delta_\odot$	S_Υ	S_φ	δ_φ	S_σ	δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	178 24.0	20 34.1	298 26.4	146 57.7	8 43.5	189 14.5	23 9.6
2	208 23.9	20 33.1	328 31.4	177 2.2	8 42.3	219 15.8	23 9.2
4	238 23.9	20 32.2	358 36.3	207 6.7	8 41.0	249 17.2	23 8.8
6	268 23.8	20 31.2	28 41.2	237 11.3	8 39.8	279 18.6	23 8.4
8	298 23.7	20 30.2	58 46.2	267 15.9	8 38.5	309 20.0	23 8.0
10	328 23.7	20 29.3	88 51.1	297 20.5	8 37.3	339 21.3	23 7.6
12	358 23.6	20 28.3	118 56.0	327 25.1	8 36.0	9 22.7	23 7.2
14	28 23.5	20 27.4	149 .9	357 29.7	8 34.8	39 24.1	23 6.8
16	58 23.5	20 26.4	179 5.9	27 34.3	8 33.5	69 25.5	23 6.4
18	88 23.4	20 25.4	209 10.8	57 39.0	8 32.3	99 26.9	23 6.0
20	118 23.4	20 24.4	239 15.7	87 43.6	8 31.1	129 28.2	23 5.6
22	148 23.3	20 23.5	269 20.7	117 48.3	8 29.9	159 29.6	23 5.2
Δ	0	−5		23	−6	7	−2

UT	MESEC				JUPITER		SATURN	
	$S_\leftmoon$	Δ	$\delta_\leftmoon$	Δ	$S_{\text{♃}}$	$\delta_{\text{♃}}$	$S_{\text{♄}}$	$\delta_{\text{♄}}$
h	° ′		° ′		° ′	° ′	° ′	° ′
0	124 49.3	153	1 49.8	−93	150 24.5	13 49.9	61 49.1	−17 49.4
2	153 58.0	153	1 31.2	−93	180 28.4	13 49.5	91 54.1	−17 49.4
4	183 6.7	154	1 12.6	−93	210 32.3	13 49.2	121 59.1	−17 49.4
6	212 15.4	154	0 54.0	−93	240 36.3	13 48.8	152 4.1	−17 49.4
8	241 24.1	154	0 35.4	−93	270 40.2	13 48.5	182 9.2	−17 49.4
10	270 32.9	154	0 16.8	−75	300 44.1	13 48.1	212 14.2	−17 49.4
12	299 41.7	154	0 1.8	93	330 48.1	13 47.8	242 19.2	−17 49.4
14	328 50.4	154	0 20.4	93	0 52.0	13 47.5	272 24.3	−17 49.4
16	357 59.2	154	0 39.0	93	30 56.0	13 47.1	302 29.3	−17 49.4
18	27 8.0	154	0 57.6	93	60 59.9	13 46.8	332 34.3	−17 49.4
20	56 16.8	154	1 16.2	93	91 3.8	13 46.4	2 39.3	−17 49.4
22	85 25.5	154	1 34.8	93	121 7.8	13 46.1	32 44.4	−17 49.4
Δ					20	−2	25	0

φ	SUNCE		TRAJANJE SUMRAKA		MESEC			
	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 15	20 56	1 10	: ::	9 56	.8	22 33	2.8
55	3 50	20 22	0 50	: ::	9 57	1.0	22 30	2.6
50	4 14	19 58	0 41	3 0	9 57	1.1	22 28	2.5
45	4 33	19 39	0 35	2 15	9 57	1.2	22 27	2.4
40	4 48	19 24	0 31	1 54	9 57	1.3	22 25	2.3
35	5 1	19 11	0 29	1 41	9 57	1.4	22 24	2.2
30	5 12	19 0	0 27	1 32	9 57	1.4	22 23	2.1
20	5 31	18 41	0 24	1 21	9 58	1.6	22 22	2.0
10	5 48	18 25	0 23	1 16	9 58	1.7	22 20	1.9
0	6 3	18 10	0 22	1 13	9 58	1.8	22 18	1.8
10	6 18	17 55	0 22	1 14	9 58	1.9	22 17	1.7
20	6 34	17 39	0 23	1 17	9 59	2.0	22 15	1.6
30	6 52	17 21	0 26	1 24	9 59	2.1	22 14	1.4
35	7 3	17 10	0 27	1 29	9 59	2.2	22 12	1.4
40	7 15	16 58	0 30	1 35	9 59	2.2	22 11	1.3
45	7 29	16 44	0 33	1 44	9 59	2.3	22 10	1.2
50	7 46	16 27	0 37	1 55	9 60	2.4	22 8	1.1
55	8 8	16 5	0 42	2 11	10 0	2.6	22 6	1.0
60	8 39	15 35	0 52	2 35	10 1	2.7	22 4	.8
S								

SUNCE				MESEC			
UT	$e = T_p - UT$	Δ/24	r	Prolaz		Δ/24	$\pi_\leftmoon$	r
h	min s	s	′		h min	min	′	′
00	− 6 24.0	−.1	15.8	$T_{\overline{m}}$	16 8	1.8	54.2	14.8
12	− 6 25.5	$T_{\overline{m}_\odot}$ 12 h	6.4 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 10	.1	209	−6.1	♃	13 57	.0	212	−1.3
♂	11 23	.1	251	1.8	♄	19 49	.0	123	.6

UT	SUNCE		PROLEĆ. TAČKA	VENERA		MARS	
	$S_\odot$	$\delta_\odot$	S_Υ	S_φ	δ_φ	S_σ	δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	178 23.3	20 22.5	299 25.6	147 53.0	8 28.6	189 31.0	23 4.8
2	208 23.2	20 21.5	329 30.5	177 57.7	8 27.4	219 32.4	23 4.3
4	238 23.1	20 20.5	359 35.4	208 2.4	8 26.2	249 33.8	23 3.9
6	268 23.1	20 19.5	29 40.4	238 7.2	8 25.0	279 35.2	23 3.5
8	298 23.0	20 18.6	59 45.3	268 11.9	8 23.8	309 36.5	23 3.1
10	328 23.0	20 17.6	89 50.2	298 16.7	8 22.6	339 37.9	23 2.7
12	358 22.9	20 16.6	119 55.1	328 21.5	8 21.4	9 39.3	23 2.3
14	28 22.9	20 15.6	150 .1	358 26.3	8 20.2	39 40.7	23 1.8
16	58 22.8	20 14.6	180 5.0	28 31.1	8 19.0	69 42.1	23 1.4
18	88 22.8	20 13.6	210 9.9	58 35.9	8 17.9	99 43.5	23 1.0
20	118 22.7	20 12.6	240 14.9	88 40.8	8 16.7	129 44.9	23 .6
22	148 22.7	20 11.6	270 19.8	118 45.6	8 15.5	159 46.3	23 .1
Δ	0	−5		24	−6	7	−2

UT	MESEC				JUPITER		SATURN	
	$S_\leftmoon$	Δ	$\delta_\leftmoon$	Δ	$S_{\mathrm{♃}}$	$\delta_{\mathrm{♃}}$	$S_{\mathrm{♄}}$	$\delta_{\mathrm{♄}}$
h	° ′		° ′		° ′	° ′	° ′	° ′
0	114 34.3	154	1 53.3	93	151 11.7	13 45.7	62 49.4	−17 49.4
2	143 43.0	153	2 11.8	92	181 15.6	13 45.4	92 54.4	−17 49.4
4	172 51.6	153	2 30.3	92	211 19.6	13 45.0	122 59.4	−17 49.4
6	202 .3	153	2 48.7	92	241 23.5	13 44.7	153 4.5	−17 49.4
8	231 8.8	153	3 7.1	92	271 27.4	13 44.3	183 9.5	−17 49.4
10	260 17.4	152	3 25.5	92	301 31.4	13 44.0	213 14.5	−17 49.4
12	289 25.8	152	3 43.8	91	331 35.3	13 43.6	243 19.5	−17 49.4
14	318 34.3	152	4 2.1	91	1 39.2	13 43.3	273 24.6	−17 49.4
16	347 42.6	151	4 20.2	91	31 43.2	13 42.9	303 29.6	−17 49.4
18	16 50.9	151	4 38.4	90	61 47.1	13 42.6	333 34.6	−17 49.4
20	45 59.1	151	4 56.4	90	91 51.0	13 42.3	3 39.6	−17 49.4
22	75 7.2	150	5 14.4	90	121 55.0	13 41.9	33 44.6	−17 49.4
Δ					20	−2	25	0

φ	SUNCE		TRAJANJE SUMRAKA		MESEC			
	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 17	20 54	1 9	: ::	10 16	.7	23 40	2.9
55	3 51	20 21	0 50	: ::	10 20	.9	23 33	2.7
50	4 15	19 57	0 41	2 57	10 23	1.0	23 28	2.6
45	4 34	19 38	0 35	2 14	10 26	1.2	23 23	2.4
40	4 49	19 23	0 31	1 54	10 28	1.3	23 20	2.3
35	5 2	19 11	0 28	1 41	10 30	1.3	23 17	2.3
30	5 13	18 60	0 26	1 32	10 32	1.4	23 14	2.2
20	5 32	18 41	0 24	1 21	10 35	1.6	23 9	2.0
10	5 48	18 25	0 23	1 16	10 38	1.7	23 5	1.9
0	6 3	18 10	0 22	1 13	10 40	1.8	23 1	1.8
10	6 18	17 55	0 22	1 14	10 43	1.9	22 57	1.7
20	6 34	17 39	0 23	1 17	10 46	2.0	22 53	1.6
30	6 52	17 22	0 26	1 24	10 49	2.2	22 48	1.4
35	7 2	17 11	0 27	1 28	10 51	2.2	22 45	1.4
40	7 14	16 59	0 29	1 35	10 53	2.3	22 42	1.3
45	7 28	16 45	0 32	1 44	10 55	2.4	22 39	1.2
50	7 45	16 28	0 36	1 55	10 58	2.6	22 34	1.1
55	8 7	16 7	0 42	2 11	11 2	2.7	22 29	.9
60	8 37	15 37	0 51	2 34	11 6	2.9	22 22	.7
S								

SUNCE				MESEC			
UT	e = T_p − UT	Δ/24	r	Prolaz	Δ/24	$\pi_\leftmoon$	r
h	min s	s	′	h min	min	′	′
00	− 6 27.0	−.1	15.8	$T_{\overline{m}}$ 16 51	1.8	54.2	14.8
12	− 6 28.2	$T_{\overline{m}_\odot}$ 12 h 6.5 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 6	.1	208	−6.2	♄	13 53	.0	212	−1.3
♂	11 21	.1	250	1.8	♇	19 45	.0	123	.6

UT	SUNCE		PROLEĆ. TAČKA	VENERA		MARS	
	$S_\odot$	$\delta_\odot$	S_Υ	S_φ	δ_φ	S_σ	δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	178 22.7	20 10.6	300 24.7	148 50.5	8 14.3	189 47.6	22 59.7
2	208 22.6	20 9.6	330 29.6	178 55.4	8 13.2	219 49.0	22 59.3
4	238 22.6	20 8.6	0 34.6	209 .3	8 12.0	249 50.4	22 58.9
6	268 22.5	20 7.5	30 39.5	239 5.2	8 10.8	279 51.8	22 58.4
8	298 22.5	20 6.5	60 44.4	269 10.1	8 9.7	309 53.2	22 58.0
10	328 22.5	20 5.5	90 49.4	299 15.1	8 8.5	339 54.6	22 57.6
12	358 22.4	20 4.5	120 54.3	329 20.0	8 7.4	9 56.0	22 57.1
14	28 22.4	20 3.5	150 59.2	359 25.0	8 6.3	39 57.4	22 56.7
16	58 22.3	20 2.4	181 4.1	29 30.0	8 5.1	69 58.8	22 56.3
18	88 22.3	20 1.4	211 9.1	59 35.0	8 4.0	100 .2	22 55.8
20	118 22.3	20 .4	241 14.0	89 40.1	8 2.9	130 1.6	22 55.4
22	148 22.2	19 59.4	271 18.9	119 45.1	8 1.7	160 3.0	22 54.9
Δ	0	−5		25	−6	7	−2

UT	MESEC				JUPITER		SATURN	
	$S_\leftmoon$	Δ	$\delta_\leftmoon$	Δ	$S_{\mathrm{♃}}$	$\delta_{\mathrm{♃}}$	$S_{\mathrm{♄}}$	$\delta_{\mathrm{♄}}$
h	° ′		° ′		° ′	° ′	° ′	° ′
0	104 15.2	150	5 32.4	89	151 58.9	13 41.6	63 49.6	−17 49.4
2	133 23.1	149	5 50.2	89	182 2.8	13 41.2	93 54.7	−17 49.4
4	162 30.9	149	6 8.0	88	212 6.8	13 40.9	123 59.7	−17 49.4
6	191 38.6	148	6 25.6	88	242 10.7	13 40.5	154 4.7	−17 49.4
8	220 46.2	147	6 43.2	87	272 14.6	13 40.2	184 9.7	−17 49.4
10	249 53.7	147	7 .7	87	302 18.6	13 39.8	214 14.7	−17 49.4
12	279 1.0	146	7 18.1	86	332 22.5	13 39.5	244 19.7	−17 49.4
14	308 8.2	145	7 35.4	86	2 26.4	13 39.1	274 24.7	−17 49.4
16	337 15.3	145	7 52.5	85	32 30.3	13 38.8	304 29.8	−17 49.4
18	6 22.3	144	8 9.6	85	62 34.3	13 38.4	334 34.8	−17 49.4
20	35 29.1	143	8 26.5	84	92 38.2	13 38.1	4 39.8	−17 49.4
22	64 35.7	142	8 43.4	83	122 42.1	13 37.7	34 44.8	−17 49.4
Δ					20	−2	25	0

φ	SUNCE		TRAJANJE SUMRAKA		MESEC			
	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 19	20 52	1 8	: ::	10 32	.8	. . .	.0
55	3 53	20 19	0 50	: ::	10 41	1.0	. . .	.0
50	4 17	19 56	0 40	2 55	10 48	1.1	. . .	.0
45	4 35	19 37	0 35	2 13	10 54	1.2	. . .	.0
40	4 50	19 23	0 31	1 53	10 58	1.3	. . .	.0
35	5 3	19 10	0 28	1 40	11 3	1.4	. . .	.0
30	5 13	18 59	0 26	1 32	11 6	1.5	. . .	.0
20	5 32	18 41	0 24	1 21	11 12	1.6	23 58	2.1
10	5 48	18 25	0 22	1 16	11 18	1.7	23 51	2.0
0	6 3	18 10	0 22	1 13	11 23	1.8	23 44	1.9
10	6 18	17 55	0 22	1 14	11 29	1.9	23 38	1.8
20	6 33	17 40	0 23	1 17	11 34	2.1	23 31	1.7
30	6 51	17 22	0 26	1 23	11 41	2.2	23 23	1.5
35	7 1	17 12	0 27	1 28	11 44	2.3	23 18	1.5
40	7 13	17 0	0 29	1 35	11 49	2.4	23 13	1.4
45	7 27	16 46	0 32	1 43	11 54	2.5	23 7	1.3
50	7 44	16 30	0 36	1 55	11 60	2.6	22 60	1.2
55	8 5	16 8	0 42	2 11	12 7	2.7	22 51	1.0
60	8 35	15 39	0 51	2 34	12 17	3.0	22 40	.8
S								

SUNCE				MESEC			
UT	e = T_p − UT	Δ/24	r	Prolaz	Δ/24	$\pi_\leftmoon$	r
h	min s	s	′	h min	min	′	′
00	− 6 29.4	−.1	15.8	$T_{\overline{m}}$ 17 34	1.8	54.3	14.8
12	− 6 30.3	$T_{\overline{m}_\odot}$ 12 h 6.5 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 2	.1	208	−6.2	♄	13 50	.0	212	−1.3
♂	11 20	.1	249	1.8	♇	19 41	.0	123	.6

UT	SUNCE		PROLEĆ. TAČKA	VENERA		MARS	
	$S_\odot$	$\delta_\odot$	S_Υ	S_φ	δ_φ	S_σ	δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	178 22.2	19 58.3	301 23.9	149 50.1	8 .6	190 4.4	22 54.5
2	208 22.2	19 57.3	331 28.8	179 55.2	7 59.5	220 5.8	22 54.1
4	238 22.2	19 56.2	1 33.7	210 .3	7 58.4	250 7.2	22 53.6
6	268 22.1	19 55.2	31 38.6	240 5.4	7 57.3	280 8.6	22 53.2
8	298 22.1	19 54.2	61 43.6	270 10.5	7 56.2	310 10.0	22 52.7
10	328 22.1	19 53.1	91 48.5	300 15.6	7 55.1	340 11.4	22 52.3
12	358 22.0	19 52.1	121 53.4	330 20.8	7 54.0	10 12.8	22 51.8
14	28 22.0	19 51.0	151 58.4	0 26.0	7 52.9	40 14.2	22 51.4
16	58 22.0	19 50.0	182 3.3	30 31.1	7 51.8	70 15.6	22 50.9
18	88 22.0	19 48.9	212 8.2	60 36.3	7 50.8	100 17.0	22 50.5
20	118 22.0	19 47.9	242 13.1	90 41.5	7 49.7	130 18.4	22 50.0
22	148 21.9	19 46.8	272 18.1	120 46.8	7 48.6	160 19.8	22 49.6
Δ	0	−5		26	−5	7	−2

UT	MESEC				JUPITER		SATURN	
	$S_\leftmoon$	Δ	$\delta_\leftmoon$	Δ	$S_{\text{♃}}$	$\delta_{\text{♃}}$	$S_{\text{♄}}$	$\delta_{\text{♄}}$
h	° ′		° ′		° ′	° ′	° ′	° ′
0	93 42.2	142	9 .0	83	152 46.1	13 37.4	64 49.8	−17 49.4
2	122 48.5	141	9 16.6	82	182 50.0	13 37.0	94 54.8	−17 49.4
4	151 54.6	140	9 33.0	81	212 53.9	13 36.7	124 59.8	−17 49.4
6	181 .6	139	9 49.3	81	242 57.8	13 36.3	155 4.8	−17 49.4
8	210 6.4	138	10 5.4	80	273 1.8	13 36.0	185 9.8	−17 49.4
10	239 12.0	137	10 21.4	79	303 5.7	13 35.6	215 14.8	−17 49.4
12	268 17.4	136	10 37.2	78	333 9.6	13 35.3	245 19.8	−17 49.4
14	297 22.6	135	10 52.8	77	3 13.6	13 34.9	275 24.8	−17 49.4
16	326 27.7	134	11 8.3	77	33 17.5	13 34.6	305 29.8	−17 49.4
18	355 32.5	133	11 23.6	76	63 21.4	13 34.2	335 34.8	−17 49.4
20	24 37.1	132	11 38.8	75	93 25.3	13 33.9	5 39.8	−17 49.5
22	53 41.5	131	11 53.7	74	123 29.3	13 33.5	35 44.9	−17 49.5
Δ					20	−2	25	0

φ	SUNCE		TRAJANJE SUMRAKA		MESEC			
	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 22	20 50	1 7	: ::	10 51	.9	0 51	2.9
55	3 54	20 18	0 49	: ::	11 4	1.1	0 39	2.7
50	4 18	19 54	0 40	2 52	11 15	1.3	0 29	2.6
45	4 36	19 36	0 35	2 12	11 23	1.4	0 22	2.5
40	4 51	19 22	0 31	1 53	11 30	1.5	0 16	2.4
35	5 3	19 9	0 28	1 40	11 37	1.5	0 11	2.3
30	5 14	18 59	0 26	1 32	11 42	1.6	0 6	2.2
20	5 32	18 40	0 24	1 21	11 51	1.7	. . .	.0
10	5 48	18 25	0 22	1 15	11 60	1.8	. . .	.0
0	6 3	18 10	0 22	1 13	12 7	1.9	. . .	.0
10	6 18	17 56	0 22	1 14	12 15	2.0	. . .	.0
20	6 33	17 40	0 23	1 17	12 24	2.1	. . .	.0
30	6 51	17 23	0 26	1 23	12 33	2.2	23 60	1.7
35	7 1	17 13	0 27	1 28	12 39	2.3	23 54	1.6
40	7 12	17 1	0 29	1 35	12 45	2.4	23 46	1.5
45	7 26	16 47	0 32	1 43	12 53	2.5	23 38	1.5
50	7 43	16 31	0 36	1 54	13 2	2.6	23 28	1.4
55	8 4	16 10	0 42	2 10	13 13	2.8	23 16	1.2
60	8 33	15 41	0 51	2 33	13 28	3.0	22 60	1.0
S								

SUNCE				MESEC			
UT	e = Tp − UT	Δ/24	r	Prolaz	Δ/24	$\pi_\leftmoon$	r
h	min s	s	′	h min	min	′	′
00	− 6 31.2	.0	15.8	$T_{\overline{m}}$ 18 18	2.0	54.7	14.9
12	− 6 31.7	$T_{\overline{m}_\odot}$ 12 h	6.5 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	′	°	
♀	13 58	.1	208	−6.2	♄	13 47	.0	211	−1.3
♂	11 19	.1	249	1.8	♇	19 37	.0	123	.6

UT	SUNCE		PROLEĆ. TAČKA	VENERA		MARS	
	$S_\odot$	$\delta_\odot$	S_Υ	S_φ	δ_φ	S_σ	δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	178 21.9	19 45.7	302 23.0	150 52.0	7 47.6	190 21.2	22 49.1
2	208 21.9	19 44.7	332 27.9	180 57.2	7 46.5	220 22.6	22 48.6
4	238 21.9	19 43.6	2 32.9	211 2.5	7 45.4	250 24.0	22 48.2
6	268 21.9	19 42.5	32 37.8	241 7.8	7 44.4	280 25.4	22 47.7
8	298 21.8	19 41.5	62 42.7	271 13.1	7 43.4	310 26.8	22 47.3
10	328 21.8	19 40.4	92 47.6	301 18.4	7 42.3	340 28.2	22 46.8
12	358 21.8	19 39.3	122 52.6	331 23.8	7 41.3	10 29.7	22 46.3
14	28 21.8	19 38.2	152 57.5	1 29.1	7 40.3	40 31.1	22 45.9
16	58 21.8	19 37.2	183 2.4	31 34.5	7 39.2	70 32.5	22 45.4
18	88 21.8	19 36.1	213 7.4	61 39.8	7 38.2	100 33.9	22 44.9
20	118 21.8	19 35.0	243 12.3	91 45.2	7 37.2	130 35.3	22 44.5
22	148 21.8	19 33.9	273 17.2	121 50.6	7 36.2	160 36.7	22 44.0
Δ	0	−5		27	−5	7	−2

UT	MESEC				JUPITER		SATURN	
	$S_\leftmoon$	Δ	$\delta_\leftmoon$	Δ	$S_{\text{♃}}$	$\delta_{\text{♃}}$	$S_{\text{♄}}$	$\delta_{\text{♄}}$
h	° ′		° ′		° ′	° ′	° ′	° ′
0	82 45.7	130	12 8.5	73	153 33.2	13 33.1	65 49.9	−17 49.5
2	111 49.7	129	12 23.0	72	183 37.1	13 32.8	95 54.9	−17 49.5
4	140 53.4	128	12 37.4	71	213 41.0	13 32.4	125 59.9	−17 49.5
6	169 56.9	126	12 51.5	70	243 45.0	13 32.1	156 4.8	−17 49.5
8	199 .2	125	13 5.5	69	273 48.9	13 31.7	186 9.8	−17 49.5
10	228 3.2	124	13 19.2	68	303 52.8	13 31.4	216 14.8	−17 49.5
12	257 6.0	123	13 32.7	66	333 56.7	13 31.0	246 19.8	−17 49.5
14	286 8.6	122	13 46.0	65	4 .7	13 30.7	276 24.8	−17 49.5
16	315 10.9	120	13 59.0	64	34 4.6	13 30.3	306 29.8	−17 49.5
18	344 12.9	119	14 11.8	63	64 8.5	13 30.0	336 34.8	−17 49.5
20	13 14.7	118	14 24.4	61	94 12.4	13 29.6	6 39.8	−17 49.5
22	42 16.3	116	14 36.7	60	124 16.4	13 29.3	36 44.8	−17 49.5
Δ					20	−2	25	0

φ	SUNCE		TRAJANJE SUMRAKA		MESEC			
	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 24	20 48	1 6	: ::	11 13	1.2	2 1	2.9
55	3 56	20 16	0 49	: ::	11 31	1.3	1 44	2.7
50	4 19	19 53	0 40	2 50	11 45	1.5	1 32	2.6
45	4 37	19 35	0 35	2 11	11 56	1.6	1 21	2.5
40	4 52	19 21	0 31	1 52	12 6	1.6	1 13	2.4
35	5 4	19 9	0 28	1 40	12 14	1.7	1 6	2.3
30	5 15	18 58	0 26	1 31	12 21	1.8	0 59	2.3
20	5 33	18 40	0 24	1 21	12 33	1.9	0 48	2.2
10	5 48	18 25	0 22	1 15	12 44	2.0	0 38	2.1
0	6 3	18 10	0 22	1 13	12 54	2.0	0 29	2.0
10	6 17	17 56	0 22	1 14	13 4	2.1	0 20	1.9
20	6 33	17 41	0 23	1 17	13 15	2.2	0 11	1.8
30	6 50	17 23	0 26	1 23	13 27	2.3	. . .	.0
35	7 0	17 13	0 27	1 28	13 35	2.4	. . .	.0
40	7 12	17 2	0 29	1 35	13 43	2.4	. . .	.0
45	7 25	16 48	0 32	1 43	13 52	2.5	. . .	.0
50	7 41	16 32	0 36	1 54	14 4	2.6	. . .	.0
55	8 2	16 11	0 42	2 10	14 19	2.7	23 45	1.5
60	8 31	15 43	0 51	2 33	14 39	2.9	23 24	1.3
S								

SUNCE				MESEC			
UT	e = Tp − UT	Δ/24	r	Prolaz	Δ/24	$\pi_\leftmoon$	r
h	min s	s	′	h min	min	′	′
00	− 6 32.3	.0	15.8	$T_{\overline{m}}$ 19 5	2.1	55.2	15.0
12	− 6 32.6	$T_{\overline{m}_\odot}$ 12 h	6.5 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	′	°	
♀	13 54	.1	208	−6.3	♄	13 44	.0	211	−1.3
♂	11 18	.1	248	1.8	♇	19 33	.0	123	.6

UT	SUNCE		PROLEĆ. TAČKA	VENERA		MARS	
	$S_\odot$	$\delta_\odot$	S_Υ	S_φ	δ_φ	S_σ	δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	178 21.8	19 32.8	303 22.1	151 56.1	7 35.2	190 38.1	22 43.5
2	208 21.8	19 31.7	333 27.1	182 1.5	7 34.2	220 39.5	22 43.1
4	238 21.8	19 30.6	3 32.0	212 7.0	7 33.2	250 41.0	22 42.6
6	268 21.8	19 29.5	33 36.9	242 12.4	7 32.2	280 42.4	22 42.1
8	298 21.8	19 28.5	63 41.8	272 17.9	7 31.2	310 43.8	22 41.6
10	328 21.8	19 27.4	93 46.8	302 23.4	7 30.2	340 45.2	22 41.2
12	358 21.8	19 26.3	123 51.7	332 29.0	7 29.2	10 46.6	22 40.7
14	28 21.8	19 25.1	153 56.6	2 34.5	7 28.3	40 48.0	22 40.2
16	58 21.8	19 24.0	184 1.6	32 40.0	7 27.3	70 49.5	22 39.7
18	88 21.8	19 22.9	214 6.5	62 45.6	7 26.3	100 50.9	22 39.2
20	118 21.8	19 21.8	244 11.4	92 51.2	7 25.4	130 52.3	22 38.8
22	148 21.8	19 20.7	274 16.3	122 56.8	7 24.4	160 53.7	22 38.3
Δ	0	−6		28	−5	7	−2

UT	MESEC				JUPITER		SATURN	
	$S_\leftmoon$	Δ	$\delta_\leftmoon$	Δ	$S_{\mathrm{♃}}$	$\delta_{\mathrm{♃}}$	$S_{\mathrm{♄}}$	$\delta_{\mathrm{♄}}$
h	° ′		° ′		° ′	° ′	° ′	° ′
0	71 17.6	115	14 48.7	59	154 20.3	13 28.9	66 49.8	−17 49.5
2	100 18.6	114	15 .5	58	184 24.2	13 28.6	96 54.8	−17 49.5
4	129 19.4	113	15 12.0	56	214 28.1	13 28.2	126 59.8	−17 49.5
6	158 19.9	111	15 23.2	55	244 32.1	13 27.9	157 4.8	−17 49.6
8	187 20.1	110	15 34.2	53	274 36.0	13 27.5	187 9.8	−17 49.6
10	216 20.1	109	15 44.8	52	304 39.9	13 27.1	217 14.8	−17 49.6
12	245 19.8	107	15 55.2	50	334 43.8	13 26.8	247 19.7	−17 49.6
14	274 19.3	106	16 5.3	49	4 47.8	13 26.4	277 24.7	−17 49.6
16	303 18.4	104	16 15.0	47	34 51.7	13 26.1	307 29.7	−17 49.6
18	332 17.3	103	16 24.4	46	64 55.6	13 25.7	337 34.7	−17 49.6
20	1 16.0	102	16 33.5	44	94 59.5	13 25.4	7 39.7	−17 49.6
22	30 14.3	100	16 42.3	42	125 3.4	13 25.0	37 44.7	−17 49.6
Δ					20	−2	25	0

φ	SUNCE		TRAJANJE SUMRAKA		MESEC			
	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 26	20 46	1 5	: ::	11 41	1.5	3 12	2.8
55	3 58	20 14	0 48	: ::	12 3	1.6	2 50	2.7
50	4 21	19 52	0 40	2 47	12 20	1.7	2 34	2.6
45	4 38	19 34	0 34	2 10	12 34	1.8	2 21	2.5
40	4 53	19 20	0 31	1 51	12 45	1.9	2 11	2.4
35	5 5	19 8	0 28	1 39	12 55	1.9	2 2	2.4
30	5 15	18 58	0 26	1 31	13 3	2.0	1 54	2.3
20	5 33	18 40	0 24	1 21	13 18	2.0	1 40	2.2
10	5 49	18 24	0 22	1 15	13 31	2.1	1 28	2.2
0	6 3	18 10	0 22	1 13	13 43	2.2	1 17	2.1
10	6 17	17 56	0 22	1 13	13 55	2.2	1 6	2.0
20	6 32	17 41	0 23	1 17	14 8	2.3	0 54	1.9
30	6 50	17 24	0 25	1 23	14 22	2.3	0 40	1.9
35	6 59	17 14	0 27	1 28	14 31	2.4	0 32	1.8
40	7 11	17 3	0 29	1 34	14 41	2.4	0 24	1.8
45	7 24	16 49	0 32	1 43	14 53	2.5	0 13	1.7
50	7 40	16 33	0 36	1 54	15 7	2.5	0 1	1.6
55	8 1	16 13	0 42	2 9	15 25	2.6	.. ..	.0
60	8 29	15 45	0 50	2 32	15 49	2.8	23 55	1.7
S								

SUNCE				MESEC				
UT	e = T_p − UT	Δ/24	r	Prolaz		Δ/24	$\pi_\leftmoon$	r
h	min s	s	′	$T_{\overline{m}}$	h min	min	′	′
00	− 6 32.9	.0	15.8		19 55	2.2	55.8	15.2
12	− 6 32.9	$T_{\overline{m}_\odot}$ 12 h	6.5 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	′	°	
♀	13 50	.1	209	−6.3	♄	13 41	.0	211	−1.3
♂	11 17	.1	247	1.8	♇	19 29	.0	123	.6

UT	SUNCE		PROLEĆ. TAČKA	VENERA		MARS	
	$S_\odot$	$\delta_\odot$	S_Υ	S_φ	δ_φ	S_σ	δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	178 21.8	19 19.6	304 21.3	153 2.4	7 23.5	190 55.1	22 37.8
2	208 21.8	19 18.5	334 26.2	183 8.0	7 22.6	220 56.6	22 37.3
4	238 21.8	19 17.4	4 31.1	213 13.7	7 21.6	250 58.0	22 36.8
6	268 21.8	19 16.2	34 36.1	243 19.3	7 20.7	280 59.4	22 36.3
8	298 21.8	19 15.1	64 41.0	273 25.0	7 19.8	311 .8	22 35.8
10	328 21.8	19 14.0	94 45.9	303 30.7	7 18.9	341 2.3	22 35.3
12	358 21.8	19 12.9	124 50.8	333 36.4	7 17.9	11 3.7	22 34.9
14	28 21.8	19 11.7	154 55.8	3 42.1	7 17.0	41 5.1	22 34.4
16	58 21.9	19 10.6	185 .7	33 47.9	7 16.1	71 6.5	22 33.9
18	88 21.9	19 9.5	215 5.6	63 53.6	7 15.2	101 8.0	22 33.4
20	118 21.9	19 8.3	245 10.6	93 59.4	7 14.3	131 9.4	22 32.9
22	148 21.9	19 7.2	275 15.5	124 5.2	7 13.4	161 10.8	22 32.4
Δ	0	−6		29	−5	7	−2

UT	MESEC				JUPITER		SATURN	
	$S_\leftmoon$	Δ	$\delta_\leftmoon$	Δ	$S_{\mathrm{♃}}$	$\delta_{\mathrm{♃}}$	$S_{\mathrm{♄}}$	$\delta_{\mathrm{♄}}$
h	° ′		° ′		° ′	° ′	° ′	° ′
0	59 12.4	99	16 50.8	41	155 7.4	13 24.7	67 49.7	−17 49.6
2	88 10.2	98	16 58.9	39	185 11.3	13 24.3	97 54.6	−17 49.6
4	117 7.8	96	17 6.6	37	215 15.2	13 23.9	127 59.6	−17 49.6
6	146 5.1	95	17 14.1	35	245 19.1	13 23.6	158 4.6	−17 49.7
8	175 2.1	94	17 21.1	33	275 23.1	13 23.2	188 9.6	−17 49.7
10	203 58.9	92	17 27.8	32	305 27.0	13 22.9	218 14.6	−17 49.7
12	232 55.4	91	17 34.1	30	335 30.9	13 22.5	248 19.6	−17 49.7
14	261 51.6	90	17 40.1	28	5 34.8	13 22.2	278 24.5	−17 49.7
16	290 47.6	89	17 45.6	26	35 38.7	13 21.8	308 29.5	−17 49.7
18	319 43.3	87	17 50.8	24	65 42.7	13 21.5	338 34.5	−17 49.7
20	348 38.8	86	17 55.6	22	95 46.6	13 21.1	8 39.5	−17 49.7
22	17 34.0	85	18 .0	20	125 50.5	13 20.7	38 44.4	−17 49.7
Δ					20	−2	25	0

φ	SUNCE		TRAJANJE SUMRAKA		MESEC			
	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 28	20 43	1 4	: ::	12 17	2.0	4 20	2.6
55	3 59	20 13	0 48	: ::	12 43	2.0	3 55	2.5
50	4 22	19 50	0 40	2 45	13 2	2.1	3 36	2.5
45	4 39	19 33	0 34	2 9	13 18	2.1	3 21	2.4
40	4 53	19 19	0 31	1 51	13 30	2.1	3 9	2.4
35	5 5	19 7	0 28	1 39	13 41	2.2	2 58	2.4
30	5 16	18 57	0 26	1 31	13 50	2.2	2 49	2.3
20	5 34	18 39	0 24	1 20	14 7	2.2	2 34	2.3
10	5 49	18 24	0 22	1 15	14 21	2.2	2 20	2.2
0	6 3	18 10	0 22	1 13	14 34	2.3	2 7	2.2
10	6 17	17 56	0 22	1 13	14 48	2.3	1 54	2.2
20	6 32	17 41	0 23	1 17	15 2	2.3	1 41	2.1
30	6 49	17 24	0 25	1 23	15 18	2.3	1 25	2.1
35	6 59	17 15	0 27	1 28	15 28	2.4	1 16	2.0
40	7 10	17 4	0 29	1 34	15 39	2.4	1 6	2.0
45	7 23	16 50	0 32	1 43	15 52	2.4	0 54	2.0
50	7 39	16 35	0 36	1 54	16 8	2.4	0 39	1.9
55	7 59	16 14	0 41	2 9	16 28	2.5	0 20	1.8
60	8 27	15 47	0 50	2 32	16 55	2.5	.. ..	.0
S								

SUNCE				MESEC				
UT	e = T_p − UT	Δ/24	r	Prolaz		Δ/24	$\pi_\leftmoon$	r
h	min s	s	′	$T_{\overline{m}}$	h min	min	′	′
00	− 6 32.9	.0	15.8		20 47	2.3	56.6	15.4
12	− 6 32.6	$T_{\overline{m}_\odot}$ 12 h	6.5 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	′	°	
♀	13 45	.1	209	−6.3	♄	13 38	.0	211	−1.3
♂	11 16	.1	247	1.8	♇	19 25	.0	123	.6

UT	SUNCE		PROLEĆ. TAČKA	VENERA		MARS	
	$S_\odot$	$\delta_\odot$	S_Υ	S_φ	δ_φ	S_σ	δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	178 21.9	19 6.0	305 20.4	154 11.0	7 12.6	191 12.2	22 31.9
2	208 22.0	19 4.9	335 25.3	184 16.8	7 11.7	221 13.7	22 31.4
4	238 22.0	19 3.7	5 30.3	214 22.6	7 10.8	251 15.1	22 30.9
6	268 22.0	19 2.6	35 35.2	244 28.5	7 10.0	281 16.5	22 30.4
8	298 22.0	19 1.5	65 40.1	274 34.3	7 9.1	311 18.0	22 29.9
10	328 22.0	19 .3	95 45.1	304 40.2	7 8.2	341 19.4	22 29.4
12	358 22.1	18 59.1	125 50.0	334 46.1	7 7.4	11 20.8	22 28.8
14	28 22.1	18 58.0	155 54.9	4 52.0	7 6.5	41 22.3	22 28.3
16	58 22.1	18 56.8	185 59.8	34 58.0	7 5.7	71 23.7	22 27.8
18	88 22.2	18 55.7	216 4.8	65 3.9	7 4.9	101 25.1	22 27.3
20	118 22.2	18 54.5	246 9.7	95 9.9	7 4.1	131 26.6	22 26.8
22	148 22.2	18 53.3	276 14.6	125 15.8	7 3.2	161 28.0	22 26.3
Δ	0	−6		30	−4	7	−3

UT	MESEC				JUPITER		SATURN	
	$S_\leftmoon$	Δ	$\delta_\leftmoon$	Δ	S_{4}	δ_{4}	S_η	δ_η
h	° ′		° ′		° ′	° ′	° ′	° ′
0	46 29.0	84	18 3.9	18	155 54.4	13 20.4	68 49.4	−17 49.7
2	75 23.8	83	18 7.5	16	185 58.3	13 20.0	98 54.4	−17 49.8
4	104 18.3	81	18 10.6	14	216 2.2	13 19.7	128 59.4	−17 49.8
6	133 12.6	80	18 13.4	12	246 6.2	13 19.3	159 4.3	−17 49.8
8	162 6.7	79	18 15.7	9	276 10.1	13 19.0	189 9.3	−17 49.8
10	191 .5	78	18 17.6	7	306 14.0	13 18.6	219 14.3	−17 49.8
12	219 54.2	77	18 19.0	5	336 17.9	13 18.2	249 19.3	−17 49.8
14	248 47.6	76	18 20.0	3	6 21.8	13 17.9	279 24.2	−17 49.8
16	277 40.9	75	18 20.6	1	36 25.8	13 17.5	309 29.2	−17 49.8
18	306 33.9	74	18 20.7	−2	66 29.7	13 17.2	339 34.2	−17 49.8
20	335 26.8	73	18 20.4	−4	96 33.6	13 16.8	9 39.1	−17 49.9
22	4 19.5	73	18 19.6	−6	126 37.5	13 16.5	39 44.1	−17 49.9
Δ					20	−2	25	0

φ	SUNCE		TRAJANJE SUMRAKA		MESEC			
	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 31	20 41	1 3	: : :	13 4	2.5	5 23	2.3
55	4 1	20 11	0 48	: : :	13 32	2.5	4 56	2.3
50	4 23	19 49	0 39	2 43	13 52	2.5	4 35	2.3
45	4 40	19 32	0 34	2 9	14 9	2.4	4 19	2.3
40	4 54	19 18	0 31	1 50	14 22	2.4	4 6	2.3
35	5 6	19 7	0 28	1 39	14 33	2.4	3 55	2.3
30	5 16	18 56	0 26	1 31	14 43	2.4	3 45	2.3
20	5 34	18 39	0 24	1 20	14 60	2.4	3 28	2.3
10	5 49	18 24	0 22	1 15	15 15	2.4	3 14	2.3
0	6 3	18 10	0 22	1 13	15 29	2.4	3 0	2.3
10	6 17	17 56	0 22	1 13	15 43	2.3	2 46	2.3
20	6 32	17 42	0 23	1 16	15 57	2.3	2 32	2.3
30	6 48	17 25	0 25	1 23	16 15	2.3	2 15	2.3
35	6 58	17 15	0 27	1 28	16 25	2.3	2 5	2.3
40	7 9	17 4	0 29	1 34	16 36	2.3	1 54	2.3
45	7 22	16 52	0 32	1 42	16 49	2.2	1 41	2.3
50	7 38	16 36	0 36	1 53	17 6	2.2	1 24	2.3
55	7 58	16 16	0 41	2 9	17 27	2.2	1 4	2.2
60	8 24	15 49	0 50	2 31	17 55	2.1	0 36	2.2
S								

SUNCE				MESEC			
UT	$e = T_p - UT$	Δ/24	r	Prolaz		Δ/24	$\pi_\leftmoon$	r
h	min s	s	′		h min	min	′	′
00	− 6 32.3	.1	15.8	$T_{\overline{m}}$	21 42	2.4	57.5	15.7
12	− 6 31.6	$T_{\overline{m}_\odot}$ 12 h 6.5 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	′	°	
♀	13 41	.1	209	−6.4	♃	13 35	.0	211	−1.3
♂	11 15	.1	246	1.8	♄	19 21	.0	123	.6

UT	SUNCE		PROLEĆ. TAČKA	VENERA		MARS	
	$S_\odot$	$\delta_\odot$	S_Υ	S_φ	δ_φ	S_σ	δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	178 22.2	18 52.2	306 19.6	155 21.8	7 2.4	191 29.4	22 25.8
2	208 22.3	18 51.0	336 24.5	185 27.8	7 1.6	221 30.9	22 25.3
4	238 22.3	18 49.8	6 29.4	215 33.9	7 .8	251 32.3	22 24.7
6	268 22.4	18 48.7	36 34.3	245 39.9	7 .0	281 33.8	22 24.2
8	298 22.4	18 47.5	66 39.3	275 45.9	6 59.2	311 35.2	22 23.7
10	328 22.4	18 46.3	96 44.2	305 52.0	6 58.4	341 36.6	22 23.2
12	358 22.5	18 45.1	126 49.1	335 58.1	6 57.6	11 38.1	22 22.7
14	28 22.5	18 43.9	156 54.0	6 4.2	6 56.9	41 39.5	22 22.2
16	58 22.5	18 42.8	186 59.0	36 10.3	6 56.1	71 41.0	22 21.6
18	88 22.6	18 41.6	217 3.9	66 16.4	6 55.3	101 42.4	22 21.1
20	118 22.6	18 40.4	247 8.8	96 22.6	6 54.6	131 43.9	22 20.6
22	148 22.7	18 39.2	277 13.8	126 28.8	6 53.8	161 45.3	22 20.0
Δ	0	−6		30	−4	7	−3

UT	MESEC				JUPITER		SATURN	
	$S_\leftmoon$	Δ	$\delta_\leftmoon$	Δ	S_{4}	δ_{4}	S_η	δ_η
h	° ′		° ′		° ′	° ′	° ′	° ′
0	33 12.0	72	18 18.3	−8	156 41.4	13 16.1	69 49.1	−17 49.9
2	62 4.3	71	18 16.6	−11	186 45.3	13 15.7	99 54.1	−17 49.9
4	90 56.5	70	18 14.5	−13	216 49.3	13 15.4	129 59.0	−17 49.9
6	119 48.5	69	18 11.9	−15	246 53.2	13 15.0	160 4.0	−17 49.9
8	148 40.4	69	18 8.8	−18	276 57.1	13 14.7	190 8.9	−17 49.9
10	177 32.2	68	18 5.2	−20	307 1.0	13 14.3	220 13.9	−17 49.9
12	206 23.8	68	18 1.2	−22	337 4.9	13 13.9	250 18.9	−17 50.0
14	235 15.3	67	17 56.7	−25	7 8.8	13 13.6	280 23.8	−17 50.0
16	264 6.7	66	17 51.7	−27	37 12.8	13 13.2	310 28.8	−17 50.0
18	292 58.0	66	17 46.3	−30	67 16.7	13 12.9	340 33.8	−17 50.0
20	321 49.2	66	17 40.4	−32	97 20.6	13 12.5	10 38.7	−17 50.0
22	350 40.3	65	17 34.0	−34	127 24.5	13 12.1	40 43.7	−17 50.0
Δ					20	−2	25	0

φ	SUNCE		TRAJANJE SUMRAKA		MESEC			
	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 33	20 39	1 3	: : :	14 4	3.0	6 19	1.9
55	4 3	20 9	0 47	: : :	14 31	2.9	5 51	2.0
50	4 25	19 48	0 39	2 41	14 51	2.8	5 31	2.1
45	4 41	19 31	0 34	2 8	15 7	2.7	5 15	2.1
40	4 55	19 17	0 31	1 50	15 20	2.7	5 2	2.2
35	5 7	19 6	0 28	1 38	15 31	2.6	4 51	2.2
30	5 17	18 56	0 26	1 30	15 41	2.6	4 41	2.3
20	5 34	18 39	0 24	1 20	15 57	2.5	4 24	2.3
10	5 49	18 24	0 22	1 15	16 12	2.5	4 9	2.3
0	6 3	18 10	0 22	1 13	16 25	2.4	3 55	2.4
10	6 17	17 56	0 22	1 13	16 39	2.3	3 42	2.4
20	6 31	17 42	0 23	1 16	16 53	2.3	3 27	2.5
30	6 48	17 26	0 25	1 23	17 10	2.2	3 10	2.5
35	6 57	17 16	0 27	1 28	17 19	2.2	2 60	2.5
40	7 8	17 5	0 29	1 34	17 30	2.1	2 48	2.5
45	7 21	16 53	0 32	1 42	17 43	2.0	2 35	2.6
50	7 36	16 37	0 36	1 53	17 59	2.0	2 19	2.6
55	7 56	16 18	0 41	2 8	18 19	1.9	1 58	2.7
60	8 22	15 51	0 49	2 30	18 46	1.7	1 29	2.8
S								

SUNCE				MESEC			
UT	$e = T_p - UT$	Δ/24	r	Prolaz		Δ/24	$\pi_\leftmoon$	r
h	min s	s	′		h min	min	′	′
00	− 6 31.0	.1	15.8	$T_{\overline{m}}$	22 39	2.4	58.3	15.9
12	− 6 30.1	$T_{\overline{m}_\odot}$ 12 h 6.5 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	′	°	
♀	13 36	.1	209	−6.4	♃	13 31	.0	210	−1.3
♂	11 13	.1	245	1.8	♄	19 18	.0	123	.6

UT	SUNCE		PROLEĆ. TAČKA	VENERA		MARS	
	$S_\odot$	$\delta_\odot$	S_Υ	S_φ	δ_φ	S_σ	δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	178 22.7	18 38.0	307 18.7	156 34.9	6 53.1	191 46.7	22 19.5
2	208 22.8	18 36.8	337 23.6	186 41.1	6 52.3	221 48.2	22 19.0
4	238 22.8	18 35.6	7 28.5	216 47.3	6 51.6	251 49.6	22 18.5
6	268 22.9	18 34.4	37 33.5	246 53.6	6 50.9	281 51.1	22 17.9
8	298 22.9	18 33.2	67 38.4	276 59.8	6 50.1	311 52.5	22 17.4
10	328 23.0	18 32.0	97 43.3	307 6.0	6 49.4	341 54.0	22 16.9
12	358 23.0	18 30.8	127 48.3	337 12.3	6 48.7	11 55.4	22 16.3
14	28 23.1	18 29.6	157 53.2	7 18.6	6 48.0	41 56.9	22 15.8
16	58 23.1	18 28.4	187 58.1	37 24.9	6 47.3	71 58.3	22 15.3
18	88 23.2	18 27.2	218 3.0	67 31.2	6 46.6	101 59.8	22 14.7
20	118 23.2	18 25.9	248 8.0	97 37.6	6 45.9	132 1.2	22 14.2
22	148 23.3	18 24.7	278 12.9	127 43.9	6 45.2	162 2.7	22 13.6
Δ	0	−6		31	−4	7	−3

UT	MESEC				JUPITER		SATURN	
	$S_\leftmoon$	Δ	$\delta_\leftmoon$	Δ	S_{4}	δ_{4}	S_η	δ_η
h	° ′		° ′		° ′	° ′	° ′	° ′
0	19 31.4	65	17 27.2	−37	157 28.4	13 11.8	70 48.6	−17 50.0
2	48 22.4	65	17 19.9	−39	187 32.3	13 11.4	100 53.6	−17 50.1
4	77 13.3	64	17 12.1	−41	217 36.3	13 11.1	130 58.6	−17 50.1
6	106 4.1	64	17 3.8	−44	247 40.2	13 10.7	161 3.5	−17 50.1
8	134 55.0	64	16 55.1	−46	277 44.1	13 10.3	191 8.5	−17 50.1
10	163 45.7	64	16 46.0	−48	307 48.0	13 10.0	221 13.4	−17 50.1
12	192 36.5	64	16 36.3	−50	337 51.9	13 9.6	251 18.4	−17 50.1
14	221 27.2	64	16 26.2	−53	7 55.8	13 9.3	281 23.3	−17 50.1
16	250 17.9	64	16 15.7	−55	37 59.7	13 8.9	311 28.3	−17 50.2
18	279 8.7	64	16 4.7	−57	68 3.6	13 8.5	341 33.3	−17 50.2
20	307 59.4	64	15 53.3	−59	98 7.6	13 8.2	11 38.2	−17 50.2
22	336 50.1	64	15 41.4	−62	128 11.5	13 7.8	41 43.2	−17 50.2
Δ					20	−2	25	0

φ	SUNCE		TRAJANJE SUMRAKA		MESEC			
	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 35	20 36	1 2	: ::	15 17	3.4	7 5	1.5
55	4 5	20 7	0 47	: ::	15 41	3.2	6 40	1.7
50	4 26	19 46	0 39	2 39	15 58	3.1	6 21	1.8
45	4 43	19 30	0 34	2 7	16 12	2.9	6 7	1.9
40	4 56	19 16	0 30	1 49	16 24	2.8	5 54	2.0
35	5 8	19 5	0 28	1 38	16 34	2.8	5 44	2.1
30	5 18	18 55	0 26	1 30	16 43	2.7	5 35	2.1
20	5 35	18 38	0 24	1 20	16 57	2.6	5 19	2.2
10	5 49	18 24	0 22	1 15	17 10	2.5	5 5	2.3
0	6 3	18 10	0 22	1 13	17 23	2.4	4 53	2.4
10	6 16	17 57	0 22	1 13	17 35	2.3	4 40	2.5
20	6 31	17 42	0 23	1 16	17 48	2.2	4 26	2.6
30	6 47	17 26	0 25	1 23	18 3	2.1	4 10	2.6
35	6 56	17 17	0 27	1 27	18 11	2.0	4 0	2.7
40	7 7	17 6	0 29	1 34	18 21	1.9	3 50	2.8
45	7 20	16 54	0 32	1 42	18 32	1.8	3 37	2.8
50	7 35	16 39	0 36	1 53	18 46	1.7	3 22	2.9
55	7 54	16 19	0 41	2 8	19 4	1.6	3 2	3.1
60	8 20	15 54	0 49	2 30	19 27	1.4	2 36	3.2
S								

SUNCE				MESEC			
UT	e = T_p − UT	Δ/24	r	Prolaz		Δ/24	$\pi_\leftmoon$	r
h	min s	s	′		h min	min	′	′
00	− 6 29.1	.1	15.8	$T_{\overline{m}}$	23 36	2.4	59.1	16.1
12	− 6 27.9	$T_{\overline{m}_\odot}$	12 h 6.5 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	′	°	
♀	13 31	.1	209	−6.4	♃	13 28	.0	210	−1.3
♂	11 12	.1	244	1.8	♄	19 14	.0	123	.6

UT	SUNCE		PROLEĆ. TAČKA	VENERA		MARS	
	$S_\odot$	$\delta_\odot$	S_Υ	S_φ	δ_φ	S_σ	δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	178 23.3	18 23.5	308 17.8	157 50.3	6 44.6	192 4.1	22 13.1
2	208 23.4	18 22.3	338 22.8	187 56.6	6 43.9	222 5.6	22 12.6
4	238 23.5	18 21.1	8 27.7	218 3.0	6 43.2	252 7.1	22 12.0
6	268 23.5	18 19.8	38 32.6	248 9.4	6 42.6	282 8.5	22 11.5
8	298 23.6	18 18.6	68 37.5	278 15.9	6 41.9	312 10.0	22 10.9
10	328 23.6	18 17.4	98 42.5	308 22.3	6 41.3	342 11.4	22 10.4
12	358 23.7	18 16.2	128 47.4	338 28.8	6 40.6	12 12.9	22 9.8
14	28 23.8	18 14.9	158 52.3	8 35.2	6 40.0	42 14.3	22 9.3
16	58 23.8	18 13.7	188 57.3	38 41.7	6 39.4	72 15.8	22 8.7
18	88 23.9	18 12.5	219 2.2	68 48.2	6 38.8	102 17.3	22 8.2
20	118 24.0	18 11.2	249 7.1	98 54.7	6 38.1	132 18.7	22 7.6
22	148 24.0	18 10.0	279 12.0	129 1.3	6 37.5	162 20.2	22 7.1
Δ	0	−6		32	−3	7	−3

UT	MESEC				JUPITER		SATURN	
	$S_\leftmoon$	Δ	$\delta_\leftmoon$	Δ	S_{4}	δ_{4}	S_η	δ_η
h	° ′		° ′		° ′	° ′	° ′	° ′
0	5 40.9	64	15 29.1	−64	158 15.4	13 7.5	71 48.1	−17 50.2
2	34 31.7	64	15 16.3	−66	188 19.3	13 7.1	101 53.1	−17 50.2
4	63 22.5	64	15 3.2	−68	218 23.2	13 6.7	131 58.0	−17 50.3
6	92 13.3	64	14 49.6	−70	248 27.1	13 6.4	162 3.0	−17 50.3
8	121 4.2	65	14 35.6	−72	278 31.0	13 6.0	192 7.9	−17 50.3
10	149 55.2	65	14 21.2	−74	308 35.0	13 5.6	222 12.9	−17 50.3
12	178 46.2	65	14 6.3	−76	338 38.9	13 5.3	252 17.8	−17 50.3
14	207 37.3	66	13 51.1	−78	8 42.8	13 4.9	282 22.8	−17 50.3
16	236 28.4	66	13 35.5	−80	38 46.7	13 4.6	312 27.7	−17 50.4
18	265 19.6	66	13 19.6	−82	68 50.6	13 4.2	342 32.6	−17 50.4
20	294 10.9	67	13 3.2	−84	98 54.5	13 3.8	12 37.6	−17 50.4
22	323 2.3	67	12 46.5	−85	128 58.4	13 3.5	42 42.5	−17 50.4
Δ					20	−2	25	0

φ	SUNCE		TRAJANJE SUMRAKA		MESEC			
	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 37	20 34	1 1	: ::	16 39	3.6	7 41	1.2
55	4 6	20 5	0 47	: ::	16 57	3.4	7 21	1.5
50	4 27	19 45	0 39	2 37	17 12	3.2	7 5	1.6
45	4 44	19 28	0 34	2 6	17 23	3.1	6 53	1.7
40	4 57	19 15	0 30	1 49	17 32	2.9	6 43	1.9
35	5 8	19 4	0 28	1 38	17 40	2.8	6 34	1.9
30	5 18	18 54	0 26	1 30	17 47	2.8	6 26	2.0
20	5 35	18 38	0 24	1 20	17 60	2.6	6 13	2.2
10	5 49	18 23	0 22	1 15	18 10	2.5	6 1	2.3
0	6 3	18 10	0 22	1 12	18 20	2.4	5 50	2.4
10	6 16	17 57	0 22	1 13	18 30	2.2	5 39	2.5
20	6 30	17 43	0 23	1 16	18 41	2.1	5 27	2.6
30	6 46	17 27	0 25	1 23	18 53	2.0	5 13	2.7
35	6 56	17 18	0 27	1 27	18 60	1.9	5 5	2.8
40	7 6	17 7	0 29	1 34	19 7	1.8	4 56	2.9
45	7 19	16 55	0 32	1 42	19 17	1.7	4 45	3.0
50	7 33	16 40	0 35	1 53	19 28	1.5	4 32	3.1
55	7 52	16 21	0 41	2 8	19 41	1.3	4 16	3.3
60	8 18	15 56	0 49	2 29	19 59	1.1	3 54	3.6
S								

SUNCE				MESEC			
UT	e = T_p − UT	Δ/24	r	Prolaz		Δ/24	$\pi_\leftmoon$	r
h	min s	s	′		h min	min	′	′
00	− 6 26.6	.1	15.8	$T_{\overline{m}}$	. . .	1.0	59.8	16.3
12	− 6 25.1	$T_{\overline{m}_\odot}$	12 h 6.4 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	′	°	
♀	13 26	.1	210	−6.4	♃	13 25	.0	210	−1.3
♂	11 11	.1	244	1.8	♄	19 10	.0	123	.6

1. AVGUST 2015. SUBOTA

UT	SUNCE $S_\odot$	SUNCE $\delta_\odot$	PROLEĆ. TAČKA S_Υ	VENERA S_φ	VENERA δ_φ	MARS S_σ	MARS δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	178 24.1	18 8.7	309 17.0	159 7.8	6 36.9	192 21.6	22 6.5
2	208 24.2	18 7.5	339 21.9	189 14.4	6 36.3	222 23.1	22 5.9
4	238 24.3	18 6.2	9 26.8	219 20.9	6 35.8	252 24.6	22 5.4
6	268 24.3	18 5.0	39 31.8	249 27.5	6 35.2	282 26.0	22 4.8
8	298 24.4	18 3.7	69 36.7	279 34.1	6 34.6	312 27.5	22 4.3
10	328 24.5	18 2.5	99 41.6	309 40.7	6 34.0	342 29.0	22 3.7
12	358 24.6	18 1.2	129 46.5	339 47.4	6 33.5	12 30.4	22 3.1
14	28 24.6	18 .0	159 51.5	9 54.0	6 32.9	42 31.9	22 2.6
16	58 24.7	17 58.7	189 56.4	40 .7	6 32.3	72 33.4	22 2.0
18	88 24.8	17 57.4	220 1.3	70 7.4	6 31.8	102 34.8	22 1.4
20	118 24.9	17 56.2	250 6.3	100 14.1	6 31.3	132 36.3	22 .9
22	148 25.0	17 54.9	280 11.2	130 20.8	6 30.7	162 37.8	22 .3
Δ	0	−6		33	−3	7	−3

UT	MESEC $S_\leftmoon$	MESEC Δ	MESEC $\delta_\leftmoon$	MESEC Δ	JUPITER $S_{\jupiter}$	JUPITER $\delta_{\jupiter}$	SATURN $S_{\saturn}$	SATURN $\delta_{\saturn}$
h	° ′		° ′		° ′	° ′	° ′	° ′
0	351 53.8	68	12 29.5	−87	159 2.3	13 3.1	72 47.5	−17 50.4
2	20 45.3	68	12 12.0	−89	189 6.2	13 2.7	102 52.4	−17 50.4
4	49 37.0	69	11 54.3	−90	219 10.2	13 2.4	132 57.4	−17 50.5
6	78 28.7	69	11 36.2	−92	249 14.1	13 2.0	163 2.3	−17 50.5
8	107 20.6	70	11 17.8	−94	279 18.0	13 1.6	193 7.2	−17 50.5
10	136 12.5	70	10 59.1	−95	309 21.9	13 1.3	223 12.2	−17 50.5
12	165 4.6	71	10 40.1	−96	339 25.8	13 .9	253 17.1	−17 50.5
14	193 56.8	71	10 20.8	−98	9 29.7	13 .6	283 22.1	−17 50.6
16	222 49.1	72	10 1.3	−99	39 33.6	13 .2	313 27.0	−17 50.6
18	251 41.5	73	9 41.4	−101	69 37.5	12 59.8	343 31.9	−17 50.6
20	280 34.0	73	9 21.3	−102	99 41.4	12 59.5	13 36.9	−17 50.6
22	309 26.6	74	9 1.0	−103	129 45.3	12 59.1	43 41.8	−17 50.6
Δ					20	−2	25	0

φ	SUNCE IZLAZ	SUNCE ZALAZ	TRAJANJE SUMRAKA GRAĐ.	TRAJANJE SUMRAKA ASTR.	MESEC IZLAZ	MESEC Δ/24	MESEC ZALAZ	MESEC Δ/24
N	h min	h min	h min	h min	h min	min	h min	min
60	3 40	20 31	1 0	: ::	18 6	3.7	8 10	1.0
55	4 8	20 3	0 46	: ::	18 19	3.5	7 56	1.3
50	4 29	19 43	0 39	2 35	18 29	3.3	7 44	1.4
45	4 45	19 27	0 34	2 5	18 37	3.1	7 35	1.6
40	4 58	19 14	0 30	1 48	18 43	3.0	7 27	1.7
35	5 9	19 3	0 28	1 37	18 49	2.9	7 21	1.8
30	5 19	18 54	0 26	1 29	18 54	2.8	7 15	1.9
20	5 35	18 37	0 23	1 20	19 2	2.6	7 5	2.1
10	5 50	18 23	0 22	1 14	19 10	2.4	6 56	2.2
0	6 3	18 10	0 22	1 12	19 17	2.3	6 47	2.3
10	6 16	17 57	0 22	1 13	19 24	2.2	6 39	2.5
20	6 30	17 43	0 23	1 16	19 31	2.0	6 29	2.6
30	6 46	17 27	0 25	1 22	19 40	1.9	6 19	2.8
35	6 55	17 18	0 27	1 27	19 45	1.8	6 13	2.9
40	7 5	17 8	0 29	1 33	19 50	1.7	6 6	3.0
45	7 17	16 56	0 32	1 42	19 56	1.5	5 58	3.1
50	7 32	16 41	0 35	1 52	20 4	1.4	5 48	3.3
55	7 51	16 23	0 41	2 7	20 13	1.2	5 35	3.4
60	8 16	15 58	0 48	2 29	20 26	.9	5 19	3.7
S								

SUNCE UT	SUNCE $e = T_p - UT$	SUNCE Δ/24	SUNCE r	MESEC Prolaz	MESEC Δ/24	MESEC $\pi_\leftmoon$	MESEC r
h	min s	s	′	h min	min	′	′
00	− 6 23.5	.2	15.8	$T_{\overline{m}}$ 0 34	2.3	60.3	16.4
12	− 6 21.7	$T_{\overline{m}_\odot}$ 12 h 6.4 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	′	°	
♀	13 21	.1	210	−6.5	♃	13 22	.0	210	−1.3
♂	11 10	.1	243	1.8	♄	19 6	.0	124	.6

2. AVGUST NEDELJA

UT	SUNCE $S_\odot$	SUNCE $\delta_\odot$	PROLEĆ. TAČKA S_Υ	VENERA S_φ	VENERA δ_φ	MARS S_σ	MARS δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	178 25.0	17 53.6	310 16.1	160 27.5	6 30.2	192 39.2	21 59.7
2	208 25.1	17 52.4	340 21.0	190 34.2	6 29.7	222 40.7	21 59.2
4	238 25.2	17 51.1	10 26.0	220 41.0	6 29.2	252 42.2	21 58.6
6	268 25.3	17 49.8	40 30.9	250 47.7	6 28.7	282 43.7	21 58.0
8	298 25.4	17 48.6	70 35.8	280 54.5	6 28.2	312 45.1	21 57.5
10	328 25.5	17 47.3	100 40.7	311 1.3	6 27.7	342 46.6	21 56.9
12	358 25.6	17 46.0	130 45.7	341 8.1	6 27.2	12 48.1	21 56.3
14	28 25.7	17 44.7	160 50.6	11 14.9	6 26.7	42 49.6	21 55.7
16	58 25.7	17 43.4	190 55.5	41 21.8	6 26.2	72 51.0	21 55.1
18	88 25.8	17 42.1	221 .5	71 28.6	6 25.7	102 52.5	21 54.6
20	118 25.9	17 40.9	251 5.4	101 35.5	6 25.3	132 54.0	21 54.0
22	148 26.0	17 39.6	281 10.3	131 42.4	6 24.8	162 55.5	21 53.4
Δ	0	−6		34	−2	7	−3

UT	MESEC $S_\leftmoon$	MESEC Δ	MESEC $\delta_\leftmoon$	MESEC Δ	JUPITER $S_{\jupiter}$	JUPITER $\delta_{\jupiter}$	SATURN $S_{\saturn}$	SATURN $\delta_{\saturn}$
h	° ′		° ′		° ′	° ′	° ′	° ′
0	338 19.4	74	8 40.4	−104	159 49.3	12 58.7	73 46.7	−17 50.6
2	7 12.2	75	8 19.5	−105	189 53.2	12 58.4	103 51.7	−17 50.7
4	36 5.2	76	7 58.5	−106	219 57.1	12 58.0	133 56.6	−17 50.7
6	64 58.3	76	7 37.3	−107	250 1.0	12 57.6	164 1.5	−17 50.7
8	93 51.6	77	7 15.8	−108	280 4.9	12 57.3	194 6.5	−17 50.7
10	122 44.9	77	6 54.2	−109	310 8.8	12 56.9	224 11.4	−17 50.7
12	151 38.4	78	6 32.4	−110	340 12.7	12 56.5	254 16.3	−17 50.8
14	180 31.9	78	6 10.4	−111	10 16.6	12 56.2	284 21.3	−17 50.8
16	209 25.6	79	5 48.3	−111	40 20.5	12 55.8	314 26.2	−17 50.8
18	238 19.4	80	5 26.0	−112	70 24.4	12 55.5	344 31.1	−17 50.8
20	267 13.3	80	5 3.7	−113	100 28.3	12 55.1	14 36.1	−17 50.9
22	296 7.3	81	4 41.2	−113	130 32.3	12 54.7	44 41.0	−17 50.9
Δ					20	−2	25	0

φ	SUNCE IZLAZ	SUNCE ZALAZ	TRAJANJE SUMRAKA GRAĐ.	TRAJANJE SUMRAKA ASTR.	MESEC IZLAZ	MESEC Δ/24	MESEC ZALAZ	MESEC Δ/24
N	h min	h min	h min	h min	h min	min	h min	min
60	3 42	20 29	0 59	: ::	19 36	3.7	8 35	.9
55	4 10	20 2	0 46	: ::	19 42	3.5	8 26	1.1
50	4 30	19 42	0 38	2 33	19 47	3.3	8 19	1.3
45	4 46	19 26	0 34	2 4	19 51	3.1	8 13	1.5
40	4 59	19 13	0 30	1 48	19 55	3.0	8 8	1.6
35	5 10	19 2	0 28	1 37	19 58	2.8	8 4	1.7
30	5 19	18 53	0 26	1 29	20 0	2.7	8 1	1.8
20	5 36	18 37	0 23	1 19	20 5	2.6	7 54	2.0
10	5 50	18 23	0 22	1 14	20 9	2.4	7 49	2.1
0	6 3	18 10	0 22	1 12	20 12	2.3	7 43	2.3
10	6 16	17 57	0 22	1 13	20 16	2.1	7 38	2.4
20	6 29	17 43	0 23	1 16	20 20	2.0	7 32	2.6
30	6 45	17 28	0 25	1 22	20 24	1.8	7 25	2.8
35	6 54	17 19	0 27	1 27	20 27	1.7	7 22	2.9
40	7 4	17 9	0 29	1 33	20 30	1.6	7 17	3.0
45	7 16	16 57	0 32	1 41	20 33	1.4	7 12	3.1
50	7 31	16 43	0 35	1 52	20 37	1.3	7 6	3.3
55	7 49	16 24	0 40	2 7	20 42	1.1	6 58	3.5
60	8 13	16 0	0 48	2 28	20 48	.9	6 48	3.7
S								

SUNCE UT	SUNCE $e = T_p - UT$	SUNCE Δ/24	SUNCE r	MESEC Prolaz	MESEC Δ/24	MESEC $\pi_\leftmoon$	MESEC r
h	min s	s	′	h min	min	′	′
00	− 6 19.8	.2	15.8	$T_{\overline{m}}$ 1 30	2.3	60.5	16.5
12	− 6 17.7	$T_{\overline{m}_\odot}$ 12 h 6.3 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	′	°	
♀	13 15	.1	210	−6.5	♃	13 19	.0	210	−1.3
♂	11 9	.1	242	1.8	♄	19 2	.0	124	.6

UT	SUNCE		PROLEĆ. TAČKA	VENERA		MARS	
	$S_\odot$	$\delta_\odot$	S_Υ	S_φ	δ_φ	S_σ	δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	178 26.1	17 38.3	311 15.2	161 49.3	6 24.4	192 56.9	21 52.8
2	208 26.2	17 37.0	341 20.2	191 56.2	6 23.9	222 58.4	21 52.2
4	238 26.3	17 35.7	11 25.1	222 3.1	6 23.5	252 59.9	21 51.7
6	268 26.4	17 34.4	41 30.0	252 10.0	6 23.1	283 1.4	21 51.1
8	298 26.5	17 33.1	71 35.0	282 17.0	6 22.6	313 2.9	21 50.5
10	328 26.6	17 31.8	101 39.9	312 23.9	6 22.2	343 4.3	21 49.9
12	358 26.7	17 30.5	131 44.8	342 30.9	6 21.8	13 5.8	21 49.3
14	28 26.8	17 29.2	161 49.7	12 37.9	6 21.4	43 7.3	21 48.7
16	58 26.9	17 27.9	191 54.7	42 44.9	6 21.0	73 8.8	21 48.1
18	88 27.0	17 26.6	221 59.6	72 51.9	6 20.6	103 10.3	21 47.5
20	118 27.1	17 25.2	252 4.5	102 59.0	6 20.2	133 11.8	21 46.9
22	148 27.2	17 23.9	282 9.5	133 6.0	6 19.8	163 13.2	21 46.3
Δ	1	−7		35	−2	7	−3

UT	MESEC				JUPITER		SATURN	
	$S_\leftmoon$	Δ	$\delta_\leftmoon$	Δ	$S_{\mathrm{♃}}$	$\delta_{\mathrm{♃}}$	$S_{\mathrm{♄}}$	$\delta_{\mathrm{♄}}$
h	° ′		° ′		° ′	° ′	° ′	° ′
0	325 1.5	81	4 18.5	−114	160 36.2	12 54.4	74 45.9	−17 50.9
2	353 55.7	82	3 55.8	−114	190 40.1	12 54.0	104 50.8	−17 50.9
4	22 50.1	82	3 33.0	−114	220 44.0	12 53.6	134 55.8	−17 50.9
6	51 44.5	83	3 10.2	−115	250 47.9	12 53.3	165 .7	−17 51.0
8	80 39.0	83	2 47.2	−115	280 51.8	12 52.9	195 5.6	−17 51.0
10	109 33.7	84	2 24.3	−115	310 55.7	12 52.5	225 10.5	−17 51.0
12	138 28.4	84	2 1.2	−115	340 59.6	12 52.2	255 15.5	−17 51.0
14	167 23.2	85	1 38.2	−115	11 3.5	12 51.8	285 20.4	−17 51.0
16	196 18.2	85	1 15.1	−115	41 7.4	12 51.4	315 25.3	−17 51.1
18	225 13.2	85	0 52.0	−115	71 11.3	12 51.1	345 30.2	−17 51.1
20	254 8.2	86	0 28.9	−115	101 15.2	12 50.7	15 35.2	−17 51.1
22	283 3.4	86	0 5.9	56	131 19.1	12 50.3	45 40.1	−17 51.1
Δ					20	−2	25	0

φ	SUNCE		TRAJANJE SUMRAKA		MESEC			
	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 44	20 26	0 59	: : :	21 5	1.0	8 56	2.1
55	4 12	19 60	0 45	: : :	21 5	1.2	8 53	2.1
50	4 32	19 40	0 38	2 31	21 5	1.4	8 51	2.1
45	4 47	19 25	0 33	2 4	21 6	1.5	8 49	2.2
40	4 60	19 12	0 30	1 47	21 6	1.6	8 47	2.2
35	5 11	19 1	0 28	1 37	21 6	1.7	8 46	2.2
30	5 20	18 52	0 26	1 29	21 6	1.8	8 44	2.2
20	5 36	18 36	0 23	1 19	21 6	2.0	8 42	2.2
10	5 50	18 22	0 22	1 14	21 6	2.1	8 40	2.2
0	6 3	18 10	0 22	1 12	21 7	2.2	8 38	2.2
10	6 15	17 57	0 22	1 13	21 7	2.4	8 36	2.3
20	6 29	17 44	0 23	1 16	21 7	2.5	8 34	2.3
30	6 44	17 28	0 25	1 22	21 7	2.6	8 32	2.3
35	6 53	17 20	0 27	1 27	21 7	2.7	8 30	2.3
40	7 3	17 10	0 29	1 33	21 8	2.8	8 29	2.3
45	7 15	16 58	0 31	1 41	21 8	3.0	8 27	2.4
50	7 29	16 44	0 35	1 52	21 8	3.1	8 24	2.4
55	7 47	16 26	0 40	2 7	21 8	3.3	8 22	2.4
60	8 11	16 2	0 48	2 28	21 9	3.5	8 18	2.4
S								

SUNCE				MESEC			
UT	e = T_p − UT	Δ/24	r	Prolaz	Δ/24	$\pi_\leftmoon$	r
h	min s	s	′	h min	min	′	′
00	− 6 15.5	.2	15.8	$T_{\overline{m}}$ 2 25	2.2	60.5	16.5
12	− 6 13.1	$T_{\overline{m}_\odot}$ 12 h 6.2 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	′	°	
♀	13 10	.1	211	−6.5	♃	13 16	.0	209	−1.3
♂	11 8	.1	242	1.8	♄	18 58	.0	124	.6

UT	SUNCE		PROLEĆ. TAČKA	VENERA		MARS	
	$S_\odot$	$\delta_\odot$	S_Υ	S_φ	δ_φ	S_σ	δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	178 27.3	17 22.6	312 14.4	163 13.1	6 19.5	193 14.7	21 45.7
2	208 27.5	17 21.3	342 19.3	193 20.1	6 19.1	223 16.2	21 45.1
4	238 27.6	17 20.0	12 24.2	223 27.2	6 18.8	253 17.7	21 44.5
6	268 27.7	17 18.7	42 29.2	253 34.3	6 18.4	283 19.2	21 43.9
8	298 27.8	17 17.3	72 34.1	283 41.4	6 18.1	313 20.7	21 43.3
10	328 27.9	17 16.0	102 39.0	313 48.5	6 17.7	343 22.2	21 42.7
12	358 28.0	17 14.7	132 44.0	343 55.7	6 17.4	13 23.7	21 42.1
14	28 28.1	17 13.3	162 48.9	14 2.8	6 17.1	43 25.2	21 41.5
16	58 28.2	17 12.0	192 53.8	44 10.0	6 16.7	73 26.6	21 40.9
18	88 28.4	17 10.7	222 58.7	74 17.2	6 16.4	103 28.1	21 40.3
20	118 28.5	17 9.3	253 3.7	104 24.3	6 16.1	133 29.6	21 39.7
22	148 28.6	17 8.0	283 8.6	134 31.5	6 15.8	163 31.1	21 39.1
Δ	1	−7		36	−2	7	−3

UT	MESEC				JUPITER		SATURN	
	$S_\leftmoon$	Δ	$\delta_\leftmoon$	Δ	$S_{\mathrm{♃}}$	$\delta_{\mathrm{♃}}$	$S_{\mathrm{♄}}$	$\delta_{\mathrm{♄}}$
h	° ′		° ′		° ′	° ′	° ′	° ′
0	311 58.6	87	0 17.2	115	161 23.0	12 50.0	75 45.0	−17 51.2
2	340 53.9	87	0 40.2	115	191 26.9	12 49.6	105 49.9	−17 51.2
4	9 49.3	87	1 3.1	115	221 30.9	12 49.2	135 54.8	−17 51.2
6	38 44.8	88	1 26.1	114	251 34.8	12 48.9	165 59.7	−17 51.2
8	67 40.3	88	1 48.9	114	281 38.7	12 48.5	196 4.7	−17 51.3
10	96 35.8	88	2 11.7	113	311 42.6	12 48.1	226 9.6	−17 51.3
12	125 31.5	88	2 34.4	113	341 46.5	12 47.7	256 14.5	−17 51.3
14	154 27.1	89	2 57.0	112	11 50.4	12 47.4	286 19.4	−17 51.3
16	183 22.9	89	3 19.5	112	41 54.3	12 47.0	316 24.3	−17 51.4
18	212 18.6	89	3 41.8	111	71 58.2	12 46.6	346 29.2	−17 51.4
20	241 14.4	89	4 4.1	111	102 2.1	12 46.3	16 34.1	−17 51.4
22	270 10.3	89	4 26.2	110	132 6.0	12 45.9	46 39.1	−17 51.4
Δ					20	−2	25	0

φ	SUNCE		TRAJANJE SUMRAKA		MESEC			
	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 47	20 24	0 58	: : :	21 29	.9	9 47	3.6
55	4 13	19 58	0 45	: : :	21 34	1.1	9 44	3.4
50	4 33	19 38	0 38	2 30	21 39	1.3	9 42	3.2
45	4 48	19 23	0 33	2 3	21 42	1.5	9 41	3.0
40	5 1	19 11	0 30	1 47	21 45	1.6	9 39	2.9
35	5 11	19 0	0 28	1 36	21 47	1.7	9 38	2.8
30	5 21	18 51	0 26	1 29	21 49	1.8	9 37	2.7
20	5 36	18 36	0 23	1 19	21 53	1.9	9 35	2.5
10	5 50	18 22	0 22	1 14	21 57	2.1	9 33	2.4
0	6 3	18 10	0 22	1 12	21 60	2.2	9 32	2.2
10	6 15	17 57	0 22	1 13	22 3	2.3	9 30	2.1
20	6 28	17 44	0 23	1 16	22 7	2.5	9 29	1.9
30	6 44	17 29	0 25	1 22	22 11	2.7	9 27	1.8
35	6 52	17 20	0 27	1 27	22 13	2.8	9 26	1.7
40	7 2	17 11	0 29	1 33	22 16	2.9	9 25	1.6
45	7 14	16 59	0 31	1 41	22 19	3.0	9 23	1.4
50	7 27	16 45	0 35	1 52	22 23	3.1	9 21	1.3
55	7 45	16 28	0 40	2 6	22 27	3.3	9 19	1.1
60	8 8	16 5	0 48	2 27	22 33	3.6	9 17	.9
S								

SUNCE				MESEC			
UT	e = T_p − UT	Δ/24	r	Prolaz	Δ/24	$\pi_\leftmoon$	r
h	min s	s	′	h min	min	′	′
00	− 6 10.6	.2	15.8	$T_{\overline{m}}$ 3 19	2.3	60.2	16.4
12	− 6 7.9	$T_{\overline{m}_\odot}$ 12 h 6.1 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 4	.1	211	−6.5	♃	13 13	.0	209	−1.3
♂	11 6	.1	241	1.8	♄	18 54	.0	124	.6

UT	SUNCE		PROLEĆ. TAČKA	VENERA		MARS	
	$S_\odot$	$\delta_\odot$	S_Υ	S_φ	δ_φ	S_σ	δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	178 28.7	17 6.7	313 13.5	164 38.8	6 15.5	193 32.6	21 38.5
2	208 28.8	17 5.3	343 18.5	194 46.0	6 15.2	223 34.1	21 37.9
4	238 29.0	17 4.0	13 23.4	224 53.2	6 15.0	253 35.6	21 37.3
6	268 29.1	17 2.6	43 28.3	255 .5	6 14.7	283 37.1	21 36.7
8	298 29.2	17 1.3	73 33.2	285 7.7	6 14.4	313 38.6	21 36.0
10	328 29.3	16 59.9	103 38.2	315 15.0	6 14.2	343 40.1	21 35.4
12	358 29.5	16 58.6	133 43.1	345 22.3	6 13.9	13 41.6	21 34.8
14	28 29.6	16 57.2	163 48.0	15 29.6	6 13.7	43 43.1	21 34.2
16	58 29.7	16 55.9	193 52.9	45 36.9	6 13.4	73 44.6	21 33.6
18	88 29.8	16 54.5	223 57.9	75 44.2	6 13.2	103 46.1	21 33.0
20	118 30.0	16 53.2	254 2.8	105 51.5	6 13.0	133 47.6	21 32.3
22	148 30.1	16 51.8	284 7.7	135 58.9	6 12.7	163 49.1	21 31.7
Δ	1	−7		36	−1	7	−3

UT	MESEC				JUPITER		SATURN	
	$S_\leftmoon$	Δ	$\delta_\leftmoon$	Δ	$S_{\text{♃}}$	$\delta_{\text{♃}}$	$S_{\text{♄}}$	$\delta_{\text{♄}}$
h	° ′		° ′		° ′	° ′	° ′	° ′
0	299 6.2	90	4 48.2	109	162 9.9	12 45.5	76 44.0	−17 51.4
2	328 2.1	90	5 10.0	108	192 13.8	12 45.2	106 48.9	−17 51.5
4	356 58.0	90	5 31.7	108	222 17.7	12 44.8	136 53.8	−17 51.5
6	25 54.0	90	5 53.2	107	252 21.6	12 44.4	166 58.7	−17 51.5
8	54 50.0	90	6 14.6	106	282 25.5	12 44.1	197 3.6	−17 51.5
10	83 46.0	90	6 35.7	105	312 29.4	12 43.7	227 8.5	−17 51.6
12	112 42.0	90	6 56.7	104	342 33.3	12 43.3	257 13.4	−17 51.6
14	141 38.0	90	7 17.4	103	12 37.2	12 43.0	287 18.3	−17 51.6
16	170 34.1	90	7 38.0	102	42 41.1	12 42.6	317 23.2	−17 51.7
18	199 30.2	90	7 58.3	101	72 45.0	12 42.2	347 28.1	−17 51.7
20	228 26.2	90	8 18.4	99	102 48.9	12 41.8	17 33.0	−17 51.7
22	257 22.3	90	8 38.3	98	132 52.8	12 41.5	47 37.9	−17 51.7
Δ					20	−2	25	0

φ	SUNCE		TRAJANJE SUMRAKA		MESEC			
	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 49	20 21	0 57	: ::	21 50	1.0	11 14	3.5
55	4 15	19 56	0 45	3 48	22 1	1.2	11 5	3.3
50	4 34	19 37	0 38	2 28	22 10	1.4	10 59	3.1
45	4 49	19 22	0 33	2 2	22 17	1.5	10 53	2.9
40	5 2	19 10	0 30	1 46	22 23	1.6	10 49	2.8
35	5 12	18 59	0 27	1 36	22 28	1.7	10 45	2.7
30	5 21	18 51	0 26	1 28	22 32	1.8	10 41	2.6
20	5 37	18 35	0 23	1 19	22 40	2.0	10 35	2.5
10	5 50	18 22	0 22	1 14	22 47	2.1	10 30	2.3
0	6 3	18 9	0 22	1 12	22 53	2.2	10 25	2.2
10	6 15	17 57	0 22	1 12	22 60	2.3	10 20	2.1
20	6 28	17 44	0 23	1 16	23 6	2.2	10 15	1.9
30	6 43	17 30	0 25	1 22	23 14	2.2	10 9	1.8
35	6 51	17 21	0 27	1 27	23 19	2.2	10 6	1.7
40	7 1	17 12	0 29	1 33	23 24	2.2	10 2	1.6
45	7 12	17 0	0 31	1 41	23 31	2.2	9 57	1.5
50	7 26	16 47	0 35	1 52	23 38	2.3	9 52	1.3
55	7 43	16 30	0 40	2 6	23 47	2.3	9 46	1.2
60	8 6	16 7	0 47	2 27	23 59	2.3	9 37	.9
S								

SUNCE				MESEC			
UT	e = T_p − UT	Δ/24	r	Prolaz	Δ/24	$\pi_\leftmoon$	r
h	min s	s	′	h min	min	′	′
00	− 6 5.1	.3	15.8	$T_{\overline{m}}$ 4 13	2.2	59.8	16.3
12	− 6 2.1	$T_{\overline{m}_\odot}$ 12 h 6.0 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	′	°	
♀	12 58	.1	211	−6.6	♃	13 10	.0	209	−1.3
♂	11 5	.1	240	1.8	♄	18 50	.0	123	.7

UT	SUNCE		PROLEĆ. TAČKA	VENERA		MARS	
	$S_\odot$	$\delta_\odot$	S_Υ	S_φ	δ_φ	S_σ	δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	178 30.2	16 50.4	314 12.7	166 6.3	6 12.5	193 50.6	21 31.1
2	208 30.4	16 49.1	344 17.6	196 13.6	6 12.3	223 52.1	21 30.5
4	238 30.5	16 47.7	14 22.5	226 21.0	6 12.1	253 53.6	21 29.8
6	268 30.6	16 46.4	44 27.4	256 28.4	6 11.9	283 55.1	21 29.2
8	298 30.8	16 45.0	74 32.4	286 35.8	6 11.7	313 56.6	21 28.6
10	328 30.9	16 43.6	104 37.3	316 43.2	6 11.6	343 58.1	21 28.0
12	358 31.0	16 42.2	134 42.2	346 50.6	6 11.4	13 59.7	21 27.3
14	28 31.2	16 40.9	164 47.2	16 58.1	6 11.2	44 1.2	21 26.7
16	58 31.3	16 39.5	194 52.1	47 5.5	6 11.1	74 2.7	21 26.1
18	88 31.5	16 38.1	224 57.0	77 13.0	6 10.9	104 4.2	21 25.4
20	118 31.6	16 36.7	255 1.9	107 20.5	6 10.8	134 5.7	21 24.8
22	148 31.8	16 35.3	285 6.9	137 27.9	6 10.6	164 7.2	21 24.2
Δ	1	−7		37	−1	8	−3

UT	MESEC				JUPITER		SATURN	
	$S_\leftmoon$	Δ	$\delta_\leftmoon$	Δ	$S_{\text{♃}}$	$\delta_{\text{♃}}$	$S_{\text{♄}}$	$\delta_{\text{♄}}$
h	° ′		° ′		° ′	° ′	° ′	° ′
0	286 18.3	90	8 57.9	97	162 56.8	12 41.1	77 42.8	−17 51.8
2	315 14.4	90	9 17.3	96	193 .7	12 40.7	107 47.7	−17 51.8
4	344 10.5	90	9 36.4	94	223 4.6	12 40.4	137 52.6	−17 51.8
6	13 6.5	90	9 55.3	93	253 8.5	12 40.0	167 57.5	−17 51.8
8	42 2.6	90	10 13.9	92	283 12.4	12 39.6	198 2.4	−17 51.9
10	70 58.6	90	10 32.2	90	313 16.3	12 39.2	228 7.3	−17 51.9
12	99 54.6	90	10 50.3	89	343 20.2	12 38.9	258 12.2	−17 51.9
14	128 50.7	90	11 8.0	87	13 24.1	12 38.5	288 17.1	−17 51.9
16	157 46.7	90	11 25.5	86	43 28.0	12 38.1	318 22.0	−17 52.0
18	186 42.6	90	11 42.6	84	73 31.9	12 37.8	348 26.9	−17 52.0
20	215 38.6	90	11 59.5	83	103 35.8	12 37.4	18 31.8	−17 52.0
22	244 34.6	90	12 16.0	81	133 39.7	12 37.0	48 36.7	−17 52.1
Δ					20	−2	24	0

φ	SUNCE		TRAJANJE SUMRAKA		MESEC			
	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 52	20 19	0 56	: ::	22 15	1.2	12 39	3.4
55	4 17	19 54	0 44	3 35	22 31	1.4	12 24	3.1
50	4 36	19 35	0 38	2 27	22 44	1.6	12 13	3.0
45	4 51	19 21	0 33	2 1	22 54	1.7	12 4	2.8
40	5 3	19 9	0 30	1 46	23 2	1.8	11 56	2.7
35	5 13	18 59	0 27	1 36	23 9	1.8	11 50	2.6
30	5 22	18 50	0 26	1 28	23 16	2.2	11 44	2.6
20	5 37	18 35	0 23	1 19	23 27	2.2	11 35	2.4
10	5 50	18 22	0 22	1 14	23 37	2.2	11 26	2.3
0	6 2	18 9	0 22	1 12	23 46	2.2	11 18	2.2
10	6 15	17 57	0 22	1 12	23 55	2.2	11 10	2.1
20	6 27	17 45	0 23	1 16	23 60	2.5	11 2	2.0
30	6 42	17 30	0 25	1 22	. . .	.0	10 52	1.9
35	6 50	17 22	0 27	1 27	. . .	.0	10 47	1.8
40	6 60	17 12	0 29	1 33	. . .	.0	10 40	1.7
45	7 11	17 1	0 31	1 41	. . .	.0	10 33	1.6
50	7 24	16 48	0 35	1 51	. . .	.0	10 24	1.5
55	7 41	16 31	0 40	2 6	. . .	.0	10 14	1.3
60	8 4	16 9	0 47	2 26	. . .	.0	9 60	1.1
S								

SUNCE				MESEC			
UT	e = T_p − UT	Δ/24	r	Prolaz	Δ/24	$\pi_\leftmoon$	r
h	min s	s	′	h min	min	′	′
00	− 5 59.1	.3	15.8	$T_{\overline{m}}$ 5 6	2.2	59.3	16.1
12	− 5 55.7	$T_{\overline{m}_\odot}$ 12 h 5.9 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	′	°	
♀	12 52	.1	212	−6.6	♃	13 7	.0	209	−1.3
♂	11 4	.1	240	1.8	♄	18 46	.0	123	.7

UT	SUNCE		PROLEĆ. TAČKA	VENERA		MARS	
	$S_\odot$	$\delta_\odot$	S_Υ	S_φ	δ_φ	S_σ	δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	178 31.9	16 34.0	315 11.8	167 35.4	6 10.5	194 8.7	21 23.5
2	208 32.0	16 32.6	345 16.7	197 42.9	6 10.4	224 10.2	21 22.9
4	238 32.2	16 31.2	15 21.7	227 50.4	6 10.3	254 11.7	21 22.3
6	268 32.3	16 29.8	45 26.6	257 58.0	6 10.1	284 13.2	21 21.6
8	298 32.5	16 28.4	75 31.5	288 5.5	6 10.0	314 14.8	21 21.0
10	328 32.6	16 27.0	105 36.4	318 13.0	6 9.9	344 16.3	21 20.3
12	358 32.8	16 25.6	135 41.4	348 20.6	6 9.8	14 17.8	21 19.7
14	28 32.9	16 24.2	165 46.3	18 28.2	6 9.8	44 19.3	21 19.0
16	58 33.1	16 22.8	195 51.2	48 35.7	6 9.7	74 20.8	21 18.4
18	88 33.2	16 21.4	225 56.2	78 43.3	6 9.6	104 22.3	21 17.8
20	118 33.4	16 20.0	256 1.1	108 50.9	6 9.5	134 23.9	21 17.1
22	148 33.5	16 18.6	286 6.0	138 58.5	6 9.5	164 25.4	21 16.5
Δ	1	−7		38	0	8	−3

UT	MESEC				JUPITER		SATURN	
	$S_\leftmoon$	Δ	$\delta_\leftmoon$	Δ	$S_{\text{♃}}$	$\delta_{\text{♃}}$	$S_{\text{♄}}$	$\delta_{\text{♄}}$
h	° ′		° ′		° ′	° ′	° ′	° ′
0	273 30.5	90	12 32.3	80	163 43.6	12 36.7	78 41.6	−17 52.1
2	302 26.5	90	12 48.2	78	193 47.5	12 36.3	108 46.5	−17 52.1
4	331 22.4	89	13 3.7	76	223 51.4	12 35.9	138 51.4	−17 52.1
6	0 18.3	89	13 19.0	75	253 55.3	12 35.5	168 56.3	−17 52.2
8	29 14.1	89	13 33.9	73	283 59.2	12 35.2	199 1.2	−17 52.2
10	58 10.0	89	13 48.4	71	314 3.1	12 34.8	229 6.1	−17 52.2
12	87 5.8	89	14 2.7	69	344 7.0	12 34.4	259 11.0	−17 52.3
14	116 1.7	89	14 16.5	68	14 10.9	12 34.0	289 15.8	−17 52.3
16	144 57.5	89	14 30.0	66	44 14.8	12 33.7	319 20.7	−17 52.3
18	173 53.3	89	14 43.2	64	74 18.7	12 33.3	349 25.6	−17 52.4
20	202 49.1	89	14 55.9	62	104 22.6	12 32.9	19 30.5	−17 52.4
22	231 44.9	89	15 8.3	60	134 26.5	12 32.6	49 35.4	−17 52.4
Δ					20	−2	24	0

φ	SUNCE		TRAJANJE SUMRAKA		MESEC			
	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 54	20 16	0 56	: : :	22 43	1.5	13 59	3.1
55	4 19	19 51	0 44	3 27	23 5	1.6	13 39	2.9
50	4 37	19 33	0 37	2 25	23 21	2.2	13 24	2.8
45	4 52	19 19	0 33	2 0	23 34	2.2	13 12	2.7
40	5 4	19 7	0 30	1 45	23 44	2.2	13 2	2.6
35	5 14	18 58	0 27	1 35	23 54	2.2	12 53	2.5
30	5 22	18 49	0 26	1 28	. . .	.0	12 46	2.5
20	5 37	18 34	0 23	1 19	. . .	.0	12 33	2.4
10	5 50	18 21	0 22	1 14	. . .	.0	12 22	2.3
0	6 2	18 9	0 22	1 12	. . .	.0	12 11	2.2
10	6 14	17 57	0 22	1 12	. . .	.0	12 1	2.1
20	6 27	17 45	0 23	1 15	. . .	.0	11 50	2.1
30	6 41	17 31	0 25	1 22	0 17	2.5	11 37	2.0
35	6 49	17 23	0 26	1 26	0 24	2.6	11 30	1.9
40	6 59	17 13	0 28	1 33	0 31	2.7	11 21	1.8
45	7 10	17 3	0 31	1 41	0 40	2.8	11 11	1.7
50	7 23	16 50	0 35	1 51	0 51	2.9	10 60	1.6
55	7 39	16 33	0 40	2 5	1 4	3.0	10 45	1.5
60	8 1	16 11	0 47	2 26	1 22	3.2	10 26	1.3
S								

SUNCE				MESEC			
UT	e = T_p − UT	Δ/24	r	Prolaz	Δ/24	$\pi_\leftmoon$	r
h	min s	s	′	h min	min	′	′
00	− 5 52.4	.3	15.8	$T_{\overline{m}}$ 5 59	2.2	58.6	16.0
12	− 5 48.8	$T_{\overline{m}_\odot}$ 12 h 5.8 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	′	°	
♀	12 46	.1	212	−6.6	♃	13 3	.0	209	−1.3
♂	11 3	.1	239	1.8	♄	18 42	.0	123	.7

UT	SUNCE		PROLEĆ. TAČKA	VENERA		MARS	
	$S_\odot$	$\delta_\odot$	S_Υ	S_φ	δ_φ	S_σ	δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	178 33.7	16 17.2	316 10.9	169 6.1	6 9.4	194 26.9	21 15.8
2	208 33.9	16 15.8	346 15.9	199 13.8	6 9.4	224 28.4	21 15.2
4	238 34.0	16 14.4	16 20.8	229 21.4	6 9.3	254 29.9	21 14.5
6	268 34.2	16 13.0	46 25.7	259 29.0	6 9.3	284 31.5	21 13.9
8	298 34.3	16 11.5	76 30.7	289 36.7	6 9.3	314 33.0	21 13.2
10	328 34.5	16 10.1	106 35.6	319 44.3	6 9.3	344 34.5	21 12.6
12	358 34.7	16 8.7	136 40.5	349 52.0	6 9.2	14 36.0	21 11.9
14	28 34.8	16 7.3	166 45.4	19 59.7	6 9.2	44 37.6	21 11.2
16	58 35.0	16 5.9	196 50.4	50 7.4	6 9.2	74 39.1	21 10.6
18	88 35.2	16 4.4	226 55.3	80 15.1	6 9.2	104 40.6	21 9.9
20	118 35.3	16 3.0	257 .2	110 22.8	6 9.3	134 42.1	21 9.3
22	148 35.5	16 1.6	287 5.2	140 30.5	6 9.3	164 43.7	21 8.6
Δ	1	−7		38	0	8	−3

UT	MESEC				JUPITER		SATURN	
	$S_\leftmoon$	Δ	$\delta_\leftmoon$	Δ	$S_{\text{♃}}$	$\delta_{\text{♃}}$	$S_{\text{♄}}$	$\delta_{\text{♄}}$
h	° ′		° ′		° ′	° ′	° ′	° ′
0	260 40.6	89	15 20.4	58	164 30.4	12 32.2	79 40.3	−17 52.4
2	289 36.4	89	15 32.0	56	194 34.3	12 31.8	109 45.2	−17 52.5
4	318 32.2	89	15 43.3	54	224 38.2	12 31.4	139 50.1	−17 52.5
6	347 27.9	89	15 54.2	53	254 42.1	12 31.1	169 54.9	−17 52.5
8	16 23.7	89	16 4.7	51	284 46.0	12 30.7	199 59.8	−17 52.6
10	45 19.5	89	16 14.9	49	314 49.9	12 30.3	230 4.7	−17 52.6
12	74 15.2	89	16 24.6	47	344 53.8	12 29.9	260 9.6	−17 52.6
14	103 11.0	89	16 33.9	45	14 57.7	12 29.6	290 14.5	−17 52.7
16	132 6.8	89	16 42.9	43	45 1.6	12 29.2	320 19.3	−17 52.7
18	161 2.6	89	16 51.4	41	75 5.5	12 28.8	350 24.2	−17 52.7
20	189 58.4	89	16 59.6	39	105 9.4	12 28.5	20 29.1	−17 52.7
22	218 54.3	89	17 7.3	37	135 13.3	12 28.1	50 34.0	−17 52.8
Δ					19	−2	24	0

φ	SUNCE		TRAJANJE SUMRAKA		MESEC			
	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 56	20 13	0 55	: : :	23 19	2.2	15 13	2.7
55	4 21	19 49	0 44	3 20	23 44	2.2	14 49	2.6
50	4 39	19 32	0 37	2 24	. . .	.0	14 31	2.5
45	4 53	19 18	0 33	1 60	. . .	.0	14 16	2.5
40	5 5	19 6	0 30	1 45	. . .	.0	14 4	2.4
35	5 14	18 57	0 27	1 35	. . .	.0	13 54	2.4
30	5 23	18 48	0 26	1 28	0 2	2.0	13 46	2.4
20	5 38	18 33	0 23	1 18	0 15	2.1	13 30	2.3
10	5 50	18 21	0 22	1 13	0 28	2.2	13 17	2.3
0	6 2	18 9	0 22	1 12	0 39	2.2	13 5	2.2
10	6 14	17 58	0 22	1 12	0 51	2.3	12 52	2.2
20	6 26	17 45	0 23	1 15	1 3	2.3	12 39	2.1
30	6 40	17 31	0 25	1 22	1 17	2.4	12 24	2.1
35	6 48	17 23	0 26	1 26	1 26	2.5	12 15	2.0
40	6 58	17 14	0 28	1 32	1 35	2.5	12 5	2.0
45	7 8	17 4	0 31	1 40	1 46	2.6	11 53	1.9
50	7 21	16 51	0 35	1 51	1 60	2.7	11 39	1.9
55	7 37	16 35	0 39	2 5	2 17	2.8	11 21	1.8
60	7 59	16 14	0 47	2 25	2 40	2.9	10 57	1.6
S								

SUNCE				MESEC			
UT	e = T_p − UT	Δ/24	r	Prolaz	Δ/24	$\pi_\leftmoon$	r
h	min s	s	′	h min	min	′	′
00	− 5 45.2	.3	15.8	$T_{\overline{m}}$ 6 52	2.2	58.0	15.8
12	− 5 41.3	$T_{\overline{m}_\odot}$ 12 h 5.7 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	′	°	
♀	12 40	.1	213	−6.6	♃	13 0	.0	208	−1.3
♂	11 2	.1	238	1.8	♄	18 38	.0	123	.7

UT	SUNCE		PROLEĆ. TAČKA	VENERA		MARS	
	$S_\odot$	$\delta_\odot$	S_Υ	S_φ	δ_φ	S_σ	δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	178 35.6	16 .2	317 10.1	170 38.2	6 9.3	194 45.2	21 7.9
2	208 35.8	15 58.7	347 15.0	200 45.9	6 9.3	224 46.7	21 7.3
4	238 36.0	15 57.3	17 19.9	230 53.7	6 9.4	254 48.3	21 6.6
6	268 36.2	15 55.9	47 24.9	261 1.4	6 9.4	284 49.8	21 6.0
8	298 36.3	15 54.4	77 29.8	291 9.2	6 9.5	314 51.3	21 5.3
10	328 36.5	15 53.0	107 34.7	321 16.9	6 9.5	344 52.8	21 4.6
12	358 36.7	15 51.6	137 39.6	351 24.7	6 9.6	14 54.4	21 4.0
14	28 36.9	15 50.1	167 44.6	21 32.5	6 9.7	44 55.9	21 3.3
16	58 37.0	15 48.7	197 49.5	51 40.3	6 9.7	74 57.4	21 2.6
18	88 37.2	15 47.2	227 54.4	81 48.1	6 9.8	104 59.0	21 1.9
20	118 37.4	15 45.8	257 59.4	111 55.9	6 9.9	135 .5	21 1.3
22	148 37.6	15 44.3	288 4.3	142 3.7	6 10.0	165 2.1	21 .6
Δ	1	−7		39	0	8	−3

UT	MESEC				JUPITER		SATURN	
	$S_\leftmoon$	Δ	$\delta_\leftmoon$	Δ	S_{4}	δ_{4}	S_{5}	δ_{5}
h	° ′		° ′		° ′	° ′	° ′	° ′
0	247 50.1	89	17 14.7	35	165 17.2	12 27.7	80 38.9	−17 52.8
2	276 46.0	90	17 21.6	33	195 21.1	12 27.3	110 43.7	−17 52.8
4	305 41.9	90	17 28.1	31	225 25.0	12 27.0	140 48.6	−17 52.9
6	334 37.9	90	17 34.3	29	255 28.9	12 26.6	170 53.5	−17 52.9
8	3 33.9	90	17 40.0	27	285 32.8	12 26.2	200 58.4	−17 52.9
10	32 29.9	90	17 45.3	25	315 36.7	12 25.8	231 3.2	−17 53.0
12	61 26.0	91	17 50.2	22	345 40.6	12 25.5	261 8.1	−17 53.0
14	90 22.1	91	17 54.7	20	15 44.5	12 25.1	291 13.0	−17 53.0
16	119 18.3	91	17 58.8	18	45 48.4	12 24.7	321 17.8	−17 53.1
18	148 14.6	92	18 2.5	16	75 52.3	12 24.3	351 22.7	−17 53.1
20	177 10.9	92	18 5.7	14	105 56.2	12 24.0	21 27.6	−17 53.1
22	206 7.3	92	18 8.6	12	136 .1	12 23.6	51 32.5	−17 53.2
Δ					19	−2	24	0

φ	SUNCE		TRAJANJE SUMRAKA		MESEC			
	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 59	20 11	0 54	: ::	. . . .	.0	16 19	2.3
55	4 23	19 47	0 44	3 15	. . . .	.0	15 52	2.3
50	4 40	19 30	0 37	2 22	0 3	2.0	15 32	2.3
45	4 54	19 16	0 33	1 59	0 18	2.0	15 16	2.3
40	5 5	19 5	0 30	1 44	0 30	2.0	15 3	2.2
35	5 15	18 55	0 27	1 35	0 40	2.1	14 52	2.2
30	5 24	18 47	0 25	1 27	0 50	2.1	14 42	2.2
20	5 38	18 33	0 23	1 18	1 6	2.1	14 26	2.2
10	5 51	18 20	0 22	1 13	1 19	2.2	14 11	2.2
0	6 2	18 9	0 21	1 11	1 32	2.2	13 58	2.2
10	6 14	17 58	0 22	1 12	1 46	2.2	13 44	2.2
20	6 26	17 46	0 23	1 15	1 60	2.3	13 30	2.2
30	6 39	17 32	0 25	1 21	2 16	2.3	13 13	2.1
35	6 47	17 24	0 26	1 26	2 25	2.3	13 4	2.1
40	6 56	17 15	0 28	1 32	2 36	2.3	12 53	2.1
45	7 7	17 5	0 31	1 40	2 49	2.4	12 40	2.1
50	7 19	16 52	0 34	1 51	3 4	2.4	12 24	2.1
55	7 35	16 37	0 39	2 5	3 24	2.5	12 4	2.1
60	7 56	16 16	0 46	2 25	3 50	2.5	11 37	2.0
S								

SUNCE				MESEC			
UT	e = T_p − UT	Δ/24	r	Prolaz	Δ/24	$\pi_\leftmoon$	r
h	min s	s	′	h min	min	′	′
00	− 5 37.4	.3	15.8	$T_{\overline{m}}$ 7 45	2.2	57.3	15.6
12	− 5 33.2	$T_{\overline{m}_\odot}$ 12 h 5.6 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	′	°	
♀	12 34	.1	213	−6.6	♃	12 57	.0	208	−1.3
♂	11 0	.1	238	1.8	♄	18 34	.0	123	.7

UT	SUNCE		PROLEĆ. TAČKA	VENERA		MARS	
	$S_\odot$	$\delta_\odot$	S_Υ	S_φ	δ_φ	S_σ	δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	178 37.7	15 42.9	318 9.2	172 11.5	6 10.1	195 3.6	20 59.9
2	208 37.9	15 41.4	348 14.1	202 19.3	6 10.2	225 5.1	20 59.3
4	238 38.1	15 40.0	18 19.1	232 27.1	6 10.3	255 6.7	20 58.6
6	268 38.3	15 38.5	48 24.0	262 35.0	6 10.5	285 8.2	20 57.9
8	298 38.5	15 37.1	78 28.9	292 42.8	6 10.6	315 9.7	20 57.2
10	328 38.6	15 35.6	108 33.9	322 50.7	6 10.7	345 11.3	20 56.5
12	358 38.8	15 34.1	138 38.8	352 58.5	6 10.9	15 12.8	20 55.9
14	28 39.0	15 32.7	168 43.7	23 6.4	6 11.0	45 14.4	20 55.2
16	58 39.2	15 31.2	198 48.6	53 14.3	6 11.2	75 15.9	20 54.5
18	88 39.4	15 29.8	228 53.6	83 22.1	6 11.3	105 17.5	20 53.8
20	118 39.6	15 28.3	258 58.5	113 30.0	6 11.5	135 19.0	20 53.1
22	148 39.8	15 26.8	289 3.4	143 37.9	6 11.7	165 20.5	20 52.4
Δ	1	−7		39	1	8	−3

UT	MESEC				JUPITER		SATURN	
	$S_\leftmoon$	Δ	$\delta_\leftmoon$	Δ	S_{4}	δ_{4}	S_{5}	δ_{5}
h	° ′		° ′		° ′	° ′	° ′	° ′
0	235 3.7	93	18 11.0	10	166 4.0	12 23.2	81 37.3	−17 53.2
2	264 .2	93	18 13.1	8	196 7.9	12 22.8	111 42.2	−17 53.2
4	292 56.8	93	18 14.7	6	226 11.8	12 22.5	141 47.1	−17 53.3
6	321 53.5	94	18 16.0	4	256 15.6	12 22.1	171 51.9	−17 53.3
8	350 50.3	94	18 16.8	2	286 19.5	12 21.7	201 56.8	−17 53.3
10	19 47.2	95	18 17.2	0	316 23.4	12 21.3	232 1.7	−17 53.4
12	48 44.1	95	18 17.3	−2	346 27.3	12 21.0	262 6.5	−17 53.4
14	77 41.2	96	18 16.9	−4	16 31.2	12 20.6	292 11.4	−17 53.4
16	106 38.4	96	18 16.1	−6	46 35.1	12 20.2	322 16.3	−17 53.5
18	135 35.7	97	18 15.0	−8	76 39.0	12 19.8	352 21.1	−17 53.5
20	164 33.1	98	18 13.4	−10	106 42.9	12 19.4	22 26.0	−17 53.6
22	193 30.6	98	18 11.5	−12	136 46.8	12 19.1	52 30.8	−17 53.6
Δ					19	−2	24	0

φ	SUNCE		TRAJANJE SUMRAKA		MESEC			
	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 1	20 8	0 54	: ::	0 2	2.2	17 14	1.8
55	4 24	19 45	0 43	3 10	0 30	2.2	16 47	1.9
50	4 42	19 28	0 37	2 21	0 50	2.2	16 26	2.0
45	4 55	19 15	0 32	1 58	1 6	2.2	16 10	2.0
40	5 6	19 4	0 29	1 44	1 19	2.2	15 57	2.0
35	5 16	18 54	0 27	1 34	1 30	2.2	15 46	2.0
30	5 24	18 46	0 25	1 27	1 40	2.2	15 36	2.1
20	5 38	18 32	0 23	1 18	1 57	2.2	15 19	2.1
10	5 51	18 20	0 22	1 13	2 12	2.2	15 4	2.1
0	6 2	18 9	0 21	1 11	2 25	2.2	14 51	2.1
10	6 13	17 58	0 22	1 12	2 39	2.2	14 37	2.2
20	6 25	17 46	0 23	1 15	2 54	2.2	14 22	2.2
30	6 39	17 33	0 25	1 21	3 11	2.1	14 5	2.2
35	6 46	17 25	0 26	1 26	3 21	2.1	13 55	2.2
40	6 55	17 16	0 28	1 32	3 32	2.1	13 44	2.2
45	7 5	17 6	0 31	1 40	3 45	2.1	13 30	2.3
50	7 18	16 54	0 34	1 50	4 2	2.1	13 14	2.3
55	7 33	16 38	0 39	2 4	4 22	2.1	12 53	2.3
60	7 53	16 18	0 46	2 24	4 51	2.1	12 25	2.4
S								

SUNCE				MESEC			
UT	e = T_p − UT	Δ/24	r	Prolaz	Δ/24	$\pi_\leftmoon$	r
h	min s	s	′	h min	min	′	′
00	− 5 29.0	.4	15.8	$T_{\overline{m}}$ 8 38	2.2	56.7	15.5
12	− 5 24.6	$T_{\overline{m}_\odot}$ 12 h 5.4 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	′	°	
♀	12 28	.1	214	−6.6	♃	12 54	.0	208	−1.3
♂	10 59	.1	237	1.8	♄	18 31	.0	123	.7

UT	SUNCE		PROLEĆ. TAČKA	VENERA		MARS	
	$S_\odot$	$\delta_\odot$	S_Υ	S_φ	δ_φ	S_σ	δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	178 40.0	15 25.3	319 8.4	173 45.8	6 11.9	195 22.1	20 51.8
2	208 40.2	15 23.9	349 13.3	203 53.7	6 12.1	225 23.6	20 51.1
4	238 40.3	15 22.4	19 18.2	234 1.6	6 12.2	255 25.2	20 50.4
6	268 40.5	15 20.9	49 23.1	264 9.5	6 12.4	285 26.7	20 49.7
8	298 40.7	15 19.4	79 28.1	294 17.4	6 12.6	315 28.3	20 49.0
10	328 40.9	15 18.0	109 33.0	324 25.4	6 12.9	345 29.8	20 48.3
12	358 41.1	15 16.5	139 37.9	354 33.3	6 13.1	15 31.4	20 47.6
14	28 41.3	15 15.0	169 42.9	24 41.2	6 13.3	45 32.9	20 46.9
16	58 41.5	15 13.5	199 47.8	54 49.1	6 13.5	75 34.5	20 46.2
18	88 41.7	15 12.0	229 52.7	84 57.1	6 13.8	105 36.0	20 45.5
20	118 41.9	15 10.5	259 57.6	115 5.0	6 14.0	135 37.6	20 44.8
22	148 42.1	15 9.1	290 2.6	145 13.0	6 14.3	165 39.1	20 44.1
Δ	1	−7		40	1	8	−3

UT	MESEC				JUPITER		SATURN	
	$S_\leftmoon$	Δ	$\delta_\leftmoon$	Δ	$S_{\text{♃}}$	$\delta_{\text{♃}}$	$S_{\text{♄}}$	$\delta_{\text{♄}}$
h	° ′		° ′		° ′	° ′	° ′	° ′
0	222 28.2	99	18 9.2	−14	166 50.7	12 18.7	82 35.7	−17 53.6
2	251 26.0	99	18 6.5	−15	196 54.6	12 18.3	112 40.6	−17 53.7
4	280 23.9	100	18 3.4	−17	226 58.5	12 17.9	142 45.4	−17 53.7
6	309 21.9	101	17 59.9	−19	257 2.4	12 17.6	172 50.3	−17 53.7
8	338 20.1	102	17 56.0	−21	287 6.3	12 17.2	202 55.1	−17 53.8
10	7 18.4	102	17 51.8	−23	317 10.2	12 16.8	232 60.0	−17 53.8
12	36 16.9	103	17 47.2	−25	347 14.1	12 16.4	263 4.8	−17 53.8
14	65 15.5	104	17 42.3	−27	17 18.0	12 16.1	293 9.7	−17 53.9
16	94 14.2	105	17 37.0	−28	47 21.9	12 15.7	323 14.6	−17 53.9
18	123 13.2	105	17 31.3	−30	77 25.8	12 15.3	353 19.4	−17 54.0
20	152 12.2	106	17 25.2	−32	107 29.7	12 14.9	23 24.3	−17 54.0
22	181 11.5	107	17 18.9	−34	137 33.6	12 14.5	53 29.1	−17 54.0
Δ					19	−2	24	0

φ	SUNCE		TRAJANJE SUMRAKA		MESEC			
	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 4	20 5	0 53	: ::	0 55	2.5	17 59	1.5
55	4 26	19 43	0 43	3 6	1 22	2.4	17 33	1.6
50	4 43	19 26	0 37	2 19	1 43	2.4	17 13	1.7
45	4 56	19 13	0 32	1 57	1 59	2.3	16 58	1.8
40	5 7	19 3	0 29	1 43	2 12	2.3	16 46	1.8
35	5 17	18 53	0 27	1 34	2 23	2.3	16 35	1.9
30	5 25	18 45	0 25	1 27	2 32	2.2	16 26	1.9
20	5 39	18 32	0 23	1 18	2 49	2.2	16 9	2.0
10	5 51	18 20	0 22	1 13	3 4	2.1	15 55	2.0
0	6 2	18 9	0 21	1 11	3 17	2.1	15 42	2.1
10	6 13	17 58	0 22	1 12	3 31	2.1	15 29	2.1
20	6 25	17 46	0 23	1 15	3 46	2.0	15 14	2.2
30	6 38	17 33	0 25	1 21	4 2	2.0	14 58	2.2
35	6 45	17 26	0 26	1 26	4 12	2.0	14 48	2.3
40	6 54	17 17	0 28	1 32	4 23	1.9	14 38	2.3
45	7 4	17 7	0 31	1 40	4 36	1.9	14 25	2.4
50	7 16	16 55	0 34	1 50	4 52	1.8	14 9	2.4
55	7 31	16 40	0 39	2 4	5 13	1.7	13 49	2.5
60	7 51	16 21	0 46	2 24	5 40	1.6	13 22	2.7
S								

SUNCE				MESEC			
UT	$e=T_p-UT$	Δ/24	r	Prolaz		Δ/24	$\pi_\leftmoon$	r
h	min s	s	′	$T_{\overline{m}}$	h min	min	′	′
00	− 5 20.1	.4	15.8		9 30	2.1	56.2	15.3
12	− 5 15.4	$T_{\overline{m}_\odot}$ 12 h 5.3 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	′	°	
♀	12 22	.1	215	−6.7	♃	12 51	.0	208	−1.3
♂	10 58	.1	236	1.8	♄	18 27	.0	123	.7

UT	SUNCE		PROLEĆ. TAČKA	VENERA		MARS	
	$S_\odot$	$\delta_\odot$	S_Υ	S_φ	δ_φ	S_σ	δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	178 42.3	15 7.6	320 7.5	175 20.9	6 14.5	195 40.7	20 43.4
2	208 42.5	15 6.1	350 12.4	205 28.9	6 14.8	225 42.2	20 42.7
4	238 42.7	15 4.6	20 17.4	235 36.9	6 15.0	255 43.8	20 42.0
6	268 42.9	15 3.1	50 22.3	265 44.8	6 15.3	285 45.4	20 41.3
8	298 43.2	15 1.6	80 27.2	295 52.8	6 15.6	315 46.9	20 40.6
10	328 43.4	15 .1	110 32.1	326 .8	6 15.9	345 48.5	20 39.9
12	358 43.6	14 58.6	140 37.1	356 8.7	6 16.2	15 50.0	20 39.2
14	28 43.8	14 57.1	170 42.0	26 16.7	6 16.5	45 51.6	20 38.5
16	58 44.0	14 55.6	200 46.9	56 24.7	6 16.8	75 53.1	20 37.8
18	88 44.2	14 54.1	230 51.8	86 32.7	6 17.1	105 54.7	20 37.1
20	118 44.4	14 52.6	260 56.8	116 40.7	6 17.4	135 56.3	20 36.4
22	148 44.6	14 51.1	291 1.7	146 48.7	6 17.7	165 57.8	20 35.7
Δ	1	−8		40	1	8	−4

UT	MESEC				JUPITER		SATURN	
	$S_\leftmoon$	Δ	$\delta_\leftmoon$	Δ	$S_{\text{♃}}$	$\delta_{\text{♃}}$	$S_{\text{♄}}$	$\delta_{\text{♄}}$
h	° ′		° ′		° ′	° ′	° ′	° ′
0	210 10.8	108	17 12.1	−35	167 37.5	12 14.2	83 34.0	−17 54.1
2	239 10.4	109	17 5.1	−37	197 41.4	12 13.8	113 38.8	−17 54.1
4	268 10.1	109	16 57.7	−39	227 45.3	12 13.4	143 43.7	−17 54.1
6	297 10.0	110	16 49.9	−40	257 49.2	12 13.0	173 48.5	−17 54.2
8	326 10.1	111	16 41.8	−42	287 53.1	12 12.7	203 53.4	−17 54.2
10	355 10.3	112	16 33.5	−44	317 56.9	12 12.3	233 58.2	−17 54.3
12	24 10.7	113	16 24.7	−45	348 .8	12 11.9	264 3.1	−17 54.3
14	53 11.3	114	16 15.7	−47	18 4.7	12 11.5	294 7.9	−17 54.3
16	82 12.1	115	16 6.4	−48	48 8.6	12 11.1	324 12.8	−17 54.4
18	111 13.0	116	15 56.7	−50	78 12.5	12 10.8	354 17.6	−17 54.4
20	140 14.1	117	15 46.8	−51	108 16.4	12 10.4	24 22.5	−17 54.4
22	169 15.4	117	15 36.5	−53	138 20.3	12 10.0	54 27.3	−17 54.5
Δ					19	−2	24	0

φ	SUNCE		TRAJANJE SUMRAKA		MESEC			
	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 6	20 2	0 53	: ::	1 56	2.8	18 33	1.1
55	4 28	19 41	0 43	3 2	2 21	2.6	18 11	1.3
50	4 45	19 25	0 36	2 18	2 40	2.5	17 54	1.4
45	4 58	19 12	0 32	1 57	2 54	2.4	17 40	1.5
40	5 8	19 1	0 29	1 43	3 7	2.4	17 29	1.6
35	5 17	18 52	0 27	1 34	3 17	2.3	17 20	1.7
30	5 25	18 44	0 25	1 27	3 26	2.3	17 11	1.7
20	5 39	18 31	0 23	1 18	3 42	2.2	16 57	1.8
10	5 51	18 19	0 22	1 13	3 55	2.1	16 44	1.9
0	6 2	18 9	0 21	1 11	4 8	2.0	16 32	2.0
10	6 12	17 58	0 22	1 12	4 21	2.0	16 20	2.1
20	6 24	17 47	0 23	1 15	4 34	1.9	16 7	2.2
30	6 37	17 34	0 25	1 21	4 50	1.8	15 52	2.3
35	6 44	17 26	0 26	1 26	4 59	1.8	15 43	2.3
40	6 53	17 18	0 28	1 32	5 9	1.7	15 33	2.4
45	7 2	17 8	0 31	1 40	5 21	1.6	15 22	2.4
50	7 14	16 57	0 34	1 50	5 36	1.6	15 8	2.5
55	7 29	16 42	0 39	2 4	5 54	1.4	14 50	2.7
60	7 48	16 23	0 46	2 23	6 19	1.3	14 26	2.8
S								

SUNCE				MESEC			
UT	$e=T_p-UT$	Δ/24	r	Prolaz		Δ/24	$\pi_\leftmoon$	r
h	min s	s	′	$T_{\overline{m}}$	h min	min	′	′
00	− 5 10.7	.4	15.8		10 20	2.0	55.7	15.2
12	− 5 5.7	$T_{\overline{m}_\odot}$ 12 h 5.1 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	′	°	
♀	12 15	.1	215	−6.7	♃	12 48	.0	207	−1.3
♂	10 57	.1	236	1.8	♄	18 23	.0	123	.7

UT	SUNCE		PROLEĆ. TAČKA	VENERA		MARS	
	$S_\odot$	$\delta_\odot$	S_Υ	S_φ	δ_φ	S_σ	δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	178 44.8	14 49.5	321 6.6	176 56.7	6 18.0	195 59.4	20 35.0
2	208 45.1	14 48.0	351 11.6	207 4.7	6 18.4	226 1.0	20 34.3
4	238 45.3	14 46.5	21 16.5	237 12.7	6 18.7	256 2.5	20 33.6
6	268 45.5	14 45.0	51 21.4	267 20.7	6 19.0	286 4.1	20 32.8
8	298 45.7	14 43.5	81 26.3	297 28.7	6 19.4	316 5.6	20 32.1
10	328 45.9	14 42.0	111 31.3	327 36.7	6 19.7	346 7.2	20 31.4
12	358 46.1	14 40.4	141 36.2	357 44.7	6 20.1	16 8.8	20 30.7
14	28 46.4	14 38.9	171 41.1	27 52.7	6 20.5	46 10.3	20 30.0
16	58 46.6	14 37.4	201 46.1	58 .8	6 20.8	76 11.9	20 29.3
18	88 46.8	14 35.9	231 51.0	88 8.8	6 21.2	106 13.5	20 28.5
20	118 47.0	14 34.3	261 55.9	118 16.8	6 21.6	136 15.1	20 27.8
22	148 47.3	14 32.8	292 .8	148 24.8	6 22.0	166 16.6	20 27.1
Δ	1	−8		40	2	8	−4

UT	MESEC				JUPITER		SATURN	
	$S_\leftmoon$	Δ	$\delta_\leftmoon$	Δ	S_{4}	δ_{4}	S_η	δ_η
h	° ′		° ′		° ′	° ′	° ′	° ′
0	198 16.9	118	15 26.0	−54	168 24.2	12 9.6	84 32.1	−17 54.5
2	227 18.6	119	15 15.2	−56	198 28.1	12 9.3	114 37.0	−17 54.6
4	256 20.4	120	15 4.1	−57	228 32.0	12 8.9	144 41.8	−17 54.6
6	285 22.5	121	14 52.7	−58	258 35.9	12 8.5	174 46.7	−17 54.6
8	314 24.7	122	14 41.0	−60	288 39.8	12 8.1	204 51.5	−17 54.7
10	343 27.1	123	14 29.1	−61	318 43.7	12 7.7	234 56.4	−17 54.7
12	12 29.7	124	14 17.0	−62	348 47.6	12 7.4	265 1.2	−17 54.8
14	41 32.4	125	14 4.5	−63	18 51.5	12 7.0	295 6.0	−17 54.8
16	70 35.4	126	13 51.9	−65	48 55.4	12 6.6	325 10.9	−17 54.8
18	99 38.5	127	13 38.9	−66	78 59.3	12 6.2	355 15.7	−17 54.9
20	128 41.8	127	13 25.8	−67	109 3.2	12 5.8	25 20.6	−17 54.9
22	157 45.3	128	13 12.4	−68	139 7.1	12 5.5	55 25.4	−17 55.0
Δ					19	−2	24	0

φ	SUNCE		TRAJANJE SUMRAKA		MESEC			
	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 8	19 60	0 52	: ::	3 2	2.9	19 1	.9
55	4 30	19 39	0 42	2 58	3 24	2.7	18 43	1.1
50	4 46	19 23	0 36	2 17	3 40	2.6	18 29	1.3
45	4 59	19 10	0 32	1 56	3 53	2.5	18 17	1.4
40	5 9	18 60	0 29	1 43	4 3	2.4	18 8	1.5
35	5 18	18 51	0 27	1 33	4 12	2.3	18 0	1.5
30	5 26	18 43	0 25	1 26	4 20	2.2	17 53	1.6
20	5 39	18 30	0 23	1 18	4 34	2.1	17 41	1.7
10	5 51	18 19	0 22	1 13	4 46	2.0	17 30	1.8
0	6 2	18 8	0 21	1 11	4 57	2.0	17 20	1.9
10	6 12	17 58	0 22	1 12	5 8	1.9	17 10	2.0
20	6 23	17 47	0 23	1 15	5 20	1.8	16 59	2.1
30	6 36	17 34	0 25	1 21	5 34	1.7	16 46	2.2
35	6 43	17 27	0 26	1 26	5 41	1.6	16 39	2.3
40	6 51	17 19	0 28	1 32	5 50	1.5	16 30	2.4
45	7 1	17 9	0 31	1 40	6 1	1.5	16 21	2.5
50	7 12	16 58	0 34	1 50	6 13	1.3	16 9	2.6
55	7 27	16 44	0 39	2 4	6 29	1.2	15 54	2.7
60	7 46	16 25	0 45	2 23	6 50	1.0	15 34	2.9
S								

SUNCE				MESEC			
UT	$e = T_p - UT$	Δ/24	r	Prolaz	Δ/24	$\pi_\leftmoon$	r
h	min s	s	′	h min	min	′	′
00	− 5 .6	.4	15.8	$T_{\overline{m}}$ 11 8	2.0	55.2	15.1
12	− 4 55.4	$T_{\overline{m}_\odot}$ 12 h 4.9 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	′	°	
♀	12 9	.1	216	−6.7	♃	12 45	.0	207	−1.2
♂	10 55	.1	235	1.8	♄	18 19	.0	123	.7

UT	SUNCE		PROLEĆ. TAČKA	VENERA		MARS	
	$S_\odot$	$\delta_\odot$	S_Υ	S_φ	δ_φ	S_σ	δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	178 47.5	14 31.3	322 5.8	178 32.8	6 22.4	196 18.2	20 26.4
2	208 47.7	14 29.7	352 10.7	208 40.9	6 22.8	226 19.8	20 25.7
4	238 47.9	14 28.2	22 15.6	238 48.9	6 23.2	256 21.3	20 24.9
6	268 48.2	14 26.7	52 20.6	268 56.9	6 23.6	286 22.9	20 24.2
8	298 48.4	14 25.1	82 25.5	299 5.0	6 24.0	316 24.5	20 23.5
10	328 48.6	14 23.6	112 30.4	329 13.0	6 24.4	346 26.1	20 22.8
12	358 48.9	14 22.1	142 35.3	359 21.0	6 24.9	16 27.6	20 22.0
14	28 49.1	14 20.5	172 40.3	29 29.0	6 25.3	46 29.2	20 21.3
16	58 49.3	14 19.0	202 45.2	59 37.1	6 25.7	76 30.8	20 20.6
18	88 49.6	14 17.4	232 50.1	89 45.1	6 26.2	106 32.4	20 19.8
20	118 49.8	14 15.9	262 55.1	119 53.1	6 26.6	136 34.0	20 19.1
22	148 50.0	14 14.3	293 .0	150 1.2	6 27.1	166 35.5	20 18.4
Δ	1	−8		40	2	8	−4

UT	MESEC				JUPITER		SATURN	
	$S_\leftmoon$	Δ	$\delta_\leftmoon$	Δ	S_{4}	δ_{4}	S_η	δ_η
h	° ′		° ′		° ′	° ′	° ′	° ′
0	186 49.0	129	12 58.8	−69	169 10.9	12 5.1	85 30.2	−17 55.0
2	215 52.8	130	12 44.9	−70	199 14.8	12 4.7	115 35.1	−17 55.0
4	244 56.9	131	12 30.9	−71	229 18.7	12 4.3	145 39.9	−17 55.1
6	274 1.1	132	12 16.6	−72	259 22.6	12 3.9	175 44.7	−17 55.1
8	303 5.4	133	12 2.1	−73	289 26.5	12 3.6	205 49.6	−17 55.2
10	332 10.0	134	11 47.4	−74	319 30.4	12 3.2	235 54.4	−17 55.2
12	1 14.7	134	11 32.6	−75	349 34.3	12 2.8	265 59.2	−17 55.2
14	30 19.5	135	11 17.5	−76	19 38.2	12 2.4	296 4.1	−17 55.3
16	59 24.6	136	11 2.3	−77	49 42.1	12 2.0	326 8.9	−17 55.3
18	88 29.8	137	10 46.8	−78	79 46.0	12 1.7	356 13.7	−17 55.4
20	117 35.1	138	10 31.2	−79	109 49.9	12 1.3	26 18.5	−17 55.4
22	146 40.7	138	10 15.5	−80	139 53.8	12 .9	56 23.4	−17 55.5
Δ					19	−2	24	0

φ	SUNCE		TRAJANJE SUMRAKA		MESEC			
	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 11	19 57	0 52	: ::	4 11	2.9	19 23	.8
55	4 32	19 36	0 42	2 55	4 28	2.7	19 10	1.0
50	4 48	19 21	0 36	2 16	4 41	2.6	18 59	1.1
45	4 60	19 9	0 32	1 55	4 52	2.5	18 50	1.2
40	5 10	18 59	0 29	1 42	5 0	2.4	18 43	1.3
35	5 19	18 50	0 27	1 33	5 7	2.3	18 37	1.4
30	5 27	18 43	0 25	1 26	5 14	2.2	18 32	1.5
20	5 40	18 30	0 23	1 17	5 25	2.1	18 22	1.6
10	5 51	18 18	0 22	1 13	5 35	2.0	18 14	1.7
0	6 1	18 8	0 21	1 11	5 44	1.9	18 6	1.8
10	6 12	17 58	0 22	1 12	5 53	1.8	17 58	2.0
20	6 23	17 47	0 23	1 15	6 3	1.7	17 49	2.1
30	6 35	17 35	0 25	1 21	6 14	1.5	17 40	2.2
35	6 42	17 28	0 26	1 26	6 20	1.5	17 34	2.3
40	6 50	17 20	0 28	1 32	6 27	1.4	17 27	2.4
45	6 59	17 11	0 31	1 39	6 36	1.3	17 20	2.5
50	7 11	16 60	0 34	1 50	6 46	1.2	17 11	2.6
55	7 25	16 46	0 39	2 3	6 58	1.0	16 59	2.7
60	7 43	16 27	0 45	2 23	7 15	.8	16 45	2.9
S								

SUNCE				MESEC			
UT	$e = T_p - UT$	Δ/24	r	Prolaz	Δ/24	$\pi_\leftmoon$	r
h	min s	s	′	h min	min	′	′
00	− 4 50.1	.5	15.8	$T_{\overline{m}}$ 11 55	1.9	54.9	14.9
12	− 4 44.5	$T_{\overline{m}_\odot}$ 12 h 4.7 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	′	°	
♀	12 3	.1	216	−6.7	♃	12 42	.0	207	−1.2
♂	10 54	.1	234	1.8	♄	18 15	.0	123	.7

UT	SUNCE		PROLEĆ. TAČKA	VENERA		MARS	
	$S_\odot$	$\delta_\odot$	S_Υ	S_φ	δ_φ	S_σ	δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	178 50.3	14 12.8	323 4.9	180 9.2	6 27.5	196 37.1	20 17.6
2	208 50.5	14 11.2	353 9.8	210 17.2	6 28.0	226 38.7	20 16.9
4	238 50.7	14 9.7	23 14.8	240 25.3	6 28.5	256 40.3	20 16.2
6	268 51.0	14 8.1	53 19.7	270 33.3	6 28.9	286 41.9	20 15.4
8	298 51.2	14 6.6	83 24.6	300 41.3	6 29.4	316 43.4	20 14.7
10	328 51.5	14 5.0	113 29.6	330 49.3	6 29.9	346 45.0	20 13.9
12	358 51.7	14 3.5	143 34.5	0 57.4	6 30.4	16 46.6	20 13.2
14	28 51.9	14 1.9	173 39.4	31 5.4	6 30.9	46 48.2	20 12.5
16	58 52.2	14 .3	203 44.3	61 13.4	6 31.4	76 49.8	20 11.7
18	88 52.4	13 58.8	233 49.3	91 21.4	6 31.9	106 51.4	20 11.0
20	118 52.7	13 57.2	263 54.2	121 29.5	6 32.4	136 53.0	20 10.2
22	148 52.9	13 55.6	293 59.1	151 37.5	6 32.9	166 54.6	20 9.5
Δ	1	−8		40	2	8	−4

UT	MESEC				JUPITER		SATURN	
	$S_\leftmoon$	Δ	$\delta_\leftmoon$	Δ	$S_{\mathrm{♃}}$	$\delta_{\mathrm{♃}}$	$S_{\mathrm{♄}}$	$\delta_{\mathrm{♄}}$
h	° ′		° ′		° ′	° ′	° ′	° ′
0	175 46.3	139	9 59.5	−80	169 57.7	12 .5	86 28.2	−17 55.5
2	204 52.2	140	9 43.4	−81	200 1.6	12 .1	116 33.0	−17 55.5
4	233 58.1	141	9 27.2	−82	230 5.5	11 59.8	146 37.9	−17 55.6
6	263 4.3	141	9 10.8	−83	260 9.4	11 59.4	176 42.7	−17 55.6
8	292 10.5	142	8 54.2	−83	290 13.2	11 59.0	206 47.5	−17 55.7
10	321 16.9	143	8 37.6	−84	320 17.1	11 58.6	236 52.3	−17 55.7
12	350 23.5	143	8 20.8	−85	350 21.0	11 58.2	266 57.2	−17 55.8
14	19 30.1	144	8 3.8	−85	20 24.9	11 57.9	297 2.0	−17 55.8
16	48 36.9	145	7 46.8	−86	50 28.8	11 57.5	327 6.8	−17 55.8
18	77 43.9	145	7 29.6	−86	80 32.7	11 57.1	357 11.6	−17 55.9
20	106 50.9	146	7 12.3	−87	110 36.6	11 56.7	27 16.4	−17 55.9
22	135 58.1	146	6 55.0	−87	140 40.5	11 56.3	57 21.3	−17 56.0
Δ					19	−2	24	0

φ	SUNCE		TRAJANJE SUMRAKA		MESEC			
	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 13	19 54	0 51	: ::	5 22	2.9	19 42	.7
55	4 34	19 34	0 42	2 52	5 34	2.7	19 33	.9
50	4 49	19 19	0 36	2 15	5 43	2.6	19 26	1.0
45	5 1	19 7	0 32	1 55	5 51	2.5	19 20	1.2
40	5 11	18 57	0 29	1 42	5 57	2.3	19 15	1.3
35	5 20	18 49	0 27	1 33	6 2	2.3	19 11	1.4
30	5 27	18 42	0 25	1 26	6 7	2.2	19 8	1.4
20	5 40	18 29	0 23	1 17	6 15	2.0	19 1	1.6
10	5 51	18 18	0 22	1 13	6 22	1.9	18 56	1.7
0	6 1	18 8	0 21	1 11	6 29	1.8	18 50	1.8
10	6 11	17 58	0 22	1 11	6 36	1.7	18 45	1.9
20	6 22	17 47	0 23	1 15	6 43	1.6	18 39	2.0
30	6 34	17 35	0 25	1 21	6 51	1.5	18 32	2.2
35	6 41	17 29	0 26	1 25	6 55	1.4	18 28	2.2
40	6 49	17 21	0 28	1 31	7 1	1.3	18 24	2.3
45	6 58	17 12	0 31	1 39	7 7	1.2	18 19	2.4
50	7 9	17 1	0 34	1 49	7 14	1.1	18 13	2.6
55	7 22	16 47	0 38	2 3	7 23	.9	18 5	2.7
60	7 40	16 30	0 45	2 22	7 35	.7	17 55	2.9
S								

SUNCE				MESEC			
UT	e = T_p − UT	Δ/24	r	Prolaz		Δ/24	$\pi_\leftmoon$	r
h	min s	s	′		h min	min	′	′
00	− 4 38.9	.5	15.8	$T_{\overline{m}}$	12 40	1.8	54.5	14.9
12	− 4 33.1	$T_{\overline{m}_\odot}$ 12 h	4.6 min	Starost	.4 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	217	−6.7	♆	12 39	.0	207	−1.2
♂	10 53	.1	234	1.8	♄	18 11	.0	123	.7

UT	SUNCE		PROLEĆ. TAČKA	VENERA		MARS	
	$S_\odot$	$\delta_\odot$	S_Υ	S_φ	δ_φ	S_σ	δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	178 53.2	13 54.1	324 4.1	181 45.5	6 33.4	196 56.1	20 8.7
2	208 53.4	13 52.5	354 9.0	211 53.5	6 34.0	226 57.7	20 8.0
4	238 53.7	13 50.9	24 13.9	242 1.5	6 34.5	256 59.3	20 7.3
6	268 53.9	13 49.4	54 18.8	272 9.5	6 35.0	287 .9	20 6.5
8	298 54.2	13 47.8	84 23.8	302 17.6	6 35.6	317 2.5	20 5.8
10	328 54.4	13 46.2	114 28.7	332 25.6	6 36.1	347 4.1	20 5.0
12	358 54.7	13 44.6	144 33.6	2 33.6	6 36.7	17 5.7	20 4.3
14	28 54.9	13 43.1	174 38.5	32 41.6	6 37.2	47 7.3	20 3.5
16	58 55.2	13 41.5	204 43.5	62 49.6	6 37.8	77 8.9	20 2.7
18	88 55.5	13 39.9	234 48.4	92 57.6	6 38.3	107 10.5	20 2.0
20	118 55.7	13 38.3	264 53.3	123 5.6	6 38.9	137 12.1	20 1.2
22	148 56.0	13 36.7	294 58.3	153 13.6	6 39.5	167 13.7	20 .5
Δ	1	−8		40	3	8	−4

UT	MESEC				JUPITER		SATURN	
	$S_\leftmoon$	Δ	$\delta_\leftmoon$	Δ	$S_{\mathrm{♃}}$	$\delta_{\mathrm{♃}}$	$S_{\mathrm{♄}}$	$\delta_{\mathrm{♄}}$
h	° ′		° ′		° ′	° ′	° ′	° ′
0	165 5.4	147	6 37.5	−88	170 44.4	11 55.9	87 26.1	−17 56.0
2	194 12.8	148	6 19.9	−88	200 48.3	11 55.6	117 30.9	−17 56.1
4	223 20.3	148	6 2.2	−89	230 52.2	11 55.2	147 35.7	−17 56.1
6	252 27.9	149	5 44.4	−89	260 56.1	11 54.8	177 40.5	−17 56.2
8	281 35.6	149	5 26.6	−90	290 60.0	11 54.4	207 45.3	−17 56.2
10	310 43.4	149	5 8.7	−90	321 3.9	11 54.0	237 50.2	−17 56.2
12	339 51.3	150	4 50.7	−90	351 7.7	11 53.7	267 55.0	−17 56.3
14	8 59.3	150	4 32.6	−91	21 11.6	11 53.3	297 59.8	−17 56.3
16	38 7.3	151	4 14.5	−91	51 15.5	11 52.9	328 4.6	−17 56.4
18	67 15.5	151	3 56.3	−91	81 19.4	11 52.5	358 9.4	−17 56.4
20	96 23.7	151	3 38.1	−91	111 23.3	11 52.1	28 14.2	−17 56.5
22	125 32.0	152	3 19.8	−92	141 27.2	11 51.7	58 19.0	−17 56.5
Δ					19	−2	24	0

φ	SUNCE		TRAJANJE SUMRAKA		MESEC			
	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	: ::	6 32	2.9	19 59	.7
55	4 36	19 32	0 42	2 49	6 40	2.7	19 54	.9
50	4 51	19 17	0 36	2 13	6 45	2.6	19 51	1.0
45	5 2	19 6	0 32	1 54	6 50	2.4	19 48	1.1
40	5 12	18 56	0 29	1 41	6 53	2.3	19 46	1.2
35	5 20	18 48	0 27	1 32	6 56	2.2	19 44	1.3
30	5 28	18 41	0 25	1 26	6 59	2.2	19 42	1.4
20	5 40	18 28	0 23	1 17	7 4	2.0	19 39	1.5
10	5 51	18 18	0 22	1 12	7 9	1.9	19 36	1.7
0	6 1	18 8	0 21	1 11	7 13	1.8	19 33	1.8
10	6 11	17 58	0 22	1 11	7 17	1.7	19 31	1.9
20	6 21	17 48	0 23	1 15	7 21	1.5	19 28	2.0
30	6 33	17 36	0 25	1 21	7 26	1.4	19 24	2.1
35	6 40	17 29	0 26	1 25	7 29	1.3	19 22	2.2
40	6 47	17 22	0 28	1 31	7 32	1.2	19 20	2.3
45	6 56	17 13	0 30	1 39	7 36	1.1	19 18	2.4
50	7 7	17 2	0 34	1 49	7 40	1.0	19 15	2.5
55	7 20	16 49	0 38	2 3	7 45	.9	19 11	2.7
60	7 38	16 32	0 45	2 22	7 52	.7	19 6	2.9
S								

SUNCE				MESEC			
UT	e = T_p − UT	Δ/24	r	Prolaz		Δ/24	$\pi_\leftmoon$	r
h	min s	s	′		h min	min	′	′
00	− 4 27.3	.5	15.8	$T_{\overline{m}}$	13 23	1.7	54.3	14.8
12	− 4 21.2	$T_{\overline{m}_\odot}$ 12 h	4.4 min	Starost	1.4 d	Faza	●	

PLANETE

Pl.	$T_{\overline{m}}$	π	360 − α	Vel.	Pl.	$T_{\overline{m}}$	π	360 − α	Vel.
	h min	′	°			h min	′	°	
♀	11 50	.1	218	−6.7	♆	12 35	.0	207	−1.2
♂	10 52	.1	233	1.8	♄	18 7	.0	123	.7

UT	SUNCE		PROLEĆ. TAČKA	VENERA		MARS	
	$S_\odot$	$\delta_\odot$	S_Υ	S_φ	δ_φ	S_σ	δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	178 56.2	13 35.1	325 3.2	183 21.5	6 40.0	197 15.3	19 59.7
2	208 56.5	13 33.5	355 8.1	213 29.5	6 40.6	227 16.9	19 59.0
4	238 56.7	13 32.0	25 13.0	243 37.5	6 41.2	257 18.5	19 58.2
6	268 57.0	13 30.4	55 18.0	273 45.5	6 41.8	287 20.1	19 57.4
8	298 57.3	13 28.8	85 22.9	303 53.5	6 42.4	317 21.7	19 56.7
10	328 57.5	13 27.2	115 27.8	334 1.4	6 43.0	347 23.3	19 55.9
12	358 57.8	13 25.6	145 32.8	4 9.4	6 43.6	17 24.9	19 55.2
14	28 58.1	13 24.0	175 37.7	34 17.4	6 44.2	47 26.5	19 54.4
16	58 58.3	13 22.4	205 42.6	64 25.3	6 44.8	77 28.1	19 53.6
18	88 58.6	13 20.8	235 47.5	94 33.3	6 45.4	107 29.7	19 52.9
20	118 58.9	13 19.2	265 52.5	124 41.2	6 46.0	137 31.3	19 52.1
22	148 59.1	13 17.6	295 57.4	154 49.2	6 46.7	167 32.9	19 51.3
Δ	1	−8		40	3	8	−4

UT	MESEC				JUPITER		SATURN	
	$S_\leftmoon$	Δ	$\delta_\leftmoon$	Δ	$S_{\text{♃}}$	$\delta_{\text{♃}}$	$S_{\text{♄}}$	$\delta_{\text{♄}}$
h	° ′		° ′		° ′	° ′	° ′	° ′
0	154 40.3	152	3 1.5	−92	171 31.1	11 51.4	88 23.9	−17 56.6
2	183 48.7	152	2 43.2	−92	201 35.0	11 51.0	118 28.7	−17 56.6
4	212 57.2	153	2 24.8	−92	231 38.9	11 50.6	148 33.5	−17 56.7
6	242 5.7	153	2 6.3	−92	261 42.8	11 50.2	178 38.3	−17 56.7
8	271 14.3	153	1 47.9	−92	291 46.7	11 49.8	208 43.1	−17 56.7
10	300 22.9	153	1 29.4	−92	321 50.6	11 49.4	238 47.9	−17 56.8
12	329 31.5	153	1 10.9	−92	351 54.5	11 49.1	268 52.7	−17 56.8
14	358 40.2	154	0 52.4	−93	21 58.4	11 48.7	298 57.5	−17 56.9
16	27 48.9	154	0 33.9	−93	52 2.2	11 48.3	329 2.3	−17 56.9
18	56 57.7	154	0 15.4	−62	82 6.1	11 47.9	359 7.1	−17 57.0
20	86 6.4	154	0 3.1	92	112 10.0	11 47.5	29 11.9	−17 57.0
22	115 15.2	154	0 21.6	92	142 13.9	11 47.1	59 16.7	−17 57.1
Δ					19	−2	24	0

φ	SUNCE		TRAJANJE SUMRAKA		MESEC			
	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 18	19 49	0 50	: ::	7 43	1.7	20 16	2.9
55	4 37	19 30	0 41	2 46	7 45	1.7	20 16	2.7
50	4 52	19 15	0 36	2 12	7 47	1.7	20 16	2.5
45	5 4	19 4	0 32	1 53	7 48	1.7	20 16	2.4
40	5 13	18 55	0 29	1 41	7 49	1.7	20 16	2.3
35	5 21	18 47	0 27	1 32	7 50	1.7	20 16	2.2
30	5 28	18 40	0 25	1 25	7 51	1.7	20 16	2.1
20	5 40	18 28	0 23	1 17	7 53	1.7	20 16	2.0
10	5 51	18 17	0 22	1 12	7 54	1.8	20 16	1.9
0	6 1	18 8	0 21	1 11	7 55	1.8	20 16	1.8
10	6 10	17 58	0 22	1 11	7 57	1.8	20 16	1.6
20	6 21	17 48	0 23	1 14	7 58	1.8	20 16	1.5
30	6 32	17 37	0 25	1 21	7 60	1.8	20 15	1.4
35	6 39	17 30	0 26	1 25	8 1	1.8	20 15	1.3
40	6 46	17 23	0 28	1 31	8 2	1.8	20 15	1.2
45	6 55	17 14	0 30	1 39	8 3	1.8	20 15	1.1
50	7 5	17 4	0 34	1 49	8 4	1.8	20 15	1.0
55	7 18	16 51	0 38	2 3	8 6	1.8	20 15	.8
60	7 35	16 34	0 44	2 22	8 8	1.8	20 15	.6
S								

SUNCE				MESEC			
UT	e = T_p − UT	Δ/24	r	Prolaz	Δ/24	$\pi_\leftmoon$	r
h	min s	s	′	h min	min	′	′
00	− 4 15.1	.5	15.8	$T_{\overline{m}}$ 14 5	1.8	54.1	14.7
12	− 4 8.7	$T_{\overline{m}_\odot}$ 12 h 4.1 min		Starost 2.4 d	Faza ●		

PLANETE

Pl.	$T_{\overline{m}}$	π	360 − α	Vel.	Pl.	$T_{\overline{m}}$	π	360 − α	Vel.
	h min	′	°			h min	′	°	
♀	11 43	.1	218	−6.7	♆	12 32	.0	206	−1.2
♂	10 50	.1	232	1.8	♇	18 4	.0	123	.7

UT	SUNCE		PROLEĆ. TAČKA	VENERA		MARS	
	$S_\odot$	$\delta_\odot$	S_Υ	S_φ	δ_φ	S_σ	δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	178 59.4	13 16.0	326 2.3	184 57.1	6 47.3	197 34.5	19 50.6
2	208 59.7	13 14.4	356 7.3	215 5.0	6 47.9	227 36.1	19 49.8
4	239 .0	13 12.8	26 12.2	245 13.0	6 48.6	257 37.7	19 49.0
6	269 .2	13 11.2	56 17.1	275 20.9	6 49.2	287 39.3	19 48.3
8	299 .5	13 9.6	86 22.0	305 28.8	6 49.8	317 40.9	19 47.5
10	329 .8	13 7.9	116 27.0	335 36.7	6 50.5	347 42.6	19 46.7
12	359 1.0	13 6.3	146 31.9	5 44.6	6 51.1	17 44.2	19 45.9
14	29 1.3	13 4.7	176 36.8	35 52.5	6 51.8	47 45.8	19 45.2
16	59 1.6	13 3.1	206 41.8	66 .4	6 52.4	77 47.4	19 44.4
18	89 1.9	13 1.5	236 46.7	96 8.3	6 53.1	107 49.0	19 43.6
20	119 2.2	12 59.9	266 51.6	126 16.2	6 53.8	137 50.6	19 42.8
22	149 2.4	12 58.2	296 56.5	156 24.1	6 54.4	167 52.2	19 42.1
Δ	1	−8		40	3	8	−4

UT	MESEC				JUPITER		SATURN	
	$S_\leftmoon$	Δ	$\delta_\leftmoon$	Δ	$S_{\text{♃}}$	$\delta_{\text{♃}}$	$S_{\text{♄}}$	$\delta_{\text{♄}}$
h	° ′		° ′		° ′	° ′	° ′	° ′
0	144 24.0	154	0 40.0	92	172 17.8	11 46.8	89 21.5	−17 57.1
2	173 32.7	154	0 58.5	92	202 21.7	11 46.4	119 26.3	−17 57.2
4	202 41.5	154	1 17.0	92	232 25.6	11 46.0	149 31.1	−17 57.2
6	231 50.3	154	1 35.4	92	262 29.5	11 45.6	179 35.9	−17 57.3
8	260 59.1	154	1 53.8	92	292 33.4	11 45.2	209 40.7	−17 57.3
10	290 7.8	154	2 12.1	92	322 37.3	11 44.8	239 45.5	−17 57.4
12	319 16.5	154	2 30.5	91	352 41.2	11 44.5	269 50.3	−17 57.4
14	348 25.2	153	2 48.8	91	22 45.1	11 44.1	299 55.1	−17 57.5
16	17 33.9	153	3 7.0	91	52 48.9	11 43.7	329 59.9	−17 57.5
18	46 42.6	153	3 25.2	91	82 52.8	11 43.3	0 4.7	−17 57.6
20	75 51.1	153	3 43.3	90	112 56.7	11 42.9	30 9.5	−17 57.6
22	104 59.7	153	4 1.4	90	143 .6	11 42.5	60 14.3	−17 57.7
Δ					19	−2	24	0

φ	SUNCE		TRAJANJE SUMRAKA		MESEC			
	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 21	19 46	0 50	: ::	8 24	.7	21 26	2.9
55	4 39	19 27	0 41	2 44	8 26	.9	21 21	2.7
50	4 54	19 13	0 35	2 11	8 28	1.0	21 17	2.5
45	5 5	19 2	0 32	1 53	8 30	1.1	21 14	2.4
40	5 14	18 53	0 29	1 40	8 31	1.2	21 11	2.3
35	5 22	18 45	0 27	1 32	8 32	1.3	21 9	2.2
30	5 29	18 39	0 25	1 25	8 33	1.4	21 7	2.1
20	5 41	18 27	0 23	1 17	8 35	1.5	21 4	2.0
10	5 51	18 17	0 22	1 12	8 36	1.7	21 1	1.9
0	6 1	18 7	0 21	1 11	8 37	1.8	20 58	1.8
10	6 10	17 58	0 22	1 11	8 39	1.9	20 55	1.7
20	6 20	17 48	0 23	1 14	8 41	2.0	20 52	1.6
30	6 31	17 37	0 25	1 21	8 42	2.1	20 49	1.4
35	6 37	17 31	0 26	1 25	8 43	2.2	20 47	1.3
40	6 45	17 24	0 28	1 31	8 45	2.3	20 44	1.3
45	6 53	17 15	0 30	1 39	8 46	2.4	20 42	1.2
50	7 3	17 5	0 34	1 49	8 48	2.5	20 39	1.0
55	7 16	16 53	0 38	2 2	8 50	2.7	20 35	.9
60	7 32	16 37	0 44	2 21	8 52	2.9	20 30	.7
S								

SUNCE				MESEC			
UT	e = T_p − UT	Δ/24	r	Prolaz	Δ/24	$\pi_\leftmoon$	r
h	min s	s	′	h min	min	′	′
00	− 4 2.4	.6	15.8	$T_{\overline{m}}$ 14 48	1.7	54.0	14.7
12	− 3 55.7	$T_{\overline{m}_\odot}$ 12 h 3.9 min		Starost 3.4 d	Faza ●		

PLANETE

Pl.	$T_{\overline{m}}$	π	360 − α	Vel.	Pl.	$T_{\overline{m}}$	π	360 − α	Vel.
	h min	′	°			h min	′	°	
♀	11 37	.1	219	−6.7	♆	12 29	.0	206	−1.2
♂	10 49	.1	232	1.8	♇	17 60	.0	123	.7

UT	SUNCE		PROLEĆ. TAČKA	VENERA		MARS	
	$S_\odot$	$\delta_\odot$	S_Υ	S_φ	δ_φ	S_σ	δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	179 2.7	12 56.6	327 1.5	186 32.0	6 55.1	197 53.9	19 41.3
2	209 3.0	12 55.0	357 6.4	216 39.8	6 55.8	227 55.5	19 40.5
4	239 3.3	12 53.4	27 11.3	246 47.7	6 56.5	257 57.1	19 39.7
6	269 3.6	12 51.8	57 16.3	276 55.6	6 57.2	287 58.7	19 38.9
8	299 3.8	12 50.1	87 21.2	307 3.4	6 57.8	318 .3	19 38.1
10	329 4.1	12 48.5	117 26.1	337 11.2	6 58.5	348 1.9	19 37.4
12	359 4.4	12 46.9	147 31.0	7 19.1	6 59.2	18 3.6	19 36.6
14	29 4.7	12 45.2	177 36.0	37 26.9	6 59.9	48 5.2	19 35.8
16	59 5.0	12 43.6	207 40.9	67 34.7	7 .6	78 6.8	19 35.0
18	89 5.3	12 42.0	237 45.8	97 42.5	7 1.3	108 8.4	19 34.2
20	119 5.6	12 40.3	267 50.7	127 50.3	7 2.0	138 10.1	19 33.4
22	149 5.9	12 38.7	297 55.7	157 58.1	7 2.7	168 11.7	19 32.6
Δ	1	−8		39	3	8	−4

UT	MESEC				JUPITER		SATURN	
	$S_\leftmoon$	Δ	$\delta_\leftmoon$	Δ	$S_{\mathrm{♃}}$	$\delta_{\mathrm{♃}}$	$S_{\mathrm{♄}}$	$\delta_{\mathrm{♄}}$
h	° ′		° ′		° ′	° ′	° ′	° ′
0	134 8.2	152	4 19.4	90	173 4.5	11 42.2	90 19.1	−17 57.7
2	163 16.6	152	4 37.4	89	203 8.4	11 41.8	120 23.9	−17 57.8
4	192 25.0	152	4 55.2	89	233 12.3	11 41.4	150 28.7	−17 57.8
6	221 33.3	151	5 13.0	89	263 16.2	11 41.0	180 33.5	−17 57.8
8	250 41.6	151	5 30.8	88	293 20.1	11 40.6	210 38.3	−17 57.9
10	279 49.8	150	5 48.4	88	323 24.0	11 40.2	240 43.1	−17 57.9
12	308 57.9	150	6 5.9	87	353 27.9	11 39.8	270 47.9	−17 58.0
14	338 5.9	150	6 23.4	87	23 31.8	11 39.5	300 52.7	−17 58.0
16	7 13.8	149	6 40.7	86	53 35.7	11 39.1	330 57.5	−17 58.1
18	36 21.6	149	6 58.0	86	83 39.5	11 38.7	1 2.2	−17 58.1
20	65 29.3	148	7 15.2	85	113 43.4	11 38.3	31 7.0	−17 58.2
22	94 36.9	148	7 32.2	85	143 47.3	11 37.9	61 11.8	−17 58.3
Δ					19	−2	24	0

φ	SUNCE		TRAJANJE SUMRAKA		MESEC			
	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 23	19 43	0 49	: ::	8 40	.7	22 35	2.9
55	4 41	19 25	0 41	2 42	8 47	.9	22 25	2.7
50	4 55	19 11	0 35	2 10	8 52	1.1	22 18	2.5
45	5 6	19 1	0 31	1 52	8 57	1.2	22 12	2.4
40	5 15	18 52	0 29	1 40	9 0	1.3	22 7	2.3
35	5 23	18 44	0 27	1 31	9 4	1.4	22 2	2.2
30	5 29	18 38	0 25	1 25	9 6	1.4	21 59	2.2
20	5 41	18 26	0 23	1 17	9 11	1.6	21 52	2.0
10	5 51	18 16	0 22	1 12	9 16	1.7	21 46	1.9
0	6 0	18 7	0 21	1 10	9 20	1.8	21 41	1.8
10	6 10	17 58	0 21	1 11	9 24	1.9	21 35	1.7
20	6 19	17 48	0 23	1 14	9 29	2.0	21 29	1.6
30	6 30	17 38	0 24	1 20	9 34	2.2	21 23	1.5
35	6 36	17 32	0 26	1 25	9 37	2.2	21 19	1.4
40	6 43	17 25	0 28	1 31	9 40	2.3	21 15	1.3
45	6 52	17 16	0 30	1 39	9 44	2.4	21 10	1.2
50	7 1	17 7	0 33	1 49	9 49	2.5	21 4	1.1
55	7 13	16 55	0 38	2 2	9 55	2.7	20 56	1.0
60	7 29	16 39	0 44	2 21	10 2	2.9	20 47	.8
S								

SUNCE				MESEC				
UT	e = T_p − UT	Δ/24	r	Prolaz		Δ/24	$\pi_\leftmoon$	r
h	min s	s	′	$T_{\overline{m}}$	h min	min	′	′
00	− 3 49.1	.6	15.8	$T_{\overline{m}}$	15 30	1.8	54.1	14.7
12	− 3 42.3	$T_{\overline{m}_\odot}$ 12 h	3.7 min	Starost	4.4 d	Faza	◐	

PLANETE								
Pl.	$T_{\overline{m}}$	π	360 − α	Vel.	Pl.	$T_{\overline{m}}$	π	360 − α	Vel.
	h min	′	°			h min	′	°	
♀	11 31	.1	219	−6.7	♃	12 26	.0	206	−1.2
♂	10 48	.1	231	1.8	♄	17 56	.0	123	.7

UT	SUNCE		PROLEĆ. TAČKA	VENERA		MARS	
	$S_\odot$	$\delta_\odot$	S_Υ	S_φ	δ_φ	S_σ	δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	179 6.2	12 37.1	328 .6	188 5.9	7 3.5	198 13.3	19 31.8
2	209 6.4	12 35.4	358 5.5	218 13.7	7 4.2	228 14.9	19 31.1
4	239 6.7	12 33.8	28 10.5	248 21.5	7 4.9	258 16.6	19 30.3
6	269 7.0	12 32.1	58 15.4	278 29.2	7 5.6	288 18.2	19 29.5
8	299 7.3	12 30.5	88 20.3	308 37.0	7 6.4	318 19.8	19 28.7
10	329 7.6	12 28.8	118 25.2	338 44.7	7 7.1	348 21.4	19 27.9
12	359 7.9	12 27.2	148 30.2	8 52.5	7 7.8	18 23.1	19 27.1
14	29 8.2	12 25.6	178 35.1	39 .2	7 8.6	48 24.7	19 26.3
16	59 8.5	12 23.9	208 40.0	69 7.9	7 9.3	78 26.3	19 25.5
18	89 8.8	12 22.3	238 45.0	99 15.6	7 10.0	108 28.0	19 24.7
20	119 9.1	12 20.6	268 49.9	129 23.3	7 10.8	138 29.6	19 23.9
22	149 9.4	12 19.0	298 54.8	159 31.0	7 11.5	168 31.2	19 23.1
Δ	1	−8		39	4	8	−4

UT	MESEC				JUPITER		SATURN	
	$S_\leftmoon$	Δ	$\delta_\leftmoon$	Δ	$S_{\mathrm{♃}}$	$\delta_{\mathrm{♃}}$	$S_{\mathrm{♄}}$	$\delta_{\mathrm{♄}}$
h	° ′		° ′		° ′	° ′	° ′	° ′
0	123 44.5	147	7 49.1	84	173 51.2	11 37.5	91 16.6	−17 58.3
2	152 51.8	146	8 5.9	83	203 55.1	11 37.2	121 21.4	−17 58.4
4	181 59.1	146	8 22.6	83	233 59.0	11 36.8	151 26.2	−17 58.4
6	211 6.3	145	8 39.2	82	264 2.9	11 36.4	181 31.0	−17 58.5
8	240 13.3	144	8 55.6	81	294 6.8	11 36.0	211 35.7	−17 58.5
10	269 20.2	144	9 11.9	81	324 10.7	11 35.6	241 40.5	−17 58.6
12	298 26.9	143	9 28.0	80	354 14.6	11 35.2	271 45.3	−17 58.6
14	327 33.5	142	9 44.0	79	24 18.5	11 34.8	301 50.1	−17 58.7
16	356 40.0	142	9 59.9	78	54 22.4	11 34.5	331 54.9	−17 58.7
18	25 46.3	141	10 15.5	78	84 26.2	11 34.1	1 59.7	−17 58.8
20	54 52.4	140	10 31.1	77	114 30.1	11 33.7	32 4.4	−17 58.8
22	83 58.4	139	10 46.4	76	144 34.0	11 33.3	62 9.2	−17 58.9
Δ					19	−2	24	0

φ	SUNCE		TRAJANJE SUMRAKA		MESEC			
	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 25	19 40	0 49	: ::	8 58	.8	23 45	2.9
55	4 43	19 23	0 41	2 39	9 9	1.0	23 30	2.7
50	4 56	19 9	0 35	2 9	9 18	1.2	23 19	2.6
45	5 7	18 59	0 31	1 51	9 25	1.3	23 10	2.4
40	5 16	18 50	0 29	1 40	9 31	1.4	23 3	2.3
35	5 23	18 43	0 26	1 31	9 37	1.5	22 56	2.3
30	5 30	18 36	0 25	1 25	9 41	1.5	22 51	2.2
20	5 41	18 25	0 23	1 16	9 49	1.7	22 41	2.1
10	5 51	18 16	0 22	1 12	9 56	1.8	22 32	2.0
0	6 0	18 7	0 21	1 10	10 3	1.9	22 24	1.9
10	6 9	17 58	0 21	1 11	10 10	2.0	22 17	1.8
20	6 18	17 49	0 22	1 14	10 17	2.1	22 8	1.7
30	6 29	17 38	0 24	1 20	10 25	2.2	21 58	1.6
35	6 35	17 32	0 26	1 25	10 30	2.3	21 53	1.5
40	6 42	17 25	0 28	1 31	10 36	2.3	21 47	1.5
45	6 50	17 18	0 30	1 39	10 42	2.4	21 39	1.4
50	6 59	17 8	0 33	1 49	10 50	2.6	21 30	1.3
55	7 11	16 57	0 38	2 2	10 59	2.7	21 20	1.1
60	7 27	16 41	0 44	2 21	11 12	2.9	21 5	.9
S								

SUNCE				MESEC				
UT	e = T_p − UT	Δ/24	r	Prolaz		Δ/24	$\pi_\leftmoon$	r
h	min s	s	′	$T_{\overline{m}}$	h min	min	′	′
00	− 3 35.4	.6	15.8	$T_{\overline{m}}$	16 14	1.9	54.3	14.8
12	− 3 28.3	$T_{\overline{m}_\odot}$ 12 h	3.5 min	Starost	5.4 d	Faza	◐	

PLANETE								
Pl.	$T_{\overline{m}}$	π	360 − α	Vel.	Pl.	$T_{\overline{m}}$	π	360 − α	Vel.
	h min	′	°			h min	′	°	
♀	11 25	.1	220	−6.6	♃	12 23	.0	206	−1.2
♂	10 47	.1	230	1.8	♄	17 52	.0	123	.7

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UT	SUNCE		PROLEĆ. TAČKA	VENERA		MARS	
	$S_\odot$	$\delta_\odot$	S_Υ	S_φ	δ_φ	S_σ	δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	179 9.7	12 17.3	328 59.7	189 38.7	7 12.3	198 32.9	19 22.3
2	209 10.0	12 15.6	359 4.7	219 46.4	7 13.0	228 34.5	19 21.5
4	239 10.3	12 14.0	29 9.6	249 54.1	7 13.8	258 36.1	19 20.7
6	269 10.6	12 12.3	59 14.5	280 1.7	7 14.5	288 37.8	19 19.9
8	299 10.9	12 10.7	89 19.5	310 9.4	7 15.3	318 39.4	19 19.1
10	329 11.2	12 9.0	119 24.4	340 17.0	7 16.1	348 41.0	19 18.3
12	359 11.5	12 7.3	149 29.3	10 24.7	7 16.8	18 42.7	19 17.5
14	29 11.8	12 5.7	179 34.2	40 32.3	7 17.6	48 44.3	19 16.7
16	59 12.2	12 4.0	209 39.2	70 39.9	7 18.4	78 46.0	19 15.8
18	89 12.5	12 2.3	239 44.1	100 47.5	7 19.1	108 47.6	19 15.0
20	119 12.8	12 .7	269 49.0	130 55.1	7 19.9	138 49.2	19 14.2
22	149 13.1	11 59.0	299 54.0	161 2.7	7 20.7	168 50.9	19 13.4
Δ	2	−8		38	4	8	−4

UT	MESEC				JUPITER		SATURN	
	$S_\leftmoon$	Δ	$\delta_\leftmoon$	Δ	$S_{\mathrm{♃}}$	$\delta_{\mathrm{♃}}$	$S_{\mathrm{♄}}$	$\delta_{\mathrm{♄}}$
h	° ′		° ′		° ′	° ′	° ′	° ′
0	113 4.2	138	11 1.6	75	174 37.9	11 32.9	92 14.0	−17 58.9
2	142 9.9	137	11 16.7	74	204 41.8	11 32.5	122 18.8	−17 59.0
4	171 15.3	136	11 31.5	73	234 45.7	11 32.1	152 23.5	−17 59.0
6	200 20.6	136	11 46.2	72	264 49.6	11 31.8	182 28.3	−17 59.1
8	229 25.7	135	12 .6	71	294 53.5	11 31.4	212 33.1	−17 59.1
10	258 30.7	134	12 14.9	70	324 57.4	11 31.0	242 37.9	−17 59.2
12	287 35.4	133	12 29.0	69	355 1.3	11 30.6	272 42.6	−17 59.2
14	316 39.9	132	12 42.9	68	25 5.2	11 30.2	302 47.4	−17 59.3
16	345 44.3	131	12 56.5	67	55 9.1	11 29.8	332 52.2	−17 59.3
18	14 48.4	130	13 10.0	66	85 12.9	11 29.4	2 57.0	−17 59.4
20	43 52.4	129	13 23.2	65	115 16.8	11 29.1	33 1.7	−17 59.5
22	72 56.1	128	13 36.2	64	145 20.7	11 28.7	63 6.5	−17 59.5
Δ					19	−2	24	0

φ	SUNCE		TRAJANJE SUMRAKA		MESEC			
	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 28	19 37	0 48	: ::	9 18	1.0	. . .	.0
55	4 45	19 20	0 40	2 37	9 34	1.2	. . .	.0
50	4 58	19 7	0 35	2 8	9 46	1.3	. . .	.0
45	5 8	18 57	0 31	1 51	9 56	1.5	. . .	.0
40	5 17	18 49	0 28	1 39	10 5	1.5	23 59	2.4
35	5 24	18 42	0 26	1 31	10 12	1.6	23 51	2.3
30	5 31	18 35	0 25	1 24	10 18	1.7	23 44	2.2
20	5 42	18 25	0 23	1 16	10 29	1.8	23 31	2.2
10	5 51	18 15	0 22	1 12	10 39	1.9	23 20	2.1
0	5 60	18 7	0 21	1 10	10 48	1.9	23 10	2.0
10	6 9	17 58	0 21	1 11	10 57	2.0	22 60	1.9
20	6 18	17 49	0 22	1 14	11 7	2.1	22 49	1.8
30	6 28	17 39	0 24	1 20	11 18	2.2	22 37	1.7
35	6 34	17 33	0 26	1 25	11 24	2.3	22 29	1.7
40	6 41	17 26	0 28	1 31	11 32	2.4	22 21	1.6
45	6 48	17 19	0 30	1 38	11 41	2.4	22 12	1.5
50	6 57	17 10	0 33	1 48	11 51	2.5	22 1	1.4
55	7 9	16 58	0 38	2 2	12 4	2.7	21 46	1.3
60	7 24	16 44	0 44	2 21	12 22	2.9	21 28	1.1
S								

SUNCE				MESEC			
UT	$e = T_p - UT$	Δ/24	r	Prolaz	Δ/24	$\pi_\leftmoon$	r
h	min s	s	′	h min	min	′	′
00	− 3 21.1	.6	15.8	$T_{\overline{m}}$ 16 59	2.0	54.6	14.9
12	− 3 13.8	$T_{\overline{m}_\odot}$ 12 h	3.2 min	Starost 6.4 d	Faza ◐		

PLANETE

Pl.	$T_{\overline{m}}$	π	360−α	Vel.	Pl.	$T_{\overline{m}}$	π	360−α	Vel.
	h min	′	°			h min	′	°	
♀	11 19	.1	221	−6.6	♆	12 20	.0	206	−1.2
♂	10 45	.1	230	1.8	♄	17 48	.0	123	.7

22. AVGUST SUBOTA

UT	SUNCE		PROLEĆ. TAČKA	VENERA		MARS	
	$S_\odot$	$\delta_\odot$	S_Υ	S_φ	δ_φ	S_σ	δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	179 13.4	11 57.3	329 58.9	191 10.2	7 21.5	198 52.5	19 12.6
2	209 13.7	11 55.7	0 3.8	221 17.8	7 22.3	228 54.2	19 11.8
4	239 14.0	11 54.0	30 8.7	251 25.3	7 23.0	258 55.8	19 11.0
6	269 14.3	11 52.3	60 13.7	281 32.9	7 23.8	288 57.5	19 10.2
8	299 14.6	11 50.6	90 18.6	311 40.4	7 24.6	318 59.1	19 9.3
10	329 15.0	11 49.0	120 23.5	341 47.9	7 25.4	349 .8	19 8.5
12	359 15.3	11 47.3	150 28.5	11 55.4	7 26.2	19 2.4	19 7.7
14	29 15.6	11 45.6	180 33.4	42 2.9	7 27.0	49 4.1	19 6.9
16	59 15.9	11 43.9	210 38.3	72 10.4	7 27.8	79 5.7	19 6.1
18	89 16.2	11 42.2	240 43.2	102 17.9	7 28.6	109 7.4	19 5.3
20	119 16.6	11 40.6	270 48.2	132 25.4	7 29.4	139 9.0	19 4.4
22	149 16.9	11 38.9	300 53.1	162 32.8	7 30.2	169 10.7	19 3.6
Δ	2	−8		38	4	8	−4

UT	MESEC				JUPITER		SATURN	
	$S_\leftmoon$	Δ	$\delta_\leftmoon$	Δ	$S_{\mathrm{♃}}$	$\delta_{\mathrm{♃}}$	$S_{\mathrm{♄}}$	$\delta_{\mathrm{♄}}$
h	° ′		° ′		° ′	° ′	° ′	° ′
0	101 59.6	126	13 49.0	63	175 24.6	11 28.3	93 11.3	−17 59.6
2	131 2.9	125	14 1.6	62	205 28.5	11 27.9	123 16.0	−17 59.6
4	160 6.0	124	14 13.9	60	235 32.4	11 27.5	153 20.8	−17 59.7
6	189 8.8	123	14 25.9	59	265 36.3	11 27.1	183 25.6	−17 59.7
8	218 11.5	122	14 37.8	58	295 40.2	11 26.7	213 30.4	−17 59.8
10	247 13.9	121	14 49.3	56	325 44.1	11 26.3	243 35.1	−17 59.8
12	276 16.1	120	15 .6	55	355 48.0	11 26.0	273 39.9	−17 59.9
14	305 18.0	119	15 11.6	54	25 51.9	11 25.6	303 44.7	−17 59.9
16	334 19.7	117	15 22.4	52	55 55.8	11 25.2	333 49.4	−17 60.0
18	3 21.2	116	15 32.9	51	85 59.6	11 24.8	3 54.2	−18 .1
20	32 22.5	115	15 43.1	50	116 3.5	11 24.4	33 58.9	−18 .1
22	61 23.5	114	15 53.0	48	146 7.4	11 24.0	64 3.7	−18 .2
Δ					19	−2	24	0

φ	SUNCE		TRAJANJE SUMRAKA		MESEC			
	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 30	19 34	0 48	3 52	9 43	1.3	0 55	2.8
55	4 47	19 18	0 40	2 35	10 3	1.5	0 35	2.6
50	4 59	19 5	0 35	2 7	10 19	1.6	0 20	2.5
45	5 10	18 56	0 31	1 50	10 31	1.7	0 9	2.4
40	5 18	18 47	0 28	1 39	10 41	1.7	. . .	.0
35	5 25	18 40	0 26	1 30	10 50	1.8	. . .	.0
30	5 31	18 34	0 25	1 24	10 58	1.8	. . .	.0
20	5 42	18 24	0 23	1 16	11 12	1.9	. . .	.0
10	5 51	18 15	0 21	1 12	11 23	2.0	. . .	.0
0	5 60	18 6	0 21	1 10	11 35	2.0	23 58	2.1
10	6 8	17 58	0 21	1 11	11 46	2.1	23 46	2.0
20	6 17	17 49	0 22	1 14	11 58	2.2	23 33	2.0
30	6 27	17 39	0 24	1 20	12 11	2.3	23 18	1.9
35	6 33	17 34	0 26	1 25	12 19	2.3	23 10	1.9
40	6 39	17 27	0 28	1 31	12 29	2.4	23 0	1.8
45	6 47	17 20	0 30	1 38	12 39	2.4	22 49	1.8
50	6 56	17 11	0 33	1 48	12 52	2.5	22 35	1.7
55	7 7	17 0	0 38	2 2	13 9	2.6	22 18	1.6
60	7 21	16 46	0 44	2 20	13 31	2.8	21 55	1.5
S								

SUNCE				MESEC			
UT	$e = T_p - UT$	Δ/24	r	Prolaz	Δ/24	$\pi_\leftmoon$	r
h	min s	s	′	h min	min	′	′
00	− 3 6.4	.6	15.8	$T_{\overline{m}}$ 17 46	2.1	55.1	15.0
12	− 2 58.8	$T_{\overline{m}_\odot}$ 12 h	3.0 min	Starost 7.4 d	Faza ◐		

PLANETE

Pl.	$T_{\overline{m}}$	π	360−α	Vel.	Pl.	$T_{\overline{m}}$	π	360−α	Vel.
	h min	′	°			h min	′	°	
♀	11 13	.1	221	−6.6	♆	12 17	.0	205	−1.2
♂	10 44	.1	229	1.8	♄	17 44	.0	123	.7

UT	SUNCE		PROLEĆ. TAČKA	VENERA		MARS	
	$S_\odot$	$\delta_\odot$	S_Υ	S_φ	δ_φ	S_σ	δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	179 17.2	11 37.2	330 58.0	192 40.3	7 31.0	199 12.3	19 2.8
2	209 17.5	11 35.5	1 3.0	222 47.7	7 31.8	229 14.0	19 2.0
4	239 17.8	11 33.8	31 7.9	252 55.1	7 32.6	259 15.6	19 1.1
6	269 18.2	11 32.1	61 12.8	283 2.5	7 33.4	289 17.3	19 .3
8	299 18.5	11 30.4	91 17.7	313 9.9	7 34.3	319 18.9	18 59.5
10	329 18.8	11 28.7	121 22.7	343 17.3	7 35.1	349 20.6	18 58.7
12	359 19.1	11 27.1	151 27.6	13 24.6	7 35.9	19 22.2	18 57.8
14	29 19.5	11 25.4	181 32.5	43 32.0	7 36.7	49 23.9	18 57.0
16	59 19.8	11 23.7	211 37.4	73 39.3	7 37.5	79 25.5	18 56.2
18	89 20.1	11 22.0	241 42.4	103 46.7	7 38.3	109 27.2	18 55.3
20	119 20.5	11 20.3	271 47.3	133 54.0	7 39.2	139 28.9	18 54.5
22	149 20.8	11 18.6	301 52.2	164 1.3	7 40.0	169 30.5	18 53.7
Δ	2	−8		37	4	8	−4

UT	MESEC				JUPITER		SATURN	
	$S_\leftmoon$	Δ	$\delta_\leftmoon$	Δ	S_{4}	δ_{4}	S_{5}	δ_{5}
h	° ′		° ′		° ′	° ′	° ′	° ′
0	90 24.2	113	16 2.6	47	176 11.3	11 23.6	94 8.5	−18 .2
2	119 24.7	111	16 12.0	45	206 15.2	11 23.2	124 13.2	−18 .3
4	148 25.0	110	16 21.0	44	236 19.1	11 22.9	154 18.0	−18 .3
6	177 25.1	109	16 29.7	42	266 23.0	11 22.5	184 22.8	−18 .4
8	206 24.8	108	16 38.1	40	296 26.9	11 22.1	214 27.5	−18 .4
10	235 24.4	106	16 46.1	39	326 30.8	11 21.7	244 32.3	−18 .5
12	264 23.7	105	16 53.9	37	356 34.7	11 21.3	274 37.0	−18 .6
14	293 22.7	104	17 1.3	35	26 38.6	11 20.9	304 41.8	−18 .6
16	322 21.5	103	17 8.4	34	56 42.5	11 20.5	334 46.5	−18 .7
18	351 20.1	102	17 15.1	32	86 46.4	11 20.1	4 51.3	−18 .7
20	20 18.4	100	17 21.5	30	116 50.2	11 19.8	34 56.1	−18 .8
22	49 16.5	99	17 27.5	28	146 54.1	11 19.4	65 .8	−18 .8
Δ					19	−2	24	0

φ	SUNCE		TRAJANJE SUMRAKA		MESEC			
	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 33	19 31	0 48	3 41	10 14	1.7	2 2	2.7
55	4 49	19 15	0 40	2 34	10 38	1.8	1 39	2.5
50	5 1	19 3	0 35	2 6	10 57	1.9	1 21	2.5
45	5 11	18 54	0 31	1 50	11 11	1.9	1 7	2.4
40	5 19	18 46	0 28	1 38	11 23	2.0	0 56	2.3
35	5 26	18 39	0 26	1 30	11 33	2.0	0 46	2.3
30	5 32	18 33	0 25	1 24	11 42	2.0	0 37	2.3
20	5 42	18 23	0 23	1 16	11 57	2.1	0 23	2.2
10	5 51	18 14	0 21	1 12	12 11	2.1	0 10	2.2
0	5 59	18 6	0 21	1 10	12 24	2.2	.. ..	.0
10	6 8	17 58	0 21	1 11	12 36	2.2	.. ..	.0
20	6 16	17 49	0 22	1 14	12 50	2.2	.. ..	.0
30	6 26	17 40	0 24	1 20	13 6	2.3	.. ..	.0
35	6 31	17 34	0 26	1 25	13 15	2.3	23 55	2.1
40	6 38	17 28	0 28	1 31	13 25	2.3	23 44	2.1
45	6 45	17 21	0 30	1 38	13 38	2.4	23 32	2.1
50	6 54	17 13	0 33	1 48	13 53	2.4	23 16	2.0
55	7 4	17 2	0 37	2 2	14 12	2.5	22 57	2.0
60	7 18	16 48	0 43	2 20	14 37	2.6	22 31	1.9
S								

SUNCE				MESEC			
UT	$e = T_p - UT$	Δ/24	r	Prolaz	Δ/24	$\pi_\leftmoon$	r
h	min s	s	′	$T_{\overline{m}}$ h min	min	′	′
00	− 2 51.2	.7	15.8	$T_{\overline{m}}$ 18 36	2.2	55.7	15.2
12	− 2 43.4	$T_{\overline{m}_\odot}$ 12 h	2.7 min	Starost 8.4 d	Faza ◐		

PLANETE

Pl.	$T_{\overline{m}}$	π	360−α	Vel.	Pl.	$T_{\overline{m}}$	π	360−α	Vel.
	h min	′	°			h min	′	°	
♀	11 7	.1	222	−6.6	♃	12 14	.0	205	−1.2
♂	10 43	.1	228	1.8	♄	17 41	.0	123	.7

UT	SUNCE		PROLEĆ. TAČKA	VENERA		MARS	
	$S_\odot$	$\delta_\odot$	S_Υ	S_φ	δ_φ	S_σ	δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	179 21.1	11 16.9	331 57.2	194 8.6	7 40.8	199 32.2	18 52.8
2	209 21.4	11 15.2	2 2.1	224 15.9	7 41.6	229 33.8	18 52.0
4	239 21.8	11 13.5	32 7.0	254 23.2	7 42.5	259 35.5	18 51.2
6	269 22.1	11 11.8	62 11.9	284 30.4	7 43.3	289 37.2	18 50.3
8	299 22.4	11 10.0	92 16.9	314 37.7	7 44.1	319 38.8	18 49.5
10	329 22.8	11 8.3	122 21.8	344 44.9	7 45.0	349 40.5	18 48.7
12	359 23.1	11 6.6	152 26.7	14 52.1	7 45.8	19 42.2	18 47.8
14	29 23.4	11 4.9	182 31.7	44 59.3	7 46.6	49 43.8	18 47.0
16	59 23.8	11 3.2	212 36.6	75 6.5	7 47.5	79 45.5	18 46.2
18	89 24.1	11 1.5	242 41.5	105 13.7	7 48.3	109 47.2	18 45.3
20	119 24.5	10 59.8	272 46.4	135 20.9	7 49.1	139 48.8	18 44.5
22	149 24.8	10 58.1	302 51.4	165 28.0	7 50.0	169 50.5	18 43.6
Δ	2	−9		36	4	8	−4

UT	MESEC				JUPITER		SATURN	
	$S_\leftmoon$	Δ	$\delta_\leftmoon$	Δ	S_{4}	δ_{4}	S_{5}	δ_{5}
h	° ′		° ′		° ′	° ′	° ′	° ′
0	78 14.3	98	17 33.2	27	176 58.0	11 19.0	95 5.6	−18 .9
2	107 11.9	97	17 38.5	25	207 1.9	11 18.6	125 10.3	−18 1.0
4	136 9.3	96	17 43.5	23	237 5.8	11 18.2	155 15.1	−18 1.0
6	165 6.4	94	17 48.1	21	267 9.7	11 17.8	185 19.8	−18 1.1
8	194 3.3	93	17 52.2	19	297 13.6	11 17.4	215 24.6	−18 1.1
10	222 59.9	92	17 56.1	17	327 17.5	11 17.0	245 29.3	−18 1.2
12	251 56.3	91	17 59.5	15	357 21.4	11 16.7	275 34.1	−18 1.2
14	280 52.5	90	18 2.5	13	27 25.3	11 16.3	305 38.8	−18 1.3
16	309 48.5	89	18 5.1	11	57 29.2	11 15.9	335 43.6	−18 1.4
18	338 44.2	88	18 7.4	9	87 33.1	11 15.5	5 48.3	−18 1.4
20	7 39.7	86	18 9.2	7	117 36.9	11 15.1	35 53.1	−18 1.5
22	36 35.0	85	18 10.6	5	147 40.8	11 14.7	65 57.8	−18 1.5
Δ					19	−2	24	0

φ	SUNCE		TRAJANJE SUMRAKA		MESEC			
	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 35	19 28	0 47	3 33	10 55	2.2	3 6	2.4
55	4 51	19 13	0 40	2 32	11 21	2.2	2 40	2.4
50	5 2	19 1	0 35	2 5	11 41	2.2	2 20	2.3
45	5 12	18 52	0 31	1 49	11 57	2.2	2 5	2.3
40	5 20	18 44	0 28	1 38	12 10	2.2	1 52	2.3
35	5 26	18 38	0 26	1 30	12 21	2.2	1 41	2.3
30	5 32	18 32	0 25	1 24	12 31	2.2	1 32	2.3
20	5 42	18 22	0 23	1 16	12 47	2.2	1 16	2.2
10	5 51	18 14	0 21	1 12	13 2	2.3	1 1	2.2
0	5 59	18 6	0 21	1 10	13 15	2.3	0 48	2.2
10	6 7	17 58	0 21	1 11	13 29	2.3	0 35	2.2
20	6 15	17 50	0 22	1 14	13 44	2.3	0 21	2.2
30	6 25	17 40	0 24	1 20	14 0	2.3	0 5	2.1
35	6 30	17 35	0 26	1 25	14 10	2.3	.. ..	.0
40	6 36	17 29	0 28	1 31	14 21	2.3	.. ..	.0
45	6 43	17 22	0 30	1 38	14 35	2.3	.. ..	.0
50	6 52	17 14	0 33	1 48	14 51	2.3	.. ..	.0
55	7 2	17 4	0 37	2 1	15 11	2.3	23 44	2.4
60	7 15	16 51	0 43	2 20	15 39	2.3	23 16	2.4
S								

SUNCE				MESEC			
UT	$e = T_p - UT$	Δ/24	r	Prolaz	Δ/24	$\pi_\leftmoon$	r
h	min s	s	′	$T_{\overline{m}}$ h min	min	′	′
00	− 2 35.6	.7	15.8	$T_{\overline{m}}$ 19 28	2.3	56.5	15.4
12	− 2 27.5	$T_{\overline{m}_\odot}$ 12 h	2.5 min	Starost 9.4 d	Faza ◐		

PLANETE

Pl.	$T_{\overline{m}}$	π	360−α	Vel.	Pl.	$T_{\overline{m}}$	π	360−α	Vel.
	h min	′	°			h min	′	°	
♀	11 1	.1	222	−6.6	♃	12 11	.0	205	−1.2
♂	10 41	.1	228	1.8	♄	17 37	.0	123	.7

UT	SUNCE		PROLEĆ. TAČKA	VENERA		MARS	
	$S_\odot$	$\delta_\odot$	S_Υ	S_φ	δ_φ	S_σ	δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	179 25.1	10 56.4	332 56.3	195 35.1	7 50.8	199 52.2	18 42.8
2	209 25.5	10 54.6	3 1.2	225 42.3	7 51.6	229 53.8	18 41.9
4	239 25.8	10 52.9	33 6.2	255 49.4	7 52.5	259 55.5	18 41.1
6	269 26.2	10 51.2	63 11.1	285 56.5	7 53.3	289 57.2	18 40.3
8	299 26.5	10 49.5	93 16.0	316 3.6	7 54.2	319 58.9	18 39.4
10	329 26.8	10 47.8	123 20.9	346 10.6	7 55.0	350 .5	18 38.6
12	359 27.2	10 46.0	153 25.9	16 17.7	7 55.9	20 2.2	18 37.7
14	29 27.5	10 44.3	183 30.8	46 24.7	7 56.7	50 3.9	18 36.9
16	59 27.9	10 42.6	213 35.7	76 31.8	7 57.6	80 5.6	18 36.0
18	89 28.2	10 40.9	243 40.7	106 38.8	7 58.4	110 7.2	18 35.2
20	119 28.6	10 39.1	273 45.6	136 45.8	7 59.2	140 8.9	18 34.3
22	149 28.9	10 37.4	303 50.5	166 52.8	8 .1	170 10.6	18 33.5
Δ	2	−9		35	4	8	−4

UT	MESEC				JUPITER		SATURN	
	$S_\leftmoon$	Δ	$\delta_\leftmoon$	Δ	$S_{\text{♃}}$	$\delta_{\text{♃}}$	$S_{\text{♄}}$	$\delta_{\text{♄}}$
h	° ′		° ′		° ′	° ′	° ′	° ′
0	65 30.1	84	18 11.6	3	177 44.7	11 14.3	96 2.6	−18 1.6
2	94 24.9	83	18 12.1	1	207 48.6	11 13.9	126 7.3	−18 1.7
4	123 19.6	82	18 12.3	−1	237 52.5	11 13.5	156 12.1	−18 1.7
6	152 14.1	81	18 12.0	−4	267 56.4	11 13.2	186 16.8	−18 1.8
8	181 8.4	80	18 11.3	−6	298 .3	11 12.8	216 21.5	−18 1.8
10	210 2.4	79	18 10.2	−8	328 4.2	11 12.4	246 26.3	−18 1.9
12	238 56.3	79	18 8.6	−10	358 8.1	11 12.0	276 31.0	−18 1.9
14	267 50.1	78	18 6.6	−12	28 12.0	11 11.6	306 35.8	−18 2.0
16	296 43.6	77	18 4.1	−15	58 15.9	11 11.2	336 40.5	−18 2.1
18	325 37.0	76	18 1.2	−17	88 19.8	11 10.8	6 45.3	−18 2.1
20	354 30.2	75	17 57.8	−19	118 23.7	11 10.4	36 50.0	−18 2.2
22	23 23.2	74	17 54.0	−21	148 27.6	11 10.0	66 54.7	−18 2.2
Δ					19	−2	24	0

φ	SUNCE		TRAJANJE SUMRAKA		MESEC			
	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 37	19 25	0 47	3 26	11 47	2.7	4 4	2.1
55	4 52	19 11	0 39	2 30	12 14	2.6	3 37	2.1
50	5 4	18 59	0 34	2 5	12 35	2.6	3 16	2.2
45	5 13	18 50	0 31	1 49	12 50	2.5	3 1	2.2
40	5 21	18 43	0 28	1 38	13 4	2.5	2 47	2.2
35	5 27	18 37	0 26	1 30	13 15	2.5	2 36	2.2
30	5 33	18 31	0 25	1 24	13 24	2.4	2 26	2.2
20	5 43	18 21	0 23	1 16	13 41	2.4	2 10	2.3
10	5 51	18 13	0 21	1 11	13 56	2.4	1 55	2.3
0	5 59	18 6	0 21	1 10	14 10	2.3	1 41	2.3
10	6 7	17 58	0 21	1 11	14 23	2.3	1 27	2.3
20	6 15	17 50	0 22	1 14	14 38	2.3	1 13	2.3
30	6 24	17 41	0 24	1 20	14 55	2.2	0 56	2.3
35	6 29	17 36	0 26	1 25	15 5	2.2	0 46	2.4
40	6 35	17 30	0 28	1 30	15 16	2.2	0 34	2.4
45	6 42	17 23	0 30	1 38	15 29	2.1	0 21	2.4
50	6 50	17 16	0 33	1 48	15 45	2.1	0 5	2.4
55	6 60	17 6	0 37	2 1	16 5	2.0	. . .	.0
60	7 13	16 53	0 43	2 20	16 33	1.9	. . .	.0
S								

SUNCE				MESEC			
UT	e = T_p − UT	Δ/24	r	Prolaz		Δ/24	$\pi_\leftmoon$	r
h	min s	s	′		h min	min	′	′
00	− 2 19.4	.7	15.8	$T_{\overline{m}}$	20 23	2.3	57.4	15.6
12	− 2 11.2	$T_{\overline{m}_\odot}$	12 h 2.2 min	Starost 10.4 d		Faza ◐		

PLANETE								
Pl.	$T_{\overline{m}}$	π	360 − α	Vel.	Pl.	$T_{\overline{m}}$	π	360 − α	Vel.
	h min	′	°			h min	′	°	
♀	10 55	.1	223	−6.6	♄	12 7	.0	205	−1.2
♂	10 40	.1	227	1.8	♃	17 33	.0	123	.7

UT	SUNCE		PROLEĆ. TAČKA	VENERA		MARS	
	$S_\odot$	$\delta_\odot$	S_Υ	S_φ	δ_φ	S_σ	δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	179 29.3	10 35.7	333 55.4	196 59.7	8 .9	200 12.3	18 32.6
2	209 29.6	10 34.0	4 .4	227 6.7	8 1.8	230 13.9	18 31.8
4	239 30.0	10 32.2	34 5.3	257 13.6	8 2.6	260 15.6	18 30.9
6	269 30.3	10 30.5	64 10.2	287 20.6	8 3.5	290 17.3	18 30.0
8	299 30.7	10 28.8	94 15.2	317 27.5	8 4.3	320 19.0	18 29.2
10	329 31.0	10 27.0	124 20.1	347 34.4	8 5.2	350 20.7	18 28.3
12	359 31.4	10 25.3	154 25.0	17 41.3	8 6.0	20 22.4	18 27.5
14	29 31.7	10 23.5	184 29.9	47 48.1	8 6.9	50 24.0	18 26.6
16	59 32.1	10 21.8	214 34.9	77 55.0	8 7.7	80 25.7	18 25.7
18	89 32.4	10 20.1	244 39.8	108 1.8	8 8.6	110 27.4	18 24.9
20	119 32.8	10 18.3	274 44.7	138 8.7	8 9.5	140 29.1	18 24.0
22	149 33.2	10 16.6	304 49.6	168 15.5	8 10.3	170 30.8	18 23.2
Δ	2	−9		34	4	8	−4

UT	MESEC				JUPITER		SATURN	
	$S_\leftmoon$	Δ	$\delta_\leftmoon$	Δ	$S_{\text{♃}}$	$\delta_{\text{♃}}$	$S_{\text{♄}}$	$\delta_{\text{♄}}$
h	° ′		° ′		° ′	° ′	° ′	° ′
0	52 16.1	74	17 49.8	−24	178 31.4	11 9.7	96 59.5	−18 2.3
2	81 8.9	73	17 45.1	−26	208 35.3	11 9.3	127 4.2	−18 2.4
4	110 1.5	72	17 39.9	−28	238 39.2	11 8.9	157 8.9	−18 2.4
6	138 54.0	72	17 34.3	−30	268 43.1	11 8.5	187 13.7	−18 2.5
8	167 46.3	71	17 28.2	−33	298 47.0	11 8.1	217 18.4	−18 2.6
10	196 38.5	71	17 21.7	−35	328 50.9	11 7.7	247 23.2	−18 2.6
12	225 30.6	70	17 14.7	−37	358 54.8	11 7.3	277 27.9	−18 2.7
14	254 22.6	69	17 7.2	−40	28 58.7	11 6.9	307 32.6	−18 2.7
16	283 14.5	69	16 59.3	−42	59 2.6	11 6.5	337 37.4	−18 2.8
18	312 6.3	69	16 51.0	−44	89 6.5	11 6.2	7 42.1	−18 2.9
20	340 58.1	68	16 42.2	−46	119 10.4	11 5.8	37 46.8	−18 2.9
22	9 49.7	68	16 32.9	−49	149 14.3	11 5.4	67 51.6	−18 3.0
Δ					19	−2	24	0

φ	SUNCE		TRAJANJE SUMRAKA		MESEC			
	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 40	19 23	0 47	3 21	12 52	3.2	4 54	1.7
55	4 54	19 8	0 39	2 29	13 17	3.0	4 28	1.8
50	5 5	18 57	0 34	2 4	13 36	2.9	4 8	1.9
45	5 14	18 49	0 31	1 48	13 51	2.8	3 53	2.0
40	5 22	18 41	0 28	1 37	14 4	2.7	3 40	2.1
35	5 28	18 35	0 26	1 29	14 14	2.7	3 30	2.1
30	5 33	18 30	0 25	1 23	14 23	2.6	3 20	2.2
20	5 43	18 21	0 22	1 16	14 39	2.5	3 4	2.2
10	5 51	18 13	0 21	1 11	14 53	2.5	2 50	2.3
0	5 59	18 5	0 21	1 10	15 6	2.4	2 36	2.4
10	6 6	17 58	0 21	1 11	15 18	2.3	2 23	2.4
20	6 14	17 50	0 22	1 14	15 32	2.2	2 8	2.5
30	6 23	17 42	0 24	1 20	15 48	2.1	1 52	2.5
35	6 28	17 37	0 26	1 24	15 57	2.1	1 42	2.6
40	6 33	17 31	0 27	1 30	16 7	2.0	1 31	2.6
45	6 40	17 25	0 30	1 38	16 20	1.9	1 18	2.7
50	6 48	17 17	0 33	1 48	16 35	1.8	1 2	2.7
55	6 57	17 7	0 37	2 1	16 53	1.7	0 42	2.8
60	7 10	16 55	0 43	2 20	17 18	1.5	0 15	3.0
S								

SUNCE				MESEC			
UT	e = T_p − UT	Δ/24	r	Prolaz		Δ/24	$\pi_\leftmoon$	r
h	min s	s	′		h min	min	′	′
00	− 2 2.9	.7	15.9	$T_{\overline{m}}$	21 19	2.4	58.4	15.9
12	− 1 54.4	$T_{\overline{m}_\odot}$	12 h 1.9 min	Starost 11.4 d		Faza ◐		

PLANETE								
Pl.	$T_{\overline{m}}$	π	360 − α	Vel.	Pl.	$T_{\overline{m}}$	π	360 − α	Vel.
	h min	′	°			h min	′	°	
♀	10 50	.1	223	−6.6	♄	12 4	.0	205	−1.2
♂	10 39	.1	226	1.8	♃	17 29	.0	123	.7

UT	SUNCE		PROLEĆ. TAČKA	VENERA		MARS	
	$S_\odot$	$\delta_\odot$	S_Υ	S_φ	δ_φ	S_σ	δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	179 33.5	10 14.8	334 54.6	198 22.3	8 11.2	200 32.5	18 22.3
2	209 33.9	10 13.1	4 59.5	228 29.0	8 12.0	230 34.2	18 21.4
4	239 34.2	10 11.3	35 4.4	258 35.8	8 12.9	260 35.8	18 20.6
6	269 34.6	10 9.6	65 9.4	288 42.6	8 13.7	290 37.5	18 19.7
8	299 34.9	10 7.9	95 14.3	318 49.3	8 14.6	320 39.2	18 18.8
10	329 35.3	10 6.1	125 19.2	348 56.0	8 15.4	350 40.9	18 18.0
12	359 35.7	10 4.4	155 24.1	19 2.7	8 16.3	20 42.6	18 17.1
14	29 36.0	10 2.6	185 29.1	49 9.4	8 17.1	50 44.3	18 16.2
16	59 36.4	10 .9	215 34.0	79 16.1	8 18.0	80 46.0	18 15.4
18	89 36.8	9 59.1	245 38.9	109 22.7	8 18.8	110 47.7	18 14.5
20	119 37.1	9 57.3	275 43.9	139 29.4	8 19.7	140 49.4	18 13.6
22	149 37.5	9 55.6	305 48.8	169 36.0	8 20.5	170 51.1	18 12.8
Δ	2	−9		33	4	8	−4

UT	MESEC				JUPITER		SATURN	
	$S_\leftmoon$	Δ	$\delta_\leftmoon$	Δ	$S_{\text{♃}}$	$\delta_{\text{♃}}$	$S_{\text{♄}}$	$\delta_{\text{♄}}$
h	° ′		° ′		° ′	° ′	° ′	° ′
0	38 41.2	67	16 23.2	−51	179 18.2	11 5.0	97 56.3	−18 3.0
2	67 32.7	67	16 13.0	−53	209 22.1	11 4.6	128 1.0	−18 3.1
4	96 24.1	67	16 2.4	−55	239 26.0	11 4.2	158 5.7	−18 3.2
6	125 15.5	67	15 51.3	−58	269 29.8	11 3.8	188 10.5	−18 3.2
8	154 6.8	66	15 39.8	−60	299 33.7	11 3.4	218 15.2	−18 3.3
10	182 58.1	66	15 27.9	−62	329 37.6	11 3.0	248 19.9	−18 3.4
12	211 49.3	66	15 15.5	−64	359 41.5	11 2.6	278 24.7	−18 3.4
14	240 40.5	66	15 2.7	−66	29 45.4	11 2.3	308 29.4	−18 3.5
16	269 31.7	66	14 49.5	−68	59 49.3	11 1.9	338 34.1	−18 3.5
18	298 22.8	66	14 35.8	−70	89 53.2	11 1.5	8 38.8	−18 3.6
20	327 14.0	66	14 21.7	−72	119 57.1	11 1.1	38 43.6	−18 3.7
22	356 5.1	66	14 7.2	−74	150 1.0	11 .7	68 48.3	−18 3.7
Δ					19	−2	24	0

φ	SUNCE		TRAJANJE SUMRAKA		MESEC			
	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 42	19 20	0 46	3 16	14 8	3.5	5 35	1.4
55	4 56	19 6	0 39	2 27	14 30	3.3	5 12	1.6
50	5 7	18 55	0 34	2 3	14 46	3.1	4 55	1.7
45	5 15	18 47	0 31	1 48	14 59	3.0	4 42	1.8
40	5 23	18 40	0 28	1 37	15 9	2.9	4 30	1.9
35	5 29	18 34	0 26	1 29	15 18	2.8	4 21	2.0
30	5 34	18 29	0 25	1 23	15 26	2.7	4 12	2.1
20	5 43	18 20	0 22	1 15	15 40	2.6	3 58	2.2
10	5 51	18 12	0 21	1 11	15 51	2.5	3 45	2.3
0	5 58	18 5	0 21	1 10	16 3	2.4	3 33	2.4
10	6 5	17 58	0 21	1 11	16 14	2.3	3 21	2.5
20	6 13	17 50	0 22	1 14	16 26	2.2	3 8	2.6
30	6 22	17 42	0 24	1 20	16 39	2.0	2 53	2.7
35	6 26	17 37	0 26	1 24	16 47	2.0	2 44	2.7
40	6 32	17 32	0 27	1 30	16 56	1.9	2 34	2.8
45	6 38	17 26	0 30	1 38	17 6	1.8	2 22	2.9
50	6 46	17 18	0 33	1 48	17 19	1.6	2 8	3.0
55	6 55	17 9	0 37	2 1	17 34	1.5	1 50	3.2
60	7 7	16 57	0 43	2 19	17 55	1.2	1 26	3.4
S								

SUNCE				MESEC			
UT	e = T_p − UT	Δ/24	r	Prolaz	Δ/24	$\pi_\leftmoon$	r
h	min s	s	′	h min	min	′	′
00	− 1 46.0	.7	15.9	$T_{\overline{m}}$ 22 16	2.4	59.3	16.2
12	− 1 37.3	$T_{\overline{m}_\odot}$ 12 h	1.6 min	Starost 12.4 d	Faza ○		

PLANETE

Pl.	$T_{\overline{m}}$	π	360 − α	Vel.	Pl.	$T_{\overline{m}}$	π	360 − α	Vel.
	h min	′	°			h min	′	°	
♀	10 44	.1	223	−6.5	♆	12 1	.0	204	−1.2
♂	10 37	.1	226	1.8	♄	17 26	.0	123	.7

UT	SUNCE		PROLEĆ. TAČKA	VENERA		MARS	
	$S_\odot$	$\delta_\odot$	S_Υ	S_φ	δ_φ	S_σ	δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	179 37.9	9 53.8	335 53.7	199 42.6	8 21.4	200 52.8	18 11.9
2	209 38.2	9 52.1	5 58.6	229 49.2	8 22.2	230 54.5	18 11.0
4	239 38.6	9 50.3	36 3.6	259 55.8	8 23.1	260 56.2	18 10.1
6	269 39.0	9 48.6	66 8.5	290 2.4	8 23.9	290 57.9	18 9.3
8	299 39.3	9 46.8	96 13.4	320 8.9	8 24.8	320 59.6	18 8.4
10	329 39.7	9 45.0	126 18.4	350 15.4	8 25.6	351 1.3	18 7.5
12	359 40.1	9 43.3	156 23.3	20 22.0	8 26.5	21 3.0	18 6.6
14	29 40.4	9 41.5	186 28.2	50 28.5	8 27.3	51 4.7	18 5.7
16	59 40.8	9 39.7	216 33.1	80 34.9	8 28.2	81 6.4	18 4.9
18	89 41.2	9 38.0	246 38.1	110 41.4	8 29.0	111 8.1	18 4.0
20	119 41.5	9 36.2	276 43.0	140 47.9	8 29.9	141 9.8	18 3.1
22	149 41.9	9 34.4	306 47.9	170 54.3	8 30.7	171 11.5	18 2.2
Δ	2	−9		33	4	9	−4

UT	MESEC				JUPITER		SATURN	
	$S_\leftmoon$	Δ	$\delta_\leftmoon$	Δ	$S_{\text{♃}}$	$\delta_{\text{♃}}$	$S_{\text{♄}}$	$\delta_{\text{♄}}$
h	° ′		° ′		° ′	° ′	° ′	° ′
0	24 56.2	66	13 52.3	−76	180 4.9	11 .3	98 53.0	−18 3.8
2	53 47.3	66	13 37.0	−78	210 8.8	10 59.9	128 57.7	−18 3.9
4	82 38.4	66	13 21.3	−80	240 12.7	10 59.5	159 2.4	−18 3.9
6	111 29.6	66	13 5.3	−82	270 16.6	10 59.1	189 7.2	−18 4.0
8	140 20.7	66	12 48.8	−84	300 20.5	10 58.7	219 11.9	−18 4.1
10	169 11.9	66	12 32.0	−86	330 24.4	10 58.4	249 16.6	−18 4.1
12	198 3.1	66	12 14.8	−88	0 28.3	10 58.0	279 21.3	−18 4.2
14	226 54.3	66	11 57.2	−90	30 32.2	10 57.6	309 26.0	−18 4.2
16	255 45.5	66	11 39.3	−91	60 36.0	10 57.2	339 30.8	−18 4.3
18	284 36.8	67	11 21.0	−93	90 39.9	10 56.8	9 35.5	−18 4.4
20	313 28.1	67	11 2.5	−95	120 43.8	10 56.4	39 40.2	−18 4.4
22	342 19.5	67	10 43.5	−96	150 47.7	10 56.0	69 44.9	−18 4.5
Δ					19	−2	24	0

φ	SUNCE		TRAJANJE SUMRAKA		MESEC			
	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 17	0 46	3 12	15 33	3.7	6 8	1.1
55	4 58	19 3	0 39	2 26	15 49	3.5	5 50	1.4
50	5 8	18 53	0 34	2 2	16 1	3.3	5 37	1.5
45	5 17	18 45	0 31	1 47	16 11	3.1	5 26	1.7
40	5 24	18 38	0 28	1 37	16 19	3.0	5 17	1.8
35	5 29	18 33	0 26	1 29	16 26	2.9	5 9	1.9
30	5 35	18 28	0 24	1 23	16 32	2.8	5 2	2.0
20	5 43	18 19	0 22	1 15	16 42	2.6	4 50	2.1
10	5 51	18 12	0 21	1 11	16 51	2.5	4 40	2.3
0	5 58	18 5	0 21	1 10	16 60	2.4	4 30	2.4
10	6 5	17 58	0 21	1 10	17 8	2.2	4 20	2.5
20	6 12	17 51	0 22	1 14	17 18	2.1	4 9	2.6
30	6 20	17 43	0 24	1 20	17 28	1.9	3 57	2.8
35	6 25	17 38	0 26	1 24	17 34	1.8	3 50	2.9
40	6 30	17 33	0 27	1 30	17 41	1.7	3 42	3.0
45	6 36	17 27	0 30	1 38	17 48	1.6	3 32	3.1
50	6 44	17 20	0 33	1 48	17 58	1.5	3 21	3.2
55	6 52	17 11	0 37	2 1	18 10	1.3	3 6	3.4
60	7 4	16 60	0 43	2 19	18 25	1.0	2 47	3.7
S								

SUNCE				MESEC			
UT	e = T_p − UT	Δ/24	r	Prolaz	Δ/24	$\pi_\leftmoon$	r
h	min s	s	′	h min	min	′	′
00	− 1 28.6	.7	15.9	$T_{\overline{m}}$ 23 14	2.3	60.1	16.4
12	− 1 19.7	$T_{\overline{m}_\odot}$ 12 h	1.3 min	Starost 13.4 d	Faza ○		

PLANETE

Pl.	$T_{\overline{m}}$	π	360 − α	Vel.	Pl.	$T_{\overline{m}}$	π	360 − α	Vel.
	h min	′	°			h min	′	°	
♀	10 39	.1	224	−6.5	♆	11 58	.0	204	−1.2
♂	10 36	.1	225	1.8	♄	17 22	.0	123	.7

UT	SUNCE		PROLEĆ. TAČKA	VENERA		MARS	
	$S_\odot$	$\delta_\odot$	S_Υ	S_φ	δ_φ	S_σ	δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	179 42.3	9 32.7	336 52.9	201 .7	8 31.6	201 13.2	18 1.3
2	209 42.7	9 30.9	6 57.8	231 7.1	8 32.4	231 14.9	18 .5
4	239 43.0	9 29.1	37 2.7	261 13.5	8 33.3	261 16.6	17 59.6
6	269 43.4	9 27.4	67 7.6	291 19.9	8 34.1	291 18.3	17 58.7
8	299 43.8	9 25.6	97 12.6	321 26.2	8 35.0	321 20.0	17 57.8
10	329 44.2	9 23.8	127 17.5	351 32.6	8 35.8	351 21.7	17 56.9
12	359 44.5	9 22.0	157 22.4	21 38.9	8 36.6	21 23.4	17 56.0
14	29 44.9	9 20.3	187 27.4	51 45.2	8 37.5	51 25.1	17 55.1
16	59 45.3	9 18.5	217 32.3	81 51.5	8 38.3	81 26.8	17 54.3
18	89 45.7	9 16.7	247 37.2	111 57.8	8 39.2	111 28.5	17 53.4
20	119 46.1	9 14.9	277 42.1	142 4.0	8 40.0	141 30.3	17 52.5
22	149 46.4	9 13.1	307 47.1	172 10.3	8 40.8	171 32.0	17 51.6
Δ	2	−9		32	4	9	−4

UT	MESEC				JUPITER		SATURN	
	$S_\leftmoon$	Δ	$\delta_\leftmoon$	Δ	$S_{\mathrm{♃}}$	$\delta_{\mathrm{♃}}$	$S_{\mathrm{♄}}$	$\delta_{\mathrm{♄}}$
h	° ′		° ′		° ′	° ′	° ′	° ′
0	11 10.9	67	10 24.3	−98	180 51.6	10 55.6	99 49.6	−18 4.6
2	40 2.4	68	10 4.8	−99	210 55.5	10 55.2	129 54.3	−18 4.6
4	68 53.9	68	9 45.0	−101	240 59.4	10 54.8	159 59.1	−18 4.7
6	97 45.4	68	9 24.8	−102	271 3.3	10 54.4	190 3.8	−18 4.8
8	126 37.0	68	9 4.5	−103	301 7.2	10 54.1	220 8.5	−18 4.8
10	155 28.7	69	8 43.8	−105	331 11.1	10 53.7	250 13.2	−18 4.9
12	184 20.4	69	8 22.9	−106	1 15.0	10 53.3	280 17.9	−18 5.0
14	213 12.2	69	8 1.7	−107	31 18.9	10 52.9	310 22.6	−18 5.0
16	242 4.0	69	7 40.3	−108	61 22.8	10 52.5	340 27.3	−18 5.1
18	270 55.9	70	7 18.7	−109	91 26.7	10 52.1	10 32.0	−18 5.2
20	299 47.9	70	6 56.9	−110	121 30.6	10 51.7	40 36.7	−18 5.2
22	328 39.9	70	6 34.9	−111	151 34.5	10 51.3	70 41.5	−18 5.3
Δ					19	−2	24	0

φ	SUNCE		TRAJANJE SUMRAKA		MESEC			
	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 14	0 46	3 8	17 3	3.8	6 35	1.0
55	4 60	19 1	0 39	2 24	17 13	3.6	6 23	1.2
50	5 10	18 51	0 34	2 1	17 20	3.3	6 14	1.4
45	5 18	18 43	0 30	1 47	17 26	3.2	6 6	1.6
40	5 24	18 37	0 28	1 36	17 31	3.0	6 0	1.7
35	5 30	18 31	0 26	1 29	17 35	2.9	5 55	1.8
30	5 35	18 27	0 24	1 23	17 39	2.8	5 50	1.9
20	5 44	18 18	0 22	1 15	17 46	2.6	5 41	2.1
10	5 51	18 11	0 21	1 11	17 51	2.5	5 34	2.2
0	5 58	18 4	0 21	1 10	17 57	2.3	5 27	2.4
10	6 4	17 58	0 21	1 10	18 2	2.2	5 20	2.5
20	6 11	17 51	0 22	1 14	18 8	2.0	5 12	2.6
30	6 19	17 43	0 24	1 20	18 14	1.9	5 4	2.8
35	6 24	17 39	0 26	1 24	18 18	1.8	4 59	2.9
40	6 29	17 34	0 27	1 30	18 22	1.7	4 53	3.0
45	6 35	17 28	0 30	1 38	18 27	1.5	4 46	3.2
50	6 41	17 21	0 33	1 48	18 33	1.4	4 38	3.3
55	6 50	17 13	0 37	2 1	18 40	1.2	4 28	3.5
60	7 1	17 2	0 43	2 19	18 50	.9	4 15	3.8
S								

SUNCE				MESEC			
UT	e = Tp − UT	Δ/24	r	Prolaz		Δ/24	$\pi_\leftmoon$	r
h	min s	s	′	$T_{\overline{m}}$	h min	min	′	′
00	− 1 10.8	.8	15.9	$T_{\overline{m}}$	. . .	1.0	60.8	16.6
12	− 1 1.8	$T_{\overline{m}_\odot}$	12 h 1.0 min	Starost 14.4 d		Faza ○		

PLANETE

Pl.	$T_{\overline{m}}$	π	360 − α	Vel.	Pl.	$T_{\overline{m}}$	π	360 − α	Vel.
	h min	′	°			h min	′	°	
♀	10 34	.1	224	−6.5	♆	11 55	.0	204	−1.2
♂	10 35	.1	224	1.8	♄	17 18	.0	123	.7

UT	SUNCE		PROLEĆ. TAČKA	VENERA		MARS	
	$S_\odot$	$\delta_\odot$	S_Υ	S_φ	δ_φ	S_σ	δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	179 46.8	9 11.4	337 52.0	202 16.5	8 41.7	201 33.7	17 50.7
2	209 47.2	9 9.6	7 56.9	232 22.7	8 42.5	231 35.4	17 49.8
4	239 47.6	9 7.8	38 1.9	262 28.9	8 43.4	261 37.1	17 48.9
6	269 48.0	9 6.0	68 6.8	292 35.1	8 44.2	291 38.8	17 48.0
8	299 48.3	9 4.2	98 11.7	322 41.2	8 45.0	321 40.5	17 47.1
10	329 48.7	9 2.4	128 16.6	352 47.4	8 45.9	351 42.3	17 46.2
12	359 49.1	9 .6	158 21.6	22 53.5	8 46.7	21 44.0	17 45.3
14	29 49.5	8 58.9	188 26.5	52 59.6	8 47.5	51 45.7	17 44.4
16	59 49.9	8 57.1	218 31.4	83 5.7	8 48.3	81 47.4	17 43.5
18	89 50.3	8 55.3	248 36.3	113 11.8	8 49.2	111 49.1	17 42.6
20	119 50.7	8 53.5	278 41.3	143 17.8	8 50.0	141 50.9	17 41.7
22	149 51.0	8 51.7	308 46.2	173 23.9	8 50.8	171 52.6	17 40.8
Δ	2	−9		31	4	9	−4

UT	MESEC				JUPITER		SATURN	
	$S_\leftmoon$	Δ	$\delta_\leftmoon$	Δ	$S_{\mathrm{♃}}$	$\delta_{\mathrm{♃}}$	$S_{\mathrm{♄}}$	$\delta_{\mathrm{♄}}$
h	° ′		° ′		° ′	° ′	° ′	° ′
0	357 32.0	71	6 12.6	−112	181 38.4	10 50.9	100 46.2	−18 5.4
2	26 24.1	71	5 50.2	−113	211 42.3	10 50.5	130 50.9	−18 5.4
4	55 16.3	71	5 27.7	−114	241 46.2	10 50.1	160 55.6	−18 5.5
6	84 8.6	72	5 5.0	−114	271 50.1	10 49.8	191 .3	−18 5.6
8	113 .9	72	4 42.1	−115	301 53.9	10 49.4	221 5.0	−18 5.6
10	141 53.3	72	4 19.1	−116	331 57.8	10 49.0	251 9.7	−18 5.7
12	170 45.8	73	3 56.0	−116	2 1.7	10 48.6	281 14.4	−18 5.8
14	199 38.3	73	3 32.8	−117	32 5.6	10 48.2	311 19.1	−18 5.8
16	228 30.9	73	3 9.5	−117	62 9.5	10 47.8	341 23.8	−18 5.9
18	257 23.5	73	2 46.1	−117	92 13.4	10 47.4	11 28.5	−18 6.0
20	286 16.2	74	2 22.7	−118	122 17.3	10 47.0	41 33.2	−18 6.0
22	315 9.0	74	1 59.2	−118	152 21.2	10 46.6	71 37.9	−18 6.1
Δ					19	−2	24	0

φ	SUNCE		TRAJANJE SUMRAKA		MESEC			
	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 49	19 11	0 45	3 4	18 34	2.4	6 59	.9
55	5 2	18 58	0 39	2 23	18 38	2.4	6 53	1.1
50	5 11	18 49	0 34	2 1	18 40	2.4	6 48	1.3
45	5 19	18 42	0 30	1 46	18 42	2.4	6 44	1.5
40	5 25	18 35	0 28	1 36	18 44	2.4	6 41	1.6
35	5 31	18 30	0 26	1 28	18 46	2.4	6 38	1.7
30	5 36	18 25	0 24	1 23	18 47	2.4	6 35	1.8
20	5 44	18 17	0 22	1 15	18 49	2.3	6 31	2.0
10	5 51	18 10	0 21	1 11	18 51	2.3	6 27	2.2
0	5 57	18 4	0 21	1 10	18 53	2.3	6 24	2.3
10	6 4	17 58	0 21	1 10	18 55	2.3	6 20	2.5
20	6 11	17 51	0 22	1 14	18 57	2.3	6 16	2.6
30	6 18	17 44	0 24	1 20	18 59	2.3	6 11	2.8
35	6 22	17 40	0 26	1 24	19 1	2.3	6 9	2.9
40	6 27	17 35	0 27	1 30	19 2	2.3	6 6	3.1
45	6 33	17 29	0 30	1 38	19 4	2.3	6 2	3.2
50	6 39	17 23	0 33	1 48	19 6	2.3	5 58	3.4
55	6 48	17 15	0 37	2 1	19 9	2.3	5 53	3.6
60	6 58	17 4	0 42	2 19	19 12	2.3	5 46	3.9
S								

SUNCE				MESEC			
UT	e = Tp − UT	Δ/24	r	Prolaz		Δ/24	$\pi_\leftmoon$	r
h	min s	s	′	$T_{\overline{m}}$	h min	min	′	′
00	− 0 52.7	.8	15.9	$T_{\overline{m}}$	0 10	2.3	61.1	16.7
12	− 0 43.5	$T_{\overline{m}_\odot}$	12 h .7 min	Starost 15.4 d		Faza ○		

PLANETE

Pl.	$T_{\overline{m}}$	π	360 − α	Vel.	Pl.	$T_{\overline{m}}$	π	360 − α	Vel.
	h min	′	°			h min	′	°	
♀	10 29	.1	224	−6.5	♆	11 52	.0	204	−1.2
♂	10 33	.1	224	1.8	♄	17 14	.0	123	.7

UT	SUNCE		PROLEĆ. TAČKA	VENERA		MARS	
	$S_\odot$	$\delta_\odot$	S_Υ	S_φ	δ_φ	S_σ	δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	179 51.4	8 49.9	338 51.1	203 29.9	8 51.6	201 54.3	17 39.9
2	209 51.8	8 48.1	8 56.1	233 35.9	8 52.5	231 56.0	17 39.0
4	239 52.2	8 46.3	39 1.0	263 41.9	8 53.3	261 57.7	17 38.1
6	269 52.6	8 44.5	69 5.9	293 47.9	8 54.1	291 59.5	17 37.2
8	299 53.0	8 42.7	99 10.8	323 53.8	8 54.9	322 1.2	17 36.3
10	329 53.4	8 40.9	129 15.8	353 59.8	8 55.7	352 2.9	17 35.4
12	359 53.8	8 39.1	159 20.7	24 5.7	8 56.6	22 4.6	17 34.5
14	29 54.2	8 37.3	189 25.6	54 11.6	8 57.4	52 6.4	17 33.6
16	59 54.5	8 35.5	219 30.6	84 17.5	8 58.2	82 8.1	17 32.7
18	89 54.9	8 33.7	249 35.5	114 23.4	8 59.0	112 9.8	17 31.8
20	119 55.3	8 31.9	279 40.4	144 29.2	8 59.8	142 11.6	17 30.9
22	149 55.7	8 30.1	309 45.3	174 35.1	9 .6	172 13.3	17 30.0
Δ	2	−9		30	4	9	−5

UT	MESEC				JUPITER		SATURN	
	$S_\leftmoon$	Δ	$\delta_\leftmoon$	Δ	$S_{\mathrm{♃}}$	$\delta_{\mathrm{♃}}$	$S_{\mathrm{♄}}$	$\delta_{\mathrm{♄}}$
h	° ′		° ′		° ′	° ′	° ′	° ′
0	344 1.8	74	1 35.6	−118	182 25.1	10 46.2	101 42.6	−18 6.2
2	12 54.7	75	1 12.0	−118	212 29.0	10 45.8	131 47.3	−18 6.2
4	41 47.6	75	0 48.4	−118	242 32.9	10 45.5	161 52.0	−18 6.3
6	70 40.6	75	0 24.8	−118	272 36.8	10 45.1	191 56.7	−18 6.4
8	99 33.6	75	0 1.2	106	302 40.7	10 44.7	222 1.4	−18 6.4
10	128 26.7	76	0 22.4	118	332 44.6	10 44.3	252 6.1	−18 6.5
12	157 19.8	76	0 45.9	118	2 48.5	10 43.9	282 10.8	−18 6.6
14	186 13.0	76	1 9.5	117	32 52.4	10 43.5	312 15.5	−18 6.6
16	215 6.2	76	1 32.9	117	62 56.3	10 43.1	342 20.2	−18 6.7
18	243 59.4	76	1 56.3	117	93 .2	10 42.7	12 24.9	−18 6.8
20	272 52.7	77	2 19.7	116	123 4.1	10 42.3	42 29.6	−18 6.8
22	301 46.1	77	2 42.9	116	153 8.0	10 41.9	72 34.3	−18 6.9
Δ					19	−2	23	0

φ	SUNCE		TRAJANJE SUMRAKA		MESEC			
	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 52	19 8	0 45	3 1	19 33	.9	7 19	3.7
55	5 4	18 56	0 38	2 22	19 36	1.2	7 19	3.5
50	5 13	18 47	0 34	1 60	19 38	1.3	7 19	3.3
45	5 20	18 40	0 30	1 46	19 40	1.5	7 19	3.1
40	5 26	18 34	0 28	1 36	19 41	1.6	7 19	3.0
35	5 32	18 29	0 26	1 28	19 42	1.7	7 20	2.9
30	5 36	18 24	0 24	1 22	19 43	1.8	7 20	2.8
20	5 44	18 16	0 22	1 15	19 45	2.0	7 20	2.6
10	5 51	18 10	0 21	1 11	19 47	2.2	7 20	2.5
0	5 57	18 4	0 21	1 9	19 49	2.3	7 20	2.3
10	6 3	17 58	0 21	1 10	19 50	2.4	7 20	2.2
20	6 10	17 51	0 22	1 13	19 52	2.6	7 19	2.0
30	6 17	17 44	0 24	1 20	19 54	2.8	7 19	1.9
35	6 21	17 40	0 26	1 24	19 56	2.9	7 19	1.8
40	6 26	17 36	0 27	1 30	19 57	3.0	7 19	1.6
45	6 31	17 30	0 30	1 38	19 59	3.1	7 19	1.5
50	6 37	17 24	0 33	1 48	20 1	3.3	7 19	1.4
55	6 45	17 17	0 37	2 1	20 3	3.5	7 19	1.2
60	6 55	17 7	0 42	2 19	20 6	3.8	7 18	1.0
S								

SUNCE				MESEC			
UT	e = T_p − UT	Δ/24	r	Prolaz	Δ/24	$\pi_\leftmoon$	r
h	min s	s	′	h min	min	′	′
00	− 0 34.3	.8	15.9	$T_{\overline{m}}$ 1 6	2.3	61.2	16.7
12	− 0 24.9	$T_{\overline{m}_\odot}$ 12 h .4 min		Starost 16.4 d	Faza ○		

PLANETE

Pl.	$T_{\overline{m}}$	π	360 − α	Vel.	Pl.	$T_{\overline{m}}$	π	360 − α	Vel.
	h min	′	°			h min	′	°	
♀	10 24	.1	225	−6.4	♄	11 49	.0	204	−1.2
♂	10 32	.1	223	1.8	♇	17 10	.0	123	.7

UT	SUNCE		PROLEĆ. TAČKA	VENERA		MARS	
	$S_\odot$	$\delta_\odot$	S_Υ	S_φ	δ_φ	S_σ	δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	179 56.1	8 28.3	339 50.3	204 40.9	9 1.4	202 15.0	17 29.1
2	209 56.5	8 26.5	9 55.2	234 46.7	9 2.2	232 16.8	17 28.1
4	239 56.9	8 24.7	40 .1	264 52.5	9 3.0	262 18.5	17 27.2
6	269 57.3	8 22.9	70 5.1	294 58.2	9 3.8	292 20.2	17 26.3
8	299 57.7	8 21.1	100 10.0	325 4.0	9 4.6	322 21.9	17 25.4
10	329 58.1	8 19.3	130 14.9	355 9.7	9 5.4	352 23.7	17 24.5
12	359 58.5	8 17.4	160 19.8	25 15.5	9 6.2	22 25.4	17 23.6
14	29 58.9	8 15.6	190 24.8	55 21.2	9 7.0	52 27.2	17 22.7
16	59 59.3	8 13.8	220 29.7	85 26.8	9 7.8	82 28.9	17 21.7
18	89 59.7	8 12.0	250 34.6	115 32.5	9 8.6	112 30.6	17 20.8
20	120 .1	8 10.2	280 39.6	145 38.2	9 9.4	142 32.4	17 19.9
22	150 .5	8 8.4	310 44.5	175 43.8	9 10.2	172 34.1	17 19.0
Δ	2	−9		29	4	9	−5

UT	MESEC				JUPITER		SATURN	
	$S_\leftmoon$	Δ	$\delta_\leftmoon$	Δ	$S_{\mathrm{♃}}$	$\delta_{\mathrm{♃}}$	$S_{\mathrm{♄}}$	$\delta_{\mathrm{♄}}$
h	° ′		° ′		° ′	° ′	° ′	° ′
0	330 39.4	77	3 6.1	115	183 11.9	10 41.5	102 39.0	−18 7.0
2	359 32.8	77	3 29.1	115	213 15.8	10 41.1	132 43.6	−18 7.1
4	28 26.3	77	3 52.0	114	243 19.7	10 40.8	162 48.3	−18 7.1
6	57 19.8	78	4 14.8	113	273 23.6	10 40.4	192 53.0	−18 7.2
8	86 13.3	78	4 37.5	112	303 27.5	10 40.0	222 57.7	−18 7.3
10	115 6.8	78	4 59.9	112	333 31.4	10 39.6	253 2.4	−18 7.3
12	144 .4	78	5 22.3	111	3 35.3	10 39.2	283 7.1	−18 7.4
14	172 53.9	78	5 44.4	110	33 39.2	10 38.8	313 11.8	−18 7.5
16	201 47.6	78	6 6.4	109	63 43.1	10 38.4	343 16.5	−18 7.5
18	230 41.2	78	6 28.2	108	93 47.0	10 38.0	13 21.2	−18 7.6
20	259 34.9	78	6 49.7	107	123 50.9	10 37.6	43 25.8	−18 7.7
22	288 28.5	79	7 11.1	106	153 54.7	10 37.2	73 30.5	−18 7.8
Δ					19	−2	23	0

φ	SUNCE		TRAJANJE SUMRAKA		MESEC			
	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 54	19 5	0 45	2 58	19 55	1.0	8 49	3.7
55	5 6	18 53	0 38	2 20	20 3	1.2	8 43	3.4
50	5 14	18 45	0 34	1 59	20 10	1.4	8 38	3.2
45	5 21	18 38	0 30	1 45	20 15	1.6	8 34	3.1
40	5 27	18 32	0 28	1 35	20 20	1.7	8 31	3.0
35	5 32	18 27	0 26	1 28	20 24	1.8	8 29	2.8
30	5 37	18 23	0 24	1 22	20 27	1.9	8 26	2.7
20	5 44	18 16	0 22	1 15	20 33	2.0	8 22	2.6
10	5 51	18 9	0 21	1 11	20 39	2.2	8 18	2.4
0	5 57	18 3	0 21	1 9	20 44	2.3	8 15	2.3
10	6 3	17 58	0 21	1 10	20 49	2.4	8 12	2.2
20	6 9	17 52	0 22	1 13	20 55	2.6	8 8	2.0
30	6 16	17 45	0 24	1 20	21 1	2.7	8 4	1.8
35	6 20	17 41	0 25	1 24	21 5	2.8	8 1	1.8
40	6 24	17 37	0 27	1 30	21 9	2.9	7 59	1.6
45	6 29	17 32	0 30	1 38	21 14	3.0	7 56	1.5
50	6 35	17 26	0 33	1 48	21 20	3.2	7 52	1.4
55	6 43	17 18	0 37	2 1	21 27	3.4	7 47	1.2
60	6 52	17 9	0 42	2 19	21 36	3.6	7 41	.9
S								

SUNCE				MESEC			
UT	e = T_p − UT	Δ/24	r	Prolaz	Δ/24	$\pi_\leftmoon$	r
h	min s	s	′	h min	min	′	′
00	− 0 15.5	.8	15.9	$T_{\overline{m}}$ 2 2	2.3	60.9	16.6
12	− 0 6.0	$T_{\overline{m}_\odot}$ 12 h .1 min		Starost 17.4 d	Faza ◑		

PLANETE

Pl.	$T_{\overline{m}}$	π	360 − α	Vel.	Pl.	$T_{\overline{m}}$	π	360 − α	Vel.
	h min	′	°			h min	′	°	
♀	10 19	.1	225	−6.4	♄	11 46	.0	203	−1.2
♂	10 30	.1	222	1.8	♇	17 7	.0	123	.8

UT	SUNCE		PROLEĆ. TAČKA	VENERA		MARS	
	$S_\odot$	$\delta_\odot$	S_Υ	S_φ	δ_φ	S_σ	δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	180 .9	8 6.6	340 49.4	205 49.4	9 11.0	202 35.8	17 18.1
2	210 1.3	8 4.7	10 54.3	235 55.0	9 11.7	232 37.6	17 17.2
4	240 1.7	8 2.9	40 59.3	266 .6	9 12.5	262 39.3	17 16.2
6	270 2.1	8 1.1	71 4.2	296 6.2	9 13.3	292 41.1	17 15.3
8	300 2.5	7 59.3	101 9.1	326 11.7	9 14.1	322 42.8	17 14.4
10	330 2.9	7 57.5	131 14.1	356 17.3	9 14.9	352 44.5	17 13.5
12	0 3.3	7 55.6	161 19.0	26 22.8	9 15.6	22 46.3	17 12.5
14	30 3.7	7 53.8	191 23.9	56 28.3	9 16.4	52 48.0	17 11.6
16	60 4.1	7 52.0	221 28.8	86 33.7	9 17.2	82 49.8	17 10.7
18	90 4.5	7 50.2	251 33.8	116 39.2	9 17.9	112 51.5	17 9.8
20	120 4.9	7 48.3	281 38.7	146 44.7	9 18.7	142 53.3	17 8.8
22	150 5.3	7 46.5	311 43.6	176 50.1	9 19.5	172 55.0	17 7.9
Δ	2	−9		28	4	9	−5

UT	MESEC				JUPITER		SATURN	
	$S_\leftmoon$	Δ	$\delta_\leftmoon$	Δ	S_{4}	δ_{4}	S_η	δ_η
h	° ′		° ′		° ′	° ′	° ′	° ′
0	317 22.2	79	7 32.2	105	183 58.6	10 36.8	103 35.2	−18 7.8
2	346 16.0	79	7 53.1	103	214 2.5	10 36.4	133 39.9	−18 7.9
4	15 9.7	79	8 13.8	102	244 6.4	10 36.0	163 44.6	−18 8.0
6	44 3.4	79	8 34.2	101	274 10.3	10 35.7	193 49.3	−18 8.0
8	72 57.2	79	8 54.4	99	304 14.2	10 35.3	223 53.9	−18 8.1
10	101 51.0	79	9 14.3	98	334 18.1	10 34.9	253 58.6	−18 8.2
12	130 44.8	79	9 33.9	97	4 22.0	10 34.5	284 3.3	−18 8.3
14	159 38.6	79	9 53.2	95	34 25.9	10 34.1	314 8.0	−18 8.3
16	188 32.5	79	10 12.2	94	64 29.8	10 33.7	344 12.7	−18 8.4
18	217 26.3	79	10 31.0	92	94 33.7	10 33.3	14 17.3	−18 8.5
20	246 20.2	79	10 49.4	91	124 37.6	10 32.9	44 22.0	−18 8.5
22	275 14.1	79	11 7.6	89	154 41.5	10 32.5	74 26.7	−18 8.6
Δ					19	−2	23	0

φ	SUNCE		TRAJANJE SUMRAKA		MESEC			
	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 56	19 2	0 45	2 55	20 19	1.2	10 18	3.5
55	5 7	18 51	0 38	2 19	20 33	1.4	10 5	3.3
50	5 16	18 43	0 33	1 59	20 44	1.5	9 56	3.1
45	5 23	18 36	0 30	1 45	20 53	1.7	9 49	3.0
40	5 28	18 31	0 28	1 35	21 0	1.8	9 42	2.9
35	5 33	18 26	0 26	1 28	21 7	1.9	9 37	2.8
30	5 37	18 22	0 24	1 22	21 12	1.9	9 32	2.7
20	5 45	18 15	0 22	1 15	21 22	2.1	9 24	2.5
10	5 51	18 9	0 21	1 11	21 31	2.2	9 17	2.4
0	5 56	18 3	0 21	1 9	21 39	2.3	9 10	2.3
10	6 2	17 58	0 21	1 10	21 47	2.4	9 3	2.2
20	6 8	17 52	0 22	1 13	21 56	2.5	8 56	2.0
30	6 15	17 45	0 24	1 20	22 6	2.6	8 48	1.9
35	6 18	17 42	0 25	1 24	22 12	2.7	8 43	1.8
40	6 23	17 38	0 27	1 30	22 19	2.8	8 38	1.7
45	6 27	17 33	0 30	1 38	22 27	2.9	8 32	1.6
50	6 33	17 27	0 33	1 48	22 36	3.0	8 25	1.5
55	6 40	17 20	0 37	2 1	22 48	3.2	8 16	1.3
60	6 49	17 11	0 42	2 19	23 3	2.3	8 4	1.1
S								

SUNCE				MESEC			
UT	e = T_p − UT	Δ/24	r	Prolaz	Δ/24	$\pi_\leftmoon$	r
h	min s	s	′	h min	min	′	′
00	0 3.5	.8	15.9	$T_{\overline{m}}$ 2 57	2.3	60.4	16.5
12	0 13.2	$T_{\overline{m}_\odot}$ 11 h 59.8 min		Starost 18.4 d	Faza ◑		

PLANETE								
Pl.	$T_{\overline{m}}$	π	360 − α	Vel.	Pl.	$T_{\overline{m}}$	π	360 − α	Vel.
	h min	′	°			h min	′	°	
♀	10 15	.1	225	−6.4	♃	11 43	.0	203	−1.2
♂	10 29	.1	222	1.8	♄	17 3	.0	123	.8

UT	SUNCE		PROLEĆ. TAČKA	VENERA		MARS	
	$S_\odot$	$\delta_\odot$	S_Υ	S_φ	δ_φ	S_σ	δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	180 5.7	7 44.7	341 48.5	206 55.5	9 20.2	202 56.8	17 7.0
2	210 6.1	7 42.9	11 53.5	237 .9	9 21.0	232 58.5	17 6.0
4	240 6.5	7 41.0	41 58.4	267 6.3	9 21.7	263 .3	17 5.1
6	270 6.9	7 39.2	72 3.3	297 11.6	9 22.5	293 2.0	17 4.2
8	300 7.3	7 37.4	102 8.3	327 17.0	9 23.2	323 3.7	17 3.3
10	330 7.8	7 35.5	132 13.2	357 22.3	9 24.0	353 5.5	17 2.3
12	0 8.2	7 33.7	162 18.1	27 27.6	9 24.7	23 7.3	17 1.4
14	30 8.6	7 31.9	192 23.0	57 32.9	9 25.5	53 9.0	17 .5
16	60 9.0	7 30.0	222 28.0	87 38.2	9 26.2	83 10.8	16 59.5
18	90 9.4	7 28.2	252 32.9	117 43.5	9 27.0	113 12.5	16 58.6
20	120 9.8	7 26.4	282 37.8	147 48.7	9 27.7	143 14.3	16 57.7
22	150 10.2	7 24.5	312 42.8	177 53.9	9 28.5	173 16.0	16 56.7
Δ	2	−9		27	4	9	−5

UT	MESEC				JUPITER		SATURN	
	$S_\leftmoon$	Δ	$\delta_\leftmoon$	Δ	S_{4}	δ_{4}	S_η	δ_η
h	° ′		° ′		° ′	° ′	° ′	° ′
0	304 7.9	80	11 25.4	87	184 45.4	10 32.1	104 31.4	−18 8.7
2	333 1.9	80	11 42.8	86	214 49.3	10 31.7	134 36.1	−18 8.8
4	1 55.8	80	12 .0	84	244 53.2	10 31.3	164 40.7	−18 8.8
6	30 49.7	80	12 16.8	82	274 57.1	10 30.9	194 45.4	−18 8.9
8	59 43.7	80	12 33.3	81	305 1.0	10 30.6	224 50.1	−18 9.0
10	88 37.7	80	12 49.4	79	335 4.9	10 30.2	254 54.8	−18 9.0
12	117 31.7	80	13 5.1	77	5 8.8	10 29.8	284 59.4	−18 9.1
14	146 25.7	80	13 20.5	75	35 12.7	10 29.4	315 4.1	−18 9.2
16	175 19.8	80	13 35.6	73	65 16.6	10 29.0	345 8.8	−18 9.3
18	204 13.8	81	13 50.2	71	95 20.5	10 28.6	15 13.4	−18 9.3
20	233 7.9	81	14 4.5	70	125 24.4	10 28.2	45 18.1	−18 9.4
22	262 2.1	81	14 18.4	68	155 28.3	10 27.8	75 22.8	−18 9.5
Δ					19	−2	23	0

φ	SUNCE		TRAJANJE SUMRAKA		MESEC			
	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 59	18 59	0 44	2 53	20 47	1.4	11 43	3.3
55	5 9	18 48	0 38	2 18	21 6	1.6	11 24	3.1
50	5 17	18 41	0 33	1 58	21 21	1.7	11 11	2.9
45	5 24	18 34	0 30	1 44	21 33	1.8	10 60	2.8
40	5 29	18 29	0 28	1 35	21 43	1.9	10 51	2.7
35	5 34	18 25	0 26	1 27	21 51	2.0	10 43	2.6
30	5 38	18 21	0 24	1 22	21 59	2.0	10 36	2.6
20	5 45	18 14	0 22	1 15	22 12	2.1	10 25	2.5
10	5 51	18 8	0 21	1 11	22 23	2.2	10 15	2.4
0	5 56	18 3	0 21	1 9	22 34	2.3	10 5	2.3
10	6 2	17 57	0 21	1 10	22 45	2.3	9 55	2.2
20	6 7	17 52	0 22	1 13	22 56	2.4	9 45	2.1
30	6 13	17 46	0 24	1 20	23 9	2.3	9 34	2.0
35	6 17	17 42	0 25	1 24	23 17	2.3	9 27	1.9
40	6 21	17 39	0 27	1 30	23 26	2.3	9 19	1.8
45	6 26	17 34	0 29	1 38	23 36	2.3	9 11	1.7
50	6 31	17 29	0 32	1 48	23 49	2.3	9 0	1.6
55	6 38	17 22	0 36	2 1	.. ..	.0	8 47	1.5
60	6 46	17 14	0 42	2 19	23 60	3.4	8 30	1.3
S								

SUNCE				MESEC			
UT	e = T_p − UT	Δ/24	r	Prolaz	Δ/24	$\pi_\leftmoon$	r
h	min s	s	′	h min	min	′	′
00	0 22.9	.8	15.9	$T_{\overline{m}}$ 3 52	2.3	59.7	16.3
12	0 32.7	$T_{\overline{m}_\odot}$ 11 h 59.5 min		Starost 19.4 d	Faza ◑		

PLANETE								
Pl.	$T_{\overline{m}}$	π	360 − α	Vel.	Pl.	$T_{\overline{m}}$	π	360 − α	Vel.
	h min	′	°			h min	′	°	
♀	10 11	.1	225	−6.3	♃	11 39	.0	203	−1.2
♂	10 28	.1	221	1.8	♄	16 59	.0	123	.8

4. SEPTEMBAR 2015. PETAK

UT	SUNCE $S_\odot$	SUNCE $\delta_\odot$	PROLEĆ. TAČKA S_Υ	VENERA S_φ	VENERA δ_φ	MARS S_σ	MARS δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	180 10.6	7 22.7	342 47.7	207 59.1	9 29.2	203 17.8	16 55.8
2	210 11.0	7 20.9	12 52.6	238 4.3	9 29.9	233 19.5	16 54.8
4	240 11.4	7 19.0	42 57.5	268 9.5	9 30.7	263 21.3	16 53.9
6	270 11.8	7 17.2	73 2.5	298 14.7	9 31.4	293 23.0	16 53.0
8	300 12.3	7 15.3	103 7.4	328 19.8	9 32.1	323 24.8	16 52.0
10	330 12.7	7 13.5	133 12.3	358 24.9	9 32.8	353 26.6	16 51.1
12	0 13.1	7 11.7	163 17.3	28 30.1	9 33.5	23 28.3	16 50.1
14	30 13.5	7 9.8	193 22.2	58 35.1	9 34.3	53 30.1	16 49.2
16	60 13.9	7 8.0	223 27.1	88 40.2	9 35.0	83 31.8	16 48.3
18	90 14.3	7 6.1	253 32.0	118 45.3	9 35.7	113 33.6	16 47.3
20	120 14.7	7 4.3	283 37.0	148 50.3	9 36.4	143 35.4	16 46.4
22	150 15.2	7 2.4	313 41.9	178 55.3	9 37.1	173 37.1	16 45.4
Δ	2	−9		26	4	9	−5

UT	MESEC $S_\leftmoon$	MESEC Δ	MESEC $\delta_\leftmoon$	MESEC Δ	JUPITER $S_{\mathrm{♃}}$	JUPITER $\delta_{\mathrm{♃}}$	SATURN $S_{\mathrm{♄}}$	SATURN $\delta_{\mathrm{♄}}$
h	° ′		° ′		° ′	° ′	° ′	° ′
0	290 56.2	81	14 31.9	66	185 32.2	10 27.4	105 27.5	−18 9.6
2	319 50.4	81	14 45.1	64	215 36.1	10 27.0	135 32.1	−18 9.6
4	348 44.6	81	14 57.8	62	245 40.0	10 26.6	165 36.8	−18 9.7
6	17 38.9	82	15 10.2	60	275 43.9	10 26.2	195 41.5	−18 9.8
8	46 33.2	82	15 22.2	58	305 47.8	10 25.8	225 46.1	−18 9.8
10	75 27.6	82	15 33.7	56	335 51.7	10 25.5	255 50.8	−18 9.9
12	104 21.9	82	15 44.9	54	5 55.6	10 25.1	285 55.5	−18 10.0
14	133 16.4	82	15 55.6	52	35 59.5	10 24.7	316 .1	−18 10.1
16	162 10.9	83	16 6.0	50	66 3.4	10 24.3	346 4.8	−18 10.1
18	191 5.4	83	16 15.9	48	96 7.3	10 23.9	16 9.5	−18 10.2
20	220 .0	83	16 25.4	46	126 11.2	10 23.5	46 14.1	−18 10.3
22	248 54.7	84	16 34.5	43	156 15.1	10 23.1	76 18.8	−18 10.4
Δ					20	−2	23	0

φ	SUNCE IZLAZ	SUNCE ZALAZ	TRAJANJE SUMRAKA GRAĐ.	TRAJANJE SUMRAKA ASTR.	MESEC IZLAZ	MESEC Δ/24	MESEC ZALAZ	MESEC Δ/24
N	h min	h min	h min	h min	h min	min	h min	min
60	5 1	18 56	0 44	2 50	21 21	1.7	13 1	2.9
55	5 11	18 46	0 38	2 17	21 44	1.8	12 38	2.8
50	5 19	18 38	0 33	1 57	22 2	1.9	12 21	2.7
45	5 25	18 32	0 30	1 44	22 16	2.0	12 7	2.6
40	5 30	18 27	0 28	1 34	22 28	2.0	11 56	2.5
35	5 35	18 23	0 26	1 27	22 38	2.1	11 47	2.5
30	5 38	18 19	0 24	1 22	22 47	2.1	11 38	2.5
20	5 45	18 13	0 22	1 14	23 2	2.2	11 24	2.4
10	5 51	18 7	0 21	1 11	23 16	2.2	11 11	2.3
0	5 56	18 2	0 21	1 9	23 28	2.2	10 60	2.3
10	6 1	17 57	0 21	1 10	23 41	2.2	10 48	2.2
20	6 6	17 52	0 22	1 13	23 54	2.2	10 35	2.1
30	6 12	17 46	0 24	1 20	. . .	.0	10 21	2.1
35	6 16	17 43	0 25	1 24	. . .	.0	10 13	2.0
40	6 19	17 39	0 27	1 30	. . .	.0	10 3	2.0
45	6 24	17 35	0 29	1 38	. . .	.0	9 52	1.9
50	6 29	17 30	0 32	1 48	. . .	.0	9 39	1.8
55	6 35	17 24	0 36	2 1	0 5	2.9	9 22	1.7
60	6 43	17 16	0 42	2 19	. . .	.0	9 0	1.6
S								

SUNCE UT	SUNCE $e = T_p - UT$	SUNCE Δ/24	SUNCE r	MESEC Prolaz	MESEC Δ/24	MESEC $\pi_\leftmoon$	MESEC r
h	min s	s	′	h min	min	′	′
00	0 42.5	.8	15.9	$T_{\overline{m}}$ 4 47	2.3	58.9	16.0
12	0 52.4	$T_{\overline{m}_\odot}$ 11 h 59.1 min		Starost 20.4 d	Faza ◑		

PLANETE Pl.	$T_{\overline{m}}$	π	360−α	Vel.	Pl.	$T_{\overline{m}}$	π	360−α	Vel.
	h min	′	°			h min	′	°	
♀	10 6	.1	225	−6.3	♄	11 36	.0	203	−1.2
♂	10 26	.1	220	1.8	♅	16 56	.0	123	.8

5. SEPTEMBAR SUBOTA

UT	SUNCE $S_\odot$	SUNCE $\delta_\odot$	PROLEĆ. TAČKA S_Υ	VENERA S_φ	VENERA δ_φ	MARS S_σ	MARS δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	180 15.6	7 .6	343 46.8	209 .4	9 37.8	203 38.9	16 44.5
2	210 16.0	6 58.7	13 51.8	239 5.3	9 38.5	233 40.6	16 43.5
4	240 16.4	6 56.9	43 56.7	269 10.3	9 39.2	263 42.4	16 42.6
6	270 16.8	6 55.0	74 1.6	299 15.3	9 39.9	293 44.2	16 41.6
8	300 17.2	6 53.2	104 6.5	329 20.2	9 40.6	323 45.9	16 40.7
10	330 17.7	6 51.3	134 11.5	359 25.1	9 41.3	353 47.7	16 39.7
12	0 18.1	6 49.5	164 16.4	29 30.1	9 42.0	23 49.5	16 38.8
14	30 18.5	6 47.6	194 21.3	59 34.9	9 42.7	53 51.2	16 37.8
16	60 18.9	6 45.8	224 26.3	89 39.8	9 43.4	83 53.0	16 36.9
18	90 19.3	6 43.9	254 31.2	119 44.7	9 44.0	113 54.8	16 35.9
20	120 19.7	6 42.1	284 36.1	149 49.5	9 44.7	143 56.6	16 35.0
22	150 20.2	6 40.2	314 41.0	179 54.3	9 45.4	173 58.3	16 34.0
Δ	2	−9		25	3	9	−5

UT	MESEC $S_\leftmoon$	MESEC Δ	MESEC $\delta_\leftmoon$	MESEC Δ	JUPITER $S_{\mathrm{♃}}$	JUPITER $\delta_{\mathrm{♃}}$	SATURN $S_{\mathrm{♄}}$	SATURN $\delta_{\mathrm{♄}}$
h	° ′		° ′		° ′	° ′	° ′	° ′
0	277 49.4	84	16 43.2	41	186 19.0	10 22.7	106 23.4	−18 10.4
2	306 44.2	84	16 51.5	39	216 22.9	10 22.3	136 28.1	−18 10.5
4	335 39.1	85	16 59.4	37	246 26.8	10 21.9	166 32.8	−18 10.6
6	4 34.0	85	17 6.8	35	276 30.7	10 21.5	196 37.4	−18 10.7
8	33 29.0	85	17 13.8	33	306 34.6	10 21.1	226 42.1	−18 10.7
10	62 24.1	86	17 20.5	31	336 38.5	10 20.7	256 46.7	−18 10.8
12	91 19.3	86	17 26.7	29	6 42.4	10 20.3	286 51.4	−18 10.9
14	120 14.5	87	17 32.4	27	36 46.3	10 20.0	316 56.1	−18 11.0
16	149 9.9	87	17 37.8	25	66 50.2	10 19.6	347 .7	−18 11.0
18	178 5.3	88	17 42.7	23	96 54.1	10 19.2	17 5.4	−18 11.1
20	207 .9	88	17 47.2	21	126 58.0	10 18.8	47 10.0	−18 11.2
22	235 56.5	89	17 51.4	18	157 1.9	10 18.4	77 14.7	−18 11.3
Δ					20	−2	23	0

φ	SUNCE IZLAZ	SUNCE ZALAZ	TRAJANJE SUMRAKA GRAĐ.	TRAJANJE SUMRAKA ASTR.	MESEC IZLAZ	MESEC Δ/24	MESEC ZALAZ	MESEC Δ/24
N	h min	h min	h min	h min	h min	min	h min	min
60	5 3	18 53	0 44	2 48	22 2	2.1	14 11	2.5
55	5 13	18 43	0 38	2 16	22 29	2.1	13 45	2.4
50	5 20	18 36	0 33	1 57	22 48	2.1	13 25	2.4
45	5 26	18 31	0 30	1 44	23 4	2.1	13 10	2.3
40	5 31	18 26	0 28	1 34	23 17	2.2	12 57	2.3
35	5 35	18 22	0 26	1 27	23 28	2.2	12 47	2.3
30	5 39	18 18	0 24	1 22	23 37	2.2	12 37	2.3
20	5 45	18 12	0 22	1 14	23 54	2.2	12 21	2.3
10	5 51	18 7	0 21	1 11	. . .	.0	12 7	2.2
0	5 56	18 2	0 21	1 9	. . .	.0	11 54	2.2
10	6 0	17 57	0 21	1 10	. . .	.0	11 41	2.2
20	6 5	17 52	0 22	1 13	. . .	.0	11 27	2.2
30	6 11	17 47	0 24	1 19	0 10	2.4	11 11	2.1
35	6 14	17 44	0 25	1 24	0 19	2.4	11 1	2.1
40	6 18	17 40	0 27	1 30	0 29	2.4	10 51	2.1
45	6 22	17 36	0 29	1 38	0 41	2.5	10 38	2.1
50	6 27	17 32	0 32	1 48	0 56	2.5	10 23	2.0
55	6 33	17 26	0 36	2 1	1 15	2.6	10 3	2.0
60	6 40	17 18	0 42	2 19	1 40	2.7	9 37	1.9
S								

SUNCE UT	SUNCE $e = T_p - UT$	SUNCE Δ/24	SUNCE r	MESEC Prolaz	MESEC Δ/24	MESEC $\pi_\leftmoon$	MESEC r
h	min s	s	′	h min	min	′	′
00	1 2.3	.8	15.9	$T_{\overline{m}}$ 5 41	2.3	58.0	15.8
12	1 12.3	$T_{\overline{m}_\odot}$ 11 h 58.8 min		Starost 21.4 d	Faza ◑		

PLANETE Pl.	$T_{\overline{m}}$	π	360−α	Vel.	Pl.	$T_{\overline{m}}$	π	360−α	Vel.
	h min	′	°			h min	′	°	
♀	10 2	.1	225	−6.3	♄	11 33	.0	203	−1.2
♂	10 25	.1	220	1.8	♅	16 52	.0	123	.8

6. SEPTEMBAR 2015. NEDELJA

UT	SUNCE		PROLEĆ. TAČKA	VENERA		MARS	
	$S_\odot$	$\delta_\odot$	S_Υ	S_φ	δ_φ	S_σ	δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	180 20.6	6 38.3	344 46.0	209 59.2	9 46.1	204 .1	16 33.1
2	210 21.0	6 36.5	14 50.9	240 3.9	9 46.7	234 1.9	16 32.1
4	240 21.4	6 34.6	44 55.8	270 8.7	9 47.4	264 3.6	16 31.2
6	270 21.8	6 32.8	75 .8	300 13.5	9 48.1	294 5.4	16 30.2
8	300 22.3	6 30.9	105 5.7	330 18.2	9 48.7	324 7.2	16 29.3
10	330 22.7	6 29.1	135 10.6	0 23.0	9 49.4	354 9.0	16 28.3
12	0 23.1	6 27.2	165 15.5	30 27.7	9 50.1	24 10.7	16 27.3
14	30 23.5	6 25.3	195 20.5	60 32.4	9 50.7	54 12.5	16 26.4
16	60 23.9	6 23.5	225 25.4	90 37.0	9 51.4	84 14.3	16 25.4
18	90 24.4	6 21.6	255 30.3	120 41.7	9 52.0	114 16.1	16 24.5
20	120 24.8	6 19.7	285 35.2	150 46.3	9 52.6	144 17.8	16 23.5
22	150 25.2	6 17.9	315 40.2	180 51.0	9 53.3	174 19.6	16 22.5
Δ	2	−9		24	3	9	−5

UT	MESEC				JUPITER		SATURN	
	$S_\leftmoon$	Δ	$\delta_\leftmoon$	Δ	$S_{\mathrm{♃}}$	$\delta_{\mathrm{♃}}$	$S_{\mathrm{♄}}$	$\delta_{\mathrm{♄}}$
h	° ′		° ′		° ′	° ′	° ′	° ′
0	264 52.3	89	17 55.0	16	187 5.9	10 18.0	107 19.3	−18 11.3
2	293 48.2	90	17 58.3	14	217 9.8	10 17.6	137 24.0	−18 11.4
4	322 44.1	90	18 1.2	12	247 13.7	10 17.2	167 28.7	−18 11.5
6	351 40.2	91	18 3.6	10	277 17.6	10 16.8	197 33.3	−18 11.6
8	20 36.4	92	18 5.7	8	307 21.5	10 16.4	227 38.0	−18 11.7
10	49 32.8	92	18 7.3	6	337 25.4	10 16.0	257 42.6	−18 11.7
12	78 29.3	93	18 8.5	4	7 29.3	10 15.6	287 47.3	−18 11.8
14	107 25.9	94	18 9.3	2	37 33.2	10 15.2	317 51.9	−18 11.9
16	136 22.6	94	18 9.8	0	67 37.1	10 14.8	347 56.6	−18 12.0
18	165 19.5	95	18 9.8	−2	97 41.0	10 14.5	18 1.2	−18 12.0
20	194 16.5	96	18 9.4	−4	127 44.9	10 14.1	48 5.9	−18 12.1
22	223 13.6	97	18 8.6	−6	157 48.8	10 13.7	78 10.5	−18 12.2
Δ					20	−2	23	0

φ	SUNCE		TRAJANJE SUMRAKA		MESEC			
	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 6	18 50	0 44	2 46	22 52	2.4	15 10	2.0
55	5 15	18 41	0 37	2 15	23 19	2.1	14 42	2.0
50	5 22	18 34	0 33	1 56	23 40	2.1	14 22	2.1
45	5 27	18 29	0 30	1 43	23 55	2.1	14 6	2.1
40	5 32	18 24	0 27	1 34	. . .	.0	13 53	2.1
35	5 36	18 20	0 26	1 27	. . .	.0	13 42	2.1
30	5 39	18 17	0 24	1 21	. . .	.0	13 32	2.1
20	5 45	18 11	0 22	1 14	. . .	.0	13 16	2.1
10	5 50	18 6	0 21	1 10	0 8	2.2	13 1	2.1
0	5 55	18 2	0 21	1 9	0 22	2.2	12 47	2.2
10	5 60	17 57	0 21	1 10	0 35	2.2	12 33	2.2
20	6 5	17 53	0 22	1 13	0 50	2.2	12 19	2.2
30	6 10	17 47	0 24	1 19	1 7	2.2	12 2	2.2
35	6 13	17 45	0 25	1 24	1 16	2.2	11 52	2.2
40	6 16	17 41	0 27	1 30	1 27	2.2	11 41	2.2
45	6 20	17 38	0 29	1 38	1 41	2.2	11 28	2.2
50	6 25	17 33	0 32	1 48	1 57	2.2	11 12	2.2
55	6 30	17 28	0 36	2 1	2 17	2.2	10 51	2.2
60	6 37	17 21	0 42	2 20	2 45	2.2	10 23	2.3
S								

SUNCE				MESEC			
UT	e = Tp − UT	Δ/24	r	Prolaz		Δ/24	$\pi_\leftmoon$	r
h	min s	s	′		h min	min	′	′
00	1 22.3	.8	15.9	$T_{\overline{m}}$	6 35	2.2	57.2	15.6
12	1 32.4	$T_{\overline{m}_\odot}$	11 h 58.5 min	Starost 22.4 d		Faza ◑		

PLANETE

Pl.	$T_{\overline{m}}$	π	360 − α	Vel.	Pl.	$T_{\overline{m}}$	π	360 − α	Vel.
	h min	′	°			h min	′	°	
♀	9 58	.1	225	−6.3	♃	11 30	.0	202	−1.2
♂	10 23	.1	219	1.8	♄	16 48	.0	123	.8

7. SEPTEMBAR PONEDELJAK

UT	SUNCE		PROLEĆ. TAČKA	VENERA		MARS	
	$S_\odot$	$\delta_\odot$	S_Υ	S_φ	δ_φ	S_σ	δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	180 25.6	6 16.0	345 45.1	210 55.6	9 53.9	204 21.4	16 21.6
2	210 26.1	6 14.1	15 50.0	241 .2	9 54.6	234 23.2	16 20.6
4	240 26.5	6 12.3	45 55.0	271 4.8	9 55.2	264 25.0	16 19.6
6	270 26.9	6 10.4	75 59.9	301 9.3	9 55.8	294 26.7	16 18.7
8	300 27.3	6 8.5	106 4.8	331 13.9	9 56.5	324 28.5	16 17.7
10	330 27.8	6 6.7	136 9.7	1 18.4	9 57.1	354 30.3	16 16.7
12	0 28.2	6 4.8	166 14.7	31 22.9	9 57.7	24 32.1	16 15.8
14	30 28.6	6 2.9	196 19.6	61 27.4	9 58.3	54 33.9	16 14.8
16	60 29.0	6 1.1	226 24.5	91 31.9	9 58.9	84 35.7	16 13.8
18	90 29.5	5 59.2	256 29.5	121 36.4	9 59.6	114 37.4	16 12.9
20	120 29.9	5 57.3	286 34.4	151 40.8	10 .2	144 39.2	16 11.9
22	150 30.3	5 55.4	316 39.3	181 45.3	10 .8	174 41.0	16 10.9
Δ	2	−9		23	3	9	−5

UT	MESEC				JUPITER		SATURN	
	$S_\leftmoon$	Δ	$\delta_\leftmoon$	Δ	$S_{\mathrm{♃}}$	$\delta_{\mathrm{♃}}$	$S_{\mathrm{♄}}$	$\delta_{\mathrm{♄}}$
h	° ′		° ′		° ′	° ′	° ′	° ′
0	252 10.9	97	18 7.5	−8	187 52.7	10 13.3	108 15.2	−18 12.3
2	281 8.4	98	18 5.9	−10	217 56.6	10 12.9	138 19.8	−18 12.3
4	310 6.0	99	18 4.0	−12	248 .5	10 12.5	168 24.4	−18 12.4
6	339 3.7	100	18 1.6	−14	278 4.4	10 12.1	198 29.1	−18 12.5
8	8 1.7	100	17 58.9	−15	308 8.3	10 11.7	228 33.7	−18 12.6
10	36 59.7	101	17 55.8	−17	338 12.2	10 11.3	258 38.4	−18 12.7
12	65 58.0	102	17 52.4	−19	8 16.1	10 10.9	288 43.0	−18 12.7
14	94 56.4	103	17 48.5	−21	38 20.0	10 10.5	318 47.7	−18 12.8
16	123 54.9	104	17 44.4	−23	68 23.9	10 10.1	348 52.3	−18 12.9
18	152 53.7	105	17 39.8	−25	98 27.8	10 9.7	18 57.0	−18 13.0
20	181 52.6	105	17 34.9	−26	128 31.7	10 9.3	49 1.6	−18 13.0
22	210 51.7	106	17 29.6	−28	158 35.6	10 9.0	79 6.2	−18 13.1
Δ					20	−2	23	0

φ	SUNCE		TRAJANJE SUMRAKA		MESEC			
	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 8	18 47	0 43	2 44	23 50	2.1	15 58	1.6
55	5 17	18 38	0 37	2 14	. . .	.0	15 31	1.7
50	5 23	18 32	0 33	1 56	. . .	.0	15 12	1.8
45	5 29	18 27	0 30	1 43	. . .	.0	14 56	1.8
40	5 33	18 23	0 27	1 34	0 8	2.3	14 44	1.9
35	5 37	18 19	0 26	1 27	0 20	2.2	14 33	1.9
30	5 40	18 16	0 24	1 21	0 29	2.2	14 23	1.9
20	5 46	18 10	0 22	1 14	0 46	2.2	14 7	2.0
10	5 50	18 6	0 21	1 10	1 1	2.1	13 52	2.0
0	5 55	18 1	0 21	1 9	1 14	2.1	13 39	2.1
10	5 59	17 57	0 21	1 10	1 28	2.1	13 26	2.1
20	6 4	17 53	0 22	1 13	1 43	2.1	13 11	2.2
30	6 9	17 48	0 24	1 19	1 60	2.0	12 55	2.2
35	6 11	17 45	0 25	1 24	2 9	2.0	12 45	2.3
40	6 15	17 42	0 27	1 30	2 20	2.0	12 34	2.3
45	6 18	17 39	0 29	1 38	2 34	1.9	12 21	2.3
50	6 23	17 35	0 32	1 48	2 50	1.9	12 5	2.4
55	6 28	17 29	0 36	2 1	3 10	1.8	11 45	2.5
60	6 35	17 23	0 42	2 20	3 38	1.8	11 17	2.6
S								

SUNCE				MESEC			
UT	e = Tp − UT	Δ/24	r	Prolaz		Δ/24	$\pi_\leftmoon$	r
h	min s	s	′		h min	min	′	′
00	1 42.6	.9	15.9	$T_{\overline{m}}$	7 27	2.1	56.5	15.4
12	1 52.8	$T_{\overline{m}_\odot}$	11 h 58.1 min	Starost 23.4 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	.1	225	−6.2	♃	11 27	.0	202	−1.2
♂	10 22	.1	219	1.8	♄	16 44	.0	122	.8

UT	SUNCE		PROLEĆ. TAČKA	VENERA		MARS	
	$S_\odot$	$\delta_\odot$	S_Υ	S_φ	δ_φ	S_σ	δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	180 30.7	5 53.6	346 44.2	211 49.7	10 1.4	204 42.8	16 10.0
2	210 31.2	5 51.7	16 49.2	241 54.1	10 2.0	234 44.6	16 9.0
4	240 31.6	5 49.8	46 54.1	271 58.5	10 2.6	264 46.4	16 8.0
6	270 32.0	5 47.9	76 59.0	302 2.8	10 3.2	294 48.2	16 7.1
8	300 32.5	5 46.1	107 4.0	332 7.2	10 3.8	324 50.0	16 6.1
10	330 32.9	5 44.2	137 8.9	2 11.5	10 4.4	354 51.8	16 5.1
12	0 33.3	5 42.3	167 13.8	32 15.9	10 4.9	24 53.5	16 4.1
14	30 33.7	5 40.4	197 18.7	62 20.2	10 5.5	54 55.3	16 3.2
16	60 34.2	5 38.5	227 23.7	92 24.5	10 6.1	84 57.1	16 2.2
18	90 34.6	5 36.7	257 28.6	122 28.8	10 6.7	114 58.9	16 1.2
20	120 35.0	5 34.8	287 33.5	152 33.0	10 7.2	145 .7	16 .2
22	150 35.5	5 32.9	317 38.5	182 37.3	10 7.8	175 2.5	15 59.3
Δ	2	−9		22	3	9	−5

UT	MESEC				JUPITER		SATURN	
	$S_\leftmoon$	Δ	$\delta_\leftmoon$	Δ	$S_{\text{♃}}$	$\delta_{\text{♃}}$	$S_{\text{♄}}$	$\delta_{\text{♄}}$
h	° ′		° ′		° ′	° ′	° ′	° ′
0	239 51.0	107	17 24.0	−30	188 39.5	10 8.6	109 10.9	−18 13.2
2	268 50.4	108	17 18.0	−32	218 43.4	10 8.2	139 15.5	−18 13.3
4	297 50.0	109	17 11.7	−33	248 47.4	10 7.8	169 20.2	−18 13.4
6	326 49.8	110	17 5.0	−35	278 51.3	10 7.4	199 24.8	−18 13.4
8	355 49.8	111	16 58.1	−37	308 55.2	10 7.0	229 29.4	−18 13.5
10	24 49.9	112	16 50.7	−38	338 59.1	10 6.6	259 34.1	−18 13.6
12	53 50.3	113	16 43.1	−40	9 3.0	10 6.2	289 38.7	−18 13.7
14	82 50.8	114	16 35.1	−41	39 6.9	10 5.8	319 43.3	−18 13.8
16	111 51.5	114	16 26.8	−43	69 10.8	10 5.4	349 48.0	−18 13.8
18	140 52.4	115	16 18.3	−45	99 14.7	10 5.0	19 52.6	−18 13.9
20	169 53.5	116	16 9.3	−46	129 18.6	10 4.6	49 57.2	−18 14.0
22	198 54.8	117	16 .1	−48	159 22.5	10 4.2	80 1.9	−18 14.1
Δ					20	−2	23	0

φ	SUNCE		TRAJANJE SUMRAKA		MESEC			
	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 10	18 44	0 43	2 43	. . . .	.0	16 35	1.2
55	5 19	18 36	0 37	2 13	0 16	2.5	16 12	1.4
50	5 25	18 30	0 33	1 55	0 35	2.4	15 54	1.5
45	5 30	18 25	0 30	1 43	0 50	2.4	15 40	1.6
40	5 34	18 21	0 27	1 33	1 3	2.3	15 28	1.7
35	5 37	18 18	0 26	1 26	1 13	2.3	15 18	1.7
30	5 41	18 15	0 24	1 21	1 22	2.2	15 10	1.8
20	5 46	18 9	0 22	1 14	1 38	2.2	14 55	1.9
10	5 50	18 5	0 21	1 10	1 52	2.1	14 42	1.9
0	5 55	18 1	0 21	1 9	2 5	2.0	14 29	2.0
10	5 59	17 57	0 21	1 10	2 18	2.0	14 17	2.1
20	6 3	17 53	0 22	1 13	2 32	1.9	14 3	2.1
30	6 7	17 49	0 24	1 19	2 48	1.9	13 48	2.2
35	6 10	17 46	0 25	1 24	2 57	1.8	13 39	2.3
40	6 13	17 43	0 27	1 30	3 8	1.8	13 29	2.3
45	6 16	17 40	0 29	1 38	3 20	1.7	13 17	2.4
50	6 20	17 36	0 32	1 48	3 35	1.6	13 2	2.5
55	6 25	17 31	0 36	2 1	3 54	1.5	12 44	2.6
60	6 32	17 25	0 42	2 20	4 20	1.4	12 19	2.8
S								

SUNCE				MESEC			
UT	e = Tp − UT	Δ/24	r	Prolaz	Δ/24	$\pi_\leftmoon$	r
h	min s	s	′	h min	min	′	′
00	2 3.0	.9	15.9	$T_{\overline{m}}$ 8 17	2.0	55.8	15.2
12	2 13.3	$T_{\overline{m}_\odot}$ 11 h 57.8 min		Starost 24.4 d		Faza ◑	

PLANETE								
Pl.	$T_{\overline{m}}$	π	360 − α	Vel.	Pl.	$T_{\overline{m}}$	π	360 − α	Vel.
	h min	′	°			h min	′	°	
♀	9 51	.1	225	−6.2	♃	11 24	.0	202	−1.2
♂	10 21	.1	218	1.7	♄	16 41	.0	122	.8

UT	SUNCE		PROLEĆ. TAČKA	VENERA		MARS	
	$S_\odot$	$\delta_\odot$	S_Υ	S_φ	δ_φ	S_σ	δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	180 35.9	5 31.0	347 43.4	212 41.5	10 8.4	205 4.3	15 58.3
2	210 36.3	5 29.1	17 48.3	242 45.7	10 8.9	235 6.1	15 57.3
4	240 36.8	5 27.2	47 53.2	272 49.9	10 9.5	265 7.9	15 56.3
6	270 37.2	5 25.4	77 58.2	302 54.1	10 10.1	295 9.7	15 55.3
8	300 37.6	5 23.5	108 3.1	332 58.3	10 10.6	325 11.5	15 54.4
10	330 38.0	5 21.6	138 8.0	3 2.4	10 11.2	355 13.3	15 53.4
12	0 38.5	5 19.7	168 13.0	33 6.6	10 11.7	25 15.1	15 52.4
14	30 38.9	5 17.8	198 17.9	63 10.7	10 12.3	55 16.9	15 51.4
16	60 39.3	5 15.9	228 22.8	93 14.8	10 12.8	85 18.7	15 50.4
18	90 39.8	5 14.0	258 27.7	123 18.9	10 13.3	115 20.5	15 49.4
20	120 40.2	5 12.1	288 32.7	153 23.0	10 13.9	145 22.3	15 48.5
22	150 40.6	5 10.3	318 37.6	183 27.0	10 14.4	175 24.1	15 47.5
Δ	2	−9		21	3	9	−5

UT	MESEC				JUPITER		SATURN	
	$S_\leftmoon$	Δ	$\delta_\leftmoon$	Δ	$S_{\text{♃}}$	$\delta_{\text{♃}}$	$S_{\text{♄}}$	$\delta_{\text{♄}}$
h	° ′		° ′		° ′	° ′	° ′	° ′
0	227 56.2	118	15 50.6	−49	189 26.4	10 3.8	110 6.5	−18 14.2
2	256 57.8	119	15 40.8	−50	219 30.3	10 3.4	140 11.1	−18 14.2
4	285 59.7	120	15 30.8	−52	249 34.2	10 3.1	170 15.8	−18 14.3
6	315 1.7	121	15 20.4	−53	279 38.1	10 2.7	200 20.4	−18 14.4
8	344 3.8	122	15 9.7	−55	309 42.0	10 2.3	230 25.0	−18 14.5
10	13 6.2	123	14 58.8	−56	339 45.9	10 1.9	260 29.7	−18 14.6
12	42 8.8	124	14 47.6	−57	9 49.9	10 1.5	290 34.3	−18 14.6
14	71 11.5	125	14 36.1	−59	39 53.8	10 1.1	320 38.9	−18 14.7
16	100 14.4	125	14 24.4	−60	69 57.7	10 .7	350 43.6	−18 14.8
18	129 17.5	126	14 12.5	−61	100 1.6	10 .3	20 48.2	−18 14.9
20	158 20.8	127	14 .2	−62	130 5.5	9 59.9	50 52.8	−18 15.0
22	187 24.2	128	13 47.8	−64	160 9.4	9 59.5	80 57.4	−18 15.0
Δ					20	−2	23	0

φ	SUNCE		TRAJANJE SUMRAKA		MESEC			
	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 13	18 41	0 43	2 41	0 54	2.8	17 5	1.0
55	5 20	18 33	0 37	2 13	1 17	2.6	16 45	1.2
50	5 26	18 28	0 33	1 55	1 34	2.5	16 30	1.3
45	5 31	18 23	0 30	1 42	1 47	2.4	16 18	1.4
40	5 35	18 19	0 27	1 33	1 58	2.3	16 8	1.5
35	5 38	18 16	0 26	1 26	2 8	2.3	15 60	1.6
30	5 41	18 13	0 24	1 21	2 16	2.2	15 52	1.6
20	5 46	18 9	0 22	1 14	2 30	2.1	15 39	1.7
10	5 50	18 4	0 21	1 10	2 43	2.0	15 28	1.8
0	5 54	18 1	0 21	1 9	2 54	2.0	15 17	1.9
10	5 58	17 57	0 21	1 10	3 6	1.9	15 6	2.0
20	6 2	17 53	0 22	1 13	3 18	1.8	14 55	2.1
30	6 6	17 49	0 24	1 19	3 33	1.7	14 42	2.2
35	6 9	17 47	0 25	1 24	3 41	1.6	14 34	2.3
40	6 11	17 44	0 27	1 30	3 50	1.6	14 25	2.4
45	6 15	17 41	0 29	1 38	4 1	1.5	14 15	2.4
50	6 18	17 37	0 32	1 48	4 14	1.4	14 2	2.5
55	6 23	17 33	0 36	2 1	4 31	1.3	13 46	2.7
60	6 29	17 28	0 42	2 20	4 53	1.1	13 25	2.9
S								

SUNCE				MESEC			
UT	e = Tp − UT	Δ/24	r	Prolaz	Δ/24	$\pi_\leftmoon$	r
h	min s	s	′	h min	min	′	′
00	2 23.6	.9	15.9	$T_{\overline{m}}$ 9 6	2.0	55.3	15.1
12	2 33.9	$T_{\overline{m}_\odot}$ 11 h 57.4 min		Starost 25.4 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	.1	225	−6.2	♃	11 21	.0	202	−1.2
♂	10 19	.1	217	1.7	♄	16 37	.0	122	.8

UT	SUNCE		PROLEĆ. TAČKA	VENERA		MARS	
	$S_\odot$	$\delta_\odot$	S_Υ	S_φ	δ_φ	S_σ	δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	180 41.1	5 8.4	348 42.5	213 31.1	10 14.9	205 25.9	15 46.5
2	210 41.5	5 6.5	18 47.5	243 35.1	10 15.5	235 27.7	15 45.5
4	240 41.9	5 4.6	48 52.4	273 39.1	10 16.0	265 29.5	15 44.5
6	270 42.4	5 2.7	78 57.3	303 43.1	10 16.5	295 31.3	15 43.5
8	300 42.8	5 .8	109 2.2	333 47.1	10 17.0	325 33.1	15 42.5
10	330 43.3	4 58.9	139 7.2	3 51.1	10 17.5	355 34.9	15 41.5
12	0 43.7	4 57.0	169 12.1	33 55.1	10 18.0	25 36.7	15 40.6
14	30 44.1	4 55.1	199 17.0	63 59.0	10 18.5	55 38.6	15 39.6
16	60 44.6	4 53.2	229 21.9	94 2.9	10 19.0	85 40.4	15 38.6
18	90 45.0	4 51.3	259 26.9	124 6.8	10 19.5	115 42.2	15 37.6
20	120 45.4	4 49.4	289 31.8	154 10.7	10 20.0	145 44.0	15 36.6
22	150 45.9	4 47.5	319 36.7	184 14.6	10 20.5	175 45.8	15 35.6
Δ	2	−9		20	3	9	−5

UT	MESEC				JUPITER		SATURN	
	$S_\leftmoon$	Δ	$\delta_\leftmoon$	Δ	S_{4}	δ_{4}	S_{5}	δ_{5}
h	° ′		° ′		° ′	° ′	° ′	° ′
0	216 27.9	129	13 35.0	−65	190 13.3	9 59.1	111 2.1	−18 15.1
2	245 31.7	130	13 22.1	−66	220 17.2	9 58.7	141 6.7	−18 15.2
4	274 35.6	131	13 8.9	−67	250 21.1	9 58.3	171 11.3	−18 15.3
6	303 39.8	132	12 55.5	−68	280 25.0	9 57.9	201 15.9	−18 15.4
8	332 44.1	132	12 41.9	−69	310 28.9	9 57.6	231 20.6	−18 15.5
10	1 48.5	133	12 28.1	−70	340 32.8	9 57.2	261 25.2	−18 15.5
12	30 53.2	134	12 14.0	−71	10 36.8	9 56.8	291 29.8	−18 15.6
14	59 58.0	135	11 59.8	−72	40 40.7	9 56.4	321 34.4	−18 15.7
16	89 3.0	136	11 45.3	−73	70 44.6	9 56.0	351 39.0	−18 15.8
18	118 8.1	136	11 30.7	−74	100 48.5	9 55.6	21 43.7	−18 15.9
20	147 13.3	137	11 15.8	−75	130 52.4	9 55.2	51 48.3	−18 15.9
22	176 18.8	138	11 .8	−76	160 56.3	9 54.8	81 52.9	−18 16.0
Δ					20	−2	23	0

φ	SUNCE		TRAJANJE SUMRAKA		MESEC			
	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 15	18 38	0 43	2 39	2 2	2.9	17 29	.8
55	5 22	18 31	0 37	2 12	2 20	2.7	17 13	1.0
50	5 28	18 25	0 33	1 54	2 34	2.6	17 2	1.2
45	5 32	18 21	0 30	1 42	2 45	2.4	16 52	1.3
40	5 36	18 18	0 27	1 33	2 54	2.4	16 45	1.4
35	5 39	18 15	0 25	1 26	3 2	2.3	16 38	1.5
30	5 42	18 12	0 24	1 21	3 9	2.2	16 32	1.5
20	5 46	18 8	0 22	1 14	3 21	2.1	16 21	1.6
10	5 50	18 4	0 21	1 10	3 32	2.0	16 12	1.8
0	5 54	18 0	0 21	1 9	3 41	1.9	16 4	1.9
10	5 57	17 57	0 21	1 10	3 51	1.8	15 55	2.0
20	6 1	17 53	0 22	1 13	4 2	1.7	15 46	2.1
30	6 5	17 50	0 24	1 19	4 13	1.6	15 35	2.2
35	6 7	17 47	0 25	1 24	4 20	1.5	15 29	2.3
40	6 10	17 45	0 27	1 30	4 28	1.4	15 22	2.3
45	6 13	17 42	0 29	1 38	4 37	1.3	15 13	2.4
50	6 16	17 39	0 32	1 48	4 48	1.2	15 3	2.6
55	6 20	17 35	0 36	2 1	5 2	1.1	14 51	2.7
60	6 26	17 30	0 42	2 20	5 19	.9	14 34	2.9
S								

SUNCE				MESEC			
UT	e = T_p − UT	Δ/24	r	Prolaz		Δ/24	$\pi_\leftmoon$	r
h	min s	s	′		h min	min	′	′
00	2 44.3	.9	15.9	$T_{\overline{m}}$	9 53	1.8	54.8	14.9
12	2 54.8	$T_{\overline{m}_\odot}$	11 h 57.1 min	Starost 26.4 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	.1	225	−6.1	♃	11 18	.0	202	−1.2
♂	10 18	.1	217	1.7	♄	16 33	.0	122	.8

UT	SUNCE		PROLEĆ. TAČKA	VENERA		MARS	
	$S_\odot$	$\delta_\odot$	S_Υ	S_φ	δ_φ	S_σ	δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	180 46.3	4 45.6	349 41.7	214 18.5	10 21.0	205 47.6	15 34.6
2	210 46.7	4 43.7	19 46.6	244 22.4	10 21.5	235 49.4	15 33.6
4	240 47.2	4 41.8	49 51.5	274 26.2	10 22.0	265 51.2	15 32.6
6	270 47.6	4 39.9	79 56.4	304 30.0	10 22.4	295 53.1	15 31.6
8	300 48.0	4 38.0	110 1.4	334 33.8	10 22.9	325 54.9	15 30.6
10	330 48.5	4 36.1	140 6.3	4 37.6	10 23.4	355 56.7	15 29.6
12	0 48.9	4 34.2	170 11.2	34 41.4	10 23.9	25 58.5	15 28.6
14	30 49.4	4 32.3	200 16.2	64 45.2	10 24.3	56 .3	15 27.6
16	60 49.8	4 30.4	230 21.1	94 48.9	10 24.8	86 2.1	15 26.6
18	90 50.2	4 28.5	260 26.0	124 52.7	10 25.2	116 3.9	15 25.6
20	120 50.7	4 26.6	290 30.9	154 56.4	10 25.7	146 5.8	15 24.6
22	150 51.1	4 24.7	320 35.9	185 .1	10 26.1	176 7.6	15 23.6
Δ	2	−10		19	2	9	−5

UT	MESEC				JUPITER		SATURN	
	$S_\leftmoon$	Δ	$\delta_\leftmoon$	Δ	S_{4}	δ_{4}	S_{5}	δ_{5}
h	° ′		° ′		° ′	° ′	° ′	° ′
0	205 24.4	139	10 45.6	−77	191 .2	9 54.4	111 57.5	−18 16.1
2	234 30.1	139	10 30.2	−78	221 4.1	9 54.0	142 2.1	−18 16.2
4	263 35.9	140	10 14.7	−79	251 8.0	9 53.6	172 6.8	−18 16.3
6	292 42.0	141	9 59.0	−79	281 11.9	9 53.2	202 11.4	−18 16.4
8	321 48.1	141	9 43.1	−80	311 15.9	9 52.8	232 16.0	−18 16.4
10	350 54.4	142	9 27.1	−81	341 19.8	9 52.4	262 20.6	−18 16.5
12	20 .8	143	9 10.9	−82	11 23.7	9 52.1	292 25.2	−18 16.6
14	49 7.3	143	8 54.6	−82	41 27.6	9 51.7	322 29.8	−18 16.7
16	78 14.0	144	8 38.1	−83	71 31.5	9 51.3	352 34.4	−18 16.8
18	107 20.8	145	8 21.5	−84	101 35.4	9 50.9	22 39.1	−18 16.9
20	136 27.7	145	8 4.8	−84	131 39.3	9 50.5	52 43.7	−18 16.9
22	165 34.7	146	7 47.9	−85	161 43.2	9 50.1	82 48.3	−18 17.0
Δ					20	−2	23	0

φ	SUNCE		TRAJANJE SUMRAKA		MESEC			
	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 17	18 35	0 43	2 38	3 11	2.9	17 49	.7
55	5 24	18 28	0 37	2 11	3 25	2.7	17 38	.9
50	5 29	18 23	0 33	1 54	3 36	2.6	17 30	1.1
45	5 33	18 19	0 30	1 42	3 44	2.4	17 23	1.2
40	5 37	18 16	0 27	1 33	3 51	2.3	17 18	1.3
35	5 40	18 13	0 25	1 26	3 57	2.3	17 13	1.4
30	5 42	18 11	0 24	1 21	4 2	2.2	17 8	1.4
20	5 46	18 7	0 22	1 14	4 11	2.0	17 1	1.6
10	5 50	18 3	0 21	1 10	4 19	1.9	16 54	1.7
0	5 53	17 60	0 21	1 9	4 27	1.8	16 48	1.8
10	5 57	17 57	0 21	1 10	4 34	1.7	16 42	1.9
20	6 0	17 54	0 22	1 13	4 42	1.6	16 35	2.0
30	6 4	17 50	0 24	1 19	4 51	1.5	16 27	2.2
35	6 6	17 48	0 25	1 24	4 57	1.4	16 23	2.2
40	6 8	17 46	0 27	1 30	5 2	1.3	16 18	2.3
45	6 11	17 43	0 29	1 38	5 9	1.2	16 12	2.4
50	6 14	17 40	0 32	1 48	5 17	1.1	16 5	2.6
55	6 18	17 37	0 36	2 2	5 28	1.0	15 56	2.7
60	6 23	17 32	0 42	2 21	5 41	.8	15 44	2.9
S								

SUNCE				MESEC			
UT	e = T_p − UT	Δ/24	r	Prolaz		Δ/24	$\pi_\leftmoon$	r
h	min s	s	′		h min	min	′	′
00	3 5.2	.9	15.9	$T_{\overline{m}}$	10 37	1.8	54.5	14.8
12	3 15.7	$T_{\overline{m}_\odot}$	11 h 56.7 min	Starost 27.4 d		Faza ●		

PLANETE								
Pl.	$T_{\overline{m}}$	π	360 − α	Vel.	Pl.	$T_{\overline{m}}$	π	360 − α	Vel.
	h min	′	°			h min	′	°	
♀	9 42	.1	225	−6.1	♃	11 15	.0	201	−1.2
♂	10 16	.1	216	1.7	♄	16 30	.0	122	.8

UT	SUNCE		PROLEĆ. TAČKA	VENERA		MARS	
	$S_\odot$	$\delta_\odot$	S_Υ	S_φ	δ_φ	S_σ	δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	180 51.6	4 22.8	350 40.8	215 3.8	10 26.6	206 9.4	15 22.6
2	210 52.0	4 20.9	20 45.7	245 7.5	10 27.0	236 11.2	15 21.6
4	240 52.4	4 19.0	50 50.7	275 11.1	10 27.5	266 13.0	15 20.6
6	270 52.9	4 17.1	80 55.6	305 14.8	10 27.9	296 14.9	15 19.6
8	300 53.3	4 15.2	111 .5	335 18.4	10 28.3	326 16.7	15 18.6
10	330 53.7	4 13.3	141 5.4	5 22.1	10 28.8	356 18.5	15 17.6
12	0 54.2	4 11.4	171 10.4	35 25.7	10 29.2	26 20.3	15 16.6
14	30 54.6	4 9.5	201 15.3	65 29.3	10 29.6	56 22.2	15 15.6
16	60 55.1	4 7.6	231 20.2	95 32.8	10 30.0	86 24.0	15 14.6
18	90 55.5	4 5.7	261 25.2	125 36.4	10 30.4	116 25.8	15 13.6
20	120 55.9	4 3.8	291 30.1	155 40.0	10 30.9	146 27.6	15 12.6
22	150 56.4	4 1.9	321 35.0	185 43.5	10 31.3	176 29.5	15 11.6
Δ	2	−10		18	2	9	−5

UT	MESEC				JUPITER		SATURN	
	$S_\leftmoon$	Δ	$\delta_\leftmoon$	Δ	S_{4}	δ_{4}	S_η	δ_η
h	° ′		° ′		° ′	° ′	° ′	° ′
0	194 41.9	146	7 31.0	−85	191 47.2	9 49.7	112 52.9	−18 17.1
2	223 49.1	147	7 13.9	−86	221 51.1	9 49.3	142 57.5	−18 17.2
4	252 56.5	147	6 56.7	−87	251 55.0	9 48.9	173 2.1	−18 17.3
6	282 3.9	148	6 39.4	−87	281 58.9	9 48.5	203 6.7	−18 17.4
8	311 11.5	148	6 22.0	−88	312 2.8	9 48.1	233 11.3	−18 17.4
10	340 19.1	149	6 4.4	−88	342 6.7	9 47.7	263 15.9	−18 17.5
12	9 26.9	149	5 46.9	−88	12 10.6	9 47.3	293 20.6	−18 17.6
14	38 34.7	150	5 29.2	−89	42 14.5	9 47.0	323 25.2	−18 17.7
16	67 42.6	150	5 11.4	−89	72 18.5	9 46.6	353 29.8	−18 17.8
18	96 50.6	150	4 53.6	−90	102 22.4	9 46.2	23 34.4	−18 17.9
20	125 58.7	151	4 35.7	−90	132 26.3	9 45.8	53 39.0	−18 17.9
22	155 6.8	151	4 17.7	−90	162 30.2	9 45.4	83 43.6	−18 18.0
Δ					20	−2	23	0

φ	SUNCE		TRAJANJE SUMRAKA		MESEC			
	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 20	18 31	0 43	2 36	4 21	2.9	18 6	.7
55	5 26	18 26	0 37	2 10	4 30	2.7	17 60	.9
50	5 31	18 21	0 33	1 53	4 37	2.6	17 55	1.0
45	5 35	18 17	0 30	1 41	4 42	2.4	17 52	1.1
40	5 38	18 14	0 27	1 32	4 47	2.3	17 48	1.2
35	5 40	18 12	0 25	1 26	4 51	2.2	17 46	1.3
30	5 43	18 10	0 24	1 21	4 54	2.2	17 43	1.4
20	5 47	18 6	0 22	1 14	5 0	2.0	17 39	1.5
10	5 50	18 3	0 21	1 10	5 6	1.9	17 35	1.7
0	5 53	17 60	0 21	1 9	5 11	1.8	17 31	1.8
10	5 56	17 57	0 21	1 10	5 16	1.7	17 28	1.9
20	5 59	17 54	0 22	1 13	5 21	1.6	17 24	2.0
30	6 3	17 51	0 24	1 19	5 27	1.4	17 19	2.1
35	6 4	17 49	0 25	1 24	5 30	1.3	17 17	2.2
40	6 7	17 47	0 27	1 30	5 34	1.3	17 14	2.3
45	6 9	17 45	0 29	1 38	5 39	1.2	17 11	2.4
50	6 12	17 42	0 32	1 48	5 44	1.0	17 6	2.6
55	6 15	17 39	0 36	2 2	5 51	.9	17 1	2.7
60	6 20	17 34	0 41	2 21	5 59	.7	16 55	2.9
S								

SUNCE				MESEC			
UT	$e = T_p - UT$	Δ/24	r	Prolaz		Δ/24	$\pi_\leftmoon$	r
h	min s	s	′	T_m	h min	min	′	′
00	3 26.2	.9	15.9		11 21	1.8	54.2	14.8
12	3 36.8	$T_{m_\odot}$	11 h 56.4 min	Starost 28.4 d		Faza ●		

PLANETE

Pl.	T_m	π	360−α	Vel.	Pl.	T_m	π	360−α	Vel.
	h min	′	°			h min	′	°	
♀	9 39	.1	224	−6.1	♃	11 11	.0	201	−1.3
♂	10 15	.1	215	1.7	♄	16 26	.0	122	.8

UT	SUNCE		PROLEĆ. TAČKA	VENERA		MARS	
	$S_\odot$	$\delta_\odot$	S_Υ	S_φ	δ_φ	S_σ	δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	180 56.8	3 59.9	351 39.9	215 47.0	10 31.7	206 31.3	15 10.6
2	210 57.3	3 58.0	21 44.9	245 50.5	10 32.1	236 33.1	15 9.6
4	240 57.7	3 56.1	51 49.8	275 54.0	10 32.5	266 35.0	15 8.5
6	270 58.2	3 54.2	81 54.7	305 57.5	10 32.9	296 36.8	15 7.5
8	300 58.6	3 52.3	111 59.7	336 1.0	10 33.3	326 38.6	15 6.5
10	330 59.0	3 50.4	142 4.6	6 4.5	10 33.6	356 40.4	15 5.5
12	0 59.5	3 48.5	172 9.5	36 7.9	10 34.0	26 42.3	15 4.5
14	30 59.9	3 46.6	202 14.4	66 11.3	10 34.4	56 44.1	15 3.5
16	61 .4	3 44.7	232 19.4	96 14.8	10 34.8	86 45.9	15 2.5
18	91 .8	3 42.7	262 24.3	126 18.2	10 35.1	116 47.8	15 1.5
20	121 1.2	3 40.8	292 29.2	156 21.5	10 35.5	146 49.6	15 .4
22	151 1.7	3 38.9	322 34.1	186 24.9	10 35.9	176 51.4	14 59.4
Δ	2	−10		17	2	9	−5

UT	MESEC				JUPITER		SATURN	
	$S_\leftmoon$	Δ	$\delta_\leftmoon$	Δ	S_{4}	δ_{4}	S_η	δ_η
h	° ′		° ′		° ′	° ′	° ′	° ′
0	184 15.0	151	3 59.6	−90	192 34.1	9 45.0	113 48.2	−18 18.1
2	213 23.3	152	3 41.5	−91	222 38.0	9 44.6	143 52.8	−18 18.2
4	242 31.6	152	3 23.4	−91	252 41.9	9 44.2	173 57.4	−18 18.3
6	271 40.0	152	3 5.2	−91	282 45.9	9 43.8	204 2.0	−18 18.4
8	300 48.4	152	2 47.0	−91	312 49.8	9 43.4	234 6.6	−18 18.5
10	329 56.9	153	2 28.7	−92	342 53.7	9 43.0	264 11.2	−18 18.5
12	359 5.4	153	2 10.4	−92	12 57.6	9 42.6	294 15.8	−18 18.6
14	28 13.9	153	1 52.0	−92	43 1.5	9 42.2	324 20.4	−18 18.7
16	57 22.5	153	1 33.6	−92	73 5.4	9 41.9	354 25.0	−18 18.8
18	86 31.1	153	1 15.3	−92	103 9.3	9 41.5	24 29.6	−18 18.9
20	115 39.8	153	0 56.8	−92	133 13.3	9 41.1	54 34.2	−18 19.0
22	144 48.5	153	0 38.4	−92	163 17.2	9 40.7	84 38.8	−18 19.1
Δ					20	−2	23	0

φ	SUNCE		TRAJANJE SUMRAKA		MESEC			
	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 22	18 28	0 42	2 35	5 31	2.5	18 22	2.2
55	5 28	18 23	0 37	2 10	5 35	2.4	18 21	2.1
50	5 32	18 19	0 33	1 53	5 38	2.3	18 20	2.0
45	5 36	18 16	0 30	1 41	5 41	2.2	18 19	2.0
40	5 39	18 13	0 27	1 32	5 43	2.1	18 18	2.0
35	5 41	18 10	0 25	1 26	5 45	2.1	18 17	1.9
30	5 43	18 8	0 24	1 21	5 46	2.0	18 17	1.9
20	5 47	18 5	0 22	1 14	5 49	1.9	18 16	1.8
10	5 50	18 2	0 21	1 10	5 51	1.8	18 15	1.8
0	5 53	17 59	0 21	1 9	5 54	1.8	18 14	1.8
10	5 55	17 57	0 21	1 10	5 56	1.7	18 13	1.7
20	5 58	17 54	0 22	1 13	5 58	1.6	18 12	1.7
30	6 1	17 51	0 24	1 19	6 1	1.5	18 11	1.6
35	6 3	17 50	0 25	1 24	6 2	1.5	18 10	1.6
40	6 5	17 48	0 27	1 30	6 4	1.4	18 10	1.6
45	6 7	17 46	0 29	1 38	6 6	1.4	18 9	1.5
50	6 10	17 43	0 32	1 48	6 9	1.3	18 8	1.5
55	6 13	17 40	0 36	2 2	6 12	1.2	18 6	1.4
60	6 17	17 37	0 41	2 21	6 16	1.1	18 5	1.4
S								

SUNCE				MESEC			
UT	$e = T_p - UT$	Δ/24	r	Prolaz		Δ/24	$\pi_\leftmoon$	r
h	min s	s	′	T_m	h min	min	′	′
00	3 47.3	.9	15.9		12 4	1.7	54.0	14.7
12	3 57.9	$T_{m_\odot}$	11 h 56.0 min	Starost 29.4 d		Faza ●		

PLANETE

Pl.	T_m	π	360−α	Vel.	Pl.	T_m	π	360−α	Vel.
	h min	′	°			h min	′	°	
♀	9 36	.1	224	−6.0	♃	11 8	.0	201	−1.3
♂	10 13	.1	215	1.7	♄	16 22	.0	122	.8

UT	SUNCE		PROLEĆ. TAČKA	VENERA		MARS	
	$S_\odot$	$\delta_\odot$	S_Υ	S_φ	δ_φ	S_σ	δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	181 2.1	3 37.0	352 39.1	216 28.3	10 36.2	206 53.3	14 58.4
2	211 2.6	3 35.1	22 44.0	246 31.6	10 36.6	236 55.1	14 57.4
4	241 3.0	3 33.2	52 48.9	276 35.0	10 37.0	266 57.0	14 56.4
6	271 3.5	3 31.2	82 53.9	306 38.3	10 37.3	296 58.8	14 55.4
8	301 3.9	3 29.3	112 58.8	336 41.6	10 37.6	327 .6	14 54.3
10	331 4.3	3 27.4	143 3.7	6 44.9	10 38.0	357 2.5	14 53.3
12	1 4.8	3 25.5	173 8.6	36 48.2	10 38.3	27 4.3	14 52.3
14	31 5.2	3 23.6	203 13.6	66 51.5	10 38.7	57 6.2	14 51.3
16	61 5.7	3 21.7	233 18.5	96 54.7	10 39.0	87 8.0	14 50.3
18	91 6.1	3 19.7	263 23.4	126 58.0	10 39.3	117 9.8	14 49.3
20	121 6.6	3 17.8	293 28.4	157 1.2	10 39.6	147 11.7	14 48.2
22	151 7.0	3 15.9	323 33.3	187 4.4	10 40.0	177 13.5	14 47.2
Δ	2	−10		16	2	9	−5

UT	MESEC				JUPITER		SATURN	
	$S_\leftmoon$	Δ	$\delta_\leftmoon$	Δ	$S_{\mathrm{♃}}$	$\delta_{\mathrm{♃}}$	$S_{\mathrm{♄}}$	$\delta_{\mathrm{♄}}$
h	° ′		° ′		° ′	° ′	° ′	° ′
0	173 57.1	154	0 20.0	−92	193 21.1	9 40.3	114 43.4	−18 19.1
2	203 5.8	154	0 1.6	76	223 25.0	9 39.9	144 48.0	−18 19.2
4	232 14.6	154	0 16.8	92	253 28.9	9 39.5	174 52.6	−18 19.3
6	261 23.3	154	0 35.3	92	283 32.8	9 39.1	204 57.2	−18 19.4
8	290 32.0	154	0 53.7	92	313 36.8	9 38.7	235 1.8	−18 19.5
10	319 40.7	154	1 12.0	92	343 40.7	9 38.3	265 6.4	−18 19.6
12	348 49.4	153	1 30.4	92	13 44.6	9 37.9	295 11.0	−18 19.7
14	17 58.1	153	1 48.7	92	43 48.5	9 37.5	325 15.6	−18 19.7
16	47 6.8	153	2 7.1	91	73 52.4	9 37.1	355 20.2	−18 19.8
18	76 15.4	153	2 25.3	91	103 56.3	9 36.8	25 24.8	−18 19.9
20	105 24.1	153	2 43.6	91	134 .3	9 36.4	55 29.3	−18 20.0
22	134 32.7	153	3 1.8	91	164 4.2	9 36.0	85 33.9	−18 20.1
Δ					20	−2	23	0

φ	SUNCE		TRAJANJE SUMRAKA		MESEC			
	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 25	18 25	0 42	2 34	6 32	.7	19 14	2.9
55	5 30	18 20	0 37	2 9	6 32	.9	19 11	2.7
50	5 34	18 17	0 33	1 52	6 33	1.0	19 9	2.5
45	5 37	18 14	0 29	1 41	6 33	1.1	19 7	2.4
40	5 40	18 11	0 27	1 32	6 34	1.2	19 5	2.3
35	5 42	18 9	0 25	1 25	6 34	1.3	19 4	2.2
30	5 44	18 7	0 24	1 20	6 34	1.4	19 2	2.1
20	5 47	18 4	0 22	1 14	6 35	1.5	19 0	2.0
10	5 50	18 1	0 21	1 10	6 35	1.7	18 58	1.9
0	5 52	17 59	0 21	1 9	6 36	1.8	18 56	1.8
10	5 55	17 57	0 21	1 10	6 36	1.9	18 54	1.7
20	5 57	17 54	0 22	1 13	6 37	2.0	18 52	1.5
30	6 0	17 52	0 24	1 19	6 38	2.1	18 50	1.4
35	6 2	17 50	0 25	1 24	6 38	2.2	18 49	1.3
40	6 3	17 49	0 27	1 30	6 38	2.3	18 47	1.2
45	6 5	17 47	0 29	1 38	6 39	2.4	18 46	1.1
50	6 7	17 45	0 32	1 48	6 39	2.5	18 44	1.0
55	6 10	17 42	0 36	2 2	6 40	2.7	18 41	.9
60	6 13	17 39	0 41	2 22	6 41	2.9	18 38	.7
S								

SUNCE				MESEC			
UT	e = T_p − UT	Δ/24	r	Prolaz	Δ/24	$\pi_\leftmoon$	r
h	min s	s	′	h min	min	′	′
00	4 8.5	.9	15.9	$T_{\overline{m}}$ 12 46	1.7	54.0	14.7
12	4 19.2	$T_{\overline{m}_\odot}$ 11 h 55.7 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	′	°	
♀	9 33	.1	224	−6.0	♄	11 5	.0	201	−1.3
♂	10 12	.1	214	1.7	♇	16 19	.0	122	.8

UT	SUNCE		PROLEĆ. TAČKA	VENERA		MARS	
	$S_\odot$	$\delta_\odot$	S_Υ	S_φ	δ_φ	S_σ	δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	181 7.4	3 14.0	353 38.2	217 7.6	10 40.3	207 15.4	14 46.2
2	211 7.9	3 12.0	23 43.1	247 10.8	10 40.6	237 17.2	14 45.2
4	241 8.3	3 10.1	53 48.1	277 14.0	10 40.9	267 19.1	14 44.1
6	271 8.8	3 8.2	83 53.0	307 17.1	10 41.2	297 20.9	14 43.1
8	301 9.2	3 6.3	113 57.9	337 20.3	10 41.5	327 22.7	14 42.1
10	331 9.7	3 4.4	144 2.9	7 23.4	10 41.8	357 24.6	14 41.1
12	1 10.1	3 2.4	174 7.8	37 26.6	10 42.1	27 26.4	14 40.0
14	31 10.6	3 .5	204 12.7	67 29.7	10 42.4	57 28.3	14 39.0
16	61 11.0	2 58.6	234 17.6	97 32.8	10 42.7	87 30.1	14 38.0
18	91 11.4	2 56.7	264 22.6	127 35.9	10 43.0	117 32.0	14 37.0
20	121 11.9	2 54.7	294 27.5	157 38.9	10 43.2	147 33.8	14 35.9
22	151 12.3	2 52.8	324 32.4	187 42.0	10 43.5	177 35.7	14 34.9
Δ	2	−10		16	1	9	−5

UT	MESEC				JUPITER		SATURN	
	$S_\leftmoon$	Δ	$\delta_\leftmoon$	Δ	$S_{\mathrm{♃}}$	$\delta_{\mathrm{♃}}$	$S_{\mathrm{♄}}$	$\delta_{\mathrm{♄}}$
h	° ′		° ′		° ′	° ′	° ′	° ′
0	163 41.2	153	3 19.9	90	194 8.1	9 35.6	115 38.5	−18 20.2
2	192 49.8	152	3 38.0	90	224 12.0	9 35.2	145 43.1	−18 20.3
4	221 58.3	152	3 56.0	90	254 15.9	9 34.8	175 47.7	−18 20.4
6	251 6.7	152	4 14.0	90	284 19.9	9 34.4	205 52.3	−18 20.4
8	280 15.1	152	4 31.9	89	314 23.8	9 34.0	235 56.9	−18 20.5
10	309 23.4	151	4 49.7	89	344 27.7	9 33.6	266 1.5	−18 20.6
12	338 31.7	151	5 7.5	88	14 31.6	9 33.2	296 6.1	−18 20.7
14	7 39.9	151	5 25.1	88	44 35.5	9 32.8	326 10.7	−18 20.8
16	36 48.1	150	5 42.7	88	74 39.5	9 32.4	356 15.2	−18 20.9
18	65 56.2	150	6 .2	87	104 43.4	9 32.1	26 19.8	−18 21.0
20	95 4.2	150	6 17.6	87	134 47.3	9 31.7	56 24.4	−18 21.1
22	124 12.1	149	6 34.9	86	164 51.2	9 31.3	86 29.0	−18 21.1
Δ					20	−2	23	0

φ	SUNCE		TRAJANJE SUMRAKA		MESEC			
	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 27	18 22	0 42	2 33	6 47	.7	20 24	2.9
55	5 32	18 18	0 37	2 8	6 53	.9	20 16	2.7
50	5 35	18 14	0 32	1 52	6 57	1.0	20 10	2.5
45	5 38	18 12	0 29	1 40	7 0	1.2	20 5	2.4
40	5 40	18 9	0 27	1 32	7 3	1.3	20 0	2.3
35	5 43	18 8	0 25	1 25	7 6	1.4	19 57	2.2
30	5 44	18 6	0 24	1 20	7 8	1.4	19 54	2.2
20	5 47	18 3	0 22	1 14	7 12	1.6	19 48	2.0
10	5 50	18 1	0 21	1 10	7 15	1.7	19 43	1.9
0	5 52	17 59	0 21	1 9	7 18	1.8	19 39	1.8
10	5 54	17 57	0 21	1 10	7 21	1.9	19 34	1.7
20	5 56	17 54	0 22	1 13	7 25	2.0	19 29	1.6
30	5 59	17 52	0 24	1 19	7 29	2.1	19 24	1.5
35	6 0	17 51	0 25	1 24	7 31	2.2	19 21	1.4
40	6 2	17 50	0 27	1 30	7 34	2.3	19 17	1.3
45	6 3	17 48	0 29	1 38	7 37	2.4	19 13	1.2
50	6 5	17 46	0 32	1 48	7 40	2.5	19 8	1.1
55	6 8	17 44	0 36	2 2	7 45	2.7	19 2	.9
60	6 10	17 41	0 41	2 22	7 51	2.9	18 54	.7
S								

SUNCE				MESEC			
UT	e = T_p − UT	Δ/24	r	Prolaz	Δ/24	$\pi_\leftmoon$	r
h	min s	s	′	h min	min	′	′
00	4 29.8	.9	15.9	$T_{\overline{m}}$ 13 28	1.8	54.0	14.7
12	4 40.4	$T_{\overline{m}_\odot}$ 11 h 55.3 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	′	°	
♀	9 31	.1	223	−6.0	♄	11 2	.0	200	−1.3
♂	10 10	.1	214	1.7	♇	16 15	.0	122	.8

UT	SUNCE		PROLEĆ. TAČKA	VENERA		MARS	
	$S_\odot$	$\delta_\odot$	S_Υ	S_φ	δ_φ	S_σ	δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	181 12.8	2 50.9	354 37.4	217 45.1	10 43.8	207 37.5	14 33.9
2	211 13.2	2 49.0	24 42.3	247 48.1	10 44.1	237 39.4	14 32.8
4	241 13.7	2 47.0	54 47.2	277 51.1	10 44.3	267 41.2	14 31.8
6	271 14.1	2 45.1	84 52.1	307 54.1	10 44.6	297 43.1	14 30.8
8	301 14.6	2 43.2	114 57.1	337 57.1	10 44.8	327 45.0	14 29.7
10	331 15.0	2 41.3	145 2.0	8 .1	10 45.1	357 46.8	14 28.7
12	1 15.4	2 39.3	175 6.9	38 3.1	10 45.3	27 48.7	14 27.7
14	31 15.9	2 37.4	205 11.9	68 6.1	10 45.6	57 50.5	14 26.6
16	61 16.3	2 35.5	235 16.8	98 9.0	10 45.8	87 52.4	14 25.6
18	91 16.8	2 33.5	265 21.7	128 12.0	10 46.1	117 54.2	14 24.6
20	121 17.2	2 31.6	295 26.6	158 14.9	10 46.3	147 56.1	14 23.5
22	151 17.7	2 29.7	325 31.6	188 17.8	10 46.5	177 58.0	14 22.5
Δ	2	−10		15	1	9	−5

UT	MESEC				JUPITER		SATURN	
	$S_\leftmoon$	Δ	$\delta_\leftmoon$	Δ	$S_{\mathrm{♃}}$	$\delta_{\mathrm{♃}}$	$S_{\mathrm{♄}}$	$\delta_{\mathrm{♄}}$
h	° ′		° ′		° ′	° ′	° ′	° ′
0	153 20.0	149	6 52.2	85	194 55.1	9 30.9	116 33.6	−18 21.2
2	182 27.7	148	7 9.3	85	224 59.1	9 30.5	146 38.2	−18 21.3
4	211 35.4	148	7 26.2	84	255 3.0	9 30.1	176 42.7	−18 21.4
6	240 43.0	147	7 43.1	84	285 6.9	9 29.7	206 47.3	−18 21.5
8	269 50.5	147	7 59.9	83	315 10.8	9 29.3	236 51.9	−18 21.6
10	298 57.8	146	8 16.5	82	345 14.7	9 28.9	266 56.5	−18 21.7
12	328 5.1	146	8 33.0	82	15 18.7	9 28.5	297 1.1	−18 21.8
14	357 12.3	145	8 49.3	81	45 22.6	9 28.1	327 5.6	−18 21.9
16	26 19.3	145	9 5.5	80	75 26.5	9 27.7	357 10.2	−18 21.9
18	55 26.2	144	9 21.6	80	105 30.4	9 27.4	27 14.8	−18 22.0
20	84 33.0	143	9 37.5	79	135 34.4	9 27.0	57 19.4	−18 22.1
22	113 39.7	143	9 53.3	78	165 38.3	9 26.6	87 24.0	−18 22.2
Δ					20	−2	23	0

φ	SUNCE		TRAJANJE SUMRAKA		MESEC			
	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 29	18 19	0 42	2 32	7 4	.8	21 34	2.9
55	5 33	18 15	0 36	2 8	7 14	1.0	21 21	2.7
50	5 37	18 12	0 32	1 52	7 22	1.1	21 11	2.5
45	5 39	18 10	0 29	1 40	7 28	1.3	21 3	2.4
40	5 41	18 8	0 27	1 32	7 33	1.3	20 56	2.3
35	5 43	18 6	0 25	1 25	7 38	1.4	20 50	2.2
30	5 45	18 5	0 24	1 20	7 42	1.5	20 45	2.2
20	5 47	18 2	0 22	1 14	7 49	1.6	20 37	2.1
10	5 50	18 0	0 21	1 10	7 55	1.7	20 29	2.0
0	5 52	17 58	0 21	1 9	8 1	1.8	20 22	1.9
10	5 54	17 56	0 21	1 10	8 7	1.9	20 15	1.8
20	5 56	17 55	0 22	1 13	8 13	2.0	20 7	1.7
30	5 58	17 53	0 24	1 20	8 20	2.2	19 59	1.5
35	5 59	17 52	0 25	1 24	8 25	2.2	19 54	1.5
40	5 60	17 51	0 27	1 30	8 29	2.3	19 48	1.4
45	6 1	17 49	0 29	1 38	8 35	2.4	19 42	1.3
50	6 3	17 48	0 32	1 48	8 41	2.5	19 34	1.2
55	6 5	17 46	0 36	2 3	8 50	2.7	19 24	1.1
60	6 7	17 44	0 41	2 22	9 1	2.9	19 12	.9
S								

SUNCE				MESEC			
UT	e = T_p − UT	Δ/24	r	Prolaz		Δ/24	$\pi_\leftmoon$	r
h	min s	s	′	$T_{\overline{m}}$	h min	min	′	′
00	4 51.1	.9	15.9	$T_{\overline{m}}$	14 12	1.8	54.1	14.7
12	5 1.8	$T_{\overline{m}_\odot}$	11 h 55.0 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	′	°	
♀	9 28	.1	223	−5.9	♄	10 59	.0	200	−1.3
♂	10 9	.1	213	1.7	♅	16 11	.0	122	.8

UT	SUNCE		PROLEĆ. TAČKA	VENERA		MARS	
	$S_\odot$	$\delta_\odot$	S_Υ	S_φ	δ_φ	S_σ	δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	181 18.1	2 27.8	355 36.5	218 20.7	10 46.8	207 59.8	14 21.5
2	211 18.6	2 25.8	25 41.4	248 23.6	10 47.0	238 1.7	14 20.4
4	241 19.0	2 23.9	55 46.4	278 26.5	10 47.2	268 3.5	14 19.4
6	271 19.5	2 22.0	85 51.3	308 29.3	10 47.4	298 5.4	14 18.4
8	301 19.9	2 20.0	115 56.2	338 32.2	10 47.6	328 7.3	14 17.3
10	331 20.3	2 18.1	146 1.1	8 35.0	10 47.8	358 9.1	14 16.3
12	1 20.8	2 16.2	176 6.1	38 37.9	10 48.0	28 11.0	14 15.2
14	31 21.2	2 14.2	206 11.0	68 40.7	10 48.2	58 12.8	14 14.2
16	61 21.7	2 12.3	236 15.9	98 43.5	10 48.4	88 14.7	14 13.2
18	91 22.1	2 10.4	266 20.8	128 46.3	10 48.6	118 16.6	14 12.1
20	121 22.6	2 8.4	296 25.8	158 49.1	10 48.8	148 18.4	14 11.1
22	151 23.0	2 6.5	326 30.7	188 51.9	10 49.0	178 20.3	14 10.0
Δ	2	−10		14	1	9	−5

UT	MESEC				JUPITER		SATURN	
	$S_\leftmoon$	Δ	$\delta_\leftmoon$	Δ	$S_{\mathrm{♃}}$	$\delta_{\mathrm{♃}}$	$S_{\mathrm{♄}}$	$\delta_{\mathrm{♄}}$
h	° ′		° ′		° ′	° ′	° ′	° ′
0	142 46.3	142	10 8.9	77	195 42.2	9 26.2	117 28.5	−18 22.3
2	171 52.7	141	10 24.4	76	225 46.1	9 25.8	147 33.1	−18 22.4
4	200 58.9	141	10 39.7	76	255 50.0	9 25.4	177 37.7	−18 22.5
6	230 5.1	140	10 54.8	75	285 54.0	9 25.0	207 42.3	−18 22.6
8	259 11.1	139	11 9.7	74	315 57.9	9 24.6	237 46.8	−18 22.7
10	288 16.9	139	11 24.5	73	346 1.8	9 24.2	267 51.4	−18 22.7
12	317 22.6	138	11 39.0	72	16 5.7	9 23.8	297 56.0	−18 22.8
14	346 28.2	137	11 53.4	71	46 9.7	9 23.4	328 .6	−18 22.9
16	15 33.6	136	12 7.6	70	76 13.6	9 23.1	358 5.1	−18 23.0
18	44 38.8	135	12 21.6	69	106 17.5	9 22.7	28 9.7	−18 23.1
20	73 43.9	135	12 35.4	68	136 21.4	9 22.3	58 14.3	−18 23.2
22	102 48.8	134	12 48.9	67	166 25.4	9 21.9	88 18.9	−18 23.3
Δ					20	−2	23	0

φ	SUNCE		TRAJANJE SUMRAKA		MESEC			
	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 32	18 16	0 42	2 30	7 24	1.0	22 43	2.8
55	5 35	18 13	0 36	2 7	7 38	1.1	22 25	2.6
50	5 38	18 10	0 32	1 51	7 49	1.3	22 11	2.5
45	5 40	18 8	0 29	1 40	7 58	1.4	22 1	2.4
40	5 42	18 6	0 27	1 31	8 6	1.5	21 52	2.3
35	5 44	18 5	0 25	1 25	8 12	1.5	21 44	2.3
30	5 45	18 3	0 24	1 20	8 18	1.6	21 38	2.2
20	5 48	18 1	0 22	1 13	8 28	1.7	21 26	2.1
10	5 50	17 59	0 21	1 10	8 37	1.8	21 16	2.0
0	5 51	17 58	0 21	1 9	8 45	1.9	21 7	1.9
10	5 53	17 56	0 21	1 10	8 53	2.0	20 57	1.9
20	5 55	17 55	0 22	1 13	9 2	2.1	20 47	1.8
30	5 56	17 53	0 24	1 20	9 12	2.2	20 36	1.7
35	5 57	17 53	0 25	1 24	9 18	2.3	20 29	1.6
40	5 58	17 52	0 27	1 30	9 25	2.3	20 22	1.5
45	5 59	17 51	0 29	1 38	9 33	2.4	20 13	1.5
50	6 1	17 49	0 32	1 49	9 42	2.5	20 3	1.4
55	6 2	17 48	0 36	2 3	9 54	2.7	19 50	1.2
60	6 4	17 46	0 41	2 23	10 10	2.9	19 33	1.0
S								

SUNCE				MESEC			
UT	e = T_p − UT	Δ/24	r	Prolaz		Δ/24	$\pi_\leftmoon$	r
h	min s	s	′	$T_{\overline{m}}$	h min	min	′	′
00	5 12.5	.9	15.9	$T_{\overline{m}}$	14 56	1.9	54.3	14.8
12	5 23.1	$T_{\overline{m}_\odot}$	11 h 54.6 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	′	°	
♀	9 26	.1	223	−5.9	♄	10 56	.0	200	−1.3
♂	10 7	.1	212	1.7	♅	16 8	.0	122	.8

UT	SUNCE		PROLEĆ. TAČKA	VENERA		MARS	
	$S_\odot$	$\delta_\odot$	S_Υ	S_φ	δ_φ	S_σ	δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	181 23.5	2 4.6	356 35.6	218 54.6	10 49.2	208 22.2	14 9.0
2	211 23.9	2 2.6	26 40.6	248 57.4	10 49.4	238 24.0	14 8.0
4	241 24.3	2 .7	56 45.5	279 .1	10 49.5	268 25.9	14 6.9
6	271 24.8	1 58.8	86 50.4	309 2.8	10 49.7	298 27.8	14 5.9
8	301 25.2	1 56.8	116 55.3	339 5.5	10 49.9	328 29.6	14 4.8
10	331 25.7	1 54.9	147 .3	9 8.2	10 50.0	358 31.5	14 3.8
12	1 26.1	1 53.0	177 5.2	39 10.9	10 50.2	28 33.4	14 2.7
14	31 26.6	1 51.0	207 10.1	69 13.6	10 50.3	58 35.3	14 1.7
16	61 27.0	1 49.1	237 15.1	99 16.3	10 50.5	88 37.1	14 .6
18	91 27.5	1 47.2	267 20.0	129 18.9	10 50.6	118 39.0	13 59.6
20	121 27.9	1 45.2	297 24.9	159 21.6	10 50.8	148 40.9	13 58.5
22	151 28.4	1 43.3	327 29.8	189 24.2	10 50.9	178 42.8	13 57.5
Δ	2	−10		13	1	9	−5

UT	MESEC				JUPITER		SATURN	
	$S_\leftmoon$	Δ	$\delta_\leftmoon$	Δ	S_{4}	δ_{4}	S_η	δ_η
h	° ′		° ′		° ′	° ′	° ′	° ′
0	131 53.6	133	13 2.3	66	196 29.3	9 21.5	118 23.4	−18 23.4
2	160 58.1	132	13 15.4	65	226 33.2	9 21.1	148 28.0	−18 23.5
4	190 2.6	131	13 28.3	63	256 37.1	9 20.7	178 32.6	−18 23.6
6	219 6.8	130	13 41.0	62	286 41.1	9 20.3	208 37.1	−18 23.6
8	248 10.8	129	13 53.5	61	316 45.0	9 19.9	238 41.7	−18 23.7
10	277 14.7	128	14 5.7	60	346 48.9	9 19.5	268 46.3	−18 23.8
12	306 18.4	128	14 17.7	59	16 52.9	9 19.1	298 50.8	−18 23.9
14	335 21.9	127	14 29.4	57	46 56.8	9 18.8	328 55.4	−18 24.0
16	4 25.2	126	14 40.9	56	77 .7	9 18.4	358 60.0	−18 24.1
18	33 28.4	125	14 52.1	55	107 4.6	9 18.0	29 4.5	−18 24.2
20	62 31.3	124	15 3.0	53	137 8.6	9 17.6	59 9.1	−18 24.3
22	91 34.1	123	15 13.7	52	167 12.5	9 17.2	89 13.7	−18 24.4
Δ					20	−2	23	0

φ	SUNCE		TRAJANJE SUMRAKA		MESEC			
	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 34	18 13	0 42	2 29	7 47	1.2	23 50	2.7
55	5 37	18 10	0 36	2 6	8 5	1.3	23 28	2.5
50	5 40	18 8	0 32	1 51	8 20	1.5	23 12	2.4
45	5 42	18 6	0 29	1 40	8 31	1.6	22 59	2.4
40	5 43	18 5	0 27	1 31	8 41	1.6	22 48	2.3
35	5 45	18 3	0 25	1 25	8 49	1.7	22 39	2.3
30	5 46	18 2	0 24	1 20	8 56	1.7	22 31	2.2
20	5 48	18 0	0 22	1 13	9 9	1.8	22 17	2.1
10	5 50	17 59	0 21	1 10	9 20	1.9	22 4	2.1
0	5 51	17 58	0 21	1 9	9 30	2.0	21 53	2.0
10	5 52	17 56	0 21	1 10	9 41	2.0	21 42	2.0
20	5 54	17 55	0 22	1 13	9 52	2.1	21 30	1.9
30	5 55	17 54	0 24	1 20	10 5	2.2	21 16	1.8
35	5 56	17 53	0 25	1 24	10 12	2.3	21 8	1.8
40	5 57	17 53	0 27	1 30	10 21	2.3	20 59	1.7
45	5 58	17 52	0 29	1 38	10 31	2.4	20 48	1.7
50	5 59	17 51	0 32	1 49	10 43	2.5	20 35	1.6
55	5 60	17 50	0 36	2 3	10 58	2.6	20 19	1.5
60	6 1	17 48	0 41	2 23	11 19	2.8	19 58	1.3
S								

SUNCE				MESEC			
UT	e = T_p − UT	Δ/24	r	Prolaz	Δ/24	$\pi_\leftmoon$	r
h	min s	s	′	h min	min	′	′
00	5 33.8	.9	15.9	$T_{\overline{m}}$ 15 42	2.0	54.6	14.9
12	5 44.5	$T_{\overline{m}_\odot}$ 11 h 54.3 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	′	°	
♀	9 24	.1	222	−5.9	♃	10 53	.0	200	−1.3
♂	10 6	.1	212	1.7	♄	16 4	.0	122	.8

UT	SUNCE		PROLEĆ. TAČKA	VENERA		MARS	
	$S_\odot$	$\delta_\odot$	S_Υ	S_φ	δ_φ	S_σ	δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	181 28.8	1 41.4	357 34.8	219 26.9	10 51.0	208 44.6	13 56.4
2	211 29.2	1 39.4	27 39.7	249 29.5	10 51.2	238 46.5	13 55.4
4	241 29.7	1 37.5	57 44.6	279 32.1	10 51.3	268 48.4	13 54.3
6	271 30.1	1 35.5	87 49.6	309 34.7	10 51.4	298 50.3	13 53.3
8	301 30.6	1 33.6	117 54.5	339 37.2	10 51.5	328 52.1	13 52.2
10	331 31.0	1 31.7	147 59.4	9 39.8	10 51.7	358 54.0	13 51.2
12	1 31.5	1 29.7	178 4.3	39 42.4	10 51.8	28 55.9	13 50.1
14	31 31.9	1 27.8	208 9.3	69 44.9	10 51.9	58 57.8	13 49.1
16	61 32.4	1 25.8	238 14.2	99 47.4	10 52.0	88 59.6	13 48.0
18	91 32.8	1 23.9	268 19.1	129 50.0	10 52.1	119 1.5	13 47.0
20	121 33.3	1 22.0	298 24.1	159 52.5	10 52.2	149 3.4	13 45.9
22	151 33.7	1 20.0	328 29.0	189 55.0	10 52.3	179 5.3	13 44.9
Δ	2	−10		13	1	9	−5

UT	MESEC				JUPITER		SATURN	
	$S_\leftmoon$	Δ	$\delta_\leftmoon$	Δ	S_{4}	δ_{4}	S_η	δ_η
h	° ′		° ′		° ′	° ′	° ′	° ′
0	120 36.6	122	15 24.1	51	197 16.4	9 16.8	119 18.2	−18 24.5
2	149 39.0	121	15 34.3	49	227 20.3	9 16.4	149 22.8	−18 24.6
4	178 41.1	120	15 44.2	48	257 24.3	9 16.0	179 27.4	−18 24.6
6	207 43.1	119	15 53.7	46	287 28.2	9 15.6	209 31.9	−18 24.7
8	236 44.9	118	16 3.0	45	317 32.1	9 15.2	239 36.5	−18 24.8
10	265 46.5	117	16 12.0	43	347 36.1	9 14.9	269 41.0	−18 24.9
12	294 47.9	116	16 20.7	42	17 40.0	9 14.5	299 45.6	−18 25.0
14	323 49.0	115	16 29.1	40	47 43.9	9 14.1	329 50.2	−18 25.1
16	352 50.0	114	16 37.2	39	77 47.8	9 13.7	359 54.7	−18 25.2
18	21 50.8	113	16 44.9	37	107 51.8	9 13.3	29 59.3	−18 25.3
20	50 51.4	112	16 52.4	36	137 55.7	9 12.9	60 3.8	−18 25.4
22	79 51.8	111	16 59.5	34	167 59.6	9 12.5	90 8.4	−18 25.5
Δ					20	−2	23	0

φ	SUNCE		TRAJANJE SUMRAKA		MESEC			
	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 36	18 10	0 42	2 29	8 15	1.5	. . .	.0
55	5 39	18 8	0 36	2 6	8 38	1.6	. . .	.0
50	5 41	18 6	0 32	1 51	8 55	1.7	. . .	.0
45	5 43	18 4	0 29	1 39	9 9	1.8	23 55	2.3
40	5 44	18 3	0 27	1 31	9 20	1.8	23 43	2.3
35	5 45	18 2	0 25	1 25	9 30	1.9	23 33	2.2
30	5 46	18 1	0 24	1 20	9 38	1.9	23 24	2.2
20	5 48	17 59	0 22	1 13	9 53	2.0	23 8	2.2
10	5 49	17 58	0 21	1 10	10 6	2.0	22 54	2.1
0	5 51	17 57	0 21	1 9	10 18	2.1	22 42	2.1
10	5 52	17 56	0 21	1 10	10 30	2.1	22 29	2.1
20	5 53	17 55	0 22	1 13	10 43	2.2	22 15	2.0
30	5 54	17 54	0 24	1 20	10 58	2.2	21 59	2.0
35	5 54	17 54	0 25	1 24	11 7	2.3	21 50	2.0
40	5 55	17 53	0 27	1 30	11 17	2.3	21 40	1.9
45	5 56	17 53	0 29	1 38	11 28	2.3	21 28	1.9
50	5 56	17 52	0 32	1 49	11 43	2.4	21 13	1.8
55	5 57	17 52	0 36	2 3	12 1	2.5	20 54	1.8
60	5 58	17 51	0 42	2 24	12 25	2.6	20 29	1.7
S								

SUNCE				MESEC			
UT	e = T_p − UT	Δ/24	r	Prolaz	Δ/24	$\pi_\leftmoon$	r
h	min s	s	′	h min	min	′	′
00	5 55.2	.9	15.9	$T_{\overline{m}}$ 16 30	2.1	55.0	15.0
12	6 5.9	$T_{\overline{m}_\odot}$ 11 h 53.9 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	′	°	
♀	9 21	.1	222	−5.8	♃	10 49	.0	200	−1.3
♂	10 4	.1	211	1.7	♄	16 0	.0	122	.8

20. SEPTEMBAR 2015. NEDELJA

UT	SUNCE		PROLEĆ. TAČKA	VENERA		MARS	
	$S_\odot$	$\delta_\odot$	S_Υ	S_φ	δ_φ	S_σ	δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	181 34.1	1 18.1	358 33.9	219 57.5	10 52.4	209 7.2	13 43.8
2	211 34.6	1 16.1	28 38.8	249 60.0	10 52.4	239 9.1	13 42.8
4	241 35.0	1 14.2	58 43.8	280 2.4	10 52.5	269 10.9	13 41.7
6	271 35.5	1 12.3	88 48.7	310 4.9	10 52.6	299 12.8	13 40.6
8	301 35.9	1 10.3	118 53.6	340 7.3	10 52.7	329 14.7	13 39.6
10	331 36.4	1 8.4	148 58.6	10 9.8	10 52.7	359 16.6	13 38.5
12	1 36.8	1 6.4	179 3.5	40 12.2	10 52.8	29 18.5	13 37.5
14	31 37.3	1 4.5	209 8.4	70 14.6	10 52.9	59 20.4	13 36.4
16	61 37.7	1 2.6	239 13.3	100 17.0	10 52.9	89 22.3	13 35.4
18	91 38.1	1 .6	269 18.3	130 19.4	10 53.0	119 24.1	13 34.3
20	121 38.6	0 58.7	299 23.2	160 21.8	10 53.0	149 26.0	13 33.2
22	151 39.0	0 56.7	329 28.1	190 24.2	10 53.1	179 27.9	13 32.2
Δ	2	−10		12	0	9	−5

UT	MESEC				JUPITER		SATURN	
	$S_\leftmoon$	Δ	$\delta_\leftmoon$	Δ	S_{4}	δ_{4}	S_{5}	δ_{5}
h	° ′		° ′		° ′	° ′	° ′	° ′
0	108 51.9	110	17 6.3	32	198 3.6	9 12.1	120 12.9	−18 25.6
2	137 51.9	109	17 12.8	31	228 7.5	9 11.7	150 17.5	−18 25.7
4	166 51.7	108	17 18.9	29	258 11.4	9 11.4	180 22.1	−18 25.8
6	195 51.3	107	17 24.7	27	288 15.4	9 11.0	210 26.6	−18 25.8
8	224 50.6	106	17 30.2	26	318 19.3	9 10.6	240 31.2	−18 25.9
10	253 49.8	105	17 35.3	24	348 23.2	9 10.2	270 35.7	−18 26.0
12	282 48.8	104	17 40.0	22	18 27.2	9 9.8	300 40.3	−18 26.1
14	311 47.6	103	17 44.4	20	48 31.1	9 9.4	330 44.8	−18 26.2
16	340 46.2	102	17 48.4	18	78 35.0	9 9.0	0 49.4	−18 26.3
18	9 44.6	101	17 52.1	16	108 39.0	9 8.6	30 53.9	−18 26.4
20	38 42.8	100	17 55.4	15	138 42.9	9 8.2	60 58.5	−18 26.5
22	67 40.8	99	17 58.3	13	168 46.8	9 7.8	91 3.0	−18 26.6
Δ					20	−2	23	0

φ	SUNCE		TRAJANJE SUMRAKA		MESEC			
	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 39	18 7	0 42	2 28	8 51	1.9	0 55	2.5
55	5 41	18 5	0 36	2 5	9 17	2.0	0 29	2.4
50	5 43	18 3	0 32	1 50	9 36	2.0	0 10	2.3
45	5 44	18 2	0 29	1 39	9 51	2.0	. . .	.0
40	5 45	18 1	0 27	1 31	10 4	2.1	. . .	.0
35	5 46	18 0	0 25	1 25	10 14	2.1	. . .	.0
30	5 47	17 60	0 24	1 20	10 24	2.1	. . .	.0
20	5 48	17 58	0 22	1 13	10 40	2.1	. . .	.0
10	5 49	17 58	0 21	1 10	10 54	2.1	23 46	2.2
0	5 50	17 57	0 21	1 9	11 7	2.1	23 32	2.2
10	5 51	17 56	0 21	1 10	11 21	2.2	23 18	2.2
20	5 52	17 56	0 22	1 13	11 35	2.2	23 4	2.2
30	5 53	17 55	0 24	1 20	11 51	2.2	22 47	2.2
35	5 53	17 55	0 25	1 24	12 1	2.2	22 37	2.2
40	5 53	17 54	0 27	1 31	12 12	2.2	22 26	2.2
45	5 54	17 54	0 29	1 39	12 25	2.2	22 13	2.2
50	5 54	17 54	0 32	1 49	12 40	2.3	21 57	2.2
55	5 55	17 53	0 36	2 4	13 0	2.3	21 37	2.2
60	5 55	17 53	0 42	2 25	13 27	2.3	21 10	2.1
S								

SUNCE				MESEC			
UT	e = T_p − UT	Δ/24	r	Prolaz		Δ/24	$\pi_\leftmoon$	r
h	min s	s	′	$T_{\overline{m}}$	h min	min	′	′
00	6 16.6	.9	15.9	$T_{\overline{m}}$	17 20	2.2	55.6	15.2
12	6 27.2	$T_{\overline{m}_\odot}$	11 h 53.5 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	′	°	
♀	9 19	.1	221	−5.8	♄	10 46	.0	199	−1.3
♂	10 3	.1	211	1.7	♃	15 57	.0	122	.8

21. SEPTEMBAR PONEDELJAK

UT	SUNCE		PROLEĆ. TAČKA	VENERA		MARS	
	$S_\odot$	$\delta_\odot$	S_Υ	S_φ	δ_φ	S_σ	δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	181 39.5	0 54.8	359 33.0	220 26.5	10 53.1	209 29.8	13 31.1
2	211 39.9	0 52.9	29 38.0	250 28.9	10 53.1	239 31.7	13 30.1
4	241 40.4	0 50.9	59 42.9	280 31.2	10 53.2	269 33.6	13 29.0
6	271 40.8	0 49.0	89 47.8	310 33.6	10 53.2	299 35.5	13 27.9
8	301 41.2	0 47.0	119 52.8	340 35.9	10 53.2	329 37.4	13 26.9
10	331 41.7	0 45.1	149 57.7	10 38.2	10 53.2	359 39.3	13 25.8
12	1 42.1	0 43.1	180 2.6	40 40.5	10 53.3	29 41.2	13 24.7
14	31 42.6	0 41.2	210 7.5	70 42.8	10 53.3	59 43.1	13 23.7
16	61 43.0	0 39.3	240 12.5	100 45.1	10 53.3	89 45.0	13 22.6
18	91 43.5	0 37.3	270 17.4	130 47.3	10 53.3	119 46.8	13 21.5
20	121 43.9	0 35.4	300 22.3	160 49.6	10 53.3	149 48.7	13 20.5
22	151 44.3	0 33.4	330 27.3	190 51.9	10 53.3	179 50.6	13 19.4
Δ	2	−10		11	0	9	−5

UT	MESEC				JUPITER		SATURN	
	$S_\leftmoon$	Δ	$\delta_\leftmoon$	Δ	S_{4}	δ_{4}	S_{5}	δ_{5}
h	° ′		° ′		° ′	° ′	° ′	° ′
0	96 38.7	98	18 .8	11	198 50.8	9 7.5	121 7.6	−18 26.7
2	125 36.3	97	18 3.0	9	228 54.7	9 7.1	151 12.1	−18 26.8
4	154 33.8	96	18 4.8	7	258 58.6	9 6.7	181 16.7	−18 26.9
6	183 31.1	96	18 6.2	5	289 2.6	9 6.3	211 21.2	−18 27.0
8	212 28.2	95	18 7.2	3	319 6.5	9 5.9	241 25.8	−18 27.1
10	241 25.1	94	18 7.8	1	349 10.4	9 5.5	271 30.3	−18 27.1
12	270 21.8	93	18 8.0	−1	19 14.4	9 5.1	301 34.9	−18 27.2
14	299 18.4	92	18 7.8	−3	49 18.3	9 4.7	331 39.4	−18 27.3
16	328 14.9	91	18 7.2	−5	79 22.2	9 4.3	1 44.0	−18 27.4
18	357 11.1	90	18 6.2	−7	109 26.2	9 4.0	31 48.5	−18 27.5
20	26 7.2	90	18 4.8	−9	139 30.1	9 3.6	61 53.1	−18 27.6
22	55 3.1	89	18 3.0	−11	169 34.0	9 3.2	91 57.6	−18 27.7
Δ					20	−2	23	0

φ	SUNCE		TRAJANJE SUMRAKA		MESEC			
	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 41	18 4	0 42	2 27	9 37	2.4	1 54	2.2
55	5 43	18 2	0 36	2 5	10 4	2.4	1 26	2.2
50	5 44	18 1	0 32	1 50	10 24	2.3	1 6	2.2
45	5 45	18 0	0 29	1 39	10 40	2.3	0 50	2.2
40	5 46	17 60	0 27	1 31	10 53	2.3	0 37	2.2
35	5 47	17 59	0 25	1 25	11 4	2.3	0 26	2.2
30	5 48	17 58	0 24	1 20	11 14	2.3	0 17	2.2
20	5 49	17 58	0 22	1 13	11 31	2.3	0 0	2.2
10	5 49	17 57	0 21	1 10	11 45	2.2	. . .	.0
0	5 50	17 56	0 21	1 9	11 59	2.2	. . .	.0
10	5 50	17 56	0 21	1 10	12 13	2.2	. . .	.0
20	5 51	17 56	0 22	1 13	12 27	2.2	23 56	2.3
30	5 51	17 56	0 24	1 20	12 44	2.2	23 39	2.4
35	5 52	17 55	0 25	1 25	12 54	2.1	23 30	2.4
40	5 52	17 55	0 27	1 31	13 5	2.1	23 19	2.4
45	5 52	17 55	0 29	1 39	13 19	2.1	23 5	2.5
50	5 52	17 55	0 32	1 49	13 35	2.1	22 49	2.5
55	5 52	17 55	0 36	2 4	13 55	2.0	22 29	2.5
60	5 52	17 55	0 42	2 25	14 23	2.0	22 1	2.6
S								

SUNCE				MESEC			
UT	e = T_p − UT	Δ/24	r	Prolaz		Δ/24	$\pi_\leftmoon$	r
h	min s	s	′	$T_{\overline{m}}$	h min	min	′	′
00	6 37.9	.9	16.0	$T_{\overline{m}}$	18 12	2.2	56.4	15.4
12	6 48.5	$T_{\overline{m}_\odot}$	11 h 53.2 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	′	°	
♀	9 18	.1	221	−5.8	♄	10 43	.0	199	−1.3
♂	10 1	.1	210	1.7	♃	15 53	.0	122	.8

UT	SUNCE		PROLEĆ. TAČKA	VENERA		MARS	
	$S_\odot$	$\delta_\odot$	S_Υ	S_φ	δ_φ	S_σ	δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	181 44.8	0 31.5	0 32.2	220 54.1	10 53.3	209 52.5	13 18.3
2	211 45.2	0 29.5	30 37.1	250 56.3	10 53.3	239 54.4	13 17.3
4	241 45.7	0 27.6	60 42.0	280 58.6	10 53.2	269 56.3	13 16.2
6	271 46.1	0 25.6	90 47.0	311 .8	10 53.2	299 58.2	13 15.1
8	301 46.6	0 23.7	120 51.9	341 3.0	10 53.2	330 .1	13 14.1
10	331 47.0	0 21.8	150 56.8	11 5.2	10 53.2	0 2.0	13 13.0
12	1 47.4	0 19.8	181 1.8	41 7.3	10 53.1	30 3.9	13 11.9
14	31 47.9	0 17.9	211 6.7	71 9.5	10 53.1	60 5.8	13 10.9
16	61 48.3	0 15.9	241 11.6	101 11.7	10 53.1	90 7.7	13 9.8
18	91 48.8	0 14.0	271 16.5	131 13.8	10 53.0	120 9.6	13 8.7
20	121 49.2	0 12.0	301 21.5	161 16.0	10 53.0	150 11.5	13 7.6
22	151 49.6	0 10.1	331 26.4	191 18.1	10 52.9	180 13.4	13 6.6
Δ	2	−10		11	0	10	−5

UT	MESEC				JUPITER		SATURN	
	$S_\leftmoon$	Δ	$\delta_\leftmoon$	Δ	S_{4}	δ_{4}	S_{5}	δ_{5}
h	° ′		° ′		° ′	° ′	° ′	° ′
0	83 58.9	88	18 .7	−13	199 38.0	9 2.8	122 2.2	−18 27.8
2	112 54.6	87	17 58.1	−15	229 41.9	9 2.4	152 6.7	−18 27.9
4	141 50.0	87	17 55.0	−17	259 45.8	9 2.0	182 11.2	−18 28.0
6	170 45.4	86	17 51.5	−20	289 49.8	9 1.6	212 15.8	−18 28.1
8	199 40.6	85	17 47.6	−22	319 53.7	9 1.2	242 20.3	−18 28.2
10	228 35.6	85	17 43.2	−24	349 57.7	9 .9	272 24.9	−18 28.3
12	257 30.6	84	17 38.5	−26	20 1.6	9 .5	302 29.4	−18 28.4
14	286 25.4	83	17 33.3	−28	50 5.5	9 .1	332 34.0	−18 28.5
16	315 20.1	83	17 27.7	−30	80 9.5	8 59.7	2 38.5	−18 28.6
18	344 14.6	82	17 21.6	−32	110 13.4	8 59.3	32 43.0	−18 28.7
20	13 9.1	82	17 15.1	−35	140 17.3	8 58.9	62 47.6	−18 28.8
22	42 3.4	81	17 8.2	−37	170 21.3	8 58.5	92 52.1	−18 28.9
Δ					20	−2	23	0

φ	SUNCE		TRAJANJE SUMRAKA		MESEC			
	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 43	18 1	0 42	2 26	10 34	2.9	2 45	1.8
55	5 45	17 60	0 36	2 5	11 1	2.7	2 18	1.9
50	5 46	17 59	0 32	1 50	11 20	2.7	1 58	2.0
45	5 46	17 58	0 29	1 39	11 36	2.6	1 43	2.0
40	5 47	17 58	0 27	1 31	11 48	2.5	1 30	2.1
35	5 48	17 57	0 25	1 25	11 59	2.5	1 19	2.1
30	5 48	17 57	0 24	1 20	12 9	2.5	1 9	2.1
20	5 49	17 57	0 22	1 13	12 25	2.4	0 53	2.2
10	5 49	17 56	0 21	1 10	12 39	2.3	0 38	2.2
0	5 50	17 56	0 21	1 9	12 52	2.3	0 24	2.3
10	5 50	17 56	0 21	1 10	13 6	2.2	0 11	2.3
20	5 50	17 56	0 22	1 13	13 20	2.2	. . .	.0
30	5 50	17 56	0 24	1 20	13 36	2.1	. . .	.0
35	5 50	17 56	0 25	1 25	13 46	2.1	. . .	.0
40	5 50	17 56	0 27	1 31	13 56	2.0	. . .	.0
45	5 50	17 57	0 29	1 39	14 9	2.0	. . .	.0
50	5 50	17 57	0 32	1 50	14 25	1.9	23 49	2.8
55	5 50	17 57	0 36	2 5	14 44	1.8	23 30	2.9
60	5 49	17 58	0 42	2 26	15 11	1.6	23 4	3.1
S								

SUNCE				MESEC			
UT	e = T_p − UT	Δ/24	r	Prolaz		Δ/24	$\pi_\leftmoon$	r
h	min s	s	′		h min	min	′	′
00	6 59.1	.9	16.0	$T_{\overline{m}}$	19 5	2.3	57.2	15.6
12	7 9.7	$T_{\overline{m}_\odot}$	11 h 52.8 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	′	°	
♀	9 16	.1	220	−5.7	♃	10 40	.0	199	−1.3
♂	9 60	.1	209	1.7	♄	15 49	.0	121	.8

UT	SUNCE		PROLEĆ. TAČKA	VENERA		MARS	
	$S_\odot$	$\delta_\odot$	S_Υ	S_φ	δ_φ	S_σ	δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	181 50.1	0 8.1	1 31.3	221 20.2	10 52.9	210 15.4	13 5.5
2	211 50.5	0 6.2	31 36.3	251 22.3	10 52.8	240 17.3	13 4.4
4	241 51.0	0 4.3	61 41.2	281 24.5	10 52.8	270 19.2	13 3.4
6	271 51.4	0 2.3	91 46.1	311 26.5	10 52.7	300 21.1	13 2.3
8	301 51.8	0 .4	121 51.0	341 28.6	10 52.6	330 23.0	13 1.2
10	331 52.3	− 0 1.6	151 56.0	11 30.7	10 52.5	0 24.9	13 .1
12	1 52.7	− 0 3.5	182 .9	41 32.8	10 52.5	30 26.8	12 59.1
14	31 53.2	− 0 5.5	212 5.8	71 34.8	10 52.4	60 28.7	12 58.0
16	61 53.6	− 0 7.4	242 10.8	101 36.9	10 52.3	90 30.6	12 56.9
18	91 54.0	− 0 9.4	272 15.7	131 38.9	10 52.2	120 32.5	12 55.8
20	121 54.5	− 0 11.3	302 20.6	161 40.9	10 52.1	150 34.4	12 54.7
22	151 54.9	− 0 13.3	332 25.5	191 43.0	10 52.0	180 36.3	12 53.7
Δ	2	−10		10	0	10	−5

UT	MESEC				JUPITER		SATURN	
	$S_\leftmoon$	Δ	$\delta_\leftmoon$	Δ	S_{4}	δ_{4}	S_{5}	δ_{5}
h	° ′		° ′		° ′	° ′	° ′	° ′
0	70 57.6	81	17 .9	−39	200 25.2	8 58.1	122 56.7	−18 28.9
2	99 51.7	80	16 53.2	−41	230 29.2	8 57.8	153 1.2	−18 29.0
4	128 45.7	80	16 45.0	−43	260 33.1	8 57.4	183 5.7	−18 29.1
6	157 39.7	79	16 36.3	−45	290 37.0	8 57.0	213 10.3	−18 29.2
8	186 33.5	79	16 27.3	−47	320 41.0	8 56.6	243 14.8	−18 29.3
10	215 27.2	78	16 17.8	−49	350 44.9	8 56.2	273 19.3	−18 29.4
12	244 20.9	78	16 7.9	−52	20 48.9	8 55.8	303 23.9	−18 29.5
14	273 14.5	77	15 57.6	−54	50 52.8	8 55.4	333 28.4	−18 29.6
16	302 8.0	77	15 46.9	−56	80 56.7	8 55.0	3 32.9	−18 29.7
18	331 1.4	77	15 35.7	−58	111 .7	8 54.7	33 37.5	−18 29.8
20	359 54.7	76	15 24.1	−60	141 4.6	8 54.3	63 42.0	−18 29.9
22	28 48.0	76	15 12.2	−62	171 8.6	8 53.9	93 46.5	−18 30.0
Δ					20	−2	23	0

φ	SUNCE		TRAJANJE SUMRAKA		MESEC			
	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 46	17 58	0 41	2 25	11 43	3.3	3 28	1.5
55	5 47	17 57	0 36	2 4	12 6	3.1	3 4	1.7
50	5 47	17 57	0 32	1 49	12 24	2.9	2 46	1.8
45	5 48	17 56	0 29	1 39	12 38	2.8	2 31	1.9
40	5 48	17 56	0 27	1 31	12 49	2.7	2 19	1.9
35	5 48	17 56	0 25	1 24	12 59	2.7	2 9	2.0
30	5 49	17 56	0 24	1 20	13 8	2.6	2 0	2.1
20	5 49	17 56	0 22	1 13	13 22	2.5	1 45	2.1
10	5 49	17 56	0 21	1 10	13 35	2.4	1 31	2.2
0	5 49	17 56	0 21	1 9	13 47	2.3	1 18	2.3
10	5 49	17 56	0 21	1 10	13 59	2.2	1 6	2.4
20	5 49	17 56	0 22	1 13	14 12	2.1	0 52	2.4
30	5 49	17 57	0 24	1 20	14 27	2.0	0 36	2.5
35	5 49	17 57	0 25	1 25	14 35	2.0	0 27	2.6
40	5 48	17 57	0 27	1 31	14 45	1.9	0 17	2.6
45	5 48	17 58	0 29	1 39	14 56	1.8	0 4	2.7
50	5 48	17 58	0 32	1 50	15 10	1.7	. . .	.0
55	5 47	17 59	0 36	2 5	15 27	1.5	. . .	.0
60	5 46	18 0	0 42	2 27	15 50	1.3	. . .	.0
S								

SUNCE				MESEC			
UT	e = T_p − UT	Δ/24	r	Prolaz		Δ/24	$\pi_\leftmoon$	r
h	min s	s	′		h min	min	′	′
00	7 20.3	.9	16.0	$T_{\overline{m}}$	20 0	2.3	58.1	15.8
12	7 30.9	$T_{\overline{m}_\odot}$	11 h 52.5 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	′	°	
♀	9 14	.1	220	−5.7	♃	10 37	.0	199	−1.3
♂	9 58	.1	209	1.7	♄	15 46	.0	121	.8

UT	SUNCE		PROLEĆ. TAČKA	VENERA		MARS	
	$S_\odot$	$\delta_\odot$	S_Υ	S_φ	δ_φ	S_σ	δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	181 55.4	- 0 15.2	2 30.5	221 45.0	10 51.9	210 38.3	12 52.6
2	211 55.8	- 0 17.1	32 35.4	251 47.0	10 51.8	240 40.2	12 51.5
4	241 56.2	- 0 19.1	62 40.3	281 49.0	10 51.7	270 42.1	12 50.4
6	271 56.7	- 0 21.0	92 45.3	311 51.0	10 51.6	300 44.0	12 49.3
8	301 57.1	- 0 23.0	122 50.2	341 52.9	10 51.5	330 45.9	12 48.3
10	331 57.5	- 0 24.9	152 55.1	11 54.9	10 51.3	0 47.8	12 47.2
12	1 58.0	- 0 26.9	183 .0	41 56.8	10 51.2	30 49.7	12 46.1
14	31 58.4	- 0 28.8	213 5.0	71 58.8	10 51.1	60 51.7	12 45.0
16	61 58.9	- 0 30.8	243 9.9	102 .7	10 50.9	90 53.6	12 43.9
18	91 59.3	- 0 32.7	273 14.8	132 2.7	10 50.8	120 55.5	12 42.9
20	121 59.7	- 0 34.7	303 19.7	162 4.6	10 50.7	150 57.4	12 41.8
22	152 .2	- 0 36.6	333 24.7	192 6.5	10 50.5	180 59.3	12 40.7
Δ	2	-10		10	-1	10	-5

UT	MESEC				JUPITER		SATURN	
	$S_\leftmoon$	Δ	$\delta_\leftmoon$	Δ	S_{4}	δ_{4}	S_{5}	δ_{5}
h	° ′		° ′		° ′	° ′	° ′	° ′
0	57 41.3	76	14 59.7	-64	201 12.5	8 53.5	123 51.1	-18 30.1
2	86 34.4	76	14 46.9	-66	231 16.5	8 53.1	153 55.6	-18 30.2
4	115 27.6	75	14 33.7	-68	261 20.4	8 52.7	184 .1	-18 30.3
6	144 20.6	75	14 20.1	-70	291 24.3	8 52.3	214 4.7	-18 30.4
8	173 13.6	75	14 6.1	-72	321 28.3	8 51.9	244 9.2	-18 30.5
10	202 6.6	75	13 51.7	-74	351 32.2	8 51.6	274 13.7	-18 30.6
12	230 59.5	74	13 36.9	-76	21 36.2	8 51.2	304 18.3	-18 30.7
14	259 52.4	74	13 21.7	-78	51 40.1	8 50.8	334 22.8	-18 30.8
16	288 45.3	74	13 6.1	-80	81 44.1	8 50.4	4 27.3	-18 30.9
18	317 38.1	74	12 50.2	-82	111 48.0	8 50.0	34 31.8	-18 31.0
20	346 30.9	74	12 33.9	-83	141 52.0	8 49.6	64 36.4	-18 31.1
22	15 23.7	74	12 17.2	-85	171 55.9	8 49.2	94 40.9	-18 31.2
Δ					20	-2	23	0

φ	SUNCE		TRAJANJE SUMRAKA		MESEC			
	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 48	17 55	0 41	2 25	13 1	3.6	4 4	1.2
55	5 48	17 55	0 36	2 4	13 20	3.3	3 44	1.4
50	5 49	17 55	0 32	1 49	13 34	3.2	3 28	1.6
45	5 49	17 55	0 29	1 39	13 46	3.0	3 16	1.7
40	5 49	17 55	0 27	1 31	13 55	2.9	3 6	1.8
35	5 49	17 55	0 25	1 24	14 3	2.8	2 57	1.9
30	5 49	17 55	0 24	1 20	14 10	2.7	2 50	2.0
20	5 49	17 55	0 22	1 13	14 22	2.6	2 36	2.1
10	5 49	17 55	0 21	1 10	14 33	2.4	2 25	2.2
0	5 49	17 55	0 21	1 9	14 43	2.3	2 14	2.3
10	5 49	17 56	0 21	1 10	14 53	2.2	2 3	2.4
20	5 48	17 56	0 22	1 13	15 3	2.1	1 51	2.5
30	5 48	17 57	0 24	1 20	15 15	1.9	1 37	2.7
35	5 47	17 58	0 25	1 25	15 22	1.9	1 29	2.7
40	5 47	17 58	0 27	1 31	15 30	1.8	1 20	2.8
45	5 46	17 59	0 29	1 39	15 39	1.7	1 9	2.9
50	5 45	17 60	0 32	1 50	15 50	1.5	0 56	3.1
55	5 44	18 1	0 36	2 5	16 4	1.3	0 40	3.2
60	5 43	18 2	0 42	2 27	16 22	1.1	0 18	3.4
S								

SUNCE				MESEC			
UT	e = T_p − UT	Δ/24	r	Prolaz		Δ/24	$\pi_\leftmoon$	r
h	min s	s	′	$T_{\overline{m}}$	h min	min	′	′
00	7 41.4	.9	16.0	$T_{\overline{m}}$	20 56	2.3	59.1	16.1
12	7 51.9	$T_{\overline{m}_\odot}$	11 h 52.1 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	′	°	
♀	9 12	.1	219	-5.7	♃	10 34	.0	199	-1.3
♂	9 57	.1	208	1.7	♄	15 42	.0	121	.8

UT	SUNCE		PROLEĆ. TAČKA	VENERA		MARS	
	$S_\odot$	$\delta_\odot$	S_Υ	S_φ	δ_φ	S_σ	δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	182 .6	- 0 38.6	3 29.6	222 8.4	10 50.4	211 1.2	12 39.6
2	212 1.0	- 0 40.5	33 34.5	252 10.3	10 50.2	241 3.2	12 38.5
4	242 1.5	- 0 42.5	63 39.5	282 12.2	10 50.1	271 5.1	12 37.4
6	272 1.9	- 0 44.4	93 44.4	312 14.0	10 49.9	301 7.0	12 36.4
8	302 2.3	- 0 46.3	123 49.3	342 15.9	10 49.7	331 8.9	12 35.3
10	332 2.8	- 0 48.3	153 54.2	12 17.8	10 49.6	1 10.8	12 34.2
12	2 3.2	- 0 50.2	183 59.2	42 19.6	10 49.4	31 12.8	12 33.1
14	32 3.6	- 0 52.2	214 4.1	72 21.5	10 49.2	61 14.7	12 32.0
16	62 4.1	- 0 54.1	244 9.0	102 23.3	10 49.0	91 16.6	12 30.9
18	92 4.5	- 0 56.1	274 14.0	132 25.1	10 48.8	121 18.5	12 29.8
20	122 4.9	- 0 58.0	304 18.9	162 26.9	10 48.6	151 20.5	12 28.7
22	152 5.4	- 1 .0	334 23.8	192 28.7	10 48.5	181 22.4	12 27.7
Δ	2	-10		9	-1	10	-5

UT	MESEC				JUPITER		SATURN	
	$S_\leftmoon$	Δ	$\delta_\leftmoon$	Δ	S_{4}	δ_{4}	S_{5}	δ_{5}
h	° ′		° ′		° ′	° ′	° ′	° ′
0	44 16.4	74	12 .2	-87	201 59.8	8 48.9	124 45.4	-18 31.3
2	73 9.1	73	11 42.8	-89	232 3.8	8 48.5	154 49.9	-18 31.4
4	102 1.8	73	11 25.0	-90	262 7.7	8 48.1	184 54.5	-18 31.4
6	130 54.5	73	11 7.0	-92	292 11.7	8 47.7	214 59.0	-18 31.5
8	159 47.1	73	10 48.6	-94	322 15.6	8 47.3	245 3.5	-18 31.6
10	188 39.8	73	10 29.9	-95	352 19.6	8 46.9	275 8.0	-18 31.7
12	217 32.4	73	10 10.8	-97	22 23.5	8 46.5	305 12.6	-18 31.8
14	246 25.0	73	9 51.5	-98	52 27.5	8 46.2	335 17.1	-18 31.9
16	275 17.6	73	9 31.9	-100	82 31.4	8 45.8	5 21.6	-18 32.0
18	304 10.2	73	9 11.9	-101	112 35.4	8 45.4	35 26.1	-18 32.1
20	333 2.7	73	8 51.7	-102	142 39.3	8 45.0	65 30.6	-18 32.2
22	1 55.3	73	8 31.2	-104	172 43.3	8 44.6	95 35.2	-18 32.3
Δ					20	-2	23	0

φ	SUNCE		TRAJANJE SUMRAKA		MESEC			
	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 50	17 52	0 41	2 24	14 27	3.7	4 33	1.0
55	5 50	17 52	0 36	2 3	14 40	3.5	4 18	1.3
50	5 50	17 52	0 32	1 49	14 50	3.3	4 7	1.5
45	5 50	17 53	0 29	1 38	14 58	3.1	3 58	1.6
40	5 50	17 53	0 27	1 30	15 5	3.0	3 50	1.7
35	5 50	17 53	0 25	1 24	15 10	2.9	3 43	1.8
30	5 50	17 53	0 24	1 20	15 15	2.8	3 37	1.9
20	5 49	17 54	0 22	1 13	15 24	2.6	3 27	2.1
10	5 49	17 54	0 21	1 10	15 32	2.5	3 18	2.2
0	5 49	17 55	0 21	1 9	15 39	2.3	3 9	2.3
10	5 48	17 56	0 21	1 10	15 46	2.2	3 1	2.5
20	5 47	17 57	0 22	1 13	15 53	2.1	2 52	2.6
30	5 46	17 58	0 24	1 20	16 2	1.9	2 41	2.8
35	5 46	17 58	0 25	1 25	16 7	1.8	2 35	2.8
40	5 45	17 59	0 27	1 31	16 12	1.7	2 28	3.0
45	5 44	18 0	0 29	1 39	16 19	1.6	2 20	3.1
50	5 43	18 1	0 32	1 51	16 27	1.4	2 10	3.2
55	5 42	18 3	0 36	2 6	16 36	1.2	1 57	3.4
60	5 40	18 5	0 42	2 28	16 49	1.0	1 41	3.7
S								

SUNCE				MESEC			
UT	e = T_p − UT	Δ/24	r	Prolaz		Δ/24	$\pi_\leftmoon$	r
h	min s	s	′	$T_{\overline{m}}$	h min	min	′	′
00	8 2.4	.9	16.0	$T_{\overline{m}}$	21 52	2.3	60.0	16.3
12	8 12.8	$T_{\overline{m}_\odot}$	11 h 51.8 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	′	°	
♀	9 11	.1	219	-5.6	♃	10 31	.0	198	-1.3
♂	9 55	.1	208	1.7	♄	15 39	.0	121	.8

UT	SUNCE		PROLEĆ. TAČKA	VENERA		MARS	
	$S_\odot$	$\delta_\odot$	S_Υ	S_φ	δ_φ	S_σ	δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	182 5.8	- 1 1.9	4 28.7	222 30.5	10 48.3	211 24.3	12 26.6
2	212 6.2	- 1 3.9	34 33.7	252 32.3	10 48.1	241 26.2	12 25.5
4	242 6.7	- 1 5.8	64 38.6	282 34.1	10 47.8	271 28.2	12 24.4
6	272 7.1	- 1 7.8	94 43.5	312 35.9	10 47.6	301 30.1	12 23.3
8	302 7.5	- 1 9.7	124 48.5	342 37.6	10 47.4	331 32.0	12 22.2
10	332 8.0	- 1 11.7	154 53.4	12 39.4	10 47.2	1 34.0	12 21.1
12	2 8.4	- 1 13.6	184 58.3	42 41.1	10 47.0	31 35.9	12 20.0
14	32 8.8	- 1 15.5	215 3.2	72 42.9	10 46.8	61 37.8	12 18.9
16	62 9.3	- 1 17.5	245 8.2	102 44.6	10 46.5	91 39.7	12 17.8
18	92 9.7	- 1 19.4	275 13.1	132 46.3	10 46.3	121 41.7	12 16.7
20	122 10.1	- 1 21.4	305 18.0	162 48.0	10 46.1	151 43.6	12 15.6
22	152 10.6	- 1 23.3	335 23.0	192 49.8	10 45.8	181 45.5	12 14.6
Δ	2	-10		9	-1	10	-5

UT	MESEC				JUPITER		SATURN	
	$S_\leftmoon$	Δ	$\delta_\leftmoon$	Δ	$S_{\mathrm{♃}}$	$\delta_{\mathrm{♃}}$	$S_{\mathrm{♄}}$	$\delta_{\mathrm{♄}}$
h	° ′		° ′		° ′	° ′	° ′	° ′
0	30 47.8	73	8 10.5	-105	202 47.2	8 44.2	125 39.7	-18 32.4
2	59 40.4	73	7 49.5	-106	232 51.2	8 43.8	155 44.2	-18 32.5
4	88 32.9	73	7 28.3	-107	262 55.1	8 43.5	185 48.7	-18 32.6
6	117 25.4	73	7 6.8	-109	292 59.1	8 43.1	215 53.2	-18 32.7
8	146 17.9	72	6 45.1	-110	323 3.0	8 42.7	245 57.8	-18 32.8
10	175 10.4	72	6 23.2	-111	353 7.0	8 42.3	276 2.3	-18 32.9
12	204 2.9	72	6 1.0	-112	23 10.9	8 41.9	306 6.8	-18 33.0
14	232 55.4	72	5 38.7	-112	53 14.9	8 41.5	336 11.3	-18 33.1
16	261 47.9	72	5 16.2	-113	83 18.8	8 41.1	6 15.8	-18 33.2
18	290 40.3	72	4 53.6	-114	113 22.8	8 40.8	36 20.3	-18 33.3
20	319 32.8	72	4 30.8	-115	143 26.7	8 40.4	66 24.9	-18 33.4
22	348 25.2	72	4 7.8	-116	173 30.7	8 40.0	96 29.4	-18 33.5
Δ					20	-2	23	0

φ	SUNCE		TRAJANJE SUMRAKA		MESEC			
	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 53	17 49	0 41	2 23	15 57	3.8	4 58	.9
55	5 52	17 50	0 36	2 3	16 4	3.6	4 49	1.2
50	5 52	17 50	0 32	1 49	16 9	3.4	4 42	1.4
45	5 51	17 51	0 29	1 38	16 13	3.2	4 36	1.5
40	5 51	17 51	0 27	1 30	16 17	3.1	4 31	1.7
35	5 51	17 52	0 25	1 24	16 20	2.9	4 27	1.8
30	5 50	17 52	0 24	1 20	16 22	2.8	4 23	1.9
20	5 50	17 53	0 22	1 13	16 27	2.7	4 17	2.0
10	5 49	17 54	0 21	1 10	16 31	2.5	4 11	2.2
0	5 48	17 55	0 21	1 9	16 35	2.3	4 5	2.3
10	5 47	17 56	0 21	1 10	16 39	2.2	3 60	2.5
20	5 46	17 57	0 22	1 13	16 43	2.0	3 54	2.6
30	5 45	17 58	0 24	1 20	16 47	1.9	3 47	2.8
35	5 44	17 59	0 25	1 25	16 50	1.8	3 43	2.9
40	5 43	18 0	0 27	1 31	16 53	1.6	3 39	3.0
45	5 42	18 1	0 29	1 40	16 56	1.5	3 33	3.2
50	5 41	18 3	0 32	1 51	17 0	1.3	3 27	3.3
55	5 39	18 5	0 36	2 6	17 5	1.2	3 19	3.5
60	5 37	18 7	0 42	2 29	17 12	.9	3 9	3.8
S								

SUNCE				MESEC			
UT	e = T_p − UT	Δ/24	r	Prolaz	Δ/24	$\pi_\leftmoon$	r
h	min s	s	′	h min	min	′	′
00	8 23.3	.9	16.0	$T_{\overline{m}}$ 22 48	2.3	60.7	16.5
12	8 33.6	$T_{\overline{m}_\odot}$ 11 h 51.4 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	′	°	
♀	9 9	.1	218	-5.6	♃	10 27	.0	198	-1.3
♂	9 54	.1	207	1.7	♄	15 35	.0	121	.8

UT	SUNCE		PROLEĆ. TAČKA	VENERA		MARS	
	$S_\odot$	$\delta_\odot$	S_Υ	S_φ	δ_φ	S_σ	δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	182 11.0	- 1 25.3	5 27.9	222 51.5	10 45.6	211 47.5	12 13.5
2	212 11.4	- 1 27.2	35 32.8	252 53.1	10 45.3	241 49.4	12 12.4
4	242 11.8	- 1 29.2	65 37.7	282 54.8	10 45.1	271 51.3	12 11.3
6	272 12.3	- 1 31.1	95 42.7	312 56.5	10 44.8	301 53.3	12 10.2
8	302 12.7	- 1 33.1	125 47.6	342 58.2	10 44.5	331 55.2	12 9.1
10	332 13.1	- 1 35.0	155 52.5	12 59.8	10 44.3	1 57.2	12 8.0
12	2 13.6	- 1 37.0	185 57.5	43 1.5	10 44.0	31 59.1	12 6.9
14	32 14.0	- 1 38.9	216 2.4	73 3.1	10 43.7	62 1.0	12 5.8
16	62 14.4	- 1 40.8	246 7.3	103 4.7	10 43.5	92 3.0	12 4.7
18	92 14.8	- 1 42.8	276 12.2	133 6.4	10 43.2	122 4.9	12 3.6
20	122 15.3	- 1 44.7	306 17.2	163 8.0	10 42.9	152 6.8	12 2.5
22	152 15.7	- 1 46.7	336 22.1	193 9.6	10 42.6	182 8.8	12 1.4
Δ	2	-10		8	-1	10	-5

UT	MESEC				JUPITER		SATURN	
	$S_\leftmoon$	Δ	$\delta_\leftmoon$	Δ	$S_{\mathrm{♃}}$	$\delta_{\mathrm{♃}}$	$S_{\mathrm{♄}}$	$\delta_{\mathrm{♄}}$
h	° ′		° ′		° ′	° ′	° ′	° ′
0	17 17.6	72	3 44.7	-116	203 34.6	8 39.6	126 33.9	-18 33.6
2	46 10.1	72	3 21.5	-117	233 38.6	8 39.2	156 38.4	-18 33.7
4	75 2.5	72	2 58.1	-117	263 42.5	8 38.8	186 42.9	-18 33.8
6	103 54.9	72	2 34.7	-118	293 46.5	8 38.5	216 47.4	-18 33.9
8	132 47.2	72	2 11.2	-118	323 50.4	8 38.1	246 51.9	-18 34.0
10	161 39.6	72	1 47.6	-118	353 54.4	8 37.7	276 56.5	-18 34.1
12	190 31.9	72	1 23.9	-119	23 58.3	8 37.3	307 1.0	-18 34.2
14	219 24.3	72	1 .2	-119	54 2.3	8 36.9	337 5.5	-18 34.3
16	248 16.6	71	0 36.4	-119	84 6.2	8 36.5	7 10.0	-18 34.4
18	277 8.9	71	0 12.6	-7	114 10.2	8 36.2	37 14.5	-18 34.5
20	306 1.1	71	0 11.2	119	144 14.1	8 35.8	67 19.0	-18 34.6
22	334 53.4	71	0 35.0	119	174 18.1	8 35.4	97 23.5	-18 34.7
Δ					20	-2	23	0

φ	SUNCE		TRAJANJE SUMRAKA		MESEC			
	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 55	17 46	0 41	2 23	17 29	1.1	5 20	2.2
55	5 54	17 47	0 36	2 3	17 30	1.3	5 17	2.2
50	5 53	17 48	0 32	1 49	17 30	1.5	5 15	2.2
45	5 53	17 49	0 29	1 38	17 30	1.6	5 13	2.3
40	5 52	17 50	0 27	1 30	17 30	1.7	5 11	2.3
35	5 51	17 50	0 25	1 24	17 30	1.8	5 9	2.3
30	5 51	17 51	0 24	1 19	17 30	1.9	5 8	2.3
20	5 50	17 52	0 22	1 13	17 31	2.1	5 6	2.3
10	5 49	17 53	0 21	1 10	17 31	2.2	5 3	2.3
0	5 48	17 54	0 21	1 9	17 31	2.4	5 1	2.3
10	5 47	17 56	0 21	1 10	17 31	2.5	4 59	2.4
20	5 45	17 57	0 22	1 13	17 32	2.6	4 57	2.4
30	5 44	17 59	0 24	1 20	17 32	2.8	4 55	2.4
35	5 43	17 60	0 25	1 25	17 32	2.9	4 53	2.4
40	5 42	18 1	0 27	1 32	17 32	3.0	4 52	2.4
45	5 40	18 3	0 29	1 40	17 32	3.1	4 50	2.5
50	5 39	18 4	0 32	1 51	17 33	3.3	4 47	2.5
55	5 37	18 7	0 36	2 7	17 33	3.4	4 44	2.5
60	5 34	18 10	0 42	2 30	17 34	3.7	4 41	2.6
S								

SUNCE				MESEC			
UT	e = T_p − UT	Δ/24	r	Prolaz	Δ/24	$\pi_\leftmoon$	r
h	min s	s	′	h min	min	′	′
00	8 43.9	.9	16.0	$T_{\overline{m}}$ 23 44	2.4	61.2	16.7
12	8 54.2	$T_{\overline{m}_\odot}$ 11 h 51.1 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	′	°	
♀	9 8	.1	217	-5.6	♃	10 24	.0	198	-1.3
♂	9 52	.1	206	1.7	♄	15 31	.0	121	.8

UT	SUNCE		PROLEĆ. TAČKA	VENERA		MARS	
	$S_\odot$	$\delta_\odot$	S_Υ	S_φ	δ_φ	S_σ	δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	182 16.1	- 1 48.6	6 27.0	223 11.2	10 42.3	212 10.7	12 .3
2	212 16.5	- 1 50.6	36 31.9	253 12.8	10 42.0	242 12.7	11 59.2
4	242 17.0	- 1 52.5	66 36.9	283 14.4	10 41.7	272 14.6	11 58.1
6	272 17.4	- 1 54.5	96 41.8	313 15.9	10 41.4	302 16.5	11 57.0
8	302 17.8	- 1 56.4	126 46.7	343 17.5	10 41.1	332 18.5	11 55.9
10	332 18.2	- 1 58.3	156 51.7	13 19.1	10 40.8	2 20.4	11 54.8
12	2 18.7	- 2 .3	186 56.6	43 20.6	10 40.4	32 22.4	11 53.7
14	32 19.1	- 2 2.2	217 1.5	73 22.2	10 40.1	62 24.3	11 52.6
16	62 19.5	- 2 4.2	247 6.4	103 23.7	10 39.8	92 26.3	11 51.5
18	92 19.9	- 2 6.1	277 11.4	133 25.3	10 39.5	122 28.2	11 50.4
20	122 20.3	- 2 8.1	307 16.3	163 26.8	10 39.1	152 30.1	11 49.3
22	152 20.8	- 2 10.0	337 21.2	193 28.3	10 38.8	182 32.1	11 48.2
Δ	2	-10		8	-2	10	-6

UT	MESEC				JUPITER		SATURN	
	$S_\leftmoon$	Δ	$\delta_\leftmoon$	Δ	$S_{\mathrm{♃}}$	$\delta_{\mathrm{♃}}$	$S_{\mathrm{♄}}$	$\delta_{\mathrm{♄}}$
h	° ′		° ′		° ′	° ′	° ′	° ′
0	3 45.6	71	0 58.8	119	204 22.1	8 35.0	127 28.0	-18 34.8
2	32 37.8	71	1 22.5	119	234 26.0	8 34.6	157 32.5	-18 34.9
4	61 30.0	71	1 46.2	118	264 30.0	8 34.2	187 37.0	-18 35.0
6	90 22.2	71	2 9.9	118	294 33.9	8 33.9	217 41.5	-18 35.1
8	119 14.3	71	2 33.5	118	324 37.9	8 33.5	247 46.0	-18 35.2
10	148 6.4	70	2 57.1	117	354 41.8	8 33.1	277 50.6	-18 35.3
12	176 58.5	70	3 20.5	117	24 45.8	8 32.7	307 55.1	-18 35.4
14	205 50.5	70	3 43.9	116	54 49.8	8 32.3	337 59.6	-18 35.5
16	234 42.5	70	4 7.1	116	84 53.7	8 31.9	8 4.1	-18 35.6
18	263 34.5	70	4 30.2	115	114 57.7	8 31.6	38 8.6	-18 35.7
20	292 26.5	70	4 53.2	114	145 1.6	8 31.2	68 13.1	-18 35.8
22	321 18.4	70	5 16.0	113	175 5.6	8 30.8	98 17.6	-18 35.9
Δ					20	-2	23	0

φ	SUNCE		TRAJANJE SUMRAKA		MESEC			
	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 57	17 43	0 41	2 22	17 56	1.0	6 13	3.8
55	5 56	17 45	0 36	2 2	18 1	1.2	6 10	3.6
50	5 55	17 46	0 32	1 48	18 5	1.4	6 8	3.4
45	5 54	17 47	0 29	1 38	18 9	1.6	6 7	3.2
40	5 53	17 48	0 27	1 30	18 12	1.7	6 5	3.1
35	5 52	17 49	0 25	1 24	18 14	1.8	6 4	2.9
30	5 51	17 50	0 24	1 19	18 17	1.9	6 3	2.8
20	5 50	17 51	0 22	1 13	18 21	2.1	6 1	2.7
10	5 49	17 53	0 21	1 10	18 24	2.2	5 59	2.5
0	5 48	17 54	0 21	1 9	18 27	2.4	5 58	2.4
10	5 46	17 56	0 21	1 10	18 31	2.5	5 56	2.2
20	5 45	17 57	0 22	1 14	18 34	2.7	5 54	2.1
30	5 43	17 59	0 24	1 20	18 39	2.8	5 52	1.9
35	5 41	18 1	0 25	1 25	18 41	2.9	5 51	1.8
40	5 40	18 2	0 27	1 32	18 44	3.0	5 50	1.7
45	5 39	18 4	0 29	1 40	18 47	3.2	5 49	1.5
50	5 37	18 6	0 32	1 52	18 51	3.3	5 47	1.4
55	5 34	18 9	0 37	2 7	18 56	3.5	5 45	1.2
60	5 31	18 12	0 42	2 31	19 2	3.8	5 42	.9
S								

SUNCE				MESEC			
UT	e = Tp − UT	Δ/24	r	Prolaz	Δ/24	$\pi_\leftmoon$	r
h	min s	s	′	h min	min	′	′
00	9 4.4	.8	16.0	$T_{\overline{m}}$	1.0	61.4	16.7
12	9 14.6	$T_{\overline{m}_\odot}$ 11 h 50.8 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	′	°	
♀	9 7	.1	217	-5.5	♃	10 21	.0	198	-1.3
♂	9 51	.1	206	1.7	♄	15 28	.0	121	.8

UT	SUNCE		PROLEĆ. TAČKA	VENERA		MARS	
	$S_\odot$	$\delta_\odot$	S_Υ	S_φ	δ_φ	S_σ	δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	182 21.2	- 2 12.0	7 26.2	223 29.8	10 38.5	212 34.0	11 47.1
2	212 21.6	- 2 13.9	37 31.1	253 31.3	10 38.1	242 36.0	11 46.0
4	242 22.0	- 2 15.8	67 36.0	283 32.8	10 37.8	272 37.9	11 44.8
6	272 22.4	- 2 17.8	97 40.9	313 34.3	10 37.4	302 39.9	11 43.7
8	302 22.9	- 2 19.7	127 45.9	343 35.8	10 37.0	332 41.8	11 42.6
10	332 23.3	- 2 21.7	157 50.8	13 37.2	10 36.7	2 43.8	11 41.5
12	2 23.7	- 2 23.6	187 55.7	43 38.7	10 36.3	32 45.7	11 40.4
14	32 24.1	- 2 25.6	218 .7	73 40.2	10 35.9	62 47.7	11 39.3
16	62 24.5	- 2 27.5	248 5.6	103 41.6	10 35.6	92 49.6	11 38.2
18	92 24.9	- 2 29.4	278 10.5	133 43.0	10 35.2	122 51.6	11 37.1
20	122 25.4	- 2 31.4	308 15.4	163 44.5	10 34.8	152 53.5	11 36.0
22	152 25.8	- 2 33.3	338 20.4	193 45.9	10 34.4	182 55.5	11 34.9
Δ	2	-10		7	-2	10	-6

UT	MESEC				JUPITER		SATURN	
	$S_\leftmoon$	Δ	$\delta_\leftmoon$	Δ	$S_{\mathrm{♃}}$	$\delta_{\mathrm{♃}}$	$S_{\mathrm{♄}}$	$\delta_{\mathrm{♄}}$
h	° ′		° ′		° ′	° ′	° ′	° ′
0	350 10.4	69	5 38.7	112	205 9.5	8 30.4	128 22.1	-18 36.0
2	19 2.2	69	6 1.2	112	235 13.5	8 30.0	158 26.6	-18 36.1
4	47 54.1	69	6 23.5	111	265 17.5	8 29.6	188 31.1	-18 36.2
6	76 45.9	69	6 45.6	110	295 21.4	8 29.3	218 35.6	-18 36.3
8	105 37.7	69	7 7.5	108	325 25.4	8 28.9	248 40.1	-18 36.4
10	134 29.5	69	7 29.2	107	355 29.3	8 28.5	278 44.6	-18 36.5
12	163 21.2	69	7 50.7	106	25 33.3	8 28.1	308 49.1	-18 36.6
14	192 13.0	68	8 11.9	105	55 37.3	8 27.7	338 53.6	-18 36.7
16	221 4.7	68	8 32.9	104	85 41.2	8 27.4	8 58.1	-18 36.8
18	249 56.3	68	8 53.6	102	115 45.2	8 27.0	39 2.6	-18 36.9
20	278 48.0	68	9 14.1	101	145 49.2	8 26.6	69 7.1	-18 37.0
22	307 39.6	68	9 34.2	99	175 53.1	8 26.2	99 11.6	-18 37.1
Δ					20	-2	22	-1

φ	SUNCE		TRAJANJE SUMRAKA		MESEC			
	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 60	17 40	0 41	2 22	18 19	1.1	7 45	3.7
55	5 58	17 42	0 36	2 2	18 30	1.4	7 36	3.5
50	5 56	17 44	0 32	1 48	18 39	1.5	7 29	3.3
45	5 55	17 45	0 29	1 38	18 46	1.7	7 23	3.1
40	5 54	17 46	0 27	1 30	18 52	1.8	7 19	3.0
35	5 53	17 47	0 25	1 24	18 58	1.9	7 15	2.9
30	5 52	17 48	0 24	1 19	19 2	2.0	7 11	2.8
20	5 50	17 50	0 22	1 13	19 10	2.1	7 5	2.6
10	5 49	17 52	0 21	1 10	19 17	2.2	6 59	2.5
0	5 47	17 54	0 21	1 9	19 24	2.4	6 54	2.4
10	5 46	17 55	0 21	1 10	19 31	2.5	6 49	2.2
20	5 44	17 58	0 22	1 14	19 38	2.6	6 44	2.1
30	5 41	17 60	0 24	1 20	19 47	2.8	6 38	1.9
35	5 40	18 1	0 25	1 25	19 51	2.9	6 34	1.8
40	5 38	18 3	0 27	1 32	19 57	3.0	6 30	1.7
45	5 37	18 5	0 29	1 40	20 3	3.1	6 25	1.6
50	5 34	18 7	0 33	1 52	20 11	3.2	6 20	1.5
55	5 32	18 10	0 37	2 8	20 21	3.4	6 13	1.3
60	5 28	18 14	0 42	2 32	20 33	3.7	6 4	1.0
S								

SUNCE				MESEC			
UT	e = Tp − UT	Δ/24	r	Prolaz	Δ/24	$\pi_\leftmoon$	r
h	min s	s	′	h min	min	′	′
00	9 24.7	.8	16.0	$T_{\overline{m}}$ 0 41	2.4	61.3	16.7
12	9 34.7	$T_{\overline{m}_\odot}$ 11 h 50.4 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	′	°	
♀	9 6	.1	216	-5.5	♃	10 18	.0	198	-1.3
♂	9 49	.1	205	1.7	♄	15 24	.0	121	.8

UT	SUNCE		PROLEĆ. TAČKA	VENERA		MARS	
	$S_\odot$	$\delta_\odot$	S_Υ	S_φ	δ_φ	S_σ	δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	182 26.2	- 2 35.3	8 25.3	223 47.3	10 34.0	212 57.4	11 33.8
2	212 26.6	- 2 37.2	38 30.2	253 48.7	10 33.6	242 59.4	11 32.7
4	242 27.0	- 2 39.2	68 35.2	283 50.1	10 33.2	273 1.3	11 31.5
6	272 27.4	- 2 41.1	98 40.1	313 51.5	10 32.8	303 3.3	11 30.4
8	302 27.8	- 2 43.0	128 45.0	343 52.9	10 32.4	333 5.3	11 29.3
10	332 28.3	- 2 45.0	158 49.9	13 54.3	10 32.0	3 7.2	11 28.2
12	2 28.7	- 2 46.9	188 54.9	43 55.7	10 31.6	33 9.2	11 27.1
14	32 29.1	- 2 48.9	218 59.8	73 57.1	10 31.2	63 11.1	11 26.0
16	62 29.5	- 2 50.8	249 4.7	103 58.4	10 30.8	93 13.1	11 24.9
18	92 29.9	- 2 52.7	279 9.7	133 59.8	10 30.4	123 15.0	11 23.8
20	122 30.3	- 2 54.7	309 14.6	164 1.1	10 29.9	153 17.0	11 22.7
22	152 30.7	- 2 56.6	339 19.5	194 2.5	10 29.5	183 19.0	11 21.5
Δ	2	-10		7	-2	10	-6

UT	MESEC				JUPITER		SATURN	
	$S_\leftmoon$	Δ	$\delta_\leftmoon$	Δ	$S_{\mathrm{♃}}$	$\delta_{\mathrm{♃}}$	$S_{\mathrm{♄}}$	$\delta_{\mathrm{♄}}$
h	° ′		° ′		° ′	° ′	° ′	° ′
0	336 31.2	68	9 54.1	98	205 57.1	8 25.8	129 16.1	-18 37.2
2	5 22.8	68	10 13.7	96	236 1.0	8 25.4	159 20.6	-18 37.3
4	34 14.4	68	10 32.9	95	266 5.0	8 25.1	189 25.1	-18 37.4
6	63 6.0	68	10 51.9	93	296 9.0	8 24.7	219 29.6	-18 37.5
8	91 57.5	68	11 10.5	91	326 12.9	8 24.3	249 34.0	-18 37.6
10	120 49.1	68	11 28.8	90	356 16.9	8 23.9	279 38.5	-18 37.7
12	149 40.6	68	11 46.7	88	26 20.9	8 23.5	309 43.0	-18 37.8
14	178 32.1	68	12 4.3	86	56 24.8	8 23.2	339 47.5	-18 37.9
16	207 23.7	68	12 21.5	84	86 28.8	8 22.8	9 52.0	-18 38.0
18	236 15.2	68	12 38.4	82	116 32.7	8 22.4	39 56.5	-18 38.1
20	265 6.8	68	12 54.9	81	146 36.7	8 22.0	70 1.0	-18 38.2
22	293 58.3	68	13 11.0	79	176 40.7	8 21.6	100 5.5	-18 38.3
Δ					20	-2	22	-1

φ	SUNCE		TRAJANJE SUMRAKA		MESEC			
	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 2	17 37	0 41	2 21	18 46	1.3	9 15	3.5
55	5 60	17 39	0 36	2 2	19 3	1.6	8 60	3.3
50	5 58	17 41	0 32	1 48	19 16	1.7	8 48	3.1
45	5 56	17 43	0 29	1 38	19 27	1.8	8 39	3.0
40	5 55	17 45	0 27	1 30	19 35	1.9	8 31	2.9
35	5 54	17 46	0 25	1 24	19 43	2.0	8 24	2.8
30	5 53	17 47	0 24	1 19	19 50	2.1	8 18	2.7
20	5 51	17 49	0 22	1 13	20 1	2.2	8 8	2.6
10	5 49	17 51	0 21	1 10	20 11	2.3	7 59	2.5
0	5 47	17 53	0 21	1 9	20 21	2.4	7 51	2.4
10	5 45	17 55	0 21	1 10	20 31	2.5	7 43	2.3
20	5 43	17 58	0 22	1 14	20 41	2.6	7 34	2.1
30	5 40	18 1	0 24	1 20	20 53	2.7	7 24	2.0
35	5 39	18 2	0 25	1 25	21 0	2.7	7 18	1.9
40	5 37	18 4	0 27	1 32	21 8	2.8	7 12	1.8
45	5 35	18 6	0 30	1 41	21 17	2.9	7 4	1.7
50	5 32	18 9	0 33	1 52	21 28	3.0	6 55	1.6
55	5 29	18 12	0 37	2 9	21 43	3.2	6 44	1.4
60	5 25	18 17	0 42	2 33	22 1	3.4	6 29	1.2
S								

SUNCE				MESEC				
UT	e = T_p − UT	Δ/24	r	Prolaz		Δ/24	$\pi_\leftmoon$	r
h	min s	s	′	$T_{\overline{m}}$	h min	min	′	′
00	9 44.8	.8	16.0	$T_{\overline{m}}$	1 38	2.4	60.8	16.6
12	9 54.6	$T_{\overline{m}_\odot}$	11 h 50.1 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	′	°	
♀	9 4	.1	215	-5.5	♃	10 15	.0	198	-1.3
♂	9 48	.1	205	1.7	♄	15 21	.0	121	.8

UT	SUNCE		PROLEĆ. TAČKA	VENERA		MARS	
	$S_\odot$	$\delta_\odot$	S_Υ	S_φ	δ_φ	S_σ	δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	182 31.1	- 2 58.6	9 24.4	224 3.8	10 29.0	213 20.9	11 20.4
2	212 31.5	- 3 .5	39 29.4	254 5.1	10 28.6	243 22.9	11 19.3
4	242 31.9	- 3 2.4	69 34.3	284 6.5	10 28.2	273 24.8	11 18.2
6	272 32.4	- 3 4.4	99 39.2	314 7.8	10 27.7	303 26.8	11 17.1
8	302 32.8	- 3 6.3	129 44.2	344 9.1	10 27.3	333 28.8	11 16.0
10	332 33.2	- 3 8.3	159 49.1	14 10.4	10 26.8	3 30.7	11 14.8
12	2 33.6	- 3 10.2	189 54.0	44 11.7	10 26.3	33 32.7	11 13.7
14	32 34.0	- 3 12.1	219 58.9	74 13.0	10 25.9	63 34.6	11 12.6
16	62 34.4	- 3 14.1	250 3.9	104 14.3	10 25.4	93 36.6	11 11.5
18	92 34.8	- 3 16.0	280 8.8	134 15.5	10 24.9	123 38.6	11 10.4
20	122 35.2	- 3 17.9	310 13.7	164 16.8	10 24.5	153 40.5	11 9.3
22	152 35.6	- 3 19.9	340 18.6	194 18.1	10 24.0	183 42.5	11 8.1
Δ	2	-10		6	-2	10	-6

UT	MESEC				JUPITER		SATURN	
	$S_\leftmoon$	Δ	$\delta_\leftmoon$	Δ	$S_{\mathrm{♃}}$	$\delta_{\mathrm{♃}}$	$S_{\mathrm{♄}}$	$\delta_{\mathrm{♄}}$
h	° ′		° ′		° ′	° ′	° ′	° ′
0	322 49.9	68	13 26.8	77	206 44.6	8 21.3	130 10.0	-18 38.4
2	351 41.5	68	13 42.1	75	236 48.6	8 20.9	160 14.5	-18 38.5
4	20 33.1	68	13 57.0	73	266 52.6	8 20.5	190 19.0	-18 38.6
6	49 24.8	68	14 11.6	71	296 56.5	8 20.1	220 23.5	-18 38.7
8	78 16.4	69	14 25.7	69	327 .5	8 19.7	250 27.9	-18 38.8
10	107 8.2	69	14 39.4	67	357 4.5	8 19.4	280 32.4	-18 38.9
12	135 59.9	69	14 52.8	64	27 8.4	8 19.0	310 36.9	-18 39.0
14	164 51.7	69	15 5.6	62	57 12.4	8 18.6	340 41.4	-18 39.1
16	193 43.5	69	15 18.1	60	87 16.4	8 18.2	10 45.9	-18 39.2
18	222 35.4	70	15 30.1	58	117 20.4	8 17.8	40 50.4	-18 39.3
20	251 27.4	70	15 41.7	56	147 24.3	8 17.5	70 54.9	-18 39.4
22	280 19.4	70	15 52.9	54	177 28.3	8 17.1	100 59.4	-18 39.5
Δ					20	-2	22	-1

φ	SUNCE		TRAJANJE SUMRAKA		MESEC			
	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 34	0 41	2 21	19 18	1.7	10 40	3.2
55	6 2	17 37	0 36	2 2	19 40	1.8	10 19	3.0
50	5 59	17 39	0 32	1 48	19 57	1.9	10 3	2.9
45	5 57	17 41	0 29	1 38	20 10	2.0	9 51	2.8
40	5 56	17 43	0 27	1 30	20 21	2.0	9 40	2.7
35	5 54	17 45	0 25	1 24	20 31	2.1	9 32	2.7
30	5 53	17 46	0 24	1 19	20 39	2.1	9 24	2.6
20	5 51	17 48	0 22	1 13	20 53	2.2	9 11	2.5
10	5 49	17 51	0 21	1 10	21 6	2.3	8 59	2.4
0	5 47	17 53	0 21	1 9	21 18	2.3	8 48	2.4
10	5 44	17 55	0 21	1 10	21 30	2.4	8 37	2.3
20	5 42	17 58	0 22	1 14	21 42	2.5	8 26	2.2
30	5 39	18 1	0 24	1 21	21 57	2.5	8 12	2.1
35	5 37	18 3	0 25	1 26	22 6	2.6	8 5	2.0
40	5 35	18 5	0 27	1 32	22 16	2.6	7 56	2.0
45	5 33	18 8	0 30	1 41	22 27	2.7	7 46	1.9
50	5 30	18 10	0 33	1 53	22 41	2.7	7 34	1.8
55	5 26	18 14	0 37	2 9	22 59	2.4	7 18	1.7
60	5 22	18 19	0 42	2 35	23 22	2.4	6 58	1.5
S								

SUNCE				MESEC				
UT	e = T_p − UT	Δ/24	r	Prolaz		Δ/24	$\pi_\leftmoon$	r
h	min s	s	′	$T_{\overline{m}}$	h min	min	′	′
00	10 4.5	.8	16.0	$T_{\overline{m}}$	2 35	2.3	60.1	16.4
12	10 14.3	$T_{\overline{m}_\odot}$	11 h 49.8 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	′	°	
♀	9 3	.1	215	-5.4	♃	10 12	.0	197	-1.3
♂	9 46	.1	204	1.7	♄	15 17	.0	121	.8

2. OKTOBAR 2015. PETAK

UT	SUNCE		PROLEĆ. TAČKA	VENERA		MARS	
	$S_\odot$	$\delta_\odot$	S_Υ	S_φ	δ_φ	S_σ	δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	182 36.0	- 3 21.8	10 23.6	224 19.3	10 23.5	213 44.5	11 7.0
2	212 36.4	- 3 23.8	40 28.5	254 20.6	10 23.0	243 46.4	11 5.9
4	242 36.8	- 3 25.7	70 33.4	284 21.8	10 22.5	273 48.4	11 4.8
6	272 37.2	- 3 27.6	100 38.4	314 23.0	10 22.0	303 50.4	11 3.7
8	302 37.6	- 3 29.6	130 43.3	344 24.3	10 21.5	333 52.3	11 2.5
10	332 38.0	- 3 31.5	160 48.2	14 25.5	10 21.0	3 54.3	11 1.4
12	2 38.4	- 3 33.4	190 53.1	44 26.7	10 20.5	33 56.3	11 .3
14	32 38.8	- 3 35.4	220 58.1	74 27.9	10 20.0	63 58.2	10 59.2
16	62 39.2	- 3 37.3	251 3.0	104 29.1	10 19.5	94 .2	10 58.1
18	92 39.6	- 3 39.2	281 7.9	134 30.3	10 18.9	124 2.2	10 56.9
20	122 40.0	- 3 41.2	311 12.9	164 31.5	10 18.4	154 4.1	10 55.8
22	152 40.4	- 3 43.1	341 17.8	194 32.7	10 17.9	184 6.1	10 54.7
Δ	2	-10		6	-3	10	-6

UT	MESEC				JUPITER		SATURN	
	$S_\leftmoon$	Δ	$\delta_\leftmoon$	Δ	$S_{\mathrm{♃}}$	$\delta_{\mathrm{♃}}$	$S_{\mathrm{♄}}$	$\delta_{\mathrm{♄}}$
h	° ′		° ′		° ′	° ′	° ′	° ′
0	309 11.5	71	16 3.6	51	207 32.3	8 16.7	131 3.8	-18 39.6
2	338 3.6	71	16 13.9	49	237 36.2	8 16.3	161 8.3	-18 39.7
4	6 55.8	72	16 23.8	47	267 40.2	8 15.9	191 12.8	-18 39.8
6	35 48.2	72	16 33.2	45	297 44.2	8 15.6	221 17.3	-18 39.9
8	64 40.6	72	16 42.2	43	327 48.1	8 15.2	251 21.8	-18 40.0
10	93 33.1	73	16 50.7	40	357 52.1	8 14.8	281 26.3	-18 40.1
12	122 25.7	74	16 58.8	38	27 56.1	8 14.4	311 30.7	-18 40.2
14	151 18.4	74	17 6.4	36	58 .1	8 14.0	341 35.2	-18 40.4
16	180 11.2	75	17 13.6	34	88 4.0	8 13.7	11 39.7	-18 40.5
18	209 4.1	75	17 20.3	31	118 8.0	8 13.3	41 44.2	-18 40.6
20	237 57.1	76	17 26.6	29	148 12.0	8 12.9	71 48.7	-18 40.7
22	266 50.3	77	17 32.4	27	178 15.9	8 12.5	101 53.1	-18 40.8
Δ					20	-2	22	-1

φ	SUNCE		TRAJANJE SUMRAKA		MESEC			
	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 7	17 31	0 41	2 21	19 58	2.0	11 56	2.7
55	6 4	17 34	0 36	2 1	20 23	2.1	11 31	2.6
50	6 1	17 37	0 32	1 48	20 43	2.1	11 13	2.6
45	5 59	17 39	0 29	1 38	20 58	2.1	10 58	2.5
40	5 57	17 41	0 27	1 30	21 10	2.2	10 46	2.5
35	5 55	17 43	0 25	1 24	21 21	2.2	10 35	2.5
30	5 54	17 45	0 24	1 19	21 30	2.2	10 26	2.4
20	5 51	17 48	0 22	1 13	21 46	2.2	10 11	2.4
10	5 49	17 50	0 21	1 10	22 1	2.3	9 57	2.3
0	5 46	17 53	0 21	1 9	22 14	2.3	9 45	2.3
10	5 44	17 55	0 21	1 10	22 27	2.3	9 32	2.3
20	5 41	17 58	0 22	1 14	22 41	2.3	9 18	2.2
30	5 38	18 2	0 24	1 21	22 58	2.3	9 3	2.2
35	5 36	18 4	0 25	1 26	23 7	2.3	8 54	2.2
40	5 34	18 6	0 27	1 32	23 18	2.3	8 44	2.1
45	5 31	18 9	0 30	1 41	23 31	2.3	8 32	2.1
50	5 28	18 12	0 33	1 53	23 47	2.3	8 17	2.0
55	5 24	18 16	0 37	2 10	23 55	2.8	7 59	1.9
60	5 19	18 22	0 43	2 36	. . .	.0	7 34	1.8
S								

SUNCE				MESEC			
UT	e = T_p − UT	Δ/24	r	Prolaz	Δ/24	$\pi_\leftmoon$	r
h	min s	s	′	h min	min	′	′
00	10 24.0	.8	16.0	$T_{\overline{m}}$ 3 31	2.3	59.2	16.1
12	10 33.6	$T_{\overline{m}_\odot}$ 11 h 49.4 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	′	°	
♀	9 2	.1	214	-5.4	♄	10 9	.0	197	-1.3
♂	9 44	.1	203	1.7	♇	15 13	.0	121	.8

3. OKTOBAR SUBOTA

UT	SUNCE		PROLEĆ. TAČKA	VENERA		MARS	
	$S_\odot$	$\delta_\odot$	S_Υ	S_φ	δ_φ	S_σ	δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	182 40.8	- 3 45.0	11 22.7	224 33.9	10 17.4	214 8.1	10 53.6
2	212 41.2	- 3 47.0	41 27.6	254 35.0	10 16.8	244 10.1	10 52.4
4	242 41.6	- 3 48.9	71 32.6	284 36.2	10 16.3	274 12.0	10 51.3
6	272 42.0	- 3 50.8	101 37.5	314 37.4	10 15.7	304 14.0	10 50.2
8	302 42.4	- 3 52.8	131 42.4	344 38.5	10 15.2	334 16.0	10 49.1
10	332 42.8	- 3 54.7	161 47.4	14 39.7	10 14.6	4 18.0	10 47.9
12	2 43.2	- 3 56.6	191 52.3	44 40.8	10 14.1	34 19.9	10 46.8
14	32 43.5	- 3 58.6	221 57.2	74 41.9	10 13.5	64 21.9	10 45.7
16	62 43.9	- 4 .5	252 2.1	104 43.1	10 13.0	94 23.9	10 44.6
18	92 44.3	- 4 2.4	282 7.1	134 44.2	10 12.4	124 25.9	10 43.4
20	122 44.7	- 4 4.4	312 12.0	164 45.3	10 11.8	154 27.8	10 42.3
22	152 45.1	- 4 6.3	342 16.9	194 46.4	10 11.3	184 29.8	10 41.2
Δ	2	-10		6	-3	10	-6

UT	MESEC				JUPITER		SATURN	
	$S_\leftmoon$	Δ	$\delta_\leftmoon$	Δ	$S_{\mathrm{♃}}$	$\delta_{\mathrm{♃}}$	$S_{\mathrm{♄}}$	$\delta_{\mathrm{♄}}$
h	° ′		° ′		° ′	° ′	° ′	° ′
0	295 43.6	77	17 37.8	25	208 19.9	8 12.2	131 57.6	-18 40.9
2	324 37.1	78	17 42.8	23	238 23.9	8 11.8	162 2.1	-18 41.0
4	353 30.6	79	17 47.3	20	268 27.9	8 11.4	192 6.6	-18 41.1
6	22 24.4	79	17 51.4	18	298 31.8	8 11.0	222 11.1	-18 41.2
8	51 18.2	80	17 55.0	16	328 35.8	8 10.6	252 15.5	-18 41.3
10	80 12.3	81	17 58.2	14	358 39.8	8 10.3	282 20.0	-18 41.4
12	109 6.4	82	18 .9	12	28 43.8	8 9.9	312 24.5	-18 41.5
14	138 .8	83	18 3.2	9	58 47.7	8 9.5	342 29.0	-18 41.6
16	166 55.3	83	18 5.1	7	88 51.7	8 9.1	12 33.4	-18 41.7
18	195 50.0	84	18 6.6	5	118 55.7	8 8.8	42 37.9	-18 41.8
20	224 44.9	85	18 7.6	3	148 59.7	8 8.4	72 42.4	-18 41.9
22	253 39.9	86	18 8.2	1	179 3.6	8 8.0	102 46.9	-18 42.0
Δ					20	-2	22	-1

φ	SUNCE		TRAJANJE SUMRAKA		MESEC			
	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 9	17 28	0 41	2 20	20 46	2.4	13 2	2.2
55	6 5	17 32	0 36	2 1	21 13	2.3	12 34	2.2
50	6 2	17 35	0 32	1 48	21 33	2.3	12 14	2.2
45	5 60	17 38	0 29	1 38	21 49	2.3	11 59	2.2
40	5 58	17 40	0 27	1 30	22 2	2.3	11 46	2.2
35	5 56	17 42	0 25	1 24	22 14	2.3	11 35	2.2
30	5 54	17 44	0 24	1 19	22 23	2.2	11 25	2.2
20	5 51	17 47	0 22	1 13	22 40	2.2	11 8	2.2
10	5 49	17 50	0 21	1 10	22 55	2.2	10 54	2.2
0	5 46	17 52	0 21	1 9	23 8	2.2	10 40	2.2
10	5 43	17 55	0 21	1 10	23 22	2.2	10 26	2.2
20	5 40	17 58	0 22	1 14	23 37	2.2	10 12	2.2
30	5 36	18 2	0 24	1 21	23 54	2.2	9 55	2.2
35	5 34	18 4	0 25	1 26	. . .	.0	9 45	2.2
40	5 32	18 7	0 27	1 33	. . .	.0	9 34	2.2
45	5 29	18 10	0 30	1 41	. . .	.0	9 21	2.2
50	5 26	18 14	0 33	1 54	. . .	.0	9 5	2.2
55	5 21	18 18	0 37	2 11	. . .	.0	8 45	2.2
60	5 16	18 24	0 43	2 37	0 34	2.5	8 18	2.2
S								

SUNCE				MESEC			
UT	e = T_p − UT	Δ/24	r	Prolaz	Δ/24	$\pi_\leftmoon$	r
h	min s	s	′	h min	min	′	′
00	10 43.2	.8	16.0	$T_{\overline{m}}$ 4 27	2.3	58.3	15.9
12	10 52.6	$T_{\overline{m}_\odot}$ 11 h 49.1 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	′	°	
♀	9 1	.1	213	-5.4	♄	10 5	.0	197	-1.3
♂	9 43	.1	203	1.7	♇	15 10	.0	121	.8

UT	SUNCE		PROLEĆ. TAČKA	VENERA		MARS	
	$S_\odot$	$\delta_\odot$	S_Υ	S_φ	δ_φ	S_σ	δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	182 45.5	- 4 8.2	12 21.9	224 47.5	10 10.7	214 31.8	10 40.1
2	212 45.9	- 4 10.2	42 26.8	254 48.6	10 10.1	244 33.8	10 38.9
4	242 46.3	- 4 12.1	72 31.7	284 49.7	10 9.5	274 35.7	10 37.8
6	272 46.7	- 4 14.0	102 36.6	314 50.8	10 8.9	304 37.7	10 36.7
8	302 47.0	- 4 15.9	132 41.6	344 51.9	10 8.3	334 39.7	10 35.5
10	332 47.4	- 4 17.9	162 46.5	14 52.9	10 7.7	4 41.7	10 34.4
12	2 47.8	- 4 19.8	192 51.4	44 54.0	10 7.1	34 43.7	10 33.3
14	32 48.2	- 4 21.7	222 56.4	74 55.1	10 6.5	64 45.6	10 32.2
16	62 48.6	- 4 23.7	253 1.3	104 56.1	10 5.9	94 47.6	10 31.0
18	92 49.0	- 4 25.6	283 6.2	134 57.2	10 5.3	124 49.6	10 29.9
20	122 49.4	- 4 27.5	313 11.1	164 58.2	10 4.7	154 51.6	10 28.8
22	152 49.7	- 4 29.4	343 16.1	194 59.3	10 4.1	184 53.6	10 27.6
Δ	2	-10		5	-3	10	-6

UT	MESEC				JUPITER		SATURN	
	$S_\leftmoon$	Δ	$\delta_\leftmoon$	Δ	S_{4}	δ_{4}	S_{5}	δ_{5}
h	° ′		° ′		° ′	° ′	° ′	° ′
0	282 35.2	87	18 8.4	-1	209 7.6	8 7.6	132 51.3	-18 42.1
2	311 30.6	88	18 8.2	-3	239 11.6	8 7.3	162 55.8	-18 42.2
4	340 26.2	89	18 7.5	-5	269 15.6	8 6.9	193 .3	-18 42.3
6	9 22.0	90	18 6.5	-7	299 19.6	8 6.5	223 4.8	-18 42.4
8	38 18.0	91	18 5.0	-9	329 23.5	8 6.1	253 9.2	-18 42.5
10	67 14.2	92	18 3.1	-11	359 27.5	8 5.7	283 13.7	-18 42.6
12	96 10.6	93	18 .9	-13	29 31.5	8 5.4	313 18.2	-18 42.7
14	125 7.3	94	17 58.2	-15	59 35.5	8 5.0	343 22.6	-18 42.8
16	154 4.1	95	17 55.2	-17	89 39.5	8 4.6	13 27.1	-18 42.9
18	183 1.1	96	17 51.8	-19	119 43.4	8 4.2	43 31.6	-18 43.0
20	211 58.4	97	17 48.0	-21	149 47.4	8 3.9	73 36.1	-18 43.1
22	240 55.9	98	17 43.8	-23	179 51.4	8 3.5	103 40.5	-18 43.2
Δ					20	-2	22	-1

φ	SUNCE		TRAJANJE SUMRAKA		MESEC			
	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 25	0 41	2 20	21 42	2.6	13 55	1.7
55	6 7	17 29	0 36	2 1	22 9	2.5	13 28	1.8
50	6 4	17 33	0 32	1 48	22 29	2.4	13 8	1.9
45	6 1	17 36	0 29	1 38	22 44	2.4	12 52	1.9
40	5 59	17 38	0 27	1 30	22 57	2.3	12 39	2.0
35	5 57	17 40	0 25	1 24	23 8	2.1	12 28	2.0
30	5 55	17 42	0 24	1 19	23 17	2.1	12 19	2.0
20	5 52	17 46	0 22	1 13	23 33	2.1	12 2	2.1
10	5 48	17 49	0 21	1 10	23 48	2.1	11 47	2.1
0	5 46	17 52	0 21	1 9	. . .	.0	11 34	2.1
10	5 43	17 55	0 21	1 10	. . .	.0	11 20	2.2
20	5 39	17 59	0 22	1 14	. . .	.0	11 6	2.2
30	5 35	18 3	0 24	1 21	. . .	.0	10 49	2.3
35	5 33	18 5	0 25	1 26	0 4	2.1	10 39	2.3
40	5 30	18 8	0 27	1 33	0 15	2.1	10 28	2.3
45	5 27	18 11	0 30	1 42	0 28	2.1	10 15	2.3
50	5 23	18 15	0 33	1 54	0 44	2.1	9 59	2.4
55	5 19	18 20	0 37	2 11	1 5	2.0	9 38	2.4
60	5 13	18 26	0 43	2 39	1 33	2.0	9 10	2.5
S								

SUNCE				MESEC			
UT	e = T_p − UT	Δ/24	r	Prolaz	Δ/24	$\pi_\leftmoon$	r
h	min s	s	′	h min	min	′	′
00	11 2.0	.8	16.0	$T_{\overline{m}}$ 5 21	2.2	57.3	15.6
12	11 11.2	$T_{\overline{m}_\odot}$ 11 h 48.8 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	′	°	
♀	9 1	.1	212	-5.4	♃	10 2	.0	197	-1.3
♂	9 41	.1	202	1.7	♄	15 6	.0	120	.8

UT	SUNCE		PROLEĆ. TAČKA	VENERA		MARS	
	$S_\odot$	$\delta_\odot$	S_Υ	S_φ	δ_φ	S_σ	δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	182 50.1	- 4 31.4	13 21.0	225 .3	10 3.4	214 55.6	10 26.5
2	212 50.5	- 4 33.3	43 25.9	255 1.3	10 2.8	244 57.5	10 25.4
4	242 50.9	- 4 35.2	73 30.8	285 2.3	10 2.2	274 59.5	10 24.2
6	272 51.3	- 4 37.1	103 35.8	315 3.4	10 1.5	305 1.5	10 23.1
8	302 51.6	- 4 39.1	133 40.7	345 4.4	10 .9	335 3.5	10 22.0
10	332 52.0	- 4 41.0	163 45.6	15 5.4	10 .3	5 5.5	10 20.8
12	2 52.4	- 4 42.9	193 50.6	45 6.4	9 59.6	35 7.5	10 19.7
14	32 52.8	- 4 44.8	223 55.5	75 7.4	9 59.0	65 9.5	10 18.6
16	62 53.1	- 4 46.8	254 .4	105 8.4	9 58.3	95 11.5	10 17.4
18	92 53.5	- 4 48.7	284 5.3	135 9.3	9 57.6	125 13.4	10 16.3
20	122 53.9	- 4 50.6	314 10.3	165 10.3	9 57.0	155 15.4	10 15.2
22	152 54.3	- 4 52.5	344 15.2	195 11.3	9 56.3	185 17.4	10 14.0
Δ	2	-10		5	-3	10	-6

UT	MESEC				JUPITER		SATURN	
	$S_\leftmoon$	Δ	$\delta_\leftmoon$	Δ	S_{4}	δ_{4}	S_{5}	δ_{5}
h	° ′		° ′		° ′	° ′	° ′	° ′
0	269 53.5	100	17 39.2	-25	209 55.4	8 3.1	133 45.0	-18 43.4
2	298 51.5	101	17 34.3	-26	239 59.4	8 2.7	163 49.5	-18 43.5
4	327 49.6	102	17 29.0	-28	270 3.3	8 2.4	193 53.9	-18 43.6
6	356 47.9	103	17 23.3	-30	300 7.3	8 2.0	223 58.4	-18 43.7
8	25 46.5	104	17 17.3	-32	330 11.3	8 1.6	254 2.9	-18 43.8
10	54 45.3	105	17 11.0	-33	0 15.3	8 1.2	284 7.3	-18 43.9
12	83 44.3	106	17 4.3	-35	30 19.3	8 .9	314 11.8	-18 44.0
14	112 43.6	107	16 57.3	-37	60 23.3	8 .5	344 16.3	-18 44.1
16	141 43.1	108	16 49.9	-38	90 27.2	8 .1	14 20.7	-18 44.2
18	170 42.8	110	16 42.2	-40	120 31.2	7 59.7	44 25.2	-18 44.3
20	199 42.7	111	16 34.2	-42	150 35.2	7 59.4	74 29.7	-18 44.4
22	228 42.8	112	16 25.9	-43	180 39.2	7 59.0	104 34.1	-18 44.5
Δ					20	-2	22	-1

φ	SUNCE		TRAJANJE SUMRAKA		MESEC			
	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 14	17 22	0 41	2 20	22 45	2.8	14 36	1.3
55	6 9	17 27	0 36	2 1	23 9	2.0	14 12	1.5
50	6 5	17 31	0 32	1 47	23 27	2.0	13 53	1.6
45	6 2	17 34	0 29	1 37	23 41	2.0	13 39	1.7
40	5 60	17 37	0 27	1 30	23 53	2.0	13 27	1.7
35	5 57	17 39	0 25	1 24	23 58	2.2	13 16	1.8
30	5 55	17 41	0 24	1 19	. . .	.0	13 7	1.8
20	5 52	17 45	0 22	1 13	. . .	.0	12 52	1.9
10	5 48	17 48	0 21	1 10	. . .	.0	12 38	2.0
0	5 45	17 52	0 21	1 9	0 1	2.1	12 25	2.1
10	5 42	17 55	0 21	1 10	0 14	2.0	12 13	2.1
20	5 38	17 59	0 22	1 14	0 29	2.0	11 59	2.2
30	5 34	18 3	0 24	1 21	0 45	1.9	11 43	2.3
35	5 32	18 6	0 26	1 26	0 54	1.9	11 34	2.3
40	5 29	18 9	0 27	1 33	1 5	1.9	11 23	2.3
45	5 25	18 13	0 30	1 42	1 18	1.8	11 11	2.4
50	5 21	18 17	0 33	1 54	1 33	1.7	10 56	2.5
55	5 16	18 22	0 37	2 12	1 53	1.6	10 37	2.6
60	5 10	18 29	0 43	2 40	2 19	1.5	10 11	2.7
S								

SUNCE				MESEC			
UT	e = T_p − UT	Δ/24	r	Prolaz	Δ/24	$\pi_\leftmoon$	r
h	min s	s	′	h min	min	′	′
00	11 20.5	.8	16.0	$T_{\overline{m}}$ 6 13	2.1	56.5	15.4
12	11 29.5	$T_{\overline{m}_\odot}$ 11 h 48.5 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	′	°	
♀	8 60	.1	212	-5.3	♃	9 59	.0	197	-1.3
♂	9 40	.1	202	1.7	♄	15 3	.0	120	.8

UT	SUNCE		PROLEĆ. TAČKA	VENERA		MARS	
	$S_\odot$	$\delta_\odot$	S_Υ	S_φ	δ_φ	S_σ	δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	182 54.6	- 4 54.5	14 20.1	225 12.3	9 55.6	215 19.4	10 12.9
2	212 55.0	- 4 56.4	44 25.1	255 13.2	9 55.0	245 21.4	10 11.8
4	242 55.4	- 4 58.3	74 30.0	285 14.2	9 54.3	275 23.4	10 10.6
6	272 55.8	- 5 .2	104 34.9	315 15.1	9 53.6	305 25.4	10 9.5
8	302 56.1	- 5 2.1	134 39.8	345 16.1	9 52.9	335 27.4	10 8.3
10	332 56.5	- 5 4.1	164 44.8	15 17.0	9 52.2	5 29.4	10 7.2
12	2 56.9	- 5 6.0	194 49.7	45 17.9	9 51.5	35 31.4	10 6.1
14	32 57.2	- 5 7.9	224 54.6	75 18.9	9 50.8	65 33.4	10 4.9
16	62 57.6	- 5 9.8	254 59.6	105 19.8	9 50.1	95 35.3	10 3.8
18	92 58.0	- 5 11.7	285 4.5	135 20.7	9 49.4	125 37.3	10 2.7
20	122 58.3	- 5 13.6	315 9.4	165 21.6	9 48.7	155 39.3	10 1.5
22	152 58.7	- 5 15.6	345 14.3	195 22.5	9 48.0	185 41.3	10 .4
Δ	2	-10		5	-3	10	-6

UT	MESEC				JUPITER		SATURN	
	$S_\leftmoon$	Δ	$\delta_\leftmoon$	Δ	$S_{\mathrm{♃}}$	$\delta_{\mathrm{♃}}$	$S_{\mathrm{♄}}$	$\delta_{\mathrm{♄}}$
h	° ′		° ′		° ′	° ′	° ′	° ′
0	257 43.2	113	16 17.2	-45	210 43.2	7 58.6	134 38.6	-18 44.6
2	286 43.8	114	16 8.3	-46	240 47.2	7 58.2	164 43.0	-18 44.7
4	315 44.6	115	15 59.0	-48	270 51.1	7 57.9	194 47.5	-18 44.8
6	344 45.7	116	15 49.5	-49	300 55.1	7 57.5	224 52.0	-18 44.9
8	13 46.9	117	15 39.6	-51	330 59.1	7 57.1	254 56.4	-18 45.0
10	42 48.4	118	15 29.5	-52	1 3.1	7 56.7	285 .9	-18 45.1
12	71 50.1	120	15 19.1	-53	31 7.1	7 56.4	315 5.3	-18 45.2
14	100 52.0	121	15 8.4	-55	61 11.1	7 56.0	345 9.8	-18 45.3
16	129 54.1	122	14 57.4	-56	91 15.1	7 55.6	15 14.3	-18 45.4
18	158 56.5	123	14 46.2	-57	121 19.1	7 55.3	45 18.7	-18 45.6
20	187 59.0	124	14 34.7	-59	151 23.0	7 54.9	75 23.2	-18 45.7
22	217 1.8	125	14 22.9	-60	181 27.0	7 54.5	105 27.6	-18 45.8
Δ					20	-2	22	-1

φ	SUNCE		TRAJANJE SUMRAKA		MESEC			
	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 16	17 19	0 41	2 20	23 52	2.0	15 9	1.1
55	6 11	17 24	0 36	2 1	23 58	2.5	14 48	1.2
50	6 7	17 29	0 32	1 47	. . . .	.0	14 32	1.4
45	6 4	17 32	0 29	1 37	. . . .	.0	14 19	1.5
40	6 1	17 35	0 27	1 30	. . . .	.0	14 9	1.6
35	5 58	17 38	0 25	1 24	. . . .	.0	13 60	1.6
30	5 56	17 40	0 24	1 19	0 11	2.2	13 52	1.7
20	5 52	17 44	0 22	1 13	0 26	2.1	13 38	1.8
10	5 48	17 48	0 21	1 10	0 39	2.1	13 26	1.9
0	5 45	17 51	0 21	1 9	0 51	2.0	13 15	2.0
10	5 41	17 55	0 21	1 10	1 3	1.9	13 3	2.0
20	5 37	17 59	0 22	1 14	1 16	1.8	12 51	2.1
30	5 33	18 4	0 24	1 21	1 31	1.8	12 37	2.2
35	5 30	18 7	0 26	1 26	1 40	1.7	12 29	2.3
40	5 27	18 10	0 27	1 33	1 50	1.6	12 20	2.4
45	5 23	18 14	0 30	1 42	2 1	1.6	12 9	2.4
50	5 19	18 18	0 33	1 55	2 15	1.5	11 56	2.5
55	5 14	18 24	0 37	2 13	2 32	1.4	11 39	2.7
60	5 7	18 31	0 43	2 42	2 56	1.2	11 16	2.9
S								

SUNCE				MESEC			
UT	$e = T_p - UT$	Δ/24	r	Prolaz	Δ/24	$\pi_\leftmoon$	r
h	min s	s	′	h min	min	′	′
00	11 38.6	.7	16.0	$T_{\overline{m}}$ 7 3	2.0	55.7	15.2
12	11 47.4	$T_{\overline{m}_\odot}$ 11 h 48.2 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	′	°	
♀	8 59	.1	211	-5.3	♃	9 56	.0	196	-1.3
♂	9 38	.1	201	1.7	♄	14 59	.0	120	.8

UT	SUNCE		PROLEĆ. TAČKA	VENERA		MARS	
	$S_\odot$	$\delta_\odot$	S_Υ	S_φ	δ_φ	S_σ	δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	182 59.1	- 5 17.5	15 19.3	225 23.4	9 47.3	215 43.3	9 59.2
2	212 59.4	- 5 19.4	45 24.2	255 24.3	9 46.6	245 45.3	9 58.1
4	242 59.8	- 5 21.3	75 29.1	285 25.2	9 45.8	275 47.3	9 57.0
6	273 .2	- 5 23.2	105 34.1	315 26.1	9 45.1	305 49.3	9 55.8
8	303 .5	- 5 25.1	135 39.0	345 27.0	9 44.4	335 51.3	9 54.7
10	333 .9	- 5 27.0	165 43.9	15 27.9	9 43.7	5 53.3	9 53.5
12	3 1.2	- 5 29.0	195 48.8	45 28.8	9 42.9	35 55.3	9 52.4
14	33 1.6	- 5 30.9	225 53.8	75 29.6	9 42.2	65 57.3	9 51.3
16	63 2.0	- 5 32.8	255 58.7	105 30.5	9 41.4	95 59.3	9 50.1
18	93 2.3	- 5 34.7	286 3.6	135 31.3	9 40.7	126 1.3	9 49.0
20	123 2.7	- 5 36.6	316 8.6	165 32.2	9 39.9	156 3.3	9 47.8
22	153 3.0	- 5 38.5	346 13.5	195 33.0	9 39.2	186 5.3	9 46.7
Δ	2	-10		4	-4	10	-6

UT	MESEC				JUPITER		SATURN	
	$S_\leftmoon$	Δ	$\delta_\leftmoon$	Δ	$S_{\mathrm{♃}}$	$\delta_{\mathrm{♃}}$	$S_{\mathrm{♄}}$	$\delta_{\mathrm{♄}}$
h	° ′		° ′		° ′	° ′	° ′	° ′
0	246 4.8	126	14 10.9	-61	211 31.0	7 54.1	135 32.1	-18 45.9
2	275 7.9	127	13 58.7	-62	241 35.0	7 53.8	165 36.6	-18 46.0
4	304 11.3	128	13 46.2	-64	271 39.0	7 53.4	195 41.0	-18 46.1
6	333 14.9	129	13 33.5	-65	301 43.0	7 53.0	225 45.5	-18 46.2
8	2 18.7	130	13 20.5	-66	331 47.0	7 52.6	255 49.9	-18 46.3
10	31 22.6	131	13 7.3	-67	1 51.0	7 52.3	285 54.4	-18 46.4
12	60 26.8	132	12 53.9	-68	31 55.0	7 51.9	315 58.8	-18 46.5
14	89 31.1	133	12 40.3	-69	61 59.0	7 51.5	346 3.3	-18 46.6
16	118 35.7	134	12 26.5	-70	92 3.0	7 51.2	16 7.8	-18 46.7
18	147 40.4	134	12 12.4	-71	122 6.9	7 50.8	46 12.2	-18 46.8
20	176 45.3	135	11 58.2	-72	152 10.9	7 50.4	76 16.7	-18 46.9
22	205 50.3	136	11 43.8	-73	182 14.9	7 50.0	106 21.1	-18 47.0
Δ					20	-2	22	-1

φ	SUNCE		TRAJANJE SUMRAKA		MESEC			
	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 19	17 16	0 41	2 19	. . . .	.0	15 34	.9
55	6 13	17 22	0 36	2 1	. . . .	.0	15 17	1.1
50	6 9	17 26	0 32	1 47	0 27	2.5	15 5	1.2
45	6 5	17 30	0 29	1 37	0 39	2.4	14 55	1.3
40	6 2	17 33	0 27	1 30	0 49	2.3	14 46	1.4
35	5 59	17 36	0 25	1 24	0 58	2.3	14 39	1.5
30	5 57	17 39	0 24	1 19	1 5	2.2	14 32	1.6
20	5 52	17 43	0 22	1 13	1 18	2.1	14 21	1.7
10	5 48	17 47	0 21	1 10	1 29	2.0	14 11	1.8
0	5 45	17 51	0 21	1 9	1 39	1.9	14 2	1.9
10	5 41	17 55	0 21	1 10	1 50	1.8	13 52	2.0
20	5 37	17 60	0 22	1 14	2 1	1.7	13 42	2.1
30	5 32	18 5	0 24	1 21	2 13	1.6	13 31	2.2
35	5 29	18 8	0 26	1 27	2 21	1.5	13 24	2.3
40	5 25	18 11	0 27	1 34	2 29	1.5	13 16	2.3
45	5 22	18 15	0 30	1 43	2 39	1.4	13 7	2.4
50	5 17	18 20	0 33	1 56	2 50	1.3	12 56	2.6
55	5 11	18 26	0 37	2 14	3 5	1.1	12 43	2.7
60	5 4	18 34	0 43	2 44	3 24	1.0	12 25	2.9
S								

SUNCE				MESEC			
UT	$e = T_p - UT$	Δ/24	r	Prolaz	Δ/24	$\pi_\leftmoon$	r
h	min s	s	′	h min	min	′	′
00	11 56.3	.7	16.0	$T_{\overline{m}}$ 7 50	1.9	55.1	15.0
12	12 4.9	$T_{\overline{m}_\odot}$ 11 h 47.9 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	′	°	
♀	8 58	.1	210	-5.3	♃	9 53	.0	196	-1.3
♂	9 36	.1	200	1.7	♄	14 56	.0	120	.8

UT	SUNCE		PROLEĆ. TAČKA	VENERA		MARS	
	$S_\odot$	$\delta_\odot$	S_Υ	S_φ	δ_φ	S_σ	δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	183 3.4	- 5 40.4	16 18.4	225 33.9	9 38.4	216 7.3	9 45.5
2	213 3.7	- 5 42.3	46 23.3	255 34.7	9 37.6	246 9.3	9 44.4
4	243 4.1	- 5 44.3	76 28.3	285 35.6	9 36.9	276 11.3	9 43.3
6	273 4.5	- 5 46.2	106 33.2	315 36.4	9 36.1	306 13.3	9 42.1
8	303 4.8	- 5 48.1	136 38.1	345 37.2	9 35.3	336 15.3	9 41.0
10	333 5.2	- 5 50.0	166 43.1	15 38.0	9 34.5	6 17.3	9 39.8
12	3 5.5	- 5 51.9	196 48.0	45 38.8	9 33.8	36 19.3	9 38.7
14	33 5.9	- 5 53.8	226 52.9	75 39.6	9 33.0	66 21.3	9 37.5
16	63 6.2	- 5 55.7	256 57.8	105 40.4	9 32.2	96 23.4	9 36.4
18	93 6.6	- 5 57.6	287 2.8	135 41.2	9 31.4	126 25.4	9 35.2
20	123 6.9	- 5 59.5	317 7.7	165 42.0	9 30.6	156 27.4	9 34.1
22	153 7.3	- 6 1.4	347 12.6	195 42.8	9 29.8	186 29.4	9 32.9
Δ	2	-10		4	-4	10	-6

UT	MESEC				JUPITER		SATURN	
	$S_\leftmoon$	Δ	$\delta_\leftmoon$	Δ	S_{4}	δ_{4}	S_η	δ_η
h	° ′		° ′		° ′	° ′	° ′	° ′
0	234 55.6	137	11 29.2	-74	212 18.9	7 49.7	136 25.6	-18 47.1
2	264 1.0	138	11 14.3	-75	242 22.9	7 49.3	166 30.0	-18 47.2
4	293 6.5	139	10 59.4	-76	272 26.9	7 48.9	196 34.5	-18 47.4
6	322 12.3	139	10 44.2	-77	302 30.9	7 48.6	226 38.9	-18 47.5
8	351 18.2	140	10 28.9	-78	332 34.9	7 48.2	256 43.4	-18 47.6
10	20 24.2	141	10 13.4	-78	2 38.9	7 47.8	286 47.8	-18 47.7
12	49 30.4	142	9 57.7	-79	32 42.9	7 47.5	316 52.3	-18 47.8
14	78 36.7	142	9 41.9	-80	62 46.9	7 47.1	346 56.7	-18 47.9
16	107 43.2	143	9 25.9	-81	92 50.9	7 46.7	17 1.2	-18 48.0
18	136 49.8	144	9 9.8	-81	122 54.9	7 46.3	47 5.6	-18 48.1
20	165 56.6	144	8 53.5	-82	152 58.9	7 46.0	77 10.1	-18 48.2
22	195 3.4	145	8 37.1	-83	183 2.9	7 45.6	107 14.5	-18 48.3
Δ					20	-2	22	-1

φ	SUNCE		TRAJANJE SUMRAKA		MESEC			
	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 21	17 13	0 42	2 19	1 2	2.9	15 55	.7
55	6 15	17 19	0 36	2 1	1 17	2.7	15 43	.9
50	6 10	17 24	0 32	1 47	1 29	2.6	15 34	1.1
45	6 6	17 28	0 29	1 37	1 38	2.4	15 26	1.2
40	6 3	17 32	0 27	1 30	1 46	2.3	15 20	1.3
35	5 60	17 35	0 25	1 24	1 52	2.3	15 14	1.4
30	5 57	17 38	0 24	1 19	1 58	2.2	15 9	1.5
20	5 53	17 42	0 22	1 13	2 8	2.1	15 1	1.6
10	5 48	17 47	0 21	1 10	2 17	1.9	14 54	1.7
0	5 44	17 51	0 21	1 9	2 25	1.8	14 47	1.8
10	5 40	17 55	0 21	1 10	2 33	1.7	14 39	1.9
20	5 36	17 60	0 22	1 14	2 42	1.6	14 32	2.0
30	5 30	18 5	0 24	1 21	2 52	1.5	14 23	2.2
35	5 27	18 8	0 26	1 27	2 58	1.4	14 18	2.2
40	5 24	18 12	0 27	1 34	3 4	1.3	14 13	2.3
45	5 20	18 16	0 30	1 43	3 12	1.3	14 6	2.4
50	5 15	18 21	0 33	1 56	3 21	1.1	13 58	2.6
55	5 9	18 28	0 37	2 15	3 32	1.0	13 48	2.7
60	5 1	18 36	0 44	2 45	3 47	.8	13 35	2.9
S								

SUNCE				MESEC			
UT	e = T_p − UT	Δ/24	r	Prolaz		Δ/24	$\pi_\leftmoon$	r
h	min s	s	′		h min	min	′	′
00	12 13.5	.7	16.0	$T_{\overline{m}}$	8 36	1.8	54.6	14.9
12	12 22.0	$T_{\overline{m}_\odot}$	11 h 47.6 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	′	°	
♀	8 57	.1	209	-5.2	♃	9 49	.0	196	-1.3
♂	9 35	.1	200	1.6	♄	14 52	.0	120	.8

UT	SUNCE		PROLEĆ. TAČKA	VENERA		MARS	
	$S_\odot$	$\delta_\odot$	S_Υ	S_φ	δ_φ	S_σ	δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	183 7.6	- 6 3.3	17 17.5	225 43.6	9 29.0	216 31.4	9 31.8
2	213 7.9	- 6 5.2	47 22.5	255 44.4	9 28.2	246 33.4	9 30.7
4	243 8.3	- 6 7.1	77 27.4	285 45.2	9 27.4	276 35.4	9 29.5
6	273 8.6	- 6 9.0	107 32.3	315 45.9	9 26.5	306 37.4	9 28.4
8	303 9.0	- 6 10.9	137 37.3	345 46.7	9 25.7	336 39.4	9 27.2
10	333 9.3	- 6 12.8	167 42.2	15 47.5	9 24.9	6 41.4	9 26.1
12	3 9.7	- 6 14.7	197 47.1	45 48.2	9 24.1	36 43.4	9 24.9
14	33 10.0	- 6 16.6	227 52.0	75 49.0	9 23.2	66 45.4	9 23.8
16	63 10.4	- 6 18.5	257 57.0	105 49.7	9 22.4	96 47.5	9 22.6
18	93 10.7	- 6 20.4	288 1.9	135 50.5	9 21.6	126 49.5	9 21.5
20	123 11.0	- 6 22.3	318 6.8	165 51.2	9 20.7	156 51.5	9 20.3
22	153 11.4	- 6 24.2	348 11.8	195 51.9	9 19.9	186 53.5	9 19.2
Δ	2	-10		4	-4	10	-6

UT	MESEC				JUPITER		SATURN	
	$S_\leftmoon$	Δ	$\delta_\leftmoon$	Δ	S_{4}	δ_{4}	S_η	δ_η
h	° ′		° ′		° ′	° ′	° ′	° ′
0	224 10.4	146	8 20.6	-83	213 6.9	7 45.2	137 19.0	-18 48.4
2	253 17.6	146	8 3.9	-84	243 10.9	7 44.9	167 23.4	-18 48.5
4	282 24.8	147	7 47.1	-85	273 14.9	7 44.5	197 27.9	-18 48.6
6	311 32.1	147	7 30.2	-85	303 18.9	7 44.1	227 32.3	-18 48.7
8	340 39.6	148	7 13.2	-86	333 22.9	7 43.8	257 36.8	-18 48.8
10	9 47.2	148	6 56.0	-86	3 26.9	7 43.4	287 41.2	-18 48.9
12	38 54.8	149	6 38.8	-87	33 30.9	7 43.0	317 45.6	-18 49.1
14	68 2.6	149	6 21.4	-87	63 34.9	7 42.6	347 50.1	-18 49.2
16	97 10.4	150	6 4.0	-88	93 38.9	7 42.3	17 54.5	-18 49.3
18	126 18.4	150	5 46.5	-88	123 42.9	7 41.9	47 59.0	-18 49.4
20	155 26.4	150	5 28.8	-89	153 46.9	7 41.5	78 3.4	-18 49.5
22	184 34.5	151	5 11.1	-89	183 50.9	7 41.2	108 7.9	-18 49.6
Δ					20	-2	22	-1

φ	SUNCE		TRAJANJE SUMRAKA		MESEC			
	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 24	17 10	0 42	2 19	2 11	2.9	16 13	.7
55	6 17	17 17	0 36	2 1	2 22	2.7	16 6	.9
50	6 12	17 22	0 32	1 47	2 30	2.5	15 60	1.0
45	6 7	17 27	0 29	1 37	2 36	2.4	15 55	1.1
40	6 4	17 30	0 27	1 30	2 42	2.3	15 51	1.2
35	6 1	17 34	0 25	1 24	2 46	2.2	15 48	1.3
30	5 58	17 36	0 24	1 19	2 50	2.2	15 45	1.4
20	5 53	17 42	0 22	1 13	2 57	2.0	15 39	1.5
10	5 48	17 46	0 21	1 10	3 3	1.9	15 35	1.7
0	5 44	17 51	0 21	1 9	3 9	1.8	15 30	1.8
10	5 40	17 55	0 21	1 10	3 15	1.7	15 26	1.9
20	5 35	18 0	0 22	1 14	3 21	1.6	15 21	2.0
30	5 29	18 6	0 24	1 22	3 28	1.4	15 15	2.1
35	5 26	18 9	0 26	1 27	3 32	1.4	15 12	2.2
40	5 22	18 13	0 28	1 34	3 37	1.3	15 8	2.3
45	5 18	18 18	0 30	1 44	3 42	1.2	15 4	2.4
50	5 13	18 23	0 33	1 57	3 48	1.0	14 59	2.5
55	5 6	18 30	0 38	2 16	3 56	.9	14 53	2.7
60	4 58	18 39	0 44	2 47	4 6	.7	14 45	2.9
S								

SUNCE				MESEC			
UT	e = T_p − UT	Δ/24	r	Prolaz		Δ/24	$\pi_\leftmoon$	r
h	min s	s	′		h min	min	′	′
00	12 30.4	.7	16.0	$T_{\overline{m}}$	9 20	1.8	54.3	14.8
12	12 38.6	$T_{\overline{m}_\odot}$	11 h 47.4 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	′	°	
♀	8 57	.1	208	-5.2	♃	9 46	.0	196	-1.3
♂	9 33	.1	199	1.6	♄	14 49	.0	120	.8

UT	SUNCE		PROLEĆ. TAČKA	VENERA		MARS	
	$S_\odot$	$\delta_\odot$	S_Υ	S_φ	δ_φ	S_σ	δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	183 11.7	- 6 26.1	18 16.7	225 52.7	9 19.0	216 55.5	9 18.0
2	213 12.0	- 6 28.0	48 21.6	255 53.4	9 18.2	246 57.5	9 16.9
4	243 12.4	- 6 29.9	78 26.5	285 54.1	9 17.3	276 59.5	9 15.7
6	273 12.7	- 6 31.8	108 31.5	315 54.8	9 16.5	307 1.6	9 14.6
8	303 13.0	- 6 33.7	138 36.4	345 55.5	9 15.6	337 3.6	9 13.4
10	333 13.4	- 6 35.6	168 41.3	15 56.3	9 14.7	7 5.6	9 12.3
12	3 13.7	- 6 37.5	198 46.3	45 57.0	9 13.9	37 7.6	9 11.1
14	33 14.0	- 6 39.4	228 51.2	75 57.7	9 13.0	67 9.6	9 10.0
16	63 14.4	- 6 41.3	258 56.1	105 58.4	9 12.1	97 11.6	9 8.8
18	93 14.7	- 6 43.2	289 1.0	135 59.0	9 11.2	127 13.7	9 7.7
20	123 15.0	- 6 45.1	319 6.0	165 59.7	9 10.3	157 15.7	9 6.5
22	153 15.4	- 6 47.0	349 10.9	196 .4	9 9.4	187 17.7	9 5.4
Δ	2	-9		4	-4	10	-6

UT	MESEC				JUPITER		SATURN	
	$S_\leftmoon$	Δ	$\delta_\leftmoon$	Δ	$S_{\mathrm{♃}}$	$\delta_{\mathrm{♃}}$	$S_{\mathrm{♄}}$	$\delta_{\mathrm{♄}}$
h	° ′		° ′		° ′	° ′	° ′	° ′
0	213 42.6	151	4 53.4	-89	213 54.9	7 40.8	138 12.3	-18 49.7
2	242 50.9	152	4 35.5	-90	243 58.9	7 40.4	168 16.7	-18 49.8
4	271 59.2	152	4 17.6	-90	274 2.9	7 40.1	198 21.2	-18 49.9
6	301 7.5	152	3 59.6	-90	304 6.9	7 39.7	228 25.6	-18 50.0
8	330 16.0	152	3 41.5	-91	334 10.9	7 39.3	258 30.1	-18 50.1
10	359 24.4	153	3 23.4	-91	4 14.9	7 39.0	288 34.5	-18 50.2
12	28 32.9	153	3 5.3	-91	34 18.9	7 38.6	318 39.0	-18 50.3
14	57 41.5	153	2 47.1	-91	64 22.9	7 38.2	348 43.4	-18 50.4
16	86 50.1	153	2 28.8	-91	94 26.9	7 37.9	18 47.8	-18 50.6
18	115 58.7	153	2 10.5	-92	124 30.9	7 37.5	48 52.3	-18 50.7
20	145 7.4	153	1 52.2	-92	154 35.0	7 37.1	78 56.7	-18 50.8
22	174 16.1	154	1 33.8	-92	184 39.0	7 36.8	109 1.1	-18 50.9
Δ					20	-2	22	-1

φ	SUNCE		TRAJANJE SUMRAKA		MESEC			
	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 26	17 7	0 42	2 19	3 21	2.9	16 29	1.4
55	6 19	17 14	0 36	2 1	3 27	2.7	16 27	1.5
50	6 13	17 20	0 32	1 47	3 31	2.5	16 24	1.5
45	6 9	17 25	0 29	1 37	3 34	2.4	16 22	1.6
40	6 5	17 29	0 27	1 30	3 37	2.3	16 21	1.6
35	6 1	17 32	0 25	1 24	3 40	2.2	16 20	1.6
30	5 58	17 35	0 24	1 19	3 42	2.1	16 18	1.7
20	5 53	17 41	0 22	1 13	3 46	2.0	16 16	1.7
10	5 48	17 46	0 21	1 10	3 49	1.9	16 14	1.7
0	5 44	17 50	0 21	1 9	3 52	1.8	16 13	1.8
10	5 39	17 55	0 21	1 11	3 55	1.7	16 11	1.8
20	5 34	18 0	0 22	1 14	3 59	1.5	16 9	1.8
30	5 28	18 7	0 24	1 22	4 2	1.4	16 7	1.9
35	5 25	18 10	0 26	1 27	4 5	1.3	16 5	1.9
40	5 21	18 14	0 28	1 34	4 7	1.2	16 4	1.9
45	5 16	18 19	0 30	1 44	4 10	1.1	16 2	2.0
50	5 11	18 25	0 33	1 57	4 13	1.0	16 0	2.0
55	5 4	18 32	0 38	2 17	4 18	.9	15 58	2.0
60	4 55	18 41	0 44	2 50	4 23	.7	15 54	2.1
S								

SUNCE				MESEC			
UT	$e = T_p - UT$	Δ/24	r	Prolaz		Δ/24	$\pi_\leftmoon$	r
h	min s	s	′	$T_{\overline{m}}$	h min	min	′	′
00	12 46.8	.7	16.0	$T_{\overline{m}}$	10 2	1.8	54.1	14.7
12	12 54.8	$T_{\overline{m}_\odot}$	11 h 47.1 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	′	°	
♀	8 56	.1	208	-5.2	♃	9 43	.0	196	-1.3
♂	9 32	.1	199	1.6	♄	14 45	.0	120	.8

UT	SUNCE		PROLEĆ. TAČKA	VENERA		MARS	
	$S_\odot$	$\delta_\odot$	S_Υ	S_φ	δ_φ	S_σ	δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	183 15.7	- 6 48.8	19 15.8	226 1.1	9 8.6	217 19.7	9 4.2
2	213 16.0	- 6 50.7	49 20.8	256 1.8	9 7.7	247 21.7	9 3.0
4	243 16.3	- 6 52.6	79 25.7	286 2.4	9 6.8	277 23.8	9 1.9
6	273 16.7	- 6 54.5	109 30.6	316 3.1	9 5.9	307 25.8	9 .7
8	303 17.0	- 6 56.4	139 35.5	346 3.8	9 4.9	337 27.8	8 59.6
10	333 17.3	- 6 58.3	169 40.5	16 4.4	9 4.0	7 29.8	8 58.4
12	3 17.6	- 7 .2	199 45.4	46 5.1	9 3.1	37 31.8	8 57.3
14	33 18.0	- 7 2.1	229 50.3	76 5.7	9 2.2	67 33.9	8 56.1
16	63 18.3	- 7 3.9	259 55.3	106 6.4	9 1.3	97 35.9	8 55.0
18	93 18.6	- 7 5.8	290 .2	136 7.0	9 .4	127 37.9	8 53.8
20	123 18.9	- 7 7.7	320 5.1	166 7.6	8 59.4	157 39.9	8 52.7
22	153 19.2	- 7 9.6	350 10.0	196 8.3	8 58.5	187 42.0	8 51.5
Δ	2	-9		3	-5	10	-6

UT	MESEC				JUPITER		SATURN	
	$S_\leftmoon$	Δ	$\delta_\leftmoon$	Δ	$S_{\mathrm{♃}}$	$\delta_{\mathrm{♃}}$	$S_{\mathrm{♄}}$	$\delta_{\mathrm{♄}}$
h	° ′		° ′		° ′	° ′	° ′	° ′
0	203 24.8	154	1 15.5	-92	214 43.0	7 36.4	139 5.6	-18 51.0
2	232 33.5	154	0 57.1	-92	244 47.0	7 36.0	169 10.0	-18 51.1
4	261 42.2	154	0 38.7	-92	274 51.0	7 35.7	199 14.5	-18 51.2
6	290 50.9	154	0 20.2	-92	304 55.0	7 35.3	229 18.9	-18 51.3
8	319 59.7	154	0 1.8	74	334 59.0	7 34.9	259 23.3	-18 51.4
10	349 8.4	154	0 16.6	92	5 3.0	7 34.6	289 27.8	-18 51.5
12	18 17.1	154	0 35.0	92	35 7.0	7 34.2	319 32.2	-18 51.6
14	47 25.9	154	0 53.4	92	65 11.0	7 33.8	349 36.6	-18 51.7
16	76 34.6	153	1 11.9	92	95 15.0	7 33.5	19 41.1	-18 51.8
18	105 43.2	153	1 30.2	92	125 19.1	7 33.1	49 45.5	-18 52.0
20	134 51.9	153	1 48.6	92	155 23.1	7 32.7	79 49.9	-18 52.1
22	164 .5	153	2 7.0	92	185 27.1	7 32.4	109 54.4	-18 52.2
Δ					20	-2	22	-1

φ	SUNCE		TRAJANJE SUMRAKA		MESEC			
	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 29	17 4	0 42	2 19	4 30	1.0	17 4	2.9
55	6 21	17 12	0 36	2 0	4 31	1.1	17 3	2.7
50	6 15	17 18	0 32	1 47	4 32	1.2	17 1	2.5
45	6 10	17 23	0 29	1 37	4 32	1.3	17 0	2.4
40	6 6	17 27	0 27	1 30	4 32	1.4	16 59	2.3
35	6 2	17 31	0 25	1 24	4 33	1.5	16 59	2.2
30	5 59	17 34	0 24	1 19	4 33	1.5	16 58	2.1
20	5 53	17 40	0 22	1 13	4 34	1.6	16 57	2.0
10	5 48	17 45	0 21	1 10	4 34	1.7	16 56	1.9
0	5 44	17 50	0 21	1 9	4 35	1.8	16 55	1.8
10	5 39	17 55	0 21	1 11	4 35	1.8	16 54	1.7
20	5 33	18 1	0 22	1 15	4 36	1.9	16 53	1.5
30	5 27	18 7	0 24	1 22	4 36	2.0	16 52	1.4
35	5 23	18 11	0 26	1 27	4 36	2.1	16 51	1.3
40	5 19	18 15	0 28	1 35	4 37	2.1	16 50	1.2
45	5 14	18 20	0 30	1 44	4 37	2.2	16 49	1.1
50	5 8	18 26	0 33	1 58	4 38	2.3	16 48	1.0
55	5 1	18 34	0 38	2 18	4 39	2.4	16 47	.9
60	4 52	18 44	0 44	2 52	4 39	2.6	16 45	.7
S								

SUNCE				MESEC			
UT	$e = T_p - UT$	Δ/24	r	Prolaz		Δ/24	$\pi_\leftmoon$	r
h	min s	s	′	$T_{\overline{m}}$	h min	min	′	′
00	13 2.8	.6	16.0	$T_{\overline{m}}$	10 45	1.7	54.0	14.7
12	13 10.5	$T_{\overline{m}_\odot}$	11 h 46.8 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	′	°	
♀	8 56	.1	207	-5.2	♃	9 40	.0	195	-1.3
♂	9 30	.1	198	1.6	♄	14 41	.0	120	.8

UT	SUNCE		PROLEĆ. TAČKA	VENERA		MARS	
	$S_\odot$	$\delta_\odot$	S_Υ	S_φ	δ_φ	S_σ	δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	183 19.6	− 7 11.5	20 15.0	226 8.9	8 57.6	217 44.0	8 50.3
2	213 19.9	− 7 13.4	50 19.9	256 9.5	8 56.6	247 46.0	8 49.2
4	243 20.2	− 7 15.2	80 24.8	286 10.1	8 55.7	277 48.0	8 48.0
6	273 20.5	− 7 17.1	110 29.7	316 10.8	8 54.7	307 50.1	8 46.9
8	303 20.8	− 7 19.0	140 34.7	346 11.4	8 53.8	337 52.1	8 45.7
10	333 21.1	− 7 20.9	170 39.6	16 12.0	8 52.8	7 54.1	8 44.6
12	3 21.4	− 7 22.8	200 44.5	46 12.6	8 51.9	37 56.1	8 43.4
14	33 21.8	− 7 24.6	230 49.5	76 13.2	8 50.9	67 58.2	8 42.2
16	63 22.1	− 7 26.5	260 54.4	106 13.8	8 49.9	98 .2	8 41.1
18	93 22.4	− 7 28.4	290 59.3	136 14.4	8 49.0	128 2.2	8 39.9
20	123 22.7	− 7 30.3	321 4.2	166 15.0	8 48.0	158 4.3	8 38.8
22	153 23.0	− 7 32.1	351 9.2	196 15.5	8 47.0	188 6.3	8 37.6
Δ	2	−9		3	−5	10	−6

UT	MESEC				JUPITER		SATURN	
	$S_\leftmoon$	Δ	$\delta_\leftmoon$	Δ	$S_{\mathrm{♃}}$	$\delta_{\mathrm{♃}}$	$S_{\mathrm{♄}}$	$\delta_{\mathrm{♄}}$
h	° ′		° ′		° ′	° ′	° ′	° ′
0	193 9.1	153	2 25.3	91	215 31.1	7 32.0	139 58.8	−18 52.3
2	222 17.7	153	2 43.5	91	245 35.1	7 31.6	170 3.2	−18 52.4
4	251 26.2	152	3 1.8	91	275 39.1	7 31.3	200 7.7	−18 52.5
6	280 34.7	152	3 20.0	91	305 43.1	7 30.9	230 12.1	−18 52.6
8	309 43.2	152	3 38.1	90	335 47.1	7 30.6	260 16.5	−18 52.7
10	338 51.5	152	3 56.2	90	5 51.2	7 30.2	290 21.0	−18 52.8
12	7 59.9	151	4 14.3	90	35 55.2	7 29.8	320 25.4	−18 52.9
14	37 8.1	151	4 32.2	90	65 59.2	7 29.5	350 29.8	−18 53.0
16	66 16.3	151	4 50.1	89	96 3.2	7 29.1	20 34.3	−18 53.1
18	95 24.5	150	5 8.0	89	126 7.2	7 28.7	50 38.7	−18 53.2
20	124 32.5	150	5 25.7	88	156 11.2	7 28.4	80 43.1	−18 53.4
22	153 40.5	150	5 43.4	88	186 15.3	7 28.0	110 47.5	−18 53.5
Δ					20	−2	22	−1

φ	SUNCE		TRAJANJE SUMRAKA		MESEC			
	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 31	17 1	0 42	2 19	4 55	.7	18 14	2.9
55	6 23	17 9	0 36	2 0	4 58	.9	18 7	2.7
50	6 16	17 16	0 32	1 47	5 1	1.0	18 2	2.6
45	6 11	17 21	0 29	1 37	5 4	1.2	17 58	2.4
40	6 7	17 26	0 27	1 30	5 6	1.3	17 55	2.3
35	6 3	17 30	0 25	1 24	5 8	1.3	17 52	2.2
30	5 60	17 33	0 24	1 19	5 9	1.4	17 49	2.2
20	5 54	17 39	0 22	1 13	5 12	1.6	17 45	2.0
10	5 48	17 45	0 21	1 10	5 14	1.7	17 41	1.9
0	5 43	17 50	0 21	1 9	5 17	1.8	17 37	1.8
10	5 38	17 55	0 21	1 11	5 19	1.9	17 34	1.7
20	5 32	18 1	0 22	1 15	5 22	2.0	17 30	1.6
30	5 26	18 8	0 24	1 22	5 25	2.2	17 25	1.4
35	5 22	18 12	0 26	1 28	5 26	2.2	17 23	1.4
40	5 18	18 16	0 28	1 35	5 28	2.3	17 20	1.3
45	5 13	18 21	0 30	1 45	5 30	2.4	17 16	1.2
50	5 6	18 28	0 34	1 58	5 33	2.6	17 12	1.1
55	4 59	18 36	0 38	2 19	5 36	2.7	17 7	.9
60	4 49	18 46	0 45	2 54	5 41	2.9	17 1	.7
S								

SUNCE				MESEC			
UT	$e = T_p - UT$	Δ/24	r	Prolaz		Δ/24	$\pi_\leftmoon$	r
h	min s	s	′	$T_{\overline{m}}$	h min	min	′	′
00	13 18.2	.6	16.0		11 27	1.8	54.0	14.7
12	13 25.7	$T_{\overline{m}_\odot}$	11 h 46.6 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	′	°	
♀	8 55	.1	206	−5.1	♃	9 37	.0	195	−1.3
♂	9 28	.1	197	1.6	♄	14 38	.0	120	.8

UT	SUNCE		PROLEĆ. TAČKA	VENERA		MARS	
	$S_\odot$	$\delta_\odot$	S_Υ	S_φ	δ_φ	S_σ	δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	183 23.3	− 7 34.0	21 14.1	226 16.1	8 46.1	218 8.3	8 36.4
2	213 23.6	− 7 35.9	51 19.0	256 16.7	8 45.1	248 10.4	8 35.3
4	243 23.9	− 7 37.8	81 24.0	286 17.3	8 44.1	278 12.4	8 34.1
6	273 24.2	− 7 39.6	111 28.9	316 17.8	8 43.1	308 14.4	8 33.0
8	303 24.5	− 7 41.5	141 33.8	346 18.4	8 42.1	338 16.4	8 31.8
10	333 24.8	− 7 43.4	171 38.7	16 19.0	8 41.1	8 18.5	8 30.6
12	3 25.1	− 7 45.2	201 43.7	46 19.5	8 40.1	38 20.5	8 29.5
14	33 25.4	− 7 47.1	231 48.6	76 20.1	8 39.1	68 22.5	8 28.3
16	63 25.7	− 7 49.0	261 53.5	106 20.6	8 38.1	98 24.6	8 27.2
18	93 26.0	− 7 50.8	291 58.5	136 21.2	8 37.1	128 26.6	8 26.0
20	123 26.3	− 7 52.7	322 3.4	166 21.7	8 36.1	158 28.7	8 24.8
22	153 26.6	− 7 54.6	352 8.3	196 22.3	8 35.1	188 30.7	8 23.7
Δ	2	−9		3	−5	10	−6

UT	MESEC				JUPITER		SATURN	
	$S_\leftmoon$	Δ	$\delta_\leftmoon$	Δ	$S_{\mathrm{♃}}$	$\delta_{\mathrm{♃}}$	$S_{\mathrm{♄}}$	$\delta_{\mathrm{♄}}$
h	° ′		° ′		° ′	° ′	° ′	° ′
0	182 48.4	149	6 1.0	87	216 19.3	7 27.6	140 52.0	−18 53.6
2	211 56.2	149	6 18.5	87	246 23.3	7 27.3	170 56.4	−18 53.7
4	241 4.0	148	6 35.9	86	276 27.3	7 26.9	201 .8	−18 53.8
6	270 11.6	148	6 53.2	86	306 31.3	7 26.6	231 5.3	−18 53.9
8	299 19.2	147	7 10.3	85	336 35.4	7 26.2	261 9.7	−18 54.0
10	328 26.6	147	7 27.4	85	6 39.4	7 25.8	291 14.1	−18 54.1
12	357 34.0	146	7 44.4	84	36 43.4	7 25.5	321 18.5	−18 54.2
14	26 41.2	146	8 1.2	84	66 47.4	7 25.1	351 23.0	−18 54.3
16	55 48.3	145	8 18.0	83	96 51.4	7 24.7	21 27.4	−18 54.4
18	84 55.4	145	8 34.5	82	126 55.5	7 24.4	51 31.8	−18 54.5
20	114 2.3	144	8 51.0	82	156 59.5	7 24.0	81 36.2	−18 54.7
22	143 9.1	143	9 7.3	81	187 3.5	7 23.7	111 40.7	−18 54.8
Δ					20	−2	22	−1

φ	SUNCE		TRAJANJE SUMRAKA		MESEC			
	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 33	16 58	0 42	2 19	5 11	.8	19 24	2.9
55	6 25	17 7	0 36	2 0	5 20	1.0	19 12	2.7
50	6 18	17 14	0 32	1 47	5 26	1.1	19 4	2.5
45	6 13	17 19	0 29	1 37	5 31	1.2	18 57	2.4
40	6 8	17 24	0 27	1 30	5 36	1.3	18 51	2.3
35	6 4	17 28	0 25	1 24	5 40	1.4	18 46	2.3
30	6 0	17 32	0 24	1 19	5 43	1.5	18 41	2.2
20	5 54	17 38	0 22	1 13	5 49	1.6	18 34	2.1
10	5 48	17 44	0 21	1 10	5 55	1.7	18 27	1.9
0	5 43	17 50	0 21	1 9	5 60	1.8	18 21	1.8
10	5 38	17 55	0 21	1 11	6 5	1.9	18 14	1.7
20	5 32	18 1	0 22	1 15	6 10	2.0	18 8	1.6
30	5 25	18 8	0 24	1 22	6 16	2.2	17 60	1.5
35	5 21	18 13	0 26	1 28	6 20	2.2	17 56	1.4
40	5 16	18 17	0 28	1 35	6 24	2.3	17 51	1.4
45	5 11	18 23	0 30	1 45	6 29	2.4	17 45	1.3
50	5 4	18 29	0 34	1 59	6 34	2.6	17 38	1.2
55	4 56	18 38	0 38	2 20	6 41	2.7	17 29	1.0
60	4 46	18 49	0 45	2 57	6 51	2.9	17 18	.8
S								

SUNCE				MESEC			
UT	$e = T_p - UT$	Δ/24	r	Prolaz		Δ/24	$\pi_\leftmoon$	r
h	min s	s	′	$T_{\overline{m}}$	h min	min	′	′
00	13 33.2	.6	16.1		12 10	1.8	54.0	14.7
12	13 40.5	$T_{\overline{m}_\odot}$	11 h 46.3 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	′	°	
♀	8 55	.1	205	−5.1	♃	9 33	.0	195	−1.3
♂	9 27	.1	197	1.6	♄	14 34	.0	120	.8

UT	SUNCE $S_\odot$	SUNCE $\delta_\odot$	PROLEĆ. TAČKA S_Υ	VENERA S_φ	VENERA δ_φ	MARS S_σ	MARS δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	183 26.9	- 7 56.4	22 13.2	226 22.8	8 34.1	218 32.7	8 22.5
2	213 27.2	- 7 58.3	52 18.2	256 23.3	8 33.0	248 34.8	8 21.4
4	243 27.5	- 8 .2	82 23.1	286 23.9	8 32.0	278 36.8	8 20.2
6	273 27.8	- 8 2.0	112 28.0	316 24.4	8 31.0	308 38.8	8 19.0
8	303 28.1	- 8 3.9	142 33.0	346 24.9	8 29.9	338 40.9	8 17.9
10	333 28.4	- 8 5.8	172 37.9	16 25.4	8 28.9	8 42.9	8 16.7
12	3 28.7	- 8 7.6	202 42.8	46 25.9	8 27.9	38 45.0	8 15.5
14	33 29.0	- 8 9.5	232 47.7	76 26.4	8 26.8	68 47.0	8 14.4
16	63 29.3	- 8 11.3	262 52.7	106 26.9	8 25.8	98 49.0	8 13.2
18	93 29.5	- 8 13.2	292 57.6	136 27.5	8 24.7	128 51.1	8 12.0
20	123 29.8	- 8 15.1	323 2.5	166 28.0	8 23.7	158 53.1	8 10.9
22	153 30.1	- 8 16.9	353 7.5	196 28.4	8 22.6	188 55.2	8 9.7
Δ	1	-9		3	-5	10	-6

UT	MESEC $S_\leftmoon$	MESEC Δ	MESEC $\delta_\leftmoon$	MESEC Δ	JUPITER $S_{\jupiter}$	JUPITER $\delta_{\jupiter}$	SATURN $S_{\saturn}$	SATURN $\delta_{\saturn}$
h	° ′		° ′		° ′	° ′	° ′	° ′
0	172 15.8	143	9 23.5	80	217 7.5	7 23.3	141 45.1	-18 54.9
2	201 22.3	142	9 39.5	79	247 11.5	7 22.9	171 49.5	-18 55.0
4	230 28.7	141	9 55.4	79	277 15.6	7 22.6	201 53.9	-18 55.1
6	259 35.0	141	10 11.1	78	307 19.6	7 22.2	231 58.3	-18 55.2
8	288 41.2	140	10 26.6	77	337 23.6	7 21.9	262 2.8	-18 55.3
10	317 47.2	139	10 42.0	76	7 27.6	7 21.5	292 7.2	-18 55.4
12	346 53.1	139	10 57.2	75	37 31.7	7 21.1	322 11.6	-18 55.5
14	15 58.9	138	11 12.2	74	67 35.7	7 20.8	352 16.0	-18 55.6
16	45 4.5	137	11 27.1	73	97 39.7	7 20.4	22 20.4	-18 55.7
18	74 9.9	137	11 41.7	72	127 43.7	7 20.1	52 24.9	-18 55.9
20	103 15.3	136	11 56.2	71	157 47.8	7 19.7	82 29.3	-18 56.0
22	132 20.4	135	12 10.4	70	187 51.8	7 19.3	112 33.7	-18 56.1
Δ					20	-2	22	-1

φ	SUNCE IZLAZ	SUNCE ZALAZ	TRAJANJE SUMRAKA GRAĐ.	TRAJANJE SUMRAKA ASTR.	MESEC IZLAZ	MESEC Δ/24	MESEC ZALAZ	MESEC 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	5 30	.9	20 34	2.9
55	6 27	17 4	0 36	2 0	5 43	1.1	20 17	2.7
50	6 20	17 12	0 32	1 47	5 53	1.2	20 5	2.5
45	6 14	17 18	0 29	1 37	6 1	1.3	19 55	2.4
40	6 9	17 23	0 27	1 30	6 8	1.4	19 47	2.3
35	6 5	17 27	0 25	1 24	6 14	1.5	19 40	2.3
30	6 1	17 31	0 24	1 20	6 19	1.6	19 34	2.2
20	5 54	17 38	0 22	1 13	6 28	1.7	19 23	2.1
10	5 48	17 44	0 21	1 10	6 36	1.8	19 14	2.0
0	5 43	17 49	0 21	1 9	6 43	1.9	19 5	1.9
10	5 37	17 55	0 21	1 11	6 51	2.0	18 56	1.8
20	5 31	18 2	0 22	1 15	6 59	2.1	18 47	1.7
30	5 24	18 9	0 24	1 22	7 8	2.2	18 36	1.6
35	5 19	18 13	0 26	1 28	7 14	2.3	18 30	1.6
40	5 15	18 18	0 28	1 36	7 20	2.3	18 23	1.5
45	5 9	18 24	0 30	1 46	7 27	2.4	18 15	1.4
50	5 2	18 31	0 34	1 60	7 36	2.5	18 6	1.3
55	4 54	18 40	0 38	2 21	7 46	2.7	17 54	1.2
60	4 43	18 51	0 45	2 60	8 1	2.9	17 38	1.0
S								

SUNCE UT	SUNCE e = T_p − UT	SUNCE Δ/24	SUNCE r	MESEC Prolaz	MESEC Δ/24	MESEC $\pi_\leftmoon$	MESEC r
h	min s	s	′	h min	min	′	′
00	13 47.7	.6	16.1	$T_{\overline{m}}$ 12 54	1.9	54.2	14.8
12	13 54.6	$T_{\overline{m}_\odot}$ 11 h 46.1 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	′	°	
♀	8 54	.1	204	-5.1	♃	9 30	.0	195	-1.3
♂	9 25	.1	196	1.6	♄	14 31	.0	120	.8

UT	SUNCE $S_\odot$	SUNCE $\delta_\odot$	PROLEĆ. TAČKA S_Υ	VENERA S_φ	VENERA δ_φ	MARS S_σ	MARS δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	183 30.4	- 8 18.8	23 12.4	226 28.9	8 21.6	218 57.2	8 8.6
2	213 30.7	- 8 20.6	53 17.3	256 29.4	8 20.5	248 59.2	8 7.4
4	243 31.0	- 8 22.5	83 22.2	286 29.9	8 19.4	279 1.3	8 6.2
6	273 31.3	- 8 24.3	113 27.2	316 30.4	8 18.4	309 3.3	8 5.1
8	303 31.5	- 8 26.2	143 32.1	346 30.9	8 17.3	339 5.4	8 3.9
10	333 31.8	- 8 28.0	173 37.0	16 31.4	8 16.2	9 7.4	8 2.7
12	3 32.1	- 8 29.9	203 42.0	46 31.8	8 15.1	39 9.5	8 1.6
14	33 32.4	- 8 31.7	233 46.9	76 32.3	8 14.0	69 11.5	8 .4
16	63 32.6	- 8 33.6	263 51.8	106 32.8	8 13.0	99 13.5	7 59.2
18	93 32.9	- 8 35.4	293 56.7	136 33.2	8 11.9	129 15.6	7 58.1
20	123 33.2	- 8 37.3	324 1.7	166 33.7	8 10.8	159 17.6	7 56.9
22	153 33.5	- 8 39.1	354 6.6	196 34.1	8 9.7	189 19.7	7 55.7
Δ	1	-9		2	-5	10	-6

UT	MESEC $S_\leftmoon$	MESEC Δ	MESEC $\delta_\leftmoon$	MESEC Δ	JUPITER $S_{\jupiter}$	JUPITER $\delta_{\jupiter}$	SATURN $S_{\saturn}$	SATURN $\delta_{\saturn}$
h	° ′		° ′		° ′	° ′	° ′	° ′
0	161 25.4	134	12 24.5	69	217 55.8	7 19.0	142 38.1	-18 56.2
2	190 30.3	134	12 38.3	68	247 59.9	7 18.6	172 42.5	-18 56.3
4	219 35.0	133	12 52.0	67	278 3.9	7 18.3	202 47.0	-18 56.4
6	248 39.6	132	13 5.4	66	308 7.9	7 17.9	232 51.4	-18 56.5
8	277 44.0	131	13 18.6	65	338 11.9	7 17.5	262 55.8	-18 56.6
10	306 48.2	130	13 31.5	64	8 16.0	7 17.2	293 .2	-18 56.7
12	335 52.3	130	13 44.3	62	38 20.0	7 16.8	323 4.6	-18 56.8
14	4 56.2	129	13 56.8	61	68 24.0	7 16.5	353 9.0	-18 56.9
16	33 59.9	128	14 9.0	60	98 28.1	7 16.1	23 13.5	-18 57.1
18	63 3.5	127	14 21.0	59	128 32.1	7 15.8	53 17.9	-18 57.2
20	92 6.9	126	14 32.8	57	158 36.1	7 15.4	83 22.3	-18 57.3
22	121 10.2	125	14 44.3	56	188 40.2	7 15.0	113 26.7	-18 57.4
Δ					20	-2	22	-1

φ	SUNCE IZLAZ	SUNCE ZALAZ	TRAJANJE SUMRAKA GRAĐ.	TRAJANJE SUMRAKA ASTR.	MESEC IZLAZ	MESEC Δ/24	MESEC ZALAZ	MESEC Δ/24
N	h min	h min	h min	h min	h min	min	h min	min
60	6 38	16 52	0 42	2 19	5 51	1.1	21 42	2.7
55	6 29	17 2	0 37	2 0	6 9	1.3	21 21	2.6
50	6 21	17 10	0 33	1 47	6 22	1.4	21 6	2.5
45	6 15	17 16	0 30	1 37	6 33	1.5	20 53	2.4
40	6 10	17 21	0 27	1 30	6 42	1.6	20 43	2.3
35	6 6	17 26	0 25	1 24	6 50	1.6	20 34	2.3
30	6 2	17 30	0 24	1 20	6 56	1.7	20 26	2.2
20	5 55	17 37	0 22	1 13	7 8	1.8	20 13	2.1
10	5 48	17 43	0 21	1 10	7 19	1.9	20 2	2.1
0	5 43	17 49	0 21	1 9	7 28	2.0	19 51	2.0
10	5 37	17 55	0 21	1 11	7 38	2.0	19 40	1.9
20	5 30	18 2	0 22	1 15	7 49	2.1	19 29	1.8
30	5 22	18 10	0 24	1 23	8 1	2.2	19 15	1.8
35	5 18	18 14	0 26	1 28	8 8	2.3	19 8	1.7
40	5 13	18 19	0 28	1 36	8 16	2.3	18 59	1.7
45	5 7	18 25	0 30	1 46	8 25	2.4	18 49	1.6
50	5 0	18 33	0 34	2 0	8 37	2.5	18 37	1.5
55	4 51	18 42	0 39	2 23	8 51	2.6	18 22	1.4
60	4 40	18 54	0 45	3 3	9 10	2.8	18 2	1.2
S								

SUNCE UT	SUNCE e = T_p − UT	SUNCE Δ/24	SUNCE r	MESEC Prolaz	MESEC Δ/24	MESEC $\pi_\leftmoon$	MESEC r
h	min s	s	′	h min	min	′	′
00	14 1.6	.6	16.1	$T_{\overline{m}}$ 13 40	2.0	54.5	14.8
12	14 8.3	$T_{\overline{m}_\odot}$ 11 h 45.9 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	′	°	
♀	8 54	.1	203	-5.1	♃	9 27	.0	195	-1.3
♂	9 24	.1	196	1.6	♄	14 27	.0	119	.8

UT	SUNCE		PROLEĆ. TAČKA	VENERA		MARS	
	$S_\odot$	$\delta_\odot$	S_Υ	S_φ	δ_φ	S_σ	δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	183 33.7	− 8 41.0	24 11.5	226 34.6	8 8.6	219 21.7	7 54.6
2	213 34.0	− 8 42.8	54 16.4	256 35.0	8 7.5	249 23.8	7 53.4
4	243 34.3	− 8 44.7	84 21.4	286 35.5	8 6.4	279 25.8	7 52.2
6	273 34.6	− 8 46.5	114 26.3	316 35.9	8 5.2	309 27.9	7 51.1
8	303 34.8	− 8 48.3	144 31.2	346 36.4	8 4.1	339 29.9	7 49.9
10	333 35.1	− 8 50.2	174 36.2	16 36.8	8 3.0	9 32.0	7 48.7
12	3 35.4	− 8 52.0	204 41.1	46 37.2	8 1.9	39 34.0	7 47.6
14	33 35.6	− 8 53.9	234 46.0	76 37.7	8 .8	69 36.1	7 46.4
16	63 35.9	− 8 55.7	264 50.9	106 38.1	7 59.6	99 38.1	7 45.2
18	93 36.2	− 8 57.5	294 55.9	136 38.5	7 58.5	129 40.2	7 44.1
20	123 36.4	− 8 59.4	325 .8	166 38.9	7 57.4	159 42.2	7 42.9
22	153 36.7	− 9 1.2	355 5.7	196 39.3	7 56.2	189 44.3	7 41.7
Δ	1	−9		2	−6	10	−6

UT	MESEC				JUPITER		SATURN	
	$S_\leftmoon$	Δ	$\delta_\leftmoon$	Δ	$S_{\mathrm{♃}}$	$\delta_{\mathrm{♃}}$	$S_{\mathrm{♄}}$	$\delta_{\mathrm{♄}}$
h	° ′		° ′		° ′	° ′	° ′	° ′
0	150 13.3	125	14 55.5	55	218 44.2	7 14.7	143 31.1	−18 57.5
2	179 16.2	124	15 6.5	53	248 48.2	7 14.3	173 35.5	−18 57.6
4	208 19.0	123	15 17.2	52	278 52.3	7 14.0	203 39.9	−18 57.7
6	237 21.5	122	15 27.6	51	308 56.3	7 13.6	233 44.4	−18 57.8
8	266 23.9	121	15 37.7	49	339 .3	7 13.3	263 48.8	−18 57.9
10	295 26.2	120	15 47.6	48	9 4.4	7 12.9	293 53.2	−18 58.0
12	324 28.3	120	15 57.1	46	39 8.4	7 12.5	323 57.6	−18 58.1
14	353 30.2	119	16 6.4	45	69 12.4	7 12.2	354 2.0	−18 58.3
16	22 31.9	118	16 15.4	43	99 16.5	7 11.8	24 6.4	−18 58.4
18	51 33.5	117	16 24.1	42	129 20.5	7 11.5	54 10.8	−18 58.5
20	80 34.9	116	16 32.4	40	159 24.6	7 11.1	84 15.2	−18 58.6
22	109 36.1	115	16 40.5	39	189 28.6	7 10.8	114 19.7	−18 58.7
Δ					20	−2	22	−1

φ	SUNCE		TRAJANJE SUMRAKA		MESEC			
	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 41	16 49	0 42	2 19	6 17	1.4	22 48	2.5
55	6 31	16 60	0 37	2 1	6 39	1.5	22 23	2.4
50	6 23	17 8	0 33	1 47	6 56	1.6	22 5	2.4
45	6 16	17 14	0 30	1 38	7 9	1.7	21 50	2.3
40	6 11	17 20	0 27	1 30	7 20	1.7	21 38	2.3
35	6 6	17 24	0 25	1 24	7 29	1.8	21 28	2.2
30	6 2	17 29	0 24	1 20	7 37	1.8	21 20	2.2
20	5 55	17 36	0 22	1 13	7 51	1.9	21 4	2.1
10	5 49	17 43	0 21	1 10	8 4	2.0	20 51	2.1
0	5 42	17 49	0 21	1 10	8 15	2.0	20 39	2.1
10	5 36	17 55	0 21	1 11	8 27	2.1	20 26	2.0
20	5 29	18 2	0 22	1 15	8 40	2.1	20 13	2.0
30	5 21	18 10	0 24	1 23	8 54	2.2	19 58	1.9
35	5 17	18 15	0 26	1 29	9 2	2.2	19 49	1.9
40	5 12	18 20	0 28	1 36	9 12	2.3	19 39	1.8
45	5 5	18 27	0 31	1 47	9 23	2.4	19 27	1.8
50	4 58	18 34	0 34	2 1	9 37	2.4	19 13	1.7
55	4 49	18 44	0 39	2 24	9 54	2.5	18 55	1.7
60	4 37	18 56	0 46	3 6	10 17	2.6	18 31	1.5
S								

SUNCE				MESEC				
UT	$e = T_p - UT$	Δ/24	r	Prolaz		Δ/24	$\pi_\leftmoon$	r
h	min s	s	′		h min	min	′	′
00	14 15.0	.5	16.1	$T_{\overline{m}}$	14 27	2.0	54.8	14.9
12	14 21.4	$T_{\overline{m}_\odot}$	11 h 45.6 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	′	°	
♀	8 54	.1	202	−5.0	♃	9 24	.0	195	−1.3
♂	9 22	.1	195	1.6	♄	14 24	.0	119	.8

UT	SUNCE		PROLEĆ. TAČKA	VENERA		MARS	
	$S_\odot$	$\delta_\odot$	S_Υ	S_φ	δ_φ	S_σ	δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	183 37.0	− 9 3.0	25 10.7	226 39.8	7 55.1	219 46.3	7 40.5
2	213 37.2	− 9 4.9	55 15.6	256 40.2	7 54.0	249 48.4	7 39.4
4	243 37.5	− 9 6.7	85 20.5	286 40.6	7 52.8	279 50.4	7 38.2
6	273 37.7	− 9 8.5	115 25.4	316 41.0	7 51.7	309 52.5	7 37.0
8	303 38.0	− 9 10.4	145 30.4	346 41.4	7 50.5	339 54.5	7 35.9
10	333 38.3	− 9 12.2	175 35.3	16 41.8	7 49.4	9 56.6	7 34.7
12	3 38.5	− 9 14.0	205 40.2	46 42.2	7 48.2	39 58.7	7 33.5
14	33 38.8	− 9 15.9	235 45.2	76 42.6	7 47.0	70 .7	7 32.4
16	63 39.0	− 9 17.7	265 50.1	106 42.9	7 45.9	100 2.8	7 31.2
18	93 39.3	− 9 19.5	295 55.0	136 43.3	7 44.7	130 4.8	7 30.0
20	123 39.5	− 9 21.3	325 59.9	166 43.7	7 43.5	160 6.9	7 28.8
22	153 39.8	− 9 23.2	356 4.9	196 44.1	7 42.4	190 8.9	7 27.7
Δ	1	−9		2	−6	10	−6

UT	MESEC				JUPITER		SATURN	
	$S_\leftmoon$	Δ	$\delta_\leftmoon$	Δ	$S_{\mathrm{♃}}$	$\delta_{\mathrm{♃}}$	$S_{\mathrm{♄}}$	$\delta_{\mathrm{♄}}$
h	° ′		° ′		° ′	° ′	° ′	° ′
0	138 37.2	115	16 48.2	37	219 32.6	7 10.4	144 24.1	−18 58.8
2	167 38.1	114	16 55.7	36	249 36.7	7 10.1	174 28.5	−18 58.9
4	196 38.8	113	17 2.8	34	279 40.7	7 9.7	204 32.9	−18 59.0
6	225 39.4	112	17 9.5	32	309 44.7	7 9.3	234 37.3	−18 59.1
8	254 39.8	111	17 16.0	31	339 48.8	7 9.0	264 41.7	−18 59.2
10	283 40.1	110	17 22.1	29	9 52.8	7 8.6	294 46.1	−18 59.4
12	312 40.2	110	17 27.9	27	39 56.9	7 8.3	324 50.5	−18 59.5
14	341 40.1	109	17 33.3	25	70 .9	7 7.9	354 54.9	−18 59.6
16	10 39.9	108	17 38.4	24	100 5.0	7 7.6	24 59.3	−18 59.7
18	39 39.5	107	17 43.1	22	130 9.0	7 7.2	55 3.7	−18 59.8
20	68 39.0	107	17 47.5	20	160 13.0	7 6.9	85 8.1	−18 59.9
22	97 38.3	106	17 51.5	18	190 17.1	7 6.5	115 12.5	−19 .0
Δ					20	−2	22	−1

φ	SUNCE		TRAJANJE SUMRAKA		MESEC			
	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 43	16 46	0 42	2 19	6 50	1.7	23 48	2.2
55	6 33	16 57	0 37	2 1	7 16	1.8	23 21	2.2
50	6 24	17 6	0 33	1 47	7 34	1.9	23 1	2.2
45	6 18	17 12	0 30	1 38	7 49	1.9	22 46	2.2
40	6 12	17 18	0 27	1 30	8 2	2.0	22 33	2.2
35	6 7	17 23	0 26	1 24	8 12	2.0	22 22	2.2
30	6 3	17 28	0 24	1 20	8 21	2.0	22 12	2.2
20	5 55	17 35	0 22	1 14	8 37	2.0	21 56	2.1
10	5 49	17 42	0 21	1 10	8 51	2.1	21 41	2.1
0	5 42	17 49	0 21	1 10	9 4	2.1	21 28	2.1
10	5 36	17 55	0 21	1 11	9 17	2.1	21 14	2.1
20	5 28	18 3	0 22	1 15	9 31	2.2	21 0	2.1
30	5 20	18 11	0 24	1 23	9 47	2.2	20 44	2.1
35	5 15	18 16	0 26	1 29	9 56	2.2	20 34	2.1
40	5 10	18 22	0 28	1 36	10 7	2.2	20 23	2.1
45	5 4	18 28	0 31	1 47	10 20	2.3	20 10	2.0
50	4 56	18 36	0 34	2 2	10 35	2.3	19 55	2.0
55	4 46	18 46	0 39	2 25	10 54	2.3	19 35	2.0
60	4 34	18 59	0 46	3 10	11 21	2.4	19 8	1.9
S								

SUNCE				MESEC				
UT	$e = T_p - UT$	Δ/24	r	Prolaz		Δ/24	$\pi_\leftmoon$	r
h	min s	s	′		h min	min	′	′
00	14 27.8	.5	16.1	$T_{\overline{m}}$	15 16	2.1	55.2	15.0
12	14 34.0	$T_{\overline{m}_\odot}$	11 h 45.4 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	′	°	
♀	8 53	.1	201	−5.0	♃	9 21	.0	194	−1.3
♂	9 20	.1	195	1.6	♄	14 20	.0	119	.8

UT	SUNCE		PROLEĆ. TAČKA	VENERA		MARS	
	$S_\odot$	$\delta_\odot$	S_Υ	S_φ	δ_φ	S_σ	δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	183 40.0	- 9 25.0	26 9.8	226 44.5	7 41.2	220 11.0	7 26.5
2	213 40.3	- 9 26.8	56 14.7	256 44.8	7 40.0	250 13.1	7 25.3
4	243 40.5	- 9 28.6	86 19.7	286 45.2	7 38.8	280 15.1	7 24.1
6	273 40.8	- 9 30.5	116 24.6	316 45.6	7 37.6	310 17.2	7 23.0
8	303 41.0	- 9 32.3	146 29.5	346 45.9	7 36.4	340 19.2	7 21.8
10	333 41.3	- 9 34.1	176 34.4	16 46.3	7 35.2	10 21.3	7 20.6
12	3 41.5	- 9 35.9	206 39.4	46 46.7	7 34.0	40 23.4	7 19.5
14	33 41.7	- 9 37.7	236 44.3	76 47.0	7 32.8	70 25.4	7 18.3
16	63 42.0	- 9 39.6	266 49.2	106 47.4	7 31.6	100 27.5	7 17.1
18	93 42.2	- 9 41.4	296 54.2	136 47.7	7 30.4	130 29.5	7 15.9
20	123 42.5	- 9 43.2	326 59.1	166 48.1	7 29.2	160 31.6	7 14.8
22	153 42.7	- 9 45.0	357 4.0	196 48.4	7 28.0	190 33.7	7 13.6
Δ	1	-9		2	-6	10	-6

UT	MESEC				JUPITER		SATURN	
	$S_\leftmoon$	Δ	$\delta_\leftmoon$	Δ	S_{4}	δ_{4}	S_η	δ_η
h	° ′		° ′		° ′	° ′	° ′	° ′
0	126 37.5	105	17 55.1	16	220 21.1	7 6.2	145 16.9	-19 .1
2	155 36.5	104	17 58.4	15	250 25.2	7 5.8	175 21.4	-19 .2
4	184 35.4	104	18 1.4	13	280 29.2	7 5.5	205 25.8	-19 .3
6	213 34.2	103	18 3.9	11	310 33.3	7 5.1	235 30.2	-19 .4
8	242 32.8	102	18 6.1	9	340 37.3	7 4.7	265 34.6	-19 .6
10	271 31.3	102	18 7.9	7	10 41.4	7 4.4	295 39.0	-19 .7
12	300 29.6	101	18 9.4	5	40 45.4	7 4.0	325 43.4	-19 .8
14	329 27.9	100	18 10.4	3	70 49.4	7 3.7	355 47.8	-19 .9
16	358 25.9	100	18 11.1	1	100 53.5	7 3.3	25 52.2	-19 1.0
18	27 23.9	99	18 11.4	0	130 57.5	7 3.0	55 56.6	-19 1.1
20	56 21.8	99	18 11.3	-2	161 1.6	7 2.6	86 1.0	-19 1.2
22	85 19.5	98	18 10.8	-4	191 5.6	7 2.3	116 5.4	-19 1.3
Δ					20	-2	22	-1

φ	SUNCE		TRAJANJE SUMRAKA		MESEC			
	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 46	16 44	0 42	2 19	7 32	2.2	. . .	.0
55	6 35	16 55	0 37	2 1	7 59	2.2	. . .	.0
50	6 26	17 4	0 33	1 47	8 20	2.2	23 54	2.0
45	6 19	17 11	0 30	1 38	8 35	2.2	23 38	2.0
40	6 13	17 17	0 27	1 30	8 48	2.2	23 25	2.1
35	6 8	17 22	0 26	1 24	8 59	2.2	23 14	2.1
30	6 4	17 27	0 24	1 20	9 9	2.2	23 4	2.1
20	5 56	17 35	0 22	1 14	9 26	2.2	22 47	2.1
10	5 49	17 42	0 21	1 10	9 40	2.2	22 33	2.2
0	5 42	17 49	0 21	1 10	9 54	2.2	22 19	2.2
10	5 35	17 56	0 21	1 11	10 8	2.1	22 5	2.2
20	5 28	18 3	0 22	1 15	10 23	2.1	21 50	2.2
30	5 19	18 12	0 25	1 23	10 39	2.1	21 34	2.2
35	5 14	18 17	0 26	1 29	10 49	2.1	21 24	2.3
40	5 9	18 23	0 28	1 37	11 0	2.1	21 12	2.3
45	5 2	18 29	0 31	1 48	11 14	2.1	20 59	2.3
50	4 54	18 38	0 34	2 3	11 30	2.1	20 43	2.3
55	4 44	18 48	0 39	2 27	11 50	2.1	20 22	2.3
60	4 31	19 1	0 46	3 15	12 18	2.1	19 54	2.4
S								

SUNCE				MESEC			
UT	e = T_p − UT	Δ/24	r	Prolaz		Δ/24	$\pi_\leftmoon$	r
h	min s	s	′		h min	min	′	′
00	14 40.1	.5	16.1	$T_{\overline{m}}$	16 6	2.2	55.7	15.2
12	14 45.9	$T_{\overline{m}_\odot}$	11 h 45.2 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	′	°	
♀	8 53	.1	201	-5.0	♃	9 17	.0	194	-1.3
♂	9 19	.1	194	1.6	♄	14 17	.0	119	.8

UT	SUNCE		PROLEĆ. TAČKA	VENERA		MARS	
	$S_\odot$	$\delta_\odot$	S_Υ	S_φ	δ_φ	S_σ	δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	183 42.9	- 9 46.8	27 8.9	226 48.7	7 26.8	220 35.7	7 12.4
2	213 43.2	- 9 48.6	57 13.9	256 49.1	7 25.6	250 37.8	7 11.2
4	243 43.4	- 9 50.4	87 18.8	286 49.4	7 24.3	280 39.8	7 10.1
6	273 43.6	- 9 52.2	117 23.7	316 49.7	7 23.1	310 41.9	7 8.9
8	303 43.9	- 9 54.1	147 28.6	346 50.1	7 21.9	340 44.0	7 7.7
10	333 44.1	- 9 55.9	177 33.6	16 50.4	7 20.6	10 46.0	7 6.5
12	3 44.3	- 9 57.7	207 38.5	46 50.7	7 19.4	40 48.1	7 5.4
14	33 44.6	- 9 59.5	237 43.4	76 51.0	7 18.2	70 50.2	7 4.2
16	63 44.8	-10 1.3	267 48.4	106 51.4	7 16.9	100 52.2	7 3.0
18	93 45.0	-10 3.1	297 53.3	136 51.7	7 15.7	130 54.3	7 1.8
20	123 45.3	-10 4.9	327 58.2	166 52.0	7 14.4	160 56.4	7 .7
22	153 45.5	-10 6.7	358 3.1	196 52.3	7 13.2	190 58.4	6 59.5
Δ	1	-9		2	-6	10	-6

UT	MESEC				JUPITER		SATURN	
	$S_\leftmoon$	Δ	$\delta_\leftmoon$	Δ	S_{4}	δ_{4}	S_η	δ_η
h	° ′		° ′		° ′	° ′	° ′	° ′
0	114 17.1	98	18 9.9	-6	221 9.7	7 1.9	146 9.8	-19 1.4
2	143 14.6	97	18 8.7	-8	251 13.7	7 1.6	176 14.2	-19 1.6
4	172 12.0	96	18 7.0	-10	281 17.8	7 1.2	206 18.6	-19 1.7
6	201 9.3	96	18 4.9	-12	311 21.8	7 .9	236 23.0	-19 1.8
8	230 6.5	95	18 2.5	-14	341 25.9	7 .5	266 27.4	-19 1.9
10	259 3.6	95	17 59.6	-16	11 29.9	7 .2	296 31.8	-19 2.0
12	288 .6	95	17 56.4	-18	41 34.0	6 59.8	326 36.2	-19 2.1
14	316 57.5	94	17 52.7	-20	71 38.0	6 59.5	356 40.6	-19 2.2
16	345 54.3	94	17 48.7	-22	101 42.1	6 59.1	26 45.0	-19 2.3
18	14 51.0	93	17 44.2	-24	131 46.2	6 58.8	56 49.4	-19 2.4
20	43 47.7	93	17 39.3	-26	161 50.2	6 58.4	86 53.8	-19 2.5
22	72 44.2	92	17 34.1	-28	191 54.3	6 58.1	116 58.2	-19 2.7
Δ					20	-2	22	-1

φ	SUNCE		TRAJANJE SUMRAKA		MESEC			
	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 48	16 41	0 43	2 19	8 24	2.6	0 42	1.9
55	6 37	16 53	0 37	2 1	8 52	2.5	0 14	2.0
50	6 28	17 2	0 33	1 48	9 12	2.5	. . .	.0
45	6 20	17 9	0 30	1 38	9 27	2.4	. . .	.0
40	6 14	17 15	0 27	1 30	9 40	2.4	. . .	.0
35	6 9	17 21	0 26	1 24	9 51	2.4	. . .	.0
30	6 4	17 25	0 24	1 20	10 1	2.3	23 54	2.0
20	5 56	17 34	0 22	1 14	10 18	2.3	23 38	2.1
10	5 49	17 41	0 21	1 11	10 32	2.2	23 24	2.2
0	5 42	17 48	0 21	1 10	10 46	2.2	23 11	2.2
10	5 35	17 56	0 21	1 11	10 59	2.2	22 58	2.3
20	5 27	18 3	0 22	1 16	11 14	2.1	22 44	2.3
30	5 18	18 12	0 25	1 23	11 31	2.1	22 27	2.4
35	5 13	18 18	0 26	1 29	11 40	2.0	22 18	2.4
40	5 7	18 24	0 28	1 37	11 51	2.0	22 7	2.5
45	5 0	18 31	0 31	1 48	12 4	2.0	21 54	2.5
50	4 52	18 39	0 34	2 4	12 20	1.9	21 39	2.6
55	4 42	18 50	0 39	2 28	12 40	1.8	21 19	2.7
60	4 28	19 4	0 47	3 19	13 8	1.7	20 52	2.8
S								

SUNCE				MESEC			
UT	e = T_p − UT	Δ/24	r	Prolaz		Δ/24	$\pi_\leftmoon$	r
h	min s	s	′		h min	min	′	′
00	14 51.7	.5	16.1	$T_{\overline{m}}$	16 58	2.2	56.4	15.4
12	14 57.3	$T_{\overline{m}_\odot}$	11 h 45.0 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	′	°	
♀	8 53	.1	200	-5.0	♃	9 14	.0	194	-1.3
♂	9 17	.1	193	1.6	♄	14 13	.0	119	.8

UT	SUNCE		PROLEĆ. TAČKA	VENERA		MARS	
	$S_\odot$	$\delta_\odot$	S_Υ	S_φ	δ_φ	S_σ	δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	183 45.7	-10 8.5	28 8.1	226 52.6	7 11.9	221 .5	6 58.3
2	213 45.9	-10 10.3	58 13.0	256 52.9	7 10.7	251 2.6	6 57.1
4	243 46.1	-10 12.1	88 17.9	286 53.2	7 9.4	281 4.6	6 56.0
6	273 46.4	-10 13.9	118 22.9	316 53.5	7 8.1	311 6.7	6 54.8
8	303 46.6	-10 15.7	148 27.8	346 53.8	7 6.9	341 8.8	6 53.6
10	333 46.8	-10 17.5	178 32.7	16 54.1	7 5.6	11 10.9	6 52.4
12	3 47.0	-10 19.3	208 37.6	46 54.4	7 4.3	41 12.9	6 51.3
14	33 47.2	-10 21.1	238 42.6	76 54.7	7 3.1	71 15.0	6 50.1
16	63 47.5	-10 22.8	268 47.5	106 54.9	7 1.8	101 17.1	6 48.9
18	93 47.7	-10 24.6	298 52.4	136 55.2	7 .5	131 19.1	6 47.7
20	123 47.9	-10 26.4	328 57.4	166 55.5	6 59.2	161 21.2	6 46.6
22	153 48.1	-10 28.2	359 2.3	196 55.8	6 57.9	191 23.3	6 45.4
Δ	1	-9		1	-6	10	-6

UT	MESEC				JUPITER		SATURN	
	$S_\leftmoon$	Δ	$\delta_\leftmoon$	Δ	$S_{\text{♃}}$	$\delta_{\text{♃}}$	$S_{\text{♄}}$	$\delta_{\text{♄}}$
h	° ′		° ′		° ′	° ′	° ′	° ′
0	101 40.7	92	17 28.4	-30	221 58.3	6 57.7	147 2.6	-19 2.8
2	130 37.1	92	17 22.3	-32	252 2.4	6 57.4	177 7.0	-19 2.9
4	159 33.5	91	17 15.9	-34	282 6.4	6 57.0	207 11.4	-19 3.0
6	188 29.8	91	17 9.0	-36	312 10.5	6 56.7	237 15.8	-19 3.1
8	217 26.0	91	17 1.7	-38	342 14.5	6 56.3	267 20.2	-19 3.2
10	246 22.1	90	16 54.0	-40	12 18.6	6 56.0	297 24.6	-19 3.3
12	275 18.2	90	16 45.9	-42	42 22.7	6 55.6	327 28.9	-19 3.4
14	304 14.3	90	16 37.5	-44	72 26.7	6 55.3	357 33.3	-19 3.5
16	333 10.2	90	16 28.6	-46	102 30.8	6 55.0	27 37.7	-19 3.6
18	2 6.2	89	16 19.3	-48	132 34.8	6 54.6	57 42.1	-19 3.8
20	31 2.0	89	16 9.6	-50	162 38.9	6 54.3	87 46.5	-19 3.9
22	59 57.9	89	15 59.6	-52	192 43.0	6 53.9	117 50.9	-19 4.0
Δ					20	-2	22	-1

φ	SUNCE		TRAJANJE SUMRAKA		MESEC			
	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 51	16 38	0 43	2 19	9 27	3.0	1 27	1.5
55	6 39	16 50	0 37	2 1	9 52	2.9	1 1	1.7
50	6 29	16 60	0 33	1 48	10 11	2.7	0 42	1.8
45	6 22	17 7	0 30	1 38	10 26	2.6	0 27	1.9
40	6 15	17 14	0 27	1 30	10 38	2.6	0 14	1.9
35	6 10	17 19	0 26	1 24	10 48	2.5	0 4	2.0
30	6 5	17 24	0 24	1 20	10 57	2.5	. . .	.0
20	5 56	17 33	0 22	1 14	11 12	2.4	. . .	.0
10	5 49	17 41	0 21	1 11	11 26	2.3	. . .	.0
0	5 42	17 48	0 21	1 10	11 39	2.2	. . .	.0
10	5 34	17 56	0 21	1 11	11 51	2.1	23 52	2.3
20	5 26	18 4	0 23	1 16	12 5	2.1	23 39	2.4
30	5 17	18 13	0 25	1 24	12 20	2.0	23 25	2.5
35	5 12	18 19	0 26	1 30	12 29	1.9	23 16	2.6
40	5 6	18 25	0 28	1 38	12 39	1.9	23 6	2.7
45	4 59	18 32	0 31	1 49	12 51	1.8	22 55	2.7
50	4 50	18 41	0 34	2 4	13 6	1.7	22 41	2.8
55	4 39	18 52	0 39	2 30	13 24	1.6	22 24	3.0
60	4 25	19 6	0 47	3 25	13 49	1.4	21 60	3.2
S								

SUNCE				MESEC			
UT	$e = T_p - UT$	Δ/24	r	Prolaz	Δ/24	$\pi_\leftmoon$	r
h	min s	s	′	h min	min	′	′
00	15 2.8	.4	16.1	$T_{\overline{m}}$ 17 51	2.2	57.1	15.6
12	15 8.0	$T_{\overline{m}_\odot}$ 11 h 44.9 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	′	°	
♀	8 52	.1	199	-4.9	♄	9 11	.0	194	-1.3
♂	9 15	.1	193	1.6	♇	14 10	.0	119	.8

UT	SUNCE		PROLEĆ. TAČKA	VENERA		MARS	
	$S_\odot$	$\delta_\odot$	S_Υ	S_φ	δ_φ	S_σ	δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	183 48.3	-10 30.0	29 7.2	226 56.1	6 56.6	221 25.4	6 44.2
2	213 48.5	-10 31.8	59 12.1	256 56.3	6 55.3	251 27.4	6 43.0
4	243 48.7	-10 33.6	89 17.1	286 56.6	6 54.0	281 29.5	6 41.8
6	273 48.9	-10 35.4	119 22.0	316 56.9	6 52.7	311 31.6	6 40.7
8	303 49.2	-10 37.1	149 26.9	346 57.1	6 51.4	341 33.7	6 39.5
10	333 49.4	-10 38.9	179 31.9	16 57.4	6 50.1	11 35.7	6 38.3
12	3 49.6	-10 40.7	209 36.8	46 57.6	6 48.8	41 37.8	6 37.1
14	33 49.8	-10 42.5	239 41.7	76 57.9	6 47.5	71 39.9	6 36.0
16	63 50.0	-10 44.3	269 46.6	106 58.2	6 46.2	101 42.0	6 34.8
18	93 50.2	-10 46.0	299 51.6	136 58.4	6 44.9	131 44.0	6 33.6
20	123 50.4	-10 47.8	329 56.5	166 58.7	6 43.6	161 46.1	6 32.4
22	153 50.6	-10 49.6	0 1.4	196 58.9	6 42.2	191 48.2	6 31.2
Δ	1	-9		1	-7	10	-6

UT	MESEC				JUPITER		SATURN	
	$S_\leftmoon$	Δ	$\delta_\leftmoon$	Δ	$S_{\text{♃}}$	$\delta_{\text{♃}}$	$S_{\text{♄}}$	$\delta_{\text{♄}}$
h	° ′		° ′		° ′	° ′	° ′	° ′
0	88 53.7	89	15 49.1	-54	222 47.0	6 53.6	147 55.3	-19 4.1
2	117 49.4	89	15 38.3	-56	252 51.1	6 53.2	177 59.7	-19 4.2
4	146 45.1	88	15 27.0	-58	282 55.1	6 52.9	208 4.1	-19 4.3
6	175 40.8	88	15 15.4	-60	312 59.2	6 52.5	238 8.5	-19 4.4
8	204 36.4	88	15 3.4	-62	343 3.3	6 52.2	268 12.9	-19 4.5
10	233 32.0	88	14 51.0	-64	13 7.3	6 51.8	298 17.3	-19 4.6
12	262 27.6	88	14 38.2	-66	43 11.4	6 51.5	328 21.7	-19 4.8
14	291 23.1	88	14 25.1	-68	73 15.5	6 51.1	358 26.0	-19 4.9
16	320 18.6	87	14 11.6	-69	103 19.5	6 50.8	28 30.4	-19 5.0
18	349 14.1	87	13 57.7	-71	133 23.6	6 50.5	58 34.8	-19 5.1
20	18 9.6	87	13 43.5	-73	163 27.7	6 50.1	88 39.2	-19 5.2
22	47 5.0	87	13 28.9	-75	193 31.7	6 49.8	118 43.6	-19 5.3
Δ					20	-2	22	-1

φ	SUNCE		TRAJANJE SUMRAKA		MESEC			
	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 53	16 35	0 43	2 19	10 40	3.3	2 4	1.3
55	6 41	16 48	0 37	2 1	11 1	3.1	1 41	1.5
50	6 31	16 58	0 33	1 48	11 17	3.0	1 25	1.6
45	6 23	17 6	0 30	1 38	11 29	2.8	1 12	1.7
40	6 16	17 12	0 27	1 30	11 39	2.7	1 1	1.8
35	6 11	17 18	0 26	1 24	11 48	2.6	0 51	1.9
30	6 6	17 23	0 24	1 20	11 56	2.6	0 43	1.9
20	5 57	17 32	0 22	1 14	12 9	2.4	0 28	2.0
10	5 49	17 40	0 21	1 11	12 21	2.3	0 16	2.1
0	5 41	17 48	0 21	1 10	12 32	2.2	0 4	2.2
10	5 34	17 56	0 21	1 12	12 43	2.1	. . .	.0
20	5 26	18 4	0 23	1 16	12 54	2.0	. . .	.0
30	5 16	18 14	0 25	1 24	13 8	1.9	. . .	.0
35	5 11	18 19	0 26	1 30	13 15	1.8	. . .	.0
40	5 4	18 26	0 28	1 38	13 24	1.7	. . .	.0
45	4 57	18 33	0 31	1 49	13 34	1.6	. . .	.0
50	4 48	18 43	0 35	2 5	13 46	1.5	23 49	3.0
55	4 37	18 54	0 40	2 32	14 2	1.4	23 35	3.2
60	4 22	19 9	0 47	3 31	14 22	1.1	23 16	3.4
S								

SUNCE				MESEC			
UT	$e = T_p - UT$	Δ/24	r	Prolaz	Δ/24	$\pi_\leftmoon$	r
h	min s	s	′	h min	min	′	′
00	15 13.3	.4	16.1	$T_{\overline{m}}$ 18 45	2.2	57.9	15.8
12	15 18.2	$T_{\overline{m}_\odot}$ 11 h 44.7 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	′	°	
♀	8 52	.1	198	-4.9	♄	9 8	.0	194	-1.3
♂	9 14	.1	192	1.6	♇	14 6	.0	119	.8

UT	SUNCE		PROLEĆ. TAČKA	VENERA		MARS	
	$S_\odot$	$\delta_\odot$	S_Υ	S_φ	δ_φ	S_σ	δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	183 50.8	-10 51.4	30 6.4	226 59.1	6 40.9	221 50.3	6 30.1
2	213 51.0	-10 53.1	60 11.3	256 59.4	6 39.6	251 52.3	6 28.9
4	243 51.2	-10 54.9	90 16.2	286 59.6	6 38.2	281 54.4	6 27.7
6	273 51.4	-10 56.7	120 21.1	316 59.9	6 36.9	311 56.5	6 26.5
8	303 51.6	-10 58.5	150 26.1	347 .1	6 35.6	341 58.6	6 25.3
10	333 51.7	-11 .2	180 31.0	17 .3	6 34.2	12 .7	6 24.2
12	3 51.9	-11 2.0	210 35.9	47 .5	6 32.9	42 2.7	6 23.0
14	33 52.1	-11 3.8	240 40.9	77 .8	6 31.5	72 4.8	6 21.8
16	63 52.3	-11 5.5	270 45.8	107 1.0	6 30.2	102 6.9	6 20.6
18	93 52.5	-11 7.3	300 50.7	137 1.2	6 28.8	132 9.0	6 19.4
20	123 52.7	-11 9.0	330 55.6	167 1.4	6 27.5	162 11.1	6 18.3
22	153 52.9	-11 10.8	1 .6	197 1.6	6 26.1	192 13.2	6 17.1
Δ	1	-9		1	-7	10	-6

UT	MESEC				JUPITER		SATURN	
	$S_\leftmoon$	Δ	$\delta_\leftmoon$	Δ	$S_{\mathrm{♃}}$	$\delta_{\mathrm{♃}}$	$S_{\mathrm{♄}}$	$\delta_{\mathrm{♄}}$
h	° ′		° ′		° ′	° ′	° ′	° ′
0	76 .4	87	13 13.9	-77	223 35.8	6 49.4	148 48.0	-19 5.4
2	104 55.7	87	12 58.6	-78	253 39.9	6 49.1	178 52.4	-19 5.5
4	133 51.1	87	12 43.0	-80	283 43.9	6 48.7	208 56.8	-19 5.6
6	162 46.4	86	12 27.0	-82	313 48.0	6 48.4	239 1.2	-19 5.8
8	191 41.7	86	12 10.7	-83	343 52.1	6 48.0	269 5.6	-19 5.9
10	220 37.0	86	11 54.0	-85	13 56.1	6 47.7	299 9.9	-19 6.0
12	249 32.2	86	11 37.0	-87	44 .2	6 47.4	329 14.3	-19 6.1
14	278 27.4	86	11 19.7	-88	74 4.3	6 47.0	359 18.7	-19 6.2
16	307 22.6	86	11 2.1	-90	104 8.4	6 46.7	29 23.1	-19 6.3
18	336 17.8	86	10 44.2	-91	134 12.4	6 46.3	59 27.5	-19 6.4
20	5 12.9	86	10 26.0	-93	164 16.5	6 46.0	89 31.9	-19 6.5
22	34 8.0	85	10 7.4	-94	194 20.6	6 45.6	119 36.3	-19 6.6
Δ					20	-2	22	-1

φ	SUNCE		TRAJANJE SUMRAKA		MESEC			
	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 56	16 32	0 43	2 19	11 60	3.5	2 34	1.1
55	6 43	16 46	0 37	2 1	12 15	3.3	2 17	1.3
50	6 33	16 56	0 33	1 48	12 27	3.1	2 3	1.5
45	6 24	17 4	0 30	1 38	12 37	3.0	1 53	1.6
40	6 17	17 11	0 28	1 30	12 45	2.9	1 44	1.7
35	6 12	17 17	0 26	1 25	12 52	2.7	1 36	1.8
30	6 6	17 22	0 24	1 20	12 58	2.7	1 29	1.9
20	5 57	17 32	0 22	1 14	13 8	2.5	1 18	2.0
10	5 49	17 40	0 21	1 11	13 17	2.4	1 7	2.1
0	5 41	17 48	0 21	1 10	13 26	2.2	0 57	2.2
10	5 33	17 56	0 21	1 12	13 34	2.1	0 48	2.4
20	5 25	18 5	0 23	1 16	13 43	2.0	0 37	2.5
30	5 15	18 15	0 25	1 24	13 53	1.8	0 25	2.6
35	5 9	18 20	0 26	1 30	13 59	1.8	0 18	2.7
40	5 3	18 27	0 28	1 38	14 6	1.7	0 10	2.8
45	4 55	18 35	0 31	1 50	14 14	1.5	0 1	2.9
50	4 46	18 44	0 35	2 6	14 23	1.4	. . .	.0
55	4 34	18 56	0 40	2 33	14 34	1.2	. . .	.0
60	4 19	19 12	0 48	3 39	14 49	1.0	. . .	.0
S								

SUNCE				MESEC			
UT	e = Tp − UT	Δ/24	r	Prolaz	Δ/24	$\pi_\leftmoon$	r
h	min s	s	′	h min	min	′	′
00	15 23.1	.4	16.1	$T_{\overline{m}}$ 19 38	2.2	58.7	16.0
12	15 27.7	$T_{\overline{m}_\odot}$ 11 h 44.5 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	′	°	
♀	8 52	.1	197	-4.9	♃	9 4	.0	193	-1.4
♂	9 12	.1	192	1.6	♄	14 3	.0	119	.8

UT	SUNCE		PROLEĆ. TAČKA	VENERA		MARS	
	$S_\odot$	$\delta_\odot$	S_Υ	S_φ	δ_φ	S_σ	δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	183 53.1	-11 12.6	31 5.5	227 1.9	6 24.7	222 15.2	6 15.9
2	213 53.3	-11 14.3	61 10.4	257 2.1	6 23.4	252 17.3	6 14.7
4	243 53.4	-11 16.1	91 15.3	287 2.3	6 22.0	282 19.4	6 13.5
6	273 53.6	-11 17.8	121 20.3	317 2.5	6 20.6	312 21.5	6 12.4
8	303 53.8	-11 19.6	151 25.2	347 2.7	6 19.3	342 23.6	6 11.2
10	333 54.0	-11 21.4	181 30.1	17 2.9	6 17.9	12 25.7	6 10.0
12	3 54.2	-11 23.1	211 35.1	47 3.1	6 16.5	42 27.7	6 8.8
14	33 54.3	-11 24.9	241 40.0	77 3.3	6 15.1	72 29.8	6 7.6
16	63 54.5	-11 26.6	271 44.9	107 3.5	6 13.7	102 31.9	6 6.4
18	93 54.7	-11 28.4	301 49.8	137 3.7	6 12.4	132 34.0	6 5.3
20	123 54.9	-11 30.1	331 54.8	167 3.9	6 11.0	162 36.1	6 4.1
22	153 55.0	-11 31.9	1 59.7	197 4.0	6 9.6	192 38.2	6 2.9
Δ	1	-9		1	-7	10	-6

UT	MESEC				JUPITER		SATURN	
	$S_\leftmoon$	Δ	$\delta_\leftmoon$	Δ	$S_{\mathrm{♃}}$	$\delta_{\mathrm{♃}}$	$S_{\mathrm{♄}}$	$\delta_{\mathrm{♄}}$
h	° ′		° ′		° ′	° ′	° ′	° ′
0	63 3.1	85	9 48.6	-95	224 24.6	6 45.3	149 40.6	-19 6.8
2	91 58.2	85	9 29.5	-97	254 28.7	6 45.0	179 45.0	-19 6.9
4	120 53.2	85	9 10.2	-98	284 32.8	6 44.6	209 49.4	-19 7.0
6	149 48.2	85	8 50.5	-100	314 36.9	6 44.3	239 53.8	-19 7.1
8	178 43.1	85	8 30.6	-101	344 40.9	6 43.9	269 58.2	-19 7.2
10	207 38.1	84	8 10.4	-102	14 45.0	6 43.6	300 2.6	-19 7.3
12	236 32.9	84	7 50.0	-103	44 49.1	6 43.3	330 6.9	-19 7.4
14	265 27.8	84	7 29.4	-104	74 53.2	6 42.9	0 11.3	-19 7.5
16	294 22.6	84	7 8.5	-105	104 57.3	6 42.6	30 15.7	-19 7.6
18	323 17.4	84	6 47.4	-107	135 1.3	6 42.2	60 20.1	-19 7.8
20	352 12.1	83	6 26.1	-108	165 5.4	6 41.9	90 24.5	-19 7.9
22	21 6.8	83	6 4.6	-109	195 9.5	6 41.6	120 28.9	-19 8.0
Δ					20	-2	22	-1

φ	SUNCE		TRAJANJE SUMRAKA		MESEC			
	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 58	16 29	0 43	2 20	13 25	3.7	2 59	.9
55	6 45	16 43	0 37	2 1	13 35	3.4	2 47	1.2
50	6 34	16 54	0 33	1 48	13 42	3.2	2 38	1.4
45	6 26	17 2	0 30	1 38	13 48	3.1	2 31	1.5
40	6 19	17 10	0 28	1 30	13 53	2.9	2 24	1.6
35	6 12	17 16	0 26	1 25	13 58	2.8	2 19	1.7
30	6 7	17 21	0 24	1 20	14 2	2.7	2 14	1.8
20	5 57	17 31	0 22	1 14	14 8	2.6	2 6	2.0
10	5 49	17 40	0 21	1 11	14 14	2.4	1 58	2.1
0	5 41	17 48	0 21	1 10	14 19	2.3	1 51	2.3
10	5 33	17 56	0 21	1 12	14 25	2.1	1 44	2.4
20	5 24	18 5	0 23	1 16	14 31	2.0	1 37	2.5
30	5 14	18 15	0 25	1 24	14 37	1.8	1 28	2.7
35	5 8	18 21	0 26	1 30	14 41	1.7	1 23	2.8
40	5 1	18 28	0 28	1 39	14 45	1.6	1 17	2.9
45	4 53	18 36	0 31	1 50	14 50	1.5	1 10	3.0
50	4 44	18 46	0 35	2 7	14 56	1.3	1 2	3.2
55	4 32	18 58	0 40	2 35	15 4	1.1	0 52	3.4
60	4 16	19 14	0 48	3 50	15 13	.9	0 39	3.6
S								

SUNCE				MESEC			
UT	e = Tp − UT	Δ/24	r	Prolaz	Δ/24	$\pi_\leftmoon$	r
h	min s	s	′	h min	min	′	′
00	15 32.3	.4	16.1	$T_{\overline{m}}$ 20 32	2.3	59.5	16.2
12	15 36.5	$T_{\overline{m}_\odot}$ 11 h 44.4 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	′	°	
♀	8 52	.1	196	-4.9	♃	9 1	.0	193	-1.4
♂	9 10	.1	191	1.6	♄	13 59	.0	119	.8

UT	SUNCE		PROLEĆ. TAČKA	VENERA		MARS	
	$S_\odot$	$\delta_\odot$	S_Υ	S_φ	δ_φ	S_σ	δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	183 55.2	-11 33.6	32 4.6	227 4.2	6 8.2	222 40.3	6 1.7
2	213 55.4	-11 35.3	62 9.6	257 4.4	6 6.8	252 42.4	6 .5
4	243 55.5	-11 37.1	92 14.5	287 4.6	6 5.4	282 44.4	5 59.4
6	273 55.7	-11 38.8	122 19.4	317 4.8	6 4.0	312 46.5	5 58.2
8	303 55.9	-11 40.6	152 24.3	347 4.9	6 2.6	342 48.6	5 57.0
10	333 56.0	-11 42.3	182 29.3	17 5.1	6 1.1	12 50.7	5 55.8
12	3 56.2	-11 44.1	212 34.2	47 5.3	5 59.7	42 52.8	5 54.6
14	33 56.4	-11 45.8	242 39.1	77 5.5	5 58.3	72 54.9	5 53.4
16	63 56.5	-11 47.5	272 44.1	107 5.6	5 56.9	102 57.0	5 52.3
18	93 56.7	-11 49.3	302 49.0	137 5.8	5 55.5	132 59.1	5 51.1
20	123 56.8	-11 51.0	332 53.9	167 5.9	5 54.1	163 1.2	5 49.9
22	153 57.0	-11 52.7	2 58.8	197 6.1	5 52.6	193 3.3	5 48.7
Δ	1	-9		1	-7	10	-6

UT	MESEC				JUPITER		SATURN	
	$S_\leftmoon$	Δ	$\delta_\leftmoon$	Δ	S_{4}	δ_{4}	S_η	δ_η
h	° ′		° ′		° ′	° ′	° ′	° ′
0	50 1.4	83	5 42.9	-109	225 13.6	6 41.2	150 33.2	-19 8.1
2	78 56.0	83	5 21.0	-110	255 17.6	6 40.9	180 37.6	-19 8.2
4	107 50.5	82	4 59.0	-111	285 21.7	6 40.5	210 42.0	-19 8.3
6	136 45.0	82	4 36.7	-112	315 25.8	6 40.2	240 46.4	-19 8.4
8	165 39.4	82	4 14.3	-113	345 29.9	6 39.9	270 50.8	-19 8.5
10	194 33.8	82	3 51.8	-113	15 34.0	6 39.5	300 55.1	-19 8.6
12	223 28.1	81	3 29.1	-114	45 38.1	6 39.2	330 59.5	-19 8.8
14	252 22.4	81	3 6.3	-115	75 42.1	6 38.8	1 3.9	-19 8.9
16	281 16.5	81	2 43.4	-115	105 46.2	6 38.5	31 8.3	-19 9.0
18	310 10.6	80	2 20.4	-116	135 50.3	6 38.2	61 12.7	-19 9.1
20	339 4.7	80	1 57.2	-116	165 54.4	6 37.8	91 17.0	-19 9.2
22	7 58.6	79	1 34.0	-116	195 58.5	6 37.5	121 21.4	-19 9.3
Δ					20	-2	22	-1

φ	SUNCE		TRAJANJE SUMRAKA		MESEC			
	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 27	0 43	2 20	14 53	2.6	3 22	.9
55	6 47	16 41	0 37	2 1	14 57	2.5	3 15	1.1
50	6 36	16 52	0 33	1 48	14 60	2.5	3 11	1.3
45	6 27	17 1	0 30	1 38	15 2	2.5	3 7	1.5
40	6 20	17 8	0 28	1 31	15 4	2.4	3 3	1.6
35	6 13	17 15	0 26	1 25	15 6	2.4	3 0	1.7
30	6 8	17 20	0 24	1 20	15 7	2.4	2 58	1.8
20	5 58	17 30	0 22	1 14	15 10	2.4	2 53	2.0
10	5 49	17 39	0 21	1 11	15 12	2.3	2 49	2.1
0	5 41	17 48	0 21	1 10	15 14	2.3	2 45	2.3
10	5 33	17 56	0 22	1 12	15 16	2.3	2 41	2.4
20	5 23	18 5	0 23	1 16	15 18	2.2	2 37	2.6
30	5 13	18 16	0 25	1 24	15 21	2.2	2 33	2.7
35	5 7	18 22	0 26	1 31	15 22	2.2	2 30	2.8
40	4 60	18 29	0 28	1 39	15 24	2.2	2 27	3.0
45	4 52	18 38	0 31	1 51	15 26	2.2	2 23	3.1
50	4 42	18 48	0 35	2 8	15 28	2.1	2 19	3.2
55	4 30	19 0	0 40	2 37	15 31	2.1	2 13	3.4
60	4 13	19 17	0 48	4 8	15 35	2.1	2 6	3.7
S								

SUNCE				MESEC			
UT	e = T_p − UT	Δ/24	r	Prolaz		Δ/24	$\pi_\leftmoon$	r
h	min s	s	′		h min	min	′	′
00	15 40.8	.3	16.1	$T_{\overline{m}}$	21 27	2.3	60.2	16.4
12	15 44.7	$T_{\overline{m}_\odot}$ 11 h 44.3 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	′	°	
♀	8 52	.1	195	-4.8	♃	8 58	.0	193	-1.4
♂	9 9	.1	191	1.6	♄	13 56	.0	118	.8

UT	SUNCE		PROLEĆ. TAČKA	VENERA		MARS	
	$S_\odot$	$\delta_\odot$	S_Υ	S_φ	δ_φ	S_σ	δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	183 57.2	-11 54.5	33 3.8	227 6.3	5 51.2	223 5.3	5 47.5
2	213 57.3	-11 56.2	63 8.7	257 6.4	5 49.8	253 7.4	5 46.3
4	243 57.5	-11 57.9	93 13.6	287 6.6	5 48.3	283 9.5	5 45.2
6	273 57.6	-11 59.6	123 18.6	317 6.7	5 46.9	313 11.6	5 44.0
8	303 57.8	-12 1.4	153 23.5	347 6.9	5 45.4	343 13.7	5 42.8
10	333 57.9	-12 3.1	183 28.4	17 7.0	5 44.0	13 15.8	5 41.6
12	3 58.1	-12 4.8	213 33.3	47 7.1	5 42.6	43 17.9	5 40.4
14	33 58.2	-12 6.5	243 38.3	77 7.3	5 41.1	73 20.0	5 39.2
16	63 58.4	-12 8.3	273 43.2	107 7.4	5 39.6	103 22.1	5 38.1
18	93 58.5	-12 10.0	303 48.1	137 7.6	5 38.2	133 24.2	5 36.9
20	123 58.7	-12 11.7	333 53.1	167 7.7	5 36.7	163 26.3	5 35.7
22	153 58.8	-12 13.4	3 58.0	197 7.8	5 35.3	193 28.4	5 34.5
Δ	1	-9		1	-7	10	-6

UT	MESEC				JUPITER		SATURN	
	$S_\leftmoon$	Δ	$\delta_\leftmoon$	Δ	S_{4}	δ_{4}	S_η	δ_η
h	° ′		° ′		° ′	° ′	° ′	° ′
0	36 52.5	79	1 10.7	-117	226 2.6	6 37.2	151 25.8	-19 9.4
2	65 46.4	79	0 47.4	-117	256 6.7	6 36.8	181 30.2	-19 9.5
4	94 40.1	78	0 24.0	-117	286 10.7	6 36.5	211 34.6	-19 9.6
6	123 33.7	78	0 .5	112	316 14.8	6 36.1	241 38.9	-19 9.8
8	152 27.3	77	0 22.9	117	346 18.9	6 35.8	271 43.3	-19 9.9
10	181 20.8	77	0 46.4	117	16 23.0	6 35.5	301 47.7	-19 10.0
12	210 14.2	77	1 9.9	117	46 27.1	6 35.1	331 52.1	-19 10.1
14	239 7.5	76	1 33.4	117	76 31.2	6 34.8	1 56.4	-19 10.2
16	268 .7	76	1 56.8	117	106 35.3	6 34.5	32 .8	-19 10.3
18	296 53.8	75	2 20.3	117	136 39.4	6 34.1	62 5.2	-19 10.4
20	325 46.9	75	2 43.7	117	166 43.5	6 33.8	92 9.6	-19 10.5
22	354 39.8	74	3 7.0	116	196 47.5	6 33.5	122 13.9	-19 10.6
Δ					20	-2	22	-1

φ	SUNCE		TRAJANJE SUMRAKA		MESEC			
	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 3	16 24	0 44	2 20	15 56	.9	3 43	3.5
55	6 49	16 39	0 38	2 2	15 58	1.2	3 42	3.3
50	6 37	16 50	0 33	1 48	15 60	1.4	3 42	3.1
45	6 28	16 59	0 30	1 38	16 1	1.5	3 42	3.0
40	6 21	17 7	0 28	1 31	16 2	1.6	3 42	2.9
35	6 14	17 14	0 26	1 25	16 3	1.8	3 41	2.8
30	6 8	17 19	0 24	1 20	16 4	1.9	3 41	2.7
20	5 58	17 30	0 22	1 14	16 6	2.0	3 41	2.6
10	5 49	17 39	0 21	1 11	16 8	2.2	3 40	2.4
0	5 41	17 48	0 21	1 10	16 9	2.3	3 40	2.3
10	5 32	17 56	0 22	1 12	16 10	2.5	3 39	2.2
20	5 23	18 6	0 23	1 16	16 12	2.6	3 39	2.1
30	5 12	18 17	0 25	1 25	16 14	2.8	3 38	1.9
35	5 6	18 23	0 26	1 31	16 15	2.9	3 38	1.9
40	4 59	18 30	0 29	1 40	16 16	3.0	3 38	1.8
45	4 50	18 39	0 31	1 51	16 18	3.2	3 37	1.7
50	4 40	18 49	0 35	2 9	16 19	3.3	3 36	1.6
55	4 27	19 2	0 41	2 39	16 21	3.6	3 36	1.4
60	4 11	19 19	0 49	: ::	16 24	3.8	3 35	1.2
S								

SUNCE				MESEC			
UT	e = T_p − UT	Δ/24	r	Prolaz		Δ/24	$\pi_\leftmoon$	r
h	min s	s	′		h min	min	′	′
00	15 48.6	.3	16.1	$T_{\overline{m}}$	22 22	2.4	60.8	16.6
12	15 52.2	$T_{\overline{m}_\odot}$ 11 h 44.1 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	′	°	
♀	8 52	.1	194	-4.8	♃	8 55	.0	193	-1.4
♂	9 7	.1	190	1.6	♄	13 52	.0	118	.8

UT	SUNCE		PROLEĆ. TAČKA	VENERA		MARS	
	$S_\odot$	$\delta_\odot$	S_Υ	S_φ	δ_φ	S_σ	δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	183 58.9	-12 15.1	34 2.9	227 8.0	5 33.8	223 30.5	5 33.3
2	213 59.1	-12 16.8	64 7.8	257 8.1	5 32.3	253 32.6	5 32.1
4	243 59.2	-12 18.6	94 12.8	287 8.2	5 30.9	283 34.7	5 30.9
6	273 59.4	-12 20.3	124 17.7	317 8.3	5 29.4	313 36.8	5 29.8
8	303 59.5	-12 22.0	154 22.6	347 8.5	5 27.9	343 38.9	5 28.6
10	333 59.6	-12 23.7	184 27.5	17 8.6	5 26.5	13 41.0	5 27.4
12	3 59.8	-12 25.4	214 32.5	47 8.7	5 25.0	43 43.1	5 26.2
14	33 59.9	-12 27.1	244 37.4	77 8.8	5 23.5	73 45.2	5 25.0
16	64 .0	-12 28.8	274 42.3	107 8.9	5 22.0	103 47.3	5 23.8
18	94 .2	-12 30.5	304 47.3	137 9.0	5 20.5	133 49.4	5 22.6
20	124 .3	-12 32.2	334 52.2	167 9.1	5 19.0	163 51.5	5 21.5
22	154 .4	-12 33.9	4 57.1	197 9.2	5 17.5	193 53.6	5 20.3
Δ	1	-9		1	-7	10	-6

UT	MESEC				JUPITER		SATURN	
	$S_\leftmoon$	Δ	$\delta_\leftmoon$	Δ	S_{4}	δ_{4}	S_η	δ_η
h	° ′		° ′		° ′	° ′	° ′	° ′
0	23 32.6	74	3 30.3	116	226 51.6	6 33.1	152 18.3	-19 10.8
2	52 25.4	73	3 53.5	116	256 55.7	6 32.8	182 22.7	-19 10.9
4	81 18.0	73	4 16.6	115	286 59.8	6 32.5	212 27.1	-19 11.0
6	110 10.5	72	4 39.6	114	317 3.9	6 32.1	242 31.4	-19 11.1
8	139 2.9	72	5 2.5	114	347 8.0	6 31.8	272 35.8	-19 11.2
10	167 55.3	71	5 25.2	113	17 12.1	6 31.5	302 40.2	-19 11.3
12	196 47.5	71	5 47.8	112	47 16.2	6 31.1	332 44.6	-19 11.4
14	225 39.6	70	6 10.3	112	77 20.3	6 30.8	2 48.9	-19 11.5
16	254 31.6	70	6 32.6	111	107 24.4	6 30.5	32 53.3	-19 11.6
18	283 23.5	69	6 54.8	110	137 28.5	6 30.1	62 57.7	-19 11.8
20	312 15.3	68	7 16.7	109	167 32.6	6 29.8	93 2.0	-19 11.9
22	341 7.0	68	7 38.4	108	197 36.7	6 29.5	123 6.4	-19 12.0
Δ					20	-2	22	-1

φ	SUNCE		TRAJANJE SUMRAKA		MESEC			
	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 6	16 21	0 44	2 20	16 18	1.0	5 7	3.8
55	6 51	16 36	0 38	2 2	16 26	1.3	5 2	3.5
50	6 39	16 48	0 33	1 48	16 32	1.5	4 57	3.3
45	6 30	16 58	0 30	1 38	16 37	1.6	4 54	3.2
40	6 22	17 6	0 28	1 31	16 42	1.7	4 51	3.0
35	6 15	17 12	0 26	1 25	16 46	1.8	4 48	2.9
30	6 9	17 19	0 24	1 20	16 49	1.9	4 46	2.8
20	5 59	17 29	0 22	1 14	16 55	2.1	4 42	2.7
10	5 49	17 38	0 21	1 11	17 0	2.2	4 39	2.5
0	5 41	17 47	0 21	1 10	17 5	2.4	4 35	2.4
10	5 32	17 56	0 22	1 12	17 10	2.5	4 32	2.2
20	5 22	18 6	0 23	1 17	17 15	2.7	4 29	2.1
30	5 11	18 17	0 25	1 25	17 22	2.8	4 25	1.9
35	5 5	18 24	0 27	1 31	17 25	2.9	4 23	1.8
40	4 57	18 31	0 29	1 40	17 29	3.0	4 20	1.7
45	4 49	18 40	0 31	1 52	17 34	3.2	4 17	1.6
50	4 38	18 51	0 35	2 10	17 40	3.3	4 14	1.4
55	4 25	19 4	0 41	2 42	17 47	3.5	4 9	1.2
60	4 8	19 22	0 49	: ::	17 56	3.8	4 4	1.0
S								

SUNCE				MESEC			
UT	e = T_p − UT	Δ/24	r	Prolaz	Δ/24	$\pi_\leftmoon$	r
h	min s	s	′	h min	min	′	′
00	15 55.8	.3	16.1	$T_{\overline{m}}$ 23 19	2.4	61.1	16.7
12	15 59.0	$T_{\overline{m}_\odot}$ 11 h 44.0 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	′	°	
♀	8 51	.1	193	-4.8	♃	8 51	.0	193	-1.4
♂	9 5	.1	189	1.6	♄	13 49	.0	118	.8

UT	SUNCE		PROLEĆ. TAČKA	VENERA		MARS	
	$S_\odot$	$\delta_\odot$	S_Υ	S_φ	δ_φ	S_σ	δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	184 .6	-12 35.6	35 2.0	227 9.3	5 16.0	223 55.7	5 19.1
2	214 .7	-12 37.3	65 7.0	257 9.4	5 14.5	253 57.8	5 17.9
4	244 .8	-12 39.0	95 11.9	287 9.5	5 13.0	283 59.9	5 16.7
6	274 .9	-12 40.7	125 16.8	317 9.6	5 11.5	314 2.0	5 15.5
8	304 1.0	-12 42.4	155 21.8	347 9.7	5 10.0	344 4.1	5 14.3
10	334 1.2	-12 44.1	185 26.7	17 9.8	5 8.5	14 6.2	5 13.2
12	4 1.3	-12 45.8	215 31.6	47 9.9	5 7.0	44 8.3	5 12.0
14	34 1.4	-12 47.5	245 36.5	77 10.0	5 5.5	74 10.4	5 10.8
16	64 1.5	-12 49.2	275 41.5	107 10.1	5 4.0	104 12.5	5 9.6
18	94 1.6	-12 50.9	305 46.4	137 10.2	5 2.5	134 14.6	5 8.4
20	124 1.8	-12 52.5	335 51.3	167 10.3	5 .9	164 16.7	5 7.2
22	154 1.9	-12 54.2	5 56.3	197 10.3	4 59.4	194 18.8	5 6.0
Δ	1	-8		0	-8	11	-6

UT	MESEC				JUPITER		SATURN	
	$S_\leftmoon$	Δ	$\delta_\leftmoon$	Δ	S_{4}	δ_{4}	S_η	δ_η
h	° ′		° ′		° ′	° ′	° ′	° ′
0	9 58.6	67	8 .0	107	227 40.8	6 29.1	153 10.8	-19 12.1
2	38 50.1	67	8 21.3	105	257 44.9	6 28.8	183 15.2	-19 12.2
4	67 41.5	66	8 42.3	104	287 49.0	6 28.5	213 19.5	-19 12.3
6	96 32.8	66	9 3.2	103	317 53.1	6 28.1	243 23.9	-19 12.4
8	125 24.0	66	9 23.7	102	347 57.2	6 27.8	273 28.3	-19 12.5
10	154 15.1	65	9 44.1	100	18 1.3	6 27.5	303 32.6	-19 12.6
12	183 6.1	65	10 4.1	99	48 5.4	6 27.1	333 37.0	-19 12.8
14	211 57.0	64	10 23.8	97	78 9.5	6 26.8	3 41.4	-19 12.9
16	240 47.8	64	10 43.2	96	108 13.6	6 26.5	33 45.7	-19 13.0
18	269 38.6	63	11 2.4	94	138 17.7	6 26.2	63 50.1	-19 13.1
20	298 29.3	63	11 21.2	92	168 21.8	6 25.8	93 54.5	-19 13.2
22	327 19.8	63	11 39.7	91	198 25.9	6 25.5	123 58.8	-19 13.3
Δ					21	-2	22	-1

φ	SUNCE		TRAJANJE SUMRAKA		MESEC			
	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 8	16 18	0 44	2 21	16 42	1.2	6 39	3.7
55	6 53	16 34	0 38	2 2	16 57	1.5	6 27	3.5
50	6 41	16 46	0 33	1 49	17 7	1.6	6 17	3.3
45	6 31	16 56	0 30	1 39	17 16	1.8	6 10	3.1
40	6 23	17 4	0 28	1 31	17 24	1.9	6 4	3.0
35	6 16	17 11	0 26	1 25	17 30	2.0	5 59	2.9
30	6 10	17 18	0 24	1 20	17 36	2.0	5 54	2.8
20	5 59	17 29	0 23	1 14	17 45	2.2	5 46	2.7
10	5 50	17 38	0 21	1 11	17 54	2.3	5 39	2.5
0	5 41	17 47	0 21	1 10	18 2	2.4	5 32	2.4
10	5 31	17 57	0 22	1 12	18 10	2.5	5 25	2.3
20	5 22	18 7	0 23	1 17	18 19	2.6	5 18	2.1
30	5 10	18 18	0 25	1 25	18 29	2.8	5 10	2.0
35	5 3	18 25	0 27	1 32	18 35	2.9	5 6	1.9
40	4 56	18 33	0 29	1 40	18 42	3.0	5 1	1.8
45	4 47	18 42	0 32	1 53	18 50	3.1	4 54	1.7
50	4 36	18 53	0 35	2 11	18 59	3.2	4 47	1.5
55	4 23	19 6	0 41	2 44	19 11	3.4	4 38	1.4
60	4 5	19 25	0 50	: ::	19 27	3.6	4 27	1.1
S								

SUNCE				MESEC			
UT	e = T_p − UT	Δ/24	r	Prolaz	Δ/24	$\pi_\leftmoon$	r
h	min s	s	′	h min	min	′	′
00	16 2.2	.2	16.1	$T_{\overline{m}}$ . . .	1.0	61.1	16.7
12	16 5.1	$T_{\overline{m}_\odot}$ 11 h 43.9 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	′	°	
♀	8 51	.1	192	-4.8	♃	8 48	.0	193	-1.4
♂	9 4	.1	189	1.5	♄	13 45	.0	118	.7

UT	SUNCE $S_\odot$	SUNCE $\delta_\odot$	PROLEĆ. TAČKA S_Υ	VENERA S_φ	VENERA δ_φ	MARS S_σ	MARS δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	184 2.0	-12 55.9	36 1.2	227 10.4	4 57.9	224 20.9	5 4.9
2	214 2.1	-12 57.6	66 6.1	257 10.5	4 56.4	254 23.0	5 3.7
4	244 2.2	-12 59.3	96 11.0	287 10.6	4 54.8	284 25.1	5 2.5
6	274 2.3	-13 .9	126 16.0	317 10.6	4 53.3	314 27.2	5 1.3
8	304 2.4	-13 2.6	156 20.9	347 10.7	4 51.8	344 29.3	5 .1
10	334 2.5	-13 4.3	186 25.8	17 10.8	4 50.2	14 31.4	4 58.9
12	4 2.6	-13 6.0	216 30.8	47 10.9	4 48.7	44 33.5	4 57.7
14	34 2.7	-13 7.6	246 35.7	77 10.9	4 47.1	74 35.7	4 56.5
16	64 2.8	-13 9.3	276 40.6	107 11.0	4 45.6	104 37.8	4 55.4
18	94 2.9	-13 11.0	306 45.5	137 11.0	4 44.0	134 39.9	4 54.2
20	124 3.0	-13 12.7	336 50.5	167 11.1	4 42.5	164 42.0	4 53.0
22	154 3.1	-13 14.3	6 55.4	197 11.2	4 40.9	194 44.1	4 51.8
Δ	1	-8		0	-8	11	-6

UT	MESEC $S_\leftmoon$	MESEC Δ	MESEC $\delta_\leftmoon$	MESEC Δ	JUPITER S_{4}	JUPITER δ_{4}	SATURN S_{η}	SATURN δ_{η}
h	° ′		° ′		° ′	° ′	° ′	° ′
0	356 10.4	62	11 57.8	89	228 30.0	6 25.2	154 3.2	-19 13.4
2	25 .8	62	12 15.6	87	258 34.1	6 24.8	184 7.6	-19 13.5
4	53 51.2	62	12 33.0	85	288 38.2	6 24.5	214 11.9	-19 13.6
6	82 41.5	61	12 50.1	83	318 42.3	6 24.2	244 16.3	-19 13.8
8	111 31.8	61	13 6.8	82	348 46.4	6 23.9	274 20.7	-19 13.9
10	140 22.0	61	13 23.1	80	18 50.6	6 23.5	304 25.0	-19 14.0
12	169 12.2	61	13 39.0	78	48 54.7	6 23.2	334 29.4	-19 14.1
14	198 2.3	60	13 54.5	76	78 58.8	6 22.9	4 33.8	-19 14.2
16	226 52.4	60	14 9.6	73	109 2.9	6 22.5	34 38.1	-19 14.3
18	255 42.5	60	14 24.3	71	139 7.0	6 22.2	64 42.5	-19 14.4
20	284 32.5	60	14 38.6	69	169 11.1	6 21.9	94 46.9	-19 14.5
22	313 22.5	60	14 52.4	67	199 15.2	6 21.6	124 51.2	-19 14.6
Δ					21	-2	22	-1

φ	SUNCE IZLAZ	SUNCE ZALAZ	TRAJANJE SUMRAKA GRAĐ.	TRAJANJE SUMRAKA ASTR.	MESEC IZLAZ	MESEC Δ/24	MESEC ZALAZ	MESEC Δ/24
N	h min	h min	h min	h min	h min	min	h min	min
60	7 11	16 16	0 44	2 21	17 12	1.5	8 8	3.5
55	6 55	16 32	0 38	2 2	17 32	1.7	7 50	3.3
50	6 42	16 45	0 34	1 49	17 47	1.8	7 36	3.1
45	6 32	16 55	0 30	1 39	17 59	2.0	7 25	3.0
40	6 24	17 3	0 28	1 31	18 9	2.0	7 16	2.9
35	6 17	17 10	0 26	1 25	18 17	2.1	7 8	2.8
30	6 11	17 17	0 25	1 21	18 25	2.2	7 1	2.7
20	5 60	17 28	0 23	1 14	18 38	2.3	6 50	2.6
10	5 50	17 38	0 22	1 11	18 49	2.3	6 39	2.5
0	5 40	17 47	0 21	1 11	19 0	2.4	6 30	2.4
10	5 31	17 57	0 22	1 12	19 11	2.5	6 20	2.3
20	5 21	18 7	0 23	1 17	19 23	2.6	6 10	2.2
30	5 9	18 19	0 25	1 25	19 36	2.7	5 58	2.1
35	5 2	18 26	0 27	1 32	19 44	2.7	5 51	2.0
40	4 55	18 34	0 29	1 41	19 53	2.8	5 44	2.0
45	4 45	18 43	0 32	1 53	20 4	2.9	5 35	1.9
50	4 34	18 54	0 36	2 12	20 16	3.0	5 24	1.7
55	4 21	19 8	0 41	2 47	20 32	3.1	5 11	1.6
60	4 2	19 27	0 50	: ::	20 54	3.3	4 54	1.4
S								

SUNCE UT	SUNCE $e = T_p - UT$	SUNCE Δ/24	SUNCE r	MESEC Prolaz	MESEC Δ/24	MESEC $\pi_\leftmoon$	MESEC r
h	min s	s	′	h min	min	′	′
00	16 7.9	.2	16.1	$T_{\overline{m}}$ 0 16	2.4	60.8	16.6
12	16 10.4	$T_{\overline{m}_\odot}$ 11 h 43.8 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	′	°	
♀	8 51	.1	191	-4.7	♃	8 45	.0	192	-1.4
♂	9 2	.1	188	1.5	♄	13 42	.0	118	.7

UT	SUNCE $S_\odot$	SUNCE $\delta_\odot$	PROLEĆ. TAČKA S_Υ	VENERA S_φ	VENERA δ_φ	MARS S_σ	MARS δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	184 3.2	-13 16.0	37 .3	227 11.2	4 39.4	224 46.2	4 50.6
2	214 3.3	-13 17.7	67 5.3	257 11.3	4 37.8	254 48.3	4 49.4
4	244 3.4	-13 19.3	97 10.2	287 11.3	4 36.2	284 50.4	4 48.2
6	274 3.5	-13 21.0	127 15.1	317 11.4	4 34.7	314 52.5	4 47.0
8	304 3.6	-13 22.6	157 20.0	347 11.4	4 33.1	344 54.6	4 45.9
10	334 3.7	-13 24.3	187 25.0	17 11.4	4 31.5	14 56.7	4 44.7
12	4 3.8	-13 26.0	217 29.9	47 11.5	4 30.0	44 58.9	4 43.5
14	34 3.8	-13 27.6	247 34.8	77 11.5	4 28.4	75 1.0	4 42.3
16	64 3.9	-13 29.3	277 39.8	107 11.6	4 26.8	105 3.1	4 41.1
18	94 4.0	-13 30.9	307 44.7	137 11.6	4 25.2	135 5.2	4 39.9
20	124 4.1	-13 32.6	337 49.6	167 11.6	4 23.7	165 7.3	4 38.7
22	154 4.2	-13 34.2	7 54.5	197 11.7	4 22.1	195 9.4	4 37.5
Δ	0	-8		0	-8	11	-6

UT	MESEC $S_\leftmoon$	MESEC Δ	MESEC $\delta_\leftmoon$	MESEC Δ	JUPITER S_{4}	JUPITER δ_{4}	SATURN S_{η}	SATURN δ_{η}
h	° ′		° ′		° ′	° ′	° ′	° ′
0	342 12.6	60	15 5.9	65	229 19.3	6 21.2	154 55.6	-19 14.8
2	11 2.6	60	15 18.8	63	259 23.4	6 20.9	184 60.0	-19 14.9
4	39 52.6	60	15 31.4	60	289 27.6	6 20.6	215 4.3	-19 15.0
6	68 42.6	60	15 43.5	58	319 31.7	6 20.3	245 8.7	-19 15.1
8	97 32.7	60	15 55.1	56	349 35.8	6 19.9	275 13.0	-19 15.2
10	126 22.8	61	16 6.3	54	19 39.9	6 19.6	305 17.4	-19 15.3
12	155 12.9	61	16 17.1	51	49 44.0	6 19.3	335 21.8	-19 15.4
14	184 3.1	61	16 27.3	49	79 48.1	6 19.0	5 26.1	-19 15.5
16	212 53.3	61	16 37.1	47	109 52.2	6 18.6	35 30.5	-19 15.6
18	241 43.6	62	16 46.5	44	139 56.4	6 18.3	65 34.9	-19 15.8
20	270 33.9	62	16 55.3	42	170 .5	6 18.0	95 39.2	-19 15.9
22	299 24.3	63	17 3.7	40	200 4.6	6 17.7	125 43.6	-19 16.0
Δ					21	-2	22	-1

φ	SUNCE IZLAZ	SUNCE ZALAZ	TRAJANJE SUMRAKA GRAĐ.	TRAJANJE SUMRAKA ASTR.	MESEC IZLAZ	MESEC Δ/24	MESEC ZALAZ	MESEC Δ/24
N	h min	h min	h min	h min	h min	min	h min	min
60	7 14	16 13	0 44	2 21	17 48	1.9	9 31	3.1
55	6 57	16 30	0 38	2 2	18 13	2.0	9 8	2.9
50	6 44	16 43	0 34	1 49	18 31	2.1	8 51	2.8
45	6 34	16 53	0 30	1 39	18 45	2.1	8 37	2.8
40	6 25	17 2	0 28	1 31	18 57	2.2	8 25	2.7
35	6 18	17 9	0 26	1 25	19 8	2.2	8 16	2.7
30	6 11	17 16	0 25	1 21	19 17	2.3	8 7	2.6
20	5 60	17 27	0 23	1 14	19 32	2.3	7 53	2.5
10	5 50	17 38	0 22	1 11	19 46	2.3	7 40	2.5
0	5 40	17 47	0 21	1 11	19 58	2.4	7 28	2.4
10	5 31	17 57	0 22	1 12	20 11	2.4	7 16	2.4
20	5 20	18 7	0 23	1 17	20 25	2.5	7 3	2.3
30	5 8	18 20	0 25	1 26	20 41	2.5	6 49	2.2
35	5 1	18 27	0 27	1 32	20 50	2.5	6 40	2.2
40	4 53	18 35	0 29	1 41	21 0	2.6	6 31	2.1
45	4 44	18 44	0 32	1 54	21 13	2.6	6 19	2.0
50	4 33	18 56	0 36	2 14	21 28	2.7	6 6	2.0
55	4 18	19 11	0 42	2 49	21 47	2.7	5 49	1.9
60	3 59	19 30	0 51	: ::	22 13	2.8	5 26	1.7
S								

SUNCE UT	SUNCE $e = T_p - UT$	SUNCE Δ/24	SUNCE r	MESEC Prolaz	MESEC Δ/24	MESEC $\pi_\leftmoon$	MESEC r
h	min s	s	′	h min	min	′	′
00	16 12.8	.2	16.1	$T_{\overline{m}}$ 1 14	2.4	60.2	16.4
12	16 14.9	$T_{\overline{m}_\odot}$ 11 h 43.8 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	′	°	
♀	8 51	.1	190	-4.7	♃	8 42	.0	192	-1.4
♂	9 0	.1	188	1.5	♄	13 38	.0	118	.7

30. OKTOBAR 2015. PETAK

UT	SUNCE $S_\odot$	SUNCE $\delta_\odot$	PROLEĆ. TAČKA S_Υ	VENERA S_φ	VENERA δ_φ	MARS S_σ	MARS δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	184 4.3	-13 35.9	37 59.5	227 11.7	4 20.5	225 11.5	4 36.3
2	214 4.3	-13 37.5	68 4.4	257 11.7	4 18.9	255 13.6	4 35.2
4	244 4.4	-13 39.2	98 9.3	287 11.8	4 17.3	285 15.8	4 34.0
6	274 4.5	-13 40.8	128 14.2	317 11.8	4 15.7	315 17.9	4 32.8
8	304 4.6	-13 42.5	158 19.2	347 11.8	4 14.1	345 20.0	4 31.6
10	334 4.6	-13 44.1	188 24.1	17 11.8	4 12.5	15 22.1	4 30.4
12	4 4.7	-13 45.7	218 29.0	47 11.9	4 10.9	45 24.2	4 29.2
14	34 4.8	-13 47.4	248 34.0	77 11.9	4 9.3	75 26.3	4 28.0
16	64 4.8	-13 49.0	278 38.9	107 11.9	4 7.7	105 28.4	4 26.8
18	94 4.9	-13 50.6	308 43.8	137 11.9	4 6.1	135 30.6	4 25.7
20	124 5.0	-13 52.3	338 48.7	167 11.9	4 4.5	165 32.7	4 24.5
22	154 5.0	-13 53.9	8 53.7	197 11.9	4 2.9	195 34.8	4 23.3
Δ	0	-8		0	-8	11	-6

UT	MESEC $S_\leftmoon$	MESEC Δ	MESEC $\delta_\leftmoon$	MESEC Δ	JUPITER $S_{\mathrm{♃}}$	JUPITER $\delta_{\mathrm{♃}}$	SATURN $S_{\mathrm{♄}}$	SATURN $\delta_{\mathrm{♄}}$
h	° ′		° ′		° ′	° ′	° ′	° ′
0	328 14.8	63	17 11.7	37	230 8.7	6 17.3	155 47.9	-19 16.1
2	357 5.4	63	17 19.1	35	260 12.8	6 17.0	185 52.3	-19 16.2
4	25 56.1	64	17 26.1	33	290 17.0	6 16.7	215 56.7	-19 16.3
6	54 46.9	65	17 32.6	30	320 21.1	6 16.4	246 1.0	-19 16.4
8	83 37.8	65	17 38.6	28	350 25.2	6 16.0	276 5.4	-19 16.5
10	112 28.9	66	17 44.2	25	20 29.3	6 15.7	306 9.7	-19 16.7
12	141 20.0	66	17 49.3	23	50 33.4	6 15.4	336 14.1	-19 16.8
14	170 11.3	67	17 53.9	21	80 37.6	6 15.1	6 18.5	-19 16.9
16	199 2.8	68	17 58.0	18	110 41.7	6 14.7	36 22.8	-19 17.0
18	227 54.4	69	18 1.7	16	140 45.8	6 14.4	66 27.2	-19 17.1
20	256 46.1	70	18 4.9	14	170 49.9	6 14.1	96 31.5	-19 17.2
22	285 38.1	70	18 7.6	11	200 54.1	6 13.8	126 35.9	-19 17.3
Δ					21	-2	22	-1

φ	SUNCE IZLAZ	SUNCE ZALAZ	TRAJANJE SUMRAKA GRAĐ.	TRAJANJE SUMRAKA ASTR.	MESEC IZLAZ	MESEC Δ/24	MESEC ZALAZ	MESEC Δ/24
N	h min	h min	h min	h min	h min	min	h min	min
60	7 16	16 10	0 45	2 22	18 34	2.3	10 45	2.5
55	6 59	16 28	0 38	2 3	19 1	2.3	10 18	2.5
50	6 46	16 41	0 34	1 49	19 21	2.3	9 59	2.5
45	6 35	16 52	0 30	1 39	19 37	2.3	9 43	2.5
40	6 26	17 1	0 28	1 31	19 50	2.3	9 30	2.4
35	6 19	17 8	0 26	1 25	20 1	2.3	9 19	2.4
30	6 12	17 15	0 25	1 21	20 11	2.3	9 10	2.4
20	6 0	17 27	0 23	1 15	20 27	2.3	8 53	2.4
10	5 50	17 37	0 22	1 11	20 42	2.3	8 39	2.4
0	5 40	17 47	0 21	1 11	20 56	2.3	8 26	2.4
10	5 30	17 57	0 22	1 13	21 9	2.3	8 12	2.3
20	5 20	18 8	0 23	1 17	21 24	2.3	7 58	2.3
30	5 7	18 20	0 25	1 26	21 41	2.3	7 42	2.3
35	5 0	18 28	0 27	1 33	21 51	2.3	7 32	2.3
40	4 52	18 36	0 29	1 42	22 2	2.3	7 21	2.3
45	4 42	18 46	0 32	1 55	22 15	2.3	7 9	2.2
50	4 31	18 58	0 36	2 15	22 32	2.3	6 53	2.2
55	4 16	19 13	0 42	2 52	22 52	2.3	6 33	2.2
60	3 57	19 33	0 51	: ::	23 20	2.3	6 7	2.1
S								

SUNCE UT	SUNCE $e = T_p - UT$	SUNCE Δ/24	SUNCE r	MESEC Prolaz	MESEC Δ/24	MESEC $\pi_\leftmoon$	MESEC r
h	min s	s	′	h min	min	′	′
00	16 17.0	.1	16.1	$T_{\overline{m}}$ 2 12	2.4	59.4	16.2
12	16 18.7	$T_{\overline{m}_\odot}$ 11 h 43.7 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	′	°	
♀	8 51	.1	189	-4.7	♄	8 38	.0	192	-1.4
♂	8 59	.1	187	1.5	♃	13 35	.0	118	.7

31. OKTOBAR SUBOTA

UT	SUNCE $S_\odot$	SUNCE $\delta_\odot$	PROLEĆ. TAČKA S_Υ	VENERA S_φ	VENERA δ_φ	MARS S_σ	MARS δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	184 5.1	-13 55.5	38 58.6	227 11.9	4 1.2	225 36.9	4 22.1
2	214 5.2	-13 57.2	69 3.5	257 11.9	3 59.6	255 39.0	4 20.9
4	244 5.2	-13 58.8	99 8.5	287 11.9	3 58.0	285 41.1	4 19.7
6	274 5.3	-14 .4	129 13.4	317 11.9	3 56.4	315 43.3	4 18.5
8	304 5.3	-14 2.1	159 18.3	347 11.9	3 54.8	345 45.4	4 17.3
10	334 5.4	-14 3.7	189 23.2	17 11.9	3 53.1	15 47.5	4 16.1
12	4 5.4	-14 5.3	219 28.2	47 11.9	3 51.5	45 49.6	4 14.9
14	34 5.5	-14 6.9	249 33.1	77 11.9	3 49.9	75 51.7	4 13.8
16	64 5.5	-14 8.5	279 38.0	107 11.9	3 48.2	105 53.9	4 12.6
18	94 5.6	-14 10.2	309 43.0	137 11.9	3 46.6	135 56.0	4 11.4
20	124 5.6	-14 11.8	339 47.9	167 11.9	3 45.0	165 58.1	4 10.2
22	154 5.7	-14 13.4	9 52.8	197 11.9	3 43.3	196 .2	4 9.0
Δ	0	-8		0	-8	11	-6

UT	MESEC $S_\leftmoon$	MESEC Δ	MESEC $\delta_\leftmoon$	MESEC Δ	JUPITER $S_{\mathrm{♃}}$	JUPITER $\delta_{\mathrm{♃}}$	SATURN $S_{\mathrm{♄}}$	SATURN $\delta_{\mathrm{♄}}$
h	° ′		° ′		° ′	° ′	° ′	° ′
0	314 30.2	71	18 9.9	9	230 58.2	6 13.5	156 40.2	-19 17.4
2	343 22.4	72	18 11.7	7	261 2.3	6 13.1	186 44.6	-19 17.5
4	12 14.9	73	18 13.1	4	291 6.4	6 12.8	216 49.0	-19 17.7
6	41 7.6	74	18 14.0	2	321 10.6	6 12.5	246 53.3	-19 17.8
8	70 .4	75	18 14.4	0	351 14.7	6 12.2	276 57.7	-19 17.9
10	98 53.5	76	18 14.4	-2	21 18.8	6 11.9	307 2.0	-19 18.0
12	127 46.8	77	18 13.9	-4	51 22.9	6 11.5	337 6.4	-19 18.1
14	156 40.3	79	18 13.1	-7	81 27.1	6 11.2	7 10.7	-19 18.2
16	185 34.0	80	18 11.7	-9	111 31.2	6 10.9	37 15.1	-19 18.3
18	214 27.9	81	18 10.0	-11	141 35.3	6 10.6	67 19.5	-19 18.4
20	243 22.1	82	18 7.8	-13	171 39.5	6 10.3	97 23.8	-19 18.5
22	272 16.5	83	18 5.2	-15	201 43.6	6 9.9	127 28.2	-19 18.7
Δ					21	-2	22	-1

φ	SUNCE IZLAZ	SUNCE ZALAZ	TRAJANJE SUMRAKA GRAĐ.	TRAJANJE SUMRAKA ASTR.	MESEC IZLAZ	MESEC Δ/24	MESEC ZALAZ	MESEC Δ/24
N	h min	h min	h min	h min	h min	min	h min	min
60	7 19	16 8	0 45	2 22	19 29	2.6	11 46	2.0
55	7 1	16 26	0 38	2 3	19 56	2.5	11 18	2.1
50	6 47	16 39	0 34	1 49	20 16	2.5	10 58	2.1
45	6 36	16 50	0 30	1 39	20 32	2.4	10 42	2.1
40	6 27	16 59	0 28	1 31	20 45	2.4	10 29	2.2
35	6 20	17 7	0 26	1 25	20 56	2.4	10 18	2.2
30	6 13	17 14	0 25	1 21	21 6	2.3	10 8	2.2
20	6 1	17 26	0 23	1 15	21 23	2.3	9 51	2.2
10	5 50	17 37	0 22	1 12	21 37	2.2	9 36	2.2
0	5 40	17 47	0 21	1 11	21 51	2.2	9 22	2.3
10	5 30	17 57	0 22	1 13	22 5	2.2	9 9	2.3
20	5 19	18 8	0 23	1 17	22 20	2.1	8 54	2.3
30	5 7	18 21	0 25	1 26	22 36	2.1	8 37	2.3
35	4 59	18 29	0 27	1 33	22 46	2.0	8 27	2.3
40	4 51	18 37	0 29	1 42	22 57	2.0	8 16	2.4
45	4 41	18 47	0 32	1 55	23 10	2.2	8 2	2.4
50	4 29	18 59	0 36	2 16	23 26	2.2	7 46	2.4
55	4 14	19 15	0 42	2 55	23 47	2.2	7 25	2.4
60	3 54	19 35	0 52	: ::	.. ..	.0	6 57	2.5
S								

SUNCE UT	SUNCE $e = T_p - UT$	SUNCE Δ/24	SUNCE r	MESEC Prolaz	MESEC Δ/24	MESEC $\pi_\leftmoon$	MESEC r
h	min s	s	′	h min	min	′	′
00	16 20.4	.1	16.1	$T_{\overline{m}}$ 3 9	2.3	58.5	15.9
12	16 21.7	$T_{\overline{m}_\odot}$ 11 h 43.6 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	′	°	
♀	8 51	.1	188	-4.7	♄	8 35	.0	192	-1.4
♂	8 57	.1	187	1.5	♃	13 31	.0	118	.7

UT	SUNCE				PROLEĆ. TAČKA	VENERA				MARS			
	$S_\odot$		$\delta_\odot$		S_Υ	S_φ		δ_φ		S_σ		δ_σ	
h	°	′	°	′	° ′	°	′	°	′	°	′	°	′
0	184	5.7	-14	15.0	39 57.7	227	11.9	3	41.7	226	2.3	4	7.8
2	214	5.8	-14	16.6	70 2.7	257	11.9	3	40.0	256	4.5	4	6.6
4	244	5.8	-14	18.2	100 7.6	287	11.8	3	38.4	286	6.6	4	5.4
6	274	5.9	-14	19.8	130 12.5	317	11.8	3	36.7	316	8.7	4	4.2
8	304	5.9	-14	21.4	160 17.5	347	11.8	3	35.1	346	10.8	4	3.1
10	334	6.0	-14	23.0	190 22.4	17	11.8	3	33.4	16	12.9	4	1.9
12	4	6.0	-14	24.6	220 27.3	47	11.8	3	31.8	46	15.1	4	.7
14	34	6.0	-14	26.2	250 32.2	77	11.7	3	30.1	76	17.2	3	59.5
16	64	6.1	-14	27.8	280 37.2	107	11.7	3	28.4	106	19.3	3	58.3
18	94	6.1	-14	29.4	310 42.1	137	11.7	3	26.8	136	21.4	3	57.1
20	124	6.1	-14	31.0	340 47.0	167	11.6	3	25.1	166	23.6	3	55.9
22	154	6.2	-14	32.6	10 52.0	197	11.6	3	23.5	196	25.7	3	54.7
Δ		0		-8			0		-8		11		-6

UT	MESEC					JUPITER				SATURN			
	$S_\leftmoon$		Δ	$\delta_\leftmoon$		Δ	$S_{\mathrm{♃}}$		$\delta_{\mathrm{♃}}$		$S_{\mathrm{♄}}$		$\delta_{\mathrm{♄}}$	
h	°	′		°	′		° ′		°	′	°	′	°	′
0	301	11.2	85	18	2.2	-17	231	47.7	6	9.6	157	32.5	-19	18.8
2	330	6.1	86	17	58.8	-19	261	51.9	6	9.3	187	36.9	-19	18.9
4	359	1.2	87	17	54.9	-21	291	56.0	6	9.0	217	41.2	-19	19.0
6	27	56.6	88	17	50.7	-23	322	.1	6	8.7	247	45.6	-19	19.1
8	56	52.3	90	17	46.1	-25	352	4.3	6	8.4	277	49.9	-19	19.2
10	85	48.2	91	17	41.0	-27	22	8.4	6	8.0	307	54.3	-19	19.3
12	114	44.4	92	17	35.6	-29	52	12.5	6	7.7	337	58.6	-19	19.4
14	143	40.8	94	17	29.8	-31	82	16.7	6	7.4	8	3.0	-19	19.5
16	172	37.5	95	17	23.7	-33	112	20.8	6	7.1	38	7.3	-19	19.7
18	201	34.5	96	17	17.2	-34	142	25.0	6	6.8	68	11.7	-19	19.8
20	230	31.7	98	17	10.3	-36	172	29.1	6	6.5	98	16.0	-19	19.9
22	259	29.2	99	17	3.0	-38	202	33.2	6	6.1	128	20.4	-19	20.0
Δ								21		-2		22		-1

φ	SUNCE		TRAJANJE SUMRAKA		MESEC			
	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 21	16 5	0 45	2 22	20 31	2.8	12 34	1.5
55	7 3	16 24	0 38	2 3	20 57	2.7	12 8	1.7
50	6 49	16 38	0 34	1 49	21 15	2.6	11 49	1.8
45	6 38	16 49	0 31	1 39	21 30	2.5	11 33	1.8
40	6 29	16 58	0 28	1 32	21 42	2.4	11 21	1.9
35	6 21	17 6	0 26	1 26	21 53	2.4	11 10	1.9
30	6 14	17 13	0 25	1 21	22 2	2.3	11 1	2.0
20	6 1	17 26	0 23	1 15	22 18	2.2	10 44	2.0
10	5 50	17 37	0 22	1 12	22 31	2.2	10 30	2.1
0	5 40	17 47	0 21	1 11	22 44	2.1	10 17	2.2
10	5 30	17 58	0 22	1 13	22 57	2.0	10 3	2.2
20	5 19	18 9	0 23	1 18	23 11	2.0	9 49	2.3
30	5 6	18 22	0 25	1 26	23 26	2.1	9 33	2.3
35	4 58	18 30	0 27	1 33	23 35	2.1	9 23	2.4
40	4 50	18 38	0 29	1 43	23 46	2.1	9 12	2.4
45	4 39	18 49	0 32	1 56	. . .	.0	8 59	2.5
50	4 27	19 1	0 36	2 17	. . .	.0	8 44	2.5
55	4 12	19 17	0 42	2 59	. . .	.0	8 23	2.6
60	3 51	19 38	0 52	: ::	0 14	1.7	7 56	2.7
S								

SUNCE				MESEC				
UT	e = T_p − UT	Δ/24	r	Prolaz		Δ/24	$\pi_\leftmoon$	r
h	min s	s	′	$T_{\overline{m}}$	h min	min	′	′
00	16 23.0	.1	16.1	$T_{\overline{m}}$	4 4	2.2	57.6	15.7
12	16 23.9	$T_{\overline{m}_\odot}$	11 h 43.6 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	′	°	
♀	8 51	.1	187	-4.7	♃	8 32	.0	192	-1.4
♂	8 55	.1	186	1.5	♄	13 28	.0	118	.7

UT	SUNCE				PROLEĆ. TAČKA	VENERA				MARS			
	$S_\odot$		$\delta_\odot$		S_Υ	S_φ		δ_φ		S_σ		δ_σ	
h	°	′	°	′	° ′	°	′	°	′	°	′	°	′
0	184	6.2	-14	34.2	40 56.9	227	11.6	3	21.8	226	27.8	3	53.5
2	214	6.2	-14	35.8	71 1.8	257	11.5	3	20.1	256	29.9	3	52.3
4	244	6.2	-14	37.4	101 6.7	287	11.5	3	18.4	286	32.1	3	51.2
6	274	6.3	-14	39.0	131 11.7	317	11.5	3	16.8	316	34.2	3	50.0
8	304	6.3	-14	40.6	161 16.6	347	11.4	3	15.1	346	36.3	3	48.8
10	334	6.3	-14	42.2	191 21.5	17	11.4	3	13.4	16	38.4	3	47.6
12	4	6.3	-14	43.7	221 26.4	47	11.3	3	11.7	46	40.6	3	46.4
14	34	6.3	-14	45.3	251 31.4	77	11.3	3	10.0	76	42.7	3	45.2
16	64	6.4	-14	46.9	281 36.3	107	11.2	3	8.3	106	44.8	3	44.0
18	94	6.4	-14	48.5	311 41.2	137	11.2	3	6.7	136	46.9	3	42.8
20	124	6.4	-14	50.0	341 46.2	167	11.1	3	5.0	166	49.1	3	41.6
22	154	6.4	-14	51.6	11 51.1	197	11.1	3	3.3	196	51.2	3	40.4
Δ		0		-8			0		-8		11		-6

UT	MESEC					JUPITER				SATURN			
	$S_\leftmoon$		Δ	$\delta_\leftmoon$		Δ	$S_{\mathrm{♃}}$		$\delta_{\mathrm{♃}}$		$S_{\mathrm{♄}}$		$\delta_{\mathrm{♄}}$	
h	°	′		°	′		° ′		°	′	°	′	°	′
0	288	27.0	100	16	55.4	-40	232	37.4	6	5.8	158	24.7	-19	20.1
2	317	25.0	102	16	47.5	-41	262	41.5	6	5.5	188	29.1	-19	20.2
4	346	23.4	103	16	39.2	-43	292	45.7	6	5.2	218	33.4	-19	20.3
6	15	21.9	104	16	30.6	-45	322	49.8	6	4.9	248	37.8	-19	20.4
8	44	20.8	106	16	21.7	-46	352	53.9	6	4.6	278	42.1	-19	20.5
10	73	19.9	107	16	12.5	-48	22	58.1	6	4.3	308	46.5	-19	20.7
12	102	19.3	108	16	2.9	-49	53	2.2	6	3.9	338	50.8	-19	20.8
14	131	19.0	110	15	53.1	-51	83	6.4	6	3.6	8	55.2	-19	20.9
16	160	18.9	111	15	42.9	-52	113	10.5	6	3.3	38	59.5	-19	21.0
18	189	19.1	112	15	32.4	-54	143	14.7	6	3.0	69	3.9	-19	21.1
20	218	19.6	114	15	21.7	-55	173	18.8	6	2.7	99	8.2	-19	21.2
22	247	20.3	115	15	10.7	-57	203	23.0	6	2.4	129	12.6	-19	21.3
Δ								21		-2		22		-1

φ	SUNCE		TRAJANJE SUMRAKA		MESEC			
	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 24	16 2	0 45	2 23	21 39	2.9	13 11	1.2
55	7 5	16 21	0 39	2 4	22 0	2.7	12 48	1.4
50	6 51	16 36	0 34	1 50	22 17	2.6	12 31	1.5
45	6 39	16 47	0 31	1 39	22 30	2.5	12 17	1.6
40	6 30	16 57	0 28	1 32	22 40	2.4	12 6	1.7
35	6 22	17 5	0 26	1 26	22 49	2.3	11 56	1.7
30	6 14	17 13	0 25	1 21	22 57	2.3	11 48	1.8
20	6 2	17 25	0 23	1 15	23 11	2.0	11 33	1.9
10	5 51	17 36	0 22	1 12	23 23	2.0	11 21	2.0
0	5 40	17 47	0 21	1 11	23 34	2.0	11 8	2.0
10	5 30	17 58	0 22	1 13	23 45	2.0	10 56	2.1
20	5 18	18 9	0 23	1 18	23 57	2.0	10 43	2.2
30	5 5	18 23	0 25	1 27	. . .	.0	10 28	2.3
35	4 57	18 31	0 27	1 34	. . .	.0	10 20	2.3
40	4 48	18 39	0 29	1 43	. . .	.0	10 10	2.4
45	4 38	18 50	0 32	1 57	0 -2	1.7	9 58	2.5
50	4 25	19 3	0 37	2 19	0 12	1.6	9 44	2.6
55	4 10	19 19	0 43	3 3	0 31	1.5	9 26	2.7
60	3 48	19 41	0 53	: ::	0 56	1.3	9 2	2.9
S								

SUNCE				MESEC				
UT	e = T_p − UT	Δ/24	r	Prolaz		Δ/24	$\pi_\leftmoon$	r
h	min s	s	′	$T_{\overline{m}}$	h min	min	′	′
00	16 24.7	.0	16.1	$T_{\overline{m}}$	4 56	2.1	56.6	15.4
12	16 25.2	$T_{\overline{m}_\odot}$	11 h 43.6 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	′	°	
♀	8 51	.1	186	-4.6	♃	8 28	.0	192	-1.4
♂	8 54	.1	186	1.5	♄	13 24	.0	117	.7

UT	SUNCE		PROLEĆ. TAČKA	VENERA		MARS	
	$S_\odot$	$\delta_\odot$	S_Υ	S_φ	δ_φ	S_σ	δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	184 6.4	−14 53.2	41 56.0	227 11.0	3 1.6	226 53.3	3 39.3
2	214 6.4	−14 54.8	72 .9	257 11.0	2 59.9	256 55.5	3 38.1
4	244 6.4	−14 56.3	102 5.9	287 10.9	2 58.2	286 57.6	3 36.9
6	274 6.5	−14 57.9	132 10.8	317 10.8	2 56.5	316 59.7	3 35.7
8	304 6.5	−14 59.5	162 15.7	347 10.8	2 54.8	347 1.8	3 34.5
10	334 6.5	−15 1.0	192 20.7	17 10.7	2 53.1	17 4.0	3 33.3
12	4 6.5	−15 2.6	222 25.6	47 10.7	2 51.3	47 6.1	3 32.1
14	34 6.5	−15 4.2	252 30.5	77 10.6	2 49.6	77 8.2	3 30.9
16	64 6.5	−15 5.7	282 35.4	107 10.5	2 47.9	107 10.4	3 29.7
18	94 6.5	−15 7.3	312 40.4	137 10.5	2 46.2	137 12.5	3 28.5
20	124 6.5	−15 8.8	342 45.3	167 10.4	2 44.5	167 14.6	3 27.4
22	154 6.5	−15 10.4	12 50.2	197 10.3	2 42.8	197 16.8	3 26.2
Δ	0	−8		0	−9	11	−6

UT	MESEC				JUPITER		SATURN	
	$S_\leftmoon$	Δ	$\delta_\leftmoon$	Δ	$S_{\mathrm{♃}}$	$\delta_{\mathrm{♃}}$	$S_{\mathrm{♄}}$	$\delta_{\mathrm{♄}}$
h	° ′		° ′		° ′	° ′	° ′	° ′
0	276 21.3	116	14 59.4	−58	233 27.1	6 2.1	159 16.9	−19 21.4
2	305 22.5	117	14 47.8	−59	263 31.2	6 1.8	189 21.3	−19 21.5
4	334 24.0	119	14 36.0	−60	293 35.4	6 1.4	219 25.6	−19 21.7
6	3 25.8	120	14 23.9	−62	323 39.5	6 1.1	249 30.0	−19 21.8
8	32 27.8	121	14 11.5	−63	353 43.7	6 .8	279 34.3	−19 21.9
10	61 30.0	122	13 58.9	−64	23 47.8	6 .5	309 38.7	−19 22.0
12	90 32.5	124	13 46.1	−65	53 52.0	6 .2	339 43.0	−19 22.1
14	119 35.3	125	13 33.0	−66	83 56.1	5 59.9	9 47.4	−19 22.2
16	148 38.2	126	13 19.7	−68	114 .3	5 59.6	39 51.7	−19 22.3
18	177 41.5	127	13 6.2	−69	144 4.5	5 59.3	69 56.1	−19 22.4
20	206 44.9	128	12 52.5	−70	174 8.6	5 59.0	100 .4	−19 22.5
22	235 48.6	129	12 38.5	−71	204 12.8	5 58.6	130 4.8	−19 22.7
Δ					21	−2	22	−1

φ	SUNCE		TRAJANJE SUMRAKA		MESEC			
	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 26	15 60	0 46	2 23	22 48	2.9	13 39	.9
55	7 7	16 19	0 39	2 4	23 6	1.9	13 21	1.1
50	6 52	16 34	0 34	1 50	23 19	1.9	13 6	1.3
45	6 41	16 46	0 31	1 40	23 29	1.9	12 55	1.4
40	6 31	16 56	0 28	1 32	23 38	1.9	12 46	1.5
35	6 22	17 4	0 26	1 26	23 45	1.9	12 38	1.6
30	6 15	17 12	0 25	1 21	23 52	1.9	12 31	1.6
20	6 2	17 25	0 23	1 15	23 59	2.1	12 18	1.7
10	5 51	17 36	0 22	1 12	. . .	.0	12 8	1.8
0	5 40	17 47	0 21	1 11	. . .	.0	11 57	1.9
10	5 29	17 58	0 22	1 13	. . .	.0	11 47	2.0
20	5 18	18 10	0 23	1 18	. . .	.0	11 36	2.1
30	5 4	18 24	0 25	1 27	0 11	1.7	11 23	2.2
35	4 56	18 32	0 27	1 34	0 19	1.6	11 16	2.3
40	4 47	18 41	0 29	1 44	0 28	1.6	11 8	2.4
45	4 37	18 51	0 32	1 58	0 38	1.5	10 58	2.5
50	4 24	19 4	0 37	2 20	0 51	1.4	10 46	2.6
55	4 7	19 21	0 43	3 7	1 7	1.2	10 31	2.7
60	3 46	19 43	0 53	: ::	1 28	1.0	10 11	2.9
S								

SUNCE				MESEC			
UT	e = T_p − UT	Δ/24	r	Prolaz		Δ/24	$\pi_\leftmoon$	r
h	min s	s	′		h min	min	′	′
00	16 25.7	.0	16.1	$T_{\overline{m}}$	5 46	2.0	55.8	15.2
12	16 25.8	$T_{\overline{m}_\odot}$	11 h 43.6 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	′	°	
♀	8 51	.1	185	−4.6	♃	8 25	.0	192	−1.4
♂	8 52	.1	185	1.5	♄	13 21	.0	117	.7

UT	SUNCE		PROLEĆ. TAČKA	VENERA		MARS	
	$S_\odot$	$\delta_\odot$	S_Υ	S_φ	δ_φ	S_σ	δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	184 6.5	−15 11.9	42 55.2	227 10.2	2 41.1	227 18.9	3 25.0
2	214 6.4	−15 13.5	73 .1	257 10.2	2 39.3	257 21.0	3 23.8
4	244 6.4	−15 15.0	103 5.0	287 10.1	2 37.6	287 23.2	3 22.6
6	274 6.4	−15 16.6	133 9.9	317 10.0	2 35.9	317 25.3	3 21.4
8	304 6.4	−15 18.1	163 14.9	347 9.9	2 34.2	347 27.4	3 20.2
10	334 6.4	−15 19.7	193 19.8	17 9.8	2 32.4	17 29.6	3 19.0
12	4 6.4	−15 21.2	223 24.7	47 9.7	2 30.7	47 31.7	3 17.8
14	34 6.4	−15 22.8	253 29.7	77 9.7	2 29.0	77 33.8	3 16.6
16	64 6.4	−15 24.3	283 34.6	107 9.6	2 27.2	107 36.0	3 15.5
18	94 6.3	−15 25.8	313 39.5	137 9.5	2 25.5	137 38.1	3 14.3
20	124 6.3	−15 27.4	343 44.4	167 9.4	2 23.7	167 40.2	3 13.1
22	154 6.3	−15 28.9	13 49.4	197 9.3	2 22.0	197 42.4	3 11.9
Δ	0	−8		0	−9	11	−6

UT	MESEC				JUPITER		SATURN	
	$S_\leftmoon$	Δ	$\delta_\leftmoon$	Δ	$S_{\mathrm{♃}}$	$\delta_{\mathrm{♃}}$	$S_{\mathrm{♄}}$	$\delta_{\mathrm{♄}}$
h	° ′		° ′		° ′	° ′	° ′	° ′
0	264 52.5	131	12 24.4	−72	234 16.9	5 58.3	160 9.1	−19 22.8
2	293 56.6	132	12 10.0	−73	264 21.1	5 58.0	190 13.5	−19 22.9
4	323 .9	133	11 55.5	−74	294 25.2	5 57.7	220 17.8	−19 23.0
6	352 5.4	134	11 40.7	−75	324 29.4	5 57.4	250 22.1	−19 23.1
8	21 10.2	135	11 25.8	−76	354 33.5	5 57.1	280 26.5	−19 23.2
10	50 15.1	136	11 10.7	−76	24 37.7	5 56.8	310 30.8	−19 23.3
12	79 20.2	137	10 55.4	−77	54 41.9	5 56.5	340 35.2	−19 23.4
14	108 25.6	138	10 39.9	−78	84 46.0	5 56.2	10 39.5	−19 23.5
16	137 31.1	139	10 24.3	−79	114 50.2	5 55.9	40 43.9	−19 23.7
18	166 36.8	139	10 8.5	−80	144 54.3	5 55.6	70 48.2	−19 23.8
20	195 42.7	140	9 52.6	−80	174 58.5	5 55.3	100 52.6	−19 23.9
22	224 48.7	141	9 36.5	−81	205 2.7	5 55.0	130 56.9	−19 24.0
Δ					21	−2	22	−1

φ	SUNCE		TRAJANJE SUMRAKA		MESEC			
	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 29	15 57	0 46	2 24	23 59	1.9	14 2	.8
55	7 9	16 17	0 39	2 4	23 52	2.7	13 48	1.0
50	6 54	16 33	0 34	1 50	. . .	.0	13 37	1.1
45	6 42	16 45	0 31	1 40	. . .	.0	13 28	1.2
40	6 32	16 55	0 28	1 32	. . .	.0	13 21	1.3
35	6 23	17 3	0 26	1 26	. . .	.0	13 15	1.4
30	6 16	17 11	0 25	1 21	. . .	.0	13 10	1.5
20	6 3	17 24	0 23	1 15	. . .	.0	12 60	1.6
10	5 51	17 36	0 22	1 12	0 12	2.0	12 52	1.7
0	5 40	17 47	0 21	1 11	0 22	1.9	12 44	1.8
10	5 29	17 58	0 22	1 13	0 31	1.8	12 36	1.9
20	5 17	18 10	0 23	1 18	0 40	1.7	12 27	2.1
30	5 3	18 24	0 25	1 27	0 52	1.6	12 17	2.2
35	4 55	18 32	0 27	1 34	0 58	1.5	12 11	2.3
40	4 46	18 42	0 29	1 44	1 5	1.4	12 5	2.4
45	4 35	18 53	0 33	1 58	1 14	1.3	11 57	2.5
50	4 22	19 6	0 37	2 21	1 24	1.2	11 48	2.6
55	4 5	19 23	0 43	3 11	1 36	1.0	11 37	2.7
60	3 43	19 46	0 54	: ::	1 53	.8	11 22	2.9
S								

SUNCE				MESEC			
UT	e = T_p − UT	Δ/24	r	Prolaz		Δ/24	$\pi_\leftmoon$	r
h	min s	s	′		h min	min	′	′
00	16 25.8	.0	16.2	$T_{\overline{m}}$	6 33	1.8	55.2	15.0
12	16 25.5	$T_{\overline{m}_\odot}$	11 h 43.6 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	′	°	
♀	8 51	.1	184	−4.6	♃	8 22	.0	191	−1.4
♂	8 50	.1	184	1.5	♄	13 17	.0	117	.7

UT	SUNCE		PROLEĆ. TAČKA	VENERA		MARS	
	$S_\odot$	$\delta_\odot$	S_Υ	S_φ	δ_φ	S_σ	δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	184 6.3	−15 30.4	43 54.3	227 9.2	2 20.2	227 44.5	3 10.7
2	214 6.3	−15 32.0	73 59.2	257 9.1	2 18.5	257 46.6	3 9.5
4	244 6.2	−15 33.5	104 4.2	287 9.0	2 16.8	287 48.8	3 8.3
6	274 6.2	−15 35.0	134 9.1	317 8.9	2 15.0	317 50.9	3 7.1
8	304 6.2	−15 36.5	164 14.0	347 8.8	2 13.3	347 53.0	3 5.9
10	334 6.1	−15 38.1	194 18.9	17 8.7	2 11.5	17 55.2	3 4.7
12	4 6.1	−15 39.6	224 23.9	47 8.6	2 9.7	47 57.3	3 3.6
14	34 6.1	−15 41.1	254 28.8	77 8.5	2 8.0	77 59.5	3 2.4
16	64 6.0	−15 42.6	284 33.7	107 8.4	2 6.2	108 1.6	3 1.2
18	94 6.0	−15 44.1	314 38.7	137 8.3	2 4.5	138 3.7	2 60.0
20	124 6.0	−15 45.7	344 43.6	167 8.2	2 2.7	168 5.9	2 58.8
22	154 5.9	−15 47.2	14 48.5	197 8.0	2 .9	198 8.0	2 57.6
Δ	0	−8		−1	−9	11	−6

UT	MESEC				JUPITER		SATURN	
	$S_\leftmoon$	Δ	$\delta_\leftmoon$	Δ	$S_{\mathrm{♃}}$	$\delta_{\mathrm{♃}}$	$S_{\mathrm{♄}}$	$\delta_{\mathrm{♄}}$
h	° ′		° ′		° ′	° ′	° ′	° ′
0	253 55.0	142	9 20.3	−82	235 6.8	5 54.7	161 1.2	−19 24.1
2	283 1.4	143	9 3.9	−83	265 11.0	5 54.3	191 5.6	−19 24.2
4	312 7.9	144	8 47.4	−83	295 15.1	5 54.0	221 9.9	−19 24.3
6	341 14.6	144	8 30.8	−84	325 19.3	5 53.7	251 14.3	−19 24.4
8	10 21.5	145	8 14.0	−84	355 23.5	5 53.4	281 18.6	−19 24.5
10	39 28.4	146	7 57.1	−85	25 27.6	5 53.1	311 23.0	−19 24.6
12	68 35.6	146	7 40.1	−86	55 31.8	5 52.8	341 27.3	−19 24.8
14	97 42.8	147	7 23.0	−86	85 36.0	5 52.5	11 31.6	−19 24.9
16	126 50.2	148	7 5.8	−87	115 40.1	5 52.2	41 36.0	−19 25.0
18	155 57.7	148	6 48.5	−87	145 44.3	5 51.9	71 40.3	−19 25.1
20	185 5.4	149	6 31.0	−88	175 48.5	5 51.6	101 44.7	−19 25.2
22	214 13.1	149	6 13.5	−88	205 52.7	5 51.3	131 49.0	−19 25.3
Δ					21	−2	22	−1

φ	SUNCE		TRAJANJE SUMRAKA		MESEC			
	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 31	15 55	0 46	2 24	. . . .	.0	14 20	.7
55	7 11	16 15	0 39	2 4	. . . .	.0	14 11	.9
50	6 56	16 31	0 34	1 50	0 21	2.6	14 4	1.0
45	6 43	16 43	0 31	1 40	0 28	2.4	13 58	1.2
40	6 33	16 54	0 28	1 32	0 34	2.3	13 53	1.3
35	6 24	17 2	0 26	1 26	0 40	2.2	13 49	1.3
30	6 17	17 10	0 25	1 21	0 45	2.2	13 46	1.4
20	6 3	17 24	0 23	1 15	0 53	2.0	13 39	1.6
10	5 51	17 36	0 22	1 12	0 60	1.9	13 33	1.7
0	5 40	17 47	0 21	1 11	1 7	1.8	13 28	1.8
10	5 29	17 59	0 22	1 13	1 13	1.7	13 22	1.9
20	5 17	18 11	0 23	1 18	1 21	1.6	13 16	2.0
30	5 2	18 25	0 25	1 28	1 29	1.5	13 10	2.2
35	4 54	18 33	0 27	1 35	1 33	1.4	13 6	2.2
40	4 45	18 43	0 30	1 45	1 39	1.3	13 1	2.3
45	4 34	18 54	0 33	1 59	1 45	1.2	12 56	2.4
50	4 20	19 8	0 37	2 23	1 52	1.1	12 50	2.6
55	4 3	19 25	0 44	3 17	2 1	.9	12 42	2.7
60	3 40	19 49	0 55	: ::	2 13	.7	12 32	2.9
S								

SUNCE				MESEC			
UT	e = Tp − UT	Δ/24	r	Prolaz	Δ/24	$\pi_\leftmoon$	r
h	min s	s	′	h min	min	′	′
00	16 25.1	−.1	16.2	$T_{\overline{m}}$ 7 17	1.8	54.6	14.9
12	16 24.4	$T_{\overline{m}_\odot}$ 11 h 43.6 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	′	°	
♀	8 51	.1	183	−4.6	♃	8 18	.0	191	−1.4
♂	8 48	.1	184	1.5	♄	13 14	.0	117	.7

UT	SUNCE		PROLEĆ. TAČKA	VENERA		MARS	
	$S_\odot$	$\delta_\odot$	S_Υ	S_φ	δ_φ	S_σ	δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	184 5.9	−15 48.7	44 53.4	227 7.9	1 59.2	228 10.1	2 56.4
2	214 5.9	−15 50.2	74 58.4	257 7.8	1 57.4	258 12.3	2 55.2
4	244 5.8	−15 51.7	105 3.3	287 7.7	1 55.6	288 14.4	2 54.0
6	274 5.8	−15 53.2	135 8.2	317 7.6	1 53.8	318 16.6	2 52.9
8	304 5.7	−15 54.7	165 13.1	347 7.5	1 52.1	348 18.7	2 51.7
10	334 5.7	−15 56.2	195 18.1	17 7.3	1 50.3	18 20.8	2 50.5
12	4 5.6	−15 57.7	225 23.0	47 7.2	1 48.5	48 23.0	2 49.3
14	34 5.6	−15 59.2	255 27.9	77 7.1	1 46.7	78 25.1	2 48.1
16	64 5.5	−16 .7	285 32.9	107 7.0	1 45.0	108 27.3	2 46.9
18	94 5.5	−16 2.2	315 37.8	137 6.8	1 43.2	138 29.4	2 45.7
20	124 5.4	−16 3.7	345 42.7	167 6.7	1 41.4	168 31.6	2 44.5
22	154 5.4	−16 5.2	15 47.6	197 6.6	1 39.6	198 33.7	2 43.3
Δ	0	−7		−1	−9	11	−6

UT	MESEC				JUPITER		SATURN	
	$S_\leftmoon$	Δ	$\delta_\leftmoon$	Δ	$S_{\mathrm{♃}}$	$\delta_{\mathrm{♃}}$	$S_{\mathrm{♄}}$	$\delta_{\mathrm{♄}}$
h	° ′		° ′		° ′	° ′	° ′	° ′
0	243 20.9	150	5 55.9	−88	235 56.8	5 51.0	161 53.3	−19 25.4
2	272 28.9	150	5 38.2	−89	266 1.0	5 50.7	191 57.7	−19 25.5
4	301 36.9	151	5 20.4	−89	296 5.2	5 50.4	222 2.0	−19 25.6
6	330 45.1	151	5 2.6	−90	326 9.3	5 50.1	252 6.4	−19 25.8
8	359 53.3	151	4 44.7	−90	356 13.5	5 49.8	282 10.7	−19 25.9
10	29 1.6	152	4 26.7	−90	26 17.7	5 49.5	312 15.0	−19 26.0
12	58 9.9	152	4 8.6	−91	56 21.9	5 49.2	342 19.4	−19 26.1
14	87 18.4	152	3 50.5	−91	86 26.0	5 48.9	12 23.7	−19 26.2
16	116 26.9	153	3 32.3	−91	116 30.2	5 48.6	42 28.1	−19 26.3
18	145 35.4	153	3 14.1	−91	146 34.4	5 48.3	72 32.4	−19 26.4
20	174 44.0	153	2 55.8	−92	176 38.6	5 48.0	102 36.7	−19 26.5
22	203 52.7	153	2 37.5	−92	206 42.7	5 47.7	132 41.1	−19 26.6
Δ					21	−2	22	−1

φ	SUNCE		TRAJANJE SUMRAKA		MESEC			
	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 34	15 52	0 46	2 25	1 9	2.9	14 37	.7
55	7 13	16 13	0 39	2 5	1 17	2.7	14 33	.9
50	6 57	16 29	0 34	1 51	1 22	2.5	14 29	1.0
45	6 45	16 42	0 31	1 40	1 27	2.4	14 26	1.1
40	6 34	16 53	0 28	1 32	1 30	2.3	14 24	1.2
35	6 25	17 2	0 26	1 26	1 34	2.2	14 22	1.3
30	6 17	17 10	0 25	1 22	1 37	2.1	14 20	1.4
20	6 4	17 23	0 23	1 15	1 42	2.0	14 16	1.5
10	5 52	17 36	0 22	1 12	1 46	1.9	14 13	1.6
0	5 40	17 47	0 22	1 12	1 50	1.8	14 11	1.8
10	5 29	17 59	0 22	1 14	1 54	1.7	14 8	1.9
20	5 16	18 11	0 23	1 18	1 59	1.5	14 5	2.0
30	5 2	18 26	0 26	1 28	2 4	1.4	14 2	2.1
35	4 53	18 34	0 27	1 35	2 7	1.3	13 60	2.2
40	4 44	18 44	0 30	1 45	2 10	1.2	13 57	2.3
45	4 32	18 56	0 33	1 60	2 14	1.1	13 55	2.4
50	4 19	19 10	0 37	2 24	2 18	1.0	13 51	2.5
55	4 1	19 27	0 44	3 23	2 24	.9	13 48	2.7
60	3 38	19 51	0 55	: ::	2 31	.7	13 42	2.9
S								

SUNCE				MESEC			
UT	e = Tp − UT	Δ/24	r	Prolaz	Δ/24	$\pi_\leftmoon$	r
h	min s	s	′	h min	min	′	′
00	16 23.6	−.1	16.2	$T_{\overline{m}}$ 8 0	1.8	54.3	14.8
12	16 22.4	$T_{\overline{m}_\odot}$ 11 h 43.6 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	′	°	
♀	8 52	.1	182	−4.6	♃	8 15	.0	191	−1.4
♂	8 47	.1	183	1.5	♄	13 11	.0	117	.7

UT	SUNCE		PROLEĆ. TAČKA	VENERA		MARS	
	$S_\odot$	$\delta_\odot$	S_Υ	S_φ	δ_φ	S_σ	δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	184 5.3	-16 6.7	45 52.6	227 6.5	1 37.8	228 35.8	2 42.1
2	214 5.2	-16 8.2	75 57.5	257 6.3	1 36.0	258 38.0	2 41.0
4	244 5.2	-16 9.6	106 2.4	287 6.2	1 34.2	288 40.1	2 39.8
6	274 5.1	-16 11.1	136 7.4	317 6.0	1 32.4	318 42.3	2 38.6
8	304 5.0	-16 12.6	166 12.3	347 5.9	1 30.6	348 44.4	2 37.4
10	334 5.0	-16 14.1	196 17.2	17 5.8	1 28.8	18 46.6	2 36.2
12	4 4.9	-16 15.6	226 22.1	47 5.6	1 27.0	48 48.7	2 35.0
14	34 4.8	-16 17.0	256 27.1	77 5.5	1 25.2	78 50.8	2 33.8
16	64 4.8	-16 18.5	286 32.0	107 5.3	1 23.4	108 53.0	2 32.6
18	94 4.7	-16 20.0	316 36.9	137 5.2	1 21.6	138 55.1	2 31.4
20	124 4.6	-16 21.4	346 41.9	167 5.0	1 19.8	168 57.3	2 30.3
22	154 4.6	-16 22.9	16 46.8	197 4.9	1 18.0	198 59.4	2 29.1
Δ	0	-7		-1	-9	11	-6

UT	MESEC				JUPITER		SATURN	
	$S_\leftmoon$	Δ	$\delta_\leftmoon$	Δ	$S_{\mathrm{♃}}$	$\delta_{\mathrm{♃}}$	$S_{\mathrm{♄}}$	$\delta_{\mathrm{♄}}$
h	° ′		° ′		° ′	° ′	° ′	° ′
0	233 1.4	154	2 19.2	-92	236 46.9	5 47.4	162 45.4	-19 26.7
2	262 10.1	154	2 .8	-92	266 51.1	5 47.1	192 49.7	-19 26.9
4	291 18.9	154	1 42.4	-92	296 55.3	5 46.8	222 54.1	-19 27.0
6	320 27.7	154	1 23.9	-92	326 59.5	5 46.5	252 58.4	-19 27.1
8	349 36.5	154	1 5.4	-92	357 3.6	5 46.2	283 2.8	-19 27.2
10	18 45.3	154	0 47.0	-92	27 7.8	5 45.9	313 7.1	-19 27.3
12	47 54.1	154	0 28.5	-93	57 12.0	5 45.6	343 11.4	-19 27.4
14	77 2.9	154	0 10.0	-7	87 16.2	5 45.3	13 15.8	-19 27.5
16	106 11.8	154	0 8.5	93	117 20.4	5 45.0	43 20.1	-19 27.6
18	135 20.6	154	0 27.1	93	147 24.5	5 44.7	73 24.4	-19 27.7
20	164 29.4	154	0 45.6	92	177 28.7	5 44.4	103 28.8	-19 27.8
22	193 38.2	154	1 4.1	92	207 32.9	5 44.1	133 33.1	-19 28.0
Δ					21	-1	22	-1

φ	SUNCE		TRAJANJE SUMRAKA		MESEC			
	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 37	15 50	0 47	2 25	2 19	1.8	14 53	2.9
55	7 15	16 12	0 39	2 5	2 21	1.8	14 53	2.7
50	6 59	16 28	0 35	1 51	2 23	1.8	14 53	2.5
45	6 46	16 41	0 31	1 40	2 25	1.8	14 53	2.4
40	6 35	16 51	0 28	1 32	2 26	1.8	14 53	2.3
35	6 26	17 1	0 26	1 26	2 27	1.8	14 53	2.2
30	6 18	17 9	0 25	1 22	2 28	1.8	14 53	2.1
20	6 4	17 23	0 23	1 15	2 30	1.8	14 53	2.0
10	5 52	17 35	0 22	1 12	2 31	1.8	14 53	1.9
0	5 40	17 47	0 22	1 12	2 33	1.8	14 53	1.8
10	5 28	17 59	0 22	1 14	2 34	1.8	14 53	1.7
20	5 16	18 12	0 23	1 19	2 36	1.8	14 53	1.5
30	5 1	18 27	0 26	1 28	2 37	1.7	14 53	1.4
35	4 52	18 35	0 27	1 35	2 38	1.7	14 53	1.3
40	4 43	18 45	0 30	1 46	2 40	1.7	14 52	1.2
45	4 31	18 57	0 33	2 1	2 41	1.7	14 52	1.1
50	4 17	19 11	0 37	2 26	2 43	1.7	14 52	1.0
55	3 59	19 29	0 44	3 30	2 45	1.7	14 52	.9
60	3 35	19 54	0 56	: ::	2 47	1.7	14 52	.7
S								

SUNCE				MESEC			
UT	e = T_p − UT	Δ/24	r	Prolaz		Δ/24	$\pi_\leftmoon$	r
h	min s	s	′		h min	min	′	′
00	16 21.2	-.1	16.2	$T_{\overline{m}}$	8 43	1.8	54.1	14.7
12	16 19.6	$T_{\overline{m}_\odot}$	11 h 43.7 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	′	°	
♀	8 52	.1	181	-4.5	♃	8 12	.0	191	-1.4
♂	8 45	.1	183	1.5	♄	13 7	.0	117	.7

UT	SUNCE		PROLEĆ. TAČKA	VENERA		MARS	
	$S_\odot$	$\delta_\odot$	S_Υ	S_φ	δ_φ	S_σ	δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	184 4.5	-16 24.4	46 51.7	227 4.7	1 16.2	229 1.6	2 27.9
2	214 4.4	-16 25.8	76 56.6	257 4.6	1 14.4	259 3.7	2 26.7
4	244 4.3	-16 27.3	107 1.6	287 4.4	1 12.6	289 5.9	2 25.5
6	274 4.2	-16 28.8	137 6.5	317 4.3	1 10.8	319 8.0	2 24.3
8	304 4.2	-16 30.2	167 11.4	347 4.1	1 8.9	349 10.2	2 23.1
10	334 4.1	-16 31.7	197 16.4	17 4.0	1 7.1	19 12.3	2 21.9
12	4 4.0	-16 33.1	227 21.3	47 3.8	1 5.3	49 14.5	2 20.8
14	34 3.9	-16 34.6	257 26.2	77 3.7	1 3.5	79 16.6	2 19.6
16	64 3.8	-16 36.0	287 31.1	107 3.5	1 1.7	109 18.8	2 18.4
18	94 3.7	-16 37.5	317 36.1	137 3.3	0 59.8	139 20.9	2 17.2
20	124 3.6	-16 38.9	347 41.0	167 3.2	0 58.0	169 23.1	2 16.0
22	154 3.6	-16 40.4	17 45.9	197 3.0	0 56.2	199 25.2	2 14.8
Δ	0	-7		-1	-9	11	-6

UT	MESEC				JUPITER		SATURN	
	$S_\leftmoon$	Δ	$\delta_\leftmoon$	Δ	$S_{\mathrm{♃}}$	$\delta_{\mathrm{♃}}$	$S_{\mathrm{♄}}$	$\delta_{\mathrm{♄}}$
h	° ′		° ′		° ′	° ′	° ′	° ′
0	222 47.0	154	1 22.5	92	237 37.1	5 43.8	163 37.4	-19 28.1
2	251 55.8	154	1 41.0	92	267 41.3	5 43.5	193 41.8	-19 28.2
4	281 4.5	153	1 59.4	92	297 45.5	5 43.2	223 46.1	-19 28.3
6	310 13.2	153	2 17.9	92	327 49.7	5 42.9	253 50.4	-19 28.4
8	339 21.8	153	2 36.3	92	357 53.9	5 42.6	283 54.8	-19 28.5
10	8 30.4	153	2 54.6	92	27 58.0	5 42.3	313 59.1	-19 28.6
12	37 38.9	152	3 12.9	91	58 2.2	5 42.0	344 3.5	-19 28.7
14	66 47.4	152	3 31.2	91	88 6.4	5 41.8	14 7.8	-19 28.8
16	95 55.9	152	3 49.4	91	118 10.6	5 41.5	44 12.1	-19 29.0
18	125 4.2	151	4 7.6	91	148 14.8	5 41.2	74 16.5	-19 29.1
20	154 12.5	151	4 25.7	90	178 19.0	5 40.9	104 20.8	-19 29.2
22	183 20.8	151	4 43.8	90	208 23.2	5 40.6	134 25.1	-19 29.3
Δ					21	-1	22	-1

φ	SUNCE		TRAJANJE SUMRAKA		MESEC			
	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 39	15 47	0 47	2 26	3 2	.7	16 2	2.9
55	7 17	16 10	0 40	2 5	3 4	.9	15 57	2.7
50	7 1	16 26	0 35	1 51	3 6	1.0	15 54	2.6
45	6 47	16 39	0 31	1 41	3 7	1.1	15 51	2.4
40	6 37	16 50	0 29	1 33	3 8	1.2	15 48	2.3
35	6 27	16 60	0 27	1 26	3 10	1.3	15 46	2.2
30	6 19	17 8	0 25	1 22	3 10	1.4	15 44	2.2
20	6 5	17 23	0 23	1 15	3 12	1.5	15 41	2.0
10	5 52	17 35	0 22	1 12	3 13	1.7	15 38	1.9
0	5 40	17 47	0 22	1 12	3 15	1.8	15 35	1.8
10	5 28	17 59	0 22	1 14	3 16	1.9	15 32	1.7
20	5 15	18 12	0 23	1 19	3 18	2.0	15 30	1.6
30	5 0	18 28	0 26	1 28	3 19	2.1	15 26	1.4
35	4 52	18 36	0 27	1 36	3 20	2.2	15 24	1.3
40	4 42	18 47	0 30	1 46	3 21	2.3	15 22	1.3
45	4 30	18 58	0 33	2 2	3 23	2.4	15 20	1.2
50	4 15	19 13	0 38	2 27	3 24	2.6	15 17	1.0
55	3 57	19 32	0 45	3 41	3 26	2.7	15 13	.9
60	3 32	19 57	0 57	: ::	3 29	2.9	15 8	.7
S								

SUNCE				MESEC			
UT	e = T_p − UT	Δ/24	r	Prolaz		Δ/24	$\pi_\leftmoon$	r
h	min s	s	′		h min	min	′	′
00	16 17.9	-.2	16.2	$T_{\overline{m}}$	9 25	1.8	54.0	14.7
12	16 15.9	$T_{\overline{m}_\odot}$	11 h 43.7 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	′	°	
♀	8 52	.1	180	-4.5	♃	8 8	.0	191	-1.4
♂	8 43	.1	182	1.5	♄	13 4	.0	117	.7

UT	SUNCE		PROLEĆ. TAČKA	VENERA		MARS	
	$S_\odot$	$\delta_\odot$	S_Υ	S_φ	δ_φ	S_σ	δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	184 3.5	-16 41.8	47 50.9	227 2.8	0 54.3	229 27.3	2 13.6
2	214 3.4	-16 43.3	77 55.8	257 2.7	0 52.5	259 29.5	2 12.4
4	244 3.3	-16 44.7	108 .7	287 2.5	0 50.7	289 31.6	2 11.2
6	274 3.2	-16 46.1	138 5.6	317 2.3	0 48.8	319 33.8	2 10.1
8	304 3.1	-16 47.6	168 10.6	347 2.1	0 47.0	349 36.0	2 8.9
10	334 3.0	-16 49.0	198 15.5	17 2.0	0 45.2	19 38.1	2 7.7
12	4 2.9	-16 50.4	228 20.4	47 1.8	0 43.3	49 40.3	2 6.5
14	34 2.8	-16 51.9	258 25.3	77 1.6	0 41.5	79 42.4	2 5.3
16	64 2.7	-16 53.3	288 30.3	107 1.4	0 39.6	109 44.6	2 4.1
18	94 2.6	-16 54.7	318 35.2	137 1.2	0 37.8	139 46.7	2 2.9
20	124 2.4	-16 56.1	348 40.1	167 1.1	0 36.0	169 48.9	2 1.7
22	154 2.3	-16 57.6	18 45.1	197 .9	0 34.1	199 51.0	2 .6
Δ	-1	-7		-1	-9	11	-6

UT	MESEC				JUPITER		SATURN	
	$S_\leftmoon$	Δ	$\delta_\leftmoon$	Δ	S_{4}	δ_{4}	S_η	δ_η
h	° ′		° ′		° ′	° ′	° ′	° ′
0	212 28.9	150	5 1.7	90	238 27.4	5 40.3	164 29.5	-19 29.4
2	241 37.0	150	5 19.7	89	268 31.6	5 40.0	194 33.8	-19 29.5
4	270 44.9	149	5 37.5	89	298 35.8	5 39.7	224 38.1	-19 29.6
6	299 52.8	149	5 55.3	88	328 40.0	5 39.4	254 42.5	-19 29.7
8	329 .6	148	6 12.9	88	358 44.2	5 39.1	284 46.8	-19 29.8
10	358 8.3	148	6 30.5	87	28 48.4	5 38.8	314 51.1	-19 29.9
12	27 15.9	147	6 48.0	87	58 52.6	5 38.5	344 55.4	-19 30.0
14	56 23.3	147	7 5.4	86	88 56.8	5 38.3	14 59.8	-19 30.2
16	85 30.7	146	7 22.7	86	119 1.0	5 38.0	45 4.1	-19 30.3
18	114 37.9	146	7 39.9	85	149 5.2	5 37.7	75 8.4	-19 30.4
20	143 45.1	145	7 56.9	85	179 9.4	5 37.4	105 12.8	-19 30.5
22	172 52.1	144	8 13.9	84	209 13.6	5 37.1	135 17.1	-19 30.6
Δ					21	-1	22	-1

φ	SUNCE		TRAJANJE SUMRAKA		MESEC			
	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 42	15 45	0 47	2 26	3 18	.7	17 12	2.9
55	7 19	16 8	0 40	2 6	3 25	.9	17 3	2.7
50	7 2	16 25	0 35	1 51	3 30	1.1	16 55	2.6
45	6 49	16 38	0 31	1 41	3 34	1.2	16 49	2.4
40	6 38	16 49	0 29	1 33	3 38	1.3	16 44	2.3
35	6 28	16 59	0 27	1 27	3 41	1.4	16 40	2.3
30	6 20	17 7	0 25	1 22	3 44	1.5	16 36	2.2
20	6 5	17 22	0 23	1 16	3 49	1.6	16 29	2.1
10	5 52	17 35	0 22	1 12	3 53	1.7	16 24	1.9
0	5 40	17 47	0 22	1 12	3 57	1.8	16 18	1.8
10	5 28	17 60	0 22	1 14	4 1	1.9	16 13	1.7
20	5 15	18 13	0 23	1 19	4 6	2.0	16 7	1.6
30	4 60	18 28	0 26	1 29	4 11	2.2	16 0	1.5
35	4 51	18 37	0 28	1 36	4 14	2.2	15 57	1.4
40	4 41	18 48	0 30	1 47	4 17	2.3	15 52	1.3
45	4 29	18 60	0 33	2 2	4 21	2.4	15 47	1.2
50	4 14	19 15	0 38	2 29	4 26	2.6	15 42	1.1
55	3 55	19 34	0 45	4 2	4 31	2.7	15 34	1.0
60	3 30	19 59	0 57	: ::	4 39	2.9	15 25	.8
S								

SUNCE				MESEC			
UT	$e=T_p-UT$	Δ/24	r	Prolaz	Δ/24	$\pi_\leftmoon$	r
h	min s	s	′	h min	min	′	′
00	16 13.8	-.2	16.2	$T_{\overline{m}}$ 10 8	1.8	54.1	14.7
12	16 11.4	$T_{\overline{m}_\odot}$ 11 h 43.8 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	′	°	
♀	8 52	.1	179	-4.5	♃	8 5	.0	191	-1.4
♂	8 42	.1	182	1.5	♄	13 0	.0	117	.7

UT	SUNCE		PROLEĆ. TAČKA	VENERA		MARS	
	$S_\odot$	$\delta_\odot$	S_Υ	S_φ	δ_φ	S_σ	δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	184 2.2	-16 59.0	48 50.0	227 .7	0 32.3	229 53.2	1 59.4
2	214 2.1	-17 .4	78 54.9	257 .5	0 30.4	259 55.3	1 58.2
4	244 2.0	-17 1.8	108 59.8	287 .3	0 28.6	289 57.5	1 57.0
6	274 1.9	-17 3.2	139 4.8	317 .1	0 26.7	319 59.6	1 55.8
8	304 1.8	-17 4.6	169 9.7	346 59.9	0 24.9	350 1.8	1 54.6
10	334 1.6	-17 6.0	199 14.6	16 59.7	0 23.0	20 3.9	1 53.4
12	4 1.5	-17 7.4	229 19.6	46 59.5	0 21.1	50 6.1	1 52.2
14	34 1.4	-17 8.9	259 24.5	76 59.4	0 19.3	80 8.2	1 51.1
16	64 1.3	-17 10.3	289 29.4	106 59.2	0 17.4	110 10.4	1 49.9
18	94 1.2	-17 11.7	319 34.3	136 59.0	0 15.6	140 12.6	1 48.7
20	124 1.0	-17 13.1	349 39.3	166 58.8	0 13.7	170 14.7	1 47.5
22	154 .9	-17 14.5	19 44.2	196 58.6	0 11.8	200 16.9	1 46.3
Δ	-1	-7		-1	-9	11	-6

UT	MESEC				JUPITER		SATURN	
	$S_\leftmoon$	Δ	$\delta_\leftmoon$	Δ	S_{4}	δ_{4}	S_η	δ_η
h	° ′		° ′		° ′	° ′	° ′	° ′
0	201 58.9	144	8 30.7	83	239 17.8	5 36.8	165 21.4	-19 30.7
2	231 5.7	143	8 47.4	83	269 22.0	5 36.5	195 25.8	-19 30.8
4	260 12.3	142	9 3.9	82	299 26.2	5 36.2	225 30.1	-19 30.9
6	289 18.8	142	9 20.3	81	329 30.4	5 35.9	255 34.4	-19 31.0
8	318 25.1	141	9 36.6	81	359 34.6	5 35.6	285 38.8	-19 31.1
10	347 31.3	140	9 52.7	80	29 38.8	5 35.4	315 43.1	-19 31.3
12	16 37.3	139	10 8.7	79	59 43.0	5 35.1	345 47.4	-19 31.4
14	45 43.2	139	10 24.5	78	89 47.2	5 34.8	15 51.7	-19 31.5
16	74 49.0	138	10 40.1	77	119 51.4	5 34.5	45 56.1	-19 31.6
18	103 54.6	137	10 55.6	76	149 55.6	5 34.2	76 .4	-19 31.7
20	133 .0	136	11 10.9	76	179 59.8	5 33.9	106 4.7	-19 31.8
22	162 5.3	136	11 26.0	75	210 4.1	5 33.6	136 9.1	-19 31.9
Δ					21	-1	22	-1

φ	SUNCE		TRAJANJE SUMRAKA		MESEC			
	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 44	15 43	0 47	2 27	3 36	.8	18 23	2.9
55	7 21	16 6	0 40	2 6	3 47	1.0	18 8	2.7
50	7 4	16 23	0 35	1 52	3 56	1.2	17 57	2.6
45	6 50	16 37	0 31	1 41	4 3	1.3	17 48	2.5
40	6 39	16 48	0 29	1 33	4 9	1.4	17 40	2.4
35	6 29	16 58	0 27	1 27	4 14	1.5	17 34	2.3
30	6 21	17 7	0 25	1 22	4 19	1.5	17 28	2.2
20	6 6	17 22	0 23	1 16	4 27	1.7	17 19	2.1
10	5 53	17 35	0 22	1 13	4 34	1.8	17 10	2.0
0	5 40	17 47	0 22	1 12	4 41	1.9	17 2	1.9
10	5 28	17 60	0 22	1 14	4 47	2.0	16 54	1.8
20	5 15	18 14	0 23	1 19	4 55	2.1	16 46	1.7
30	4 59	18 29	0 26	1 29	5 3	2.2	16 36	1.6
35	4 50	18 38	0 28	1 36	5 8	2.3	16 31	1.5
40	4 40	18 49	0 30	1 47	5 13	2.4	16 24	1.5
45	4 27	19 1	0 33	2 3	5 20	2.5	16 17	1.4
50	4 12	19 16	0 38	2 31	5 27	2.6	16 8	1.3
55	3 53	19 36	0 45	: ::	5 37	2.7	15 58	1.1
60	3 27	20 2	0 58	: ::	5 49	2.9	15 43	.9
S								

SUNCE				MESEC			
UT	$e=T_p-UT$	Δ/24	r	Prolaz	Δ/24	$\pi_\leftmoon$	r
h	min s	s	′	h min	min	′	′
00	16 8.9	-.2	16.2	$T_{\overline{m}}$ 10 51	1.9	54.3	14.8
12	16 6.0	$T_{\overline{m}_\odot}$ 11 h 43.9 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	′	°	
♀	8 52	.1	178	-4.5	♃	8 2	.0	190	-1.4
♂	8 40	.1	181	1.4	♄	12 57	.0	117	.7

UT	SUNCE $S_\odot$	SUNCE $\delta_\odot$	PROLEĆ. TAČKA S_Υ	VENERA S_φ	VENERA δ_φ	MARS S_σ	MARS δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	184 .8	-17 15.8	49 49.1	226 58.4	0 10.0	230 19.0	1 45.1
2	214 .6	-17 17.2	79 54.1	256 58.1	0 8.1	260 21.2	1 43.9
4	244 .5	-17 18.6	109 59.0	286 57.9	0 6.2	290 23.3	1 42.8
6	274 .4	-17 20.0	140 3.9	316 57.7	0 4.4	320 25.5	1 41.6
8	304 .2	-17 21.4	170 8.8	346 57.5	0 2.5	350 27.7	1 40.4
10	334 .1	-17 22.8	200 13.8	16 57.3	0 .6	20 29.8	1 39.2
12	4 .0	-17 24.2	230 18.7	46 57.1	- 0 1.3	50 32.0	1 38.0
14	33 59.8	-17 25.5	260 23.6	76 56.9	- 0 3.1	80 34.1	1 36.8
16	63 59.7	-17 26.9	290 28.6	106 56.7	- 0 5.0	110 36.3	1 35.6
18	93 59.5	-17 28.3	320 33.5	136 56.5	- 0 6.9	140 38.4	1 34.5
20	123 59.4	-17 29.7	350 38.4	166 56.2	- 0 8.8	170 40.6	1 33.3
22	153 59.3	-17 31.0	20 43.3	196 56.0	- 0 10.7	200 42.8	1 32.1
Δ	-1	-7		-1	-9	11	-6

UT	MESEC $S_\leftmoon$	MESEC Δ	MESEC $\delta_\leftmoon$	MESEC Δ	JUPITER $S_{\jupiter}$	JUPITER $\delta_{\jupiter}$	SATURN $S_{\saturn}$	SATURN $\delta_{\saturn}$
h	° ′		° ′		° ′	° ′	° ′	° ′
0	191 10.4	135	11 41.0	74	240 8.3	5 33.4	166 13.4	-19 32.0
2	220 15.3	134	11 55.7	73	270 12.5	5 33.1	196 17.7	-19 32.1
4	249 20.1	133	12 10.2	72	300 16.7	5 32.8	226 22.0	-19 32.2
6	278 24.7	132	12 24.6	71	330 20.9	5 32.5	256 26.4	-19 32.3
8	307 29.1	131	12 38.7	70	0 25.1	5 32.2	286 30.7	-19 32.5
10	336 33.4	130	12 52.6	69	30 29.3	5 31.9	316 35.0	-19 32.6
12	5 37.5	130	13 6.3	67	60 33.5	5 31.6	346 39.4	-19 32.7
14	34 41.4	129	13 19.8	66	90 37.8	5 31.4	16 43.7	-19 32.8
16	63 45.2	128	13 33.1	65	120 42.0	5 31.1	46 48.0	-19 32.9
18	92 48.7	127	13 46.1	64	150 46.2	5 30.8	76 52.3	-19 33.0
20	121 52.1	126	13 58.8	63	180 50.4	5 30.5	106 56.7	-19 33.1
22	150 55.4	125	14 11.4	61	210 54.6	5 30.2	137 1.0	-19 33.2
Δ					21	-1	22	-1

φ	SUNCE IZLAZ	SUNCE ZALAZ	TRAJANJE SUMRAKA GRAĐ.	TRAJANJE SUMRAKA ASTR.	MESEC IZLAZ	MESEC Δ/24	MESEC ZALAZ	MESEC 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	3 56	1.0	19 32	2.8
55	7 23	16 4	0 40	2 6	4 12	1.2	19 13	2.6
50	7 6	16 22	0 35	1 52	4 24	1.3	18 58	2.5
45	6 52	16 36	0 31	1 41	4 34	1.4	18 47	2.4
40	6 40	16 48	0 29	1 33	4 42	1.5	18 37	2.4
35	6 30	16 58	0 27	1 27	4 50	1.6	18 29	2.3
30	6 21	17 6	0 25	1 22	4 56	1.7	18 22	2.2
20	6 6	17 21	0 23	1 16	5 7	1.8	18 9	2.1
10	5 53	17 35	0 22	1 13	5 17	1.9	17 58	2.1
0	5 40	17 48	0 22	1 12	5 26	1.9	17 48	2.0
10	5 28	18 0	0 22	1 14	5 35	2.0	17 38	1.9
20	5 14	18 14	0 23	1 19	5 45	2.1	17 27	1.8
30	4 58	18 30	0 26	1 29	5 56	2.2	17 15	1.7
35	4 49	18 39	0 28	1 37	6 2	2.3	17 7	1.7
40	4 39	18 50	0 30	1 48	6 10	2.4	16 59	1.6
45	4 26	19 3	0 34	2 4	6 19	2.4	16 50	1.5
50	4 11	19 18	0 38	2 33	6 29	2.6	16 38	1.4
55	3 51	19 38	0 46	: ::	6 42	2.7	16 24	1.3
60	3 25	20 5	0 59	: ::	6 60	2.9	16 5	1.1
S								

SUNCE UT	SUNCE $e = T_p - UT$	SUNCE Δ/24	SUNCE r	MESEC Prolaz	MESEC Δ/24	MESEC $\pi_\leftmoon$	MESEC r
h	min s	s	′	h min	min	′	′
00	16 3.1	-.3	16.2	$T_{\overline{m}}$ 11 37	2.0	54.5	14.9
12	15 59.8	$T_{\overline{m}_\odot}$ 11 h 44.0 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	′	°	
♀	8 52	.1	177	-4.5	♃	7 58	.0	190	-1.4
♂	8 38	.1	180	1.4	♄	12 53	.0	116	.7

UT	SUNCE $S_\odot$	SUNCE $\delta_\odot$	PROLEĆ. TAČKA S_Υ	VENERA S_φ	VENERA δ_φ	MARS S_σ	MARS δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	183 59.1	-17 32.4	50 48.3	226 55.8	- 0 12.6	230 44.9	1 30.9
2	213 59.0	-17 33.8	80 53.2	256 55.6	- 0 14.4	260 47.1	1 29.7
4	243 58.8	-17 35.2	110 58.1	286 55.4	- 0 16.3	290 49.2	1 28.5
6	273 58.7	-17 36.5	141 3.1	316 55.1	- 0 18.2	320 51.4	1 27.3
8	303 58.5	-17 37.9	171 8.0	346 54.9	- 0 20.1	350 53.6	1 26.2
10	333 58.4	-17 39.2	201 12.9	16 54.7	- 0 22.0	20 55.7	1 25.0
12	3 58.2	-17 40.6	231 17.8	46 54.5	- 0 23.9	50 57.9	1 23.8
14	33 58.0	-17 41.9	261 22.8	76 54.2	- 0 25.8	81 .0	1 22.6
16	63 57.9	-17 43.3	291 27.7	106 54.0	- 0 27.7	111 2.2	1 21.4
18	93 57.7	-17 44.7	321 32.6	136 53.8	- 0 29.6	141 4.4	1 20.2
20	123 57.6	-17 46.0	351 37.6	166 53.5	- 0 31.5	171 6.5	1 19.1
22	153 57.4	-17 47.3	21 42.5	196 53.3	- 0 33.4	201 8.7	1 17.9
Δ	-1	-7		-1	-9	11	-6

UT	MESEC $S_\leftmoon$	MESEC Δ	MESEC $\delta_\leftmoon$	MESEC Δ	JUPITER $S_{\jupiter}$	JUPITER $\delta_{\jupiter}$	SATURN $S_{\saturn}$	SATURN $\delta_{\saturn}$
h	° ′		° ′		° ′	° ′	° ′	° ′
0	179 58.4	124	14 23.7	60	240 58.9	5 30.0	167 5.3	-19 33.3
2	209 1.3	123	14 35.7	59	271 3.1	5 29.7	197 9.6	-19 33.4
4	238 3.9	123	14 47.5	58	301 7.3	5 29.4	227 14.0	-19 33.5
6	267 6.4	122	14 59.0	56	331 11.5	5 29.1	257 18.3	-19 33.7
8	296 8.8	121	15 10.2	55	1 15.7	5 28.8	287 22.6	-19 33.8
10	325 10.9	120	15 21.2	53	31 20.0	5 28.5	317 26.9	-19 33.9
12	354 12.9	119	15 31.8	52	61 24.2	5 28.3	347 31.3	-19 34.0
14	23 14.7	118	15 42.2	51	91 28.4	5 28.0	17 35.6	-19 34.1
16	52 16.3	117	15 52.3	49	121 32.6	5 27.7	47 39.9	-19 34.2
18	81 17.7	116	16 2.1	48	151 36.9	5 27.4	77 44.2	-19 34.3
20	110 19.0	115	16 11.7	46	181 41.1	5 27.2	107 48.6	-19 34.4
22	139 20.1	115	16 20.9	44	211 45.3	5 26.9	137 52.9	-19 34.5
Δ					21	-1	22	-1

φ	SUNCE IZLAZ	SUNCE ZALAZ	TRAJANJE SUMRAKA GRAĐ.	TRAJANJE SUMRAKA ASTR.	MESEC IZLAZ	MESEC Δ/24	MESEC ZALAZ	MESEC Δ/24
N	h min	h min	h min	h min	h min	min	h min	min
60	7 49	15 38	0 48	2 28	4 20	1.3	20 40	2.6
55	7 25	16 2	0 40	2 7	4 41	1.4	20 17	2.5
50	7 7	16 20	0 35	1 52	4 56	1.5	19 59	2.4
45	6 53	16 35	0 31	1 41	5 9	1.6	19 45	2.4
40	6 41	16 47	0 29	1 33	5 19	1.7	19 34	2.3
35	6 31	16 57	0 27	1 27	5 28	1.8	19 24	2.3
30	6 22	17 6	0 25	1 22	5 36	1.8	19 15	2.2
20	6 7	17 21	0 23	1 16	5 49	1.9	19 0	2.2
10	5 53	17 35	0 22	1 13	6 1	2.0	18 48	2.1
0	5 41	17 48	0 22	1 12	6 12	2.0	18 36	2.1
10	5 28	18 1	0 22	1 14	6 24	2.1	18 24	2.0
20	5 14	18 15	0 23	1 20	6 36	2.2	18 11	1.9
30	4 58	18 31	0 26	1 29	6 49	2.2	17 56	1.9
35	4 48	18 40	0 28	1 37	6 57	2.3	17 48	1.8
40	4 38	18 51	0 30	1 48	7 7	2.3	17 38	1.8
45	4 25	19 4	0 34	2 5	7 17	2.4	17 26	1.7
50	4 9	19 20	0 39	2 34	7 30	2.5	17 13	1.7
55	3 50	19 40	0 46	: ::	7 47	2.6	16 56	1.6
60	3 22	20 8	0 60	: ::	8 9	2.8	16 33	1.4
S								

SUNCE UT	SUNCE $e = T_p - UT$	SUNCE Δ/24	SUNCE r	MESEC Prolaz	MESEC Δ/24	MESEC $\pi_\leftmoon$	MESEC r
h	min s	s	′	h min	min	′	′
00	15 56.4	-.3	16.2	$T_{\overline{m}}$ 12 24	2.0	54.9	15.0
12	15 52.7	$T_{\overline{m}_\odot}$ 11 h 44.1 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	′	°	
♀	8 52	.1	176	-4.4	♃	7 55	.0	190	-1.4
♂	8 36	.1	180	1.4	♄	12 50	.0	116	.7

UT	SUNCE		PROLEĆ. TAČKA	VENERA		MARS	
	$S_\odot$	$\delta_\odot$	S_Υ	S_φ	δ_φ	S_σ	δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	183 57.2	-17 48.7	51 47.4	226 53.1	- 0 35.3	231 10.9	1 16.7
2	213 57.1	-17 50.0	81 52.3	256 52.8	- 0 37.2	261 13.0	1 15.5
4	243 56.9	-17 51.4	111 57.3	286 52.6	- 0 39.1	291 15.2	1 14.3
6	273 56.7	-17 52.7	142 2.2	316 52.3	- 0 41.0	321 17.4	1 13.1
8	303 56.6	-17 54.0	172 7.1	346 52.1	- 0 42.9	351 19.5	1 11.9
10	333 56.4	-17 55.4	202 12.0	16 51.8	- 0 44.8	21 21.7	1 10.8
12	3 56.2	-17 56.7	232 17.0	46 51.6	- 0 46.7	51 23.8	1 9.6
14	33 56.0	-17 58.0	262 21.9	76 51.4	- 0 48.6	81 26.0	1 8.4
16	63 55.9	-17 59.4	292 26.8	106 51.1	- 0 50.5	111 28.2	1 7.2
18	93 55.7	-18 .7	322 31.8	136 50.9	- 0 52.4	141 30.3	1 6.0
20	123 55.5	-18 2.0	352 36.7	166 50.6	- 0 54.3	171 32.5	1 4.8
22	153 55.3	-18 3.3	22 41.6	196 50.4	- 0 56.2	201 34.7	1 3.7
Δ		-1 -7			-1 -10		11 -6

UT	MESEC				JUPITER		SATURN	
	$S_\leftmoon$	Δ	$\delta_\leftmoon$	Δ	S_{4}	δ_{4}	S_η	δ_η
h	° ′		° ′		° ′	° ′	° ′	° ′
0	168 21.0	114	16 29.8	43	241 49.5	5 26.6	167 57.2	-19 34.6
2	197 21.7	113	16 38.3	41	271 53.8	5 26.3	198 1.5	-19 34.7
4	226 22.3	112	16 46.6	40	301 58.0	5 26.0	228 5.9	-19 34.9
6	255 22.7	111	16 54.5	38	332 2.2	5 25.8	258 10.2	-19 35.0
8	284 23.0	110	17 2.2	36	2 6.5	5 25.5	288 14.5	-19 35.1
10	313 23.1	110	17 9.4	35	32 10.7	5 25.2	318 18.8	-19 35.2
12	342 23.0	109	17 16.4	33	62 14.9	5 24.9	348 23.2	-19 35.3
14	11 22.8	108	17 23.0	31	92 19.2	5 24.7	18 27.5	-19 35.4
16	40 22.4	107	17 29.3	30	122 23.4	5 24.4	48 31.8	-19 35.5
18	69 21.9	107	17 35.2	28	152 27.6	5 24.1	78 36.1	-19 35.6
20	98 21.2	106	17 40.7	26	182 31.9	5 23.8	108 40.5	-19 35.7
22	127 20.4	105	17 45.9	24	212 36.1	5 23.6	138 44.8	-19 35.8
Δ					21	-1	22	-1

φ	SUNCE		TRAJANJE SUMRAKA		MESEC			
	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 52	15 36	0 48	2 28	4 51	1.6	21 44	2.4
55	7 27	16 1	0 40	2 7	5 15	1.7	21 17	2.3
50	7 9	16 19	0 35	1 52	5 34	1.8	20 57	2.3
45	6 54	16 34	0 32	1 41	5 48	1.9	20 42	2.2
40	6 42	16 46	0 29	1 33	5 60	1.9	20 29	2.2
35	6 32	16 56	0 27	1 27	6 10	1.9	20 18	2.2
30	6 23	17 5	0 25	1 22	6 19	2.0	20 9	2.2
20	6 7	17 21	0 23	1 16	6 35	2.0	19 53	2.2
10	5 54	17 35	0 22	1 13	6 48	2.1	19 38	2.1
0	5 41	17 48	0 22	1 12	7 1	2.1	19 25	2.1
10	5 28	18 1	0 22	1 14	7 14	2.1	19 12	2.1
20	5 13	18 15	0 24	1 20	7 27	2.2	18 57	2.1
30	4 57	18 32	0 26	1 30	7 43	2.2	18 41	2.0
35	4 48	18 41	0 28	1 38	7 52	2.2	18 32	2.0
40	4 37	18 52	0 30	1 49	8 3	2.3	18 21	2.0
45	4 24	19 6	0 34	2 6	8 15	2.3	18 8	2.0
50	4 8	19 22	0 39	2 36	8 30	2.4	17 53	1.9
55	3 48	19 42	0 46	: ::	8 49	2.4	17 33	1.9
60	3 20	20 10	1 1	: ::	9 15	2.5	17 7	1.8
S								

SUNCE				MESEC			
UT	e = T_p − UT	Δ/24	r	Prolaz	Δ/24	$\pi_\leftmoon$	r
h	min s	s	′	h min	min	′	′
00	15 48.9	-.3	16.2	$T_{\overline{m}}$ 13 13	2.1	55.3	15.1
12	15 44.7	$T_{\overline{m}_\odot}$ 11 h 44.3 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	′	°	
♀	8 53	.1	175	-4.4	♃	7 52	.0	190	-1.5
♂	8 35	.1	179	1.4	♄	12 46	.0	116	.7

UT	SUNCE		PROLEĆ. TAČKA	VENERA		MARS	
	$S_\odot$	$\delta_\odot$	S_Υ	S_φ	δ_φ	S_σ	δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	183 55.1	-18 4.7	52 46.5	226 50.1	- 0 58.1	231 36.8	1 2.5
2	213 55.0	-18 6.0	82 51.5	256 49.8	- 1 .1	261 39.0	1 1.3
4	243 54.8	-18 7.3	112 56.4	286 49.6	- 1 2.0	291 41.2	1 .1
6	273 54.6	-18 8.6	143 1.3	316 49.3	- 1 3.9	321 43.3	0 58.9
8	303 54.4	-18 9.9	173 6.3	346 49.1	- 1 5.8	351 45.5	0 57.8
10	333 54.2	-18 11.2	203 11.2	16 48.8	- 1 7.7	21 47.7	0 56.6
12	3 54.0	-18 12.5	233 16.1	46 48.5	- 1 9.7	51 49.8	0 55.4
14	33 53.8	-18 13.8	263 21.0	76 48.3	- 1 11.6	81 52.0	0 54.2
16	63 53.6	-18 15.1	293 26.0	106 48.0	- 1 13.5	111 54.2	0 53.0
18	93 53.4	-18 16.4	323 30.9	136 47.7	- 1 15.4	141 56.3	0 51.8
20	123 53.2	-18 17.7	353 35.8	166 47.5	- 1 17.3	171 58.5	0 50.7
22	153 53.0	-18 19.0	23 40.8	196 47.2	- 1 19.3	202 .7	0 49.5
Δ		-1 -7			-1 -10		11 -6

UT	MESEC				JUPITER		SATURN	
	$S_\leftmoon$	Δ	$\delta_\leftmoon$	Δ	S_{4}	δ_{4}	S_η	δ_η
h	° ′		° ′		° ′	° ′	° ′	° ′
0	156 19.4	104	17 50.8	22	242 40.3	5 23.3	168 49.1	-19 35.9
2	185 18.3	104	17 55.3	21	272 44.6	5 23.0	198 53.4	-19 36.0
4	214 17.0	103	17 59.4	19	302 48.8	5 22.7	228 57.7	-19 36.2
6	243 15.7	103	18 3.1	17	332 53.1	5 22.5	259 2.1	-19 36.3
8	272 14.2	102	18 6.5	15	2 57.3	5 22.2	289 6.4	-19 36.4
10	301 12.6	101	18 9.5	13	33 1.5	5 21.9	319 10.7	-19 36.5
12	330 10.8	101	18 12.2	11	63 5.8	5 21.6	349 15.0	-19 36.6
14	359 9.0	100	18 14.4	9	93 10.0	5 21.4	19 19.4	-19 36.7
16	28 7.0	100	18 16.3	7	123 14.3	5 21.1	49 23.7	-19 36.8
18	57 4.9	99	18 17.8	5	153 18.5	5 20.8	79 28.0	-19 36.9
20	86 2.8	99	18 18.9	4	183 22.7	5 20.6	109 32.3	-19 37.0
22	115 .5	98	18 19.6	2	213 27.0	5 20.3	139 36.6	-19 37.1
Δ					21	-1	22	-1

φ	SUNCE		TRAJANJE SUMRAKA		MESEC			
	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 54	15 34	0 49	2 29	5 30	2.0	22 40	2.0
55	7 29	15 59	0 41	2 7	5 57	2.1	22 12	2.0
50	7 10	16 18	0 35	1 53	6 17	2.1	21 52	2.1
45	6 56	16 33	0 32	1 42	6 33	2.1	21 36	2.1
40	6 43	16 45	0 29	1 34	6 46	2.1	21 23	2.1
35	6 33	16 55	0 27	1 27	6 57	2.1	21 11	2.1
30	6 24	17 5	0 25	1 22	7 6	2.1	21 1	2.1
20	6 8	17 21	0 23	1 16	7 23	2.1	20 45	2.1
10	5 54	17 35	0 22	1 13	7 38	2.1	20 30	2.2
0	5 41	17 48	0 22	1 12	7 51	2.1	20 16	2.2
10	5 28	18 1	0 22	1 15	8 5	2.2	20 2	2.2
20	5 13	18 16	0 24	1 20	8 20	2.2	19 47	2.2
30	4 57	18 33	0 26	1 30	8 36	2.2	19 30	2.2
35	4 47	18 42	0 28	1 38	8 46	2.2	19 20	2.2
40	4 36	18 54	0 30	1 49	8 57	2.2	19 9	2.2
45	4 23	19 7	0 34	2 7	9 11	2.2	18 56	2.2
50	4 7	19 23	0 39	2 38	9 27	2.2	18 39	2.2
55	3 46	19 44	0 47	: ::	9 47	2.2	18 19	2.2
60	3 18	20 13	1 2	: ::	10 15	2.2	17 50	2.3
S								

SUNCE				MESEC			
UT	e = T_p − UT	Δ/24	r	Prolaz	Δ/24	$\pi_\leftmoon$	r
h	min s	s	′	h min	min	′	′
00	15 40.6	-.4	16.2	$T_{\overline{m}}$ 14 4	2.1	55.7	15.2
12	15 36.0	$T_{\overline{m}_\odot}$ 11 h 44.4 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	′	°	
♀	8 53	.1	174	-4.4	♃	7 48	.0	190	-1.5
♂	8 33	.1	179	1.4	♄	12 43	.0	116	.7

UT	SUNCE		PROLEĆ. TAČKA	VENERA		MARS	
	$S_\odot$	$\delta_\odot$	S_Υ	S_φ	δ_φ	S_σ	δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	183 52.8	-18 20.3	53 45.7	226 46.9	- 1 21.2	232 2.9	0 48.3
2	213 52.6	-18 21.6	83 50.6	256 46.7	- 1 23.1	262 5.0	0 47.1
4	243 52.4	-18 22.9	113 55.5	286 46.4	- 1 25.1	292 7.2	0 45.9
6	273 52.2	-18 24.2	144 .5	316 46.1	- 1 27.0	322 9.4	0 44.8
8	303 52.0	-18 25.4	174 5.4	346 45.8	- 1 28.9	352 11.5	0 43.6
10	333 51.8	-18 26.7	204 10.3	16 45.6	- 1 30.9	22 13.7	0 42.4
12	3 51.6	-18 28.0	234 15.3	46 45.3	- 1 32.8	52 15.9	0 41.2
14	33 51.4	-18 29.3	264 20.2	76 45.0	- 1 34.7	82 18.1	0 40.0
16	63 51.2	-18 30.6	294 25.1	106 44.7	- 1 36.7	112 20.2	0 38.9
18	93 51.0	-18 31.8	324 30.0	136 44.4	- 1 38.6	142 22.4	0 37.7
20	123 50.8	-18 33.1	354 35.0	166 44.2	- 1 40.5	172 24.6	0 36.5
22	153 50.6	-18 34.4	24 39.9	196 43.9	- 1 42.5	202 26.7	0 35.3
Δ		-1 -6			-1 -10		11 -6

UT	MESEC				JUPITER		SATURN	
	$S_\leftmoon$	Δ	$\delta_\leftmoon$	Δ	S_{4}	δ_{4}	S_η	δ_η
h	° ′		° ′		° ′	° ′	° ′	° ′
0	143 58.1	98	18 19.9	0	243 31.2	5 20.0	169 41.0	-19 37.2
2	172 55.7	97	18 19.8	-2	273 35.5	5 19.7	199 45.3	-19 37.3
4	201 53.1	97	18 19.3	-4	303 39.7	5 19.5	229 49.6	-19 37.5
6	230 50.5	97	18 18.5	-6	333 44.0	5 19.2	259 53.9	-19 37.6
8	259 47.8	96	18 17.2	-8	3 48.2	5 18.9	289 58.2	-19 37.7
10	288 45.0	96	18 15.5	-10	33 52.5	5 18.7	320 2.6	-19 37.8
12	317 42.2	96	18 13.5	-12	63 56.7	5 18.4	350 6.9	-19 37.9
14	346 39.3	95	18 11.0	-14	94 1.0	5 18.1	20 11.2	-19 38.0
16	15 36.3	95	18 8.2	-16	124 5.2	5 17.9	50 15.5	-19 38.1
18	44 33.3	95	18 4.9	-18	154 9.5	5 17.6	80 19.8	-19 38.2
20	73 30.3	94	18 1.3	-20	184 13.7	5 17.3	110 24.2	-19 38.3
22	102 27.2	94	17 57.2	-22	214 18.0	5 17.1	140 28.5	-19 38.4
Δ					21	-1	22	-1

φ	SUNCE		TRAJANJE SUMRAKA		MESEC			
	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 57	15 31	0 49	2 30	6 19	2.5	23 28	1.6
55	7 31	15 57	0 41	2 8	6 46	2.4	23 1	1.8
50	7 12	16 16	0 35	1 53	7 7	2.4	22 42	1.8
45	6 57	16 32	0 32	1 42	7 23	2.3	22 26	1.9
40	6 45	16 44	0 29	1 34	7 36	2.3	22 13	2.0
35	6 34	16 55	0 27	1 27	7 47	2.3	22 2	2.0
30	6 25	17 4	0 25	1 23	7 57	2.3	21 52	2.0
20	6 9	17 20	0 23	1 16	8 14	2.2	21 36	2.1
10	5 54	17 35	0 22	1 13	8 29	2.2	21 21	2.1
0	5 41	17 48	0 22	1 13	8 43	2.2	21 8	2.2
10	5 27	18 2	0 22	1 15	8 57	2.2	20 54	2.2
20	5 13	18 16	0 24	1 20	9 11	2.1	20 40	2.3
30	4 56	18 33	0 26	1 30	9 28	2.1	20 23	2.3
35	4 46	18 43	0 28	1 38	9 38	2.1	20 13	2.4
40	4 35	18 55	0 31	1 50	9 50	2.0	20 2	2.4
45	4 22	19 8	0 34	2 8	10 3	2.0	19 49	2.4
50	4 5	19 25	0 39	2 40	10 19	2.0	19 33	2.5
55	3 44	19 46	0 47	: ::	10 40	1.9	19 12	2.6
60	3 15	20 16	1 2	: ::	11 8	1.8	18 45	2.7
S								

SUNCE				MESEC			
UT	e = T_p − UT	Δ/24	r	Prolaz	Δ/24	$\pi_\leftmoon$	r
h	min s	s	′	h min	min	′	′
00	15 31.4	-.4	16.2	$T_{\overline{m}}$ 14 55	2.2	56.2	15.3
12	15 26.4	$T_{\overline{m}_\odot}$ 11 h 44.6 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	′	°	
♀	8 53	.1	173	-4.4	♃	7 45	.0	190	-1.5
♂	8 31	.1	178	1.4	♄	12 39	.0	116	.7

UT	SUNCE		PROLEĆ. TAČKA	VENERA		MARS	
	$S_\odot$	$\delta_\odot$	S_Υ	S_φ	δ_φ	S_σ	δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	183 50.3	-18 35.6	54 44.8	226 43.6	- 1 44.4	232 28.9	0 34.1
2	213 50.1	-18 36.9	84 49.8	256 43.3	- 1 46.4	262 31.1	0 33.0
4	243 49.9	-18 38.1	114 54.7	286 43.0	- 1 48.3	292 33.3	0 31.8
6	273 49.7	-18 39.4	144 59.6	316 42.7	- 1 50.2	322 35.4	0 30.6
8	303 49.5	-18 40.7	175 4.5	346 42.4	- 1 52.2	352 37.6	0 29.4
10	333 49.2	-18 41.9	205 9.5	16 42.1	- 1 54.1	22 39.8	0 28.2
12	3 49.0	-18 43.2	235 14.4	46 41.8	- 1 56.1	52 42.0	0 27.1
14	33 48.8	-18 44.4	265 19.3	76 41.5	- 1 58.0	82 44.1	0 25.9
16	63 48.5	-18 45.7	295 24.3	106 41.2	- 1 60.0	112 46.3	0 24.7
18	93 48.3	-18 46.9	325 29.2	136 40.9	- 2 1.9	142 48.5	0 23.5
20	123 48.1	-18 48.1	355 34.1	166 40.6	- 2 3.9	172 50.7	0 22.3
22	153 47.9	-18 49.4	25 39.0	196 40.3	- 2 5.8	202 52.8	0 21.2
Δ		-1 -6			-1 -10		11 -6

UT	MESEC				JUPITER		SATURN	
	$S_\leftmoon$	Δ	$\delta_\leftmoon$	Δ	S_{4}	δ_{4}	S_η	δ_η
h	° ′		° ′		° ′	° ′	° ′	° ′
0	131 24.0	94	17 52.7	-24	244 22.3	5 16.8	170 32.8	-19 38.5
2	160 20.8	94	17 47.9	-26	274 26.5	5 16.5	200 37.1	-19 38.6
4	189 17.6	94	17 42.6	-28	304 30.8	5 16.3	230 41.4	-19 38.7
6	218 14.4	94	17 37.0	-30	334 35.0	5 16.0	260 45.8	-19 38.9
8	247 11.1	94	17 30.9	-32	4 39.3	5 15.7	290 50.1	-19 39.0
10	276 7.8	93	17 24.5	-34	34 43.5	5 15.5	320 54.4	-19 39.1
12	305 4.5	93	17 17.6	-36	64 47.8	5 15.2	350 58.7	-19 39.2
14	334 1.2	93	17 10.4	-38	94 52.1	5 14.9	21 3.0	-19 39.3
16	2 57.9	93	17 2.8	-40	124 56.3	5 14.7	51 7.3	-19 39.4
18	31 54.5	93	16 54.7	-42	155 .6	5 14.4	81 11.7	-19 39.5
20	60 51.2	93	16 46.3	-44	185 4.8	5 14.1	111 16.0	-19 39.6
22	89 47.8	93	16 37.5	-46	215 9.1	5 13.9	141 20.3	-19 39.7
Δ					21	-1	22	-1

φ	SUNCE		TRAJANJE SUMRAKA		MESEC			
	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 60	15 29	0 49	2 30	7 18	2.9	.. ..	.0
55	7 33	15 56	0 41	2 8	7 44	2.7	23 43	1.5
50	7 14	16 15	0 36	1 53	8 4	2.6	23 26	1.6
45	6 58	16 31	0 32	1 42	8 19	2.5	23 12	1.7
40	6 46	16 43	0 29	1 34	8 32	2.5	22 60	1.8
35	6 35	16 54	0 27	1 28	8 42	2.4	22 50	1.9
30	6 26	17 4	0 25	1 23	8 52	2.4	22 41	1.9
20	6 9	17 20	0 23	1 16	9 8	2.3	22 26	2.0
10	5 55	17 35	0 22	1 13	9 22	2.3	22 13	2.1
0	5 41	17 48	0 22	1 13	9 35	2.2	22 0	2.2
10	5 27	18 2	0 22	1 15	9 48	2.1	21 48	2.3
20	5 13	18 17	0 24	1 20	10 2	2.1	21 34	2.3
30	4 56	18 34	0 26	1 31	10 18	2.0	21 19	2.4
35	4 46	18 44	0 28	1 39	10 28	1.9	21 10	2.5
40	4 34	18 56	0 31	1 50	10 38	1.9	20 60	2.6
45	4 21	19 10	0 34	2 9	10 51	1.8	20 48	2.6
50	4 4	19 27	0 39	2 43	11 6	1.7	20 33	2.7
55	3 42	19 48	0 48	: ::	11 25	1.6	20 14	2.9
60	3 13	20 18	1 3	: ::	11 51	1.5	19 49	3.0
S								

SUNCE				MESEC			
UT	e = T_p − UT	Δ/24	r	Prolaz	Δ/24	$\pi_\leftmoon$	r
h	min s	s	′	h min	min	′	′
00	15 21.3	-.5	16.2	$T_{\overline{m}}$ 15 48	2.2	56.7	15.4
12	15 15.9	$T_{\overline{m}_\odot}$ 11 h 44.7 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	′	°	
♀	8 53	.1	172	-4.4	♃	7 41	.0	190	-1.5
♂	8 29	.1	178	1.4	♄	12 36	.0	116	.7

UT	SUNCE		PROLEĆ. TAČKA	VENERA		MARS	
	$S_\odot$	$\delta_\odot$	S_Υ	S_φ	δ_φ	S_σ	δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	183 47.6	-18 50.6	55 44.0	226 40.0	- 2 7.8	232 55.0	0 20.0
2	213 47.4	-18 51.9	85 48.9	256 39.7	- 2 9.7	262 57.2	0 18.8
4	243 47.1	-18 53.1	115 53.8	286 39.4	- 2 11.7	292 59.4	0 17.6
6	273 46.9	-18 54.3	145 58.7	316 39.1	- 2 13.6	323 1.5	0 16.5
8	303 46.7	-18 55.5	176 3.7	346 38.8	- 2 15.6	353 3.7	0 15.3
10	333 46.4	-18 56.8	206 8.6	16 38.5	- 2 17.5	23 5.9	0 14.1
12	3 46.2	-18 58.0	236 13.5	46 38.2	- 2 19.5	53 8.1	0 12.9
14	33 45.9	-18 59.2	266 18.5	76 37.9	- 2 21.5	83 10.2	0 11.7
16	63 45.7	-19 .4	296 23.4	106 37.5	- 2 23.4	113 12.4	0 10.6
18	93 45.4	-19 1.7	326 28.3	136 37.2	- 2 25.4	143 14.6	0 9.4
20	123 45.2	-19 2.9	356 33.2	166 36.9	- 2 27.3	173 16.8	0 8.2
22	153 45.0	-19 4.1	26 38.2	196 36.6	- 2 29.3	203 19.0	0 7.0
Δ		-1 -6			-2 -10		11 -6

UT	MESEC				JUPITER		SATURN	
	$S_\leftmoon$	Δ	$\delta_\leftmoon$	Δ	S_{4}	δ_{4}	S_{5}	δ_{5}
h	° ′		° ′		° ′	° ′	° ′	° ′
0	118 44.5	93	16 28.4	-48	245 13.4	5 13.6	171 24.6	-19 39.8
2	147 41.2	93	16 18.8	-50	275 17.6	5 13.4	201 28.9	-19 39.9
4	176 37.8	93	16 8.8	-52	305 21.9	5 13.1	231 33.3	-19 40.0
6	205 34.5	93	15 58.5	-53	335 26.2	5 12.8	261 37.6	-19 40.1
8	234 31.2	94	15 47.8	-55	5 30.4	5 12.6	291 41.9	-19 40.2
10	263 27.9	94	15 36.8	-57	35 34.7	5 12.3	321 46.2	-19 40.4
12	292 24.7	94	15 25.3	-59	65 39.0	5 12.0	351 50.5	-19 40.5
14	321 21.4	94	15 13.5	-61	95 43.2	5 11.8	21 54.8	-19 40.6
16	350 18.2	94	15 1.4	-63	125 47.5	5 11.5	51 59.2	-19 40.7
18	19 15.0	94	14 48.9	-64	155 51.8	5 11.3	82 3.5	-19 40.8
20	48 11.8	94	14 36.0	-66	185 56.1	5 11.0	112 7.8	-19 40.9
22	77 8.6	94	14 22.8	-68	216 .3	5 10.7	142 12.1	-19 41.0
Δ					21	-1	22	-1

φ	SUNCE		TRAJANJE SUMRAKA		MESEC			
	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 2	15 27	0 50	2 31	8 27	3.2	0 7	1.3
55	7 35	15 54	0 41	2 9	8 50	3.0	. . .	.0
50	7 15	16 14	0 36	1 53	9 7	2.8	. . .	.0
45	6 60	16 30	0 32	1 42	9 20	2.7	23 53	1.6
40	6 47	16 43	0 29	1 34	9 31	2.6	23 43	1.7
35	6 36	16 54	0 27	1 28	9 41	2.5	23 35	1.8
30	6 26	17 3	0 25	1 23	9 49	2.5	23 28	1.8
20	6 10	17 20	0 23	1 16	10 3	2.4	23 15	2.0
10	5 55	17 35	0 22	1 13	10 16	2.3	23 3	2.1
0	5 41	17 48	0 22	1 13	10 28	2.2	22 53	2.2
10	5 27	18 3	0 22	1 15	10 39	2.1	22 42	2.3
20	5 12	18 18	0 24	1 20	10 52	2.0	22 31	2.4
30	4 55	18 35	0 26	1 31	11 6	1.9	22 17	2.5
35	4 45	18 45	0 28	1 39	11 14	1.8	22 10	2.6
40	4 33	18 57	0 31	1 51	11 24	1.7	22 1	2.7
45	4 19	19 11	0 34	2 9	11 34	1.6	21 51	2.8
50	4 3	19 28	0 40	2 45	11 48	1.5	21 38	2.9
55	3 41	19 50	0 48	: ::	12 4	1.4	21 23	3.1
60	3 11	20 21	1 4	: ::	12 26	1.2	21 2	3.3
S								

SUNCE				MESEC				
UT	e = T_p − UT	Δ/24	r	Prolaz		Δ/24	$\pi_\leftmoon$	r
h	min s	s	′		h min	min	′	′
00	15 10.5	-.5	16.2	$T_{\overline{m}}$	16 40	2.2	57.2	15.6
12	15 4.6	$T_{\overline{m}_\odot}$	11 h 44.9 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 53	.1	171	-4.3	♃	7 38	.0	189	-1.5
♂	8 28	.1	177	1.4	♄	12 33	.0	116	.7

UT	SUNCE		PROLEĆ. TAČKA	VENERA		MARS	
	$S_\odot$	$\delta_\odot$	S_Υ	S_φ	δ_φ	S_σ	δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	183 44.7	-19 5.3	56 43.1	226 36.3	- 2 31.3	233 21.1	0 5.9
2	213 44.4	-19 6.5	86 48.0	256 35.9	- 2 33.2	263 23.3	0 4.7
4	243 44.2	-19 7.7	116 53.0	286 35.6	- 2 35.2	293 25.5	0 3.5
6	273 43.9	-19 8.9	146 57.9	316 35.3	- 2 37.2	323 27.7	0 2.3
8	303 43.7	-19 10.1	177 2.8	346 35.0	- 2 39.1	353 29.9	0 1.2
10	333 43.4	-19 11.3	207 7.7	16 34.6	- 2 41.1	23 32.0	- 0 .0
12	3 43.2	-19 12.5	237 12.7	46 34.3	- 2 43.1	53 34.2	- 0 1.2
14	33 42.9	-19 13.7	267 17.6	76 34.0	- 2 45.0	83 36.4	- 0 2.4
16	63 42.6	-19 14.9	297 22.5	106 33.6	- 2 47.0	113 38.6	- 0 3.5
18	93 42.4	-19 16.1	327 27.5	136 33.3	- 2 49.0	143 40.8	- 0 4.7
20	123 42.1	-19 17.2	357 32.4	166 33.0	- 2 50.9	173 42.9	- 0 5.9
22	153 41.8	-19 18.4	27 37.3	196 32.6	- 2 52.9	203 45.1	- 0 7.1
Δ		-1 -6			-2 -10		11 -6

UT	MESEC				JUPITER		SATURN	
	$S_\leftmoon$	Δ	$\delta_\leftmoon$	Δ	S_{4}	δ_{4}	S_{5}	δ_{5}
h	° ′		° ′		° ′	° ′	° ′	° ′
0	106 5.4	94	14 9.2	-70	246 4.6	5 10.5	172 16.4	-19 41.1
2	135 2.3	95	13 55.3	-71	276 8.9	5 10.2	202 20.7	-19 41.2
4	163 59.2	95	13 41.0	-73	306 13.2	5 10.0	232 25.1	-19 41.3
6	192 56.1	95	13 26.5	-75	336 17.4	5 9.7	262 29.4	-19 41.4
8	221 53.1	95	13 11.5	-76	6 21.7	5 9.5	292 33.7	-19 41.5
10	250 50.1	95	12 56.3	-78	36 26.0	5 9.2	322 38.0	-19 41.6
12	279 47.1	95	12 40.8	-79	66 30.3	5 8.9	352 42.3	-19 41.7
14	308 44.1	95	12 24.9	-81	96 34.6	5 8.7	22 46.6	-19 41.9
16	337 41.1	95	12 8.7	-82	126 38.8	5 8.4	52 50.9	-19 42.0
18	6 38.2	95	11 52.3	-84	156 43.1	5 8.2	82 55.3	-19 42.1
20	35 35.3	96	11 35.5	-85	186 47.4	5 7.9	112 59.6	-19 42.2
22	64 32.4	96	11 18.4	-87	216 51.7	5 7.7	143 3.9	-19 42.3
Δ					21	-1	22	-1

φ	SUNCE		TRAJANJE SUMRAKA		MESEC			
	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 4	15 25	0 50	2 31	9 43	3.4	0 39	1.1
55	7 37	15 53	0 41	2 9	10 1	3.1	0 20	1.3
50	7 17	16 13	0 36	1 54	10 15	3.0	0 5	1.5
45	7 1	16 29	0 32	1 43	10 25	2.8	. . .	.0
40	6 48	16 42	0 29	1 34	10 34	2.7	. . .	.0
35	6 37	16 53	0 27	1 28	10 42	2.6	. . .	.0
30	6 27	17 3	0 25	1 23	10 49	2.5	. . .	.0
20	6 10	17 20	0 23	1 17	11 0	2.4	. . .	.0
10	5 56	17 35	0 22	1 13	11 11	2.3	23 53	2.0
0	5 42	17 49	0 22	1 13	11 20	2.2	23 45	2.2
10	5 27	18 3	0 22	1 15	11 29	2.1	23 37	2.3
20	5 12	18 18	0 24	1 21	11 40	1.9	23 28	2.4
30	4 55	18 36	0 26	1 31	11 51	1.8	23 18	2.6
35	4 44	18 46	0 28	1 39	11 58	1.7	23 12	2.7
40	4 33	18 58	0 31	1 52	12 5	1.6	23 5	2.8
45	4 19	19 12	0 34	2 10	12 14	1.5	22 57	2.9
50	4 1	19 30	0 40	2 47	12 25	1.4	22 48	3.0
55	3 39	19 52	0 48	: ::	12 38	1.2	22 36	3.2
60	3 8	20 23	1 5	: ::	12 55	1.0	22 21	3.4
S								

SUNCE				MESEC				
UT	e = T_p − UT	Δ/24	r	Prolaz		Δ/24	$\pi_\leftmoon$	r
h	min s	s	′		h min	min	′	′
00	14 58.8	-.5	16.2	$T_{\overline{m}}$	17 32	2.2	57.8	15.8
12	14 52.6	$T_{\overline{m}_\odot}$	11 h 45.1 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 54	.1	170	-4.3	♃	7 35	.0	189	-1.5
♂	8 26	.1	177	1.4	♄	12 29	.0	116	.7

UT	SUNCE		PROLEĆ. TAČKA	VENERA		MARS	
	$S_\odot$	$\delta_\odot$	S_Υ	S_φ	δ_φ	S_σ	δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	183 41.6	-19 19.6	57 42.2	226 32.3	- 2 54.9	233 47.3	- 0 8.2
2	213 41.3	-19 20.8	87 47.2	256 32.0	- 2 56.8	263 49.5	- 0 9.4
4	243 41.0	-19 22.0	117 52.1	286 31.6	- 2 58.8	293 51.7	- 0 10.6
6	273 40.8	-19 23.1	147 57.0	316 31.3	- 3 .8	323 53.9	- 0 11.8
8	303 40.5	-19 24.3	178 2.0	346 30.9	- 3 2.8	353 56.0	- 0 12.9
10	333 40.2	-19 25.5	208 6.9	16 30.6	- 3 4.7	23 58.2	- 0 14.1
12	3 39.9	-19 26.6	238 11.8	46 30.2	- 3 6.7	54 .4	- 0 15.3
14	33 39.7	-19 27.8	268 16.7	76 29.9	- 3 8.7	84 2.6	- 0 16.5
16	63 39.4	-19 29.0	298 21.7	106 29.5	- 3 10.7	114 4.8	- 0 17.6
18	93 39.1	-19 30.1	328 26.6	136 29.2	- 3 12.7	144 7.0	- 0 18.8
20	123 38.8	-19 31.3	358 31.5	166 28.8	- 3 14.6	174 9.1	- 0 20.0
22	153 38.5	-19 32.4	28 36.5	196 28.5	- 3 16.6	204 11.3	- 0 21.1
Δ	-1	-6		-2	-10	11	-6

UT	MESEC				JUPITER		SATURN	
	$S_\leftmoon$	Δ	$\delta_\leftmoon$	Δ	$S_{\mathrm{♃}}$	$\delta_{\mathrm{♃}}$	$S_{\mathrm{♄}}$	$\delta_{\mathrm{♄}}$
h	° ′		° ′		° ′	° ′	° ′	° ′
0	93 29.6	96	11 1.1	-88	246 56.0	5 7.4	173 8.2	-19 42.4
2	122 26.7	96	10 43.4	-90	277 .2	5 7.2	203 12.5	-19 42.5
4	151 23.9	96	10 25.5	-91	307 4.5	5 6.9	233 16.8	-19 42.6
6	180 21.0	96	10 7.3	-92	337 8.8	5 6.6	263 21.2	-19 42.7
8	209 18.2	96	9 48.9	-93	7 13.1	5 6.4	293 25.5	-19 42.8
10	238 15.4	96	9 30.2	-95	37 17.4	5 6.1	323 29.8	-19 42.9
12	267 12.6	96	9 11.2	-96	67 21.7	5 5.9	353 34.1	-19 43.0
14	296 9.8	96	8 52.1	-97	97 26.0	5 5.6	23 38.4	-19 43.1
16	325 7.0	96	8 32.6	-98	127 30.3	5 5.4	53 42.7	-19 43.2
18	354 4.3	96	8 13.0	-99	157 34.5	5 5.1	83 47.0	-19 43.3
20	23 1.5	96	7 53.1	-100	187 38.8	5 4.9	113 51.4	-19 43.4
22	51 58.7	96	7 33.0	-102	217 43.1	5 4.6	143 55.7	-19 43.6
Δ					21	-1	22	-1

φ	SUNCE		TRAJANJE SUMRAKA		MESEC			
	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 7	15 23	0 50	2 32	11 4	3.5	1 5	.9
55	7 39	15 51	0 42	2 9	11 17	3.3	0 51	1.2
50	7 19	16 12	0 36	1 54	11 26	3.1	0 40	1.3
45	7 2	16 28	0 32	1 43	11 34	2.9	0 31	1.5
40	6 49	16 41	0 29	1 34	11 40	2.8	0 24	1.6
35	6 38	16 52	0 27	1 28	11 45	2.7	0 17	1.7
30	6 28	17 2	0 25	1 23	11 50	2.6	0 12	1.8
20	6 11	17 20	0 23	1 17	11 58	2.4	0 2	1.9
10	5 56	17 35	0 22	1 13	12 5	2.3	. . ..	.0
0	5 42	17 49	0 22	1 13	12 12	2.2	. . ..	.0
10	5 27	18 3	0 22	1 15	12 19	2.0	. . ..	.0
20	5 12	18 19	0 24	1 21	12 26	1.9	. . ..	.0
30	4 54	18 37	0 26	1 31	12 34	1.7	. . ..	.0
35	4 44	18 47	0 28	1 40	12 39	1.7	. . ..	.0
40	4 32	18 59	0 31	1 52	12 44	1.6	. . ..	.0
45	4 18	19 14	0 35	2 11	12 50	1.4	. . ..	.0
50	4 0	19 31	0 40	2 50	12 58	1.3	. . ..	.0
55	3 38	19 54	0 49	: ::	13 7	1.1	23 53	3.3
60	3 6	20 26	1 6	: ::	13 19	.9	23 43	3.6
S								

UT	SUNCE			MESEC			
	$e = T_p - UT$	Δ/24	r	Prolaz		Δ/24	$\pi_\leftmoon$	r
h	min s	s	′		h min	min	′	′
00	14 46.3	-.6	16.2	$T_{\overline{m}}$	18 25	2.2	58.4	15.9
12	14 39.7	$T_{\overline{m}_\odot}$	11 h 45.3 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 54	.1	169	-4.3	♃	7 31	.0	189	-1.5
♂	8 24	.1	176	1.4	♄	12 26	.0	115	.7

UT	SUNCE		PROLEĆ. TAČKA	VENERA		MARS	
	$S_\odot$	$\delta_\odot$	S_Υ	S_φ	δ_φ	S_σ	δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	183 38.3	-19 33.6	58 41.4	226 28.1	- 3 18.6	234 13.5	- 0 22.3
2	213 38.0	-19 34.7	88 46.3	256 27.8	- 3 20.6	264 15.7	- 0 23.5
4	243 37.7	-19 35.9	118 51.2	286 27.4	- 3 22.6	294 17.9	- 0 24.7
6	273 37.4	-19 37.0	148 56.2	316 27.1	- 3 24.5	324 20.1	- 0 25.8
8	303 37.1	-19 38.2	179 1.1	346 26.7	- 3 26.5	354 22.3	- 0 27.0
10	333 36.8	-19 39.3	209 6.0	16 26.3	- 3 28.5	24 24.4	- 0 28.2
12	3 36.5	-19 40.4	239 10.9	46 26.0	- 3 30.5	54 26.6	- 0 29.3
14	33 36.2	-19 41.6	269 15.9	76 25.6	- 3 32.5	84 28.8	- 0 30.5
16	63 35.9	-19 42.7	299 20.8	106 25.2	- 3 34.5	114 31.0	- 0 31.7
18	93 35.6	-19 43.8	329 25.7	136 24.9	- 3 36.4	144 33.2	- 0 32.9
20	123 35.3	-19 44.9	359 30.7	166 24.5	- 3 38.4	174 35.4	- 0 34.0
22	153 35.0	-19 46.1	29 35.6	196 24.1	- 3 40.4	204 37.6	- 0 35.2
Δ	-1	-6		-2	-10	11	-6

UT	MESEC				JUPITER		SATURN	
	$S_\leftmoon$	Δ	$\delta_\leftmoon$	Δ	$S_{\mathrm{♃}}$	$\delta_{\mathrm{♃}}$	$S_{\mathrm{♄}}$	$\delta_{\mathrm{♄}}$
h	° ′		° ′		° ′	° ′	° ′	° ′
0	80 55.8	96	7 12.7	-103	247 47.4	5 4.4	173 60.0	-19 43.7
2	109 53.0	96	6 52.2	-104	277 51.7	5 4.1	204 4.3	-19 43.8
4	138 50.2	96	6 31.5	-104	307 56.0	5 3.9	234 8.6	-19 43.9
6	167 47.3	96	6 10.6	-105	338 .3	5 3.6	264 12.9	-19 44.0
8	196 44.4	95	5 49.5	-106	8 4.6	5 3.4	294 17.2	-19 44.1
10	225 41.5	95	5 28.3	-107	38 8.9	5 3.1	324 21.5	-19 44.2
12	254 38.5	95	5 6.9	-108	68 13.2	5 2.9	354 25.9	-19 44.3
14	283 35.6	95	4 45.3	-109	98 17.5	5 2.6	24 30.2	-19 44.4
16	312 32.5	95	4 23.6	-109	128 21.8	5 2.4	54 34.5	-19 44.5
18	341 29.5	94	4 1.8	-110	158 26.1	5 2.1	84 38.8	-19 44.6
20	10 26.3	94	3 39.8	-110	188 30.4	5 1.9	114 43.1	-19 44.7
22	39 23.2	94	3 17.7	-111	218 34.7	5 1.6	144 47.4	-19 44.8
Δ					21	-1	22	-1

φ	SUNCE		TRAJANJE SUMRAKA		MESEC			
	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 9	15 21	0 51	2 33	12 29	3.6	1 27	.9
55	7 41	15 50	0 42	2 10	12 35	3.4	1 18	1.1
50	7 20	16 11	0 36	1 54	12 40	3.2	1 12	1.3
45	7 4	16 27	0 32	1 43	12 44	3.0	1 6	1.4
40	6 50	16 40	0 29	1 35	12 47	2.9	1 1	1.5
35	6 39	16 52	0 27	1 28	12 50	2.8	0 57	1.6
30	6 29	17 2	0 26	1 23	12 52	2.7	0 54	1.7
20	6 12	17 19	0 23	1 17	12 57	2.5	0 48	1.9
10	5 56	17 35	0 22	1 14	13 1	2.3	0 42	2.0
0	5 42	17 49	0 22	1 13	13 4	2.2	0 37	2.2
10	5 27	18 4	0 22	1 15	13 8	2.0	0 32	2.3
20	5 12	18 19	0 24	1 21	13 12	1.9	0 26	2.5
30	4 54	18 38	0 26	1 32	13 16	1.7	0 20	2.6
35	4 43	18 48	0 28	1 40	13 19	1.6	0 16	2.7
40	4 31	19 1	0 31	1 53	13 21	1.5	0 12	2.8
45	4 17	19 15	0 35	2 12	13 25	1.4	0 7	2.9
50	3 59	19 33	0 40	2 52	13 29	1.2	0 1	3.1
55	3 36	19 56	0 49	: ::	13 33	1.1	. . ..	.0
60	3 4	20 29	1 7	: ::	13 40	.8	. . ..	.0
S								

UT	SUNCE			MESEC			
	$e = T_p - UT$	Δ/24	r	Prolaz		Δ/24	$\pi_\leftmoon$	r
h	min s	s	′		h min	min	′	′
00	14 33.0	-.6	16.2	$T_{\overline{m}}$	19 17	2.2	59.0	16.1
12	14 26.0	$T_{\overline{m}_\odot}$	11 h 45.6 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 54	.1	168	-4.3	♃	7 28	.0	189	-1.5
♂	8 22	.1	176	1.4	♄	12 22	.0	115	.7

UT	SUNCE		PROLEĆ. TAČKA	VENERA		MARS	
	$S_\odot$	$\delta_\odot$	S_Υ	S_φ	δ_φ	S_σ	δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	183 34.7	-19 47.2	59 40.5	226 23.7	- 3 42.4	234 39.8	- 0 36.4
2	213 34.4	-19 48.3	89 45.4	256 23.4	- 3 44.4	264 41.9	- 0 37.5
4	243 34.1	-19 49.4	119 50.4	286 23.0	- 3 46.4	294 44.1	- 0 38.7
6	273 33.8	-19 50.5	149 55.3	316 22.6	- 3 48.4	324 46.3	- 0 39.9
8	303 33.5	-19 51.7	180 .2	346 22.2	- 3 50.4	354 48.5	- 0 41.1
10	333 33.2	-19 52.8	210 5.2	16 21.9	- 3 52.3	24 50.7	- 0 42.2
12	3 32.9	-19 53.9	240 10.1	46 21.5	- 3 54.3	54 52.9	- 0 43.4
14	33 32.6	-19 55.0	270 15.0	76 21.1	- 3 56.3	84 55.1	- 0 44.6
16	63 32.3	-19 56.1	300 19.9	106 20.7	- 3 58.3	114 57.3	- 0 45.7
18	93 32.0	-19 57.2	330 24.9	136 20.3	- 4 .3	144 59.5	- 0 46.9
20	123 31.7	-19 58.3	0 29.8	166 19.9	- 4 2.3	175 1.6	- 0 48.1
22	153 31.3	-19 59.4	30 34.7	196 19.5	- 4 4.3	205 3.8	- 0 49.2
Δ	-2	-6		-2	-10	11	-6

UT	MESEC				JUPITER		SATURN	
	$S_\leftmoon$	Δ	$\delta_\leftmoon$	Δ	S_{4}	δ_{4}	S_η	δ_η
h	° ′		° ′		° ′	° ′	° ′	° ′
0	68 19.9	94	2 55.5	-112	248 39.0	5 1.4	174 51.7	-19 44.9
2	97 16.7	93	2 33.2	-112	278 43.3	5 1.2	204 56.1	-19 45.0
4	126 13.3	93	2 10.8	-112	308 47.6	5 .9	235 .4	-19 45.1
6	155 9.9	93	1 48.3	-113	338 51.9	5 .7	265 4.7	-19 45.2
8	184 6.4	92	1 25.8	-113	8 56.2	5 .4	295 9.0	-19 45.3
10	213 2.8	92	1 3.1	-113	39 .5	5 .2	325 13.3	-19 45.5
12	241 59.2	91	0 40.5	-114	69 4.8	4 59.9	355 17.6	-19 45.6
14	270 55.5	91	0 17.7	-63	99 9.2	4 59.7	25 21.9	-19 45.7
16	299 51.6	90	0 5.1	114	129 13.5	4 59.4	55 26.2	-19 45.8
18	328 47.7	90	0 27.9	114	159 17.8	4 59.2	85 30.5	-19 45.9
20	357 43.7	89	0 50.7	114	189 22.1	4 59.0	115 34.9	-19 46.0
22	26 39.6	89	1 13.5	114	219 26.4	4 58.7	145 39.2	-19 46.1
Δ					22	-1	22	-1

φ	SUNCE		TRAJANJE SUMRAKA		MESEC			
	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 12	15 19	0 51	2 33	13 55	1.0	1 48	2.0
55	7 43	15 48	0 42	2 10	13 55	1.2	1 45	2.1
50	7 22	16 9	0 36	1 54	13 56	1.4	1 42	2.1
45	7 5	16 26	0 32	1 43	13 56	1.5	1 40	2.1
40	6 51	16 40	0 29	1 35	13 56	1.6	1 39	2.1
35	6 40	16 51	0 27	1 28	13 56	1.7	1 37	2.1
30	6 30	17 2	0 26	1 23	13 56	1.8	1 36	2.1
20	6 12	17 19	0 23	1 17	13 56	2.0	1 33	2.2
10	5 57	17 35	0 22	1 14	13 57	2.1	1 31	2.2
0	5 42	17 49	0 22	1 13	13 57	2.2	1 29	2.2
10	5 28	18 4	0 22	1 16	13 57	2.4	1 27	2.2
20	5 12	18 20	0 24	1 21	13 57	2.5	1 25	2.3
30	4 53	18 38	0 26	1 32	13 58	2.6	1 22	2.3
35	4 43	18 49	0 28	1 41	13 58	2.7	1 21	2.3
40	4 30	19 2	0 31	1 53	13 58	2.8	1 19	2.3
45	4 16	19 16	0 35	2 13	13 58	3.0	1 17	2.3
50	3 58	19 35	0 40	2 55	13 59	3.1	1 15	2.4
55	3 35	19 58	0 50	: ::	13 59	3.3	1 12	2.4
60	3 2	20 31	1 9	: ::	13 60	3.5	1 8	2.5
S								

SUNCE				MESEC				
UT	e = T_p − UT	Δ/24	r	Prolaz		Δ/24	$\pi_\leftmoon$	r
h	min s	s	′		h min	min	′	′
00	14 18.9	-.6	16.2	$T_{\overline{m}}$	20 9	2.2	59.6	16.2
12	14 11.5	$T_{\overline{m}_\odot}$	11 h 45.8 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	.1	167	-4.3	♄	7 24	.0	189	-1.5
♂	8 21	.1	175	1.4	♃	12 19	.0	115	.7

UT	SUNCE		PROLEĆ. TAČKA	VENERA		MARS	
	$S_\odot$	$\delta_\odot$	S_Υ	S_φ	δ_φ	S_σ	δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	183 31.0	-20 .4	60 39.7	226 19.2	- 4 6.3	235 6.0	- 0 50.4
2	213 30.7	-20 1.5	90 44.6	256 18.8	- 4 8.3	265 8.2	- 0 51.6
4	243 30.4	-20 2.6	120 49.5	286 18.4	- 4 10.3	295 10.4	- 0 52.7
6	273 30.1	-20 3.7	150 54.4	316 18.0	- 4 12.3	325 12.6	- 0 53.9
8	303 29.7	-20 4.8	180 59.4	346 17.6	- 4 14.3	355 14.8	- 0 55.1
10	333 29.4	-20 5.9	211 4.3	16 17.2	- 4 16.3	25 17.0	- 0 56.2
12	3 29.1	-20 6.9	241 9.2	46 16.8	- 4 18.3	55 19.2	- 0 57.4
14	33 28.8	-20 8.0	271 14.2	76 16.4	- 4 20.3	85 21.4	- 0 58.6
16	63 28.4	-20 9.1	301 19.1	106 16.0	- 4 22.3	115 23.6	- 0 59.7
18	93 28.1	-20 10.2	331 24.0	136 15.6	- 4 24.3	145 25.8	- 1 .9
20	123 27.8	-20 11.2	1 28.9	166 15.2	- 4 26.3	175 27.9	- 1 2.1
22	153 27.4	-20 12.3	31 33.9	196 14.8	- 4 28.3	205 30.1	- 1 3.2
Δ	-2	-5		-2	-10	11	-6

UT	MESEC				JUPITER		SATURN	
	$S_\leftmoon$	Δ	$\delta_\leftmoon$	Δ	S_{4}	δ_{4}	S_η	δ_η
h	° ′		° ′		° ′	° ′	° ′	° ′
0	55 35.4	88	1 36.4	114	249 30.7	4 58.5	175 43.5	-19 46.2
2	84 31.0	88	1 59.2	114	279 35.0	4 58.2	205 47.8	-19 46.3
4	113 26.6	87	2 22.0	114	309 39.3	4 58.0	235 52.1	-19 46.4
6	142 22.0	87	2 44.8	114	339 43.7	4 57.8	265 56.4	-19 46.5
8	171 17.4	86	3 7.5	113	9 48.0	4 57.5	296 .7	-19 46.6
10	200 12.6	85	3 30.2	113	39 52.3	4 57.3	326 5.0	-19 46.7
12	229 7.6	85	3 52.8	113	69 56.6	4 57.0	356 9.4	-19 46.8
14	258 2.6	84	4 15.4	112	100 .9	4 56.8	26 13.7	-19 46.9
16	286 57.4	83	4 37.8	112	130 5.2	4 56.6	56 18.0	-19 47.0
18	315 52.1	83	5 .2	111	160 9.6	4 56.3	86 22.3	-19 47.1
20	344 46.6	82	5 22.4	111	190 13.9	4 56.1	116 26.6	-19 47.2
22	13 41.0	81	5 44.6	110	220 18.2	4 55.8	146 30.9	-19 47.3
Δ					22	-1	22	-1

φ	SUNCE		TRAJANJE SUMRAKA		MESEC			
	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	15 17	0 51	2 34	14 20	.9	2 37	3.7
55	7 45	15 47	0 42	2 11	14 25	1.2	2 34	3.4
50	7 23	16 8	0 36	1 55	14 29	1.4	2 32	3.2
45	7 6	16 25	0 32	1 43	14 32	1.5	2 31	3.1
40	6 53	16 39	0 29	1 35	14 35	1.6	2 29	2.9
35	6 41	16 51	0 27	1 28	14 38	1.7	2 28	2.8
30	6 31	17 1	0 26	1 23	14 40	1.8	2 27	2.7
20	6 13	17 19	0 23	1 17	14 44	2.0	2 25	2.5
10	5 57	17 35	0 22	1 14	14 47	2.1	2 24	2.4
0	5 42	17 50	0 22	1 13	14 50	2.3	2 22	2.3
10	5 28	18 5	0 23	1 16	14 54	2.4	2 21	2.1
20	5 12	18 21	0 24	1 21	14 57	2.6	2 19	2.0
30	4 53	18 39	0 27	1 32	15 1	2.7	2 17	1.8
35	4 42	18 50	0 29	1 41	15 3	2.8	2 16	1.7
40	4 30	19 3	0 31	1 54	15 6	3.0	2 15	1.6
45	4 15	19 18	0 35	2 14	15 9	3.1	2 13	1.5
50	3 57	19 36	0 41	2 58	15 13	3.3	2 12	1.3
55	3 33	20 0	0 50	: ::	15 18	3.5	2 10	1.1
60	2 60	20 34	1 10	: ::	15 24	3.7	2 7	.9
S								

SUNCE				MESEC				
UT	e = T_p − UT	Δ/24	r	Prolaz		Δ/24	$\pi_\leftmoon$	r
h	min s	s	′		h min	min	′	′
00	14 4.1	-.7	16.2	$T_{\overline{m}}$	21 3	2.3	60.1	16.4
12	13 56.3	$T_{\overline{m}_\odot}$	11 h 46.1 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 55	.1	166	-4.3	♄	7 21	.0	189	-1.5
♂	8 19	.1	174	1.4	♃	12 15	.0	115	.7

UT	SUNCE		PROLEĆ. TAČKA	VENERA		MARS	
	$S_\odot$	$\delta_\odot$	S_Υ	S_φ	δ_φ	S_σ	δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	183 27.1	-20 13.3	61 38.8	226 14.4	- 4 30.3	235 32.3	- 1 4.4
2	213 26.8	-20 14.4	91 43.7	256 13.9	- 4 32.3	265 34.5	- 1 5.6
4	243 26.4	-20 15.5	121 48.7	286 13.5	- 4 34.3	295 36.7	- 1 6.7
6	273 26.1	-20 16.5	151 53.6	316 13.1	- 4 36.3	325 38.9	- 1 7.9
8	303 25.8	-20 17.6	181 58.5	346 12.7	- 4 38.3	355 41.1	- 1 9.1
10	333 25.4	-20 18.6	212 3.4	16 12.3	- 4 40.3	25 43.3	- 1 10.2
12	3 25.1	-20 19.6	242 8.4	46 11.9	- 4 42.3	55 45.5	- 1 11.4
14	33 24.7	-20 20.7	272 13.3	76 11.4	- 4 44.3	85 47.7	- 1 12.5
16	63 24.4	-20 21.7	302 18.2	106 11.0	- 4 46.3	115 49.9	- 1 13.7
18	93 24.0	-20 22.8	332 23.2	136 10.6	- 4 48.3	145 52.1	- 1 14.9
20	123 23.7	-20 23.8	2 28.1	166 10.2	- 4 50.3	175 54.3	- 1 16.0
22	153 23.3	-20 24.8	32 33.0	196 9.8	- 4 52.3	205 56.5	- 1 17.2
Δ		-2 -5			-2 -10		11 -6

UT	MESEC				JUPITER		SATURN	
	$S_\leftmoon$	Δ	$\delta_\leftmoon$	Δ	S_{4}	δ_{4}	S_η	δ_η
h	° ′		° ′		° ′	° ′	° ′	° ′
0	42 35.3	81	6 6.6	109	250 22.5	4 55.6	176 35.2	-19 47.4
2	71 29.4	80	6 28.5	109	280 26.9	4 55.4	206 39.5	-19 47.5
4	100 23.4	79	6 50.2	108	310 31.2	4 55.1	236 43.8	-19 47.6
6	129 17.2	78	7 11.8	107	340 35.5	4 54.9	266 48.2	-19 47.8
8	158 10.9	78	7 33.2	106	10 39.8	4 54.7	296 52.5	-19 47.9
10	187 4.4	77	7 54.4	105	40 44.2	4 54.4	326 56.8	-19 48.0
12	215 57.8	76	8 15.4	104	70 48.5	4 54.2	357 1.1	-19 48.1
14	244 51.0	75	8 36.3	103	100 52.8	4 53.9	27 5.4	-19 48.2
16	273 44.0	75	8 56.9	102	130 57.1	4 53.7	57 9.7	-19 48.3
18	302 36.9	74	9 17.2	101	161 1.5	4 53.5	87 14.0	-19 48.4
20	331 29.7	73	9 37.4	100	191 5.8	4 53.2	117 18.3	-19 48.5
22	0 22.3	72	9 57.3	98	221 10.1	4 53.0	147 22.6	-19 48.6
Δ					22	-1	22	-1

φ	SUNCE		TRAJANJE SUMRAKA		MESEC			
	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 17	15 16	0 52	2 34	14 42	1.1	4 6	3.7
55	7 47	15 46	0 42	2 11	14 53	1.3	3 57	3.4
50	7 25	16 7	0 36	1 55	15 1	1.5	3 50	3.2
45	7 8	16 25	0 32	1 44	15 8	1.6	3 44	3.1
40	6 54	16 39	0 30	1 35	15 14	1.8	3 40	3.0
35	6 42	16 51	0 27	1 29	15 19	1.9	3 36	2.9
30	6 31	17 1	0 26	1 24	15 24	1.9	3 32	2.8
20	6 13	17 19	0 23	1 17	15 32	2.1	3 26	2.6
10	5 58	17 35	0 22	1 14	15 39	2.2	3 21	2.5
0	5 43	17 50	0 22	1 13	15 45	2.4	3 16	2.3
10	5 28	18 5	0 23	1 16	15 52	2.5	3 11	2.2
20	5 12	18 21	0 24	1 21	15 59	2.6	3 6	2.0
30	4 53	18 40	0 27	1 32	16 7	2.8	3 0	1.9
35	4 42	18 51	0 29	1 41	16 12	2.9	2 57	1.8
40	4 29	19 4	0 31	1 54	16 17	3.0	2 53	1.7
45	4 14	19 19	0 35	2 15	16 23	3.1	2 48	1.6
50	3 56	19 38	0 41	3 1	16 31	3.2	2 43	1.4
55	3 32	20 2	0 50	: ::	16 40	3.4	2 36	1.2
60	2 58	20 36	1 11	: ::	16 53	3.7	2 28	1.0
S								

SUNCE				MESEC			
UT	e = T_p − UT	Δ/24	r	Prolaz		Δ/24	$\pi_\leftmoon$	r
h	min s	s	′		h min	min	′	′
00	13 48.4	-.7	16.2	$T_{\overline{m}}$	21 58	2.4	60.3	16.4
12	13 40.2	$T_{\overline{m}_\odot}$	11 h 46.3 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 55	.1	165	-4.2	♃	7 17	.0	189	-1.5
♂	8 17	.1	174	1.3	♄	12 12	.0	115	.7

UT	SUNCE		PROLEĆ. TAČKA	VENERA		MARS	
	$S_\odot$	$\delta_\odot$	S_Υ	S_φ	δ_φ	S_σ	δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	183 23.0	-20 25.9	62 37.9	226 9.3	- 4 54.3	235 58.7	- 1 18.4
2	213 22.6	-20 26.9	92 42.9	256 8.9	- 4 56.3	266 .9	- 1 19.5
4	243 22.3	-20 27.9	122 47.8	286 8.5	- 4 58.3	296 3.1	- 1 20.7
6	273 21.9	-20 28.9	152 52.7	316 8.0	- 5 .3	326 5.3	- 1 21.8
8	303 21.6	-20 29.9	182 57.6	346 7.6	- 5 2.3	356 7.5	- 1 23.0
10	333 21.2	-20 31.0	213 2.6	16 7.2	- 5 4.3	26 9.7	- 1 24.2
12	3 20.9	-20 32.0	243 7.5	46 6.7	- 5 6.3	56 11.9	- 1 25.3
14	33 20.5	-20 33.0	273 12.4	76 6.3	- 5 8.3	86 14.1	- 1 26.5
16	63 20.2	-20 34.0	303 17.4	106 5.9	- 5 10.3	116 16.3	- 1 27.7
18	93 19.8	-20 35.0	333 22.3	136 5.4	- 5 12.3	146 18.4	- 1 28.8
20	123 19.4	-20 36.0	3 27.2	166 5.0	- 5 14.3	176 20.6	- 1 30.0
22	153 19.1	-20 37.0	33 32.1	196 4.5	- 5 16.3	206 22.8	- 1 31.1
Δ		-2 -5			-2 -10		11 -6

UT	MESEC				JUPITER		SATURN	
	$S_\leftmoon$	Δ	$\delta_\leftmoon$	Δ	S_{4}	δ_{4}	S_η	δ_η
h	° ′		° ′		° ′	° ′	° ′	° ′
0	29 14.8	72	10 16.9	97	251 14.5	4 52.8	177 26.9	-19 48.7
2	58 7.1	71	10 36.3	96	281 18.8	4 52.5	207 31.3	-19 48.8
4	86 59.2	70	10 55.4	94	311 23.1	4 52.3	237 35.6	-19 48.9
6	115 51.3	69	11 14.2	93	341 27.5	4 52.1	267 39.9	-19 49.0
8	144 43.1	69	11 32.7	91	11 31.8	4 51.8	297 44.2	-19 49.1
10	173 34.9	68	11 51.0	89	41 36.1	4 51.6	327 48.5	-19 49.2
12	202 26.5	67	12 8.8	88	71 40.5	4 51.4	357 52.8	-19 49.3
14	231 17.9	67	12 26.4	86	101 44.8	4 51.2	27 57.1	-19 49.4
16	260 9.2	66	12 43.6	84	131 49.2	4 50.9	58 1.4	-19 49.5
18	289 .4	65	13 .5	83	161 53.5	4 50.7	88 5.7	-19 49.6
20	317 51.5	65	13 17.0	81	191 57.8	4 50.5	118 10.0	-19 49.7
22	346 42.4	64	13 33.2	79	222 2.2	4 50.2	148 14.3	-19 49.8
Δ					22	-1	22	-1

φ	SUNCE		TRAJANJE SUMRAKA		MESEC			
	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 19	15 14	0 52	2 35	15 8	1.3	5 34	3.6
55	7 48	15 44	0 42	2 11	15 24	1.5	5 19	3.4
50	7 26	16 7	0 37	1 55	15 37	1.7	5 8	3.2
45	7 9	16 24	0 33	1 44	15 48	1.8	4 58	3.0
40	6 55	16 38	0 30	1 35	15 56	1.9	4 51	2.9
35	6 43	16 50	0 27	1 29	16 4	2.0	4 44	2.8
30	6 32	17 1	0 26	1 24	16 11	2.1	4 39	2.8
20	6 14	17 19	0 24	1 17	16 22	2.2	4 29	2.6
10	5 58	17 35	0 22	1 14	16 32	2.3	4 20	2.5
0	5 43	17 50	0 22	1 14	16 42	2.4	4 12	2.4
10	5 28	18 5	0 23	1 16	16 51	2.5	4 4	2.3
20	5 11	18 22	0 24	1 22	17 2	2.6	3 55	2.1
30	4 53	18 41	0 27	1 33	17 13	2.7	3 45	2.0
35	4 41	18 52	0 29	1 42	17 20	2.8	3 40	1.9
40	4 29	19 5	0 31	1 55	17 28	2.9	3 33	1.8
45	4 13	19 20	0 35	2 16	17 37	3.0	3 26	1.7
50	3 55	19 39	0 41	3 4	17 48	3.1	3 17	1.6
55	3 30	20 4	0 51	: ::	18 2	3.3	3 6	1.4
60	2 56	20 39	1 12	: ::	18 21	3.5	2 52	1.2
S								

SUNCE				MESEC			
UT	e = T_p − UT	Δ/24	r	Prolaz		Δ/24	$\pi_\leftmoon$	r
h	min s	s	′		h min	min	′	′
00	13 32.0	-.7	16.2	$T_{\overline{m}}$	22 55	2.4	60.4	16.5
12	13 23.4	$T_{\overline{m}_\odot}$	11 h 46.6 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 56	.1	164	-4.2	♃	7 14	.0	189	-1.5
♂	8 15	.1	173	1.3	♄	12 8	.0	115	.7

UT	SUNCE		PROLEĆ. TAČKA	VENERA		MARS	
	$S_\odot$	$\delta_\odot$	S_Υ	S_φ	δ_φ	S_σ	δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	183 18.7	-20 38.0	63 37.1	226 4.1	- 5 18.3	236 25.0	- 1 32.3
2	213 18.3	-20 39.0	93 42.0	256 3.6	- 5 20.3	266 27.2	- 1 33.5
4	243 18.0	-20 40.0	123 46.9	286 3.2	- 5 22.3	296 29.4	- 1 34.6
6	273 17.6	-20 41.0	153 51.9	316 2.7	- 5 24.4	326 31.6	- 1 35.8
8	303 17.2	-20 42.0	183 56.8	346 2.3	- 5 26.4	356 33.8	- 1 36.9
10	333 16.9	-20 42.9	214 1.7	16 1.8	- 5 28.4	26 36.0	- 1 38.1
12	3 16.5	-20 43.9	244 6.6	46 1.4	- 5 30.4	56 38.2	- 1 39.3
14	33 16.1	-20 44.9	274 11.6	76 .9	- 5 32.4	86 40.4	- 1 40.4
16	63 15.7	-20 45.9	304 16.5	106 .5	- 5 34.4	116 42.6	- 1 41.6
18	93 15.4	-20 46.8	334 21.4	135 60.0	- 5 36.4	146 44.8	- 1 42.7
20	123 15.0	-20 47.8	4 26.4	165 59.5	- 5 38.4	176 47.0	- 1 43.9
22	153 14.6	-20 48.8	34 31.3	195 59.1	- 5 40.4	206 49.2	- 1 45.0
Δ	-2	-5		-2	-10	11	-6

UT	MESEC				JUPITER		SATURN	
	$S_\leftmoon$	Δ	$\delta_\leftmoon$	Δ	S_{4}	δ_{4}	S_η	δ_η
h	° ′		° ′		° ′	° ′	° ′	° ′
0	15 33.3	64	13 49.0	77	252 6.5	4 50.0	178 18.7	-19 49.9
2	44 24.0	63	14 4.4	75	282 10.9	4 49.8	208 23.0	-19 50.0
4	73 14.6	63	14 19.4	73	312 15.2	4 49.6	238 27.3	-19 50.1
6	102 5.1	62	14 34.0	71	342 19.6	4 49.3	268 31.6	-19 50.2
8	130 55.5	62	14 48.3	69	12 23.9	4 49.1	298 35.9	-19 50.3
10	159 45.9	61	15 2.1	67	42 28.3	4 48.9	328 40.2	-19 50.4
12	188 36.1	61	15 15.5	65	72 32.6	4 48.6	358 44.5	-19 50.5
14	217 26.3	61	15 28.4	63	102 37.0	4 48.4	28 48.8	-19 50.6
16	246 16.4	60	15 40.9	60	132 41.3	4 48.2	58 53.1	-19 50.8
18	275 6.5	60	15 53.0	58	162 45.7	4 48.0	88 57.4	-19 50.9
20	303 56.5	60	16 4.7	56	192 50.0	4 47.7	119 1.7	-19 51.0
22	332 46.5	60	16 15.9	54	222 54.4	4 47.5	149 6.1	-19 51.1
Δ					22	-1	22	-1

φ	SUNCE		TRAJANJE SUMRAKA		MESEC			
	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 21	15 12	0 52	2 36	15 40	1.7	7 1	3.3
55	7 50	15 43	0 43	2 12	16 2	1.8	6 40	3.1
50	7 28	16 6	0 37	1 56	16 18	2.0	6 24	3.0
45	7 10	16 23	0 33	1 44	16 32	2.0	6 11	2.9
40	6 56	16 38	0 30	1 35	16 43	2.1	6 1	2.8
35	6 44	16 50	0 27	1 29	16 52	2.2	5 52	2.8
30	6 33	17 1	0 26	1 24	17 0	2.2	5 45	2.7
20	6 15	17 19	0 24	1 17	17 15	2.3	5 31	2.6
10	5 58	17 35	0 22	1 14	17 28	2.4	5 20	2.5
0	5 43	17 51	0 22	1 14	17 39	2.4	5 9	2.4
10	5 28	18 6	0 23	1 16	17 51	2.5	4 58	2.3
20	5 11	18 23	0 24	1 22	18 4	2.6	4 47	2.3
30	4 52	18 42	0 27	1 33	18 19	2.6	4 33	2.2
35	4 41	18 53	0 29	1 42	18 28	2.7	4 26	2.1
40	4 28	19 6	0 32	1 55	18 37	2.7	4 17	2.0
45	4 13	19 22	0 35	2 17	18 49	2.8	4 7	1.9
50	3 54	19 41	0 41	3 8	19 3	2.9	3 55	1.8
55	3 29	20 6	0 51	: ::	19 21	3.0	3 40	1.7
60	2 54	20 41	1 13	: ::	19 45	3.1	3 20	1.5
S								

SUNCE				MESEC			
UT	e = T_p − UT	Δ/24	r	Prolaz		Δ/24	$\pi_\leftmoon$	r
h	min s	s	′		h min	min	′	′
00	13 14.8	-.7	16.2	$T_{\overline{m}}$	23 53	2.5	60.3	16.4
12	13 5.8	$T_{\overline{m}_\odot}$	11 h 46.9 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 56	.1	162	-4.2	♃	7 11	.0	188	-1.5
♂	8 14	.1	173	1.3	♄	12 5	.0	115	.6

UT	SUNCE		PROLEĆ. TAČKA	VENERA		MARS	
	$S_\odot$	$\delta_\odot$	S_Υ	S_φ	δ_φ	S_σ	δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	183 14.2	-20 49.7	64 36.2	225 58.6	- 5 42.4	236 51.4	- 1 46.2
2	213 13.8	-20 50.7	94 41.1	255 58.1	- 5 44.4	266 53.6	- 1 47.4
4	243 13.4	-20 51.7	124 46.1	285 57.7	- 5 46.4	296 55.8	- 1 48.5
6	273 13.1	-20 52.6	154 51.0	315 57.2	- 5 48.5	326 58.0	- 1 49.7
8	303 12.7	-20 53.6	184 55.9	345 56.7	- 5 50.5	357 .2	- 1 50.8
10	333 12.3	-20 54.5	215 .9	15 56.2	- 5 52.5	27 2.4	- 1 52.0
12	3 11.9	-20 55.5	245 5.8	45 55.8	- 5 54.5	57 4.6	- 1 53.1
14	33 11.5	-20 56.4	275 10.7	75 55.3	- 5 56.5	87 6.9	- 1 54.3
16	63 11.1	-20 57.4	305 15.6	105 54.8	- 5 58.5	117 9.1	- 1 55.5
18	93 10.7	-20 58.3	335 20.6	135 54.3	- 6 .5	147 11.3	- 1 56.6
20	123 10.3	-20 59.3	5 25.5	165 53.9	- 6 2.5	177 13.5	- 1 57.8
22	153 9.9	-21 .2	35 30.4	195 53.4	- 6 4.5	207 15.7	- 1 58.9
Δ	-2	-5		-2	-10	11	-6

UT	MESEC				JUPITER		SATURN	
	$S_\leftmoon$	Δ	$\delta_\leftmoon$	Δ	S_{4}	δ_{4}	S_η	δ_η
h	° ′		° ′		° ′	° ′	° ′	° ′
0	1 36.4	60	16 26.6	51	252 58.7	4 47.3	179 10.4	-19 51.2
2	30 26.3	59	16 36.9	49	283 3.1	4 47.1	209 14.7	-19 51.3
4	59 16.2	59	16 46.8	47	313 7.4	4 46.8	239 19.0	-19 51.4
6	88 6.1	59	16 56.1	44	343 11.8	4 46.6	269 23.3	-19 51.5
8	116 56.0	59	17 5.0	42	13 16.1	4 46.4	299 27.6	-19 51.6
10	145 45.9	60	17 13.4	40	43 20.5	4 46.2	329 31.9	-19 51.7
12	174 35.8	60	17 21.4	37	73 24.9	4 46.0	359 36.2	-19 51.8
14	203 25.7	60	17 28.9	35	103 29.2	4 45.7	29 40.5	-19 51.9
16	232 15.7	60	17 35.8	33	133 33.6	4 45.5	59 44.8	-19 52.0
18	261 5.7	60	17 42.3	30	163 37.9	4 45.3	89 49.1	-19 52.1
20	289 55.8	61	17 48.4	28	193 42.3	4 45.1	119 53.4	-19 52.2
22	318 46.0	61	17 53.9	25	223 46.7	4 44.8	149 57.7	-19 52.3
Δ					22	-1	22	-1

φ	SUNCE		TRAJANJE SUMRAKA		MESEC			
	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 23	15 10	0 52	2 36	16 20	2.1	8 20	2.9
55	7 52	15 42	0 43	2 12	16 46	2.2	7 55	2.8
50	7 29	16 5	0 37	1 56	17 5	2.2	7 36	2.7
45	7 11	16 23	0 33	1 44	17 21	2.3	7 21	2.7
40	6 57	16 37	0 30	1 35	17 33	2.3	7 9	2.6
35	6 45	16 50	0 27	1 29	17 44	2.3	6 59	2.6
30	6 34	17 0	0 26	1 24	17 54	2.3	6 49	2.6
20	6 15	17 19	0 24	1 17	18 10	2.4	6 34	2.5
10	5 59	17 35	0 22	1 14	18 24	2.4	6 20	2.5
0	5 44	17 51	0 22	1 14	18 38	2.4	6 7	2.4
10	5 28	18 6	0 23	1 16	18 51	2.4	5 54	2.4
20	5 11	18 23	0 24	1 22	19 6	2.4	5 41	2.3
30	4 52	18 43	0 27	1 33	19 22	2.5	5 25	2.3
35	4 41	18 54	0 29	1 42	19 32	2.5	5 16	2.2
40	4 28	19 7	0 32	1 56	19 43	2.5	5 6	2.2
45	4 12	19 23	0 36	2 18	19 56	2.5	4 54	2.2
50	3 53	19 42	0 42	3 11	20 12	2.5	4 39	2.1
55	3 28	20 8	0 52	: ::	20 32	2.6	4 20	2.0
60	2 52	20 44	1 15	: ::	20 60	2.6	3 55	1.9
S								

SUNCE				MESEC			
UT	e = T_p − UT	Δ/24	r	Prolaz		Δ/24	$\pi_\leftmoon$	r
h	min s	s	′		h min	min	′	′
00	12 56.9	-.8	16.2	$T_{\overline{m}}$	. . .	1.0	59.9	16.3
12	12 47.5	$T_{\overline{m}_\odot}$	11 h 47.2 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 56	.1	161	-4.2	♃	7 7	.0	188	-1.5
♂	8 12	.1	172	1.3	♄	12 2	.0	115	.6

UT	SUNCE $S_\odot$	SUNCE $\delta_\odot$	PROLEĆ. TAČKA S_Υ	VENERA S_φ	VENERA δ_φ	MARS S_σ	MARS δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	183 9.5	-21 1.1	65 35.4	225 52.9	- 6 6.5	237 17.9	- 2 .1
2	213 9.1	-21 2.0	95 40.3	255 52.4	- 6 8.6	267 20.1	- 2 1.2
4	243 8.7	-21 3.0	125 45.2	285 51.9	- 6 10.6	297 22.3	- 2 2.4
6	273 8.3	-21 3.9	155 50.1	315 51.4	- 6 12.6	327 24.5	- 2 3.5
8	303 7.9	-21 4.8	185 55.1	345 50.9	- 6 14.6	357 26.7	- 2 4.7
10	333 7.5	-21 5.7	216 .0	15 50.4	- 6 16.6	27 28.9	- 2 5.8
12	3 7.1	-21 6.7	246 4.9	45 49.9	- 6 18.6	57 31.1	- 2 7.0
14	33 6.7	-21 7.6	276 9.8	75 49.4	- 6 20.6	87 33.3	- 2 8.2
16	63 6.3	-21 8.5	306 14.8	105 49.0	- 6 22.6	117 35.5	- 2 9.3
18	93 5.9	-21 9.4	336 19.7	135 48.5	- 6 24.6	147 37.7	- 2 10.5
20	123 5.5	-21 10.3	6 24.6	165 48.0	- 6 26.6	177 39.9	- 2 11.6
22	153 5.1	-21 11.2	36 29.6	195 47.4	- 6 28.7	207 42.1	- 2 12.8
Δ		-2 -5			-2 -10		11 -6

UT	MESEC $S_\leftmoon$	MESEC Δ	MESEC $\delta_\leftmoon$	MESEC Δ	JUPITER $S_{\jupiter}$	JUPITER $\delta_{\jupiter}$	SATURN $S_{\saturn}$	SATURN $\delta_{\saturn}$
h	° ′		° ′		° ′	° ′	° ′	° ′
0	347 36.2	62	17 59.0	23	253 51.0	4 44.6	180 2.1	-19 52.4
2	16 26.5	62	18 3.5	20	283 55.4	4 44.4	210 6.4	-19 52.5
4	45 17.0	63	18 7.6	18	313 59.8	4 44.2	240 10.7	-19 52.6
6	74 7.5	63	18 11.2	16	344 4.1	4 44.0	270 15.0	-19 52.7
8	102 58.1	64	18 14.3	13	14 8.5	4 43.8	300 19.3	-19 52.8
10	131 48.9	64	18 17.0	11	44 12.9	4 43.5	330 23.6	-19 52.9
12	160 39.8	65	18 19.1	8	74 17.2	4 43.3	0 27.9	-19 53.0
14	189 30.8	66	18 20.8	6	104 21.6	4 43.1	30 32.2	-19 53.1
16	218 22.0	67	18 22.0	4	134 26.0	4 42.9	60 36.5	-19 53.2
18	247 13.4	68	18 22.8	1	164 30.3	4 42.7	90 40.8	-19 53.3
20	276 4.9	69	18 23.0	-1	194 34.7	4 42.4	120 45.1	-19 53.4
22	304 56.6	69	18 22.8	-3	224 39.1	4 42.2	150 49.4	-19 53.5
Δ					22	-1	22	-1

φ	SUNCE IZLAZ	SUNCE ZALAZ	TRAJANJE SUMRAKA GRAĐ.	TRAJANJE SUMRAKA ASTR.	MESEC IZLAZ	MESEC Δ/24	MESEC ZALAZ	MESEC 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	17 10	2.5	9 30	2.3
55	7 54	15 41	0 43	2 12	17 38	2.5	9 2	2.3
50	7 31	16 4	0 37	1 56	17 59	2.4	8 41	2.4
45	7 13	16 22	0 33	1 44	18 15	2.4	8 25	2.4
40	6 58	16 37	0 30	1 36	18 28	2.4	8 12	2.4
35	6 46	16 49	0 28	1 29	18 40	2.4	8 1	2.4
30	6 35	17 0	0 26	1 24	18 49	2.4	7 51	2.4
20	6 16	17 19	0 24	1 17	19 7	2.4	7 34	2.4
10	5 59	17 36	0 22	1 14	19 21	2.3	7 19	2.4
0	5 44	17 51	0 22	1 14	19 35	2.3	7 5	2.4
10	5 28	18 7	0 23	1 16	19 49	2.3	6 52	2.4
20	5 11	18 24	0 24	1 22	20 4	2.3	6 37	2.4
30	4 52	18 44	0 27	1 33	20 21	2.3	6 20	2.4
35	4 40	18 55	0 29	1 43	20 31	2.2	6 10	2.4
40	4 27	19 8	0 32	1 56	20 43	2.2	5 59	2.4
45	4 11	19 24	0 36	2 19	20 56	2.2	5 45	2.4
50	3 52	19 44	0 42	3 15	21 13	2.2	5 29	2.3
55	3 27	20 10	0 52	: ::	21 34	2.1	5 9	2.3
60	2 50	20 46	1 16	: ::	22 2	2.0	4 41	2.3
S								

SUNCE UT	SUNCE $e = T_p - UT$	SUNCE Δ/24	SUNCE r	MESEC Prolaz	MESEC Δ/24	MESEC $\pi_\leftmoon$	MESEC r
h	min s	s	′	h min	min	′	′
00	12 38.1	-.8	16.2	$T_{\overline{m}}$ 0 52	2.4	59.2	16.1
12	12 28.4	$T_{\overline{m}_\odot}$ 11 h 47.5 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 57	.1	160	-4.2	♄	7 4	.0	188	-1.5
♂	8 10	.1	172	1.3	♃	11 58	.0	114	.6

UT	SUNCE $S_\odot$	SUNCE $\delta_\odot$	PROLEĆ. TAČKA S_Υ	VENERA S_φ	VENERA δ_φ	MARS S_σ	MARS δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	183 4.7	-21 12.1	66 34.5	225 46.9	- 6 30.7	237 44.3	- 2 13.9
2	213 4.3	-21 13.0	96 39.4	255 46.4	- 6 32.7	267 46.5	- 2 15.1
4	243 3.8	-21 13.9	126 44.3	285 45.9	- 6 34.7	297 48.7	- 2 16.2
6	273 3.4	-21 14.8	156 49.3	315 45.4	- 6 36.7	327 50.9	- 2 17.4
8	303 3.0	-21 15.7	186 54.2	345 44.9	- 6 38.7	357 53.1	- 2 18.5
10	333 2.6	-21 16.5	216 59.1	15 44.4	- 6 40.7	27 55.3	- 2 19.7
12	3 2.2	-21 17.4	247 4.1	45 43.9	- 6 42.7	57 57.6	- 2 20.8
14	33 1.8	-21 18.3	277 9.0	75 43.4	- 6 44.7	87 59.8	- 2 22.0
16	63 1.3	-21 19.2	307 13.9	105 42.8	- 6 46.7	118 2.0	- 2 23.1
18	93 .9	-21 20.1	337 18.8	135 42.3	- 6 48.7	148 4.2	- 2 24.3
20	123 .5	-21 20.9	7 23.8	165 41.8	- 6 50.8	178 6.4	- 2 25.4
22	153 .1	-21 21.8	37 28.7	195 41.3	- 6 52.8	208 8.6	- 2 26.6
Δ		-2 -4			-3 -10		11 -6

UT	MESEC $S_\leftmoon$	MESEC Δ	MESEC $\delta_\leftmoon$	MESEC Δ	JUPITER $S_{\jupiter}$	JUPITER $\delta_{\jupiter}$	SATURN $S_{\saturn}$	SATURN $\delta_{\saturn}$
h	° ′		° ′		° ′	° ′	° ′	° ′
0	333 48.5	70	18 22.2	-6	254 43.5	4 42.0	180 53.7	-19 53.6
2	2 40.6	71	18 21.0	-8	284 47.8	4 41.8	210 58.1	-19 53.7
4	31 32.8	72	18 19.5	-10	314 52.2	4 41.6	241 2.4	-19 53.8
6	60 25.3	74	18 17.4	-12	344 56.6	4 41.4	271 6.7	-19 53.9
8	89 18.0	75	18 15.0	-15	15 1.0	4 41.2	301 11.0	-19 54.0
10	118 11.0	76	18 12.0	-17	45 5.3	4 40.9	331 15.3	-19 54.1
12	147 4.1	77	18 8.7	-19	75 9.7	4 40.7	1 19.6	-19 54.2
14	175 57.5	78	18 4.9	-21	105 14.1	4 40.5	31 23.9	-19 54.3
16	204 51.1	79	18 .7	-23	135 18.5	4 40.3	61 28.2	-19 54.4
18	233 45.0	81	17 56.1	-25	165 22.9	4 40.1	91 32.5	-19 54.5
20	262 39.2	82	17 51.0	-27	195 27.3	4 39.9	121 36.8	-19 54.6
22	291 33.6	83	17 45.6	-29	225 31.6	4 39.7	151 41.1	-19 54.7
Δ					22	-1	22	-1

φ	SUNCE IZLAZ	SUNCE ZALAZ	TRAJANJE SUMRAKA GRAĐ.	TRAJANJE SUMRAKA ASTR.	MESEC IZLAZ	MESEC Δ/24	MESEC ZALAZ	MESEC 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	18 10	2.8	10 26	1.8
55	7 55	15 40	0 43	2 13	18 38	2.7	9 58	1.9
50	7 32	16 3	0 37	1 56	18 58	2.6	9 38	2.0
45	7 14	16 21	0 33	1 44	19 13	2.5	9 22	2.0
40	6 59	16 36	0 30	1 36	19 26	2.5	9 9	2.1
35	6 46	16 49	0 28	1 29	19 37	2.4	8 58	2.1
30	6 35	17 0	0 26	1 24	19 47	2.4	8 48	2.1
20	6 16	17 19	0 24	1 18	20 3	2.3	8 31	2.2
10	5 60	17 36	0 22	1 14	20 18	2.3	8 16	2.2
0	5 44	17 52	0 22	1 14	20 31	2.2	8 2	2.3
10	5 28	18 7	0 23	1 16	20 45	2.2	7 48	2.3
20	5 11	18 24	0 24	1 22	20 59	2.1	7 34	2.4
30	4 52	18 44	0 27	1 34	21 16	2.0	7 17	2.4
35	4 40	18 56	0 29	1 43	21 25	2.0	7 7	2.4
40	4 27	19 9	0 32	1 57	21 36	1.9	6 55	2.5
45	4 11	19 25	0 36	2 20	21 49	1.9	6 42	2.5
50	3 51	19 45	0 42	3 20	22 5	1.8	6 26	2.5
55	3 25	20 11	0 52	: ::	22 25	1.7	6 5	2.6
60	2 49	20 48	1 17	: ::	22 51	1.5	5 36	2.7
S								

SUNCE UT	SUNCE $e = T_p - UT$	SUNCE Δ/24	SUNCE r	MESEC Prolaz	MESEC Δ/24	MESEC $\pi_\leftmoon$	MESEC r
h	min s	s	′	h min	min	′	′
00	12 18.7	-.8	16.2	$T_{\overline{m}}$ 1 49	2.3	58.5	15.9
12	12 8.6	$T_{\overline{m}_\odot}$ 11 h 47.9 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 57	.1	159	-4.2	♄	7 0	.0	188	-1.5
♂	8 8	.1	171	1.3	♃	11 55	.0	114	.6

UT	SUNCE		PROLEĆ. TAČKA	VENERA		MARS	
	$S_\odot$	$\delta_\odot$	S_Υ	S_φ	δ_φ	S_σ	δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	182 59.6	-21 22.7	67 33.6	225 40.8	- 6 54.8	238 10.8	- 2 27.7
2	212 59.2	-21 23.5	97 38.6	255 40.2	- 6 56.8	268 13.0	- 2 28.9
4	242 58.8	-21 24.4	127 43.5	285 39.7	- 6 58.8	298 15.2	- 2 30.0
6	272 58.3	-21 25.2	157 48.4	315 39.2	- 7 .8	328 17.4	- 2 31.2
8	302 57.9	-21 26.1	187 53.3	345 38.6	- 7 2.8	358 19.6	- 2 32.3
10	332 57.5	-21 27.0	217 58.3	15 38.1	- 7 4.8	28 21.8	- 2 33.5
12	2 57.0	-21 27.8	248 3.2	45 37.6	- 7 6.8	58 24.0	- 2 34.6
14	32 56.6	-21 28.6	278 8.1	75 37.0	- 7 8.8	88 26.3	- 2 35.8
16	62 56.2	-21 29.5	308 13.1	105 36.5	- 7 10.8	118 28.5	- 2 36.9
18	92 55.7	-21 30.3	338 18.0	135 36.0	- 7 12.8	148 30.7	- 2 38.0
20	122 55.3	-21 31.2	8 22.9	165 35.4	- 7 14.9	178 32.9	- 2 39.2
22	152 54.9	-21 32.0	38 27.8	195 34.9	- 7 16.9	208 35.1	- 2 40.3
Δ	-2	-4		-3	-10	11	-6

UT	MESEC				JUPITER		SATURN	
	$S_\leftmoon$	Δ	$\delta_\leftmoon$	Δ	$S_{\mathrm{♃}}$	$\delta_{\mathrm{♃}}$	$S_{\mathrm{♄}}$	$\delta_{\mathrm{♄}}$
h	° ′		° ′		° ′	° ′	° ′	° ′
0	320 28.2	85	17 39.7	-31	255 36.0	4 39.5	181 45.4	-19 54.8
2	349 23.1	86	17 33.5	-33	285 40.4	4 39.3	211 49.7	-19 54.9
4	18 18.3	87	17 26.8	-35	315 44.8	4 39.0	241 54.0	-19 55.0
6	47 13.8	89	17 19.8	-37	345 49.2	4 38.8	271 58.3	-19 55.1
8	76 9.5	90	17 12.4	-39	15 53.6	4 38.6	302 2.7	-19 55.2
10	105 5.5	91	17 4.6	-41	45 58.0	4 38.4	332 7.0	-19 55.3
12	134 1.8	93	16 56.5	-42	76 2.4	4 38.2	2 11.3	-19 55.4
14	162 58.4	94	16 48.0	-44	106 6.7	4 38.0	32 15.6	-19 55.5
16	191 55.3	96	16 39.1	-46	136 11.1	4 37.8	62 19.9	-19 55.6
18	220 52.4	97	16 30.0	-48	166 15.5	4 37.6	92 24.2	-19 55.7
20	249 49.8	99	16 20.4	-49	196 19.9	4 37.4	122 28.5	-19 55.8
22	278 47.6	100	16 10.6	-51	226 24.3	4 37.2	152 32.8	-19 55.9
Δ					22	-1	22	-1

φ	SUNCE		TRAJANJE SUMRAKA		MESEC			
	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 30	15 6	0 53	2 38	19 18	3.0	11 9	1.4
55	7 57	15 39	0 43	2 13	19 42	2.8	10 44	1.5
50	7 33	16 3	0 37	1 57	19 60	2.6	10 25	1.7
45	7 15	16 21	0 33	1 45	20 14	2.6	10 11	1.7
40	7 0	16 36	0 30	1 36	20 25	2.5	9 59	1.8
35	6 47	16 49	0 28	1 29	20 35	2.4	9 48	1.9
30	6 36	16 60	0 26	1 24	20 44	2.3	9 39	1.9
20	6 17	17 19	0 24	1 18	20 59	2.2	9 23	2.0
10	6 0	17 36	0 23	1 14	21 12	2.2	9 10	2.1
0	5 45	17 52	0 22	1 14	21 24	2.1	8 57	2.2
10	5 29	18 8	0 23	1 16	21 36	2.0	8 44	2.2
20	5 11	18 25	0 24	1 22	21 49	1.9	8 30	2.3
30	4 51	18 45	0 27	1 34	22 4	1.8	8 14	2.4
35	4 40	18 57	0 29	1 43	22 13	1.8	8 5	2.4
40	4 26	19 11	0 32	1 57	22 23	1.7	7 54	2.5
45	4 10	19 27	0 36	2 21	22 34	1.6	7 42	2.6
50	3 50	19 47	0 42	3 25	22 48	1.5	7 26	2.6
55	3 24	20 13	0 53	: ::	23 5	1.4	7 7	2.8
60	2 47	20 51	1 19	: ::	23 29	2.1	6 41	2.9
S								

SUNCE				MESEC			
UT	e = T_p − UT	Δ/24	r	Prolaz		Δ/24	$\pi_\leftmoon$	r
h	min s	s	′		h min	min	′	′
00	11 58.5	-.9	16.2	$T_{\overline{m}}$	2 44	2.2	57.6	15.7
12	11 48.1	$T_{\overline{m}_\odot}$	11 h 48.2 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 57	.1	158	-4.1	♃	6 57	.0	188	-1.5
♂	8 7	.1	171	1.3	♄	11 51	.0	114	.6

UT	SUNCE		PROLEĆ. TAČKA	VENERA		MARS	
	$S_\odot$	$\delta_\odot$	S_Υ	S_φ	δ_φ	S_σ	δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	182 54.4	-21 32.8	68 32.8	225 34.3	- 7 18.9	238 37.3	- 2 41.5
2	212 54.0	-21 33.7	98 37.7	255 33.8	- 7 20.9	268 39.5	- 2 42.6
4	242 53.5	-21 34.5	128 42.6	285 33.2	- 7 22.9	298 41.7	- 2 43.8
6	272 53.1	-21 35.3	158 47.6	315 32.7	- 7 24.9	328 43.9	- 2 44.9
8	302 52.6	-21 36.1	188 52.5	345 32.1	- 7 26.9	358 46.1	- 2 46.1
10	332 52.2	-21 37.0	218 57.4	15 31.6	- 7 28.9	28 48.4	- 2 47.2
12	2 51.7	-21 37.8	249 2.3	45 31.0	- 7 30.9	58 50.6	- 2 48.4
14	32 51.3	-21 38.6	279 7.3	75 30.5	- 7 32.9	88 52.8	- 2 49.5
16	62 50.8	-21 39.4	309 12.2	105 29.9	- 7 34.9	118 55.0	- 2 50.6
18	92 50.4	-21 40.2	339 17.1	135 29.4	- 7 36.9	148 57.2	- 2 51.8
20	122 49.9	-21 41.0	9 22.1	165 28.8	- 7 38.9	178 59.4	- 2 52.9
22	152 49.5	-21 41.8	39 27.0	195 28.2	- 7 40.9	209 1.6	- 2 54.1
Δ	-2	-4		-3	-10	11	-6

UT	MESEC				JUPITER		SATURN	
	$S_\leftmoon$	Δ	$\delta_\leftmoon$	Δ	$S_{\mathrm{♃}}$	$\delta_{\mathrm{♃}}$	$S_{\mathrm{♄}}$	$\delta_{\mathrm{♄}}$
h	° ′		° ′		° ′	° ′	° ′	° ′
0	307 45.6	102	16 .4	-52	256 28.7	4 37.0	182 37.1	-19 56.0
2	336 43.9	103	15 49.9	-54	286 33.1	4 36.8	212 41.4	-19 56.1
4	5 42.5	104	15 39.1	-56	316 37.5	4 36.6	242 45.7	-19 56.2
6	34 41.4	106	15 28.0	-57	346 41.9	4 36.4	272 50.0	-19 56.3
8	63 40.5	107	15 16.6	-58	16 46.3	4 36.2	302 54.3	-19 56.4
10	92 40.0	109	15 4.9	-60	46 50.7	4 35.9	332 58.6	-19 56.5
12	121 39.7	110	14 53.0	-61	76 55.1	4 35.7	3 3.0	-19 56.6
14	150 39.8	112	14 40.7	-63	106 59.5	4 35.5	33 7.3	-19 56.7
16	179 40.1	113	14 28.2	-64	137 3.9	4 35.3	63 11.6	-19 56.8
18	208 40.7	114	14 15.5	-65	167 8.3	4 35.1	93 15.9	-19 56.9
20	237 41.5	116	14 2.4	-66	197 12.7	4 34.9	123 20.2	-19 57.0
22	266 42.7	117	13 49.2	-68	227 17.1	4 34.7	153 24.5	-19 57.1
Δ					22	-1	22	0

φ	SUNCE		TRAJANJE SUMRAKA		MESEC			
	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 32	15 5	0 54	2 39	20 29	3.0	11 41	1.1
55	7 59	15 38	0 44	2 14	20 49	2.8	11 21	1.3
50	7 35	16 2	0 37	1 57	21 3	2.6	11 5	1.4
45	7 16	16 21	0 33	1 45	21 15	2.5	10 53	1.5
40	7 1	16 36	0 30	1 36	21 25	2.4	10 42	1.6
35	6 48	16 49	0 28	1 29	21 33	2.4	10 33	1.7
30	6 37	16 60	0 26	1 24	21 40	2.3	10 25	1.7
20	6 18	17 19	0 24	1 18	21 53	2.2	10 12	1.8
10	6 1	17 36	0 23	1 15	22 4	2.1	9 60	1.9
0	5 45	17 52	0 22	1 14	22 14	2.0	9 48	2.0
10	5 29	18 8	0 23	1 17	22 24	1.9	9 37	2.1
20	5 11	18 26	0 24	1 23	22 35	1.8	9 25	2.2
30	4 51	18 46	0 27	1 34	22 48	1.6	9 11	2.3
35	4 40	18 58	0 29	1 44	22 55	1.6	9 3	2.4
40	4 26	19 12	0 32	1 58	23 3	1.5	8 54	2.5
45	4 10	19 28	0 36	2 22	23 13	1.4	8 43	2.6
50	3 50	19 48	0 42	3 31	23 24	1.9	8 30	2.7
55	3 23	20 15	0 53	: ::	23 38	1.9	8 13	2.8
60	2 46	20 53	1 20	: ::	.. ..	.0	7 51	3.0
S								

SUNCE				MESEC			
UT	e = T_p − UT	Δ/24	r	Prolaz		Δ/24	$\pi_\leftmoon$	r
h	min s	s	′		h min	min	′	′
00	11 37.7	-.9	16.2	$T_{\overline{m}}$	3 36	2.1	56.7	15.5
12	11 26.9	$T_{\overline{m}_\odot}$	11 h 48.5 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 58	.1	157	-4.1	♃	6 53	.0	188	-1.5
♂	8 5	.1	170	1.3	♄	11 48	.0	114	.6

UT	SUNCE $S_\odot$	SUNCE $\delta_\odot$	PROLEĆ. TAČKA S_Υ	VENERA S_φ	VENERA δ_φ	MARS S_σ	MARS δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	182 49.0	-21 42.6	69 31.9	225 27.7	- 7 42.9	239 3.8	- 2 55.2
2	212 48.6	-21 43.4	99 36.8	255 27.1	- 7 44.9	269 6.1	- 2 56.4
4	242 48.1	-21 44.2	129 41.8	285 26.5	- 7 46.9	299 8.3	- 2 57.5
6	272 47.6	-21 45.0	159 46.7	315 26.0	- 7 48.9	329 10.5	- 2 58.6
8	302 47.2	-21 45.8	189 51.6	345 25.4	- 7 50.9	359 12.7	- 2 59.8
10	332 46.7	-21 46.5	219 56.5	15 24.8	- 7 52.9	29 14.9	- 3 .9
12	2 46.3	-21 47.3	250 1.5	45 24.2	- 7 54.9	59 17.1	- 3 2.1
14	32 45.8	-21 48.1	280 6.4	75 23.7	- 7 56.9	89 19.3	- 3 3.2
16	62 45.3	-21 48.9	310 11.3	105 23.1	- 7 58.9	119 21.5	- 3 4.3
18	92 44.9	-21 49.6	340 16.3	135 22.5	- 8 .9	149 23.8	- 3 5.5
20	122 44.4	-21 50.4	10 21.2	165 21.9	- 8 2.9	179 26.0	- 3 6.6
22	152 43.9	-21 51.2	40 26.1	195 21.3	- 8 4.9	209 28.2	- 3 7.8
Δ	-2	-4		-3	-10	11	-6

UT	MESEC $S_\leftmoon$	MESEC Δ	MESEC $\delta_\leftmoon$	MESEC Δ	JUPITER S_{4}	JUPITER δ_{4}	SATURN S_{5}	SATURN δ_{5}
h	° ′		° ′		° ′	° ′	° ′	° ′
0	295 44.1	118	13 35.7	-69	257 21.5	4 34.5	183 28.8	-19 57.2
2	324 45.8	120	13 21.9	-70	287 26.0	4 34.3	213 33.1	-19 57.3
4	353 47.8	121	13 7.9	-71	317 30.4	4 34.1	243 37.4	-19 57.4
6	22 50.0	122	12 53.7	-72	347 34.8	4 33.9	273 41.7	-19 57.5
8	51 52.5	124	12 39.3	-73	17 39.2	4 33.7	303 46.0	-19 57.6
10	80 55.2	125	12 24.7	-74	47 43.6	4 33.5	333 50.3	-19 57.7
12	109 58.2	126	12 9.9	-75	77 48.0	4 33.3	3 54.6	-19 57.8
14	139 1.4	127	11 54.9	-76	107 52.4	4 33.1	33 58.9	-19 57.9
16	168 4.9	129	11 39.7	-77	137 56.8	4 32.9	64 3.2	-19 58.0
18	197 8.6	130	11 24.3	-78	168 1.3	4 32.7	94 7.6	-19 58.1
20	226 12.6	131	11 8.7	-79	198 5.7	4 32.5	124 11.9	-19 58.2
22	255 16.8	132	10 53.0	-80	228 10.1	4 32.4	154 16.2	-19 58.3
Δ					22	-1	22	0

φ	SUNCE IZLAZ	SUNCE ZALAZ	TRAJANJE SUMRAKA GRAĐ.	TRAJANJE SUMRAKA ASTR.	MESEC IZLAZ	MESEC Δ/24	MESEC ZALAZ	MESEC Δ/24
N	h min	h min	h min	h min	h min	min	h min	min
60	8 34	15 3	0 54	2 39	21 41	3.0	12 7	.9
55	8 0	15 37	0 44	2 14	21 56	2.8	11 51	1.1
50	7 36	16 1	0 37	1 57	22 7	2.6	11 38	1.2
45	7 17	16 20	0 33	1 45	22 16	2.5	11 29	1.3
40	7 2	16 35	0 30	1 36	22 23	2.4	11 20	1.4
35	6 49	16 48	0 28	1 30	22 30	2.3	11 13	1.5
30	6 38	16 60	0 26	1 24	22 35	2.2	11 7	1.6
20	6 18	17 19	0 24	1 18	22 45	2.1	10 56	1.7
10	6 1	17 36	0 23	1 15	22 53	2.0	10 46	1.8
0	5 45	17 53	0 22	1 14	23 1	1.9	10 37	1.9
10	5 29	18 9	0 23	1 17	23 9	1.8	10 28	2.0
20	5 12	18 26	0 24	1 23	23 18	1.6	10 18	2.1
30	4 51	18 47	0 27	1 34	23 27	1.9	10 7	2.3
35	4 39	18 59	0 29	1 44	23 33	1.9	10 0	2.3
40	4 26	19 13	0 32	1 58	23 39	1.9	9 53	2.4
45	4 9	19 29	0 36	2 23	23 46	1.9	9 44	2.5
50	3 49	19 50	0 43	3 39	. . .	.0	9 34	2.6
55	3 22	20 16	0 54	: :	. . .	.0	9 20	2.8
60	2 44	20 55	1 22	: :	0 -3	.9	9 3	3.0
S								

SUNCE UT	SUNCE $e = T_p - UT$	SUNCE Δ/24	SUNCE r	MESEC Prolaz	MESEC Δ/24	MESEC $\pi_\leftmoon$	MESEC r
h	min s	s	′	h min	min	′	′
00	11 16.1	-.9	16.2	$T_{\overline{m}}$ 4 26	1.9	56.0	15.2
12	11 5.0	$T_{\overline{m}_\odot}$ 11 h 48.9 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 58	.1	156	-4.1	♃	6 50	.0	188	-1.6
♂	8 3	.1	170	1.3	♄	11 44	.0	114	.6

UT	SUNCE $S_\odot$	SUNCE $\delta_\odot$	PROLEĆ. TAČKA S_Υ	VENERA S_φ	VENERA δ_φ	MARS S_σ	MARS δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	182 43.5	-21 51.9	70 31.0	225 20.7	- 8 6.9	239 30.4	- 3 8.9
2	212 43.0	-21 52.7	100 36.0	255 20.2	- 8 8.9	269 32.6	- 3 10.0
4	242 42.5	-21 53.5	130 40.9	285 19.6	- 8 10.9	299 34.8	- 3 11.2
6	272 42.0	-21 54.2	160 45.8	315 19.0	- 8 12.9	329 37.0	- 3 12.3
8	302 41.6	-21 55.0	190 50.8	345 18.4	- 8 14.9	359 39.3	- 3 13.4
10	332 41.1	-21 55.7	220 55.7	15 17.8	- 8 16.9	29 41.5	- 3 14.6
12	2 40.6	-21 56.5	251 .6	45 17.2	- 8 18.9	59 43.7	- 3 15.7
14	32 40.1	-21 57.2	281 5.5	75 16.6	- 8 20.9	89 45.9	- 3 16.9
16	62 39.7	-21 57.9	311 10.5	105 16.0	- 8 22.9	119 48.1	- 3 18.0
18	92 39.2	-21 58.7	341 15.4	135 15.4	- 8 24.9	149 50.3	- 3 19.1
20	122 38.7	-21 59.4	11 20.3	165 14.8	- 8 26.9	179 52.6	- 3 20.3
22	152 38.2	-22 .1	41 25.3	195 14.2	- 8 28.9	209 54.8	- 3 21.4
Δ	-2	-4		-3	-10	11	-6

UT	MESEC $S_\leftmoon$	MESEC Δ	MESEC $\delta_\leftmoon$	MESEC Δ	JUPITER S_{4}	JUPITER δ_{4}	SATURN S_{5}	SATURN δ_{5}
h	° ′		° ′		° ′	° ′	° ′	° ′
0	284 21.2	133	10 37.1	-80	258 14.5	4 32.2	184 20.5	-19 58.4
2	313 25.8	134	10 21.0	-81	288 18.9	4 32.0	214 24.8	-19 58.5
4	342 30.7	135	10 4.8	-82	318 23.3	4 31.8	244 29.1	-19 58.6
6	11 35.8	136	9 48.4	-83	348 27.8	4 31.6	274 33.4	-19 58.7
8	40 41.0	137	9 31.9	-83	18 32.2	4 31.4	304 37.7	-19 58.8
10	69 46.5	138	9 15.3	-84	48 36.6	4 31.2	334 42.0	-19 58.9
12	98 52.2	139	8 58.5	-85	78 41.0	4 31.0	4 46.3	-19 59.0
14	127 58.0	140	8 41.5	-85	108 45.5	4 30.8	34 50.6	-19 59.1
16	157 4.1	141	8 24.5	-86	138 49.9	4 30.6	64 54.9	-19 59.2
18	186 10.3	142	8 7.3	-86	168 54.3	4 30.4	94 59.2	-19 59.3
20	215 16.7	143	7 50.1	-87	198 58.7	4 30.2	125 3.5	-19 59.4
22	244 23.2	144	7 32.7	-87	229 3.2	4 30.0	155 7.8	-19 59.5
Δ					22	-1	22	0

φ	SUNCE IZLAZ	SUNCE ZALAZ	TRAJANJE SUMRAKA GRAĐ.	TRAJANJE SUMRAKA ASTR.	MESEC IZLAZ	MESEC Δ/24	MESEC ZALAZ	MESEC Δ/24
N	h min	h min	h min	h min	h min	min	h min	min
60	8 36	15 2	0 54	2 40	22 53	2.9	12 27	.7
55	8 2	15 36	0 44	2 14	23 2	2.7	12 16	.9
50	7 37	16 1	0 37	1 57	23 10	1.8	12 7	1.1
45	7 19	16 20	0 33	1 45	23 16	1.8	12 0	1.2
40	7 3	16 35	0 30	1 36	23 20	1.8	11 54	1.3
35	6 50	16 48	0 28	1 30	23 25	1.8	11 49	1.4
30	6 39	16 60	0 26	1 25	23 28	1.8	11 45	1.5
20	6 19	17 19	0 24	1 18	23 35	1.8	11 37	1.6
10	6 2	17 37	0 23	1 15	23 41	1.8	11 30	1.7
0	5 46	17 53	0 22	1 14	23 46	1.8	11 23	1.8
10	5 29	18 9	0 23	1 17	23 51	1.8	11 16	1.9
20	5 12	18 27	0 24	1 23	23 57	1.8	11 9	2.1
30	4 51	18 48	0 27	1 35	. . .	.0	11 1	2.2
35	4 39	18 60	0 29	1 44	. . .	.0	10 56	2.3
40	4 25	19 14	0 32	1 59	. . .	.0	10 51	2.4
45	4 9	19 30	0 36	2 24	. . .	.0	10 45	2.5
50	3 48	19 51	0 43	: :	0 -5	1.1	10 37	2.6
55	3 21	20 18	0 54	: :	0 6	1.0	10 28	2.8
60	2 43	20 57	1 23	: :	0 20	.8	10 15	3.0
S								

SUNCE UT	SUNCE $e = T_p - UT$	SUNCE Δ/24	SUNCE r	MESEC Prolaz	MESEC Δ/24	MESEC $\pi_\leftmoon$	MESEC r
h	min s	s	′	h min	min	′	′
00	10 53.9	-1.0	16.2	$T_{\overline{m}}$ 5 12	1.8	55.3	15.1
12	10 42.4	$T_{\overline{m}_\odot}$ 11 h 49.3 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 59	.1	155	-4.1	♃	6 46	.0	188	-1.6
♂	8 1	.1	169	1.3	♄	11 41	.0	114	.6

UT	SUNCE		PROLEĆ. TAČKA	VENERA		MARS	
	$S_\odot$	$\delta_\odot$	S_Υ	S_φ	δ_φ	S_σ	δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	182 37.7	-22 .9	71 30.2	225 13.6	- 8 30.9	239 57.0	- 3 22.5
2	212 37.3	-22 1.6	101 35.1	255 13.0	- 8 32.9	269 59.2	- 3 23.7
4	242 36.8	-22 2.3	131 40.0	285 12.3	- 8 34.9	300 1.4	- 3 24.8
6	272 36.3	-22 3.0	161 45.0	315 11.7	- 8 36.8	330 3.6	- 3 25.9
8	302 35.8	-22 3.8	191 49.9	345 11.1	- 8 38.8	0 5.9	- 3 27.1
10	332 35.3	-22 4.5	221 54.8	15 10.5	- 8 40.8	30 8.1	- 3 28.2
12	2 34.8	-22 5.2	251 59.8	45 9.9	- 8 42.8	60 10.3	- 3 29.3
14	32 34.3	-22 5.9	282 4.7	75 9.3	- 8 44.8	90 12.5	- 3 30.5
16	62 33.8	-22 6.6	312 9.6	105 8.6	- 8 46.8	120 14.7	- 3 31.6
18	92 33.3	-22 7.3	342 14.5	135 8.0	- 8 48.8	150 17.0	- 3 32.7
20	122 32.8	-22 8.0	12 19.5	165 7.4	- 8 50.8	180 19.2	- 3 33.9
22	152 32.4	-22 8.7	42 24.4	195 6.8	- 8 52.8	210 21.4	- 3 35.0
Δ	-2	-4		-3	-10	11	-6

UT	MESEC				JUPITER		SATURN	
	$S_\leftmoon$	Δ	$\delta_\leftmoon$	Δ	S_{4}	δ_{4}	S_η	δ_η
h	° ′		° ′		° ′	° ′	° ′	° ′
0	273 30.0	144	7 15.2	-88	259 7.6	4 29.8	185 12.1	-19 59.6
2	302 36.8	145	6 57.6	-88	289 12.0	4 29.6	215 16.5	-19 59.7
4	331 43.9	146	6 39.9	-89	319 16.5	4 29.5	245 20.8	-19 59.8
6	0 51.0	147	6 22.2	-89	349 20.9	4 29.3	275 25.1	-19 59.9
8	29 58.4	147	6 4.3	-90	19 25.3	4 29.1	305 29.4	-19 60.0
10	59 5.8	148	5 46.4	-90	49 29.8	4 28.9	335 33.7	-20 .1
12	88 13.4	148	5 28.4	-90	79 34.2	4 28.7	5 38.0	-20 .2
14	117 21.1	149	5 10.3	-91	109 38.6	4 28.5	35 42.3	-20 .3
16	146 28.9	150	4 52.2	-91	139 43.1	4 28.3	65 46.6	-20 .4
18	175 36.8	150	4 34.0	-91	169 47.5	4 28.1	95 50.9	-20 .5
20	204 44.8	151	4 15.7	-92	199 52.0	4 27.9	125 55.2	-20 .6
22	233 52.9	151	3 57.4	-92	229 56.4	4 27.8	155 59.5	-20 .7
Δ					22	-1	22	0

φ	SUNCE		TRAJANJE SUMRAKA		MESEC			
	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 1	0 55	2 40	. . . .	.0	12 45	.7
55	8 3	15 36	0 44	2 14	. . . .	.0	12 38	.9
50	7 39	16 0	0 38	1 57	23 53	2.5	12 33	1.0
45	7 20	16 19	0 33	1 45	23 59	2.4	12 29	1.1
40	7 4	16 35	0 30	1 36	. . . .	.0	12 26	1.2
35	6 51	16 48	0 28	1 30	. . . .	.0	12 23	1.3
30	6 39	16 60	0 26	1 25	. . . .	.0	12 20	1.4
20	6 20	17 20	0 24	1 18	. . . .	.0	12 15	1.5
10	6 2	17 37	0 23	1 15	. . . .	.0	12 11	1.7
0	5 46	17 53	0 22	1 14	. . . .	.0	12 7	1.8
10	5 30	18 10	0 23	1 17	. . . .	.0	12 3	1.9
20	5 12	18 28	0 24	1 23	. . . .	.0	11 59	2.0
30	4 51	18 48	0 27	1 35	0 3	1.4	11 54	2.2
35	4 39	19 1	0 29	1 44	0 7	1.3	11 51	2.2
40	4 25	19 15	0 32	1 59	0 11	1.3	11 48	2.3
45	4 8	19 31	0 36	2 24	0 16	1.2	11 44	2.4
50	3 48	19 52	0 43	: ::	0 22	1.0	11 39	2.6
55	3 21	20 20	0 54	: ::	0 29	.9	11 34	2.7
60	2 41	20 59	1 25	: ::	0 38	.7	11 27	2.9
S								

SUNCE				MESEC			
UT	e = T_p − UT	Δ/24	r	Prolaz		Δ/24	$\pi_\leftmoon$	r
h	min s	s	′		h min	min	′	′
00	10 31.0	-1.0	16.2	$T_{\overline{m}}$	5 56	1.8	54.7	14.9
12	10 19.2	$T_{\overline{m}_\odot}$	11 h 49.7 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 59	.1	154	-4.1	♃	6 43	.0	188	-1.6
♂	7 60	.1	168	1.3	♄	11 38	.0	114	.7

UT	SUNCE		PROLEĆ. TAČKA	VENERA		MARS	
	$S_\odot$	$\delta_\odot$	S_Υ	S_φ	δ_φ	S_σ	δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	182 31.9	-22 9.4	72 29.3	225 6.1	- 8 54.7	240 23.6	- 3 36.1
2	212 31.4	-22 10.1	102 34.3	255 5.5	- 8 56.7	270 25.8	- 3 37.3
4	242 30.9	-22 10.8	132 39.2	285 4.9	- 8 58.7	300 28.1	- 3 38.4
6	272 30.4	-22 11.4	162 44.1	315 4.2	- 9 .7	330 30.3	- 3 39.5
8	302 29.9	-22 12.1	192 49.0	345 3.6	- 9 2.7	0 32.5	- 3 40.7
10	332 29.4	-22 12.8	222 54.0	15 3.0	- 9 4.7	30 34.7	- 3 41.8
12	2 28.9	-22 13.5	252 58.9	45 2.3	- 9 6.6	60 36.9	- 3 42.9
14	32 28.4	-22 14.1	283 3.8	75 1.7	- 9 8.6	90 39.2	- 3 44.1
16	62 27.9	-22 14.8	313 8.7	105 1.0	- 9 10.6	120 41.4	- 3 45.2
18	92 27.3	-22 15.5	343 13.7	135 .4	- 9 12.6	150 43.6	- 3 46.3
20	122 26.8	-22 16.1	13 18.6	164 59.7	- 9 14.6	180 45.8	- 3 47.4
22	152 26.3	-22 16.8	43 23.5	194 59.1	- 9 16.5	210 48.0	- 3 48.6
Δ	-3	-3		-3	-10	11	-6

UT	MESEC				JUPITER		SATURN	
	$S_\leftmoon$	Δ	$\delta_\leftmoon$	Δ	S_{4}	δ_{4}	S_η	δ_η
h	° ′		° ′		° ′	° ′	° ′	° ′
0	263 1.1	151	3 39.0	-92	260 .8	4 27.6	186 3.8	-20 .8
2	292 9.4	152	3 20.6	-92	290 5.3	4 27.4	216 8.1	-20 .9
4	321 17.8	152	3 2.2	-92	320 9.7	4 27.2	246 12.4	-20 1.0
6	350 26.2	153	2 43.7	-93	350 14.2	4 27.0	276 16.7	-20 1.1
8	19 34.7	153	2 25.1	-93	20 18.6	4 26.8	306 21.1	-20 1.2
10	48 43.3	153	2 6.6	-93	50 23.1	4 26.7	336 25.4	-20 1.3
12	77 51.9	153	1 48.0	-93	80 27.5	4 26.5	6 29.7	-20 1.4
14	107 .6	154	1 29.4	-93	110 32.0	4 26.3	36 34.0	-20 1.5
16	136 9.3	154	1 10.8	-93	140 36.4	4 26.1	66 38.3	-20 1.6
18	165 18.0	154	0 52.2	-93	170 40.9	4 25.9	96 42.6	-20 1.6
20	194 26.8	154	0 33.6	-93	200 45.3	4 25.7	126 46.9	-20 1.7
22	223 35.6	154	0 14.9	-56	230 49.8	4 25.6	156 51.2	-20 1.8
Δ					22	-1	22	0

φ	SUNCE		TRAJANJE SUMRAKA		MESEC			
	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 40	14 60	0 55	2 41	0 4	2.8	13 1	1.9
55	8 5	15 35	0 44	2 15	0 8	2.6	12 59	1.9
50	7 40	15 60	0 38	1 58	. . . .	.0	12 57	1.9
45	7 21	16 19	0 33	1 45	. . . .	.0	12 56	1.8
40	7 5	16 35	0 30	1 37	0 17	2.2	12 55	1.8
35	6 52	16 48	0 28	1 30	0 19	2.2	12 54	1.8
30	6 40	16 60	0 26	1 25	0 21	2.1	12 53	1.8
20	6 20	17 20	0 24	1 18	0 24	2.0	12 52	1.8
10	6 3	17 37	0 23	1 15	0 27	1.9	12 51	1.8
0	5 46	17 54	0 22	1 14	0 29	1.8	12 50	1.8
10	5 30	18 10	0 23	1 17	0 32	1.7	12 48	1.7
20	5 12	18 28	0 24	1 23	0 35	1.6	12 47	1.7
30	4 51	18 49	0 27	1 35	0 38	1.4	12 46	1.7
35	4 39	19 1	0 29	1 45	0 40	1.4	12 45	1.7
40	4 25	19 16	0 32	1 60	0 42	1.3	12 44	1.7
45	4 8	19 32	0 37	2 25	0 44	1.2	12 42	1.7
50	3 47	19 54	0 43	: ::	0 47	1.1	12 41	1.7
55	3 20	20 21	0 55	: ::	0 50	1.0	12 39	1.7
60	2 40	21 1	1 26	: ::	0 55	.8	12 37	1.6
S								

SUNCE				MESEC			
UT	e = T_p − UT	Δ/24	r	Prolaz		Δ/24	$\pi_\leftmoon$	r
h	min s	s	′		h min	min	′	′
00	10 7.4	-1.0	16.3	$T_{\overline{m}}$	6 39	1.8	54.4	14.8
12	9 55.4	$T_{\overline{m}_\odot}$	11 h 50.1 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 60	.1	153	-4.1	♃	6 39	.0	188	-1.6
♂	7 58	.1	168	1.2	♄	11 34	.0	114	.7

5. DECEMBAR 2015. SUBOTA

UT	SUNCE		PROLEĆ. TAČKA	VENERA		MARS	
	$S_\odot$	$\delta_\odot$	S_Υ	S_φ	δ_φ	S_σ	δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	182 25.8	-22 17.5	73 28.5	224 58.4	- 9 18.5	240 50.3	- 3 49.7
2	212 25.3	-22 18.1	103 33.4	254 57.8	- 9 20.5	270 52.5	- 3 50.8
4	242 24.8	-22 18.8	133 38.3	284 57.1	- 9 22.5	300 54.7	- 3 51.9
6	272 24.3	-22 19.4	163 43.2	314 56.5	- 9 24.5	330 56.9	- 3 53.1
8	302 23.8	-22 20.1	193 48.2	344 55.8	- 9 26.4	0 59.1	- 3 54.2
10	332 23.3	-22 20.7	223 53.1	14 55.2	- 9 28.4	31 1.4	- 3 55.3
12	2 22.8	-22 21.3	253 58.0	44 54.5	- 9 30.4	61 3.6	- 3 56.5
14	32 22.2	-22 22.0	284 3.0	74 53.8	- 9 32.3	91 5.8	- 3 57.6
16	62 21.7	-22 22.6	314 7.9	104 53.2	- 9 34.3	121 8.0	- 3 58.7
18	92 21.2	-22 23.2	344 12.8	134 52.5	- 9 36.3	151 10.3	- 3 59.8
20	122 20.7	-22 23.9	14 17.7	164 51.8	- 9 38.3	181 12.5	- 4 1.0
22	152 20.2	-22 24.5	44 22.7	194 51.2	- 9 40.2	211 14.7	- 4 2.1
Δ	-3	-3		-3	-10	11	-6

UT	MESEC				JUPITER		SATURN	
	$S_\leftmoon$	Δ	$\delta_\leftmoon$	Δ	$S_{\mathrm{♃}}$	$\delta_{\mathrm{♃}}$	$S_{\mathrm{♄}}$	$\delta_{\mathrm{♄}}$
h	° ′		° ′		° ′	° ′	° ′	° ′
0	252 44.4	154	0 3.7	93	260 54.2	4 25.4	186 55.5	-20 1.9
2	281 53.2	154	0 22.3	93	290 58.7	4 25.2	216 59.8	-20 2.0
4	311 2.1	154	0 40.9	93	321 3.1	4 25.0	247 4.1	-20 2.1
6	340 10.9	154	0 59.5	93	351 7.6	4 24.8	277 8.4	-20 2.2
8	9 19.7	154	1 18.1	93	21 12.0	4 24.7	307 12.7	-20 2.3
10	38 28.5	154	1 36.7	93	51 16.5	4 24.5	337 17.0	-20 2.4
12	67 37.3	154	1 55.2	93	81 21.0	4 24.3	7 21.3	-20 2.5
14	96 46.1	154	2 13.8	92	111 25.4	4 24.1	37 25.7	-20 2.6
16	125 54.8	153	2 32.3	92	141 29.9	4 23.9	67 30.0	-20 2.7
18	155 3.5	153	2 50.7	92	171 34.3	4 23.8	97 34.3	-20 2.8
20	184 12.2	153	3 9.1	92	201 38.8	4 23.6	127 38.6	-20 2.9
22	213 20.8	153	3 27.5	92	231 43.3	4 23.4	157 42.9	-20 3.0
Δ					22	-1	22	0

φ	SUNCE		TRAJANJE SUMRAKA		MESEC			
	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 42	14 59	0 55	2 42	1 10	.6	13 47	2.9
55	8 6	15 34	0 44	2 15	1 10	.8	13 44	2.7
50	7 41	15 59	0 38	1 58	1 11	1.0	13 42	2.6
45	7 22	16 19	0 33	1 46	1 11	1.1	13 41	2.4
40	7 6	16 35	0 30	1 37	1 11	1.2	13 39	2.3
35	6 53	16 48	0 28	1 30	1 11	1.3	13 38	2.2
30	6 41	16 60	0 26	1 25	1 11	1.4	13 37	2.1
20	6 21	17 20	0 24	1 18	1 11	1.5	13 35	2.0
10	6 3	17 38	0 23	1 15	1 11	1.6	13 33	1.9
0	5 47	17 54	0 22	1 15	1 11	1.8	13 32	1.8
10	5 30	18 11	0 23	1 17	1 12	1.9	13 30	1.7
20	5 12	18 29	0 24	1 23	1 12	2.0	13 29	1.5
30	4 51	18 50	0 27	1 35	1 12	2.1	13 27	1.4
35	4 39	19 2	0 29	1 45	1 12	2.2	13 26	1.3
40	4 25	19 17	0 32	1 60	1 12	2.3	13 24	1.2
45	4 8	19 34	0 37	2 26	1 13	2.4	13 23	1.1
50	3 47	19 55	0 43	: ::	1 13	2.5	13 21	1.0
55	3 19	20 23	0 55	: ::	1 13	2.7	13 19	.9
60	2 39	21 3	1 28	: ::	1 14	2.9	13 16	.7
S								

SUNCE				MESEC			
UT	e = T_p − UT	Δ/24	r	Prolaz	Δ/24	$\pi_\leftmoon$	r
h	min s	s	′	h min	min	′	′
00	9 43.3	-1.0	16.3	$T_{\overline{m}}$ 7 22	1.7	54.2	14.8
12	9 30.9	$T_{\overline{m}_\odot}$ 11 h 50.5 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	′	°	
♀	9 0	.1	151	-4.0	♄	6 35	.0	187	-1.6
♂	7 56	.1	167	1.2	♃	11 31	.0	113	.7

6. DECEMBAR NEDELJA

UT	SUNCE		PROLEĆ. TAČKA	VENERA		MARS	
	$S_\odot$	$\delta_\odot$	S_Υ	S_φ	δ_φ	S_σ	δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	182 19.6	-22 25.1	74 27.6	224 50.5	- 9 42.2	241 16.9	- 4 3.2
2	212 19.1	-22 25.7	104 32.5	254 49.8	- 9 44.2	271 19.2	- 4 4.3
4	242 18.6	-22 26.3	134 37.5	284 49.1	- 9 46.1	301 21.4	- 4 5.4
6	272 18.1	-22 27.0	164 42.4	314 48.5	- 9 48.1	331 23.6	- 4 6.6
8	302 17.6	-22 27.6	194 47.3	344 47.8	- 9 50.1	1 25.8	- 4 7.7
10	332 17.0	-22 28.2	224 52.2	14 47.1	- 9 52.0	31 28.1	- 4 8.8
12	2 16.5	-22 28.8	254 57.2	44 46.4	- 9 54.0	61 30.3	- 4 9.9
14	32 16.0	-22 29.4	285 2.1	74 45.7	- 9 56.0	91 32.5	- 4 11.1
16	62 15.4	-22 30.0	315 7.0	104 45.0	- 9 57.9	121 34.7	- 4 12.2
18	92 14.9	-22 30.6	345 12.0	134 44.4	- 9 59.9	151 37.0	- 4 13.3
20	122 14.4	-22 31.1	15 16.9	164 43.7	-10 1.8	181 39.2	- 4 14.4
22	152 13.9	-22 31.7	45 21.8	194 43.0	-10 3.8	211 41.4	- 4 15.5
Δ	-3	-3		-3	-10	11	-6

UT	MESEC				JUPITER		SATURN	
	$S_\leftmoon$	Δ	$\delta_\leftmoon$	Δ	$S_{\mathrm{♃}}$	$\delta_{\mathrm{♃}}$	$S_{\mathrm{♄}}$	$\delta_{\mathrm{♄}}$
h	° ′		° ′		° ′	° ′	° ′	° ′
0	242 29.3	152	3 45.8	91	261 47.7	4 23.2	187 47.2	-20 3.1
2	271 37.8	152	4 4.0	91	291 52.2	4 23.1	217 51.5	-20 3.2
4	300 46.3	152	4 22.2	91	321 56.7	4 22.9	247 55.8	-20 3.3
6	329 54.6	151	4 40.4	90	352 1.1	4 22.7	278 .1	-20 3.4
8	359 2.9	151	4 58.4	90	22 5.6	4 22.5	308 4.4	-20 3.5
10	28 11.1	151	5 16.5	90	52 10.1	4 22.4	338 8.7	-20 3.6
12	57 19.3	150	5 34.4	89	82 14.5	4 22.2	8 13.0	-20 3.7
14	86 27.3	150	5 52.2	89	112 19.0	4 22.0	38 17.3	-20 3.8
16	115 35.2	149	6 10.0	88	142 23.5	4 21.8	68 21.6	-20 3.9
18	144 43.1	149	6 27.7	88	172 28.0	4 21.7	98 26.0	-20 4.0
20	173 50.8	148	6 45.3	87	202 32.4	4 21.5	128 30.3	-20 4.0
22	202 58.4	148	7 2.7	87	232 36.9	4 21.3	158 34.6	-20 4.1
Δ					22	-1	22	0

φ	SUNCE		TRAJANJE SUMRAKA		MESEC			
	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 44	14 58	0 56	2 42	1 26	.7	14 57	2.9
55	8 8	15 34	0 44	2 15	1 31	.9	14 49	2.7
50	7 42	15 59	0 38	1 58	1 34	1.0	14 44	2.6
45	7 23	16 19	0 33	1 46	1 37	1.2	14 39	2.4
40	7 7	16 35	0 30	1 37	1 40	1.3	14 35	2.3
35	6 54	16 48	0 28	1 30	1 42	1.3	14 31	2.2
30	6 42	16 60	0 26	1 25	1 44	1.4	14 28	2.2
20	6 22	17 20	0 24	1 18	1 48	1.6	14 23	2.0
10	6 4	17 38	0 23	1 15	1 51	1.7	14 19	1.9
0	5 47	17 55	0 22	1 15	1 54	1.8	14 14	1.8
10	5 30	18 11	0 23	1 17	1 57	1.9	14 10	1.7
20	5 12	18 30	0 24	1 23	1 60	2.0	14 5	1.6
30	4 51	18 51	0 27	1 35	2 3	2.2	14 0	1.5
35	4 39	19 3	0 29	1 45	2 6	2.2	13 57	1.4
40	4 25	19 17	0 32	2 0	2 8	2.3	13 54	1.3
45	4 8	19 35	0 37	2 27	2 11	2.4	13 50	1.2
50	3 46	19 56	0 43	: ::	2 14	2.6	13 45	1.1
55	3 18	20 24	0 55	: ::	2 18	2.7	13 39	.9
60	2 38	21 5	1 29	: ::	2 24	2.9	13 32	.7
S								

SUNCE				MESEC			
UT	e = T_p − UT	Δ/24	r	Prolaz	Δ/24	$\pi_\leftmoon$	r
h	min s	s	′	h min	min	′	′
00	9 18.6	-1.1	16.3	$T_{\overline{m}}$ 8 4	1.8	54.2	14.8
12	9 5.9	$T_{\overline{m}_\odot}$ 11 h 50.9 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	′	°	
♀	9 1	.1	150	-4.0	♄	6 32	.0	187	-1.6
♂	7 54	.1	167	1.2	♃	11 27	.0	113	.7

7. DECEMBAR 2015. PONEDELJAK

UT	SUNCE $S_\odot$	SUNCE $\delta_\odot$	PROLEĆ. TAČKA S_Υ	VENERA S_φ	VENERA δ_φ	MARS S_σ	MARS δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	182 13.3	-22 32.3	75 26.7	224 42.3	-10 5.8	241 43.6	- 4 16.7
2	212 12.8	-22 32.9	105 31.7	254 41.6	-10 7.7	271 45.9	- 4 17.8
4	242 12.3	-22 33.5	135 36.6	284 40.9	-10 9.7	301 48.1	- 4 18.9
6	272 11.7	-22 34.1	165 41.5	314 40.2	-10 11.6	331 50.3	- 4 20.0
8	302 11.2	-22 34.6	195 46.5	344 39.5	-10 13.6	1 52.5	- 4 21.1
10	332 10.6	-22 35.2	225 51.4	14 38.8	-10 15.5	31 54.8	- 4 22.3
12	2 10.1	-22 35.8	255 56.3	44 38.1	-10 17.5	61 57.0	- 4 23.4
14	32 9.6	-22 36.3	286 1.2	74 37.4	-10 19.4	91 59.2	- 4 24.5
16	62 9.0	-22 36.9	316 6.2	104 36.6	-10 21.4	122 1.5	- 4 25.6
18	92 8.5	-22 37.4	346 11.1	134 35.9	-10 23.3	152 3.7	- 4 26.7
20	122 8.0	-22 38.0	16 16.0	164 35.2	-10 25.3	182 5.9	- 4 27.8
22	152 7.4	-22 38.5	46 21.0	194 34.5	-10 27.2	212 8.1	- 4 29.0
Δ	-3	-3		-4	-10	11	-6

UT	MESEC $S_\leftmoon$	MESEC Δ	MESEC $\delta_\leftmoon$	MESEC Δ	JUPITER S_{4}	JUPITER δ_{4}	SATURN S_{5}	SATURN δ_{5}
h	° ′		° ′		° ′	° ′	° ′	° ′
0	232 5.9	147	7 20.1	86	262 41.4	4 21.2	188 38.9	-20 4.2
2	261 13.3	146	7 37.4	86	292 45.9	4 21.0	218 43.2	-20 4.3
4	290 20.6	146	7 54.6	85	322 50.3	4 20.8	248 47.5	-20 4.4
6	319 27.7	145	8 11.6	85	352 54.8	4 20.7	278 51.8	-20 4.5
8	348 34.7	144	8 28.5	84	22 59.3	4 20.5	308 56.1	-20 4.6
10	17 41.5	144	8 45.3	83	53 3.8	4 20.3	339 .4	-20 4.7
12	46 48.2	143	9 2.0	83	83 8.3	4 20.2	9 4.7	-20 4.8
14	75 54.8	142	9 18.6	82	113 12.8	4 20.0	39 9.0	-20 4.9
16	105 1.2	141	9 35.0	81	143 17.2	4 19.8	69 13.3	-20 5.0
18	134 7.5	140	9 51.2	81	173 21.7	4 19.6	99 17.6	-20 5.1
20	163 13.5	140	10 7.3	80	203 26.2	4 19.5	129 22.0	-20 5.2
22	192 19.5	139	10 23.3	79	233 30.7	4 19.3	159 26.3	-20 5.3
Δ					22	-1	22	0

φ	SUNCE IZLAZ	SUNCE ZALAZ	TRAJANJE SUMRAKA GRAĐ.	TRAJANJE SUMRAKA ASTR.	MESEC IZLAZ	MESEC Δ/24	MESEC ZALAZ	MESEC Δ/24
N	h min	h min	h min	h min	h min	min	h min	min
60	8 45	14 57	0 56	2 43	1 42	.8	16 7	2.9
55	8 9	15 33	0 45	2 16	1 52	1.0	15 55	2.7
50	7 44	15 59	0 38	1 58	1 59	1.1	15 45	2.6
45	7 24	16 19	0 33	1 46	2 5	1.2	15 37	2.5
40	7 8	16 35	0 30	1 37	2 10	1.3	15 31	2.4
35	6 54	16 48	0 28	1 30	2 14	1.4	15 25	2.3
30	6 42	17 0	0 26	1 25	2 18	1.5	15 20	2.2
20	6 22	17 20	0 24	1 18	2 25	1.6	15 12	2.1
10	6 4	17 38	0 23	1 15	2 31	1.7	15 5	2.0
0	5 48	17 55	0 22	1 15	2 37	1.8	14 58	1.9
10	5 31	18 12	0 23	1 17	2 42	1.9	14 51	1.8
20	5 13	18 30	0 24	1 23	2 48	2.1	14 43	1.7
30	4 51	18 51	0 27	1 35	2 55	2.2	14 35	1.5
35	4 39	19 4	0 29	1 45	2 59	2.3	14 30	1.5
40	4 25	19 18	0 32	2 1	3 4	2.4	14 25	1.4
45	4 7	19 36	0 37	2 28	3 9	2.5	14 18	1.3
50	3 46	19 57	0 44	: ::	3 16	2.6	14 11	1.2
55	3 18	20 26	0 56	: ::	3 24	2.7	14 2	1.0
60	2 37	21 7	1 31	: ::	3 34	2.9	13 49	.8
S								

SUNCE UT	SUNCE $e = T_p - UT$	SUNCE Δ/24	SUNCE r	MESEC Prolaz	MESEC Δ/24	MESEC $\pi_\leftmoon$	MESEC r
h	min s	s	′	h min	min	′	′
00	8 53.3	-1.1	16.3	$T_{\overline{m}}$ 8 47	1.9	54.3	14.8
12	8 40.4	$T_{\overline{m}_\odot}$ 11 h 51.3 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	′	°	
♀	9 1	.1	149	-4.0	♃	6 28	.0	187	-1.6
♂	7 53	.1	166	1.2	♄	11 24	.0	113	.7

8. DECEMBAR UTORAK

UT	SUNCE $S_\odot$	SUNCE $\delta_\odot$	PROLEĆ. TAČKA S_Υ	VENERA S_φ	VENERA δ_φ	MARS S_σ	MARS δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	182 6.9	-22 39.1	76 25.9	224 33.8	-10 29.2	242 10.4	- 4 30.1
2	212 6.3	-22 39.6	106 30.8	254 33.1	-10 31.1	272 12.6	- 4 31.2
4	242 5.8	-22 40.2	136 35.7	284 32.3	-10 33.1	302 14.8	- 4 32.3
6	272 5.2	-22 40.7	166 40.7	314 31.6	-10 35.0	332 17.1	- 4 33.4
8	302 4.7	-22 41.2	196 45.6	344 30.9	-10 37.0	2 19.3	- 4 34.5
10	332 4.1	-22 41.8	226 50.5	14 30.2	-10 38.9	32 21.5	- 4 35.6
12	2 3.6	-22 42.3	256 55.4	44 29.4	-10 40.9	62 23.7	- 4 36.8
14	32 3.0	-22 42.8	287 .4	74 28.7	-10 42.8	92 26.0	- 4 37.9
16	62 2.5	-22 43.4	317 5.3	104 28.0	-10 44.7	122 28.2	- 4 39.0
18	92 1.9	-22 43.9	347 10.2	134 27.2	-10 46.7	152 30.4	- 4 40.1
20	122 1.4	-22 44.4	17 15.2	164 26.5	-10 48.6	182 32.7	- 4 41.2
22	152 .8	-22 44.9	47 20.1	194 25.8	-10 50.5	212 34.9	- 4 42.3
Δ	-3	-3		-4	-10	11	-6

UT	MESEC $S_\leftmoon$	MESEC Δ	MESEC $\delta_\leftmoon$	MESEC Δ	JUPITER S_{4}	JUPITER δ_{4}	SATURN S_{5}	SATURN δ_{5}
h	° ′		° ′		° ′	° ′	° ′	° ′
0	221 25.2	138	10 39.1	78	263 35.2	4 19.2	189 30.6	-20 5.4
2	250 30.8	137	10 54.7	77	293 39.7	4 19.0	219 34.9	-20 5.5
4	279 36.2	136	11 10.1	76	323 44.2	4 18.8	249 39.2	-20 5.6
6	308 41.5	135	11 25.4	75	353 48.7	4 18.7	279 43.5	-20 5.7
8	337 46.5	134	11 40.5	75	23 53.2	4 18.5	309 47.8	-20 5.8
10	6 51.4	133	11 55.4	74	53 57.6	4 18.3	339 52.1	-20 5.8
12	35 56.1	132	12 10.1	73	84 2.1	4 18.2	9 56.4	-20 5.9
14	65 .6	132	12 24.6	72	114 6.6	4 18.0	40 .7	-20 6.0
16	94 4.9	131	12 38.9	71	144 11.1	4 17.8	70 5.0	-20 6.1
18	123 9.0	130	12 53.1	69	174 15.6	4 17.7	100 9.3	-20 6.2
20	152 12.9	129	13 6.9	68	204 20.1	4 17.5	130 13.7	-20 6.3
22	181 16.6	128	13 20.6	67	234 24.6	4 17.4	160 18.0	-20 6.4
Δ					22	-1	22	0

φ	SUNCE IZLAZ	SUNCE ZALAZ	TRAJANJE SUMRAKA GRAĐ.	TRAJANJE SUMRAKA ASTR.	MESEC IZLAZ	MESEC Δ/24	MESEC ZALAZ	MESEC Δ/24
N	h min	h min	h min	h min	h min	min	h min	min
60	8 47	14 56	0 56	2 43	2 1	.9	17 18	2.9
55	8 11	15 33	0 45	2 16	2 15	1.1	17 0	2.7
50	7 45	15 59	0 38	1 58	2 26	1.3	16 47	2.6
45	7 25	16 18	0 34	1 46	2 35	1.4	16 36	2.5
40	7 9	16 35	0 30	1 37	2 42	1.5	16 28	2.4
35	6 55	16 48	0 28	1 30	2 49	1.5	16 20	2.3
30	6 43	17 0	0 26	1 25	2 54	1.6	16 13	2.2
20	6 23	17 21	0 24	1 18	3 4	1.7	16 2	2.1
10	6 5	17 39	0 23	1 15	3 13	1.8	15 52	2.0
0	5 48	17 55	0 22	1 15	3 21	1.9	15 43	2.0
10	5 31	18 13	0 23	1 17	3 29	2.0	15 33	1.9
20	5 13	18 31	0 24	1 23	3 38	2.1	15 23	1.8
30	4 51	18 52	0 27	1 36	3 48	2.2	15 12	1.7
35	4 39	19 5	0 29	1 46	3 54	2.3	15 6	1.6
40	4 24	19 19	0 33	2 1	4 0	2.4	14 58	1.5
45	4 7	19 37	0 37	2 28	4 8	2.5	14 50	1.5
50	3 46	19 58	0 44	: ::	4 17	2.6	14 39	1.4
55	3 17	20 27	0 56	: ::	4 29	2.7	14 26	1.2
60	2 36	21 9	1 32	: ::	4 45	2.9	14 10	1.0
S								

SUNCE UT	SUNCE $e = T_p - UT$	SUNCE Δ/24	SUNCE r	MESEC Prolaz	MESEC Δ/24	MESEC $\pi_\leftmoon$	MESEC r
h	min s	s	′	h min	min	′	′
00	8 27.5	-1.1	16.3	$T_{\overline{m}}$ 9 32	1.9	54.6	14.9
12	8 14.3	$T_{\overline{m}_\odot}$ 11 h 51.8 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	′	°	
♀	9 2	.1	148	-4.0	♃	6 25	.0	187	-1.6
♂	7 51	.1	166	1.2	♄	11 20	.0	113	.7

UT	SUNCE		PROLEĆ. TAČKA	VENERA		MARS	
	$S_\odot$	$\delta_\odot$	S_Υ	S_φ	δ_φ	S_σ	δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	182 .3	-22 45.4	77 25.0	224 25.0	-10 52.5	242 37.1	- 4 43.4
2	211 59.7	-22 45.9	107 29.9	254 24.3	-10 54.4	272 39.4	- 4 44.5
4	241 59.2	-22 46.4	137 34.9	284 23.5	-10 56.3	302 41.6	- 4 45.7
6	271 58.6	-22 46.9	167 39.8	314 22.8	-10 58.3	332 43.8	- 4 46.8
8	301 58.1	-22 47.4	197 44.7	344 22.0	-11 .2	2 46.1	- 4 47.9
10	331 57.5	-22 47.9	227 49.7	14 21.3	-11 2.1	32 48.3	- 4 49.0
12	1 57.0	-22 48.4	257 54.6	44 20.5	-11 4.1	62 50.5	- 4 50.1
14	31 56.4	-22 48.9	287 59.5	74 19.8	-11 6.0	92 52.7	- 4 51.2
16	61 55.8	-22 49.4	318 4.4	104 19.0	-11 7.9	122 55.0	- 4 52.3
18	91 55.3	-22 49.9	348 9.4	134 18.3	-11 9.8	152 57.2	- 4 53.4
20	121 54.7	-22 50.3	18 14.3	164 17.5	-11 11.8	182 59.4	- 4 54.5
22	151 54.2	-22 50.8	48 19.2	194 16.8	-11 13.7	213 1.7	- 4 55.6
Δ	-3	-2		-4	-10	11	-6

UT	MESEC				JUPITER		SATURN	
	$S_\leftmoon$	Δ	$\delta_\leftmoon$	Δ	S_{4}	δ_{4}	S_η	δ_η
h	° ′		° ′		° ′	° ′	° ′	° ′
0	210 20.2	127	13 34.1	66	264 29.1	4 17.2	190 22.3	-20 6.5
2	239 23.5	126	13 47.3	65	294 33.6	4 17.0	220 26.6	-20 6.6
4	268 26.6	125	14 .3	64	324 38.1	4 16.9	250 30.9	-20 6.7
6	297 29.5	123	14 13.0	62	354 42.6	4 16.7	280 35.2	-20 6.8
8	326 32.2	122	14 25.5	61	24 47.1	4 16.6	310 39.5	-20 6.9
10	355 34.7	121	14 37.7	60	54 51.7	4 16.4	340 43.8	-20 7.0
12	24 37.0	120	14 49.7	59	84 56.2	4 16.3	10 48.1	-20 7.1
14	53 39.0	119	15 1.4	57	115 .7	4 16.1	40 52.4	-20 7.2
16	82 40.9	118	15 12.9	56	145 5.2	4 15.9	70 56.7	-20 7.3
18	111 42.6	117	15 24.1	54	175 9.7	4 15.8	101 1.0	-20 7.3
20	140 44.0	116	15 34.9	53	205 14.2	4 15.6	131 5.4	-20 7.4
22	169 45.3	115	15 45.6	52	235 18.7	4 15.5	161 9.7	-20 7.5
Δ					23	-1	22	0

φ	SUNCE		TRAJANJE SUMRAKA		MESEC			
	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	14 55	0 56	2 43	2 23	1.2	18 27	2.8
55	8 12	15 32	0 45	2 16	2 42	1.3	18 5	2.6
50	7 46	15 58	0 38	1 59	2 56	1.5	17 49	2.5
45	7 26	16 18	0 34	1 46	3 8	1.6	17 36	2.4
40	7 10	16 35	0 30	1 37	3 17	1.6	17 25	2.4
35	6 56	16 48	0 28	1 30	3 26	1.7	17 15	2.3
30	6 44	17 0	0 26	1 25	3 33	1.8	17 7	2.3
20	6 23	17 21	0 24	1 18	3 45	1.9	16 53	2.2
10	6 5	17 39	0 23	1 15	3 56	1.9	16 41	2.1
0	5 48	17 56	0 22	1 15	4 7	2.0	16 30	2.1
10	5 31	18 13	0 23	1 17	4 17	2.1	16 18	2.0
20	5 13	18 31	0 24	1 24	4 28	2.2	16 6	1.9
30	4 52	18 53	0 27	1 36	4 41	2.3	15 52	1.8
35	4 39	19 6	0 29	1 46	4 49	2.3	15 44	1.8
40	4 24	19 20	0 33	2 1	4 57	2.4	15 35	1.7
45	4 7	19 38	0 37	2 29	5 7	2.5	15 25	1.7
50	3 45	19 59	0 44	: ::	5 19	2.6	15 12	1.6
55	3 17	20 28	0 56	: ::	5 35	2.7	14 56	1.5
60	2 35	21 11	1 34	: ::	5 55	2.9	14 34	1.3
S								

SUNCE				MESEC			
UT	e = T_p − UT	Δ/24	r	Prolaz		Δ/24	$\pi_\leftmoon$	r
h	min s	s	′		h min	min	′	′
00	8 1.2	-1.1	16.3	$T_{\overline{m}}$	10 18	2.0	54.9	15.0
12	7 47.8	$T_{\overline{m}_\odot}$	11 h 52.2 min	Starost 27.3 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	.1	147	-4.0	♃	6 21	.0	187	-1.6
♂	7 49	.1	165	1.2	♄	11 17	.0	113	.7

UT	SUNCE		PROLEĆ. TAČKA	VENERA		MARS	
	$S_\odot$	$\delta_\odot$	S_Υ	S_φ	δ_φ	S_σ	δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	181 53.6	-22 51.3	78 24.2	224 16.0	-11 15.6	243 3.9	- 4 56.7
2	211 53.0	-22 51.8	108 29.1	254 15.2	-11 17.5	273 6.1	- 4 57.8
4	241 52.5	-22 52.2	138 34.0	284 14.5	-11 19.4	303 8.4	- 4 58.9
6	271 51.9	-22 52.7	168 38.9	314 13.7	-11 21.4	333 10.6	- 5 .1
8	301 51.3	-22 53.2	198 43.9	344 12.9	-11 23.3	3 12.8	- 5 1.2
10	331 50.8	-22 53.6	228 48.8	14 12.1	-11 25.2	33 15.1	- 5 2.3
12	1 50.2	-22 54.1	258 53.7	44 11.4	-11 27.1	63 17.3	- 5 3.4
14	31 49.6	-22 54.5	288 58.7	74 10.6	-11 29.0	93 19.6	- 5 4.5
16	61 49.1	-22 55.0	319 3.6	104 9.8	-11 30.9	123 21.8	- 5 5.6
18	91 48.5	-22 55.4	349 8.5	134 9.0	-11 32.8	153 24.0	- 5 6.7
20	121 47.9	-22 55.9	19 13.4	164 8.3	-11 34.8	183 26.3	- 5 7.8
22	151 47.4	-22 56.3	49 18.4	194 7.5	-11 36.7	213 28.5	- 5 8.9
Δ	-3	-2		-4	-10	11	-6

UT	MESEC				JUPITER		SATURN	
	$S_\leftmoon$	Δ	$\delta_\leftmoon$	Δ	S_{4}	δ_{4}	S_η	δ_η
h	° ′		° ′		° ′	° ′	° ′	° ′
0	198 46.3	114	15 55.9	50	265 23.2	4 15.3	191 14.0	-20 7.6
2	227 47.1	113	16 5.9	49	295 27.7	4 15.2	221 18.3	-20 7.7
4	256 47.8	112	16 15.6	47	325 32.3	4 15.0	251 22.6	-20 7.8
6	285 48.2	111	16 25.0	45	355 36.8	4 14.9	281 26.9	-20 7.9
8	314 48.4	110	16 34.1	44	25 41.3	4 14.7	311 31.2	-20 8.0
10	343 48.4	109	16 42.9	42	55 45.8	4 14.6	341 35.5	-20 8.1
12	12 48.3	108	16 51.3	41	85 50.3	4 14.4	11 39.8	-20 8.2
14	41 47.9	107	16 59.5	39	115 54.8	4 14.2	41 44.1	-20 8.3
16	70 47.3	106	17 7.2	37	145 59.4	4 14.1	71 48.5	-20 8.4
18	99 46.6	105	17 14.7	36	176 3.9	4 13.9	101 52.8	-20 8.5
20	128 45.6	104	17 21.8	34	206 8.4	4 13.8	131 57.1	-20 8.6
22	157 44.5	103	17 28.6	32	236 12.9	4 13.6	162 1.4	-20 8.6
Δ					23	-1	22	0

φ	SUNCE		TRAJANJE SUMRAKA		MESEC			
	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 50	14 55	0 56	2 44	2 51	1.5	19 34	2.5
55	8 13	15 32	0 45	2 16	3 14	1.6	19 8	2.4
50	7 47	15 58	0 38	1 59	3 31	1.7	18 49	2.4
45	7 27	16 18	0 34	1 46	3 45	1.8	18 34	2.3
40	7 10	16 35	0 30	1 37	3 57	1.8	18 21	2.3
35	6 57	16 48	0 28	1 30	4 6	1.9	18 11	2.3
30	6 45	17 1	0 26	1 25	4 15	1.9	18 2	2.3
20	6 24	17 21	0 24	1 18	4 30	2.0	17 46	2.2
10	6 6	17 39	0 23	1 15	4 43	2.0	17 32	2.2
0	5 49	17 56	0 22	1 15	4 55	2.1	17 19	2.1
10	5 32	18 14	0 23	1 17	5 7	2.1	17 6	2.1
20	5 13	18 32	0 24	1 24	5 20	2.2	16 52	2.1
30	4 52	18 54	0 27	1 36	5 36	2.3	16 36	2.0
35	4 39	19 6	0 30	1 46	5 44	2.3	16 27	2.0
40	4 25	19 21	0 33	2 2	5 54	2.3	16 17	1.9
45	4 7	19 39	0 37	2 30	6 6	2.4	16 5	1.9
50	3 45	20 0	0 44	: ::	6 21	2.5	15 50	1.9
55	3 16	20 30	0 57	: ::	6 39	2.5	15 31	1.8
60	2 34	21 12	1 36	: ::	7 3	2.7	15 5	1.7
S								

SUNCE				MESEC			
UT	e = T_p − UT	Δ/24	r	Prolaz		Δ/24	$\pi_\leftmoon$	r
h	min s	s	′		h min	min	′	′
00	7 34.4	-1.1	16.3	$T_{\overline{m}}$	11 7	2.1	55.4	15.1
12	7 20.8	$T_{\overline{m}_\odot}$	11 h 52.7 min	Starost 28.3 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	.1	146	-4.0	♃	6 18	.0	187	-1.6
♂	7 47	.1	165	1.2	♄	11 13	.0	113	.7

UT	SUNCE		PROLEĆ. TAČKA	VENERA		MARS	
	$S_\odot$	$\delta_\odot$	S_Υ	S_φ	δ_φ	S_σ	δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	181 46.8	-22 56.7	79 23.3	224 6.7	-11 38.6	243 30.7	- 5 10.0
2	211 46.2	-22 57.2	109 28.2	254 5.9	-11 40.5	273 33.0	- 5 11.1
4	241 45.6	-22 57.6	139 33.2	284 5.1	-11 42.4	303 35.2	- 5 12.2
6	271 45.1	-22 58.0	169 38.1	314 4.3	-11 44.3	333 37.4	- 5 13.3
8	301 44.5	-22 58.4	199 43.0	344 3.5	-11 46.2	3 39.7	- 5 14.4
10	331 43.9	-22 58.9	229 47.9	14 2.7	-11 48.1	33 41.9	- 5 15.5
12	1 43.3	-22 59.3	259 52.9	44 1.9	-11 50.0	63 44.1	- 5 16.6
14	31 42.8	-22 59.7	289 57.8	74 1.1	-11 51.9	93 46.4	- 5 17.7
16	61 42.2	-23 .1	320 2.7	104 .3	-11 53.8	123 48.6	- 5 18.8
18	91 41.6	-23 .5	350 7.6	133 59.5	-11 55.7	153 50.9	- 5 19.9
20	121 41.0	-23 .9	20 12.6	163 58.7	-11 57.6	183 53.1	- 5 21.0
22	151 40.5	-23 1.3	50 17.5	193 57.9	-11 59.5	213 55.3	- 5 22.1
Δ		-3 -2			-4 -9		11 -5

UT	MESEC				JUPITER		SATURN	
	$S_\leftmoon$	Δ	$\delta_\leftmoon$	Δ	$S_{\mathrm{♃}}$	$\delta_{\mathrm{♃}}$	$S_{\mathrm{♄}}$	$\delta_{\mathrm{♄}}$
h	° ′		° ′		° ′	° ′	° ′	° ′
0	186 43.2	103	17 35.0	30	266 17.5	4 13.5	192 5.7	-20 8.7
2	215 41.7	102	17 41.0	28	296 22.0	4 13.4	222 10.0	-20 8.8
4	244 40.0	101	17 46.7	27	326 26.5	4 13.2	252 14.3	-20 8.9
6	273 38.2	100	17 52.1	25	356 31.1	4 13.1	282 18.6	-20 9.0
8	302 36.2	99	17 57.0	23	26 35.6	4 12.9	312 22.9	-20 9.1
10	331 34.0	98	18 1.6	21	56 40.1	4 12.8	342 27.2	-20 9.2
12	0 31.7	98	18 5.8	19	86 44.6	4 12.6	12 31.6	-20 9.3
14	29 29.2	97	18 9.6	17	116 49.2	4 12.5	42 35.9	-20 9.4
16	58 26.5	96	18 13.1	15	146 53.7	4 12.3	72 40.2	-20 9.5
18	87 23.8	95	18 16.1	13	176 58.2	4 12.2	102 44.5	-20 9.6
20	116 20.9	95	18 18.8	11	207 2.8	4 12.0	132 48.8	-20 9.7
22	145 17.8	94	18 21.0	9	237 7.3	4 11.9	162 53.1	-20 9.7
Δ					23	-1	22	0

φ	SUNCE		TRAJANJE SUMRAKA		MESEC			
	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 52	14 54	0 57	2 44	3 27	1.9	20 35	2.2
55	8 14	15 32	0 45	2 17	3 53	2.0	20 7	2.2
50	7 48	15 58	0 38	1 59	4 13	2.0	19 46	2.2
45	7 28	16 18	0 34	1 46	4 28	2.0	19 30	2.2
40	7 11	16 35	0 30	1 37	4 41	2.1	19 17	2.2
35	6 57	16 49	0 28	1 30	4 52	2.1	19 6	2.2
30	6 45	17 1	0 26	1 25	5 1	2.1	18 56	2.2
20	6 25	17 22	0 24	1 18	5 18	2.1	18 39	2.2
10	6 6	17 40	0 23	1 15	5 32	2.2	18 24	2.2
0	5 49	17 57	0 22	1 15	5 45	2.2	18 10	2.2
10	5 32	18 14	0 23	1 17	5 59	2.2	17 56	2.2
20	5 14	18 33	0 24	1 24	6 13	2.2	17 42	2.2
30	4 52	18 54	0 27	1 36	6 30	2.2	17 25	2.2
35	4 39	19 7	0 30	1 46	6 40	2.2	17 15	2.2
40	4 25	19 22	0 33	2 2	6 51	2.3	17 4	2.2
45	4 7	19 39	0 37	2 30	7 4	2.3	16 50	2.2
50	3 45	20 2	0 44	: ::	7 20	2.3	16 34	2.2
55	3 16	20 31	0 57	: ::	7 40	2.3	16 14	2.1
60	2 33	21 14	1 37	: ::	8 8	2.4	15 46	2.1
S								

SUNCE				MESEC			
UT	e = Tp − UT	Δ/24	r	Prolaz		Δ/24	$\pi_\leftmoon$	r
h	min s	s	′		h min	min	′	′
00	7 7.1	-1.2	16.3	$T_{\overline{m}}$	11 58	2.2	55.9	15.2
12	6 53.3	$T_{\overline{m}_\odot}$ 11 h 53.1 min		Starost 29.3 d		Faza ●		

PLANETE								
Pl.	$T_{\overline{m}}$	π	360 − α	Vel.	Pl.	$T_{\overline{m}}$	π	360 − α	Vel.
	h min	′	°			h min	′	°	
♀	9 4	.1	145	-4.0	♃	6 14	.0	187	-1.6
♂	7 45	.1	164	1.2	♄	11 10	.0	113	.7

UT	SUNCE		PROLEĆ. TAČKA	VENERA		MARS	
	$S_\odot$	$\delta_\odot$	S_Υ	S_φ	δ_φ	S_σ	δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	181 39.9	-23 1.7	80 22.4	223 57.1	-12 1.3	243 57.6	- 5 23.2
2	211 39.3	-23 2.1	110 27.4	253 56.3	-12 3.2	273 59.8	- 5 24.3
4	241 38.7	-23 2.5	140 32.3	283 55.5	-12 5.1	304 2.1	- 5 25.4
6	271 38.1	-23 2.9	170 37.2	313 54.6	-12 7.0	334 4.3	- 5 26.5
8	301 37.6	-23 3.3	200 42.1	343 53.8	-12 8.9	4 6.5	- 5 27.6
10	331 37.0	-23 3.6	230 47.1	13 53.0	-12 10.8	34 8.8	- 5 28.7
12	1 36.4	-23 4.0	260 52.0	43 52.2	-12 12.7	64 11.0	- 5 29.8
14	31 35.8	-23 4.4	290 56.9	73 51.4	-12 14.5	94 13.3	- 5 30.9
16	61 35.2	-23 4.8	321 1.9	103 50.5	-12 16.4	124 15.5	- 5 32.0
18	91 34.6	-23 5.1	351 6.8	133 49.7	-12 18.3	154 17.7	- 5 33.0
20	121 34.0	-23 5.5	21 11.7	163 48.9	-12 20.2	184 20.0	- 5 34.1
22	151 33.5	-23 5.9	51 16.6	193 48.0	-12 22.0	214 22.2	- 5 35.2
Δ		-3 -2			-4 -9		11 -5

UT	MESEC				JUPITER		SATURN	
	$S_\leftmoon$	Δ	$\delta_\leftmoon$	Δ	$S_{\mathrm{♃}}$	$\delta_{\mathrm{♃}}$	$S_{\mathrm{♄}}$	$\delta_{\mathrm{♄}}$
h	° ′		° ′		° ′	° ′	° ′	° ′
0	174 14.6	94	18 22.9	7	267 11.9	4 11.7	192 57.4	-20 9.8
2	203 11.3	93	18 24.4	5	297 16.4	4 11.6	223 1.7	-20 9.9
4	232 7.9	92	18 25.4	3	327 20.9	4 11.5	253 6.0	-20 10.0
6	261 4.4	92	18 26.1	1	357 25.5	4 11.3	283 10.4	-20 10.1
8	290 .8	91	18 26.3	-1	27 30.0	4 11.2	313 14.7	-20 10.2
10	318 57.0	91	18 26.2	-3	57 34.6	4 11.0	343 19.0	-20 10.3
12	347 53.2	90	18 25.6	-5	87 39.1	4 10.9	13 23.3	-20 10.4
14	16 49.3	90	18 24.6	-7	117 43.7	4 10.8	43 27.6	-20 10.5
16	45 45.3	90	18 23.2	-9	147 48.2	4 10.6	73 31.9	-20 10.6
18	74 41.3	89	18 21.4	-11	177 52.8	4 10.5	103 36.2	-20 10.7
20	103 37.1	89	18 19.2	-13	207 57.3	4 10.3	133 40.5	-20 10.7
22	132 32.9	89	18 16.6	-15	238 1.9	4 10.2	163 44.8	-20 10.8
Δ					23	-1	22	0

φ	SUNCE		TRAJANJE SUMRAKA		MESEC			
	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 53	14 54	0 57	2 45	4 12	2.4	21 27	1.8
55	8 15	15 32	0 45	2 17	4 40	2.3	20 59	1.9
50	7 49	15 58	0 38	1 59	5 1	2.3	20 39	2.0
45	7 29	16 18	0 34	1 46	5 17	2.3	20 23	2.0
40	7 12	16 35	0 30	1 37	5 30	2.3	20 10	2.1
35	6 58	16 49	0 28	1 30	5 42	2.3	19 58	2.1
30	6 46	17 1	0 26	1 25	5 52	2.3	19 49	2.1
20	6 25	17 22	0 24	1 19	6 9	2.2	19 32	2.2
10	6 7	17 40	0 23	1 15	6 24	2.2	19 17	2.2
0	5 50	17 57	0 22	1 15	6 38	2.2	19 3	2.2
10	5 33	18 15	0 23	1 17	6 52	2.2	18 49	2.3
20	5 14	18 33	0 25	1 24	7 6	2.2	18 34	2.3
30	4 52	18 55	0 27	1 36	7 24	2.2	18 17	2.3
35	4 39	19 8	0 30	1 46	7 34	2.1	18 7	2.4
40	4 25	19 23	0 33	2 2	7 45	2.1	17 56	2.4
45	4 7	19 40	0 37	2 31	7 59	2.1	17 42	2.4
50	3 45	20 2	0 44	: ::	8 15	2.1	17 26	2.5
55	3 16	20 32	0 57	: ::	8 36	2.1	17 5	2.5
60	2 33	21 15	1 39	: ::	9 5	2.0	16 37	2.6
S								

SUNCE				MESEC			
UT	e = Tp − UT	Δ/24	r	Prolaz		Δ/24	$\pi_\leftmoon$	r
h	min s	s	′		h min	min	′	′
00	6 39.5	-1.2	16.3	$T_{\overline{m}}$	12 50	2.3	56.4	15.4
12	6 25.5	$T_{\overline{m}_\odot}$ 11 h 53.6 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	′	°	
♀	9 4	.1	144	-3.9	♃	6 10	.0	187	-1.6
♂	7 44	.1	164	1.2	♄	11 7	.0	113	.7

UT	SUNCE		PROLEĆ. TAČKA	VENERA		MARS	
	$S_\odot$	$\delta_\odot$	S_Υ	S_φ	δ_φ	S_σ	δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	181 32.9	−23 6.2	81 21.6	223 47.2	−12 23.9	244 24.5	− 5 36.3
2	211 32.3	−23 6.6	111 26.5	253 46.4	−12 25.8	274 26.7	− 5 37.4
4	241 31.7	−23 6.9	141 31.4	283 45.5	−12 27.7	304 28.9	− 5 38.5
6	271 31.1	−23 7.3	171 36.4	313 44.7	−12 29.5	334 31.2	− 5 39.6
8	301 30.5	−23 7.6	201 41.3	343 43.8	−12 31.4	4 33.4	− 5 40.7
10	331 29.9	−23 8.0	231 46.2	13 43.0	−12 33.3	34 35.7	− 5 41.8
12	1 29.3	−23 8.3	261 51.1	43 42.2	−12 35.1	64 37.9	− 5 42.9
14	31 28.8	−23 8.7	291 56.1	73 41.3	−12 37.0	94 40.1	− 5 44.0
16	61 28.2	−23 9.0	322 1.0	103 40.5	−12 38.8	124 42.4	− 5 45.1
18	91 27.6	−23 9.3	352 5.9	133 39.6	−12 40.7	154 44.6	− 5 46.1
20	121 27.0	−23 9.6	22 10.9	163 38.8	−12 42.6	184 46.9	− 5 47.2
22	151 26.4	−23 10.0	52 15.8	193 37.9	−12 44.4	214 49.1	− 5 48.3
Δ		−3			−4		11
							−9 −5

UT	MESEC				JUPITER		SATURN	
	$S_\leftmoon$	Δ	$\delta_\leftmoon$	Δ	S_{4}	δ_{4}	S_{5}	δ_{5}
h	° ′		° ′		° ′	° ′	° ′	° ′
0	161 28.7	89	18 13.5	−17	268 6.4	4 10.1	193 49.2	−20 10.9
2	190 24.4	88	18 10.0	−19	298 11.0	4 9.9	223 53.5	−20 11.0
4	219 20.0	88	18 6.1	−22	328 15.5	4 9.8	253 57.8	−20 11.1
6	248 15.7	88	18 1.8	−24	358 20.1	4 9.6	284 2.1	−20 11.2
8	277 11.3	88	17 57.1	−26	28 24.6	4 9.5	314 6.4	−20 11.3
10	306 6.8	88	17 52.0	−28	58 29.2	4 9.4	344 10.7	−20 11.4
12	335 2.4	88	17 46.4	−30	88 33.7	4 9.2	14 15.0	−20 11.5
14	3 57.9	88	17 40.5	−32	118 38.3	4 9.1	44 19.3	−20 11.6
16	32 53.4	88	17 34.1	−34	148 42.9	4 9.0	74 23.7	−20 11.6
18	61 48.9	88	17 27.3	−36	178 47.4	4 8.8	104 28.0	−20 11.7
20	90 44.4	88	17 20.1	−38	208 52.0	4 8.7	134 32.3	−20 11.8
22	119 40.0	88	17 12.5	−40	238 56.5	4 8.6	164 36.6	−20 11.9
Δ					23	−1	22	0

φ	SUNCE		TRAJANJE SUMRAKA		MESEC			
	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 54	14 54	0 57	2 45	5 9	2.8	22 10	1.4
55	8 16	15 31	0 45	2 17	5 36	2.7	21 45	1.6
50	7 50	15 58	0 38	1 59	5 56	2.6	21 26	1.7
45	7 29	16 19	0 34	1 47	6 12	2.5	21 11	1.8
40	7 13	16 35	0 30	1 37	6 25	2.5	20 59	1.9
35	6 59	16 49	0 28	1 31	6 36	2.4	20 48	1.9
30	6 47	17 1	0 26	1 25	6 46	2.4	20 39	2.0
20	6 26	17 22	0 24	1 19	7 3	2.3	20 23	2.1
10	6 8	17 41	0 23	1 15	7 17	2.3	20 9	2.2
0	5 50	17 58	0 22	1 15	7 31	2.2	19 56	2.2
10	5 33	18 15	0 23	1 18	7 44	2.2	19 43	2.3
20	5 14	18 34	0 25	1 24	7 59	2.1	19 29	2.4
30	4 52	18 56	0 27	1 36	8 16	2.1	19 13	2.4
35	4 40	19 9	0 30	1 47	8 25	2.0	19 4	2.5
40	4 25	19 23	0 33	2 2	8 36	2.0	18 53	2.5
45	4 7	19 41	0 37	2 31	8 49	1.9	18 40	2.6
50	3 45	20 3	0 44	: ::	9 5	1.8	18 25	2.7
55	3 16	20 33	0 57	: ::	9 25	1.7	18 5	2.8
60	2 32	21 17	1 40	: ::	9 52	1.6	17 39	3.0
S								

SUNCE				MESEC			
UT	e = T_p − UT	Δ/24	r	Prolaz		Δ/24	$\pi_\leftmoon$	r
h	min s	s	′		h min	min	′	′
00	6 11.5	−1.2	16.3	$T_{\overline{m}}$	13 44	2.2	56.9	15.5
12	5 57.3	$T_{\overline{m}_\odot}$	11 h 54.0 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	′	°	
♀	9 5	.1	142	−3.9	♃	6 7	.0	187	−1.6
♂	7 42	.1	163	1.1	♄	11 3	.0	112	.7

UT	SUNCE		PROLEĆ. TAČKA	VENERA		MARS	
	$S_\odot$	$\delta_\odot$	S_Υ	S_φ	δ_φ	S_σ	δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	181 25.8	−23 10.3	82 20.7	223 37.0	−12 46.3	244 51.4	− 5 49.4
2	211 25.2	−23 10.6	112 25.6	253 36.2	−12 48.1	274 53.6	− 5 50.5
4	241 24.6	−23 10.9	142 30.6	283 35.3	−12 50.0	304 55.9	− 5 51.6
6	271 24.0	−23 11.2	172 35.5	313 34.5	−12 51.8	334 58.1	− 5 52.7
8	301 23.4	−23 11.5	202 40.4	343 33.6	−12 53.7	5 .3	− 5 53.8
10	331 22.8	−23 11.9	232 45.4	13 32.7	−12 55.5	35 2.6	− 5 54.8
12	1 22.2	−23 12.2	262 50.3	43 31.8	−12 57.4	65 4.8	− 5 55.9
14	31 21.6	−23 12.5	292 55.2	73 31.0	−12 59.2	95 7.1	− 5 57.0
16	61 21.0	−23 12.7	323 .1	103 30.1	−13 1.1	125 9.3	− 5 58.1
18	91 20.4	−23 13.0	353 5.1	133 29.2	−13 2.9	155 11.6	− 5 59.2
20	121 19.8	−23 13.3	23 10.0	163 28.3	−13 4.7	185 13.8	− 6 .3
22	151 19.2	−23 13.6	53 14.9	193 27.5	−13 6.6	215 16.1	− 6 1.4
Δ		−3			−4		11
							−9 −5

UT	MESEC				JUPITER		SATURN	
	$S_\leftmoon$	Δ	$\delta_\leftmoon$	Δ	S_{4}	δ_{4}	S_{5}	δ_{5}
h	° ′		° ′		° ′	° ′	° ′	° ′
0	148 35.5	88	17 4.5	−42	269 1.1	4 8.4	194 40.9	−20 12.0
2	177 31.1	88	16 56.1	−44	299 5.7	4 8.3	224 45.2	−20 12.1
4	206 26.7	88	16 47.3	−46	329 10.2	4 8.2	254 49.5	−20 12.2
6	235 22.3	88	16 38.1	−48	359 14.8	4 8.0	284 53.9	−20 12.3
8	264 17.9	88	16 28.6	−50	29 19.4	4 7.9	314 58.2	−20 12.4
10	293 13.6	89	16 18.6	−52	59 23.9	4 7.8	345 2.5	−20 12.5
12	322 9.3	89	16 8.2	−54	89 28.5	4 7.7	15 6.8	−20 12.5
14	351 5.1	89	15 57.5	−56	119 33.1	4 7.5	45 11.1	−20 12.6
16	20 .9	89	15 46.4	−57	149 37.7	4 7.4	75 15.4	−20 12.7
18	48 56.8	90	15 34.9	−59	179 42.2	4 7.3	105 19.7	−20 12.8
20	77 52.7	90	15 23.0	−61	209 46.8	4 7.1	135 24.1	−20 12.9
22	106 48.7	90	15 10.8	−63	239 51.4	4 7.0	165 28.4	−20 13.0
Δ					23	−1	22	0

φ	SUNCE		TRAJANJE SUMRAKA		MESEC			
	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 56	14 53	0 57	2 45	6 16	3.1	22 44	1.2
55	8 17	15 31	0 45	2 17	6 40	2.9	22 23	1.4
50	7 51	15 58	0 38	1 59	6 59	2.8	22 7	1.5
45	7 30	16 19	0 34	1 47	7 13	2.7	21 55	1.6
40	7 14	16 35	0 31	1 37	7 25	2.6	21 44	1.7
35	6 60	16 49	0 28	1 31	7 35	2.5	21 35	1.8
30	6 47	17 2	0 26	1 25	7 43	2.5	21 27	1.9
20	6 26	17 23	0 24	1 19	7 59	2.4	21 13	2.0
10	6 8	17 41	0 23	1 15	8 12	2.3	21 1	2.1
0	5 51	17 58	0 23	1 15	8 24	2.2	20 50	2.2
10	5 33	18 16	0 23	1 18	8 37	2.1	20 38	2.3
20	5 15	18 34	0 25	1 24	8 50	2.0	20 26	2.4
30	4 53	18 56	0 27	1 36	9 5	1.9	20 12	2.5
35	4 40	19 9	0 30	1 47	9 14	1.9	20 4	2.6
40	4 25	19 24	0 33	2 3	9 24	1.8	19 54	2.7
45	4 7	19 42	0 37	2 32	9 35	1.7	19 43	2.8
50	3 45	20 4	0 44	: ::	9 49	1.6	19 30	2.9
55	3 15	20 34	0 58	: ::	10 7	1.5	19 13	3.0
60	2 32	21 18	1 41	: ::	10 31	1.3	18 50	3.2
S								

SUNCE				MESEC			
UT	e = T_p − UT	Δ/24	r	Prolaz		Δ/24	$\pi_\leftmoon$	r
h	min s	s	′		h min	min	′	′
00	5 43.2	−1.2	16.3	$T_{\overline{m}}$	14 37	2.2	57.4	15.6
12	5 28.8	$T_{\overline{m}_\odot}$	11 h 54.5 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	′	°	
♀	9 6	.1	141	−3.9	♃	6 3	.0	187	−1.6
♂	7 40	.1	163	1.1	♄	10 60	.0	112	.7

UT	SUNCE		PROLEĆ. TAČKA	VENERA		MARS	
	$S_\odot$	$\delta_\odot$	S_Υ	S_φ	δ_φ	S_σ	δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	181 18.6	-23 13.9	83 19.9	223 26.6	-13 8.4	245 18.3	- 6 2.4
2	211 18.0	-23 14.2	113 24.8	253 25.7	-13 10.2	275 20.6	- 6 3.5
4	241 17.4	-23 14.5	143 29.7	283 24.8	-13 12.1	305 22.8	- 6 4.6
6	271 16.8	-23 14.7	173 34.6	313 23.9	-13 13.9	335 25.0	- 6 5.7
8	301 16.2	-23 15.0	203 39.6	343 23.0	-13 15.7	5 27.3	- 6 6.8
10	331 15.6	-23 15.3	233 44.5	13 22.1	-13 17.6	35 29.5	- 6 7.8
12	1 15.0	-23 15.5	263 49.4	43 21.3	-13 19.4	65 31.8	- 6 8.9
14	31 14.4	-23 15.8	293 54.3	73 20.4	-13 21.2	95 34.0	- 6 10.0
16	61 13.8	-23 16.0	323 59.3	103 19.5	-13 23.0	125 36.3	- 6 11.1
18	91 13.2	-23 16.3	354 4.2	133 18.6	-13 24.8	155 38.5	- 6 12.2
20	121 12.6	-23 16.5	24 9.1	163 17.7	-13 26.7	185 40.8	- 6 13.2
22	151 12.0	-23 16.8	54 14.1	193 16.7	-13 28.5	215 43.0	- 6 14.3
Δ	-3	-1		-4	-9	11	-5

UT	MESEC				JUPITER		SATURN	
	$S_\leftmoon$	Δ	$\delta_\leftmoon$	Δ	S_{4}	δ_{4}	S_η	δ_η
h	° ′		° ′		° ′	° ′	° ′	° ′
0	135 44.7	91	14 58.2	-65	269 56.0	4 6.9	195 32.7	-20 13.1
2	164 40.8	91	14 45.2	-67	300 .5	4 6.8	225 37.0	-20 13.2
4	193 37.0	91	14 31.9	-68	330 5.1	4 6.6	255 41.3	-20 13.3
6	222 33.2	92	14 18.3	-70	0 9.7	4 6.5	285 45.6	-20 13.3
8	251 29.5	92	14 4.3	-72	30 14.3	4 6.4	315 49.9	-20 13.4
10	280 25.9	92	13 50.0	-73	60 18.9	4 6.3	345 54.3	-20 13.5
12	309 22.3	93	13 35.3	-75	90 23.4	4 6.1	15 58.6	-20 13.6
14	338 18.8	93	13 20.3	-76	120 28.0	4 6.0	46 2.9	-20 13.7
16	7 15.4	93	13 5.0	-78	150 32.6	4 5.9	76 7.2	-20 13.8
18	36 12.1	94	12 49.4	-80	180 37.2	4 5.8	106 11.5	-20 13.9
20	65 8.9	94	12 33.5	-81	210 41.8	4 5.6	136 15.8	-20 14.0
22	94 5.7	94	12 17.3	-83	240 46.4	4 5.5	166 20.2	-20 14.0
Δ					23	-1	22	0

φ	SUNCE		TRAJANJE SUMRAKA		MESEC			
	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	14 53	0 57	2 45	7 31	3.3	23 12	1.0
55	8 18	15 31	0 45	2 17	7 51	3.1	22 56	1.2
50	7 52	15 58	0 38	1 59	8 6	2.9	22 44	1.4
45	7 31	16 19	0 34	1 47	8 18	2.8	22 34	1.5
40	7 14	16 36	0 31	1 38	8 27	2.7	22 26	1.6
35	7 0	16 50	0 28	1 31	8 36	2.6	22 19	1.7
30	6 48	17 2	0 26	1 25	8 43	2.5	22 12	1.8
20	6 27	17 23	0 24	1 19	8 56	2.4	22 1	1.9
10	6 9	17 41	0 23	1 15	9 7	2.3	21 52	2.0
0	5 51	17 59	0 23	1 15	9 17	2.2	21 42	2.2
10	5 34	18 16	0 23	1 18	9 28	2.1	21 33	2.3
20	5 15	18 35	0 25	1 24	9 39	2.0	21 23	2.4
30	4 53	18 57	0 27	1 36	9 51	1.8	21 12	2.6
35	4 40	19 10	0 30	1 47	9 59	1.7	21 6	2.6
40	4 25	19 25	0 33	2 3	10 7	1.7	20 58	2.7
45	4 7	19 43	0 37	2 32	10 17	1.6	20 49	2.8
50	3 45	20 5	0 44	: ::	10 28	1.4	20 39	3.0
55	3 15	20 35	0 58	: ::	10 43	1.3	20 25	3.2
60	2 31	21 19	1 43	: ::	11 2	1.0	20 8	3.4
S								

SUNCE				MESEC			
UT	e = T_p − UT	Δ/24	r	Prolaz	Δ/24	$\pi_\leftmoon$	r
h	min s	s	′	h min	min	′	′
00	5 14.5	-1.2	16.3	$T_{\overline{m}}$ 15 30	2.2	57.8	15.8
12	5 .1	$T_{\overline{m}_\odot}$ 11 h 55.0 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	′	°	
♀	9 6	.1	140	-3.9	♃	5 59	.0	187	-1.6
♂	7 38	.1	162	1.1	♄	10 56	.0	112	.7

UT	SUNCE		PROLEĆ. TAČKA	VENERA		MARS	
	$S_\odot$	$\delta_\odot$	S_Υ	S_φ	δ_φ	S_σ	δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	181 11.4	-23 17.0	84 19.0	223 15.8	-13 30.3	245 45.3	- 6 15.4
2	211 10.8	-23 17.3	114 23.9	253 14.9	-13 32.1	275 47.5	- 6 16.5
4	241 10.2	-23 17.5	144 28.8	283 14.0	-13 33.9	305 49.8	- 6 17.5
6	271 9.6	-23 17.7	174 33.8	313 13.1	-13 35.7	335 52.0	- 6 18.6
8	301 9.0	-23 18.0	204 38.7	343 12.2	-13 37.5	5 54.3	- 6 19.7
10	331 8.4	-23 18.2	234 43.6	13 11.3	-13 39.3	35 56.5	- 6 20.8
12	1 7.8	-23 18.4	264 48.6	43 10.4	-13 41.1	65 58.8	- 6 21.9
14	31 7.2	-23 18.7	294 53.5	73 9.4	-13 43.0	96 1.0	- 6 22.9
16	61 6.6	-23 18.9	324 58.4	103 8.5	-13 44.8	126 3.3	- 6 24.0
18	91 6.0	-23 19.1	355 3.3	133 7.6	-13 46.6	156 5.5	- 6 25.1
20	121 5.3	-23 19.3	25 8.3	163 6.7	-13 48.3	186 7.8	- 6 26.1
22	151 4.7	-23 19.5	55 13.2	193 5.7	-13 50.1	216 10.0	- 6 27.2
Δ	-3	-1		-5	-9	11	-5

UT	MESEC				JUPITER		SATURN	
	$S_\leftmoon$	Δ	$\delta_\leftmoon$	Δ	S_{4}	δ_{4}	S_η	δ_η
h	° ′		° ′		° ′	° ′	° ′	° ′
0	123 2.6	95	12 .7	-84	270 51.0	4 5.4	196 24.5	-20 14.1
2	151 59.6	95	11 43.9	-85	300 55.6	4 5.3	226 28.8	-20 14.2
4	180 56.6	96	11 26.9	-87	331 .2	4 5.2	256 33.1	-20 14.3
6	209 53.7	96	11 9.5	-88	1 4.8	4 5.0	286 37.4	-20 14.4
8	238 50.9	96	10 51.9	-89	31 9.3	4 4.9	316 41.7	-20 14.5
10	267 48.2	97	10 34.0	-91	61 13.9	4 4.8	346 46.1	-20 14.6
12	296 45.5	97	10 15.8	-92	91 18.5	4 4.7	16 50.4	-20 14.7
14	325 42.9	97	9 57.4	-93	121 23.1	4 4.6	46 54.7	-20 14.8
16	354 40.4	98	9 38.8	-94	151 27.7	4 4.5	76 59.0	-20 14.8
18	23 37.9	98	9 19.9	-96	181 32.3	4 4.3	107 3.3	-20 14.9
20	52 35.5	98	9 .8	-97	211 36.9	4 4.2	137 7.6	-20 15.0
22	81 33.2	99	8 41.5	-98	241 41.5	4 4.1	167 12.0	-20 15.1
Δ					23	-1	22	0

φ	SUNCE		TRAJANJE SUMRAKA		MESEC			
	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	14 53	0 57	2 46	8 51	3.5	23 35	.8
55	8 19	15 32	0 45	2 17	9 5	3.2	23 25	1.1
50	7 52	15 58	0 38	1 59	9 16	3.0	23 16	1.3
45	7 32	16 19	0 34	1 47	9 25	2.9	23 10	1.4
40	7 15	16 36	0 31	1 38	9 32	2.8	23 4	1.5
35	7 1	16 50	0 28	1 31	9 39	2.7	22 59	1.6
30	6 49	17 2	0 26	1 25	9 44	2.6	22 55	1.7
20	6 28	17 23	0 24	1 19	9 54	2.4	22 47	1.9
10	6 9	17 42	0 23	1 15	10 2	2.3	22 41	2.0
0	5 52	17 59	0 23	1 15	10 10	2.2	22 34	2.1
10	5 34	18 17	0 23	1 18	10 17	2.0	22 28	2.3
20	5 15	18 36	0 25	1 24	10 26	1.9	22 21	2.4
30	4 53	18 58	0 27	1 36	10 35	1.7	22 13	2.6
35	4 40	19 11	0 30	1 47	10 41	1.7	22 9	2.7
40	4 26	19 26	0 33	2 3	10 47	1.6	22 4	2.8
45	4 8	19 44	0 37	2 33	10 54	1.4	21 58	2.9
50	3 45	20 6	0 45	: ::	11 2	1.3	21 50	3.1
55	3 15	20 36	0 58	: ::	11 13	1.1	21 41	3.2
60	2 31	21 20	1 44	: ::	11 27	.9	21 29	3.5
S								

SUNCE				MESEC			
UT	e = T_p − UT	Δ/24	r	Prolaz	Δ/24	$\pi_\leftmoon$	r
h	min s	s	′	h min	min	′	′
00	4 45.6	-1.2	16.3	$T_{\overline{m}}$ 16 22	2.2	58.2	15.9
12	4 31.1	$T_{\overline{m}_\odot}$ 11 h 55.5 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	′	°	
♀	9 7	.1	139	-3.9	♃	5 56	.0	187	-1.6
♂	7 36	.1	161	1.1	♄	10 53	.0	112	.7

UT	SUNCE		PROLEĆ. TAČKA	VENERA		MARS	
	$S_\odot$	$\delta_\odot$	S_Υ	S_φ	δ_φ	S_σ	δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	181 4.1	-23 19.7	85 18.1	223 4.8	-13 51.9	246 12.3	- 6 28.3
2	211 3.5	-23 19.9	115 23.1	253 3.9	-13 53.7	276 14.5	- 6 29.4
4	241 2.9	-23 20.1	145 28.0	283 2.9	-13 55.5	306 16.8	- 6 30.4
6	271 2.3	-23 20.3	175 32.9	313 2.0	-13 57.3	336 19.0	- 6 31.5
8	301 1.7	-23 20.5	205 37.8	343 1.1	-13 59.1	6 21.3	- 6 32.6
10	331 1.1	-23 20.7	235 42.8	13 .1	-14 .9	36 23.5	- 6 33.6
12	1 .5	-23 20.9	265 47.7	42 59.2	-14 2.7	66 25.8	- 6 34.7
14	30 59.9	-23 21.1	295 52.6	72 58.2	-14 4.4	96 28.1	- 6 35.8
16	60 59.2	-23 21.2	325 57.6	102 57.3	-14 6.2	126 30.3	- 6 36.9
18	90 58.6	-23 21.4	356 2.5	132 56.3	-14 8.0	156 32.6	- 6 37.9
20	120 58.0	-23 21.6	26 7.4	162 55.4	-14 9.8	186 34.8	- 6 39.0
22	150 57.4	-23 21.8	56 12.3	192 54.4	-14 11.5	216 37.1	- 6 40.1
Δ	-3	-1		-5	-9	11	-5

UT	MESEC				JUPITER		SATURN	
	$S_\leftmoon$	Δ	$\delta_\leftmoon$	Δ	S_4	δ_4	S_η	δ_η
h	° ′		° ′		° ′	° ′	° ′	° ′
0	110 30.9	99	8 22.0	-99	271 46.1	4 4.0	197 16.3	-20 15.2
2	139 28.7	99	8 2.2	-100	301 50.7	4 3.9	227 20.6	-20 15.3
4	168 26.5	99	7 42.3	-101	331 55.4	4 3.8	257 24.9	-20 15.4
6	197 24.3	100	7 22.1	-102	1 60.0	4 3.6	287 29.2	-20 15.4
8	226 22.2	100	7 1.8	-102	32 4.6	4 3.5	317 33.5	-20 15.5
10	255 20.2	100	6 41.4	-103	62 9.2	4 3.4	347 37.9	-20 15.6
12	284 18.2	100	6 20.7	-104	92 13.8	4 3.3	17 42.2	-20 15.7
14	313 16.2	100	5 59.9	-105	122 18.4	4 3.2	47 46.5	-20 15.8
16	342 14.3	100	5 38.9	-106	152 23.0	4 3.1	77 50.8	-20 15.9
18	11 12.3	100	5 17.8	-106	182 27.6	4 3.0	107 55.1	-20 16.0
20	40 10.4	101	4 56.6	-107	212 32.2	4 2.9	137 59.5	-20 16.1
22	69 8.6	101	4 35.2	-107	242 36.9	4 2.8	168 3.8	-20 16.1
Δ					23	-1	22	0

φ	SUNCE		TRAJANJE SUMRAKA		MESEC			
	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	14 53	0 58	2 46	10 14	3.5	23 55	1.0
55	8 20	15 32	0 45	2 18	10 22	3.3	23 50	1.2
50	7 53	15 59	0 38	1 59	10 29	3.1	23 46	1.4
45	7 32	16 19	0 34	1 47	10 34	2.9	23 43	1.5
40	7 16	16 36	0 31	1 38	10 39	2.8	23 40	1.6
35	7 2	16 50	0 28	1 31	10 42	2.7	23 38	1.7
30	6 49	17 3	0 26	1 25	10 46	2.6	23 36	1.7
20	6 28	17 24	0 24	1 19	10 51	2.4	23 32	1.9
10	6 10	17 42	0 23	1 15	10 57	2.3	23 29	2.0
0	5 52	17 60	0 23	1 15	11 1	2.1	23 26	2.1
10	5 35	18 17	0 23	1 18	11 6	2.0	23 23	2.3
20	5 16	18 36	0 25	1 24	11 11	1.9	23 19	2.4
30	4 54	18 58	0 27	1 37	11 17	1.7	23 15	2.5
35	4 41	19 11	0 30	1 47	11 20	1.6	23 13	2.6
40	4 26	19 26	0 33	2 3	11 24	1.5	23 10	2.7
45	4 8	19 44	0 37	2 33	11 28	1.4	23 7	2.9
50	3 45	20 7	0 45	: ::	11 34	1.2	23 4	3.0
55	3 16	20 37	0 58	: ::	11 40	1.0	22 59	3.2
60	2 31	21 21	1 45	: ::	11 48	.8	22 53	3.4
S								

SUNCE				MESEC			
UT	e = T_p − UT	Δ/24	r	Prolaz	Δ/24	$\pi_\leftmoon$	r
h	min s	s	′	h min	min	′	′
00	4 16.5	-1.2	16.3	$T_{\overline{m}}$ 17 14	2.1	58.6	16.0
12	4 1.9	$T_{\overline{m}_\odot}$ 11 h 56.0 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	′	°	
♀	9 8	.1	138	-3.9	♃	5 52	.0	186	-1.7
♂	7 35	.1	161	1.1	♄	10 49	.0	112	.7

UT	SUNCE		PROLEĆ. TAČKA	VENERA		MARS	
	$S_\odot$	$\delta_\odot$	S_Υ	S_φ	δ_φ	S_σ	δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	180 56.8	-23 21.9	86 17.3	222 53.5	-14 13.3	246 39.3	- 6 41.1
2	210 56.2	-23 22.1	116 22.2	252 52.5	-14 15.1	276 41.6	- 6 42.2
4	240 55.6	-23 22.2	146 27.1	282 51.6	-14 16.8	306 43.8	- 6 43.3
6	270 55.0	-23 22.4	176 32.1	312 50.6	-14 18.6	336 46.1	- 6 44.3
8	300 54.3	-23 22.6	206 37.0	342 49.6	-14 20.4	6 48.3	- 6 45.4
10	330 53.7	-23 22.7	236 41.9	12 48.7	-14 22.1	36 50.6	- 6 46.5
12	0 53.1	-23 22.9	266 46.8	42 47.7	-14 23.9	66 52.9	- 6 47.5
14	30 52.5	-23 23.0	296 51.8	72 46.7	-14 25.6	96 55.1	- 6 48.6
16	60 51.9	-23 23.1	326 56.7	102 45.7	-14 27.4	126 57.4	- 6 49.6
18	90 51.3	-23 23.3	357 1.6	132 44.8	-14 29.1	156 59.6	- 6 50.7
20	120 50.7	-23 23.4	27 6.5	162 43.8	-14 30.9	187 1.9	- 6 51.8
22	150 50.0	-23 23.5	57 11.5	192 42.8	-14 32.6	217 4.1	- 6 52.8
Δ	-3	-1		-5	-9	11	-5

UT	MESEC				JUPITER		SATURN	
	$S_\leftmoon$	Δ	$\delta_\leftmoon$	Δ	S_4	δ_4	S_η	δ_η
h	° ′		° ′		° ′	° ′	° ′	° ′
0	98 6.7	101	4 13.7	-108	272 41.5	4 2.6	198 8.1	-20 16.2
2	127 4.8	101	3 52.1	-109	302 46.1	4 2.5	228 12.4	-20 16.3
4	156 3.0	101	3 30.4	-109	332 50.7	4 2.4	258 16.7	-20 16.4
6	185 1.1	101	3 8.6	-109	2 55.3	4 2.3	288 21.1	-20 16.5
8	213 59.3	101	2 46.7	-110	32 60.0	4 2.2	318 25.4	-20 16.6
10	242 57.4	101	2 24.7	-110	63 4.6	4 2.1	348 29.7	-20 16.7
12	271 55.5	100	2 2.6	-111	93 9.2	4 2.0	18 34.0	-20 16.7
14	300 53.6	100	1 40.5	-111	123 13.8	4 1.9	48 38.3	-20 16.8
16	329 51.7	100	1 18.4	-111	153 18.4	4 1.8	78 42.7	-20 16.9
18	358 49.7	100	0 56.2	-111	183 23.1	4 1.7	108 47.0	-20 17.0
20	27 47.7	100	0 33.9	-111	213 27.7	4 1.6	138 51.3	-20 17.1
22	56 45.7	100	0 11.6	-5	243 32.3	4 1.5	168 55.6	-20 17.2
Δ					23	-1	22	0

φ	SUNCE		TRAJANJE SUMRAKA		MESEC			
	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	14 53	0 58	2 46	11 38	2.0	. . .	.0
55	8 21	15 32	0 46	2 18	11 41	2.0	. . .	.0
50	7 54	15 59	0 38	1 60	11 43	2.1	. . .	.0
45	7 33	16 20	0 34	1 47	11 44	2.1	. . .	.0
40	7 16	16 37	0 31	1 38	11 46	2.1	. . .	.0
35	7 2	16 51	0 28	1 31	11 47	2.1	. . .	.0
30	6 50	17 3	0 26	1 26	11 48	2.1	. . .	.0
20	6 29	17 24	0 24	1 19	11 50	2.1	. . .	.0
10	6 10	17 43	0 23	1 15	11 51	2.1	. . .	.0
0	5 53	18 0	0 23	1 15	11 53	2.1	. . .	.0
10	5 35	18 18	0 23	1 18	11 54	2.2	. . .	.0
20	5 16	18 37	0 25	1 24	11 56	2.2	. . .	.0
30	4 54	18 59	0 27	1 37	11 58	2.2	. . .	.0
35	4 41	19 12	0 30	1 47	11 59	2.2	. . .	.0
40	4 26	19 27	0 33	2 3	11 60	2.2	. . .	.0
45	4 8	19 45	0 37	2 33	12 1	2.2	. . .	.0
50	3 46	20 7	0 45	: ::	12 3	2.3	. . .	.0
55	3 16	20 37	0 58	: ::	12 5	2.3	. . .	.0
60	2 31	21 22	1 45	: ::	12 8	2.3	. . .	.0
S								

SUNCE				MESEC			
UT	e = T_p − UT	Δ/24	r	Prolaz	Δ/24	$\pi_\leftmoon$	r
h	min s	s	′	h min	min	′	′
00	3 47.2	-1.2	16.3	$T_{\overline{m}}$ 18 5	2.1	58.9	16.1
12	3 32.5	$T_{\overline{m}_\odot}$ 11 h 56.5 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	′	°	
♀	9 9	.1	137	-3.9	♃	5 48	.0	186	-1.7
♂	7 33	.1	160	1.1	♄	10 46	.0	112	.7

19. DECEMBAR 2015. SUBOTA

UT	SUNCE		PROLEĆ. TAČKA	VENERA		MARS	
	$S_\odot$	$\delta_\odot$	S_Υ	S_φ	δ_φ	S_σ	δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	180 49.4	-23 23.7	87 16.4	222 41.8	-14 34.4	247 6.4	- 6 53.9
2	210 48.8	-23 23.8	117 21.3	252 40.9	-14 36.1	277 8.7	- 6 55.0
4	240 48.2	-23 23.9	147 26.3	282 39.9	-14 37.9	307 10.9	- 6 56.0
6	270 47.6	-23 24.0	177 31.2	312 38.9	-14 39.6	337 13.2	- 6 57.1
8	300 47.0	-23 24.1	207 36.1	342 37.9	-14 41.4	7 15.4	- 6 58.1
10	330 46.4	-23 24.2	237 41.0	12 36.9	-14 43.1	37 17.7	- 6 59.2
12	0 45.7	-23 24.4	267 46.0	42 35.9	-14 44.8	67 19.9	- 7 .3
14	30 45.1	-23 24.5	297 50.9	72 34.9	-14 46.6	97 22.2	- 7 1.3
16	60 44.5	-23 24.6	327 55.8	102 33.9	-14 48.3	127 24.5	- 7 2.4
18	90 43.9	-23 24.7	358 .8	132 32.9	-14 50.0	157 26.7	- 7 3.4
20	120 43.3	-23 24.8	28 5.7	162 31.9	-14 51.7	187 29.0	- 7 4.5
22	150 42.7	-23 24.8	58 10.6	192 30.9	-14 53.5	217 31.2	- 7 5.5
Δ	-3	-1		-5	-9	11	-5

UT	MESEC				JUPITER		SATURN	
	$S_\leftmoon$	Δ	$\delta_\leftmoon$	Δ	S_{4}	δ_{4}	S_{5}	δ_{5}
h	° ′		° ′		° ′	° ′	° ′	° ′
0	85 43.6	99	0 10.7	112	273 37.0	4 1.4	198 59.9	-20 17.3
2	114 41.5	99	0 33.0	112	303 41.6	4 1.3	229 4.3	-20 17.3
4	143 39.3	99	0 55.3	112	333 46.2	4 1.2	259 8.6	-20 17.4
6	172 37.0	98	1 17.6	111	3 50.9	4 1.1	289 12.9	-20 17.5
8	201 34.7	98	1 39.9	111	33 55.5	4 1.0	319 17.2	-20 17.6
10	230 32.4	98	2 2.1	111	64 .1	4 .9	349 21.6	-20 17.7
12	259 29.9	97	2 24.4	111	94 4.8	4 .8	19 25.9	-20 17.8
14	288 27.4	97	2 46.6	111	124 9.4	4 .7	49 30.2	-20 17.8
16	317 24.8	97	3 8.7	110	154 14.0	4 .6	79 34.5	-20 17.9
18	346 22.1	96	3 30.8	110	184 18.7	4 .5	109 38.8	-20 18.0
20	15 19.3	96	3 52.8	110	214 23.3	4 .4	139 43.2	-20 18.1
22	44 16.4	95	4 14.7	109	244 28.0	4 .3	169 47.5	-20 18.2
Δ					23	-1	22	0

φ	SUNCE		TRAJANJE SUMRAKA		MESEC			
	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 0	14 53	0 58	2 46	12 27	.8	0 18	3.6
55	8 22	15 32	0 46	2 18	12 30	1.1	0 18	3.3
50	7 55	15 59	0 39	1 60	12 32	1.3	0 18	3.1
45	7 34	16 20	0 34	1 47	12 34	1.4	0 18	3.0
40	7 17	16 37	0 31	1 38	12 36	1.5	0 18	2.8
35	7 3	16 51	0 28	1 31	12 37	1.6	0 18	2.7
30	6 50	17 3	0 26	1 26	12 38	1.7	0 18	2.6
20	6 29	17 25	0 24	1 19	12 40	1.9	0 17	2.4
10	6 11	17 43	0 23	1 15	12 42	2.0	0 17	2.3
0	5 53	18 1	0 23	1 15	12 44	2.2	0 17	2.2
10	5 36	18 18	0 23	1 18	12 46	2.3	0 17	2.0
20	5 17	18 37	0 25	1 24	12 48	2.5	0 17	1.9
30	4 55	18 59	0 27	1 37	12 50	2.6	0 16	1.7
35	4 42	19 12	0 30	1 47	12 52	2.7	0 16	1.6
40	4 27	19 27	0 33	2 3	12 53	2.8	0 16	1.5
45	4 8	19 45	0 37	2 33	12 55	3.0	0 16	1.4
50	3 46	20 8	0 45	: ::	12 57	3.1	0 16	1.2
55	3 16	20 38	0 58	: ::	12 60	3.3	0 16	1.0
60	2 31	21 23	1 46	: ::	13 3	3.6	0 15	.8
S								

UT	SUNCE			MESEC			
	e = T_p − UT	Δ/24	r	Prolaz	Δ/24	$\pi_\leftmoon$	r
h	min s	s	′	h min	min	′	′
00	3 17.7	-1.2	16.3	$T_{\overline{m}}$ 18 56	2.2	59.2	16.1
12	3 2.9	$T_{\overline{m}_\odot}$ 11 h 56.9 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	′	°	
♀	9 10	.1	135	-3.9	♃	5 45	.0	186	-1.7
♂	7 31	.1	160	1.1	♄	10 42	.0	112	.7

20. DECEMBAR NEDELJA

UT	SUNCE		PROLEĆ. TAČKA	VENERA		MARS	
	$S_\odot$	$\delta_\odot$	S_Υ	S_φ	δ_φ	S_σ	δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	180 42.0	-23 24.9	88 15.5	222 29.9	-14 55.2	247 33.5	- 7 6.6
2	210 41.4	-23 25.0	118 20.5	252 28.9	-14 56.9	277 35.8	- 7 7.7
4	240 40.8	-23 25.1	148 25.4	282 27.9	-14 58.6	307 38.0	- 7 8.7
6	270 40.2	-23 25.2	178 30.3	312 26.9	-15 .3	337 40.3	- 7 9.8
8	300 39.6	-23 25.3	208 35.3	342 25.9	-15 2.0	7 42.5	- 7 10.8
10	330 39.0	-23 25.3	238 40.2	12 24.8	-15 3.8	37 44.8	- 7 11.9
12	0 38.3	-23 25.4	268 45.1	42 23.8	-15 5.5	67 47.1	- 7 12.9
14	30 37.7	-23 25.5	298 50.0	72 22.8	-15 7.2	97 49.3	- 7 14.0
16	60 37.1	-23 25.5	328 55.0	102 21.8	-15 8.9	127 51.6	- 7 15.0
18	90 36.5	-23 25.6	358 59.9	132 20.7	-15 10.6	157 53.8	- 7 16.1
20	120 35.9	-23 25.6	29 4.8	162 19.7	-15 12.3	187 56.1	- 7 17.1
22	150 35.2	-23 25.7	59 9.8	192 18.7	-15 14.0	217 58.4	- 7 18.2
Δ	-3	0		-5	-9	11	-5

UT	MESEC				JUPITER		SATURN	
	$S_\leftmoon$	Δ	$\delta_\leftmoon$	Δ	S_{4}	δ_{4}	S_{5}	δ_{5}
h	° ′		° ′		° ′	° ′	° ′	° ′
0	73 13.4	95	4 36.6	109	274 32.6	4 .2	199 51.8	-20 18.3
2	102 10.3	94	4 58.3	108	304 37.3	4 .1	229 56.1	-20 18.4
4	131 7.2	93	5 20.0	108	334 41.9	3 60.0	260 .5	-20 18.4
6	160 3.8	93	5 41.5	107	4 46.6	3 59.9	290 4.8	-20 18.5
8	189 .4	92	6 2.9	106	34 51.2	3 59.8	320 9.1	-20 18.6
10	217 56.9	92	6 24.2	106	64 55.9	3 59.7	350 13.4	-20 18.7
12	246 53.2	91	6 45.4	105	95 .5	3 59.6	20 17.8	-20 18.8
14	275 49.4	90	7 6.4	104	125 5.2	3 59.5	50 22.1	-20 18.9
16	304 45.4	90	7 27.2	103	155 9.8	3 59.4	80 26.4	-20 18.9
18	333 41.4	89	7 47.8	102	185 14.5	3 59.3	110 30.7	-20 19.0
20	2 37.2	88	8 8.3	101	215 19.1	3 59.2	140 35.0	-20 19.1
22	31 32.8	88	8 28.6	100	245 23.8	3 59.1	170 39.4	-20 19.2
Δ					23	0	22	0

φ	SUNCE		TRAJANJE SUMRAKA		MESEC			
	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 1	14 54	0 58	2 46	12 47	1.0	1 44	3.6
55	8 22	15 33	0 46	2 18	12 56	1.2	1 38	3.3
50	7 55	15 60	0 39	1 60	13 2	1.4	1 33	3.1
45	7 34	16 21	0 34	1 47	13 8	1.5	1 29	3.0
40	7 18	16 37	0 31	1 38	13 12	1.6	1 26	2.9
35	7 3	16 52	0 28	1 31	13 16	1.7	1 23	2.7
30	6 51	17 4	0 26	1 26	13 20	1.8	1 20	2.6
20	6 30	17 25	0 24	1 19	13 26	2.0	1 16	2.5
10	6 11	17 44	0 23	1 15	13 31	2.1	1 12	2.3
0	5 54	18 1	0 23	1 15	13 36	2.2	1 9	2.2
10	5 36	18 19	0 23	1 18	13 42	2.4	1 5	2.1
20	5 17	18 38	0 25	1 24	13 47	2.5	1 2	1.9
30	4 55	18 60	0 27	1 37	13 54	2.7	0 57	1.8
35	4 42	19 13	0 30	1 47	13 57	2.8	0 55	1.7
40	4 27	19 28	0 33	2 3	14 2	2.9	0 52	1.6
45	4 9	19 46	0 37	2 33	14 7	3.0	0 49	1.4
50	3 46	20 9	0 45	: ::	14 12	3.1	0 45	1.3
55	3 16	20 39	0 58	: ::	14 20	3.3	0 40	1.1
60	2 32	21 23	1 46	: ::	14 29	3.6	0 35	.9
S								

UT	SUNCE			MESEC			
	e = T_p − UT	Δ/24	r	Prolaz	Δ/24	$\pi_\leftmoon$	r
h	min s	s	′	h min	min	′	′
00	2 48.2	-1.2	16.3	$T_{\overline{m}}$ 19 49	2.2	59.4	16.2
12	2 33.3	$T_{\overline{m}_\odot}$ 11 h 57.4 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	′	°	
♀	9 10	.1	134	-3.8	♃	5 41	.0	186	-1.7
♂	7 29	.1	159	1.1	♄	10 39	.0	112	.7

UT	SUNCE		PROLEĆ. TAČKA	VENERA		MARS	
	$S_\odot$	$\delta_\odot$	S_Υ	S_φ	δ_φ	S_σ	δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	180 34.6	-23 25.7	89 14.7	222 17.7	-15 15.7	248 .6	- 7 19.2
2	210 34.0	-23 25.8	119 19.6	252 16.6	-15 17.4	278 2.9	- 7 20.3
4	240 33.4	-23 25.8	149 24.5	282 15.6	-15 19.1	308 5.2	- 7 21.3
6	270 32.8	-23 25.9	179 29.5	312 14.5	-15 20.7	338 7.4	- 7 22.4
8	300 32.1	-23 25.9	209 34.4	342 13.5	-15 22.4	8 9.7	- 7 23.4
10	330 31.5	-23 25.9	239 39.3	12 12.5	-15 24.1	38 11.9	- 7 24.5
12	0 30.9	-23 26.0	269 44.3	42 11.4	-15 25.8	68 14.2	- 7 25.5
14	30 30.3	-23 26.0	299 49.2	72 10.4	-15 27.5	98 16.5	- 7 26.6
16	60 29.7	-23 26.0	329 54.1	102 9.3	-15 29.1	128 18.7	- 7 27.6
18	90 29.0	-23 26.0	359 59.0	132 8.3	-15 30.8	158 21.0	- 7 28.7
20	120 28.4	-23 26.0	30 4.0	162 7.2	-15 32.5	188 23.3	- 7 29.7
22	150 27.8	-23 26.1	60 8.9	192 6.2	-15 34.2	218 25.5	- 7 30.8
Δ	-3	0		-5	-8	11	-5

UT	MESEC				JUPITER		SATURN	
	$S_\leftmoon$	Δ	$\delta_\leftmoon$	Δ	$S_{\mathrm{♃}}$	$\delta_{\mathrm{♃}}$	$S_{\mathrm{♄}}$	$\delta_{\mathrm{♄}}$
h	° ′		° ′		° ′	° ′	° ′	° ′
0	60 28.3	87	8 48.7	99	275 28.4	3 59.0	200 43.7	-20 19.3
2	89 23.7	86	9 8.6	98	305 33.1	3 58.9	230 48.0	-20 19.4
4	118 18.9	85	9 28.3	97	335 37.7	3 58.8	260 52.3	-20 19.4
6	147 14.0	85	9 47.7	96	5 42.4	3 58.8	290 56.7	-20 19.5
8	176 9.0	84	10 6.9	95	35 47.1	3 58.7	321 1.0	-20 19.6
10	205 3.7	83	10 25.9	94	65 51.7	3 58.6	351 5.3	-20 19.7
12	233 58.4	82	10 44.6	92	95 56.4	3 58.5	21 9.7	-20 19.8
14	262 52.8	82	11 3.1	91	126 1.1	3 58.4	51 14.0	-20 19.9
16	291 47.2	81	11 21.3	90	156 5.7	3 58.3	81 18.3	-20 19.9
18	320 41.3	80	11 39.2	88	186 10.4	3 58.2	111 22.6	-20 20.0
20	349 35.4	79	11 56.8	87	216 15.1	3 58.1	141 27.0	-20 20.1
22	18 29.2	79	12 14.2	85	246 19.7	3 58.1	171 31.3	-20 20.2
Δ					23	0	22	0

φ	SUNCE		TRAJANJE SUMRAKA		MESEC			
	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 2	14 54	0 58	2 46	13 10	1.1	3 10	3.5
55	8 23	15 33	0 46	2 18	13 24	1.4	2 58	3.3
50	7 56	16 0	0 39	1 60	13 35	1.5	2 48	3.1
45	7 35	16 21	0 34	1 47	13 44	1.7	2 41	3.0
40	7 18	16 38	0 31	1 38	13 51	1.8	2 34	2.9
35	7 4	16 52	0 28	1 31	13 58	1.9	2 29	2.8
30	6 51	17 4	0 26	1 26	14 3	1.9	2 24	2.7
20	6 30	17 26	0 24	1 19	14 13	2.1	2 16	2.5
10	6 12	17 44	0 23	1 15	14 22	2.2	2 9	2.4
0	5 54	18 2	0 23	1 15	14 30	2.3	2 2	2.3
10	5 37	18 19	0 23	1 18	14 38	2.4	1 55	2.2
20	5 18	18 38	0 25	1 24	14 47	2.5	1 48	2.0
30	4 55	19 0	0 27	1 37	14 58	2.7	1 40	1.9
35	4 42	19 13	0 30	1 47	15 3	2.7	1 35	1.8
40	4 27	19 29	0 33	2 3	15 10	2.8	1 30	1.7
45	4 9	19 47	0 37	2 33	15 18	2.9	1 24	1.6
50	3 47	20 9	0 45	: ::	15 28	3.1	1 16	1.4
55	3 17	20 39	0 58	: ::	15 40	3.2	1 7	1.3
60	2 32	21 24	1 47	: ::	15 55	3.5	0 56	1.0
S								

SUNCE				MESEC			
UT	e = T_p − UT	Δ/24	r	Prolaz		Δ/24	$\pi_\leftmoon$	r
h	min s	s	′		h min	min	′	′
00	2 18.5	-1.2	16.3	$T_{\overline{m}}$	20 43	2.3	59.5	16.2
12	2 3.6	$T_{\overline{m}_\odot}$	11 h 57.9 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	′	°	
♀	9 11	.1	133	-3.8	♄	5 37	.0	186	-1.7
♂	7 27	.1	159	1.1	♃	10 36	.0	111	.7

UT	SUNCE		PROLEĆ. TAČKA	VENERA		MARS	
	$S_\odot$	$\delta_\odot$	S_Υ	S_φ	δ_φ	S_σ	δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	180 27.2	-23 26.1	90 13.8	222 5.1	-15 35.8	248 27.8	- 7 31.8
2	210 26.6	-23 26.1	120 18.8	252 4.0	-15 37.5	278 30.1	- 7 32.9
4	240 25.9	-23 26.1	150 23.7	282 3.0	-15 39.2	308 32.3	- 7 33.9
6	270 25.3	-23 26.1	180 28.6	312 1.9	-15 40.8	338 34.6	- 7 34.9
8	300 24.7	-23 26.1	210 33.5	342 .9	-15 42.5	8 36.9	- 7 36.0
10	330 24.1	-23 26.1	240 38.5	11 59.8	-15 44.1	38 39.1	- 7 37.0
12	0 23.5	-23 26.1	270 43.4	41 58.7	-15 45.8	68 41.4	- 7 38.1
14	30 22.8	-23 26.0	300 48.3	71 57.6	-15 47.4	98 43.7	- 7 39.1
16	60 22.2	-23 26.0	330 53.2	101 56.6	-15 49.1	128 45.9	- 7 40.2
18	90 21.6	-23 26.0	0 58.2	131 55.5	-15 50.7	158 48.2	- 7 41.2
20	120 21.0	-23 26.0	31 3.1	161 54.4	-15 52.4	188 50.5	- 7 42.2
22	150 20.4	-23 26.0	61 8.0	191 53.3	-15 54.0	218 52.7	- 7 43.3
Δ	-3	0		-5	-8	11	-5

UT	MESEC				JUPITER		SATURN	
	$S_\leftmoon$	Δ	$\delta_\leftmoon$	Δ	$S_{\mathrm{♃}}$	$\delta_{\mathrm{♃}}$	$S_{\mathrm{♄}}$	$\delta_{\mathrm{♄}}$
h	° ′		° ′		° ′	° ′	° ′	° ′
0	47 23.0	78	12 31.2	84	276 24.4	3 58.0	201 35.6	-20 20.3
2	76 16.5	77	12 47.9	82	306 29.1	3 57.9	231 39.9	-20 20.4
4	105 10.0	76	13 4.3	80	336 33.8	3 57.8	261 44.3	-20 20.4
6	134 3.2	76	13 20.4	79	6 38.4	3 57.7	291 48.6	-20 20.5
8	162 56.4	75	13 36.1	77	36 43.1	3 57.6	321 52.9	-20 20.6
10	191 49.4	74	13 51.5	75	66 47.8	3 57.5	351 57.2	-20 20.7
12	220 42.2	74	14 6.5	73	96 52.5	3 57.5	22 1.6	-20 20.8
14	249 35.0	73	14 21.1	71	126 57.1	3 57.4	52 5.9	-20 20.8
16	278 27.6	72	14 35.4	70	157 1.8	3 57.3	82 10.2	-20 20.9
18	307 20.0	72	14 49.4	68	187 6.5	3 57.2	112 14.6	-20 21.0
20	336 12.4	71	15 2.9	66	217 11.2	3 57.1	142 18.9	-20 21.1
22	5 4.6	71	15 16.0	64	247 15.9	3 57.1	172 23.2	-20 21.2
Δ					23	0	22	0

φ	SUNCE		TRAJANJE SUMRAKA		MESEC			
	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 2	14 55	0 58	2 46	13 37	1.4	4 35	3.4
55	8 23	15 33	0 46	2 18	13 57	1.6	4 17	3.2
50	7 56	16 1	0 39	1 60	14 12	1.8	4 3	3.0
45	7 35	16 21	0 34	1 47	14 24	1.9	3 52	2.9
40	7 19	16 38	0 31	1 38	14 34	2.0	3 43	2.8
35	7 4	16 53	0 28	1 31	14 43	2.0	3 35	2.7
30	6 52	17 5	0 26	1 26	14 50	2.1	3 28	2.7
20	6 31	17 26	0 24	1 19	15 3	2.2	3 16	2.5
10	6 12	17 45	0 23	1 15	15 15	2.3	3 6	2.4
0	5 55	18 2	0 23	1 15	15 26	2.4	2 56	2.3
10	5 37	18 20	0 23	1 18	15 36	2.4	2 47	2.2
20	5 18	18 39	0 25	1 24	15 48	2.5	2 36	2.1
30	4 56	19 1	0 27	1 37	16 2	2.6	2 25	2.0
35	4 43	19 14	0 30	1 47	16 9	2.7	2 18	1.9
40	4 28	19 29	0 33	2 3	16 18	2.8	2 10	1.9
45	4 10	19 47	0 37	2 33	16 29	2.8	2 2	1.8
50	3 47	20 10	0 45	: ::	16 41	2.9	1 51	1.6
55	3 17	20 40	0 58	: ::	16 58	3.1	1 38	1.5
60	2 32	21 25	1 47	: ::	17 19	3.3	1 20	1.3
S								

SUNCE				MESEC			
UT	e = T_p − UT	Δ/24	r	Prolaz		Δ/24	$\pi_\leftmoon$	r
h	min s	s	′		h min	min	′	′
00	1 48.7	-1.2	16.3	$T_{\overline{m}}$	21 39	2.4	59.5	16.2
12	1 33.9	$T_{\overline{m}_\odot}$	11 h 58.4 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	′	°	
♀	9 12	.1	132	-3.8	♄	5 34	.0	186	-1.7
♂	7 26	.1	158	1.0	♃	10 32	.0	111	.7

UT	SUNCE		PROLEĆ. TAČKA	VENERA		MARS	
	$S_\odot$	$\delta_\odot$	S_Υ	S_φ	δ_φ	S_σ	δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	180 19.7	-23 25.9	91 13.0	221 52.3	-15 55.7	248 55.0	- 7 44.3
2	210 19.1	-23 25.9	121 17.9	251 51.2	-15 57.3	278 57.3	- 7 45.3
4	240 18.5	-23 25.9	151 22.8	281 50.1	-15 58.9	308 59.5	- 7 46.4
6	270 17.9	-23 25.8	181 27.7	311 49.0	-16 .6	339 1.8	- 7 47.4
8	300 17.3	-23 25.8	211 32.7	341 47.9	-16 2.2	9 4.1	- 7 48.5
10	330 16.6	-23 25.7	241 37.6	11 46.8	-16 3.8	39 6.3	- 7 49.5
12	0 16.0	-23 25.7	271 42.5	41 45.7	-16 5.4	69 8.6	- 7 50.5
14	30 15.4	-23 25.6	301 47.5	71 44.6	-16 7.1	99 10.9	- 7 51.6
16	60 14.8	-23 25.6	331 52.4	101 43.5	-16 8.7	129 13.1	- 7 52.6
18	90 14.2	-23 25.5	1 57.3	131 42.4	-16 10.3	159 15.4	- 7 53.6
20	120 13.5	-23 25.5	32 2.2	161 41.3	-16 11.9	189 17.7	- 7 54.7
22	150 12.9	-23 25.4	62 7.2	191 40.2	-16 13.5	219 19.9	- 7 55.7
Δ	-3	0		-5	-8	11	-5

UT	MESEC				JUPITER		SATURN	
	$S_\leftmoon$	Δ	$\delta_\leftmoon$	Δ	S_{4}	δ_{4}	S_{5}	δ_{5}
h	° ′		° ′		° ′	° ′	° ′	° ′
0	33 56.7	70	15 28.8	62	277 20.5	3 57.0	202 27.5	-20 21.3
2	62 48.7	70	15 41.1	60	307 25.2	3 56.9	232 31.9	-20 21.3
4	91 40.6	69	15 53.1	58	337 29.9	3 56.8	262 36.2	-20 21.4
6	120 32.4	69	16 4.6	56	7 34.6	3 56.7	292 40.5	-20 21.5
8	149 24.2	68	16 15.7	53	37 39.3	3 56.7	322 44.9	-20 21.6
10	178 15.8	68	16 26.4	51	67 44.0	3 56.6	352 49.2	-20 21.7
12	207 7.3	67	16 36.7	49	97 48.7	3 56.5	22 53.5	-20 21.7
14	235 58.8	67	16 46.5	47	127 53.4	3 56.4	52 57.9	-20 21.8
16	264 50.2	67	16 55.8	45	157 58.1	3 56.4	83 2.2	-20 21.9
18	293 41.6	67	17 4.8	42	188 2.8	3 56.3	113 6.5	-20 22.0
20	322 32.9	66	17 13.3	40	218 7.5	3 56.2	143 10.8	-20 22.1
22	351 24.2	66	17 21.3	38	248 12.2	3 56.1	173 15.2	-20 22.1
Δ					23	0	22	0

φ	SUNCE		TRAJANJE SUMRAKA		MESEC			
	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	14 12	1.8	5 56	3.1
55	8 24	15 34	0 46	2 18	14 36	2.0	5 33	2.9
50	7 57	16 1	0 39	1 60	14 55	2.0	5 15	2.8
45	7 36	16 22	0 34	1 47	15 9	2.1	5 1	2.7
40	7 19	16 39	0 31	1 38	15 21	2.2	4 50	2.7
35	7 5	16 53	0 28	1 31	15 31	2.2	4 40	2.6
30	6 52	17 5	0 26	1 26	15 40	2.2	4 32	2.6
20	6 31	17 27	0 24	1 19	15 56	2.3	4 17	2.5
10	6 13	17 45	0 23	1 15	16 9	2.3	4 4	2.4
0	5 55	18 3	0 23	1 15	16 22	2.4	3 52	2.4
10	5 38	18 20	0 23	1 18	16 35	2.4	3 40	2.3
20	5 19	18 39	0 25	1 24	16 49	2.5	3 28	2.2
30	4 56	19 1	0 27	1 37	17 5	2.5	3 13	2.2
35	4 43	19 14	0 30	1 47	17 14	2.6	3 5	2.1
40	4 28	19 29	0 33	2 3	17 24	2.6	2 55	2.1
45	4 10	19 48	0 37	2 33	17 37	2.6	2 44	2.0
50	3 48	20 10	0 45	: ::	17 52	2.7	2 30	1.9
55	3 18	20 40	0 58	: ::	18 11	2.8	2 13	1.8
60	2 33	21 25	1 46	: ::	18 37	2.9	1 51	1.6
S								

SUNCE				MESEC			
UT	e = T_p − UT	Δ/24	r	Prolaz	Δ/24	$\pi_\leftmoon$	r
h	min s	s	′	h min	min	′	′
00	1 19.0	-1.2	16.3	$T_{\overline{m}}$ 22 36	2.4	59.3	16.2
12	1 4.1	$T_{\overline{m}_\odot}$ 11 h 58.9 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	′	°	
♀	9 13	.1	131	-3.8	♃	5 30	.0	186	-1.7
♂	7 24	.1	158	1.0	♄	10 29	.0	111	.7

UT	SUNCE		PROLEĆ. TAČKA	VENERA		MARS	
	$S_\odot$	$\delta_\odot$	S_Υ	S_φ	δ_φ	S_σ	δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	180 12.3	-23 25.3	92 12.1	221 39.1	-16 15.1	249 22.2	- 7 56.7
2	210 11.7	-23 25.2	122 17.0	251 38.0	-16 16.8	279 24.5	- 7 57.8
4	240 11.1	-23 25.2	152 22.0	281 36.9	-16 18.4	309 26.8	- 7 58.8
6	270 10.4	-23 25.1	182 26.9	311 35.7	-16 20.0	339 29.0	- 7 59.8
8	300 9.8	-23 25.0	212 31.8	341 34.6	-16 21.6	9 31.3	- 8 .9
10	330 9.2	-23 24.9	242 36.7	11 33.5	-16 23.2	39 33.6	- 8 1.9
12	0 8.6	-23 24.8	272 41.7	41 32.4	-16 24.8	69 35.8	- 8 2.9
14	30 8.0	-23 24.7	302 46.6	71 31.3	-16 26.3	99 38.1	- 8 4.0
16	60 7.3	-23 24.6	332 51.5	101 30.1	-16 27.9	129 40.4	- 8 5.0
18	90 6.7	-23 24.5	2 56.5	131 29.0	-16 29.5	159 42.7	- 8 6.0
20	120 6.1	-23 24.4	33 1.4	161 27.9	-16 31.1	189 44.9	- 8 7.0
22	150 5.5	-23 24.3	63 6.3	191 26.7	-16 32.7	219 47.2	- 8 8.1
Δ	-3	0		-6	-8	11	-5

UT	MESEC				JUPITER		SATURN	
	$S_\leftmoon$	Δ	$\delta_\leftmoon$	Δ	S_{4}	δ_{4}	S_{5}	δ_{5}
h	° ′		° ′		° ′	° ′	° ′	° ′
0	20 15.4	66	17 28.9	36	278 16.8	3 56.1	203 19.5	-20 22.2
2	49 6.7	66	17 36.0	33	308 21.5	3 56.0	233 23.8	-20 22.3
4	77 57.9	66	17 42.6	31	338 26.2	3 55.9	263 28.2	-20 22.4
6	106 49.1	66	17 48.8	29	8 31.0	3 55.8	293 32.5	-20 22.5
8	135 40.3	66	17 54.6	26	38 35.7	3 55.8	323 36.8	-20 22.5
10	164 31.5	66	17 59.8	24	68 40.4	3 55.7	353 41.2	-20 22.6
12	193 22.7	66	18 4.6	22	98 45.1	3 55.6	23 45.5	-20 22.7
14	222 14.0	67	18 8.9	19	128 49.8	3 55.5	53 49.8	-20 22.8
16	251 5.3	67	18 12.8	17	158 54.5	3 55.5	83 54.2	-20 22.9
18	279 56.7	67	18 16.2	15	188 59.2	3 55.4	113 58.5	-20 22.9
20	308 48.1	67	18 19.1	12	219 3.9	3 55.3	144 2.8	-20 23.0
22	337 39.5	68	18 21.5	10	249 8.6	3 55.3	174 7.2	-20 23.1
Δ					24	0	22	0

φ	SUNCE		TRAJANJE SUMRAKA		MESEC			
	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	14 56	2.3	7 10	2.6
55	8 24	15 35	0 46	2 18	15 24	2.3	6 43	2.6
50	7 57	16 2	0 39	1 60	15 44	2.3	6 23	2.5
45	7 36	16 23	0 34	1 47	15 60	2.3	6 7	2.5
40	7 20	16 39	0 31	1 38	16 13	2.3	5 54	2.5
35	7 5	16 54	0 28	1 31	16 24	2.3	5 43	2.5
30	6 53	17 6	0 26	1 26	16 34	2.3	5 34	2.5
20	6 32	17 27	0 24	1 19	16 51	2.4	5 17	2.4
10	6 13	17 46	0 23	1 15	17 5	2.4	5 3	2.4
0	5 56	18 3	0 23	1 15	17 19	2.4	4 49	2.4
10	5 38	18 21	0 23	1 18	17 33	2.4	4 36	2.4
20	5 19	18 40	0 25	1 24	17 48	2.4	4 22	2.3
30	4 57	19 2	0 27	1 37	18 5	2.4	4 5	2.3
35	4 44	19 15	0 30	1 47	18 15	2.4	3 56	2.3
40	4 29	19 30	0 33	2 3	18 26	2.4	3 45	2.3
45	4 11	19 48	0 37	2 33	18 40	2.4	3 32	2.2
50	3 48	20 10	0 45	: ::	18 56	2.4	3 16	2.2
55	3 18	20 41	0 58	: ::	19 17	2.3	2 56	2.1
60	2 33	21 25	1 46	: ::	19 46	2.3	2 30	2.1
S								

SUNCE				MESEC			
UT	e = T_p − UT	Δ/24	r	Prolaz	Δ/24	$\pi_\leftmoon$	r
h	min s	s	′	h min	min	′	′
00	0 49.2	-1.2	16.3	$T_{\overline{m}}$ 23 33	2.3	59.0	16.1
12	0 34.4	$T_{\overline{m}_\odot}$ 11 h 59.4 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	′	°	
♀	9 14	.1	129	-3.8	♃	5 26	.0	186	-1.7
♂	7 22	.1	157	1.0	♄	10 25	.0	111	.7

25. DECEMBAR 2015. PETAK

UT	SUNCE $S_\odot$	SUNCE $\delta_\odot$	PROLEĆ. TAČKA S_Υ	VENERA S_φ	VENERA δ_φ	MARS S_σ	MARS δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	180 4.9	-23 24.2	93 11.2	221 25.6	-16 34.3	249 49.5	- 8 9.1
2	210 4.3	-23 24.1	123 16.2	251 24.5	-16 35.8	279 51.7	- 8 10.1
4	240 3.6	-23 24.0	153 21.1	281 23.3	-16 37.4	309 54.0	- 8 11.2
6	270 3.0	-23 23.9	183 26.0	311 22.2	-16 39.0	339 56.3	- 8 12.2
8	300 2.4	-23 23.8	213 31.0	341 21.0	-16 40.6	9 58.6	- 8 13.2
10	330 1.8	-23 23.6	243 35.9	11 19.9	-16 42.1	40 .8	- 8 14.2
12	0 1.2	-23 23.5	273 40.8	41 18.7	-16 43.7	70 3.1	- 8 15.3
14	30 .5	-23 23.4	303 45.7	71 17.6	-16 45.2	100 5.4	- 8 16.3
16	59 59.9	-23 23.3	333 50.7	101 16.4	-16 46.8	130 7.7	- 8 17.3
18	89 59.3	-23 23.1	3 55.6	131 15.3	-16 48.4	160 9.9	- 8 18.3
20	119 58.7	-23 23.0	34 .5	161 14.1	-16 49.9	190 12.2	- 8 19.3
22	149 58.1	-23 22.8	64 5.4	191 13.0	-16 51.5	220 14.5	- 8 20.4
Δ	-3	1		-6	-8	11	-5

UT	MESEC $S_\leftmoon$	MESEC Δ	MESEC $\delta_\leftmoon$	MESEC Δ	JUPITER $S_{\jupiter}$	JUPITER $\delta_{\jupiter}$	SATURN $S_{\saturn}$	SATURN $\delta_{\saturn}$
h	° ′		° ′		° ′	° ′	° ′	° ′
0	6 31.1	68	18 23.5	7	279 13.3	3 55.2	204 11.5	-20 23.2
2	35 22.7	69	18 25.0	5	309 18.0	3 55.1	234 15.8	-20 23.3
4	64 14.5	69	18 26.0	3	339 22.7	3 55.1	264 20.2	-20 23.3
6	93 6.3	70	18 26.6	1	9 27.5	3 55.0	294 24.5	-20 23.4
8	121 58.2	70	18 26.7	-2	39 32.2	3 54.9	324 28.8	-20 23.5
10	150 50.3	71	18 26.3	-4	69 36.9	3 54.9	354 33.2	-20 23.6
12	179 42.5	72	18 25.5	-6	99 41.6	3 54.8	24 37.5	-20 23.7
14	208 34.9	72	18 24.2	-9	129 46.3	3 54.7	54 41.8	-20 23.7
16	237 27.3	73	18 22.5	-11	159 51.1	3 54.7	84 46.2	-20 23.8
18	266 20.0	74	18 20.3	-13	189 55.8	3 54.6	114 50.5	-20 23.9
20	295 12.8	75	18 17.7	-15	220 .5	3 54.6	144 54.8	-20 24.0
22	324 5.8	76	18 14.6	-18	250 5.2	3 54.5	174 59.2	-20 24.1
Δ					24	0	22	0

φ	SUNCE IZLAZ	SUNCE ZALAZ	TRAJANJE SUMRAKA GRAĐ.	TRAJANJE SUMRAKA ASTR.	MESEC IZLAZ	MESEC Δ/24	MESEC ZALAZ	MESEC 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	15 51	2.7	8 12	2.1
55	8 25	15 35	0 46	2 18	16 19	2.6	7 44	2.1
50	7 57	16 2	0 39	1 60	16 39	2.5	7 23	2.2
45	7 37	16 23	0 34	1 47	16 56	2.5	7 7	2.2
40	7 20	16 40	0 31	1 38	17 9	2.5	6 54	2.2
35	7 6	16 54	0 28	1 31	17 20	2.4	6 42	2.3
30	6 53	17 7	0 26	1 26	17 30	2.4	6 33	2.3
20	6 32	17 28	0 24	1 19	17 47	2.4	6 15	2.3
10	6 14	17 46	0 23	1 15	18 2	2.3	6 0	2.3
0	5 56	18 4	0 23	1 15	18 16	2.3	5 46	2.3
10	5 39	18 21	0 23	1 18	18 30	2.2	5 32	2.3
20	5 20	18 40	0 25	1 24	18 45	2.2	5 17	2.4
30	4 58	19 2	0 27	1 37	19 2	2.2	5 0	2.4
35	4 45	19 15	0 30	1 47	19 12	2.1	4 50	2.4
40	4 29	19 30	0 33	2 3	19 23	2.1	4 39	2.4
45	4 11	19 48	0 37	2 33	19 36	2.1	4 25	2.4
50	3 49	20 11	0 45	: ::	19 53	2.0	4 9	2.4
55	3 19	20 41	0 58	: ::	20 14	1.9	3 48	2.5
60	2 34	21 25	1 45	: ::	20 42	1.8	3 19	2.5
S								

SUNCE UT	SUNCE e = T_p − UT	SUNCE Δ/24	SUNCE r	MESEC Prolaz	MESEC Δ/24	MESEC $\pi_\leftmoon$	MESEC r
h	min s	s	′	$T_{\overline{m}}$ h min	min	′	′
00	0 19.5	-1.2	16.3	$T_{\overline{m}}$ . . .	1.0	58.5	15.9
12	0 4.7	$T_{\overline{m}_\odot}$ 11 h 59.9 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	′	°	
♀	9 15	.1	128	-3.8	♃	5 22	.0	186	-1.7
♂	7 20	.1	157	1.0	♄	10 22	.0	111	.7

26. DECEMBAR SUBOTA

UT	SUNCE $S_\odot$	SUNCE $\delta_\odot$	PROLEĆ. TAČKA S_Υ	VENERA S_φ	VENERA δ_φ	MARS S_σ	MARS δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	179 57.5	-23 22.7	94 10.4	221 11.8	-16 53.0	250 16.8	- 8 21.4
2	209 56.8	-23 22.5	124 15.3	251 10.6	-16 54.6	280 19.0	- 8 22.4
4	239 56.2	-23 22.4	154 20.2	281 9.5	-16 56.1	310 21.3	- 8 23.4
6	269 55.6	-23 22.2	184 25.2	311 8.3	-16 57.6	340 23.6	- 8 24.4
8	299 55.0	-23 22.1	214 30.1	341 7.1	-16 59.2	10 25.9	- 8 25.5
10	329 54.4	-23 21.9	244 35.0	11 6.0	-17 .7	40 28.1	- 8 26.5
12	359 53.8	-23 21.7	274 39.9	41 4.8	-17 2.2	70 30.4	- 8 27.5
14	29 53.1	-23 21.6	304 44.9	71 3.6	-17 3.8	100 32.7	- 8 28.5
16	59 52.5	-23 21.4	334 49.8	101 2.4	-17 5.3	130 35.0	- 8 29.5
18	89 51.9	-23 21.2	4 54.7	131 1.3	-17 6.8	160 37.2	- 8 30.6
20	119 51.3	-23 21.0	34 59.7	161 .1	-17 8.3	190 39.5	- 8 31.6
22	149 50.7	-23 20.8	65 4.6	190 58.9	-17 9.9	220 41.8	- 8 32.6
Δ	-3	1		-6	-8	11	-5

UT	MESEC $S_\leftmoon$	MESEC Δ	MESEC $\delta_\leftmoon$	MESEC Δ	JUPITER $S_{\jupiter}$	JUPITER $\delta_{\jupiter}$	SATURN $S_{\saturn}$	SATURN $\delta_{\saturn}$
h	° ′		° ′		° ′	° ′	° ′	° ′
0	352 58.9	77	18 11.1	-20	280 10.0	3 54.4	205 3.5	-20 24.1
2	21 52.3	78	18 7.2	-22	310 14.7	3 54.4	235 7.8	-20 24.2
4	50 45.8	79	18 2.8	-24	340 19.4	3 54.3	265 12.2	-20 24.3
6	79 39.5	80	17 58.0	-26	10 24.1	3 54.2	295 16.5	-20 24.4
8	108 33.5	81	17 52.8	-28	40 28.9	3 54.2	325 20.9	-20 24.5
10	137 27.6	82	17 47.1	-30	70 33.6	3 54.1	355 25.2	-20 24.5
12	166 22.0	83	17 41.1	-32	100 38.3	3 54.1	25 29.5	-20 24.6
14	195 16.6	84	17 34.7	-34	130 43.1	3 54.0	55 33.9	-20 24.7
16	224 11.4	85	17 27.8	-36	160 47.8	3 54.0	85 38.2	-20 24.8
18	253 6.5	87	17 20.6	-38	190 52.5	3 53.9	115 42.5	-20 24.8
20	282 1.8	88	17 13.0	-40	220 57.3	3 53.8	145 46.9	-20 24.9
22	310 57.4	89	17 5.0	-42	251 2.0	3 53.8	175 51.2	-20 25.0
Δ					24	0	22	0

φ	SUNCE IZLAZ	SUNCE ZALAZ	TRAJANJE SUMRAKA GRAĐ.	TRAJANJE SUMRAKA ASTR.	MESEC IZLAZ	MESEC Δ/24	MESEC ZALAZ	MESEC 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	16 55	2.9	9 2	1.6
55	8 25	15 36	0 46	2 18	17 21	2.8	8 35	1.7
50	7 58	16 3	0 38	1 59	17 40	2.7	8 16	1.8
45	7 37	16 24	0 34	1 47	17 55	2.6	8 0	1.9
40	7 20	16 41	0 31	1 38	18 8	2.5	7 47	2.0
35	7 6	16 55	0 28	1 31	18 18	2.5	7 36	2.0
30	6 54	17 7	0 26	1 26	18 28	2.4	7 27	2.1
20	6 33	17 28	0 24	1 19	18 44	2.3	7 10	2.1
10	6 14	17 47	0 23	1 15	18 58	2.2	6 56	2.2
0	5 57	18 4	0 23	1 15	19 11	2.2	6 42	2.2
10	5 39	18 22	0 23	1 18	19 24	2.1	6 29	2.3
20	5 20	18 41	0 25	1 24	19 38	2.0	6 14	2.3
30	4 58	19 3	0 27	1 36	19 54	1.9	5 57	2.4
35	4 45	19 16	0 30	1 47	20 3	1.9	5 48	2.5
40	4 30	19 31	0 33	2 3	20 13	1.8	5 37	2.5
45	4 12	19 49	0 37	2 33	20 26	1.8	5 23	2.6
50	3 50	20 11	0 45	: ::	20 41	1.7	5 7	2.6
55	3 20	20 41	0 58	: ::	20 60	1.6	4 47	2.7
60	2 35	21 25	1 44	: ::	21 25	1.4	4 19	2.8
S								

SUNCE UT	SUNCE e = T_p − UT	SUNCE Δ/24	SUNCE r	MESEC Prolaz	MESEC Δ/24	MESEC $\pi_\leftmoon$	MESEC r
h	min s	s	′	$T_{\overline{m}}$ h min	min	′	′
00	- 0 10.2	-1.2	16.3	$T_{\overline{m}}$ 0 29	2.3	57.9	15.8
12	- 0 25.0	$T_{\overline{m}_\odot}$ 12 h .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	′	°	
♀	9 16	.1	127	-3.8	♃	5 18	.0	186	-1.7
♂	7 18	.1	156	1.0	♄	10 18	.0	111	.7

UT	SUNCE		PROLEĆ. TAČKA	VENERA		MARS	
	$S_\odot$	$\delta_\odot$	S_Υ	S_φ	δ_φ	S_σ	δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	179 50.1	-23 20.7	95 9.5	220 57.7	-17 11.4	250 44.1	- 8 33.6
2	209 49.4	-23 20.5	125 14.4	250 56.5	-17 12.9	280 46.4	- 8 34.6
4	239 48.8	-23 20.3	155 19.4	280 55.3	-17 14.4	310 48.6	- 8 35.6
6	269 48.2	-23 20.1	185 24.3	310 54.1	-17 15.9	340 50.9	- 8 36.6
8	299 47.6	-23 19.9	215 29.2	340 52.9	-17 17.4	10 53.2	- 8 37.7
10	329 47.0	-23 19.7	245 34.2	10 51.7	-17 18.9	40 55.5	- 8 38.7
12	359 46.4	-23 19.5	275 39.1	40 50.5	-17 20.4	70 57.8	- 8 39.7
14	29 45.8	-23 19.3	305 44.0	70 49.3	-17 21.9	101 .0	- 8 40.7
16	59 45.2	-23 19.1	335 48.9	100 48.1	-17 23.4	131 2.3	- 8 41.7
18	89 44.5	-23 18.8	5 53.9	130 46.9	-17 24.9	161 4.6	- 8 42.7
20	119 43.9	-23 18.6	35 58.8	160 45.7	-17 26.4	191 6.9	- 8 43.7
22	149 43.3	-23 18.4	66 3.7	190 44.5	-17 27.9	221 9.2	- 8 44.7
Δ	-3	1		-6	-7	11	-5

UT	MESEC				JUPITER		SATURN	
	$S_\leftmoon$	Δ	$\delta_\leftmoon$	Δ	S_{4}	δ_{4}	S_{5}	δ_{5}
h	° ′		° ′		° ′	° ′	° ′	° ′
0	339 53.2	90	16 56.6	-44	281 6.8	3 53.7	205 55.6	-20 25.1
2	8 49.2	92	16 47.9	-45	311 11.5	3 53.7	235 59.9	-20 25.2
4	37 45.5	93	16 38.8	-47	341 16.2	3 53.6	266 4.2	-20 25.2
6	66 42.1	94	16 29.3	-49	11 21.0	3 53.6	296 8.6	-20 25.3
8	95 38.9	95	16 19.5	-51	41 25.7	3 53.5	326 12.9	-20 25.4
10	124 36.0	97	16 9.4	-52	71 30.5	3 53.5	356 17.3	-20 25.5
12	153 33.3	98	15 58.9	-54	101 35.2	3 53.4	26 21.6	-20 25.5
14	182 31.0	99	15 48.1	-56	131 40.0	3 53.4	56 25.9	-20 25.6
16	211 28.9	101	15 37.0	-57	161 44.7	3 53.3	86 30.3	-20 25.7
18	240 27.0	102	15 25.6	-59	191 49.5	3 53.3	116 34.6	-20 25.8
20	269 25.5	104	15 13.9	-60	221 54.2	3 53.2	146 39.0	-20 25.9
22	298 24.2	105	15 1.9	-62	251 59.0	3 53.2	176 43.3	-20 25.9
Δ					24	0	22	0

φ	SUNCE		TRAJANJE SUMRAKA		MESEC			
	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 58	0 58	2 46	18 5	3.0	9 40	1.2
55	8 25	15 37	0 45	2 17	18 28	2.8	9 17	1.4
50	7 58	16 4	0 38	1 59	18 44	2.7	8 60	1.5
45	7 37	16 25	0 34	1 47	18 57	2.6	8 46	1.6
40	7 21	16 41	0 31	1 38	19 8	2.5	8 35	1.7
35	7 6	16 55	0 28	1 31	19 17	2.4	8 25	1.8
30	6 54	17 8	0 26	1 25	19 25	2.4	8 16	1.9
20	6 33	17 29	0 24	1 19	19 39	2.2	8 1	2.0
10	6 15	17 47	0 23	1 15	19 52	2.1	7 48	2.0
0	5 57	18 5	0 23	1 15	20 3	2.1	7 36	2.1
10	5 40	18 22	0 23	1 18	20 14	2.0	7 24	2.2
20	5 21	18 41	0 25	1 24	20 26	1.9	7 11	2.3
30	4 59	19 3	0 27	1 36	20 40	1.8	6 55	2.4
35	4 46	19 16	0 30	1 47	20 48	1.7	6 47	2.4
40	4 31	19 31	0 33	2 3	20 57	1.6	6 36	2.5
45	4 13	19 49	0 37	2 32	21 8	1.5	6 25	2.6
50	3 50	20 11	0 44	: ::	21 21	1.4	6 10	2.7
55	3 20	20 41	0 58	: ::	21 37	1.3	5 52	2.8
60	2 36	21 25	1 43	: ::	21 58	1.1	5 27	3.0
S								

SUNCE				MESEC			
UT	e = T_p − UT	Δ/24	r	Prolaz	Δ/24	$\pi_\leftmoon$	r
h	min s	s	′	h min	min	′	′
00	- 0 39.7	-1.2	16.3	$T_{\overline{m}}$ 1 23	2.2	57.3	15.6
12	- 0 54.5	$T_{\overline{m}_\odot}$ 12 h .9 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	′	°	
♀	9 17	.1	126	-3.8	♃	5 15	.0	186	-1.7
♂	7 17	.1	156	1.0	♄	10 15	.0	111	.7

UT	SUNCE		PROLEĆ. TAČKA	VENERA		MARS	
	$S_\odot$	$\delta_\odot$	S_Υ	S_φ	δ_φ	S_σ	δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	179 42.7	-23 18.2	96 8.7	220 43.3	-17 29.3	251 11.4	- 8 45.7
2	209 42.1	-23 17.9	126 13.6	250 42.1	-17 30.8	281 13.7	- 8 46.8
4	239 41.5	-23 17.7	156 18.5	280 40.9	-17 32.3	311 16.0	- 8 47.8
6	269 40.9	-23 17.5	186 23.4	310 39.6	-17 33.8	341 18.3	- 8 48.8
8	299 40.3	-23 17.2	216 28.4	340 38.4	-17 35.2	11 20.6	- 8 49.8
10	329 39.6	-23 17.0	246 33.3	10 37.2	-17 36.7	41 22.8	- 8 50.8
12	359 39.0	-23 16.8	276 38.2	40 36.0	-17 38.2	71 25.1	- 8 51.8
14	29 38.4	-23 16.5	306 43.2	70 34.7	-17 39.6	101 27.4	- 8 52.8
16	59 37.8	-23 16.3	336 48.1	100 33.5	-17 41.1	131 29.7	- 8 53.8
18	89 37.2	-23 16.0	6 53.0	130 32.3	-17 42.5	161 32.0	- 8 54.8
20	119 36.6	-23 15.7	36 57.9	160 31.0	-17 44.0	191 34.3	- 8 55.8
22	149 36.0	-23 15.5	67 2.9	190 29.8	-17 45.4	221 36.5	- 8 56.8
Δ	-3	1		-6	-7	11	-5

UT	MESEC				JUPITER		SATURN	
	$S_\leftmoon$	Δ	$\delta_\leftmoon$	Δ	S_{4}	δ_{4}	S_{5}	δ_{5}
h	° ′		° ′		° ′	° ′	° ′	° ′
0	327 23.2	106	14 49.6	-63	282 3.7	3 53.1	206 47.6	-20 26.0
2	356 22.4	108	14 37.0	-64	312 8.5	3 53.1	236 52.0	-20 26.1
4	25 21.9	109	14 24.1	-66	342 13.3	3 53.0	266 56.3	-20 26.2
6	54 21.7	110	14 11.0	-67	12 18.0	3 53.0	297 .7	-20 26.2
8	83 21.8	112	13 57.6	-68	42 22.8	3 52.9	327 5.0	-20 26.3
10	112 22.1	113	13 43.9	-69	72 27.5	3 52.9	357 9.3	-20 26.4
12	141 22.7	114	13 30.0	-71	102 32.3	3 52.8	27 13.7	-20 26.5
14	170 23.6	116	13 15.9	-72	132 37.1	3 52.8	57 18.0	-20 26.5
16	199 24.7	117	13 1.5	-73	162 41.8	3 52.7	87 22.4	-20 26.6
18	228 26.1	118	12 47.0	-74	192 46.6	3 52.7	117 26.7	-20 26.7
20	257 27.8	120	12 32.1	-75	222 51.3	3 52.6	147 31.1	-20 26.8
22	286 29.7	121	12 17.1	-76	252 56.1	3 52.6	177 35.4	-20 26.8
Δ					24	0	22	0

φ	SUNCE		TRAJANJE SUMRAKA		MESEC			
	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 59	0 57	2 46	19 18	3.1	10 10	1.0
55	8 25	15 38	0 45	2 17	19 36	2.8	9 51	1.2
50	7 58	16 5	0 38	1 59	19 49	2.7	9 37	1.3
45	7 38	16 25	0 34	1 47	19 59	2.6	9 26	1.4
40	7 21	16 42	0 31	1 38	20 8	2.5	9 16	1.5
35	7 7	16 56	0 28	1 31	20 16	2.4	9 8	1.6
30	6 55	17 8	0 26	1 25	20 22	2.3	9 1	1.7
20	6 33	17 29	0 24	1 19	20 33	2.2	8 48	1.8
10	6 15	17 48	0 23	1 15	20 43	2.1	8 37	1.9
0	5 58	18 5	0 23	1 15	20 52	1.9	8 27	2.0
10	5 40	18 23	0 23	1 18	21 2	1.8	8 17	2.1
20	5 21	18 41	0 25	1 24	21 11	1.7	8 5	2.2
30	4 59	19 3	0 27	1 36	21 22	1.6	7 53	2.3
35	4 46	19 16	0 30	1 47	21 29	1.5	7 45	2.4
40	4 31	19 31	0 33	2 3	21 36	1.4	7 37	2.5
45	4 14	19 49	0 37	2 32	21 45	1.3	7 27	2.6
50	3 51	20 11	0 44	: ::	21 55	1.2	7 15	2.7
55	3 21	20 41	0 58	: ::	22 7	1.1	6 60	2.9
60	2 37	21 25	1 42	: ::	22 24	.9	6 40	3.1
S								

SUNCE				MESEC			
UT	e = T_p − UT	Δ/24	r	Prolaz	Δ/24	$\pi_\leftmoon$	r
h	min s	s	′	h min	min	′	′
00	- 1 9.2	-1.2	16.3	$T_{\overline{m}}$ 2 15	2.0	56.6	15.4
12	- 1 23.8	$T_{\overline{m}_\odot}$ 12 h 1.4 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	′	°	
♀	9 17	.1	125	-3.7	♃	5 11	.0	186	-1.7
♂	7 15	.1	155	1.0	♄	10 11	.0	111	.7

UT	SUNCE		PROLEĆ. TAČKA	VENERA		MARS	
	$S_\odot$	$\delta_\odot$	S_Υ	S_φ	δ_φ	S_σ	δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	179 35.4	-23 15.2	97 7.8	220 28.6	-17 46.9	251 38.8	- 8 57.8
2	209 34.8	-23 14.9	127 12.7	250 27.3	-17 48.3	281 41.1	- 8 58.8
4	239 34.2	-23 14.7	157 17.7	280 26.1	-17 49.8	311 43.4	- 8 59.8
6	269 33.6	-23 14.4	187 22.6	310 24.8	-17 51.2	341 45.7	- 9 .8
8	299 32.9	-23 14.1	217 27.5	340 23.6	-17 52.6	11 48.0	- 9 1.8
10	329 32.3	-23 13.8	247 32.4	10 22.3	-17 54.1	41 50.2	- 9 2.8
12	359 31.7	-23 13.6	277 37.4	40 21.1	-17 55.5	71 52.5	- 9 3.8
14	29 31.1	-23 13.3	307 42.3	70 19.8	-17 56.9	101 54.8	- 9 4.8
16	59 30.5	-23 13.0	337 47.2	100 18.6	-17 58.4	131 57.1	- 9 5.8
18	89 29.9	-23 12.7	7 52.1	130 17.3	-17 59.8	161 59.4	- 9 6.8
20	119 29.3	-23 12.4	37 57.1	160 16.0	-18 1.2	192 1.7	- 9 7.8
22	149 28.7	-23 12.1	68 2.0	190 14.8	-18 2.6	222 4.0	- 9 8.8
Δ	-3	1		-6	-7	11	-5

UT	MESEC				JUPITER		SATURN	
	$S_\leftmoon$	Δ	$\delta_\leftmoon$	Δ	S_{4}	δ_{4}	S_η	δ_η
h	° ′		° ′		° ′	° ′	° ′	° ′
0	315 31.9	122	12 1.9	-77	283 .9	3 52.5	207 39.7	-20 26.9
2	344 34.3	123	11 46.5	-78	313 5.7	3 52.5	237 44.1	-20 27.0
4	13 37.0	125	11 30.8	-79	343 10.4	3 52.5	267 48.4	-20 27.1
6	42 39.9	126	11 15.0	-80	13 15.2	3 52.4	297 52.8	-20 27.1
8	71 43.0	127	10 59.0	-81	43 20.0	3 52.4	327 57.1	-20 27.2
10	100 46.4	128	10 42.9	-82	73 24.7	3 52.3	358 1.5	-20 27.3
12	129 50.1	129	10 26.6	-82	103 29.5	3 52.3	28 5.8	-20 27.4
14	158 53.9	130	10 10.1	-83	133 34.3	3 52.3	58 10.2	-20 27.4
16	187 58.0	132	9 53.4	-84	163 39.1	3 52.2	88 14.5	-20 27.5
18	217 2.3	133	9 36.7	-85	193 43.9	3 52.2	118 18.9	-20 27.6
20	246 6.8	134	9 19.7	-85	223 48.6	3 52.1	148 23.2	-20 27.7
22	275 11.6	135	9 2.7	-86	253 53.4	3 52.1	178 27.5	-20 27.7
Δ					24	0	22	0

φ	SUNCE		TRAJANJE SUMRAKA		MESEC			
	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	15 1	0 57	2 45	20 32	3.0	10 33	.8
55	8 25	15 39	0 45	2 17	20 44	2.8	10 19	1.0
50	7 58	16 6	0 38	1 59	20 53	2.6	10 8	1.2
45	7 38	16 26	0 34	1 47	21 1	2.5	9 60	1.3
40	7 21	16 43	0 31	1 38	21 7	2.4	9 53	1.4
35	7 7	16 57	0 28	1 31	21 12	2.3	9 46	1.5
30	6 55	17 9	0 26	1 25	21 17	2.2	9 41	1.5
20	6 34	17 30	0 24	1 19	21 25	2.1	9 31	1.7
10	6 15	17 48	0 23	1 15	21 32	2.0	9 23	1.8
0	5 58	18 6	0 23	1 15	21 39	1.9	9 15	1.9
10	5 41	18 23	0 23	1 18	21 46	1.7	9 7	2.0
20	5 22	18 42	0 25	1 24	21 53	1.6	8 58	2.1
30	4 60	19 4	0 27	1 36	22 1	1.5	8 49	2.3
35	4 47	19 17	0 30	1 47	22 5	1.4	8 43	2.3
40	4 32	19 31	0 33	2 3	22 11	1.3	8 36	2.4
45	4 14	19 49	0 37	2 32	22 17	1.2	8 29	2.5
50	3 52	20 12	0 44	: ::	22 24	1.1	8 20	2.7
55	3 22	20 41	0 57	: ::	22 33	.9	8 8	2.8
60	2 38	21 25	1 41	: ::	22 45	.7	7 53	3.0
S								

SUNCE				MESEC			
UT	e = T_p − UT	Δ/24	r	Prolaz		Δ/24	$\pi_\leftmoon$	r
h	min s	s	′	$T_{\overline{m}}$	h min	min	′	′
00	- 1 38.5	-1.2	16.3	$T_{\overline{m}}$	3 4	1.9	55.9	15.2
12	- 1 53.0	$T_{\overline{m}_\odot}$ 12 h	1.9 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	′	°	
♀	9 18	.1	123	-3.7	♃	5 7	.0	186	-1.7
♂	7 13	.1	155	1.0	♄	10 8	.0	111	.7

UT	SUNCE		PROLEĆ. TAČKA	VENERA		MARS	
	$S_\odot$	$\delta_\odot$	S_Υ	S_φ	δ_φ	S_σ	δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	179 28.1	-23 11.8	98 6.9	220 13.5	-18 4.0	252 6.2	- 9 9.8
2	209 27.5	-23 11.5	128 11.9	250 12.3	-18 5.4	282 8.5	- 9 10.8
4	239 26.9	-23 11.2	158 16.8	280 11.0	-18 6.8	312 10.8	- 9 11.8
6	269 26.3	-23 10.9	188 21.7	310 9.7	-18 8.2	342 13.1	- 9 12.8
8	299 25.7	-23 10.5	218 26.6	340 8.4	-18 9.6	12 15.4	- 9 13.8
10	329 25.1	-23 10.2	248 31.6	10 7.2	-18 11.0	42 17.7	- 9 14.8
12	359 24.5	-23 9.9	278 36.5	40 5.9	-18 12.4	72 20.0	- 9 15.8
14	29 23.9	-23 9.6	308 41.4	70 4.6	-18 13.8	102 22.3	- 9 16.8
16	59 23.3	-23 9.2	338 46.4	100 3.3	-18 15.2	132 24.5	- 9 17.7
18	89 22.7	-23 8.9	8 51.3	130 2.0	-18 16.6	162 26.8	- 9 18.7
20	119 22.1	-23 8.6	38 56.2	160 .8	-18 17.9	192 29.1	- 9 19.7
22	149 21.5	-23 8.2	69 1.1	189 59.5	-18 19.3	222 31.4	- 9 20.7
Δ	-3	2		-6	-7	11	-5

UT	MESEC				JUPITER		SATURN	
	$S_\leftmoon$	Δ	$\delta_\leftmoon$	Δ	S_{4}	δ_{4}	S_η	δ_η
h	° ′		° ′		° ′	° ′	° ′	° ′
0	304 16.5	136	8 45.5	-87	283 58.2	3 52.1	208 31.9	-20 27.8
2	333 21.6	137	8 28.1	-87	314 3.0	3 52.0	238 36.2	-20 27.9
4	2 27.0	138	8 10.7	-88	344 7.8	3 52.0	268 40.6	-20 28.0
6	31 32.5	139	7 53.2	-88	14 12.6	3 52.0	298 44.9	-20 28.0
8	60 38.2	140	7 35.5	-89	44 17.4	3 51.9	328 49.3	-20 28.1
10	89 44.1	140	7 17.8	-89	74 22.1	3 51.9	358 53.6	-20 28.2
12	118 50.2	141	6 59.9	-90	104 26.9	3 51.9	28 58.0	-20 28.3
14	147 56.5	142	6 42.0	-90	134 31.7	3 51.8	59 2.3	-20 28.3
16	177 2.9	143	6 23.9	-91	164 36.5	3 51.8	89 6.7	-20 28.4
18	206 9.5	144	6 5.8	-91	194 41.3	3 51.8	119 11.0	-20 28.5
20	235 16.2	144	5 47.6	-91	224 46.1	3 51.7	149 15.4	-20 28.6
22	264 23.1	145	5 29.4	-92	254 50.9	3 51.7	179 19.7	-20 28.6
Δ					24	0	22	0

φ	SUNCE		TRAJANJE SUMRAKA		MESEC			
	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	15 2	0 57	2 45	21 44	3.0	10 52	.7
55	8 25	15 40	0 45	2 17	21 51	2.8	10 43	.9
50	7 58	16 6	0 38	1 59	21 57	2.6	10 36	1.0
45	7 38	16 27	0 34	1 47	22 1	2.5	10 31	1.2
40	7 21	16 43	0 30	1 37	22 5	2.4	10 26	1.3
35	7 7	16 57	0 28	1 31	22 8	2.3	10 22	1.4
30	6 55	17 10	0 26	1 25	22 11	2.2	10 18	1.4
20	6 34	17 31	0 24	1 19	22 15	2.0	10 12	1.6
10	6 16	17 49	0 23	1 15	22 20	1.9	10 6	1.7
0	5 59	18 6	0 22	1 15	22 24	1.8	10 1	1.8
10	5 41	18 23	0 23	1 18	22 28	1.7	9 55	1.9
20	5 22	18 42	0 25	1 24	22 32	1.6	9 50	2.1
30	5 1	19 4	0 27	1 36	22 36	1.4	9 43	2.2
35	4 48	19 17	0 30	1 46	22 39	1.3	9 39	2.3
40	4 33	19 32	0 33	2 2	22 42	1.2	9 35	2.4
45	4 15	19 49	0 37	2 31	22 46	1.1	9 30	2.5
50	3 53	20 12	0 44	: ::	22 50	1.0	9 24	2.6
55	3 23	20 41	0 57	: ::	22 55	.9	9 16	2.8
60	2 39	21 25	1 39	: ::	23 2	.7	9 6	3.0
S								

SUNCE				MESEC			
UT	e = T_p − UT	Δ/24	r	Prolaz		Δ/24	$\pi_\leftmoon$	r
h	min s	s	′	$T_{\overline{m}}$	h min	min	′	′
00	- 2 7.6	-1.2	16.3	$T_{\overline{m}}$	3 50	1.8	55.3	15.1
12	- 2 22.1	$T_{\overline{m}_\odot}$ 12 h	2.4 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	′	°	
♀	9 19	.1	122	-3.7	♃	5 3	.0	186	-1.7
♂	7 11	.1	154	.9	♄	10 4	.0	110	.7

UT	SUNCE		PROLEĆ. TAČKA	VENERA		MARS	
	$S_\odot$	$\delta_\odot$	S_Υ	S_φ	δ_φ	S_σ	δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	179 20.9	−23 7.9	99 6.1	219 58.2	−18 20.7	252 33.7	− 9 21.7
2	209 20.3	−23 7.6	129 11.0	249 56.9	−18 22.1	282 36.0	− 9 22.7
4	239 19.7	−23 7.2	159 15.9	279 55.6	−18 23.4	312 38.3	− 9 23.7
6	269 19.1	−23 6.9	189 20.9	309 54.3	−18 24.8	342 40.6	− 9 24.7
8	299 18.5	−23 6.5	219 25.8	339 53.0	−18 26.2	12 42.9	− 9 25.7
10	329 17.9	−23 6.1	249 30.7	9 51.7	−18 27.5	42 45.2	− 9 26.6
12	359 17.3	−23 5.8	279 35.6	39 50.4	−18 28.9	72 47.5	− 9 27.6
14	29 16.7	−23 5.4	309 40.6	69 49.1	−18 30.2	102 49.7	− 9 28.6
16	59 16.1	−23 5.1	339 45.5	99 47.8	−18 31.6	132 52.0	− 9 29.6
18	89 15.5	−23 4.7	9 50.4	129 46.5	−18 32.9	162 54.3	− 9 30.6
20	119 14.9	−23 4.3	39 55.4	159 45.2	−18 34.3	192 56.6	− 9 31.6
22	149 14.3	−23 3.9	70 .3	189 43.9	−18 35.6	222 58.9	− 9 32.6
Δ		−3 2			−7 −7		11 −5

UT	MESEC				JUPITER		SATURN	
	$S_\leftmoon$	Δ	$\delta_\leftmoon$	Δ	$S_{\mathrm{♃}}$	$\delta_{\mathrm{♃}}$	$S_{\mathrm{♄}}$	$\delta_{\mathrm{♄}}$
h	° ′		° ′		° ′	° ′	° ′	° ′
0	293 30.1	146	5 11.0	−92	284 55.7	3 51.7	209 24.1	−20 28.7
2	322 37.3	146	4 52.7	−92	315 .5	3 51.6	239 28.4	−20 28.8
4	351 44.6	147	4 34.2	−92	345 5.3	3 51.6	269 32.8	−20 28.9
6	20 52.0	148	4 15.7	−93	15 10.1	3 51.6	299 37.1	−20 28.9
8	49 59.6	148	3 57.2	−93	45 14.9	3 51.5	329 41.5	−20 29.0
10	79 7.2	149	3 38.6	−93	75 19.7	3 51.5	359 45.8	−20 29.1
12	108 15.0	149	3 20.0	−93	105 24.5	3 51.5	29 50.2	−20 29.2
14	137 22.9	150	3 1.3	−93	135 29.3	3 51.5	59 54.5	−20 29.2
16	166 30.8	150	2 42.7	−94	165 34.1	3 51.4	89 58.9	−20 29.3
18	195 38.9	151	2 24.0	−94	195 38.9	3 51.4	120 3.2	−20 29.4
20	224 47.0	151	2 5.2	−94	225 43.7	3 51.4	150 7.6	−20 29.4
22	253 55.3	151	1 46.5	−94	255 48.6	3 51.4	180 11.9	−20 29.5
Δ					24	0	22	0

φ	SUNCE		TRAJANJE SUMRAKA		MESEC			
	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	15 3	0 57	2 45	22 55	1.8	11 9	.8
55	8 25	15 41	0 45	2 17	22 57	1.8	11 5	1.0
50	7 59	16 7	0 38	1 59	22 59	1.8	11 1	1.1
45	7 38	16 28	0 34	1 47	23 0	1.8	10 59	1.2
40	7 22	16 44	0 30	1 37	23 1	1.8	10 56	1.3
35	7 8	16 58	0 28	1 31	23 2	1.8	10 54	1.4
30	6 55	17 10	0 26	1 25	23 3	1.8	10 53	1.5
20	6 35	17 31	0 24	1 19	23 4	1.8	10 50	1.6
10	6 16	17 49	0 23	1 15	23 5	1.8	10 47	1.7
0	5 59	18 7	0 22	1 15	23 7	1.8	10 44	1.8
10	5 42	18 24	0 23	1 17	23 8	1.8	10 42	1.9
20	5 23	18 43	0 24	1 24	23 9	1.8	10 39	2.0
30	5 1	19 4	0 27	1 36	23 10	1.8	10 36	2.1
35	4 48	19 17	0 30	1 46	23 11	1.8	10 34	2.2
40	4 34	19 32	0 33	2 2	23 12	1.8	10 32	2.2
45	4 16	19 50	0 37	2 31	23 13	1.8	10 30	2.3
50	3 54	20 12	0 44	: ::	23 14	1.8	10 27	2.4
55	3 24	20 41	0 57	: ::	23 16	1.8	10 23	2.6
60	2 41	21 24	1 38	: ::	23 18	1.8	10 18	2.8
S								

SUNCE				MESEC			
UT	e = Tp − UT	Δ/24	r	Prolaz	Δ/24	$\pi_\leftmoon$	r
h	min s	s	′	h min	min	′	′
00	− 2 36.5	−1.2	16.3	$T_{\overline{m}}$ 4 34	1.8	54.8	14.9
12	− 2 50.8	$T_{\overline{m}_\odot}$ 12 h 2.8 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	′	°	
♀	9 21	.1	121	−3.7	♄	4 59	.0	186	−1.7
♂	7 9	.1	153	.9	♇	10 1	.0	110	.7

UT	SUNCE		PROLEĆ. TAČKA	VENERA		MARS	
	$S_\odot$	$\delta_\odot$	S_Υ	S_φ	δ_φ	S_σ	δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	179 13.7	−23 3.5	100 5.2	219 42.5	−18 36.9	253 1.2	− 9 33.5
2	209 13.1	−23 3.2	130 10.1	249 41.2	−18 38.3	283 3.5	− 9 34.5
4	239 12.5	−23 2.8	160 15.1	279 39.9	−18 39.6	313 5.8	− 9 35.5
6	269 11.9	−23 2.4	190 20.0	309 38.6	−18 40.9	343 8.1	− 9 36.5
8	299 11.3	−23 2.0	220 24.9	339 37.3	−18 42.2	13 10.4	− 9 37.5
10	329 10.7	−23 1.6	250 29.9	9 35.9	−18 43.6	43 12.7	− 9 38.4
12	359 10.2	−23 1.2	280 34.8	39 34.6	−18 44.9	73 15.0	− 9 39.4
14	29 9.6	−23 .8	310 39.7	69 33.3	−18 46.2	103 17.3	− 9 40.4
16	59 9.0	−23 .4	340 44.6	99 31.9	−18 47.5	133 19.6	− 9 41.4
18	89 8.4	−23 .0	10 49.6	129 30.6	−18 48.8	163 21.9	− 9 42.4
20	119 7.8	−22 59.6	40 54.5	159 29.3	−18 50.1	193 24.1	− 9 43.3
22	149 7.2	−22 59.2	70 59.4	189 27.9	−18 51.4	223 26.4	− 9 44.3
Δ		−3 2			−7 −7		11 −5

UT	MESEC				JUPITER		SATURN	
	$S_\leftmoon$	Δ	$\delta_\leftmoon$	Δ	$S_{\mathrm{♃}}$	$\delta_{\mathrm{♃}}$	$S_{\mathrm{♄}}$	$\delta_{\mathrm{♄}}$
h	° ′		° ′		° ′	° ′	° ′	° ′
0	283 3.6	152	1 27.8	−94	285 53.4	3 51.3	210 16.3	−20 29.6
2	312 11.9	152	1 9.0	−94	315 58.2	3 51.3	240 20.6	−20 29.7
4	341 20.3	152	0 50.2	−94	346 3.0	3 51.3	270 25.0	−20 29.7
6	10 28.8	153	0 31.5	−94	16 7.8	3 51.3	300 29.3	−20 29.8
8	39 37.3	153	0 12.7	−34	46 12.6	3 51.2	330 33.7	−20 29.9
10	68 45.9	153	0 6.0	94	76 17.4	3 51.2	0 38.1	−20 30.0
12	97 54.5	153	0 24.7	94	106 22.3	3 51.2	30 42.4	−20 30.0
14	127 3.1	153	0 43.4	93	136 27.1	3 51.2	60 46.8	−20 30.1
16	156 11.7	153	1 2.1	93	166 31.9	3 51.2	90 51.1	−20 30.2
18	185 20.4	153	1 20.8	93	196 36.7	3 51.1	120 55.5	−20 30.2
20	214 29.1	153	1 39.4	93	226 41.6	3 51.1	150 59.8	−20 30.3
22	243 37.7	153	1 58.0	93	256 46.4	3 51.1	181 4.2	−20 30.4
Δ					24	0	22	0

φ	SUNCE		TRAJANJE SUMRAKA		MESEC			
	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 2	15 4	0 57	2 44	23 39	1.5	11 29	2.9
55	8 25	15 42	0 45	2 17	23 40	1.6	11 29	2.7
50	7 59	16 8	0 38	1 59	23 42	1.6	11 28	2.6
45	7 38	16 29	0 34	1 46	23 43	1.6	11 28	2.4
40	7 22	16 45	0 30	1 37	23 44	1.7	11 28	2.3
35	7 8	16 59	0 28	1 30	23 45	1.7	11 28	2.2
30	6 56	17 11	0 26	1 25	23 45	1.7	11 28	2.1
20	6 35	17 32	0 24	1 18	23 47	1.7	11 27	2.0
10	6 17	17 50	0 23	1 15	23 48	1.7	11 27	1.9
0	5 60	18 7	0 22	1 15	23 49	1.8	11 27	1.8
10	5 42	18 24	0 23	1 17	23 50	1.8	11 27	1.6
20	5 24	18 43	0 24	1 24	23 51	1.8	11 27	1.5
30	5 2	19 5	0 27	1 36	23 53	1.8	11 26	1.4
35	4 49	19 17	0 30	1 46	23 54	1.9	11 26	1.3
40	4 34	19 32	0 33	2 2	23 55	1.9	11 26	1.2
45	4 17	19 50	0 37	2 30	23 56	1.9	11 26	1.1
50	3 55	20 12	0 44	: ::	23 58	1.9	11 25	1.0
55	3 25	20 41	0 57	: ::	23 59	1.9	11 25	.8
60	2 42	21 24	1 36	: ::	.. ..	.0	11 25	.6
S								

SUNCE				MESEC			
UT	e = Tp − UT	Δ/24	r	Prolaz	Δ/24	$\pi_\leftmoon$	r
h	min s	s	′	h min	min	′	′
00	− 3 5.2	−1.2	16.3	$T_{\overline{m}}$ 5 17	1.7	54.4	14.8
12	− 3 19.4	$T_{\overline{m}_\odot}$ 12 h 3.3 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	′	°	
♀	9 22	.1	120	−3.7	♄	4 56	.0	186	−1.8
♂	7 7	.1	153	.9	♇	9 57	.0	110	.7

Efemeride

NAUTIČKIH ZVEZDA

SUREKTASCENZIJE NAUTIČKIH ZVEZDA

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R.b.	Ime zvezde	$360^\circ-\alpha$	2015 JAN	FEB	MAR	APR	MAJ	JUN	JUL	AVG	SEP	OKT	NOV	DEC	2016 JAN
		°	′	′	′	′	′	′	′	′	′	′	′	′	′
1	ALPHERATZ	357	42.4	42.5	42.6	42.5	42.4	42.2	42.0	41.7	41.6	41.5	41.5	41.6	41.7
2	CAPH	357	29.9	30.2	30.3	30.3	30.1	29.8	29.4	29.1	28.8	28.7	28.8	29.0	29.2
3	DIPHDA	348	54.8	54.9	55.0	55.0	54.9	54.8	54.5	54.3	54.1	54.0	54.0	54.1	54.2
4	ACHERNAR	335	25.9	26.2	26.4	26.5	26.5	26.3	26.0	25.7	25.4	25.2	25.1	25.2	25.5
5	HAMAL	327	59.4	59.5	59.6	59.7	59.7	59.5	59.3	59.0	58.8	58.7	58.6	58.6	58.6
6	POLARIS	316	58.7	11.5	24.6	34.5	37.6	32.6	21.6	7.0	52.3	40.3	32.9	32.7	40.2
7	MIRFAK	308	38.4	38.6	38.7	38.9	39.0	38.9	38.6	38.3	38.0	37.7	37.5	37.4	37.4
8	ALDEBARAN	290	47.8	47.9	48.0	48.2	48.2	48.2	48.1	47.9	47.6	47.4	47.2	47.1	47.1
9	RIGEL	281	10.7	10.8	10.9	11.0	11.1	11.1	11.0	10.9	10.7	10.5	10.3	10.1	10.1
10	CAPELLA	280	32.4	32.4	32.6	32.8	33.0	33.0	32.8	32.6	32.3	32.0	31.7	31.5	31.4
11	BELLATRIX	278	30.5	30.6	30.7	30.8	30.9	30.9	30.8	30.7	30.5	30.3	30.1	29.9	29.8
12	EL NATH	278	10.9	10.9	11.0	11.2	11.3	11.3	11.2	11.0	10.8	10.6	10.3	10.1	10.1
13	ALNILAM	275	45.0	45.0	45.1	45.2	45.3	45.4	45.3	45.1	44.9	44.7	44.5	44.4	44.3
14	BETELGEUSE	270	59.8	59.8	59.9	0.1	0.2	0.2	0.1	60.0	59.8	59.6	59.4	59.2	59.1
15	CANOPUS	263	55.1	55.2	55.4	55.6	55.9	56.1	56.1	55.9	55.7	55.4	55.1	54.9	54.8
16	SIRIUS	258	32.4	32.4	32.5	32.7	32.8	32.9	32.9	32.7	32.6	32.4	32.2	32.0	31.9
17	ADHARA	255	11.3	11.3	11.4	11.5	11.7	11.8	11.8	11.7	11.6	11.3	11.1	10.9	10.8
18	PROCYON	244	58.3	58.2	58.3	58.4	58.5	58.6	58.6	58.5	58.4	58.2	58.0	57.8	57.6
19	POLLUX	243	26.1	26.0	26.1	26.2	26.3	26.4	26.4	26.3	26.2	26.0	25.7	25.5	25.3
20	AVIOR	234	16.9	16.8	16.9	17.2	17.5	17.8	18.0	18.0	17.9	17.6	17.2	16.9	16.6
21	AL SUHAIL	222	51.2	51.1	51.1	51.2	51.4	51.6	51.7	51.8	51.7	51.5	51.3	51.0	50.7
22	MIAPLACIDUS	221	38.5	38.3	38.4	38.7	39.2	39.6	40.0	40.1	40.1	39.8	39.3	38.8	38.4
23	ALPHARD	217	54.8	54.6	54.6	54.7	54.8	54.9	55.0	55.0	54.9	54.8	54.6	54.3	54.1
24	REGULUS	207	42.2	42.0	42.0	42.0	42.1	42.2	42.3	42.3	42.3	42.2	42.0	41.7	41.5
25	DUBHE	193	50.3	49.9	49.7	49.7	49.9	50.2	50.4	50.6	50.7	50.6	50.3	49.9	49.5
26	DENEBOLA	182	32.5	32.3	32.2	32.1	32.2	32.3	32.3	32.4	32.5	32.4	32.3	32.1	31.9
27	ACRUX	173	7.9	7.5	7.2	7.1	7.2	7.4	7.6	7.9	8.1	8.1	8.0	7.6	7.2
28	GACRUX	171	59.6	59.2	59.0	58.9	58.9	59.0	59.2	59.4	59.6	59.6	59.5	59.2	58.8
29	MINOSA	167	50.6	50.2	49.9	49.8	49.8	49.9	50.1	50.3	50.5	50.6	50.5	50.2	49.8
30	ALIOTH	166	19.9	19.6	19.3	19.2	19.2	19.4	19.6	19.8	19.9	20.0	19.9	19.7	19.4
31	MIZAR	158	52.4	52.0	51.7	51.6	51.6	51.7	51.9	52.1	52.3	52.4	52.3	52.2	51.8
32	SPICA	158	30.2	29.9	29.8	29.6	29.6	29.6	29.7	29.8	29.9	29.9	29.9	29.7	29.5
33	ALKAID	152	58.3	58.0	57.7	57.5	57.5	57.6	57.7	57.9	58.1	58.2	58.2	58.1	57.8
34	MENKENT	148	6.4	6.1	5.9	5.7	5.6	5.6	5.7	5.8	6.0	6.1	6.0	5.9	5.6
35	ARCTURUS	145	54.9	54.7	54.5	54.3	54.3	54.3	54.3	54.4	54.6	54.7	54.7	54.5	54.3
36	RIGEL KENTAURUS	139	50.6	50.1	49.8	49.5	49.3	49.3	49.5	49.7	50.0	50.2	50.2	50.1	49.7
37	KOHAB	137	20.9	20.3	19.7	19.2	19.1	19.2	19.6	20.2	20.7	21.2	21.5	21.4	21.0
38	ALPHECCA	126	10.4	10.2	9.9	9.7	9.6	9.6	9.6	9.7	9.8	10.0	10.0	10.0	9.8
39	DSCHUBBA	119	41.8	41.6	41.4	41.1	41.0	40.9	40.9	40.9	41.1	41.2	41.3	41.2	41.0
40	ANTARES	112	25.3	25.0	24.8	24.6	24.4	24.3	24.2	24.3	24.4	24.5	24.6	24.6	24.5
41	ATRIA	107	26.6	26.1	25.6	25.0	24.6	24.3	24.2	24.4	24.7	25.1	25.4	25.4	25.2
42	SHAULA	96	20.9	20.6	20.4	20.1	19.9	19.7	19.6	19.6	19.7	19.9	20.0	20.1	20.0
43	RASALHAGUE	96	5.8	5.6	5.4	5.2	5.0	4.9	4.8	4.8	5.0	5.1	5.2	5.3	5.2
44	ELTANIN	90	46.2	46.0	45.8	45.5	45.2	45.0	45.0	45.0	45.3	45.5	45.8	45.9	45.9
45	KAUS AUSTRALIS	83	42.8	42.6	42.4	42.2	41.9	41.7	41.6	41.5	41.6	41.8	41.9	42.0	41.9
46	VEGA	80	38.7	38.5	38.4	38.1	37.9	37.7	37.6	37.6	37.7	37.9	38.1	38.2	38.2
47	NUNKI	75	57.4	57.3	57.1	56.8	56.6	56.4	56.2	56.2	56.2	56.4	56.5	56.6	56.6
48	ALTAIR	62	7.5	7.5	7.3	7.1	6.9	6.7	6.6	6.5	6.5	6.6	6.8	6.9	6.9
49	PEACOCK	53	18.2	18.1	18.0	17.6	17.3	16.9	16.6	16.4	16.5	16.6	16.9	17.1	17.2
50	DENEB	49	31.1	31.1	31.0	30.8	30.5	30.3	30.1	30.0	30.0	30.1	30.3	30.5	30.7
51	ENIF	33	46.3	46.3	46.3	46.1	46.0	45.7	45.5	45.4	45.3	45.4	45.5	45.6	45.7
52	AL NA IR	27	42.8	42.8	42.8	42.6	42.4	42.1	41.8	41.5	41.5	41.5	41.7	41.8	42.0
53	FOMALHAUT	15	23.0	23.1	23.1	23.0	22.8	22.6	22.3	22.1	22.0	22.0	22.1	22.2	22.3
54	MARKAB	13	37.4	37.5	37.5	37.4	37.2	37.0	36.8	36.6	36.5	36.5	36.5	36.6	36.7

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R.b.	Zvezda–Sazvežđe	δ	2015 JAN	FEB	MAR	APR	MAJ	JUN	JUL	AVG	SEP	OKT	NOV	DEC	2016 JAN
		°	′	′	′	′	′	′	′	′	′	′	′	′	′
1	α Andromedae	29	10.6	10.5	10.4	10.3	10.3	10.3	10.4	10.5	10.7	10.8	10.8	10.9	10.9
2	β Cassiopeae	59	14.3	14.2	14.1	13.9	13.8	13.8	13.8	14.0	14.1	14.3	14.4	14.5	14.5
3	β Ceti	−17	54.4	54.4	54.4	54.3	54.2	54.1	54.0	53.9	53.9	53.9	54.0	54.1	54.1
4	α Eridani	−57	10.0	10.0	9.9	9.8	9.6	9.4	9.3	9.2	9.2	9.3	9.5	9.6	9.7
5	α Arietis	23	32.0	32.0	31.9	31.9	31.9	31.9	31.9	32.0	32.1	32.2	32.2	32.3	32.3
6	α Ursae Minoris	89	19.9	19.9	19.9	19.8	19.7	19.5	19.4	19.4	19.5	19.6	19.8	19.9	20.1
7	α Persei	49	54.9	54.9	54.9	54.8	54.7	54.7	54.6	54.6	54.7	54.8	54.9	55.0	55.1
8	α Tauri	16	32.2	32.2	32.2	32.1	32.1	32.1	32.2	32.2	32.3	32.3	32.3	32.3	32.3
9	β Orionis	− 8	11.3	11.4	11.4	11.4	11.4	11.3	11.2	11.1	11.1	11.0	11.1	11.2	11.3
10	α Aurigae	46	0.6	0.7	0.7	0.7	0.6	0.6	0.5	0.5	0.5	0.5	0.5	0.6	0.7
11	γ Orionis	6	21.6	21.5	21.5	21.5	21.5	21.5	21.6	21.7	21.7	21.7	21.7	21.7	21.6
12	β Tauri	28	37.0	37.0	37.0	37.0	37.0	37.0	37.0	37.0	37.0	37.0	37.0	37.0	37.0
13	ε Orionis	− 1	11.8	11.8	11.9	11.9	11.9	11.8	11.7	11.7	11.6	11.6	11.6	11.7	11.8
14	α Orionis	7	24.3	24.3	24.3	24.3	24.3	24.3	24.4	24.4	24.5	24.5	24.4	24.4	24.3
15	α Carinae	−52	42.5	42.6	42.7	42.7	42.7	42.6	42.4	42.3	42.1	42.1	42.2	42.3	42.5
16	α Canis Majoris	−16	44.4	44.6	44.6	44.6	44.6	44.5	44.4	44.3	44.3	44.2	44.3	44.4	44.5
17	ε Canis Majoris	−28	59.8	59.9	60.0	0.0	0.0	59.9	59.8	59.7	59.6	59.5	59.6	59.7	59.8
18	α Canis Minoris	5	10.9	10.9	10.9	10.9	10.9	10.9	10.9	11.0	11.0	11.0	10.9	10.9	10.8
19	β Geminorum	27	59.1	59.1	59.1	59.2	59.2	59.2	59.2	59.1	59.1	59.1	59.0	59.0	59.0
20	ε Carinae	−59	33.5	33.7	33.9	34.0	34.0	34.0	33.9	33.7	33.5	33.4	33.4	33.5	33.7
21	λ Velorum	−43	29.6	29.8	30.0	30.1	30.1	30.1	30.0	29.9	29.7	29.6	29.6	29.7	29.8
22	β Carinae	−69	46.7	46.9	47.1	47.2	47.3	47.3	47.2	47.0	46.9	46.8	46.7	46.8	46.9
23	α Hydrae	− 8	43.6	43.7	43.8	43.8	43.8	43.8	43.7	43.6	43.6	43.6	43.6	43.7	43.8
24	α Leonis	11	53.4	53.4	53.3	53.4	53.4	53.4	53.4	53.5	53.4	53.4	53.3	53.2	53.2
25	α Ursae Majoris	61	39.8	39.9	40.0	40.1	40.2	40.3	40.2	40.2	40.0	39.9	39.7	39.6	39.5
26	β Leonis	14	29.1	29.1	29.0	29.1	29.1	29.2	29.2	29.2	29.2	29.1	29.1	28.9	28.8
27	α Crucis	−63	10.6	10.8	10.9	11.1	11.2	11.3	11.4	11.3	11.2	11.1	11.0	10.9	10.9
28	γ Crucis	−57	11.6	11.7	11.8	12.0	12.1	12.2	12.2	12.2	12.1	12.0	11.9	11.8	11.8
29	β Crucis	−59	45.9	46.0	46.2	46.4	46.5	46.6	46.6	46.6	46.5	46.4	46.3	46.2	46.2
30	ε Ursae Majoris	55	52.4	52.4	52.4	52.6	52.7	52.8	52.9	52.8	52.8	52.6	52.4	52.3	52.1
31	ζ Ursae Majoris	54	50.6	50.5	50.6	50.7	50.8	50.9	51.0	51.0	50.9	50.8	50.6	50.4	50.3
32	α Virginis	−11	14.3	14.4	14.5	14.5	14.5	14.5	14.5	14.5	14.4	14.4	14.4	14.5	14.6
33	η Ursae Majoris	49	14.1	14.0	14.1	14.2	14.3	14.4	14.5	14.5	14.5	14.3	14.2	14.0	13.8
34	θ Centauri	−36	26.4	26.4	26.5	26.6	26.7	26.8	26.8	26.8	26.8	26.7	26.6	26.6	26.6
35	α Bootis	19	6.2	6.1	6.1	6.1	6.2	6.3	6.3	6.4	6.4	6.3	6.2	6.1	5.9
36	α Centauri	−60	53.5	53.5	53.6	53.7	53.8	54.0	54.1	54.1	54.0	53.9	53.8	53.7	53.7
37	β Ursae Minoris	74	5.4	5.4	5.4	5.5	5.6	5.8	5.9	5.9	5.9	5.8	5.6	5.4	5.2
38	α Coronae Borealis	26	39.9	39.8	39.7	39.7	39.8	39.9	40.1	40.1	40.1	40.1	40.0	39.8	39.7
39	δ Scorpii	−22	39.6	39.7	39.7	39.8	39.8	39.8	39.8	39.8	39.8	39.8	39.7	39.7	39.8
40	α Scorpii	−26	27.7	27.7	27.7	27.8	27.8	27.8	27.8	27.8	27.8	27.8	27.8	27.8	27.8
41	α Trianguli Australi	−69	2.9	2.8	2.8	2.9	3.0	3.1	3.2	3.3	3.4	3.3	3.2	3.1	3.0
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	29.4	29.2	29.1	29.1	29.2	29.3	29.5	29.6	29.7	29.7	29.7	29.5	29.4
45	ε Sagittarii	−34	22.4	22.4	22.4	22.4	22.3	22.4	22.4	22.4	22.5	22.5	22.5	22.4	22.4
46	α Lyrae	38	48.0	47.9	47.8	47.8	47.8	48.0	48.1	48.3	48.4	48.4	48.4	48.3	48.1
47	σ Sagittarii	−26	16.5	16.5	16.5	16.4	16.4	16.4	16.4	16.4	16.4	16.4	16.4	16.4	16.4
48	α Aquilae	8	54.7	54.6	54.5	54.5	54.6	54.7	54.8	54.9	54.9	55.0	55.0	54.9	54.8
49	α Pavonis	−56	41.1	41.0	40.9	40.8	40.7	40.7	40.8	40.8	41.0	41.0	41.1	41.0	41.0
50	α Cygni	45	20.3	20.2	20.0	20.0	20.0	20.1	20.2	20.4	20.5	20.6	20.7	20.6	20.5
51	ε Pegasi	9	56.8	56.7	56.7	56.7	56.7	56.8	56.9	57.0	57.1	57.1	57.1	57.1	57.0
52	α Gruis	−46	53.4	53.3	53.2	53.1	52.9	52.9	52.8	52.8	52.9	53.0	53.1	53.1	53.1
53	α Piscis Austrini	−29	32.7	32.6	32.6	32.5	32.3	32.2	32.2	32.1	32.2	32.2	32.3	32.4	32.4
54	α Pegasi	15	17.3	17.2	17.2	17.1	17.2	17.2	17.3	17.4	17.5	17.6	17.6	17.6	17.6

VREMENA GORNJIH PROLAZA NAUTIČKIH ZVEZDA

kroz meridijan u Griniču

za 1. u mesecu

R.b.	Ime zvezde	2015 JAN	FEB	MAR	APR	MAJ	JUN	JUL	AVG	SEP	OKT	NOV	DEC	2016 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 28	15 26	13 35	11 33	9 35	7 33	5 34	3 32	1 30	23 32	21 29	19 31	17 29
2	CAPH	17 29	15 26	13 36	11 34	9 36	7 33	5 35	3 33	1 31	23 32	21 30	19 32	17 30
3	DIPHDA	18 3	16 1	14 10	12 8	10 10	8 8	6 9	4 7	2 5	0 7	22 5	20 6	18 4
4	ACHERNAR	18 57	16 55	15 4	13 2	11 4	9 2	7 3	5 1	2 59	1 1	22 58	21 0	18 58
5	HAMAL	19 27	17 24	15 34	13 32	11 34	9 31	7 33	5 31	3 29	1 30	23 28	21 30	19 28
6	POLARIS	20 11	18 8	16 12	14 14	12 15	10 13	8 16	6 14	4 13	2 16	0 14	22 16	20 13
7	MIRFAK	20 44	18 42	16 51	14 49	12 51	10 49	8 50	6 48	4 46	2 48	0 46	22 47	20 45
8	ALDEBARAN	21 55	19 53	18 3	16 1	14 2	12 0	10 2	7 60	5 57	3 59	1 57	23 59	21 56
9	RIGEL	22 34	20 32	18 41	16 39	14 41	12 39	10 40	8 38	6 36	4 38	2 35	0 37	22 35
10	CAPELLA	22 37	20 34	18 44	16 42	14 43	12 41	10 43	8 41	6 38	4 40	2 38	0 40	22 38
11	BELLATRIX	22 45	20 42	18 52	16 50	14 52	12 49	10 51	8 49	6 47	4 48	2 46	0 48	22 46
12	EL NATH	22 46	20 44	18 53	16 51	14 53	12 51	10 52	8 50	6 48	4 50	2 47	0 49	22 47
13	ALNILAM	22 56	20 53	19 3	17 1	15 3	13 0	11 2	8 60	6 58	4 59	2 57	0 59	22 57
14	BETELGEUSE	23 15	21 12	19 22	17 20	15 22	13 19	11 21	9 19	7 17	5 18	3 16	1 18	23 16
15	CANOPUS	23 43	21 41	19 50	17 48	15 50	13 48	11 49	9 47	7 45	5 47	3 44	1 46	23 44
16	SIRIUS	0 5	22 2	20 12	18 10	16 11	14 9	12 11	10 9	8 6	6 8	4 6	2 8	0 6
17	ADHARA	0 18	22 16	20 25	18 23	16 25	14 23	12 24	10 22	8 20	6 22	4 19	2 21	0 19
18	PROCYON	0 59	22 57	21 6	19 4	17 6	15 3	13 5	11 3	9 1	7 2	5 0	3 2	0 60
19	POLLUX	1 5	23 3	21 12	19 10	17 12	15 10	13 11	11 9	9 7	7 9	5 6	3 8	1 6
20	AVIOR	1 42	23 39	21 49	19 47	17 48	15 46	13 48	11 46	9 43	7 45	5 43	3 45	1 43
21	AL SUHAIL	2 27	0 25	22 35	20 32	18 34	16 32	14 34	12 31	10 29	8 31	6 29	4 30	2 28
22	MIAPLACIDUS	2 32	0 30	22 40	20 37	18 39	16 37	14 38	12 36	10 34	8 36	6 34	4 35	2 33
23	ALPHARD	2 47	0 45	22 54	20 52	18 54	16 52	14 53	12 51	10 49	8 51	6 48	4 50	2 48
24	REGULUS	3 28	1 26	23 35	21 33	19 35	17 33	15 34	13 32	11 30	9 32	7 29	5 31	3 29
25	DUBHE	4 23	2 21	0 31	22 29	20 30	18 28	16 30	14 27	12 25	10 27	8 25	6 27	4 24
26	DENEBOLA	5 9	3 6	1 16	23 14	21 15	19 13	17 15	15 13	13 10	11 12	9 10	7 12	5 10
27	ACRUX	5 46	3 44	1 54	23 51	21 53	19 51	17 53	15 50	13 48	11 50	9 48	7 49	5 47
28	GACRUX	5 51	3 49	1 58	23 56	21 58	19 55	17 57	15 55	13 53	11 54	9 52	7 54	5 52
29	MINOSA	6 7	4 5	2 15	0 13	22 14	20 12	18 14	16 11	14 9	12 11	10 9	8 11	6 8
30	ALIOTH	6 13	4 11	2 21	0 19	22 20	20 18	18 20	16 18	14 15	12 17	10 15	8 17	6 14
31	MIZAR	6 43	4 41	2 51	0 48	22 50	20 48	18 50	16 47	14 45	12 47	10 45	8 46	6 44
32	SPICA	6 45	4 42	2 52	0 50	22 52	20 49	18 51	16 49	14 47	12 48	10 46	8 48	6 46
33	ALKAID	7 7	5 5	3 14	1 12	23 14	21 12	19 13	17 11	15 9	13 10	11 8	9 10	7 8
34	MENKENT	7 26	5 24	3 34	1 31	23 33	21 31	19 33	17 30	15 28	13 30	11 28	9 29	7 27
35	ARCTURUS	7 35	5 33	3 42	1 40	23 42	21 40	19 41	17 39	15 37	13 39	11 36	9 38	7 36
36	RIGEL KENTAURUS	7 59	5 57	4 7	2 5	0 6	22 4	20 6	18 4	16 1	14 3	12 1	10 3	8 0
37	KOHAB	8 9	6 7	4 17	2 15	0 16	22 14	20 16	18 14	16 11	14 13	12 11	10 12	8 10
38	ALPHECCA	8 54	6 52	5 1	2 59	1 1	22 59	21 0	18 58	16 56	14 58	12 55	10 57	8 55
39	DSCHUBBA	9 20	7 18	5 27	3 25	1 27	23 25	21 26	19 24	17 22	15 24	13 21	11 23	9 21
40	ANTARES	9 49	7 47	5 56	3 54	1 56	23 54	21 55	19 53	17 51	15 53	13 50	11 52	9 50
41	ATRIA	10 9	8 7	6 16	4 14	2 16	0 14	22 15	20 13	18 11	16 13	14 10	12 12	10 10
42	SHAULA	10 53	8 51	7 1	4 59	3 0	0 58	22 60	20 58	18 55	16 57	14 55	12 57	10 54
43	RASALHAGUE	10 54	8 52	7 2	4 59	3 1	0 59	23 1	20 59	18 56	16 58	14 56	12 58	10 55
44	ELTANIN	11 16	9 13	7 23	5 21	3 23	1 20	23 22	21 20	19 18	17 19	15 17	13 19	11 17
45	KAUS AUSTRALIS	11 44	9 42	7 51	5 49	3 51	1 49	23 50	21 48	19 46	17 48	15 45	13 47	11 45
46	VEGA	11 56	9 54	8 4	6 1	4 3	2 1	0 3	22 0	19 58	17 60	15 58	13 59	11 57
47	NUNKI	12 15	10 13	8 22	6 20	4 22	2 20	0 21	22 19	20 17	18 19	16 16	14 18	12 16
48	ALTAIR	13 10	11 8	9 18	7 15	5 17	3 15	1 17	23 14	21 12	19 14	17 12	15 13	13 11
49	PEACOCK	13 45	11 43	9 53	7 51	5 52	3 50	1 52	23 50	21 48	19 49	17 47	15 49	13 46
50	DENEB	14 1	11 58	10 8	8 6	6 8	4 5	2 7	0 5	22 3	20 4	18 2	16 4	14 2
51	ENIF	15 4	13 1	11 11	9 9	7 11	5 8	3 10	1 8	23 6	21 7	19 5	17 7	15 5
52	AL NA IR	15 28	13 26	11 35	9 33	7 35	5 33	3 34	1 32	23 30	21 32	19 29	17 31	15 29
53	FOMALHAUT	16 17	14 15	12 25	10 22	8 24	6 22	4 24	2 21	0 19	22 21	20 19	18 20	16 18
54	MARKAB	16 24	41 22	12 32	10 29	8 31	6 29	4 31	2 28	0 26	22 28	20 26	18 27	16 25

POPRAVKA ZA DATUM

uvek 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 SEVERNJAČE

TABLICA I

S♈	Popravka
°	′
0	-30.0
1	-30.5
2	-30.9
3	-31.4
4	-31.8
5	-32.2
6	-32.6
7	-33.0
8	-33.4
9	-33.8
10	-34.2
11	-34.6
12	-34.9
13	-35.3
14	-35.6
15	-35.9
16	-36.2
17	-36.5
18	-36.8
19	-37.1
20	-37.4
21	-37.6
22	-37.9
23	-38.1
24	-38.3
25	-38.6
26	-38.8
27	-38.9
28	-39.1
29	-39.3
30	-39.4
31	-39.6
32	-39.7
33	-39.8
34	-39.9
35	-40.0
36	-40.1
37	-40.2
38	-40.2
39	-40.2
40	-40.3
41	-40.3
42	-40.3
43	-40.3
44	-40.3
45	-40.2
46	-40.2
47	-40.1
48	-40.1
49	-40.0
50	-39.9
51	-39.8
52	-39.7
53	-39.5
54	-39.4
55	-39.3
56	-39.1
57	-38.9
58	-38.7
59	-38.5
60	-38.3

S♈	Popravka
°	′
60	-38.3
61	-38.1
62	-37.8
63	-37.6
64	-37.3
65	-37.1
66	-36.8
67	-36.5
68	-36.2
69	-35.9
70	-35.6
71	-35.2
72	-34.9
73	-34.5
74	-34.1
75	-33.8
76	-33.4
77	-33.0
78	-32.6
79	-32.1
80	-31.7
81	-31.3
82	-30.8
83	-30.4
84	-29.9
85	-29.4
86	-28.9
87	-28.5
88	-28.0
89	-27.4
90	-26.9
91	-26.4
92	-25.9
93	-25.3
94	-24.8
95	-24.2
96	-23.6
97	-23.1
98	-22.5
99	-21.9
100	-21.3
101	-20.7
102	-20.1
103	-19.5
104	-18.9
105	-18.2
106	-17.6
107	-17.0
108	-16.3
109	-15.7
110	-15.0
111	-14.4
112	-13.7
113	-13.1
114	-12.4
115	-11.7
116	-11.1
117	-10.4
118	-9.7
119	-9.0
120	-8.3

S♈	Popravka
°	′
120	-8.3
121	-7.6
122	-6.9
123	-6.2
124	-5.5
125	-4.9
126	-4.2
127	-3.5
128	-2.8
129	-2.0
130	-1.3
131	-0.6
132	0.1
133	0.8
134	1.5
135	2.2
136	2.9
137	3.6
138	4.3
139	5.0
140	5.7
141	6.4
142	7.1
143	7.7
144	8.4
145	9.1
146	9.8
147	10.5
148	11.2
149	11.8
150	12.5
151	13.2
152	13.8
153	14.5
154	15.2
155	15.8
156	16.4
157	17.1
158	17.7
159	18.3
160	19.0
161	19.6
162	20.2
163	20.8
164	21.4
165	22.0
166	22.6
167	23.2
168	23.7
169	24.3
170	24.9
171	25.4
172	26.0
173	26.5
174	27.0
175	27.5
176	28.0
177	28.5
178	29.0
179	29.5
180	30.0

S♈	Popravka
°	′
180	30.0
181	30.5
182	30.9
183	31.4
184	31.8
185	32.2
186	32.6
187	33.0
188	33.4
189	33.8
190	34.2
191	34.6
192	34.9
193	35.3
194	35.6
195	35.9
196	36.2
197	36.5
198	36.8
199	37.1
200	37.4
201	37.6
202	37.9
203	38.1
204	38.3
205	38.6
206	38.8
207	38.9
208	39.1
209	39.3
210	39.4
211	39.6
212	39.7
213	39.8
214	39.9
215	40.0
216	40.1
217	40.2
218	40.2
219	40.2
220	40.3
221	40.3
222	40.3
223	40.3
224	40.3
225	40.2
226	40.2
227	40.1
228	40.1
229	40.0
230	39.9
231	39.8
232	39.7
233	39.5
234	39.4
235	39.3
236	39.1
237	38.9
238	38.7
239	38.5
240	38.3

S♈	Popravka
°	′
240	38.3
241	38.1
242	37.8
243	37.6
244	37.3
245	37.1
246	36.8
247	36.5
248	36.2
249	35.9
250	35.6
251	35.2
252	34.9
253	34.5
254	34.1
255	33.8
256	33.4
257	33.0
258	32.6
259	32.1
260	31.7
261	31.3
262	30.8
263	30.4
264	29.9
265	29.4
266	28.9
267	28.5
268	28.0
269	27.4
270	26.9
271	26.4
272	25.9
273	25.3
274	24.8
275	24.2
276	23.6
277	23.1
278	22.5
279	21.9
280	21.3
281	20.7
282	20.1
283	19.5
284	18.9
285	18.2
286	17.6
287	17.0
288	16.3
289	15.7
290	15.0
291	14.4
292	13.7
293	13.1
294	12.4
295	11.7
296	11.1
297	10.4
298	9.7
299	9.0
300	8.3

S♈	Popravka
°	′
300	8.3
301	7.6
302	6.9
303	6.2
304	5.5
305	4.9
306	4.2
307	3.5
308	2.8
309	2.0
310	1.3
311	0.6
312	-0.1
313	-0.8
314	-1.5
315	-2.2
316	-2.9
317	-3.6
318	-4.3
319	-5.0
320	-5.7
321	-6.4
322	-7.1
323	-7.7
324	-8.4
325	-9.1
326	-9.8
327	-10.5
328	-11.2
329	-11.8
330	-12.5
331	-13.2
332	-13.8
333	-14.5
334	-15.2
335	-15.8
336	-16.4
337	-17.1
338	-17.7
339	-18.3
340	-19.0
341	-19.6
342	-20.2
343	-20.8
344	-21.4
345	-22.0
346	-22.6
347	-23.2
348	-23.7
349	-24.3
350	-24.9
351	-25.4
352	-26.0
353	-26.5
354	-27.0
355	-27.5
356	-28.0
357	-28.5
358	-29.0
359	-29.5
360	-30.0

TABLICA II

$S\gamma$ \ φ		0°	10°	15°	20°	25°	30°	35°	40°	45°	50°	55°	60°	62°	64°	66°	φ / $S\gamma$	
h	°	′	′	′	′	′	′	′	′	′	′	′	′	′	′	′	°	h
1	15	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	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	0.0	0.0	60	4
5	75	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	0.1	0.1	75	5
6	90	0.0	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	0.3	90	6
7	105	0.0	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	0.4	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	0.3	0.4	0.5	0.5	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	0.4	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	0.3	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	0.1	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	0.0	0.0	240	16
17	255	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	0.1	0.1	255	17
18	270	0.0	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	0.3	270	18
19	285	0.0	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	0.4	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	0.3	0.4	0.5	0.5	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	0.4	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	0.3	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

$S\gamma$ \ Datum		2015 1. JAN	1. FEB	1. MAR	1. APR	1. MAJ	1. JUN	1. JUL	1. AVG	1. SEP	1. OKT	1. NOV	1. DEC	2016 1. JAN	Datum / $S\gamma$	
h	°	′	′	′	′	′	′	′	′	′	′	′	′	′	°	h
1	15	-.2	-.2	-.1	.0	.0	.2	.3	.3	.2	.1	-.1	-.2	-.4	15	1
2	30	-.2	-.2	-.2	-.1	.0	.2	.3	.3	.2	.1	-.1	-.2	-.4	30	2
3	45	-.2	-.2	-.2	-.1	.0	.2	.3	.3	.2	.1	-.1	-.2	-.4	45	3
4	60	-.2	-.2	-.2	-.1	.0	.2	.3	.3	.2	.1	-.1	-.2	-.4	60	4
5	75	-.2	-.2	-.2	-.1	-.1	.1	.2	.3	.2	.1	.0	-.1	-.3	75	5
6	90	-.1	-.1	-.2	-.1	-.1	.1	.2	.2	.2	.1	.0	-.1	-.2	90	6
7	105	-.1	-.1	-.1	-.1	-.1	.0	.1	.1	.1	.1	.0	.0	-.1	105	7
8	120	.0	-.1	-.1	-.1	-.1	.0	.0	.1	.1	.1	.1	.0	.0	120	8
9	135	.0	.0	.0	-.1	-.1	-.1	-.1	.0	.0	.1	.1	.1	.1	135	9
10	150	.1	.0	.0	-.1	-.1	-.1	-.1	-.1	.0	.0	.1	.1	.2	150	10
11	165	.1	.1	.1	.0	-.1	-.2	-.2	-.2	-.1	.0	.1	.2	.3	165	11
12	180	.2	.1	.1	.0	-.1	-.2	-.3	-.2	-.1	.0	.1	.2	.3	180	12
13	195	.2	.2	.1	.0	.0	-.2	-.3	-.3	-.2	-.1	.1	.2	.4	195	13
14	210	.2	.2	.2	.1	.0	-.2	-.3	-.3	-.2	-.1	.1	.2	.4	210	14
15	225	.2	.2	.2	.1	.0	-.2	-.3	-.3	-.2	-.1	.1	.2	.4	225	15
16	240	.2	.2	.2	.1	.0	-.2	-.3	-.3	-.2	-.1	.1	.2	.4	240	16
17	255	.2	.2	.2	.1	.1	-.1	-.2	-.3	-.2	-.1	.0	.1	.3	255	17
18	270	.1	.1	.2	.1	.1	-.1	-.2	-.2	-.2	-.1	.0	.1	.2	270	18
19	285	.1	.1	.1	.1	.1	.0	-.1	-.1	-.1	-.1	.0	.0	.1	285	19
20	300	.0	.1	.1	.1	.1	.0	.0	-.1	-.1	-.1	-.1	.0	.0	300	20
21	315	.0	.0	.0	.1	.1	.1	.1	.0	.0	-.1	-.1	-.1	-.1	315	21
22	330	-.1	.0	.0	.1	.1	.1	.1	.1	.0	.0	-.1	-.1	-.2	330	22
23	345	-.1	-.1	-.1	.0	.1	.2	.2	.2	.1	.0	-.1	-.2	-.3	345	23
24	360	-.2	-.1	-.1	.0	.1	.2	.3	.2	.1	.0	-.1	-.2	-.3	360	24

AZIMUTI SEVERNJAČE

$s\gamma$ \ φ	0°	30°	40°	50°	55°	60°	65°	70°	75°	$+\varphi = \nu$
°	°	°	°	°	°	°	°	°	°	°
0	0.5	0.6	0.6	0.8	0.9	1.0	1.2	1.5	2.0	360
15	0.3	0.4	0.4	0.5	0.6	0.7	0.8	1.0	1.4	15
30	0.2	0.2	0.2	0.3	0.3	0.3	0.4	0.5	0.7	30
45	360.0	360.0	360.0	360.0	360.0	359.9	359.9	359.9	359.9	45
60	359.8	359.8	359.7	359.7	359.6	359.6	359.5	359.4	359.1	60
75	359.6	359.6	359.5	359.4	359.3	359.2	359.1	358.8	358.5	75
90	359.5	359.4	359.3	359.2	359.1	358.9	358.7	358.4	357.9	90
105	359.4	359.3	359.2	359.0	358.9	358.7	358.5	358.1	357.5	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	358.9	358.8	358.6	358.2	357.7	165
180	359.5	359.4	359.4	359.2	359.2	359.0	358.9	358.6	358.2	180
195	359.7	359.6	359.6	359.5	359.4	359.3	359.2	359.0	358.7	195
210	359.8	359.8	359.8	359.8	359.7	359.7	359.6	359.5	359.4	210
225	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	225
240	0.2	0.2	0.3	0.3	0.4	0.4	0.5	0.6	0.8	240
255	0.4	0.4	0.5	0.6	0.7	0.8	0.9	1.1	1.4	255
270	0.5	0.6	0.7	0.8	0.9	1.0	1.2	1.5	2.0	270
285	0.6	0.7	0.8	1.0	1.1	1.3	1.5	1.8	2.4	285
300	0.7	0.8	0.9	1.1	1.2	1.4	1.7	2.0	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	1.7	2.0	2.7	330
345	0.6	0.7	0.8	1.0	1.1	1.2	1.5	1.8	2.4	345
360	0.5	0.6	0.6	0.8	0.9	1.0	1.2	1.5	2.0	360

O B J A Š NJ E NJ E

Poslednja rubrika daje podatak, koji algebarski sabran 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 merenju visine Severnjače.

⋆ ★ ★ ★ ⋆

Interpolacione

I

POMOĆNE TABLICE

INTERPOLACIONA TABLICA

za izračunavanje trenutaka izlaza i zalaza Sunca i Meseca

za $\varphi = 0°$ do $\pm 30°$									
$\Delta\varphi$ / Δt_s	1°	2°	3°	4°	5°	6°	7°	8°	9°
1	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9
2	0.2	0.4	0.6	0.8	1.0	1.2	1.4	1.6	1.8
3	0.3	0.6	0.9	1.2	1.5	1.8	2.1	2.4	2.7
4	0.4	0.8	1.2	1.6	2.0	2.4	2.8	3.2	3.6
5	0.5	1.0	1.5	2.0	2.5	3.0	3.5	4.0	4.5
6	0.6	1.2	1.8	2.4	3.0	3.6	4.2	4.8	5.4
7	0.7	1.4	2.1	2.8	3.5	4.2	4.9	5.6	6.3
8	0.8	1.6	2.4	3.2	4.0	4.8	5.6	6.4	7.2
9	0.9	1.8	2.7	3.6	4.5	5.4	6.3	7.2	8.1
10	1.0	2.0	3.0	4.0	5.0	6.0	7.0	8.0	9.0
11	1.1	2.2	3.3	4.4	5.5	6.6	7.7	8.8	9.9
12	1.2	2.4	3.6	4.8	6.0	7.2	8.4	9.6	10.8
13	1.3	2.6	3.9	5.2	6.5	7.8	9.1	10.4	11.7
14	1.4	2.8	4.2	5.6	7.0	8.4	9.8	11.2	12.6
15	1.5	3.0	4.5	6.0	7.5	9.0	10.5	12.0	13.5
16	1.6	3.2	4.8	6.4	8.0	9.6	11.2	12.8	14.4
17	1.7	3.4	5.1	6.8	8.5	10.2	11.9	13.6	15.3
18	1.8	3.6	5.4	7.2	9.0	10.8	12.6	14.4	16.2
19	1.9	3.8	5.7	7.6	9.5	11.4	13.3	15.2	17.1
20	2.0	4.0	6.0	8.0	10.0	12.0	14.0	16.0	18.0
21	2.1	4.2	6.3	8.4	10.5	12.6	14.7	16.8	18.9
22	2.2	4.4	6.6	8.8	11.0	13.2	15.4	17.6	19.8
23	2.3	4.6	6.9	9.2	11.5	13.8	16.1	18.4	20.7
24	2.4	4.8	7.2	9.6	12.0	14.4	16.8	19.2	21.6
25	2.5	5.0	7.5	10.0	12.5	15.0	17.5	20.0	22.5
26	2.6	5.2	7.8	10.4	13.0	15.6	18.2	20.8	23.4
27	2.7	5.4	8.1	10.8	13.5	16.2	18.9	21.6	24.3
28	2.8	5.6	8.4	11.2	14.0	16.8	19.6	22.4	25.2
29	2.9	5.8	8.7	11.6	14.5	17.4	20.3	23.2	26.1
30	3.0	6.0	9.0	12.0	15.0	18.0	21.0	24.0	27.0
31	3.1	6.2	9.3	12.4	15.5	18.6	21.7	24.8	27.9
32	3.2	6.4	9.6	12.8	16.0	19.2	22.4	25.6	28.8
33	3.3	6.6	9.9	13.2	16.5	19.8	23.1	26.4	29.7
34	3.4	6.8	10.2	13.6	17.0	20.4	23.8	27.2	30.6
35	3.5	7.0	10.5	14.0	17.5	21.0	24.5	28.0	31.5
36	3.6	7.2	10.8	14.4	18.0	21.6	25.2	28.8	32.4
37	3.7	7.4	11.1	14.8	18.5	22.2	25.9	29.6	33.3
38	3.8	7.6	11.4	15.2	19.0	22.8	26.6	30.4	34.2
39	3.9	7.8	11.7	15.6	19.5	23.4	27.3	31.2	35.1
40	4.0	8.0	12.0	16.0	20.0	24.0	28.0	32.0	36.0
41	4.1	8.2	12.3	16.4	20.5	24.6	28.7	32.8	36.9
42	4.2	8.4	12.6	16.8	21.0	25.2	29.4	33.6	37.8
43	4.3	8.6	12.9	17.2	21.5	25.8	30.1	34.4	38.7
44	4.4	8.8	13.2	17.6	22.0	26.4	30.8	35.2	39.6
45	4.5	9.0	13.5	18.0	22.5	27.0	31.5	36.0	40.5
46	4.6	9.2	13.8	18.4	23.0	27.6	32.2	36.8	41.4
47	4.7	9.4	14.1	18.8	23.5	28.2	32.9	37.6	42.3
48	4.8	9.6	14.4	19.2	24.0	28.8	33.6	38.4	43.2
49	4.9	9.8	14.7	19.6	24.5	29.4	34.3	39.2	44.1
50	5.0	10.0	15.0	20.0	25.0	30.0	35.0	40.0	45.0
51	5.1	10.2	15.3	20.4	25.5	30.6	35.7	40.8	45.9
52	5.2	10.4	15.6	20.8	26.0	31.2	36.4	41.6	46.8
53	5.3	10.6	15.9	21.2	26.5	31.8	37.1	42.4	47.7
54	5.4	10.8	16.2	21.6	27.0	32.4	37.8	43.2	48.6
55	5.5	11.0	16.5	22.0	27.5	33.0	38.5	44.0	49.5
56	5.6	11.2	16.8	22.4	28.0	33.6	39.2	44.8	50.4
57	5.7	11.4	17.1	22.8	28.5	34.2	39.9	45.6	51.3
58	5.8	11.6	17.4	23.2	29.0	34.8	40.6	46.4	52.2
59	5.9	11.8	17.7	23.6	29.5	35.4	41.3	47.2	53.1
60	6.0	12.0	18.0	24.0	30.0	36.0	42.0	48.0	54.0

za $\varphi = 0°$ do $\pm 30°$										
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	0.0	0.0	0.1	0.1	0.1	0.1	0.1	1
0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.2	0.2	2
0.0	0.1	0.1	0.1	0.2	0.2	0.2	0.2	0.3	3
0.0	0.1	0.1	0.2	0.2	0.2	0.3	0.3	0.4	4
0.1	0.1	0.2	0.2	0.3	0.3	0.4	0.4	0.5	5
0.1	0.1	0.2	0.2	0.3	0.4	0.4	0.5	0.5	6
0.1	0.1	0.2	0.3	0.4	0.4	0.5	0.6	0.6	7
0.1	0.2	0.2	0.3	0.4	0.5	0.6	0.6	0.7	8
0.1	0.2	0.3	0.4	0.5	0.5	0.6	0.7	0.8	9
0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9	10
0.1	0.2	0.3	0.4	0.6	0.7	0.8	0.9	1.0	11
0.1	0.2	0.4	0.5	0.6	0.7	0.8	1.0	1.1	12
0.1	0.3	0.4	0.5	0.7	0.8	0.9	1.0	1.2	13
0.1	0.3	0.4	0.6	0.7	0.8	1.0	1.1	1.3	14
0.2	0.3	0.5	0.6	0.8	0.9	1.1	1.2	1.4	15
0.2	0.3	0.5	0.6	0.8	1.0	1.1	1.3	1.4	16
0.2	0.3	0.5	0.7	0.9	1.0	1.2	1.4	1.5	17
0.2	0.4	0.5	0.7	0.9	1.1	1.3	1.4	1.6	18
0.2	0.4	0.6	0.8	1.0	1.1	1.3	1.5	1.7	19
0.2	0.4	0.6	0.8	1.0	1.2	1.4	1.6	1.8	20
0.2	0.4	0.6	0.8	1.1	1.3	1.5	1.7	1.9	21
0.2	0.4	0.7	0.9	1.1	1.3	1.5	1.8	2.0	22
0.2	0.5	0.7	0.9	1.2	1.4	1.6	1.8	2.1	23
0.2	0.5	0.7	1.0	1.2	1.4	1.7	1.9	2.2	24
0.3	0.5	0.8	1.0	1.3	1.5	1.8	2.0	2.3	25
0.3	0.5	0.8	1.0	1.3	1.6	1.8	2.1	2.3	26
0.3	0.5	0.8	1.1	1.4	1.6	1.9	2.2	2.4	27
0.3	0.6	0.8	1.1	1.4	1.7	2.0	2.2	2.5	28
0.3	0.6	0.9	1.2	1.5	1.7	2.0	2.3	2.6	29
0.3	0.6	0.9	1.2	1.5	1.8	2.1	2.4	2.7	30
0.3	0.6	0.9	1.2	1.6	1.9	2.2	2.5	2.8	31
0.3	0.6	1.0	1.3	1.6	1.9	2.2	2.6	2.9	32
0.3	0.7	1.0	1.3	1.7	2.0	2.3	2.6	3.0	33
0.3	0.7	1.0	1.4	1.7	2.0	2.4	2.7	3.1	34
0.4	0.7	1.1	1.4	1.8	2.1	2.5	2.8	3.2	35
0.4	0.7	1.1	1.4	1.8	2.2	2.5	2.9	3.2	36
0.4	0.7	1.1	1.5	1.9	2.2	2.6	3.0	3.3	37
0.4	0.8	1.1	1.5	1.9	2.3	2.7	3.0	3.4	38
0.4	0.8	1.2	1.6	2.0	2.3	2.7	3.1	3.5	39
0.4	0.8	1.2	1.6	2.0	2.4	2.8	3.2	3.6	40
0.4	0.8	1.2	1.6	2.1	2.5	2.9	3.3	3.7	41
0.4	0.8	1.3	1.7	2.1	2.5	2.9	3.4	3.8	42
0.4	0.9	1.3	1.7	2.2	2.6	3.0	3.4	3.9	43
0.4	0.9	1.3	1.8	2.2	2.6	3.1	3.5	4.0	44
0.5	0.9	1.4	1.8	2.3	2.7	3.2	3.6	4.1	45
0.5	0.9	1.4	1.8	2.3	2.8	3.2	3.7	4.1	46
0.5	0.9	1.4	1.9	2.4	2.8	3.3	3.8	4.2	47
0.5	1.0	1.4	1.9	2.4	2.9	3.4	3.8	4.3	48
0.5	1.0	1.5	2.0	2.5	2.9	3.4	3.9	4.4	49
0.5	1.0	1.5	2.0	2.5	3.0	3.5	4.0	4.5	50
0.5	1.0	1.5	2.0	2.6	3.1	3.6	4.1	4.6	51
0.5	1.0	1.6	2.1	2.6	3.1	3.6	4.2	4.7	52
0.5	1.1	1.6	2.1	2.7	3.2	3.7	4.2	4.8	53
0.5	1.1	1.6	2.2	2.7	3.2	3.8	4.3	4.9	54
0.6	1.1	1.7	2.2	2.8	3.3	3.9	4.4	5.0	55
0.6	1.1	1.7	2.2	2.8	3.4	3.9	4.5	5.0	56
0.6	1.1	1.7	2.3	2.9	3.4	4.0	4.6	5.1	57
0.6	1.2	1.7	2.3	2.9	3.5	4.1	4.6	5.2	58
0.6	1.2	1.8	2.4	3.0	3.5	4.1	4.7	5.3	59
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 Meseca

za $\varphi = \pm(30^\circ$ do $60^\circ)$											
Δt_s \ $\Delta\varphi$	1°	2°	3°	4°	0°.1	0°.2	0°.3	0°.4	0°.5	0°.6	0°.7	0°.8	0°.9	Δt_s \ $\Delta\varphi$
1	0.2	0.4	0.6	0.8	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.2	0.2	1
2	0.4	0.8	1.2	1.6	0.0	0.1	0.1	0.2	0.2	0.2	0.3	0.3	0.4	2
3	0.6	1.2	1.8	2.4	0.1	0.1	0.2	0.2	0.3	0.4	0.4	0.5	0.5	3
4	0.8	1.6	2.4	3.2	0.1	0.2	0.2	0.3	0.4	0.5	0.6	0.6	0.7	4
5	1.0	2.0	3.0	4.0	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9	5
6	1.2	2.4	3.6	4.8	0.1	0.2	0.4	0.5	0.6	0.7	0.8	1.0	1.1	6
7	1.4	2.8	4.2	5.6	0.1	0.3	0.4	0.6	0.7	0.8	1.0	1.1	1.3	7
8	1.6	3.2	4.8	6.4	0.2	0.3	0.5	0.6	0.8	1.0	1.1	1.3	1.4	8
9	1.8	3.6	5.4	7.2	0.2	0.4	0.5	0.7	0.9	1.1	1.3	1.4	1.6	9
10	2.0	4.0	6.0	8.0	0.2	0.4	0.6	0.8	1.0	1.2	1.4	1.6	1.8	10
11	2.2	4.4	6.6	8.8	0.2	0.4	0.7	0.9	1.1	1.3	1.5	1.8	2.0	11
12	2.4	4.8	7.2	9.6	0.2	0.5	0.7	1.0	1.2	1.4	1.7	1.9	2.2	12
13	2.6	5.2	7.8	10.4	0.3	0.5	0.8	1.0	1.3	1.6	1.8	2.1	2.3	13
14	2.8	5.6	8.4	11.2	0.3	0.6	0.8	1.1	1.4	1.7	2.0	2.2	2.5	14
15	3.0	6.0	9.0	12.0	0.3	0.6	0.9	1.2	1.5	1.8	2.1	2.4	2.7	15
16	3.2	6.4	9.6	12.8	0.3	0.6	1.0	1.3	1.6	1.9	2.2	2.6	2.9	16
17	3.4	6.8	10.2	13.6	0.3	0.7	1.0	1.4	1.7	2.0	2.4	2.7	3.1	17
18	3.6	7.2	10.8	14.4	0.4	0.7	1.1	1.4	1.8	2.2	2.5	2.9	3.2	18
19	3.8	7.6	11.4	15.2	0.4	0.8	1.1	1.5	1.9	2.3	2.7	3.0	3.4	19
20	4.0	8.0	12.0	16.0	0.4	0.8	1.2	1.6	2.0	2.4	2.8	3.2	3.6	20
21	4.2	8.4	12.6	16.8	0.4	0.8	1.3	1.7	2.1	2.5	2.9	3.4	3.8	21
22	4.4	8.8	13.2	17.6	0.4	0.9	1.3	1.8	2.2	2.6	3.1	3.5	4.0	22
23	4.6	9.2	13.8	18.4	0.5	0.9	1.4	1.8	2.3	2.8	3.2	3.7	4.1	23
24	4.8	9.6	14.4	19.2	0.5	1.0	1.4	1.9	2.4	2.9	3.4	3.8	4.3	24
25	5.0	10.0	15.0	20.0	0.5	1.0	1.5	2.0	2.5	3.0	3.5	4.0	4.5	25
26	5.2	10.4	15.6	20.8	0.5	1.0	1.6	2.1	2.6	3.1	3.6	4.2	4.7	26
27	5.4	10.8	16.2	21.6	0.5	1.1	1.6	2.2	2.7	3.2	3.8	4.3	4.9	27
28	5.6	11.2	16.8	22.4	0.6	1.1	1.7	2.2	2.8	3.4	3.9	4.5	5.0	28
29	5.8	11.6	17.4	23.2	0.6	1.2	1.7	2.3	2.9	3.5	4.1	4.6	5.2	29
30	6.0	12.0	18.0	24.0	0.6	1.2	1.8	2.4	3.0	3.6	4.2	4.8	5.4	30
31	6.2	12.4	18.6	24.8	0.6	1.2	1.9	2.5	3.1	3.7	4.3	5.0	5.6	31
32	6.4	12.8	19.2	25.6	0.6	1.3	1.9	2.6	3.2	3.8	4.5	5.1	5.8	32
33	6.6	13.2	19.8	26.4	0.7	1.3	2.0	2.6	3.3	4.0	4.6	5.3	5.9	33
34	6.8	13.6	20.4	27.2	0.7	1.4	2.0	2.7	3.4	4.1	4.8	5.4	6.1	34
35	7.0	14.0	21.0	28.0	0.7	1.4	2.1	2.8	3.5	4.2	4.9	5.6	6.3	35
36	7.2	14.4	21.6	28.8	0.7	1.4	2.2	2.9	3.6	4.3	5.0	5.8	6.5	36
37	7.4	14.8	22.2	29.6	0.7	1.5	2.2	3.0	3.7	4.4	5.2	5.9	6.7	37
38	7.6	15.2	22.8	30.4	0.8	1.5	2.3	3.0	3.8	4.6	5.3	6.1	6.8	38
39	7.8	15.6	23.4	31.2	0.8	1.6	2.3	3.1	3.9	4.7	5.5	6.2	7.0	39
40	8.0	16.0	24.0	32.0	0.8	1.6	2.4	3.2	4.0	4.8	5.6	6.4	7.2	40
41	8.2	16.4	24.6	32.8	0.8	1.6	2.5	3.3	4.1	4.9	5.7	6.6	7.4	41
42	8.4	16.8	25.2	33.6	0.8	1.7	2.5	3.4	4.2	5.0	5.9	6.7	7.6	42
43	8.6	17.2	25.8	34.4	0.9	1.7	2.6	3.4	4.3	5.2	6.0	6.9	7.7	43
44	8.8	17.6	26.4	35.2	0.9	1.8	2.6	3.5	4.4	5.3	6.2	7.0	7.9	44
45	9.0	18.0	27.0	36.0	0.9	1.8	2.7	3.6	4.5	5.4	6.3	7.2	8.1	45
46	9.2	18.4	27.6	36.8	0.9	1.8	2.8	3.7	4.6	5.5	6.4	7.4	8.3	46
47	9.4	18.8	28.2	37.6	0.9	1.9	2.8	3.8	4.7	5.6	6.6	7.5	8.5	47
48	9.6	19.2	28.8	38.4	1.0	1.9	2.9	3.8	4.8	5.8	6.7	7.7	8.6	48
49	9.8	19.6	29.4	39.2	1.0	2.0	2.9	3.9	4.9	5.9	6.9	7.8	8.8	49
50	10.0	20.0	30.0	40.0	1.0	2.0	3.0	4.0	5.0	6.0	7.0	8.0	9.0	50
51	10.2	20.4	30.6	40.8	1.0	2.0	3.1	4.1	5.1	6.1	7.1	8.2	9.2	51
52	10.4	20.8	31.2	41.6	1.0	2.1	3.1	4.2	5.2	6.2	7.3	8.3	9.4	52
53	10.6	21.2	31.8	42.4	1.1	2.1	3.2	4.2	5.3	6.4	7.4	8.5	9.5	53
54	10.8	21.6	32.4	43.2	1.1	2.2	3.2	4.3	5.4	6.5	7.6	8.6	9.7	54
55	11.0	22.0	33.0	44.0	1.1	2.2	3.3	4.4	5.5	6.6	7.7	8.8	9.9	55
56	11.2	22.4	33.6	44.8	1.1	2.2	3.4	4.5	5.6	6.7	7.8	9.0	10.1	56
57	11.4	22.8	34.2	45.6	1.1	2.3	3.4	4.6	5.7	6.8	8.0	9.1	10.3	57
58	11.6	23.2	34.8	46.4	1.2	2.3	3.5	4.6	5.8	7.0	8.1	9.3	10.4	58
59	11.8	23.6	35.4	47.2	1.2	2.4	3.5	4.7	5.9	7.1	8.3	9.4	10.6	59
60	12.0	24.0	36.0	48.0	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 Meseca 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°	$\frac{\Delta}{24}$ \ λ
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

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$\frac{\Delta}{24}$ \ λ	20°	30°	40°	50°	60°	70°	80°	90°	100°	110°	120°	130°	140°	150°	160°	170°	180°	$\frac{\Delta}{24}$ \ λ
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

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$I_n$terpolaciona tablica

ZA

POPRAVKU ČASOVNOG UGLA I DEKLINACIJE

0 h 0 min

POPRAVKA ČASOVNOG UGLA				POPRAVKA DRUGOG REDA za časovni ugao i deklinaciju Sunca, Meseca i planeta					
s	SUNCA I PLANETA	PROLEĆNE TAČKE ♈	MESECA ☾	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, Meseca i planeta					
s	SUNCA I PLANETA	PROLEĆNE TAČKE ♈	MESECA ☾	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, Meseca i planeta					
s	SUNCA I PLANETA	PROLEĆNE TAČKE ♈	MESECA ☾	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, Meseca i planeta					
s	SUNCA I PLANETA	PROLEĆNE TAČKE ♈	MESECA ☾	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, Meseca i planeta					
s	SUNCA I PLANETA	PROLEĆNE TAČKE ♈	MESECA ☾	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, Meseca i planeta					
s	SUNCA I PLANETA	PROLEĆNE TAČKE ♈	MESECA ☾	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, Meseca i planeta					
s	SUNCA I PLANETA	PROLEĆNE TAČKE ♈	MESECA ☾	Δ	popr.	Δ	popr.	Δ	popr.
	° ′	° ′	° ′		′		′		′
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, Meseca i planeta					
s	SUNCA I PLANETA	PROLEĆNE TAČKE ♈	MESECA ☾	Δ	popr.	Δ	popr.	Δ	popr.
	° ′	° ′	° ′		′		′		′
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

POPRAVKA ČASOVNOG UGLA				POPRAVKA DRUGOG REDA za časovni ugao i deklinaciju Sunca, Meseca i planeta					
s	SUNCA I PLANETA	PROLEĆNE TAČKE ♈	MESECA ☾	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

POPRAVKA ČASOVNOG UGLA				POPRAVKA DRUGOG REDA za časovni ugao i deklinaciju Sunca, Meseca i planeta					
s	SUNCA I PLANETA	PROLEĆNE TAČKE ♈	MESECA ☾	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, Meseca i planeta					
s	SUNCA I PLANETA	PROLEĆNE TAČKE ♈	MESECA ☾	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, Meseca i planeta					
s	SUNCA I PLANETA	PROLEĆNE TAČKE ♈	MESECA ☾	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, Meseca i planeta					
s	SUNCA I PLANETA	PROLEĆNE TAČKE ♈	MESECA ☾	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, Meseca i planeta					
s	SUNCA I PLANETA	PROLEĆNE TAČKE ♈	MESECA ☾	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

POPRAVKA ČASOVNOG UGLA				POPRAVKA DRUGOG REDA za časovni ugao i deklinaciju Sunca, Meseca i planeta					
s	SUNCA I PLANETA	PROLEĆNE TAČKE ♈	MESECA ☾	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

POPRAVKA ČASOVNOG UGLA				POPRAVKA DRUGOG REDA za časovni ugao i deklinaciju Sunca, Meseca i planeta					
s	SUNCA I PLANETA	PROLEĆNE TAČKE ♈	MESECA ☾	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

POPRAVKA ČASOVNOG UGLA				POPRAVKA DRUGOG REDA za časovni ugao i deklinaciju Sunca, Meseca i planeta					
s	SUNCA I PLANETA	PROLEĆNE TAČKE ♈	MESECA ☾	Δ	popr.	Δ	popr.	Δ	popr.
	° ′	° ′	° ′		′		′		′
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

POPRAVKA ČASOVNOG UGLA				POPRAVKA DRUGOG REDA za časovni ugao i deklinaciju Sunca, Meseca i planeta					
s	SUNCA I PLANETA	PROLEĆNE TAČKE ♈	MESECA ☾	Δ	popr.	Δ	popr.	Δ	popr.
	° ′	° ′	° ′		′		′		′
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, Meseca i planeta					
s	SUNCA I PLANETA	PROLEĆNE TAČKE ♈	MESECA ☾	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, Meseca i planeta					
s	SUNCA I PLANETA	PROLEĆNE TAČKE ♈	MESECA ☾	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

POPRAVKA ČASOVNOG UGLA				POPRAVKA DRUGOG REDA za časovni ugao i deklinaciju Sunca, Meseca i planeta					
s	SUNCA I PLANETA	PROLEĆNE TAČKE ♈	MESECA ☾	Δ	popr.	Δ	popr.	Δ	popr.
	° ′	° ′	° ′		′		′		′
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

POPRAVKA ČASOVNOG UGLA				POPRAVKA DRUGOG REDA za časovni ugao i deklinaciju Sunca, Meseca i planeta					
s	SUNCA I PLANETA	PROLEĆNE TAČKE ♈	MESECA ☾	Δ	popr.	Δ	popr.	Δ	popr.
	° ′	° ′	° ′		′		′		′
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, Meseca i planeta					
s	SUNCA I PLANETA	PROLEĆNE TAČKE ♈	MESECA ☾	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, Meseca i planeta					
s	SUNCA I PLANETA	PROLEĆNE TAČKE ♈	MESECA ☾	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

POPRAVKA ČASOVNOG UGLA				POPRAVKA DRUGOG REDA za časovni ugao i deklinaciju Sunca, Meseca i planeta					
s	SUNCA I PLANETA	PROLEĆNE TAČKE ♈	MESECA ☾	Δ	popr.	Δ	popr.	Δ	popr.
	° ′	° ′	° ′		′		′		′
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

POPRAVKA ČASOVNOG UGLA				POPRAVKA DRUGOG REDA za časovni ugao i deklinaciju Sunca, Meseca i planeta					
s	SUNCA I PLANETA	PROLEĆNE TAČKE ♈	MESECA ☾	Δ	popr.	Δ	popr.	Δ	popr.
	° ′	° ′	° ′		′		′		′
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

POPRAVKA ČASOVNOG UGLA				POPRAVKA DRUGOG REDA za časovni ugao i deklinaciju Sunca, Meseca i planeta					
s	SUNCA I PLANETA	PROLEĆNE TAČKE ♈	MESECA ☾	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

POPRAVKA ČASOVNOG UGLA				POPRAVKA DRUGOG REDA za časovni ugao i deklinaciju Sunca, Meseca i planeta					
s	SUNCA I PLANETA	PROLEĆNE TAČKE ♈	MESECA ☾	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

POPRAVKA ČASOVNOG UGLA				POPRAVKA DRUGOG REDA za časovni ugao i deklinaciju Sunca, Meseca i planeta					
s	SUNCA I PLANETA	PROLEĆNE TAČKE ♈	MESECA ☾	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

POPRAVKA ČASOVNOG UGLA				POPRAVKA DRUGOG REDA za časovni ugao i deklinaciju Sunca, Meseca i planeta					
s	SUNCA I PLANETA	PROLEĆNE TAČKE ♈	MESECA ☾	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, Meseca i planeta					
s	SUNCA I PLANETA	PROLEĆNE TAČKE ♈	MESECA ☾	Δ	popr.	Δ	popr.	Δ	popr.
	° ′	° ′	° ′		′		′		′
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, Meseca i planeta					
s	SUNCA I PLANETA	PROLEĆNE TAČKE ♈	MESECA ☾	Δ	popr.	Δ	popr.	Δ	popr.
	° ′	° ′	° ′		′		′		′
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, Meseca i planeta					
s	SUNCA I PLANETA	PROLEĆNE TAČKE ♈	MESECA ☾	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, Meseca i planeta					
s	SUNCA I PLANETA	PROLEĆNE TAČKE ♈	MESECA ☾	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, Meseca i planeta					
s	SUNCA I PLANETA	PROLEĆNE TAČKE ♈	MESECA ☾	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, Meseca i planeta					
s	SUNCA I PLANETA	PROLEĆNE TAČKE ♈	MESECA ☾	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

POPRAVKA ČASOVNOG UGLA				POPRAVKA DRUGOG REDA za časovni ugao i deklinaciju Sunca, Meseca i planeta					
s	SUNCA I PLANETA	PROLEĆNE TAČKE ♈	MESECA ☾	Δ	popr.	Δ	popr.	Δ	popr.
	° ′	° ′	° ′		′		′		′
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

POPRAVKA ČASOVNOG UGLA				POPRAVKA DRUGOG REDA za časovni ugao i deklinaciju Sunca, Meseca i planeta					
s	SUNCA I PLANETA	PROLEĆNE TAČKE ♈	MESECA ☾	Δ	popr.	Δ	popr.	Δ	popr.
	° ′	° ′	° ′		′		′		′
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

POPRAVKA ČASOVNOG UGLA				POPRAVKA DRUGOG REDA za časovni ugao i deklinaciju Sunca, Meseca i planeta					
s	SUNCA I PLANETA	PROLEĆNE TAČKE ♈	MESECA ☾	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

POPRAVKA ČASOVNOG UGLA				POPRAVKA DRUGOG REDA za časovni ugao i deklinaciju Sunca, Meseca i planeta					
s	SUNCA I PLANETA	PROLEĆNE TAČKE ♈	MESECA ☾	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, Meseca i planeta					
s	SUNCA I PLANETA		PROLEĆNE TAČKE ♈		MESECA ☾		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, Meseca i planeta					
s	SUNCA I PLANETA		PROLEĆNE TAČKE ♈		MESECA ☾		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, Meseca i planeta					
s	SUNCA I PLANETA	PROLEĆNE TAČKE ♈	MESECA ☾	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, Meseca i planeta					
s	SUNCA I PLANETA	PROLEĆNE TAČKE ♈	MESECA ☾	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, Meseca i planeta					
s	SUNCA I PLANETA		PROLEĆNE TAČKE ♈		MESECA ☾		Δ	popr.	Δ	popr.	Δ	popr.
	°	′	°	′	°	′		′		′		′
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, Meseca i planeta					
s	SUNCA I PLANETA		PROLEĆNE TAČKE ♈		MESECA ☾		Δ	popr.	Δ	popr.	Δ	popr.
	°	′	°	′	°	′		′		′		′
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, Meseca i planeta					
s	SUNCA I PLANETA	PROLEĆNE TAČKE ♈	MESECA ☾	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, Meseca i planeta					
s	SUNCA I PLANETA	PROLEĆNE TAČKE ♈	MESECA ☾	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, Meseca i planeta					
s	SUNCA I PLANETA	PROLEĆNE TAČKE ♈	MESECA ☾	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, Meseca i planeta					
s	SUNCA I PLANETA	PROLEĆNE TAČKE ♈	MESECA ☾	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

POPRAVKA ČASOVNOG UGLA				POPRAVKA DRUGOG REDA za časovni ugao i deklinaciju Sunca, Meseca i planeta					
s	SUNCA I PLANETA	PROLEĆNE TAČKE ♈	MESECA ☾	Δ	popr.	Δ	popr.	Δ	popr.
	° ′	° ′	° ′		′		′		′
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

POPRAVKA ČASOVNOG UGLA				POPRAVKA DRUGOG REDA za časovni ugao i deklinaciju Sunca, Meseca i planeta					
s	SUNCA I PLANETA	PROLEĆNE TAČKE ♈	MESECA ☾	Δ	popr.	Δ	popr.	Δ	popr.
	° ′	° ′	° ′		′		′		′
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, Meseca i planeta					
s	SUNCA I PLANETA		PROLEĆNE TAČKE ♈		MESECA ☾		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, Meseca i planeta					
s	SUNCA I PLANETA		PROLEĆNE TAČKE ♈		MESECA ☾		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, Meseca i planeta					
s	SUNCA I PLANETA	PROLEĆNE TAČKE ♈	MESECA ☾	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, Meseca i planeta					
s	SUNCA I PLANETA	PROLEĆNE TAČKE ♈	MESECA ☾	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, Meseca i planeta					
s	SUNCA I PLANETA		PROLEĆNE TAČKE ♈		MESECA ☾		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, Meseca i planeta					
s	SUNCA I PLANETA		PROLEĆNE TAČKE ♈		MESECA ☾		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

POPRAVKA ČASOVNOG UGLA				POPRAVKA DRUGOG REDA za časovni ugao i deklinaciju Sunca, Meseca i planeta					
s	SUNCA I PLANETA	PROLEĆNE TAČKE ♈	MESECA ☾	Δ	popr.	Δ	popr.	Δ	popr.
	° ′	° ′	° ′		′		′		′
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

POPRAVKA ČASOVNOG UGLA				POPRAVKA DRUGOG REDA za časovni ugao i deklinaciju Sunca, Meseca i planeta					
s	SUNCA I PLANETA	PROLEĆNE TAČKE ♈	MESECA ☾	Δ	popr.	Δ	popr.	Δ	popr.
	° ′	° ′	° ′		′		′		′
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, Meseca i planeta					
s	SUNCA I PLANETA	PROLEĆNE TAČKE ♈	MESECA ☾	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, Meseca i planeta					
s	SUNCA I PLANETA	PROLEĆNE TAČKE ♈	MESECA ☾	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, Meseca i planeta					
s	SUNCA I PLANETA	PROLEĆNE TAČKE ♈	MESECA ☾	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, Meseca i planeta					
s	SUNCA I PLANETA	PROLEĆNE TAČKE ♈	MESECA ☾	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, Meseca i planeta					
s	SUNCA I PLANETA		PROLEĆNE TAČKE ♈		MESECA ☾	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, Meseca i planeta					
s	SUNCA I PLANETA		PROLEĆNE TAČKE ♈		MESECA ☾	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, Meseca i planeta					
s	SUNCA I PLANETA	PROLEĆNE TAČKE ♈	MESECA ☾	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, Meseca i planeta					
s	SUNCA I PLANETA	PROLEĆNE TAČKE ♈	MESECA ☾	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, Meseca i planeta					
s	SUNCA I PLANETA	PROLEĆNE TAČKE ♈	MESECA ☾	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, Meseca i planeta					
s	SUNCA I PLANETA	PROLEĆNE TAČKE ♈	MESECA ☾	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, Meseca i planeta					
s	SUNCA I PLANETA	PROLEĆNE TAČKE ♈	MESECA ☾	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, Meseca i planeta					
s	SUNCA I PLANETA	PROLEĆNE TAČKE ♈	MESECA ☾	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, Meseca i planeta					
s	SUNCA I PLANETA		PROLEĆNE TAČKE ♈		MESECA ☾		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, Meseca i planeta					
s	SUNCA I PLANETA		PROLEĆNE TAČKE ♈		MESECA ☾		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, Meseca i planeta					
s	SUNCA I PLANETA	PROLEĆNE TAČKE ♈	MESECA ☾	Δ	popr.	Δ	popr.	Δ	popr.
	° ′	° ′	° ′		′		′		′
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, Meseca i planeta					
s	SUNCA I PLANETA	PROLEĆNE TAČKE ♈	MESECA ☾	Δ	popr.	Δ	popr.	Δ	popr.
	° ′	° ′	° ′		′		′		′
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, Meseca i planeta					
s	SUNCA I PLANETA		PROLEĆNE TAČKE ♈		MESECA ☾	Δ	popr.	Δ	popr.	Δ	popr.
	°	′	°	′	°	′		′		′		′
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, Meseca i planeta					
s	SUNCA I PLANETA		PROLEĆNE TAČKE ♈		MESECA ☾	Δ	popr.	Δ	popr.	Δ	popr.
	°	′	°	′	°	′		′		′		′
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, Meseca i planeta					
s	SUNCA I PLANETA	PROLEĆNE TAČKE ♈	MESECA ☾	Δ	popr.	Δ	popr.	Δ	popr.
	° ′	° ′	° ′		′		′		′
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, Meseca i planeta					
s	SUNCA I PLANETA	PROLEĆNE TAČKE ♈	MESECA ☾	Δ	popr.	Δ	popr.	Δ	popr.
	° ′	° ′	° ′		′		′		′
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, Meseca i planeta					
s	SUNCA I PLANETA		PROLEĆNE TAČKE ♈		MESECA ☾	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, Meseca i planeta					
s	SUNCA I PLANETA		PROLEĆNE TAČKE ♈		MESECA ☾	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, Meseca i planeta		
s	SUNCA I PLANETA	PROLEĆNE TAČKE ♈	MESECA ☾	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, Meseca i planeta		
s	SUNCA I PLANETA	PROLEĆNE TAČKE ♈	MESECA ☾	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, Meseca i planeta					
s	SUNCA I PLANETA		PROLEĆNE TAČKE ♈		MESECA ☾		Δ	popr.	Δ	popr.	Δ	popr.
	°	′	°	′	°	′		′		′		′
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, Meseca i planeta					
s	SUNCA I PLANETA		PROLEĆNE TAČKE ♈		MESECA ☾		Δ	popr.	Δ	popr.	Δ	popr.
	°	′	°	′	°	′		′		′		′
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, Meseca i planeta					
s	SUNCA I PLANETA	PROLEĆNE TAČKE ♈	MESECA ☾	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, Meseca i planeta					
s	SUNCA I PLANETA	PROLEĆNE TAČKE ♈	MESECA ☾	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, Meseca i planeta					
s	SUNCA I PLANETA		PROLEĆNE TAČKE ♈		MESECA ☾	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, Meseca i planeta					
s	SUNCA I PLANETA		PROLEĆNE TAČKE ♈		MESECA ☾	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, Meseca i planeta					
s	SUNCA I PLANETA	PROLEĆNE TAČKE ♈	MESECA ☾	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, Meseca i planeta					
s	SUNCA I PLANETA	PROLEĆNE TAČKE ♈	MESECA ☾	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, Meseca i planeta					
s	SUNCA I PLANETA		PROLEĆNE TAČKE ♈		MESECA ☾		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	21	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, Meseca i planeta					
s	SUNCA I PLANETA		PROLEĆNE TAČKE ♈		MESECA ☾		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, Meseca i planeta					
s	SUNCA I PLANETA	PROLEĆNE TAČKE ♈	MESECA ☾	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, Meseca i planeta					
s	SUNCA I PLANETA	PROLEĆNE TAČKE ♈	MESECA ☾	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, Meseca i planeta					
s	SUNCA I PLANETA		PROLEĆNE TAČKE ♈		MESECA ☾		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, Meseca i planeta					
s	SUNCA I PLANETA		PROLEĆNE TAČKE ♈		MESECA ☾		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, Meseca i planeta		
s	SUNCA I PLANETA	PROLEĆNE TAČKE ♈	MESECA ☾	Δ popr.	Δ popr.	Δ popr.
	° ′	° ′	° ′	′	′	′
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, Meseca i planeta		
s	SUNCA I PLANETA	PROLEĆNE TAČKE ♈	MESECA ☾	Δ popr.	Δ popr.	Δ popr.
	° ′	° ′	° ′	′	′	′
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, Meseca i planeta					
s	SUNCA I PLANETA		PROLEĆNE TAČKE ♈		MESECA ☾		Δ	popr.	Δ	popr.	Δ	popr.
	°	′	°	′	°	′		′		′		′
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, Meseca i planeta					
s	SUNCA I PLANETA		PROLEĆNE TAČKE ♈		MESECA ☾		Δ	popr.	Δ	popr.	Δ	popr.
	°	′	°	′	°	′		′		′		′
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, Meseca i planeta		
s	SUNCA I PLANETA	PROLEĆNE TAČKE ♈	MESECA ☾	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, Meseca i planeta		
s	SUNCA I PLANETA	PROLEĆNE TAČKE ♈	MESECA ☾	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, Meseca i planeta					
s	SUNCA I PLANETA		PROLEĆNE TAČKE ♈		MESECA ☾	Δ	popr.	Δ	popr.	Δ	popr.
	°	′	°	′	°	′		′		′		′
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, Meseca i planeta					
s	SUNCA I PLANETA		PROLEĆNE TAČKE ♈		MESECA ☾	Δ	popr.	Δ	popr.	Δ	popr.
	°	′	°	′	°	′		′		′		′
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, Meseca i planeta		
s	SUNCA I PLANETA	PROLEĆNE TAČKE ♈	MESECA ☾	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, Meseca i planeta		
s	SUNCA I PLANETA	PROLEĆNE TAČKE ♈	MESECA ☾	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, Meseca i planeta					
s	SUNCA I PLANETA		PROLEĆNE TAČKE ♈		MESECA ☾		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, Meseca i planeta					
s	SUNCA I PLANETA		PROLEĆNE TAČKE ♈		MESECA ☾		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, Meseca i planeta		
s	SUNCA I PLANETA	PROLEĆNE TAČKE ♈	MESECA ☾	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, Meseca i planeta		
s	SUNCA I PLANETA	PROLEĆNE TAČKE ♈	MESECA ☾	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, Meseca i planeta					
s	SUNCA I PLANETA		PROLEĆNE TAČKE ♈		MESECA ☾		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, Meseca i planeta					
s	SUNCA I PLANETA		PROLEĆNE TAČKE ♈		MESECA ☾		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, Meseca i planeta		
s	SUNCA I PLANETA	PROLEĆNE TAČKE ♈	MESECA ☾	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, Meseca i planeta		
s	SUNCA I PLANETA	PROLEĆNE TAČKE ♈	MESECA ☾	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, Meseca i planeta					
s	SUNCA I PLANETA		PROLEĆNE TAČKE ♈		MESECA ☾		Δ	popr.	Δ	popr.	Δ	popr.
	°	′	°	′	°	′		′		′		′
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, Meseca i planeta					
s	SUNCA I PLANETA		PROLEĆNE TAČKE ♈		MESECA ☾		Δ	popr.	Δ	popr.	Δ	popr.
	°	′	°	′	°	′		′		′		′
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, Meseca i planeta		
s	SUNCA I PLANETA	PROLEĆNE TAČKE ♈	MESECA ☾	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, Meseca i planeta		
s	SUNCA I PLANETA	PROLEĆNE TAČKE ♈	MESECA ☾	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

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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 dela:
1. **Promenljivog** (efemeride Sunca, Meseca, Venere, Marsa, Jupitera, Saturna ...) i
2. **Stalnog** dela.

Efemeride se menjaju svake godine, dok su u stalnom delu prilozi koji se ne menjaju.

Efemeride sadrže:

a) Mesečeve mene, perigej, apogej, vidljivost planeta, početke godišnjih doba, pomračenje Sunca i Meseca, te kalendar za 2007. godinu;

b) časovni ugao i deklinaciju Sunca, Meseca, Venere, Marsa, Jupitera i Saturna, časovni ugao Prolećne tačke za svaki parni čas univerzalnog vremena sa jednočasovnim srednjim i stvarnim razlikama;

c) vreme izlaza i zalaza Sunca i Meseca sa jednočasovnim izmenama za Mesec, i trajanje građanskog i astronomskog sumraka za svaki datum za geografske širine od 60° N do 60° S;

d) jednačinu vremena za 00^h i 12^h univerzalnog vremena sa jednočasovnom izmenom, vreme gornjeg prolaza Sunca kroz meridijan u Griniču i prividni poluprečnik Sunca (r);

e) vreme gornjeg prolaza Meseca kroz meridijan u Griniču sa jednočasovnom izmenom, horizontsku paralaksu Meseca i njegov prividni poluprečnik za 00^h u Griniču. Dalje slede starost Meseca u danima i glavne faze (mene) za određene dane;

f) vreme gornjeg prolaza planeta kroz meridijan Griniča, horizontsku paralaksu, surektascenziju i prividnu veličinu za 00^h univerzalnog vremena;

g) surektascenzije, deklinacije i vremena gornjih prolaza zvezda kroz meridijan Griniča za svaki prvi dan u mesecu;

h) podatke za Severnjaču koje čine Tablice popravki I, II i III za određivanje geografske širine pomoću Severnjače i tablice azimuta Severnjače;

i) ovo uputstvo.

Sadržaj **stalnog** dela je:

a) interpolacione tablice za izračunavanje trenutaka izlaza-zalaza Sunca i Meseca 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 Meseca kroz meridijan;

c) interpolacione tablice za popravku časovnog ugla Sunca i planeta, Prolećne tačke i Meseca i za popravku drugog reda za časovni ugao navedenih nebeskih tela. Tablice omogućuju i popravku deklinacije tih nebeskih tela, 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 zvezdanog neba.

Primeri za rad sa Godišnjakom grupisani su, radi lakšeg pronalaženja, prema sličnosti. Za vreme svakog izračunavanja mora se voditi računa o predznaku koji je jednako važan kao i sama brojka, jer su sva izračunavanja u vidu algebarskog sabiranja odnosno oduzimanja, gde predznak određuje da li će se vršiti sabiranje ili oduzimanje.

PREGLED PRIMERA ZA KORIŠĆENJE NAUTIČKOG GODIŠNJAKA

1. Određivanje časovnog ugla i deklinacije nebeskih tela — Primer:

1.1. Određivanje časovnog ugla i deklinacije Sunca ... **1, 2**
1.2. Određivanje časovnog ugla i deklinacije Meseca ... **3, 4**
1.3. Određivanje časovnog ugla i deklinacije planeta ... **5, 6**
1.4. Određivanje časovnog ugla i deklinacije zvezda ... **7, 8**

2. Određivanje izlaza i zalaza nebeskih tela

2.1. Određivanje izlaza i zalaza Sunca, početka i završetka građanskog i astronomskog sumraka ... **9, 10**
2.2. Određivanje izlaza i zalaza Meseca ... **11, 12**

3. Određivanje gornjeg prolaza nebeskih tela kroz meridijan Primer:
3.1. Određivanje gornjeg prolaza Sunca kroz meridijan . . . **13, 14**
3.2. Određivanje gornjeg prolaza Meseca kroz meridijan . . . **15, 16**
3.3. Određivanje gornjeg prolaza planeta kroz meridijan . . . **17**
3.4. Određivanje gornjeg prolaza zvezda kroz meridijan . . . **18**

4. Severnjača
4.1. Određivanje geografske širine pomoću visine Severnjače i određivanje azimuta Severnjače . . . **19**

5. Pretvaranje raznih vrsta vremena
5.1. Pretvaranje zonskog, mesnog srednjeg vremena i vremena po časovniku u univerzalno vreme i obratno . . . **20–22**
5.2. Pretvaranje zvezdanog vremena u zonsko i mesno srednje vreme . . . **23**

6. Identifikacija zvezda pomoću zvezdanih karata . . . **24–27**

1. ODREĐIVANJE ČASOVNOG UGLA I DEKLINACIJE NEBESKIH TELA

Efemeride daju časovni ugao i deklinaciju Sunca, Meseca 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, Meseca i planeta“.

Prva popravka časovnog ugla određena je pod pretpostavkom da jednočasovne promene časovnih uglova za Sunce iznose 15°, za Prolećnu tačku 15°02′.5 i za Mesec 14°19′. Popravka drugog reda časovnog ugla Sunca, Meseca i planeta jeste popravka tih srednjih promena, jer stvarne časovne promene časovnih uglova razlikuju se za veće ili manje vrednosti od usvojenih srednjih promena. Veličina Δ za račun popravke drugog reda nalazi se na dnu efemerida Sunca i planeta, za Mesec desno od vrednosti časovnog ugla, a za popravku drugog reda Prolećne tačke ne uzima se u obzir jer su odstupanja od srednje vrednosti 15°02′.5 praktično zanemarljiva.

Određivanje deklinacije nekog nebeskog tela za određeni trenutak vršimo na taj način da u efemeridama tog dana za parni čas pronađemo osnovnu vrednost deklinacije. Popravku za određeni trenutak pronalazimo u interpolacionim tablicama u koloni „Popravka drugog reda za časovni ugao i deklinaciju Sunca, Meseca i planeta“, a pomoću vrednosti Δ.

1.1. ODREĐIVANJE ČASOVNOG UGLA I DEKLINACIJE SUNCA

▶**PRIMER 1.** Odrediti mesni časovni ugao i deklinaciju Sunca za 14. april 2007. 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	$269°53'.3$
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	$292°50'.1$
$+\lambda$	$+\ 96°14'.6$
s	$389°04'.7 \rightarrow s_W = 29°04'.7$

b) deklinacija

Sa strane za 14. april δ za 6^h	$+9°16'.9$
Iz interpol. tablica za 1^h31^m popravka za $\delta(\Delta = +9)$	$+\ 1'.4$
δ	$+9°18'.3$

▶**PRIMER 2.** Odrediti mesni časovni ugao i deklinaciju Sunca za 18. septembar 2007. 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	$1°25'.7$
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	$17°44'.4$
$+\lambda$	$-\ 28°53'.6$
s_W	$348°50'.8 \rightarrow s_E = 11°09'.2$

b) deklinacija

Sa strane za 18. septembar δ za 12^h	$+1°54'.4$
Iz interpol. tablica za 1^h5^m popravka za $\delta(\Delta = -10)$	$-\ 1'.1$
δ	$+1°53'.3$

1.2. ODREĐIVANJE ČASOVNOG UGLA I DEKLINACIJE MESECA

▶**PRIMER 3.** Odrediti mesni časovni ugao i deklinaciju Meseca za 15. mart 2007. 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	$346^\circ23'.8$
Iz interpolacionih tablica za $0^h15^m25^s$ popravka časovnog ugla Meseca	$3^\circ40'.7$
Iz interpol. tablica za 0^h15^m popravka za S($\Delta = +76$)	$2'.0$
S	$350^\circ6'.5$
$+\lambda$	$-\ 15^\circ32'.0$
s_W	$334^\circ34'.5 \rightarrow s_E = 25^\circ25'.5$

b) deklinacija

Sa strane za 15. mart δ za 8^h	$-23^\circ\ 1'.6$
Iz interpol. tablica za 0^h15^m popravka za $\delta(\Delta = +105)$	$+\ \ 2'.7$
δ	$-22^\circ58'.9$

▶**PRIMER 4.** Odrediti mesni časovni ugao i deklinaciju Meseca za 20. jun 2007. 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	$261^\circ24'.9$
Iz interpolacionih tablica za $0^h31^m18^s$ popravka časovnog ugla Meseca	$7^\circ28'.1$
Iz interpol. tablica za 0^h31^m popravka za S($\Delta = +152$)	$8'.0$
S	$269^\circ\ 1'.0$
$+\lambda$	$+\ 34^\circ23'.8$
s_W	$303^\circ24'.8 \rightarrow s_E = \ 56^\circ35'.2$

b) deklinacija

Sa strane za 20. jun δ za 10^h	$+10^\circ\ 9'.1$
Iz interpol. tablica za 0^h31^m popravka za $\delta(\Delta = -139)$	$-\ \ 7'.3$
δ	$+10^\circ\ 1'.8$

1.3. ODREĐIVANJE ČASOVNOG UGLA I DEKLINACIJE PLANETA

▶**PRIMER 5.** Odrediti mesni časovni ugao i deklinaciju Venere za 7. decembar 2007. 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	$164^\circ57'.5$
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($\Delta = -3$)	$-\ \ 0'.4$
S	$183^\circ43'.9$
$+\lambda$	$+\ 58^\circ34'.2$
s_W	$242^\circ18'.1 \rightarrow s_E = 117^\circ41'.9$

b) deklinacija

Sa strane za 7. decembar δ za 20^h	$-10^\circ15'.2$
Iz interpol. tablica za 1^h15^m popravka za $\delta(\Delta = -10)$	$-\ \ 1'.3$
δ	$-10^\circ16'.5$

▶**PRIMER 6.** Odrediti mesni časovni ugao i deklinaciju Jupitera za 23. oktobar 2007. 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	$254^\circ25'.8$
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($\Delta = +20$)	$1'.9$
S	$268^\circ18'.7$
$+\lambda$	$-145^\circ20'.1$
s	$122^\circ58'.6 \rightarrow s_E = 237^\circ\ 1'.4$

b) deklinacija

Sa strane za 23. oktobar δ za 8^h	$-22^\circ36'.2$
Iz interpol. tablica za 0^h55^m popravka za $\delta(\Delta = 0)$	$0'.0$
δ	$-22^\circ36'.2$

1.4. ODREĐIVANJE ČASOVNOG UGLA I DEKLINACIJE ZVEZDE

Za određivanje časovnog ugla zvezde prvo se određuje časovni ugao Prolećne tačke S_Υ, odnosno vrednost zvezdanog vremena izražena u stepenima. Njoj dodajemo surektascenziju $(360^\circ - \alpha)$ te zvezde prema jednačini $S_* = S_\Upsilon - \alpha_*$, odnosno $S_* = S_\Upsilon + (360^\circ - \alpha_*)$. Rektascenzija odnosno surektascenzija zvezda se tokom meseca neznatno menjaju, pa su stoga date njihove vrednosti samo za prvi dan meseca. U slučaju veće promene surektascenzije tokom meseca, njena interpolacija vrši se napamet. Isto tako, deklinacije zvezda date su za prvi dan meseca. U slučaju potrebe interpolacije, ista se vrši napamet.

▶**PRIMER 7.** Odrediti mesni časovni ugao i deklinaciju zvezde Regulus (α Leo) za 16. mart 2007. godine u UT = $18^h11^m26^s$ na $\lambda = 62°13'.2$W.

a) časovni ugao Prolećne (Υ) tačke

Sa strane za 16. mart S_Υ za 18^h	$83°56'.5$
Iz interpolacionih tablica za $0^h11^m26^s$ popravka časovnog ugla Υ tačke	$2°52'.0$
S_Υ	$86°48'.5$
Deklinacija (iz tablice deklinacija nautičkih zvezda pod r.b. 24 za 1. mart): δ	$+11°56'.2$

b) časovni ugao zvezde

S_Υ	$86°48'.5$
Iz tablice surektascenzija nautičkih zvezda pod r.b. 24 za 1. mart	$207°48'.3$
S_*	$294°36'.8$
$+\lambda$	$-\ 62°13'.2$
s_*	$232°23'.6$
s_E	$127°36'.4$

▶**PRIMER 8.** Odrediti mesni časovni ugao i deklinaciju zvezde Deneb (α Cyg) za 10. avgust 2007. godine u UT = $21^h42^m8^s$ na $\lambda = 93°14'.2$E.

a) časovni ugao Prolećne (Υ) tačke

Sa strane za 10. avgust S_Υ za 20^h	$258°54'.8$
Iz interpolacionih tablica za $1^h42^m8^s$ popravka časovnog ugla Υ tačke	$25°36'.3$
S_Υ	$284°31'.1$
Deklinacija (iz tablice deklinacija nautičkih zvezda pod r.b. 50 za 1. avgust): δ	$+\ 45°18'.2$

b) časovni ugao zvezde

S_Υ	$284°31'.1$
Iz tablice surektascenzija nautičkih zvezda pod r.b. 50 za 1. avgust	$49°34'.2$
S_*	$334°\ 5'.3$
$+\lambda$	$+\ 93°14'.2$
s_*	$427°19'.5$
s_*	$67°19'.5$

2. ODREĐIVANJE IZLAZA I ZALAZA NEBESKIH TELA

2.1. ODREĐIVANJE IZLAZA I ZALAZA SUNCA, POČETKA I ZAVRŠETKA GRAĐANSKOG I ASTRONOMSKOG SUMRAKA

Vremena izlaza i zalaza Sunca (gornjeg ruba), te trajanja sumraka, data su u efemeridama za severne i južne širine od 0° do 60°. Početak građanskog ili astronomskog svitanja određuje se oduzimanjem vremena trajanja sumraka od vremena izlaza Sunca. Završetak građanskog ili astronomskog sumraka određuje se dodavanjem vremena trajanja sumraka vremenu zalaza Sunca. Data su vremena 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 vremena trajanja sumraka vrši se po potrebi samo za celobrojne vrednosti minuta.

▶**PRIMER 9.** Odrediti vreme izlaza i zalaza Sunca, početak građanskog svitanja i završetak građanskog sumraka za 5. jul 2007. godine na $\varphi = 48°28'.2$S, $\lambda = 72°43'.6$E, $\varphi = 48°.5$S, $\lambda = 4^h50^m.9$ ($x = +5^h$).

a) izlaz

UT = t_s izlaza za $\varphi = 45°$S	$7^h38^m.0$
Popravka za 3°.5 iz interpolacionih tablica ($\Delta = +20^m$)	$+\ 14^m.0$
t_s izlaza za $\varphi = 48°.5$S	$7^h52^m.0$
$+(x - \lambda)$	$+\ 9^m.1$
t_x	$8^h01^m.1$
$-$ trajanje građanskog sumraka	$-\ 37^m.0$
početak građanskog svitanja	$7^h24^m.1$

b) zalaz

UT = t_s zalaza za $\varphi = 45°$S	$16^h31^m.0$
Popravka za 3°.5 iz interpolacionih tablica ($\Delta = -20^m$)	$-\ 14^m.0$
t_s zalaza za $\varphi = 48°.5$S	$16^h17^m.0$
$+(x - \lambda)$	$+\ 9^m.1$
t_x	$16^h26^m.1$
$+$ trajanje građanskog sumraka	$+\ 37^m.0$
završetak građanskog sumraka	$17^h03^m.1$

▶**PRIMER 10.** Odrediti vreme izlaza i zalaza Sunca, početak astronomskog svitanja i završetak astronomskog sumraka za 21. septembar 2007. 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	$17^h58^m.0$
Popravka za 2°.2 iz interpolacionih tablica ($\Delta = 0^m$)	$+\ 0^m.0$

t_s izlaza za $\varphi = 22°.2N$	$5^h48^m.8$
$+(x - \lambda)$	$-\ 13^m.3$
t_x	$5^h35^m.5$
$-$ trajanje astronomskog sumraka	$-1^h14^m.5$
početak astronomskog svitanja	$4^h21^m.0$

t_s zalaza za $\varphi = 22°.2N$	$17^h58^m.0$
$+(x - \lambda)$	$-\ 13^m.3$
t_x	$17^h44^m.7$
$+$ trajanje astronomskog sumraka	$+\ 1^h14^m.5$
završetak astronomskog sumraka	$18^h59^m.2$

2.2. ODREĐIVANJE IZLAZA I ZALAZA MESECA

Vremena izlaza i zalaza Meseca (gornjeg ruba) za svaki dan, za severne i južne geografske širine od 0° do 60°, te njihove promene za jedan čas $\Delta/24$ date su u efemeridama. Pomoću izmene $\Delta/24$ određuje se popravka $\lambda\nu$ prilikom određivanja izlaza i zalaza Meseca. U slučaju određivanja izlaza i zalaza Meseca na istočnim geografskim dužinama u cilju postizanja tačnosti uzima se vrednost $\Delta/24$ za prethodni dan. Vrednost $\Delta/24$ je uvek pozitivna zbog kašnjenja Meseca. Popravka $\lambda\nu$ se uvek algebarski oduzima od vremena izlaza ili zalaza Meseca u Griniču. Mora da se vodi računa o znacima vrednosti $\lambda\Delta/24$. Popravka $\lambda\nu$ data je u interpolacionoj tablici za izračunavanje trenutaka izlaza, zalaza i prolaza Meseca kroz meridijan. Prvo se vrši interpolacija za geografsku širinu pomoću interpolacione tablice za određivanje vremena 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 mesta označena su tačkama. U tim slučajevima koriste se podaci za naredni dan.

▶**PRIMER 11.** Odrediti vreme izlaza i zalaza Meseca za 19. jun 2007. godine na $\varphi = 17°36'.0N$, $\lambda = 72°15'.0E$, $\varphi = 17°.6N$, $\lambda = 4^h49^m.0E$ $(x = +5^h)$.

a) izlaz

$UT = t_s$ izlaza za $\varphi = 10°N$	$9^h40^m.0$
Popravka za $7°.6$ iz interpolacionih tabl. $(\Delta = -\ 2^m)$	$-\ 1^m.5$
UT izlaza za $\varphi = 17°.6N$	$9^h38^m.5$
$\lambda = 72°.3E$	
$\Delta/24 = \nu = 2^m.0$ $\quad -\lambda\nu$	$-\ 9^m.6$
t_s	$9^h28^m.9$
$+(x - \lambda)$	$+\ 11^m.0$
t_x	$9^h39^m.9$

b) zalaz

$UT = t_s$ zalaza za $\varphi = 10°N$	$22^h23^m.0$
Popravka za $7°.6$ iz interpolacionih tabl. $(\Delta = +\ 4^m)$	$+\ 3^m.0$
UT zalaza za $\varphi = 17°.6N$	$22^h26^m.0$
$\lambda = 72°.3E$	
$\Delta/24 = \nu = 1^m.6$ $\quad -\lambda\nu$	$-\ 7^m.7$
t_s	$22^h18^m.3$
$+(x - \lambda)$	$+\ 11^m.0$
t_x	$22^h29^m.3$

▶**PRIMER 12.** Odrediti vreme izlaza i zalaza Meseca za 23. oktobar 2007. godine na $\varphi = 33°25'.0S$, $\lambda = 38°53'.0W$, $\varphi = 33°.4S$, $\lambda = 2^h35^m.5W$ $(x = -3^h)$.

a) izlaz

$UT = t_s$ izlaza za $\varphi = 30°S$	$+15^h27^m.0$
Popravka za $3°.4$ iz interpolacionih tabl. $(\Delta = -10^m)$	$-\ 6^m.8$
UT izlaza za $\varphi = 33°.4S$	$+15^h20^m.2$
$\lambda = 38°.9W$	
$\Delta/24 = \nu = 2^m.8$ $\quad -\lambda\nu$	$-\ 7^m.3$
t_s	$+15^h12^m.9$
$+(x - \lambda)$	$-\ 24^m.5$
t_x	$+14^h48^m.4$

b) zalaz

$UT = t_s$ zalaza za $\varphi = 30°S$	$3^h14^m.0$
Popravka za $3°.4$ iz interpolacionih tabl. $(\Delta = +12^m)$	$+\ 8^m.2$
UT zalaza za $\varphi = 33°.4S$	$3^h22^m.2$
$\lambda = 38°.9W$	
$\Delta/24 = \nu = 1^m.4$ $\quad -\lambda\nu$	$-\ 3^m.6$
t_s	$3^h18^m.6$
$+(x - \lambda)$	$-\ 24^m.5$
t_x	$2^h54^m.1$

2.3. ODREĐIVANJE IZLAZA I ZALAZA PLANETA I ZVEZDA

Trenutak izlaza i zalaza planeta i zvezda se ne određuje jer se njihov izlaz i zalaz ne vide. Ali u slučaju potrebe može se odrediti vrednost poludnevnog luka na osnovu deklinacije određene zvezde i geografske širine posmatrača ili se ista vrednost odredi pomoću Nautičkih tablica na osnovu zadatih vrednosti. Tako određena vrednost poludnevnog luka oduzima se od vremena gornjeg prolaza određene zvezde kroz meridijan i dobija se vreme izlaza, ako se vrednost poludnevnog luka doda vremenu prolaza dobija se vreme zalaza.

3. ODREĐIVANJE GORNJEG PROLAZA NEBESKIH TELA 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 mesta ima časovni ugao 0°. Zapadna geografska dužina određenog mesta, gde 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 univerzalno vreme u kojem je časovni ugao Sunca $S_\odot$ jednak λ_W ili $(360^\circ - \lambda_E)$. Tako određenom vremenu dodaje se zonski indeks sa predznakom i dobija se zonsko vreme gornjeg prolaza Sunca kroz meridijan.

Na drugi način, gornji prolaz Sunca kroz meridijan određuje se pomoću jednačine vremena $T_p - e = UT$. U efemeridama su date vrednosti jednačine vremena $e = T_p - UT$ za 00^h i 12^h sa odgovarajućom jednočasovnom promenom. Pomoću jednačine vremena određuje se univerzalno vreme gornjeg prolaza Sunca kroz meridijan. Za istočne geografske širine koristi se $\Delta/24$ za prethodni dan radi postizanja veće tačnosti.

Treći (približni) način određivanja vremena gornjeg prolaza Sunca kroz meridijan, uz najveću moguću grešku do $\pm 0^m.2$, je ako vremenu gornjeg prolaza Sunca kroz meridijan u Griniču T_m dodamo $x - \lambda$ (primer 14b).

▶**PRIMER 13.** Odrediti vreme gornjeg prolaza Sunca kroz meridijan za 8. mart 2007. godine na $\lambda = 103^\circ 28'.8\text{W}$, $\lambda = 6^h 53^m 55^s$ $(x = -7^h)$.

a) pomoću časovnog ugla

$\lambda_W = S_\odot$	$103^\circ 28'.8$
u UT 18^h $S_\odot$	$87^\circ 17'.6$
Iz interpolacione tablice za Sunce u $1^h 04^m 45^s.0$	$16^\circ 11'.2$
UT	$19^h 04^m 45^s.0$
$+x$	$-\ 7^h 00^m 00^s.0$
t_x	$12^h 04^m 45^s.0$

b) pomoću jednačine vremena

t_p	$12^h 00^m 00^s.0$	e_{12^h}	$-10^m 53^s.0$
$-\lambda$	$+\ 6^h 53^m 55^s.0$	$\Delta/24$	$+\ 0^s.6$
T_p	$18^h 53^m 55^s.0$	Popravka	
$-e$	$+\ 10^m 48^s.9$	6.9×0.6	$4^s.1$
UT	$19^h 04^m 43^s.9$	e_{12^h}	$-10^m 53^s.0$
$+x$	$-\ 7^h 00^m 00^s.0$	Popravka	$+\ 4^s.1$
t_x	$12^h 04^m 43^s.9$	e	$-10^m 48^s.9$

▶**PRIMER 14.** Odrediti vreme gornjeg prolaza Sunca kroz meridijan za 22. januar 2007. godine na $\lambda = 145^\circ 52'.1\text{E}$, $\lambda = 9^h 43^m 28^s$ $(x = +10^h)$.

a) pomoću časovnog ugla

$(360^\circ - \lambda_E) = S_\odot$	$214^\circ 07'.9$
u UT 2^h $S_\odot$	$207^\circ\ 8'.7$
Iz interpolacione tablice za Sunce u $0^h 27^m 41^s.0$	$6^\circ 59'.2$
UT	$2^h 27^m 41^s.0$
$+x$	$+10^h 00^m 00^s.0$
t_x	$12^h 27^m 41^s.0$

b) skraćeni postupak

$T_m = t_m$	$12^h 11^m.5$	$T_m = t_m$	$12^h 11^m.5$
$-\lambda$	$-\ 9^h 43^m.5$	$+(x - \lambda)$	$0^h 16^m.5$
UT	$2^h 28^m.0$		
$+x$	$+10^h 00^m.0$		
t_x	$12^h 28^m.0$	t_x	$12^h 28^m.0$

3.2. ODREĐIVANJE GORNJEG PROLAZA MESECA KROZ MERIDIJAN

Način određivanja gornjeg prolaza Meseca kroz meridijan je isti kao određivanje izlaza i zalaza Meseca. Iz efemerida se dobija univerzalno vreme gornjeg prolaza Meseca kroz meridijan u Griniču uz odgovarajuću časovnu promenu $\Delta/24$. Ako se određuje popravka $\lambda\nu$ za zapadne geografske širine, vrednost $\Delta/24$ uzima se za dan prolaza Meseca kroz meridijan, a za istočne geografske širine uzima se vrednost $\Delta/24$ od prethodnog dana. Popravka $\lambda\nu$ data je u interpolacionoj tablici za izračunavanje trenutaka izlaza, zalaza i prolaza Meseca 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.

▶**PRIMER 15.** Odrediti vreme gornjeg prolaza Meseca kroz meridijan za 18. januar 2007. godine na $\lambda = 48^\circ 6'.0\text{W}$.

T_m	$11^h 36^m.0$	$\Delta/24 = \nu$	$2^m.4$	x	$-\ 3^h 00^m.0$
$-\lambda\nu$	$+\ 7^m.7$	λ	$48^\circ.1$	$-\lambda$	$+\ 3^h 12^m.4$
t_m	$11^h 43^m.7$	$\lambda\nu$	$-\ 7^m.7$	$+(x - \lambda)$	$+\ 0^h 12^m.4$
$+(x - \lambda)$	$12^m.4$				
t_x	$11^h 56^m.1$				

▶**PRIMER 16.** Odrediti vreme gornjeg prolaza Meseca kroz meridijan u Griniču za 23. jun 2007. godine na $\lambda = 126^\circ 40'.2\text{E}$.

T_m	$18^h46^m.0$	$\Delta/24 = \nu$	$1^m.7$	x	$+\ 8^h00^m.0$
$-\lambda\nu$	$-\ 14^m.4$	λ	$126^\circ.7$	$-\lambda$	$-\ 8^h26^m.7$
t_m	$19^h\ 0^m.4$	$\lambda\nu$	$14^m.4$	$+(x-\lambda)$	$-\ 0^h26^m.7$
$+(x-\lambda)$	$-\ 0^h26^m.7$				
t_x	$18^h33^m.7$				

3.3. ODREĐIVANJE GORNJEG PROLAZA PLANETA KROZ MERIDIJAN

Metodologija određivanja vremena gornjih prolaza planeta kroz meridijan ista je kao za Mesec, uz razliku da vrednost $\Delta/24$ može biti pozitivna, kada planeta kasni kao Mesec, ili negativna, kada planeta rani kao zvezde. Obično je vrednost $\Delta/24$ negativna.

Ako planeta rani u odnosu na prethodni dan na istočnim geografskim dužinama, vreme je veće od griničkog, a na zapadnim manje, t.j. suprotno nego kod Meseca. Ako planeta kasni postupak je isti kao u slučaju određivanja gornjeg prolaza Meseca kroz meridijan. Shodno tome, određuje se znak vrednosti $\lambda\nu$. Obično je planetarni dan kraći od srednjeg sunčevog, pa se može desiti da planeta u jednom danu dva puta prolazi kroz meridijan mesta, odmah posle pola noći i nešto pre pola noći.

Pošto je razlika između dva vremena dva uzastopna prolaza kroz meridijan mala, vrednost $\lambda\nu$ se ne određuje (primer 17b); univerzalno vreme prolaza kroz meridijan je isto kao mesno srednje vreme kojem se samo dodaje $(x-\lambda)$ i na taj način se određuje zonsko vreme prolaza planeta kroz meridijan mesta.

▶**PRIMER 17.** Odrediti vreme gornjeg prolaza Jupitera kroz meridijan za 14. jun 2007. godine na $\lambda = 46^\circ 17'.3\text{W}$, $\lambda = 3^h5^m.2$ $(x = -3^h)$.

a) tačan postupak

T_m	$23^h18^m.0$	λ	$3^h.1\text{W}$
$-\lambda\nu$	$0^m.5$	$\nu = \Delta/24$	$-4^m/24$
t_m	$23^h17^m.5$	$\lambda\nu = 3.1 \times \frac{-4}{24}$	$-0^m.5$
$+(x-\lambda)$	$+\ 5^m.2$		
t_x	$23^h22^m.7$		

b) približan postupak—u praksi dovoljno tačan

T_m	$23^h23^m.2$
$+(x-\lambda)$	$5^m.2$
t_x	$23^h23^m.2$

3.4. ODREĐIVANJE GORNJEG PROLAZA ZVEZDA KROZ MERIDIJAN

Vreme gornjeg prolaza zvezda kroz meridijan Griniča dato je u efemeridama za svaki prvi dan u mesecu. U slučaju određivanja vremena prolaza kroz meridijan za bilo koji drugi dan u mesecu, od vrednosti iz efemerida oduzima se popravka koja se nalazi na donjem delu stranice za izabrani dan.

Vreme gornjeg prolaza kroz meridijan T_m izraženo u univerzalnom vremenu može da se uzme kao mesno srednje vreme prolaza kroz meridijan posmatrača t_m, što je približno, jer zvezda 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 vreme prolaza kroz meridijan uzima kao mesno srednje vreme i, uz dodavanje $(x-\lambda)$, pretvara u zonsko.

▶**PRIMER 18.** Odrediti vreme gornjeg prolaza zvezde Arcturus (α Boo) kroz meridijan 23. maja 2007. godine na $\lambda = 28^\circ 14'.2\text{E}$, $\lambda = 1^h52^m.9$, $(x = +2^h)$.

Iz tablice gornjih prolaza zvezda kroz meridijan za 1. maj 2007. godine (r.b. zvezde 35) $T_m = t_m$	$23^h42^m.0$
Popravka za 23 dana iz iste tablice	$-\ 1^h30^m.5$
t_m	$22^h11^m.5$
$+(x-\lambda)$	$7^m.1$
t_x	$22^h18^m.6$

4. SEVERNJAČA

4.1. ODREĐIVANJE GEOGRAFSKE ŠIRINE POMOĆU VISINE SEVERNJAČE I ODREĐIVANJE AZIMUTA SEVERNJAČE

Izmerena visina Severnjače ispravlja se radi instrumentalnih 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 vrednosti tablice azimuta Severnjače su mesni časovni ugao Prolećne tačke i geografska širina posmatrača.

▶**PRIMER 19.** Odrediti geografsku širinu posmatrača pomoću visine zvezde Severnjače; odrediti njen azimut za 18. septembar 2007. godine u UT $= 22^h36^m00^s$ na $\varphi = 42^\circ23'$N i $\lambda = 38^\circ47'$W zbirne pozicije, ako je prava visina Severnjače $V_p = 41^\circ54'.2$.

a) određivanje mesnog časovnog ugla s_Υ

S_Υ za UT 22^h	$327^\circ26'.1$
Iz interpolacionih tablica popravka S_Υ za 36^m	$9^\circ\ 1'.5$
S_Υ	$336^\circ27'.6$
$+\lambda$	$-\ 38^\circ47'.0$
s_Υ	$297^\circ40'.6$

b) određivanje visine

V_p	$41^\circ54'.2$
I	$+\ 8'.1$
II	$+\ 0'.2$
III	$-\ 0'.0$
φ	$42^\circ\ 2'.5$
ω	$1^\circ.0$

5. PRETVARANJE RAZNIH VRSTA VREMENA

5.1. PRETVARANJE ZONSKOG, MESNOG SREDNJEG VREMENA I VREMENA PO ČASOVNIKU U UNIVERZALNO VREME I OBRATNO

Podaci efemerida odnose se na grinički meridijan, pa je ulazna vrednost univerzalno vreme UT.

U slučaju da časovnik osmatrača pokazuje zonsko vreme, vreme posmatranja je zonsko vreme t_x. Isto tako, može to vreme biti vreme po časovniku t_c ili mesno zonsko vreme t_s, a što nije često.

▶**PRIMER 20.** Odrediti UT ako su poznati zonsko vreme t_x, vreme po časovniku t_c i srednje mesno vreme 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.

▶**PRIMER 21.** Odrediti zonsko vreme t_x, vreme po časovniku t_c i srednje mesno vreme 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.

▶**PRIMER 22.** Odrediti zonsko vreme t_x za mesno srednje vreme $t_s = 13^h15^m36^s$ na $\lambda = 107^\circ28'.0\,W$, $\lambda = 7^h9^m52^s$ $(x = -7)$.

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	$-7^h00^m00^s$
$+(x-\lambda)$	$+\ 9^m52^s$	$-\lambda$	$7^h09^m52^s$
t_x	$13^h25^m28^s$	$(x-\lambda)$	9^m52^s

5.2. PRETVARANJE ZVEZDANOG VREMENA U ZONSKO I MESNO SREDNJE VREME

Određeno zvezdano vreme pretvorimo u mesni časovni ugao Prolećne tačke. Griničkи časovni ugao Prolećne tačke dobija se oduzimanjem geografske dužine od mesnog časovnog ugla Prolećne tačke. Iz efemerida pomoću griničkog časovnog ugla Prolećne tačke određujemo univerzalno vreme. Dodavanjem zonskog indeksa dobija sa zonsko vreme, ili dodavanjem geografske širine izražene u vremenu dobija se mesno srednje vreme. 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 širine se oduzima S_φ za naredni dan, a za istočne geografske širine za prethodni dan.

▶**PRIMER 23.** Odrediti zonsko vreme t_x odnosno mesno srednje vreme t_s za 19. januar 2007. godine ako je zvezdano vreme $t_z = 6^h36^m3^s$ na $\lambda = 112^\circ10'.5E$, $\lambda = 7^h28^m42^s$ $(x = +7)$.

$t_z = 6^h36^m03^s = s_\Upsilon$	$99^\circ0'.8 + 360^\circ$		
$-\lambda$	$-112^\circ10'.5$		
S_Υ	$346^\circ50'.3$		
19. januar u UT $14^h00^m00^s$	$-S_\Upsilon$	$-328^\circ34'.8$	
Iz interpol. tablice za Prolećnu tačku u $1^h13^m\ 2^s$	$\leftarrow$	$18^\circ15'.5$	
UT $15^h13^m\ 2^s$			

a) t_s

UT	$15^h13^m\ 2^s$
$+\lambda$	$7^h28^m42^s$
t_s	$22^h41^m44^s$

b) t_x

UT	$15^h13^m\ 2^s$
$+x$	$+\ 7^h00^m00^s$
t_x	$22^h13^m\ 2^s$

6. IDENTIFIKACIJA ZVEZDA POMOĆU ZVEZDANIH KARATA

Zvezdane karte u prilogu služe za opštu orijentaciju na zvezdanom nebu i prepoznavanje zvezda na dva moguća načina.

1. Meridijan posmatrača moguće je odrediti na zvezdanoj karti pomoću surektascenzije zvezde na tom meridijanu. Ako je posmatrač na zapadnoj geografskoj dužini i zvezda je tačno u meridijanu, vrednost λ_W jednaka je griničkom časovnom uglu te zvezde $(\lambda_W = S_*)$. Za posmatrača na istoj geografskoj dužini odnos je $(360^\circ - \lambda_E) = S_*$. Pošto je griničkи časovni ugao zvezde S_* jednak griničkom časovnom uglu Prolećne tačke umanjenom za rektascenziju zvezde $(S_* = S_\Upsilon - \alpha_*)$, onda je $(\alpha_* = S_\Upsilon - S_*)$. Surektascenzija je jednaka časovnom uglu zvezde umanjenom za časovni ugao Prolećne tačke $(360^\circ - \alpha_*) = S_* - S_\Upsilon$. Griničkи časovni ugao zvezde odgovara zapadnoj geografskoj dužini $(S_* = \lambda_W)$, pa je $(360^\circ - \alpha_*) = \lambda_W - S_\Upsilon$, dok je za istočne geografske dužine $(360^\circ - \alpha_*) = (360^\circ - \lambda_E) - S_\Upsilon$.

▶**PRIMER 24.** Odrediti za 5. jul 2007. godine u UT $= 00^h06^m.3$ na zvezdanoj karti meridijan posmatrača i prepoznajte zvezdu u zenitu ako je posmatrač na $\varphi = 45^\circ11'N$, $\lambda = 25^\circ45'.6E$.

a) određivanje S_Υ

5. jul za 00^h S_Υ	$282^\circ36'.5$
Popravka časovnog ugla Prolećne tačke za 06^m18^s	$+\ 1^\circ34'.8$
S_Υ	$284^\circ11'.3$

b) određivanje surektascenzije zvezde pomoću izraza $(360^\circ - \alpha_*) = (360^\circ - \lambda_E) - S_\Upsilon$

	$360^\circ00'.0$
$-\lambda$	$-\ 25^\circ45'.6$
$(360^\circ - \lambda)$	$334^\circ14'.4$
$-S_\Upsilon$	$284^\circ11'.3$
$(360^\circ - \alpha_*)$	$50^\circ\ 3'.1$
	$\cong 50^\circ.0$

Prepoznavanje zvezde u posmatračevom zenitu je jednostavno, jer se tačka u zenitu nalazi na njegovom meridijanu, a deklinacija zvezde jednaka je geografskoj širini posmatrača. Stoga je surektascenzija zvezde oko $50^\circ.0$, a njena deklinacija oko $45^\circ 11'.0\mathrm{N}$. Iz pregleda zvezda Godišnjaka ili zvezdane karte vidljivo je da je to zvezda Deneb (α Cyg) sa stvarnom surektascenzijom $49^\circ 34'.0$ i deklinacijom $45^\circ 18'.0$. Ostale zvezde koje nisu u zenitu raspoznaju se upoređenjem slike zvezdanog neba sa zvezdanom kartom.

▶**PRIMER 25.** Odrediti za 22. januar 2007. godine u $t_x = 4^h 8^m.6$ ($x = +2$) na zvezdanoj karti meridijan posmatrača i prepoznajte zvezdu blizu zenita. Posmatrač se nalazi na $\varphi = 54^\circ 50'\mathrm{N}$, $\lambda = 47^\circ 20'.1\mathrm{E}$.

a) određivanje UT

t_x	$4^h 08^m.6$
$-x$	$-2^h 00^m.0$
UT	$2^h 08^m.6$

b) određivanje S_Υ

22. januar u 02^h S_Υ	$151^\circ\ 2'.7$
Popravka časovnog ugla Prolećne tačke za $08^m.6$	$2^\circ 09'.4$
S_Υ	$153^\circ 12'.1$

c) određivanje surektascenzije zvezde pomoću izraza $(360^\circ - \alpha_*) = (360^\circ - \lambda_E) - S_\Upsilon$

$(360^\circ - \lambda)$	$312^\circ 39'.9$
$-S_\Upsilon$	$153^\circ 12'.1$
$(360^\circ - \alpha_*)$	$159^\circ 27'.8$

Iz zvezdane karte ili pregleda zvezda vidljivo je da je zvezda blizu zenita Mizar (ζ Ursae Majoris) čija je deklinacija $54^\circ 53'.3\mathrm{N}$, a surektascenzija $158^\circ 56'.8$.

2. Zvezdana karta u Merkatorovoj projekciji na gornjem i donjem rubu ima upisane mesece i dane i time je posmatraču omogućeno da odmah vidi koji je deo zvezdanog neba vidljiv određenog datuma u pola noći. Ako želimo tačno odrediti meridijan posmatrača, moramo odrediti mesni časovni ugao Prolećne tačke (zvezdano mesno vreme) i izračunatu vrednost oduzeti od 360°. Na gornjem rubu karte pronalazimo odgovarajuću surektascenziju i time dobijamo mesto meridijana posmatrača. Zvezde desno od meridijana su prema zapadu, a levo prema istoku od posmatrača, koji je okrenut prema jugu.

▶**PRIMER 26.** Odrediti meridijan posmatrača i prepoznajte zvezdu blizu zenita 14. aprila 2007. godine u $t_x = 23^h 17^m.9$ ($x = +2$) na $\varphi = 52^\circ 36'\mathrm{N}$, $\lambda = 37^\circ 55'.6\mathrm{E}$.

a) određivanje UT

t_x	$23^h 17^m.9$
x	$-\ 2^h 00^m.0$
UT	$21^h 17^m.9$

b) određivanje s_Υ

14. april za 20^h S_Υ	$142^\circ 36'.4$
Popravka časovnog ugla Prolećne tačke za $1^h 17^m 53^s$	$19^\circ 31'.5$
$-S_\Upsilon$	$162^\circ\ 7'.9$
$+\lambda$	$+\ 37^\circ 55'.6$
s_Υ	$200^\circ\ 3'.$
α	$200^\circ\ 3'.5$
$(360^\circ - s_\Upsilon)$	$159^\circ 56'.5$
$(360^\circ - \alpha)$	$159^\circ 56'.5$

Meridijan posmatrača nalazi se na skali surektascenzije na $159^\circ.5$. Pošto je vrednost posmatračeve geografske širine slična vrednosti deklinacije zvezde, zvezda blizu zenita može biti Mizar (ζ UMa), čija je stvarna deklinacija $54^\circ 53'.5$ i surektascenzija $158^\circ 55'.9$.

3. Prepoznavanje zvezde u blizini zenita moguće je i pomoću mesnog vremena posmatrača. Zvezdano nebo zvezdane 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) mesta posmatrača.

Ako se položaj zenita posmatrača određuje u drugo vreme, prvo se određuje zenit u ponoć i zatim se određuje vremenska razlika između $t_s = 0^h$ i mesnog vremena posmatrača, uzima u šestar na satnoj podeli donjeg ruba zvezdane karte i nanosi se od pozicije zenita u pola noći, ulevo ako je traženo vreme posle pola noći ili udesno ako je vreme pre pola noći. Dobijena tačka je pozicija zenita posmatrača.

Na taj način, određeni zenit posmatrača može poslužiti za približnu orijentaciju merenjem zenitne udaljenosti zvezda po levoj ili desnoj stepenskoj podeli 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 zvezdane karte suprotno okrenute u odnosu na navigacijsku kartu. Takođe je bitno da su na ovaj način određeni podaci u blizini horizonta posmatrača netačni.

▶**PRIMER 27.** Prepoznajte zvezdu čiji je azimut $A_w = 168^\circ$ i zenitna udaljenost $z = 29^\circ$ dana 11. marta 2007. godine na poziciji $\varphi = 41^\circ 20'\mathrm{N}$ i $\lambda = 17^\circ 56'\mathrm{E}$ u $t_x = 22^h 15^m$ ($x = +1$).

a) određivanje t_s

t_x	$22^h 15^m$
$-(x - \lambda)$	$+\ 12^m$
t_s	$22^h 27^m$

b) razlika u odnosu na ponoć

t_{s_1}	$0^h 00^m$
$-t_{s_2}$	$22^h 27^m$
Δt_s (pre ponoći)	$1^h 33^m$

Postupajući na gore opisani način, naći će se pozicija zenita u ponoć, sa koordinatama: $\phi = \delta = 41^\circ.3\mathrm{N}$ i $(360^\circ - \alpha) = 215^\circ$ (11. mart). Od ove pozicije, približno u smeru 168° i na udaljenosti 29°, pronalazimo zvezdu Regulus (α Leonis).

⋆ ★ ★ ★ ⋆

Zvanična

I

ZONSKA VREMENA

ZVANIČNA I ZONSKA VREMENA

ZONSKO VREME

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° po Griniču.

Za prelaz sa zonskog na griničko vreme koristi se obrazac, gde x označava zonski indeks:

$$\mathrm{UT} = \mathrm{t_x} - \mathrm{x}$$

(O pretvaranju vremena vidi primer u poglavlju 5 Uputstva za upotrebu Nautičkog godišnjaka).

GRANICE DATUMA

Linija na čijem se prelazu vrši promena 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 prelaza granice datuma, ploveći prema zapadu datum se *povećava* za jedan dan. Kada se ona prelazi ploveći prema istoku, *smanjuje* se za jedan dan.

ZVANIČNO VREME I LETNJE VREME

Zvanično vreme, tj. ono vreme 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 *letnje vreme* zbog racionalnog iskorišćenja dnevnog svetla. Ono se obično razlikuje od zonskog (zimskog) vremena za 1^h, a načelno važi na severnoj 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 prelaz sa *zvaničnog* na *griničko* vreme koristi se obrazac

$$\mathrm{UT} = \mathrm{t_{zv}} - \mathrm{zv},$$

gde zv označava indeks zvaničnog vremena.

HRONOLOŠKI CIKLUSI I ERE

Epakta	10
Zlatni broj (Mesečev ciklus)	II
Julijanski period	6728
Sunčev ciklus	8

Era	Godina	Počinje	Era	Godina	Počinje
Vizantijska	7524	14. Sep.	Japanska	2675	1. Jan.
Jevrejska	5776	13. Sep.	Grčka (Seleukidova)	2327	14. Sep.
Kineska (yi-wei)	(4652)	19. Feb.	Indijska (Saka)	1937	22. Mart
Rimska	2768	14. Jan.	Dioklecijanova	1732	12. Sep.
Nabonasarova	2764	20. Apr.	Islamska (Hegira)	1437	14. Okt.

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

KARTA ZONSKIH I ZVANIČNIH VREMENA

zone parnih zonskih indeksa
zone neparnih zonskih indeksa
zonski indeks veći - manji za 30 m
zonski indeks između punog i pola sata (bilo koje vreme)
neregulirano ili nepoznato zvanično vreme

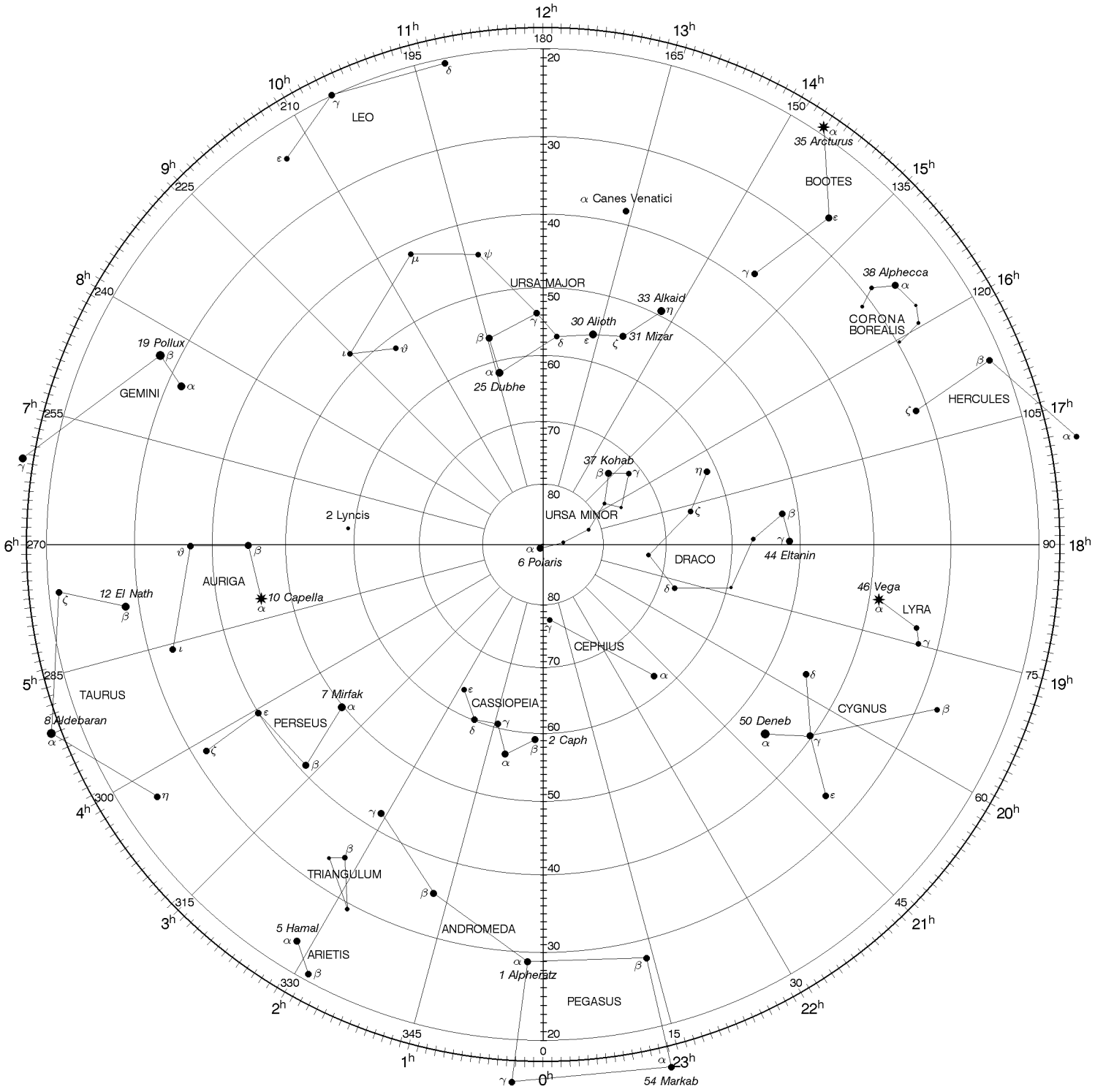
Zapadno od Greenwich-a
0° Greenwich-a
Istočno od Greenwich-a

Hidrografski institut RM Split 1990 - Prilog Nautičkom godišnjaku

Karte

ZVEZDANOG NEBA

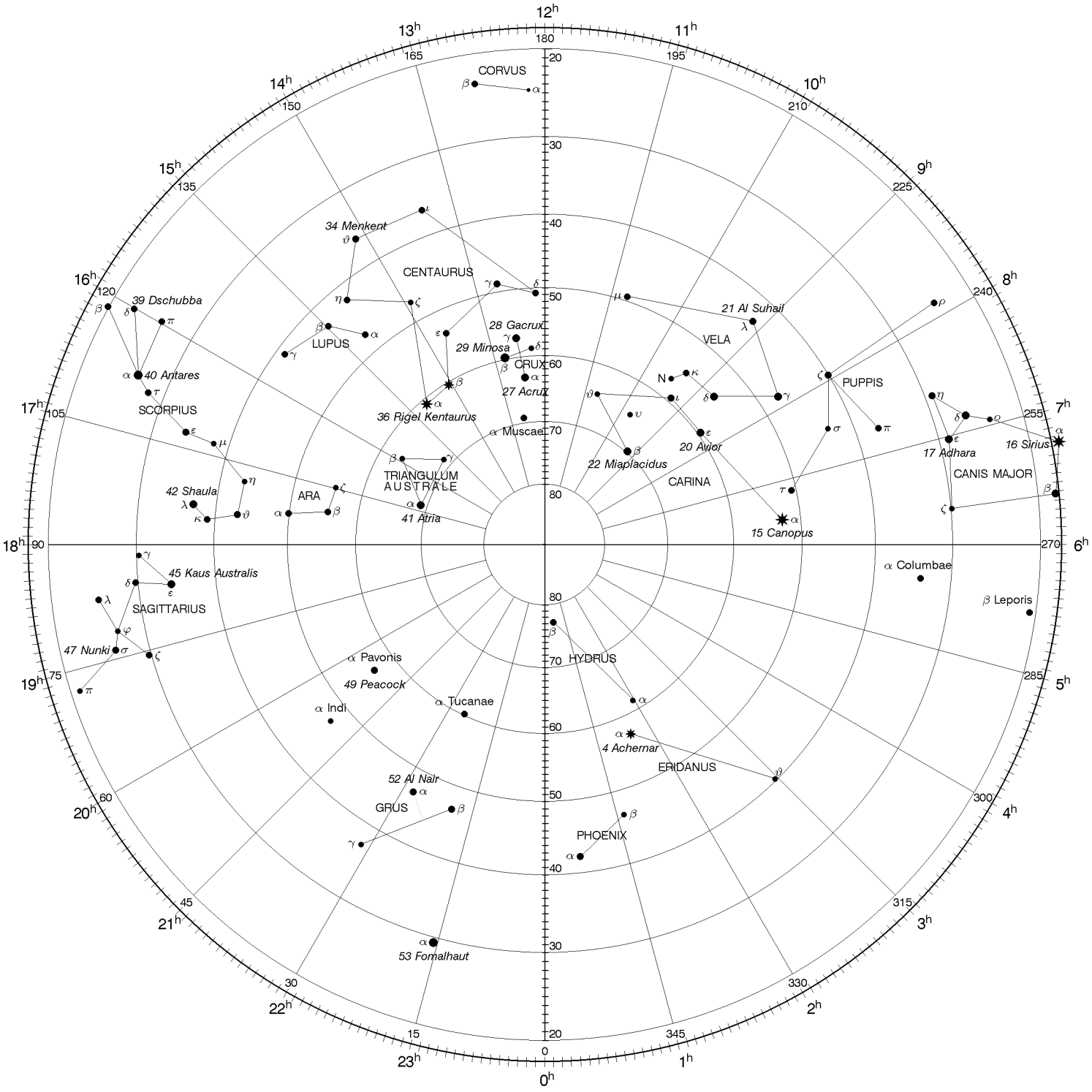
KARTA SAZVEŽĐA SEVERNOG NEBA



VELIČINE ZVEZDA

✷ $0.0 \geq m$	✷ $0.0 < m \leq 0.5$	✷ $0.5 < m \leq 1.0$	● $1.0 < m \leq 1.5$	● $1.5 < m \leq 2.0$	● $2.0 < m \leq 2.5$
● $2.5 < m \leq 3.0$	● $3.0 < m \leq 3.5$	• $3.5 < m \leq 4.0$	• $4.0 < m \leq 4.5$	• $4.5 < m \leq 5.0$	

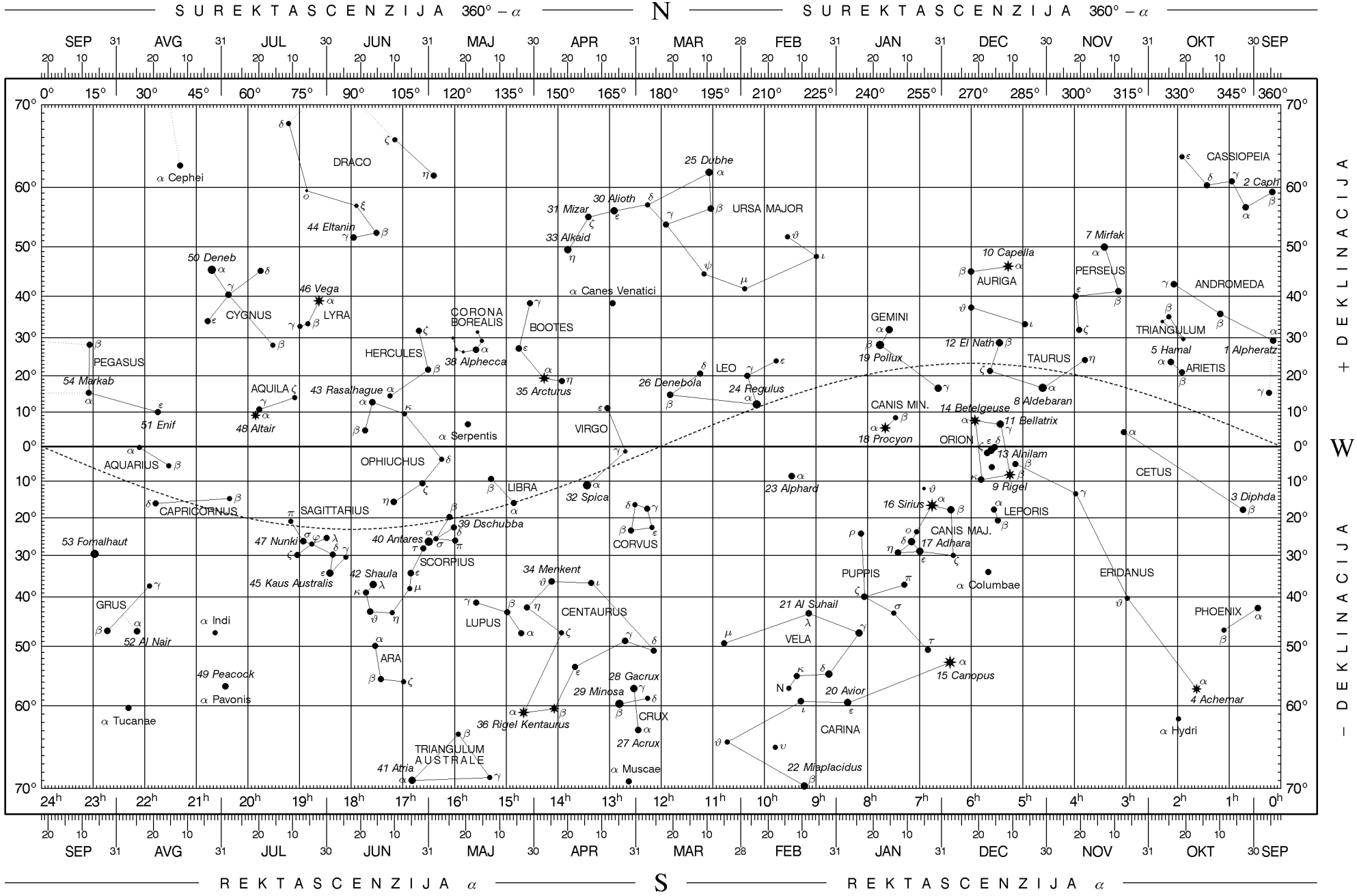
KARTA SAZVEŽĐA JUŽNOG NEBA



VELIČINE ZVEZDA

✷ $0.0 \geq m$	✷ $0.0 < m \leq 0.5$	✷ $0.5 < m \leq 1.0$	● $1.0 < m \leq 1.5$	● $1.5 < m \leq 2.0$	● $2.0 < m \leq 2.5$
● $2.5 < m \leq 3.0$	● $3.0 < m \leq 3.5$	• $3.5 < m \leq 4.0$	• $4.0 < m \leq 4.5$	• $4.5 < m \leq 5.0$	

ZVEZDANO NEBO U POLA NOĆI



✷ 0.0 ≥ m ✷ 0.0 < m ≤ 0.5 ✷ 0.5 < m ≤ 1.0 ● 1.0 < m ≤ 1.5 ● 1.5 < m ≤ 2.0 ● 2.0 < m ≤ 2.5 ● 2.5 < m ≤ 3.0 • 3.0 < m ≤ 3.5 • 3.5 < m ≤ 4.0 • 4.0 < m ≤ 4.5 • 4.5 < m ≤ 5.0