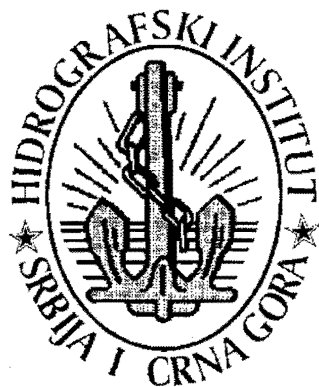


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Godina LXII



# NAUTIČKI GODIŠNJAK

— ZA —  
**2005**  
— GODINU —

HIDROGRAFSKI INSTITUT RATNE MORNARICE VOJSKE SRBIJE I CRNE GORE  
LEPETANE

# UKUPNA POPRAVKA VISINE

PRVA POPRAVKA VISINE ZA SUNCE, ZVEZDE I PLANETE		
Opažena visina	☉	★ i planeta
	refrakcija paralaksa radijus = 16'	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	/	/	/	/	/	/
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.	/	/	/	/	/	/	/	/	/	/	/	/
od 16. do kraja	+0.3	+0.2	+0.1	0.0	-0.1	-0.2	-0.2	-0.2	-0.1	+0.1	+0.2	+0.3
	+0.3	+0.2	+0.1	-0.1	-0.2	-0.2	-0.2	-0.2	0.0	+0.1	+0.2	+0.3

☉ Za gornji rub Sunca korekcija = tablična vrednost manje dvostruki radijus (2r)

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LEPETANE



PRVO IZDANJE

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POVEZ: STUDIO PLUS, Beograd

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TIRAŽ:

**200 PRIMERAKA**

ADRESA IZDAVAČA:

**HIDROGRAFSKI INSTITUT RATNE MORNARICE VOJSKE SRBIJE I CRNE GORE**

**85333 LEPETANE, TIVAT**



# PREDGOVOR

Hidrografski institut Ratne mornarice Vojske Srbije i Crne Gore iz Lepetana ove godine izdaje i dvanaesti broj NAUTIČKOG GODIŠNJAKA, koji je šezdeseti drugi u nizu izdanja ove publikacije na našim prostorima.

Za šezdesetidva broja Nautičkog godišnjaka, do sada, možemo zahvaliti jednoj maloj armiji ljudi, entuzijasta i naučnika, koji su dali svoj nesebični doprinos da ova publikacija bude prisutna među pomorcima Kraljevine Jugoslavije, Socijalističke Federativne Republike Jugoslavije, Savezne Republike Jugoslavije i Srbije i Crne Gore.

Od vremena kada je preuziman ruski Nautički godišnjak, kada se isti prevodio na naš jezik i kada su se ručno ukavale brojne vrednosti efemerida, tablice popravki i svi ostali sastavni delovi Godišnjaka, pa do današnje računarske obrade podataka, proliveno je mnogo znoja.

Od 1983. godine, zahvaljujući u mnogome 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 osamnaest, izvršio je prof. dr Stevo Šegan, nastavnik na Katedri za astronomiju Matematičkog fakulteta u Beogradu.

Ove godine suizdavač je Matematički fakultet iz Beograda.

Svi podaci potrebni za navigaciju izračunati su polazeći od heliocentričnih pravougljih koordinata nebeskih tela za standardnu epohu J2000.0, a izračunavanja su usklađena sa preporukama i rešenjima Međunarodne astronomske unije (IAU 1976–1978). 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 Grinički meridijan. Prema tome, argument u svim efemeridama je univerzalno vreme, koje se računa od ponoći (00<sup>h</sup>.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, uvažili smo.

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

NAČELNIK  
HIDROGRAFSKOG INSTITUTA RM

KAPETAN BOJNOG BRODA  
mr DUŠAN SLAVNIĆ

# ASTRONOMSKI ZNACI, SKRAĆENICE I KONSTANTE

## NAŠI I ENGLJSKI 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

## 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	

## 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

## 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 . . . . .  $\epsilon = 23^\circ 26' 21''.448$

### 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 . . . . .  $\alpha = 20''.495\,51$   
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 . . . . . 6023 600  
Venera . . . . . 408 523.7  
Zemlja + Mesec . . . . . 328 900.6  
Mars . . . . . 3098 708  
Jupiter . . . . . 1 047.349  
Saturn . . . . . 3 497.9  
Uran . . . . . 22 903  
Neptun . . . . . 19 412  
Pluton . . . . . 135 200 000

# NAŠE I ENGLLESKE SKRAĆENICE I KLJUČNE REČI

## Domestic and English Abbreviations and Key Words

<p><b>UT</b> Univerzalno (svetsko) vreme</p> <p><b>T<sub>p</sub></b> Griničko pravo vreme</p> <p><b>T<sub>z</sub></b> Griničko zvezdano vreme</p> <p><b>T<sub>m</sub></b> Srednje vreme gornjeg prolaza kroz meridijan u Griniču</p> <p><b>T<sub>m</sub></b> Srednje vreme donjeg prolaza kroz meridijan u Griniču</p> <p><b>t<sub>s</sub></b> Mesno srednje vreme</p> <p><b>t<sub>p</sub></b> Mesno pravo vreme</p> <p><b>t<sub>z</sub></b> Mesno zvezdano vreme</p> <p><b>t<sub>x</sub></b> Zonsko vreme</p> <p><b>t<sub>zv</sub></b> Zvanično vreme</p> <p><b>e</b> Jednačina vremena</p> <p><b>S</b> Grinički časovni ugao</p> <p><b>s</b> Mesni časovni ugao</p> <p><b>δ</b> Deklinacija</p> <p><b>α</b> Rektascenzija</p> <p><b>(360° - α)</b> Surektascenzija</p> <p><b>γ</b> Prolećna tačka</p> <p><b>π</b> Horizontska paralaksa</p> <p><b>φ</b> Geografska širina</p> <p><b>λ</b> Geografska dužina</p> <p><b>r</b> Poluprečnik</p> <p><b>Pl.</b> Planete</p> <p><b>Br.</b> Broj</p> <p><b>Vel.</b> Veličina</p> <p><b>d</b> Dan</p> <p><b>h</b> Čas</p> <p><b>min</b> Minut</p> <p><b>s</b> Sekunda</p>	<p><b>UT</b> Universal Time</p> <p><b>GAT</b> Greenwich Apparent Time</p> <p><b>GST</b> Greenwich Sidereal Time</p> <p><b>T<sub>U</sub></b> Greenwich Mean Time of the Upper Transit on the Meridian of Greenwich</p> <p><b>T<sub>L</sub></b> Greenwich Mean Time of the Lower Transit on the Meridian of Greenwich</p> <p><b>LMT</b> Local Mean Time</p> <p><b>LAT</b> Local Apparent Time</p> <p><b>LST</b> Local Sidereal Time</p> <p><b>ZT</b> Zone Time</p> <p><b>LCT</b> Local Civil Time</p> <p><b>Eq.T.</b> Equation of Time (App.-Mean)</p> <p><b>GHA</b> Greenwich Hour Angle</p> <p><b>LHA</b> Local Hour Angle, Meridian Angle</p> <p><b>Dec.</b> Declination</p> <p><b>RA</b> Right Ascension</p> <p><b>SHA</b> Sidereal Hour Angle</p> <p><b>γ</b> First Point of Aries</p> <p><b>H.P.</b> Horizontal Parallax</p> <p><b>Lat.</b> Latitude</p> <p><b>Long.</b> Longitude</p> <p><b>SD</b> Semidiameter</p> <p><b>Pl.</b> Planets</p> <p><b>No.</b> Number</p> <p><b>Mag.</b> Magnitude</p> <p><b>d</b> Day</p> <p><b>h</b> Hour</p> <p><b>min</b> Minute of Time</p> <p><b>s</b> Second of Time</p>
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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 PLANETAMA

MESEČEVE MENE																
mesec	PRVA ČETVRT			PUN MESEC			POSLEDNJA ČETVRT			MLAD MESEC			mesec			
	●			○			●			●						
	dan	h	min	dan	h	min	dan	h	min	dan	h	min		dan	h	min
Januar				10	12	3				25	10	32	3	17	46	Januar
Februar				8	22	28				16	0	16	2	7	27	Februar
Mart				10	9	10				17	19	19	3	17	36	Mart
April				8	20	32				16	14	37	2	0	50	April
Maj				8	8	45				16	8	56	1	6	24	Maj
Jun				6	21	55				15	1	22				Jun
Jul				6	12	2				14	15	20				Jul
Avgust				5	3	5				13	2	38				Avgust
Septembar				3	18	45				11	11	37				Septembar
Oktober				3	10	28				10	19	1				Oktober
Novembar				2	1	24				9	1	57				Novembar
Decembar	31	3	12	1	15	1				8	9	36				Decembar


PERIGEJ I APOGEJ MESECA										
mesec	PERIGEJ				APOGEJ					
	dan	h	min		dan	h	min	mesec		
Januar	10	10	8.0		23	18	55.0	Januar		
Februar	7	22	10.0		20	5	0.0	Februar		
Mart	8	3	43.0		19	22	55.0	Mart		
April	4	11	11.0	29	10	0.0	16	18	42.0	April
Maj				26	10	44.0	14	13	42.0	Maj
Jun				23	11	50.0	11	6	13.0	Jun
Jul				21	19	46.0	8	17	40.0	Jul
Avgust				19	5	33.0	4	21	50.0	Avgust
Septembar				16	13	59.0	1	2	36.0	Septembar
Oktober				14	13	51.0	28	15	21.9	Oktober
Novembar				10	0	16.0	26	9	36.0	Novembar
Decembar				5	4	33.0	23	6	19.0	Decembar
							21	2	50.0	


VIDLJIVOST PLANETA												
Osenčeni deo dijagrama pokazuje kada je planeta nevidljiva												
Planeta	Jan.	Feb.	Mart	Apr.	Maj	Jun	Jul	Avg.	Sep.	Okt.	Nov.	Dec.
♀ Venera		12. II			12. V							
♂ Mars												
♃ Jupiter									5. X		6. XI	
♄ Saturn						10. VII		5. VIII				

POČECI GODIŠNJIH DOBA			
PROLEĆE	LETO	JESEN	ZIMA
20. mart u 12 <sup>h</sup> 33 <sup>m</sup> 0	21. jun u 6 <sup>h</sup> 46 <sup>m</sup> 0	22. septembar u 22 <sup>h</sup> 23 <sup>m</sup> 0	21. decembar u 18 <sup>h</sup> 35 <sup>m</sup> 0


# POMRAČENJA SUNCA I MESECA u 2005. godini

DESIĆE SE UKUPNO ČETRI POMRAČENJA:  
DVA POMRAČENJA SUNCA (OBA PRSTENASTA, PRVO POTPUNO)  
DVA POMRAČENJA MESECA (OBA DELIMIČNA)

<b>1.</b>	<b>8. APRIL</b>	 <b>PRSTENASTO POMRAČENJE SUNCA</b>	<b>univerzalno (svetsko) vreme</b> dan h min
• ••• •••• ••• •	→ ←→ ←→ ←→ ←	POČETAK POMRAČENJA POČETAK POTPUNOG POMRAČENJA SREDINA POMRAČENJA KRAJ POTPUNOG POMRAČENJA KRAJ POMRAČENJA	8 17 51.2 8 18 53.6 8 20 15.6 8 22 18.0 8 23 20.4
		<b>VIDLJIVOST:</b> JUŽNI TIHI OKEAN, MEKSIKO, CENTRALNA I JUŽNA AMERIKA	

<b>2.</b>	<b>24. APRIL</b>	 <b>POMRAČENJE MESECA POLUSENKOM</b>	<b>univerzalno (svetsko) vreme</b> dan h min
• ••• •	→ ←→ ←	ULAZAK MESECA U POLUSENKU SREDINA POMRAČENJA IZLAZAK MESECA IZ POLUSENKE	24 7 49.8 24 9 54.8 24 11 59.8

<b>3.</b>	<b>3. OKTOBAR</b>	 <b>PRSTENASTO POMRAČENJE SUNCA</b>	<b>univerzalno (svetsko) vreme</b> dan h min
• ••• •	→ ←→ ←	POČETAK POMRAČENJA SREDINA POMRAČENJA KRAJ POMRAČENJA	3 7 35.5 3 10 10.7 3 13 27.8
		<b>VIDLJIVOST:</b> GRENLAND, SEVERNI ATLANTIK EVROPA, AFRIKA, BLISKI ISTOK, INDIJA I INDIJSKI OKEAN	

<b>4.</b>	<b>17. OKTOBAR</b>	 <b>DELIMIČNO POMRAČENJE MESECA</b>	<b>univerzalno (svetsko) vreme</b> dan h min
• ••• •••• ••• •	→ ←→ ←→ ←→ ←	ULAZAK MESECA U POLUSENKU PRVI KONTAKT SA SENKOM SREDINA POMRAČENJA POSLEDNJI KONTAKT SA SENKOM IZLAZAK MESECA IZ POLUSENKE	17 9 51.4 17 11 34.0 17 12 3.3 17 12 32.5 17 14 15.1

# KALENDAR

## za prostu 2005. godinu

JANUAR				FEBRUAR				MART				APRIL				MAJ				JUN			
Dan u sed.	Dan u mes.	Dan u god.	Julijanski datum	Dan u sed.	Dan u mes.	Dan u god.	Julijanski datum	Dan u sed.	Dan u mes.	Dan u god.	Julijanski datum	Dan u sed.	Dan u mes.	Dan u god.	Julijanski datum	Dan u sed.	Dan u mes.	Dan u god.	Julijanski datum	Dan u sed.	Dan u mes.	Dan u god.	Julijanski datum
			245				245				245				245				245				245
SU	1	1	3371.5	UT	1	32	3402.5	UT	1	60	3430.5	PE	1	91	3461.5	NE <sub>18</sub>	1	121	3491.5	SR	1	152	3522.5
NE <sub>1</sub>	2	2	3372.5	SR	2	33	3403.5	SR	2	61	3431.5	SU	2	92	3462.5	PO	2	122	3492.5	ČE	2	153	3523.5
PO	3	3	3373.5	ČE	3	34	3404.5	ČE	3	62	3432.5	NE <sub>14</sub>	3	93	3463.5	UT	3	123	3493.5	PE	3	154	3524.5
UT	4	4	3374.5	PE	4	35	3405.5	PE	4	63	3433.5	PO	4	94	3464.5	SR	4	124	3494.5	SU	4	155	3525.5
SR	5	5	3375.5	SU	5	36	3406.5	SU	5	64	3434.5	UT	5	95	3465.5	ČE	5	125	3495.5	NE <sub>23</sub>	5	156	3526.5
ČE	6	6	3376.5	NE <sub>6</sub>	6	37	3407.5	NE <sub>10</sub>	6	65	3435.5	SR	6	96	3466.5	PE	6	126	3496.5	PO	6	157	3527.5
PE	7	7	3377.5	PO	7	38	3408.5	PO	7	66	3436.5	ČE	7	97	3467.5	SU	7	127	3497.5	UT	7	158	3528.5
SU	8	8	3378.5	UT	8	39	3409.5	UT	8	67	3437.5	PE	8	98	3468.5	NE <sub>19</sub>	8	128	3498.5	SR	8	159	3529.5
NE <sub>2</sub>	9	9	3379.5	SR	9	40	3410.5	SR	9	68	3438.5	SU	9	99	3469.5	PO	9	129	3499.5	ČE	9	160	3530.5
PO	10	10	3380.5	ČE	10	41	3411.5	ČE	10	69	3439.5	NE <sub>15</sub>	10	100	3470.5	UT	10	130	3500.5	PE	10	161	3531.5
UT	11	11	3381.5	PE	11	42	3412.5	PE	11	70	3440.5	PO	11	101	3471.5	SR	11	131	3501.5	SU	11	162	3532.5
SR	12	12	3382.5	SU	12	43	3413.5	SU	12	71	3441.5	UT	12	102	3472.5	ČE	12	132	3502.5	NE <sub>24</sub>	12	163	3533.5
ČE	13	13	3383.5	NE <sub>7</sub>	13	44	3414.5	NE <sub>11</sub>	13	72	3442.5	SR	13	103	3473.5	PE	13	133	3503.5	PO	13	164	3534.5
PE	14	14	3384.5	PO	14	45	3415.5	PO	14	73	3443.5	ČE	14	104	3474.5	SU	14	134	3504.5	UT	14	165	3535.5
SU	15	15	3385.5	UT	15	46	3416.5	UT	15	74	3444.5	PE	15	105	3475.5	NE <sub>20</sub>	15	135	3505.5	SR	15	166	3536.5
NE <sub>3</sub>	16	16	3386.5	SR	16	47	3417.5	SR	16	75	3445.5	SU	16	106	3476.5	PO	16	136	3506.5	ČE	16	167	3537.5
PO	17	17	3387.5	ČE	17	48	3418.5	ČE	17	76	3446.5	NE <sub>16</sub>	17	107	3477.5	UT	17	137	3507.5	PE	17	168	3538.5
UT	18	18	3388.5	PE	18	49	3419.5	PE	18	77	3447.5	PO	18	108	3478.5	SR	18	138	3508.5	SU	18	169	3539.5
SR	19	19	3389.5	SU	19	50	3420.5	SU	19	78	3448.5	UT	19	109	3479.5	ČE	19	139	3509.5	NE <sub>25</sub>	19	170	3540.5
ČE	20	20	3390.5	NE <sub>8</sub>	20	51	3421.5	NE <sub>12</sub>	20	79	3449.5	SR	20	110	3480.5	PE	20	140	3510.5	PO	20	171	3541.5
PE	21	21	3391.5	PO	21	52	3422.5	PO	21	80	3450.5	ČE	21	111	3481.5	SU	21	141	3511.5	UT	21	172	3542.5
SU	22	22	3392.5	UT	22	53	3423.5	UT	22	81	3451.5	PE	22	112	3482.5	NE <sub>21</sub>	22	142	3512.5	SR	22	173	3543.5
NE <sub>4</sub>	23	23	3393.5	SR	23	54	3424.5	SR	23	82	3452.5	SU	23	113	3483.5	PO	23	143	3513.5	ČE	23	174	3544.5
PO	24	24	3394.5	ČE	24	55	3425.5	ČE	24	83	3453.5	NE <sub>17</sub>	24	114	3484.5	UT	24	144	3514.5	PE	24	175	3545.5
UT	25	25	3395.5	PE	25	56	3426.5	PE	25	84	3454.5	PO	25	115	3485.5	SR	25	145	3515.5	SU	25	176	3546.5
SR	26	26	3396.5	SU	26	57	3427.5	SU	26	85	3455.5	UT	26	116	3486.5	ČE	26	146	3516.5	NE <sub>26</sub>	26	177	3547.5
ČE	27	27	3397.5	NE <sub>9</sub>	27	58	3428.5	NE <sub>13</sub>	27	86	3456.5	SR	27	117	3487.5	PE	27	147	3517.5	PO	27	178	3548.5
PE	28	28	3398.5	PO	28	59	3429.5	PO	28	87	3457.5	ČE	28	118	3488.5	SU	28	148	3518.5	UT	28	179	3549.5
SU	29	29	3399.5					UT	29	88	3458.5	PE	29	119	3489.5	NE <sub>22</sub>	29	149	3519.5	SR	29	180	3550.5
NE <sub>5</sub>	30	30	3400.5					SR	30	89	3459.5	SU	30	120	3490.5	PO	30	150	3520.5	ČE	30	181	3551.5
PO	31	31	3401.5					ČE	31	90	3460.5					UT	31	151	3521.5				

JUL				AVGUST				SEPTEMBAR				OKTOBAR				NOVEMBAR				DECEMBAR			
Dan u sed.	Dan u mes.	Dan u god.	Julijanski datum	Dan u sed.	Dan u mes.	Dan u god.	Julijanski datum	Dan u sed.	Dan u mes.	Dan u god.	Julijanski datum	Dan u sed.	Dan u mes.	Dan u god.	Julijanski datum	Dan u sed.	Dan u mes.	Dan u god.	Julijanski datum	Dan u sed.	Dan u mes.	Dan u god.	Julijanski datum
			245				245				245				245				245				245
PE	1	182	3552.5	PO	1	213	3583.5	ČE	1	244	3614.5	SU	1	274	3644.5	UT	1	305	3675.5	ČE	1	335	3705.5
SU	2	183	3553.5	UT	2	214	3584.5	PE	2	245	3615.5	NE <sub>40</sub>	2	275	3645.5	SR	2	306	3676.5	PE	2	336	3706.5
NE <sub>27</sub>	3	184	3554.5	SR	3	215	3585.5	SU	3	246	3616.5	PO	3	276	3646.5	ČE	3	307	3677.5	SU	3	337	3707.5
PO	4	185	3555.5	ČE	4	216	3586.5	NE <sub>36</sub>	4	247	3617.5	UT	4	277	3647.5	PE	4	308	3678.5	NE <sub>44</sub>	4	338	3708.5
UT	5	186	3556.5	PE	5	217	3587.5	PO	5	248	3618.5	SR	5	278	3648.5	SU	5	309	3679.5	PO	5	339	3709.5
SR	6	187	3557.5	SU	6	218	3588.5	UT	6	249	3619.5	ČE	6	279	3649.5	NE <sub>45</sub>	6	310	3680.5	UT	6	340	3710.5
ČE	7	188	3558.5	NE <sub>32</sub>	7	219	3589.5	SR	7	250	3620.5	PE	7	280	3650.5	PO	7	311	3681.5	SR	7	341	3711.5
PE	8	189	3559.5	PO	8	220	3590.5	ČE	8	251	3621.5	SU	8	281	3651.5	UT	8	312	3682.5	ČE	8	342	3712.5
SU	9	190	3560.5	UT	9	221	3591.5	PE	9	252	3622.5	NE <sub>41</sub>	9	282	3652.5	SR	9	313	3683.5	PE	9	343	3713.5
NE <sub>24</sub>	10	191	3561.5	SR	10	222	3592.5	SU	10	253	3623.5	PO	10	283	3653.5	ČE	10	314	3684.5	SU	10	344	3714.5
PO	11	192	3562.5	ČE	11	223	3593.5	NE <sub>37</sub>	11	254	3624.5	UT	11	284	3654.5	PE	11	315	3685.5	NE <sub>50</sub>	11	345	3715.5
UT	12	193	3563.5	PE	12	224	3594.5	PO	12	255	3625.5	SR	12	285	3655.5	SU	12	316	3686.5	PO	12	346	3716.5
SR	13	194	3564.5	SU	13	225	3595.5	UT	13	256	3626.5	ČE	13	286	3656.5	NE <sub>46</sub>	13	317	3687.5	UT	13	347	3717.5
ČE	14	195	3565.5	NE <sub>33</sub>	14	226	3596.5	SR	14	257	3627.5	PE	14	287	3657.5	PO	14	318	3688.5	SR	14	348	3718.5
PE	15	196	3566.5	PO	15	227	3597.5	ČE	15	258	3628.5	SU	15	288	3658.5	UT	15	319	3689.5	ČE	15	349	3719.5
SU	16	197	3567.5	UT	16	228	3598.5	PE	16	259	3629.5	NE <sub>42</sub>	16	289	3659.5	SR	16	320	3690.5	PE	16	350	3720.5
NE <sub>25</sub>	17	198	3568.5	SR	17	229	3599.5	SU	17	260	3630.5	PO	17	290	3660.5	ČE	17	321	3691.5	SU	17	351	3721.5
PO	18	199	3569.5	ČE	18	230	3600.5	NE <sub>38</sub>	18	261	3631.5	UT	18	291	3661.5	PE	18	322	3692.5	NE <sub>51</sub>	18	352	3722.5
UT	19	200	3570.5	PE	19	231	3601.5	PO	19	262	3632.5	SR	19	292	3662.5	SU	19	323	3693.5	PO	19	353	3723.5
SR	20	201	3571.5	SU	20	232	3602.5	UT	20	263	3633.5	ČE	20	293	3663.5	NE <sub>47</sub>	20	324	3694.5	UT	20	354	3724.5
ČE	21	202	3572.5	NE <sub>34</sub>	21	233	3603.5	SR	21	264	3634.5	PE	21	294	3664.5	PO	21	325	3695.5	SR	21	355	3725.5
PE	22	203	3573.5	PO	22	234	3604.5	ČE	22	265	3635.5	SU	22	295	3665.5	UT	22	326	3696.5	ČE	22	356	3726.5
SU	23	204	3574.5	UT	23	235	3605.5	PE	23	266	3636.5	NE <sub>43</sub>	23	296	3666.5	SR	23	327	3697.5	PE	23	357	3727.5
NE <sub>30</sub>	24	205	3575.5	SR	24	236	3606.5	SU	24	267	3637.5</												



# ***Efemeride***

*SUNCA, MESECA, VENERE,  
MARSA, JUPITERA I SATURNA*

UT	SUNCE				PROLEĆ. TAČKA S <sub>γ</sub>	VENERA				MARS					
	S <sub>☉</sub>		δ <sub>☉</sub>			S <sub>♀</sub>		δ <sub>♀</sub>		S <sub>♂</sub>		δ <sub>♂</sub>			
h	°	'	°	'	°	'	°	'	°	'	°	'			
0	179	8.4	-23	.7	100	44.5	202	31.9	-22	15.4	218	20.4	-20	51.5	
2	209	7.9	-23	.3	130	49.4	232	30.1	-22	16.1	248	21.7	-20	52.2	
4	239	7.3	-22	59.9	160	54.3	262	28.3	-22	16.8	278	23.0	-20	52.9	
6	269	6.7	-22	59.5	190	59.3	292	26.6	-22	17.5	308	24.3	-20	53.6	
8	299	6.1	-22	59.1	221	4.2	322	24.8	-22	18.2	338	25.7	-20	54.3	
10	329	5.5	-22	58.6	251	9.1	352	23.0	-22	18.9	8	27.0	-20	55.0	
12	359	4.9	-22	58.2	281	14.1	22	21.2	-22	19.6	38	28.3	-20	55.6	
14	29	4.3	-22	57.8	311	19.0	52	19.4	-22	20.3	68	29.6	-20	56.3	
16	59	3.7	-22	57.4	341	23.9	82	17.6	-22	21.0	98	30.9	-20	57.0	
18	89	3.2	-22	56.9	11	28.8	112	15.8	-22	21.6	128	32.2	-20	57.7	
20	119	2.6	-22	56.5	41	33.8	142	14.0	-22	22.3	158	33.5	-20	58.3	
22	149	2.0	-22	56.1	71	38.7	172	12.2	-22	23.0	188	34.8	-20	59.0	
Δ		-3		2				-9		-3			7		-3

UT	MESEC				JUPITER				SATURN							
	S <sub>♃</sub>		Δ		δ <sub>♃</sub>		Δ		S <sub>♃</sub>		δ <sub>♃</sub>		S <sub>♄</sub>		δ <sub>♄</sub>	
h	°	'	°	'	°	'	°	'	°	'	°	'	°	'	°	'
0	298	23.6	155	11	38.6	-132	264	18.6	-5	35.5	343	52.6	21	7.9		
2	327	32.7	156	11	12.2	-133	294	23.0	-5	35.7	13	58.0	21	8.0		
4	356	41.9	156	10	45.7	-134	324	27.5	-5	35.9	44	3.3	21	8.1		
6	25	51.1	157	10	18.9	-135	354	32.0	-5	36.0	74	8.7	21	8.1		
8	55	.5	157	9	52.0	-136	24	36.5	-5	36.2	104	14.0	21	8.2		
10	84	9.9	157	9	24.9	-137	54	41.0	-5	36.4	134	19.3	21	8.3		
12	113	19.4	158	8	57.6	-137	84	45.5	-5	36.5	164	24.7	21	8.4		
14	142	28.9	158	8	30.1	-138	114	49.9	-5	36.7	194	30.0	21	8.5		
16	171	38.5	158	8	2.4	-139	144	54.4	-5	36.8	224	35.4	21	8.5		
18	200	48.1	158	7	34.6	-140	174	58.9	-5	37.0	254	40.7	21	8.6		
20	229	57.7	158	7	6.6	-141	205	3.4	-5	37.2	284	46.1	21	8.7		
22	259	7.4	158	6	38.4	-142	235	7.9	-5	37.3	314	51.4	21	8.8		
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	9 2	15 5	0 57	2 44	21 57	3.6	11 29	.0
55	8 25	15 43	0 45	2 17	22 6	3.2	11 18	.3
50	7 59	16 9	0 38	1 59	22 13	3.0	11 9	.5
45	7 38	16 29	0 34	1 46	22 18	2.8	11 2	.7
40	7 22	16 46	0 30	1 37	22 22	2.6	10 56	.9
35	7 8	16 59	0 28	1 30	22 26	2.5	10 50	1.0
30	6 56	17 11	0 26	1 25	22 30	2.3	10 46	1.1
20	6 35	17 32	0 24	1 18	22 35	2.1	10 38	1.4
10	6 17	17 50	0 23	1 15	22 40	1.9	10 30	1.5
0	5 60	18 7	0 22	1 15	22 45	1.7	10 24	1.7
10	5 43	18 25	0 23	1 17	22 50	1.6	10 17	1.9
20	5 24	18 43	0 24	1 24	22 55	1.4	10 9	2.1
30	5 2	19 5	0 27	1 36	23 0	1.1	10 1	2.3
35	4 50	19 17	0 30	1 46	23 4	1.0	9 56	2.4
40	4 35	19 32	0 33	2 2	23 7	.9	9 50	2.6
45	4 17	19 50	0 37	2 30	23 11	.7	9 44	2.8
50	3 55	20 12	0 44	:::	23 16	.5	9 36	3.0
55	3 26	20 41	0 57	:::	23 23	.3	9 26	3.2
60	2 43	21 23	1 35	:::	23 30	.0	9 13	3.6

SUNCE				MESEC			
UT	e = T <sub>p</sub> - UT	Δ/24	r	Prolaz	Δ/24	π <sub>♃</sub>	r
h	min s	s	'	h min	min	'	'
00	- 3 26.1	-1.2	16.3	T <sub>m</sub>	4 14	1.7	54.9 14.9
12	- 3 40.2	T <sub>m☉</sub>	12 h 3,7 min	Starost	19.9 d	Faza	☉

PLANETE									
Pl.	T <sub>m</sub>	π	360-α	Vel.	Pl.	T <sub>m</sub>	π	360-α	Vel.
h	min	'	°		h	min	'	°	
♀	10 31	.1	102	-3.8	♃	6 22	.0	164	-1.8
♂	9 26	.1	118	1.6	♄	1 4	.0	243	-2.2

UT	SUNCE				PROLEĆ. TAČKA S <sub>γ</sub>	VENERA				MARS					
	S <sub>☉</sub>		δ <sub>☉</sub>			S <sub>♀</sub>		δ <sub>♀</sub>		S <sub>♂</sub>		δ <sub>♂</sub>			
h	°	'	°	'	°	'	°	'	°	'	°	'			
0	179	1.4	-22	55.6	101	43.6	202	10.4	-22	23.6	218	36.1	-20	59.7	
2	209	.8	-22	55.2	131	48.5	232	8.5	-22	24.3	248	37.4	-21	.4	
4	239	.2	-22	54.7	161	53.5	262	6.7	-22	25.0	278	38.8	-21	1.0	
6	268	59.7	-22	54.3	191	58.4	292	4.9	-22	25.6	308	40.1	-21	1.7	
8	298	59.1	-22	53.8	222	3.3	322	3.1	-22	26.2	338	41.4	-21	2.4	
10	328	58.5	-22	53.3	252	8.3	352	1.3	-22	26.9	8	42.7	-21	3.0	
12	358	57.9	-22	52.9	282	13.2	21	59.5	-22	27.5	38	44.0	-21	3.7	
14	28	57.3	-22	52.4	312	18.1	51	57.7	-22	28.1	68	45.3	-21	4.4	
16	58	56.8	-22	51.9	342	23.0	81	55.9	-22	28.8	98	46.6	-21	5.0	
18	88	56.2	-22	51.5	12	28.0	111	54.1	-22	29.4	128	47.9	-21	5.7	
20	118	55.6	-22	51.0	42	32.9	141	52.2	-22	30.0	158	49.2	-21	6.4	
22	148	55.0	-22	50.5	72	37.8	171	50.4	-22	30.6	188	50.5	-21	7.0	
Δ		-3		2				-9		-3			7		-3

UT	MESEC				JUPITER				SATURN							
	S <sub>♃</sub>		Δ		δ <sub>♃</sub>		Δ		S <sub>♃</sub>		δ <sub>♃</sub>		S <sub>♄</sub>		δ <sub>♄</sub>	
h	°	'	°	'	°	'	°	'	°	'	°	'	°	'	°	'
0	288	17.1	158	6	10.1	-142	265	12.4	-5	37.5	344	56.7	21	8.8		
2	317	26.8	158	5	41.7	-143	295	16.9	-5	37.6	15	2.1	21	8.9		
4	346	36.4	158	5	13.1	-144	325	21.4	-5	37.8	45	7.4	21	9.0		
6	15	46.1	158	4	44.4	-144	355	25.9	-5	37.9	75	12.8	21	9.1		
8	44	55.7	158	4	15.5	-145	25	30.4	-5	38.1	105	18.1	21	9.2		
10	74	5.3	158	3	46.6	-145	55	34.9	-5	38.3	135	23.5	21	9.2		
12	103	14.9	158	3	17.5	-146	85	39.4	-5	38.4	165	28.8	21	9.3		
14	132	24.4	157	2	48.3	-146	115	43.9	-5	38.6	195	34.2	21	9.4		
16	161	33.8	157	2	19.0	-147	145	48.4	-5	38.7	225	39.5	21	9.5		
18	190	43.2	156	1	49.6	-147	175	52.9	-5	38.9	255	44.8	21	9.6		
20	219	52.5	156	1	20.1	-148	205	57.4	-5	39.0	285	50.2	21	9.6		
22	249	1.6	155	0	50.5	-148	236	1.9	-5	39.2	315	55.5	21	9.7		
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	9 2	15 7	0 56	2 44	23 23	3.7	11 29	.0
55	8 25	15 44	0 45	2 16	23 24	3.3	11 25	.3
50	7 58	16 10	0 38	1 59	23 24	3.1	11 22	.5
45	7 38	16 30	0 34	1 46	23 25	2.9	11 19	.7
40	7 22	16 46	0 30	1 37	23 25	2.7	11 17	.9
35	7 8	17 0	0 28	1 30	23 25	2.5	11 15	1.0
30	6 56	17 12	0 26	1 25	23 26	2.4	11 13	1.1
20	6 36	17 33	0 24	1 18	23 26	2.2	11 10	1.4
10	6 17	17 51	0 23	1 15	23 26	2.0	11 8	1.6
0	6 0	18 8	0 22	1 15	23 27	1.8	11 5	1.7
10	5 43	18 25	0 23	1 17	23 27	1.6	11 2	1.9
20	5 25	18 43	0 24	1 24	23 27	1.4	10 60	2.1
30	5 3	19 5	0 27	1 36	23 28	1.2	10 57	2.4
35	4 51	19 18	0 29	1 46	23 28	1.0	10 55	2.5
40	4 36	19 32	0 33	2 1	23 28	.9	10 53	2.6
45	4 18	19 50	0 37	2 29	23 29	.7	10 50	2.8
50	3 56	20 11	0 44	:::	23 29	.5	10 47	3.0
55	3 27	20 40	0 56	:::	23 29	.3	10 44	3.3
60	2 45	21 23	1 34	:::	23 30	.0	10 39	3.6

SUNCE				MESEC			
UT	e = T <sub>p</sub> - UT	Δ/24	r	Prolaz	Δ/24	π <sub>♃</sub>	r
h	min s	s	'	h min	min	'	'
00	- 3 54.2	-1.2	16.3	T <sub>m</sub>	4 55</		

UT	SUNCE		PROLEĆ. TAČKA S <sub>γ</sub>	VENERA		MARS	
	S <sub>☉</sub>	δ <sub>☉</sub>		S <sub>♀</sub>	δ <sub>♀</sub>	S <sub>♂</sub>	δ <sub>♂</sub>
h	° / ' / "	° / ' / "	° / ' / "	° / ' / "	° / ' / "	° / ' / "	° / ' / "
0	178 54.4 -22 50.0		102 42.8	201 48.6 -22 31.2	218 51.8 -21 7.7		
2	208 53.9 -22 49.5		132 47.7	231 46.8 -22 31.8	248 53.1 -21 8.3		
4	238 53.3 -22 49.1		162 52.6	261 45.0 -22 32.4	278 54.4 -21 9.0		
6	268 52.7 -22 48.6		192 57.5	291 43.1 -22 33.0	308 55.7 -21 9.6		
8	298 52.1 -22 48.1		223 2.5	321 41.3 -22 33.6	338 57.0 -21 10.3		
10	328 51.6 -22 47.6		253 7.4	351 39.5 -22 34.2	8 58.3 -21 11.0		
12	358 51.0 -22 47.1		283 12.3	21 37.7 -22 34.7	38 59.6 -21 11.6		
14	28 50.4 -22 46.6		313 17.3	51 35.8 -22 35.3	69 .8 -21 12.3		
16	58 49.9 -22 46.1		343 22.2	81 34.0 -22 35.9	99 2.1 -21 12.9		
18	88 49.3 -22 45.6		13 27.1	111 32.2 -22 36.4	129 3.4 -21 13.5		
20	118 48.7 -22 45.0		43 32.0	141 30.4 -22 37.0	159 4.7 -21 14.2		
22	148 48.1 -22 44.5		73 37.0	171 28.5 -22 37.5	189 6.0 -21 14.8		
Δ	-3	3		-9	-3	6	-3

φ	SUNCE		TRAJANJE SUMRAKA		MESEC			
	IZLAZ	ZALAZ	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 43	...	.0	11 29	.0
55	8 24	15 45	0 45	2 16	...	.0	11 32	.3
50	7 58	16 11	0 38	1 59	...	.0	11 34	.6
45	7 38	16 31	0 34	1 46	...	.0	11 36	.8
40	7 22	16 47	0 30	1 37	...	.0	11 38	.9
35	7 8	17 1	0 28	1 30	...	.0	11 40	1.1
30	6 56	17 13	0 26	1 25	...	.0	11 41	1.2
20	6 36	17 33	0 24	1 18	...	.0	11 43	1.4
10	6 18	17 51	0 23	1 15	...	.0	11 45	1.6
0	6 1	18 8	0 22	1 15	...	.0	11 47	1.8
10	5 44	18 25	0 23	1 17	...	.0	11 49	2.0
20	5 25	18 44	0 24	1 23	...	.0	11 51	2.2
30	5 4	19 5	0 27	1 36	23 56	1.3	11 53	2.5
35	4 51	19 18	0 29	1 46	23 53	1.1	11 54	2.6
40	4 37	19 32	0 32	2 1	23 50	1.0	11 56	2.7
45	4 19	19 50	0 37	2 28	23 46	.8	11 58	2.9
50	3 58	20 11	0 44	:::	23 42	.6	11 60	3.1
55	3 29	20 40	0 56	:::	23 37	.4	12 2	3.4
60	2 46	21 22	1 32	:::	23 30	.0	12 6	3.8

UT	MESEC				JUPITER		SATURN	
	S <sub>♃</sub>	Δ	δ <sub>♃</sub>	Δ	S <sub>♃</sub>	δ <sub>♃</sub>	S <sub>♄</sub>	δ <sub>♄</sub>
h	° / ' / "	° / ' / "	° / ' / "	° / ' / "	° / ' / "	° / ' / "	° / ' / "	° / ' / "
0	278 10.7 155	0	20.9	-149	266 6.4 -5	39.3	346 .9	21 9.8
2	307 19.7 154	0	8.8	-149	296 10.9 -5	39.5	16 6.2	21 9.9
4	336 28.5 153	0	38.6	-149	326 15.4 -5	39.6	46 11.6	21 10.0
6	5 37.2 153	-1	8.4	-149	356 19.9 -5	39.8	76 16.9	21 10.0
8	34 45.8 152	-1	38.3	-150	26 24.4 -5	39.9	106 22.3	21 10.1
10	63 54.1 151	-2	8.2	-150	56 28.9 -5	40.1	136 27.6	21 10.2
12	93 2.4 150	-2	38.2	-150	86 33.4 -5	40.2	166 33.0	21 10.3
14	122 10.4 149	-3	8.2	-150	116 37.9 -5	40.4	196 38.3	21 10.4
16	151 18.3 148	-3	38.2	-150	146 42.4 -5	40.5	226 43.7	21 10.4
18	180 25.9 147	-4	8.2	-150	176 46.9 -5	40.7	256 49.0	21 10.5
20	209 33.3 146	-4	38.2	-150	206 51.5 -5	40.8	286 54.4	21 10.6
22	238 40.5 145	-5	8.3	-150	236 56.0 -5	41.0	316 59.7	21 10.7
Δ					23	-1	27	0

SUNCE				MESEC			
UT	e = T <sub>p</sub> - UT	Δ/24	r	Prolaz	Δ/24	π <sub>♃</sub>	r
h	min s	s	'	h min	min	'	'
00	- 4 22.0	-1.1	16.3	T <sub>m</sub>	5 37	1.8	56.1 15.3
12	- 4 35.8	T <sub>m☉</sub>	12 h 4.6 min	Starost	21.9 d	Faza	☉

PLANETE									
Pl.	T <sub>m</sub>	π	360-α	Vel.	Pl.	T <sub>m</sub>	π	360-α	Vel.
♀	h min	'	°		♃	h min	'	°	
♂	10 33	.1	99	-3.8	♄	6 15	.0	163	-1.8
♂	9 24	.1	116	1.6	♅	0 56	.0	243	-2.2

UT	SUNCE		PROLEĆ. TAČKA S <sub>γ</sub>	VENERA		MARS	
	S <sub>☉</sub>	δ <sub>☉</sub>		S <sub>♀</sub>	δ <sub>♀</sub>	S <sub>♂</sub>	δ <sub>♂</sub>
h	° / ' / "	° / ' / "	° / ' / "	° / ' / "	° / ' / "	° / ' / "	° / ' / "
0	178 47.6 -22 44.0		103 41.9	201 26.7 -22 38.1	219 7.3 -21 15.5		
2	208 47.0 -22 43.5		133 46.8	231 24.9 -22 38.6	249 8.6 -21 16.1		
4	238 46.4 -22 43.0		163 51.8	261 23.0 -22 39.2	279 9.9 -21 16.8		
6	268 45.9 -22 42.4		193 56.7	291 21.2 -22 39.7	309 11.2 -21 17.4		
8	298 45.3 -22 41.9		224 1.6	321 19.4 -22 40.2	339 12.5 -21 18.0		
10	328 44.7 -22 41.4		254 6.5	351 17.5 -22 40.8	9 13.7 -21 18.7		
12	358 44.2 -22 40.8		284 11.5	21 15.7 -22 41.3	39 15.0 -21 19.3		
14	28 43.6 -22 40.3		314 16.4	51 13.9 -22 41.8	69 16.3 -21 20.0		
16	58 43.1 -22 39.7		344 21.3	81 12.0 -22 42.3	99 17.6 -21 20.6		
18	88 42.5 -22 39.2		14 26.3	111 10.2 -22 42.8	129 18.9 -21 21.2		
20	118 41.9 -22 38.6		44 31.2	141 8.3 -22 43.3	159 20.2 -21 21.9		
22	148 41.4 -22 38.1		74 36.1	171 6.5 -22 43.8	189 21.4 -21 22.5		
Δ	-3	3		-9	-3	6	-3

φ	SUNCE		TRAJANJE SUMRAKA		MESEC			
	IZLAZ	ZALAZ	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	15 10	0 56	2 43	0 53	3.9	11 28	.0
55	8 24	15 46	0 45	2 16	0 45	3.5	11 39	.4
50	7 58	16 12	0 38	1 58	0 39	3.2	11 48	.7
45	7 38	16 32	0 33	1 46	0 34	3.0	11 55	.9
40	7 22	16 48	0 30	1 37	0 30	2.8	12 1	1.1
35	7 8	17 2	0 28	1 30	0 26	2.7	12 6	1.2
30	6 57	17 14	0 26	1 25	0 23	2.5	12 10	1.3
20	6 36	17 34	0 24	1 18	0 18	2.3	12 18	1.6
10	6 18	17 52	0 23	1 15	0 14	2.1	12 24	1.8
0	6 1	18 9	0 22	1 15	0 10	1.9	12 31	2.0
10	5 44	18 26	0 23	1 17	0 5	1.7	12 37	2.2
20	5 26	18 44	0 24	1 23	0 1	1.5	12 44	2.4
30	5 5	19 5	0 27	1 35	...	.0	12 52	2.6
35	4 52	19 18	0 29	1 45	...	.0	12 57	2.7
40	4 38	19 32	0 32	2 1	...	.0	13 2	2.9
45	4 20	19 49	0 37	2 27	...	.0	13 8	3.1
50	3 59	20 11	0 44	:::	23 57	.8	13 15	3.3
55	3 30	20 39	0 56	:::	23 45	.5	13 24	3.6
60	2 48	21 21	1 30	:::	23 30	.1	13 36	4.0

UT	MESEC				JUPITER		SATURN	
	S <sub>♃</sub>	Δ	δ <sub>♃</sub>	Δ	S <sub>♃</sub>	δ <sub>♃</sub>	S <sub>♄</sub>	δ <sub>♄</sub>
h	° / ' / "	° / ' / "	° / ' / "	° / ' / "	° / ' / "	° / ' / "	° / ' / "	° / ' / "
0	267 47.5 144	-5	38.3	-150	267 .5 -5	41.1	347 5.1	21 10.8
2	296 54.2 142	-6	8.3	-150	297 5.0 -5	41.3	17 10.4	21 10.8
4	326 .7 141	-6	38.2	-150	327 9.5 -5	41.4	47 15.8	21 10.9
6	355 6.9 140	-7	8.2	-149	357 14.0 -5	41.6	77 21.1	21 11.0
8	24 12.8 138	-7	38.0	-149	27 18.6 -5	41.7	107 26.5	21 11.1
10	53 18.4 137	-8	7.9	-149	57 23.1 -5	41.9	137 31.8	21 11.2
12	82 23.7 135	-8	37.6	-148	87 27.6 -5	42.0	167 37.2	21 11.2
14	111 28.7 133	-9	7.3	-148	117 32.1 -5	42.2	197 42.5	21 11.3
16	140 33.4 132	-9	36.9	-148	147 36.6 -5	42.3	227 47.9	21 11.4
18	169 37.7 130	-10	6.4	-147	177 41.2 -5	42.4	257 53.2	21 11.5
20	198 41.6 128	-10	35.8	-146	207 45.7 -5	42.6	287 58.6	21 11.6
22	227 45.2 126	-11	5.1	-146	237 50.2 -5	42.7	318 3.9	21 11.7
Δ					23	-1	27	0

SUNCE				MESEC			
UT	e = T <sub>p</sub> - UT	Δ/24	r	Prolaz	Δ/24	π <sub>♃</sub>	r
h	min s	s	'	h min	min	'	'
00	- 4 49.5	-1.1	16.3	T <sub>m</sub>	6 20	1.9	56.9 15.5
12	- 5 3.1	T <sub>m☉</sub>	12 h 5.1 min	Starost	22.9 d	Faza	☉

PLANETE									
Pl.	T <sub>m</sub>	π	360-α	Vel.	Pl.	T <sub>m</sub>	π	360-α	Vel.
♀	h min	'	°		♃	h min	'	°	
♂	10 35	.1	98	-3.8	♄	6 11	.0	163	-1.8
♂	9 23	.1	115	1.6	♅	0 52	.0	243	-2.2

UT	SUNCE		PROLEĆ. TAČKA S <sub>γ</sub>	VENERA		MARS	
	S <sub>☉</sub>	δ <sub>☉</sub>		S <sub>♀</sub>	δ <sub>♀</sub>	S <sub>♂</sub>	δ <sub>♂</sub>
h	° / ' / "	° / ' / "	° / ' / "	° / ' / "	° / ' / "	° / ' / "	° / ' / "
0	178 40.8 -22 37.5		104 41.0	201 4.7 -22 44.3	219 22.7 -21 23.1		
2	208 40.2 -22 37.0		134 46.0	231 2.8 -22 44.8	249 24.0 -21 23.7		
4	238 39.7 -22 36.4		164 50.9	261 1.0 -22 45.3	279 25.3 -21 24.4		
6	268 39.1 -22 35.8		194 55.8	290 59.1 -22 45.7	309 26.6 -21 25.0		
8	298 38.6 -22 35.3		225 .8	320 57.3 -22 46.2	339 27.8 -21 25.6		
10	328 38.0 -22 34.7		255 5.7	350 55.4 -22 46.7	9 29.1 -21 26.2		
12	358 37.5 -22 34.1		285 10.6	20 53.6 -22 47.1	39 30.4 -21 26.9		
14	28 36.9 -22 33.5		315 15.5	50 51.7 -22 47.6	69 31.7 -21 27.5		
16	58 36.3 -22 33.0		345 20.5	80 49.9 -22 48.0	99 32.9 -21 28.1		
18	88 35.8 -22 32.4		15 25.4	110 48.0 -22 48.5	129 34.2 -21 28.7		
20	118 35.2 -22 31.8		45 30.3	140 46.2 -22 48.9	159 35.5 -21 29.3		
22	148 34.7 -22 31.2		75 35.2	170 44.3 -22 49.4	189 36.8 -21 29.9		
Δ	-3 3			-9 -2	6 -3		

φ	SUNCE		TRAJANJE SUMRAKA		MESEC			
	IZLAZ	ZALAZ	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 12	0 56	2 42	2 27	4.2	11 29	.1
55	8 23	15 48	0 45	2 16	2 10	3.8	11 49	.5
50	7 58	16 13	0 38	1 58	1 57	3.4	12 4	.9
45	7 38	16 33	0 33	1 46	1 46	3.2	12 16	1.1
40	7 22	16 49	0 30	1 37	1 38	3.0	12 26	1.3
35	7 9	17 3	0 28	1 30	1 30	2.8	12 35	1.4
30	6 57	17 14	0 26	1 25	1 24	2.7	12 42	1.6
20	6 36	17 35	0 24	1 18	1 13	2.5	12 55	1.8
10	6 19	17 52	0 23	1 15	1 4	2.3	13 7	2.0
0	6 2	18 9	0 22	1 15	0 55	2.1	13 18	2.2
10	5 45	18 26	0 23	1 17	0 46	1.9	13 29	2.4
20	5 27	18 44	0 24	1 23	0 37	1.7	13 41	2.6
30	5 5	19 5	0 27	1 35	0 27	1.4	13 54	2.8
35	4 53	19 18	0 29	1 45	0 21	1.3	14 2	2.9
40	4 39	19 32	0 32	2 0	0 14	1.2	14 11	3.1
45	4 21	19 49	0 37	2 27	0 7	1.0	14 22	3.3
50	3 60	20 11	0 43	:::	:::	.0	14 35	3.5
55	3 31	20 39	0 55	:::	23 56	.7	14 51	3.9
60	2 50	21 20	1 29	:::	23 32	.2	15 13	4.4
S								

UT	MESEC				JUPITER		SATURN	
	S <sub>♃</sub>	Δ	δ <sub>♃</sub>	Δ	S <sub>♃</sub>	δ <sub>♃</sub>	S <sub>♄</sub>	δ <sub>♄</sub>
h	° / ' / "	° / ' / "	° / ' / "	° / ' / "	° / ' / "	° / ' / "	° / ' / "	° / ' / "
0	256 48.4 124 -11 34.3 -145				267 54.8 - 5 42.9	348 9.3 21 11.7		
2	285 51.3 122 -12 3.3 -144				297 59.3 - 5 43.0	18 14.6 21 11.8		
4	314 53.7 120 -12 32.2 -144				328 3.8 - 5 43.2	48 20.0 21 11.9		
6	343 55.7 118 -13 .9 -143				358 8.3 - 5 43.3	78 25.3 21 12.0		
8	12 57.3 116 -13 29.5 -142				28 12.9 - 5 43.4	108 30.7 21 12.1		
10	41 58.5 114 -13 57.8 -141				58 17.4 - 5 43.6	138 36.0 21 12.1		
12	70 59.2 111 -14 26.0 -140				88 21.9 - 5 43.7	168 41.4 21 12.2		
14	99 59.5 109 -14 53.9 -139				118 26.5 - 5 43.9	198 46.7 21 12.3		
16	128 59.2 107 -15 21.6 -137				148 31.0 - 5 44.0	228 52.1 21 12.4		
18	157 58.6 104 -15 49.1 -136				178 35.6 - 5 44.1	258 57.4 21 12.5		
20	186 57.4 102 -16 16.4 -135				208 40.1 - 5 44.3	289 2.8 21 12.5		
22	215 55.7 99 -16 43.3 -133				238 44.6 - 5 44.4	319 8.1 21 12.6		
Δ					23 -1	27 0		

SUNCE				MESEC					
UT	e = T <sub>p</sub> - UT	Δ/24	r	Prolaz	Δ/24	π <sub>♃</sub>	r		
h	min s	s / ' / "		h min	min	' / "	' / "		
00	- 5 16.6	-1.1 16.3	T <sub>m</sub>	7 6	2.1	57.8	15.8		
12	- 5 30.0	T <sub>m☉</sub> 12 h 5.5 min		Starost 23.9 d	Faza ●				
PLANETE									
Pl.	T <sub>m</sub>	π	360-α	Vel.	Pl.	T <sub>m</sub>	π	360-α	Vel.
♀	h min / ' / "	°	°	°	♃	h min / ' / "	°	°	°
♂	10 36 .1 96	-3.8	♃	6 7 .0 163	-1.8				
♂	9 22 .1 115	1.5	♄	0 47 .0 243	-2.2				

UT	SUNCE		PROLEĆ. TAČKA S <sub>γ</sub>	VENERA		MARS	
	S <sub>☉</sub>	δ <sub>☉</sub>		S <sub>♀</sub>	δ <sub>♀</sub>	S <sub>♂</sub>	δ <sub>♂</sub>
h	° / ' / "	° / ' / "	° / ' / "	° / ' / "	° / ' / "	° / ' / "	° / ' / "
0	178 34.1 -22 30.6		105 40.2	200 42.5 -22 49.8	219 38.0 -21 30.6		
2	208 33.6 -22 30.0		135 45.1	230 40.6 -22 50.2	249 39.3 -21 31.2		
4	238 33.0 -22 29.4		165 50.0	260 38.8 -22 50.7	279 40.6 -21 31.8		
6	268 32.5 -22 28.8		195 55.0	290 36.9 -22 51.1	309 41.8 -21 32.4		
8	298 31.9 -22 28.2		225 59.9	320 35.1 -22 51.5	339 43.1 -21 33.0		
10	328 31.4 -22 27.6		256 4.8	350 33.2 -22 51.9	9 44.4 -21 33.6		
12	358 30.8 -22 27.0		286 9.7	20 31.4 -22 52.3	39 45.6 -21 34.2		
14	28 30.3 -22 26.3		316 14.7	50 29.5 -22 52.7	69 46.9 -21 34.8		
16	58 29.7 -22 25.7		346 19.6	80 27.6 -22 53.1	99 48.2 -21 35.4		
18	88 29.2 -22 25.1		16 24.5	110 25.8 -22 53.5	129 49.4 -21 36.0		
20	118 28.7 -22 24.5		46 29.5	140 23.9 -22 53.9	159 50.7 -21 36.6		
22	148 28.1 -22 23.8		76 34.4	170 22.1 -22 54.3	189 52.0 -21 37.2		
Δ	-3 3			-9 -2	6 -3		

φ	SUNCE		TRAJANJE SUMRAKA		MESEC			
	IZLAZ	ZALAZ	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 55	2 42	4 9	4.6	11 31	.2
55	8 23	15 49	0 44	2 15	3 40	4.0	12 2	.8
50	7 58	16 15	0 38	1 58	3 19	3.6	12 24	1.2
45	7 38	16 34	0 33	1 46	3 3	3.4	12 42	1.4
40	7 22	16 50	0 30	1 37	2 50	3.2	12 56	1.6
35	7 9	17 3	0 28	1 30	2 39	3.0	13 9	1.8
30	6 57	17 15	0 26	1 25	2 29	2.9	13 20	1.9
20	6 37	17 35	0 24	1 18	2 12	2.7	13 38	2.1
10	6 19	17 53	0 23	1 15	1 58	2.5	13 55	2.3
0	6 2	18 10	0 22	1 15	1 45	2.3	14 10	2.4
10	5 45	18 26	0 23	1 17	1 31	2.1	14 26	2.6
20	5 27	18 44	0 24	1 23	1 18	1.9	14 42	2.8
30	5 6	19 5	0 27	1 35	1 2	1.7	15 1	3.0
35	4 54	19 18	0 29	1 45	0 53	1.6	15 13	3.1
40	4 39	19 32	0 32	1 60	0 42	1.4	15 25	3.2
45	4 22	19 49	0 37	2 26	0 30	1.2	15 41	3.4
50	4 1	20 10	0 43	:::	0 16	1.0	15 60	3.7
55	3 33	20 38	0 55	:::	:::	.0	16 24	4.0
60	2 52	21 19	1 27	:::	23 36	.4	16 59	4.7
S								

UT	MESEC				JUPITER		SATURN	
	S <sub>♃</sub>	Δ	δ <sub>♃</sub>	Δ	S <sub>♃</sub>	δ <sub>♃</sub>	S <sub>♄</sub>	δ <sub>♄</sub>
h	° / ' / "	° / ' / "	° / ' / "	° / ' / "	° / ' / "	° / ' / "	° / ' / "	° / ' / "
0	244 53.6 97 -17 10.0 -132				268 49.2 - 5 44.6	349 13.5 21 12.7		
2	273 50.9 94 -17 36.4 -130				298 53.7 - 5 44.7	19 18.8 21 12.8		
4	302 47.7 91 -18 2.4 -129				328 58.3 - 5 44.8	49 24.2 21 12.9		
6	331 44.0 89 -18 28.2 -127				359 2.8 - 5 45.0	79 29.5 21 12.9		
8	0 39.7 86 -18 53.6 -125				29 7.3 - 5 45.1	109 34.9 21 13.0		
10	29 34.9 83 -19 18.6 -123				59 11.9 - 5 45.2	139 40.3 21 13.1		
12	58 29.5 80 -19 43.3 -121				89 16.4 - 5 45.4	169 45.6 21 13.2		
14	87 23.6 78 -20 7.5 -119				119 21.0 - 5 45.5	199 51.0 21 13.3		
16	116 17.1 75 -20 31.4 -117				149 25.5 - 5 45.6	229 56.3 21 13.3		
18	145 10.0 72 -20 54.8 -115				179 30.1 - 5 45.8	260 1.7 21 13.4		
20	174 2.4 69 -21 17.8 -113				209 34.6 - 5 45.9	290 7.0 21 13.5		
22	202 54.2 66 -21 40.3 -110				239 39.2 - 5 46.0	320 12.4 21 13.6		
Δ					23 -1	27 0		

SUNCE				MESEC					
UT	e = T <sub>p</sub> - UT	Δ/24	r	Prolaz	Δ/24	π <sub>♃</sub>	r		
h	min s	s / ' / "		h min	min	' / "	' / "		
00	- 5 43.3	-1.1 16.3	T <sub>m</sub>	7 57	2.4	58.8	16.0		
12	- 5 56.4	T <sub>m☉</sub> 12 h 5.9 min		Starost 24.9 d	Faza ●				
PLANETE									
Pl.	T <sub>m</sub>	π	360-α	Vel.	Pl.	T <sub>m</sub>	π	360-α	Vel.
♀	h min / ' / "	°	°	°	♃	h min / ' / "	°	°	°
♂	10 38 .1 95	-3.8	♃	6 4 .0 163	-1.9				
♂	9 21 .1 114	1.5	♄	0 43 .0 244	-2.2				

UT	SUNCE		PROLEĆ. TAČKA S <sub>γ</sub>	VENERA		MARS									
	S <sub>☉</sub>	δ <sub>☉</sub>		S <sub>♀</sub>	δ <sub>♀</sub>	S <sub>♂</sub>	δ <sub>♂</sub>								
h	°	'	°	'	°	'	°	'							
0	178	27.6	-22	23.2	106	39.3	200	20.2	-22	54.6	219	53.2	-21	37.8	
2	208	27.0	-22	22.6	136	44.2	230	18.3	-22	55.0	249	54.5	-21	38.4	
4	238	26.5	-22	21.9	166	49.2	260	16.5	-22	55.4	279	55.8	-21	39.0	
6	268	25.9	-22	21.3	196	54.1	290	14.6	-22	55.7	309	57.0	-21	39.6	
8	298	25.4	-22	20.7	226	59.0	320	12.8	-22	56.1	339	58.3	-21	40.2	
10	328	24.9	-22	20.0	257	4.0	350	10.9	-22	56.4	9	59.5	-21	40.8	
12	358	24.3	-22	19.4	287	8.9	20	9.0	-22	56.8	40	.8	-21	41.4	
14	28	23.8	-22	18.7	317	13.8	50	7.2	-22	57.1	70	2.1	-21	42.0	
16	58	23.3	-22	18.1	347	18.7	80	5.3	-22	57.5	100	3.3	-21	42.6	
18	88	22.7	-22	17.4	17	23.7	110	3.4	-22	57.8	130	4.6	-21	43.1	
20	118	22.2	-22	16.7	47	28.6	140	1.6	-22	58.1	160	5.8	-21	43.7	
22	148	21.7	-22	16.1	77	33.5	169	59.7	-22	58.4	190	7.1	-21	44.3	
Δ		-3		3				-9		-2		6			-3

UT	MESEC				JUPITER		SATURN								
	S <sub>♃</sub>	Δ	δ <sub>♃</sub>	Δ	S <sub>♃</sub>	δ <sub>♃</sub>	S <sub>♄</sub>	δ <sub>♄</sub>							
h	°	'	°	'	°	'	°	'							
0	231	45.5	63	-22	2.4	-108	269	43.7	-5	46.2	350	17.7	21	13.7	
2	260	36.1	60	-22	23.9	-105	299	48.3	-5	46.3	20	23.1	21	13.7	
4	289	26.2	57	-22	45.0	-103	329	52.8	-5	46.4	50	28.5	21	13.8	
6	318	15.7	55	-23	5.5	-100	359	57.4	-5	46.6	80	33.8	21	13.9	
8	347	4.6	52	-23	25.4	-97	30	2.0	-5	46.7	110	39.2	21	14.0	
10	15	53.0	49	-23	44.8	-94	60	6.5	-5	46.8	140	44.5	21	14.1	
12	44	40.7	46	-24	3.6	-91	90	11.1	-5	46.9	170	49.9	21	14.1	
14	73	28.0	43	-24	21.8	-88	120	15.6	-5	47.1	200	55.2	21	14.2	
16	102	14.6	41	-24	39.3	-85	150	20.2	-5	47.2	231	.6	21	14.3	
18	131	.8	38	-24	56.3	-81	180	24.8	-5	47.3	261	6.0	21	14.4	
20	159	46.4	35	-25	12.5	-78	210	29.3	-5	47.5	291	11.3	21	14.5	
22	188	31.4	33	-25	28.1	-75	240	33.9	-5	47.6	321	16.7	21	14.5	
Δ								23		-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	8 58	15 15	0 55	2 42	5 60	4.8	11 36	.6
55	8 22	15 51	0 44	2 15	5 16	4.0	12 22	1.4
50	7 57	16 16	0 38	1 58	4 46	3.6	12 53	1.7
45	7 38	16 35	0 33	1 46	4 24	3.4	13 16	1.9
40	7 22	16 51	0 30	1 37	4 6	3.2	13 35	2.1
35	7 9	17 4	0 28	1 30	3 51	3.1	13 51	2.2
30	6 57	17 16	0 26	1 25	3 38	3.0	14 5	2.3
20	6 37	17 36	0 24	1 18	3 16	2.8	14 28	2.4
10	6 19	17 54	0 23	1 15	2 57	2.7	14 49	2.6
0	6 3	18 10	0 22	1 14	2 40	2.6	15 8	2.7
10	5 46	18 27	0 23	1 17	2 22	2.4	15 27	2.8
20	5 28	18 45	0 24	1 23	2 4	2.3	15 48	2.9
30	5 7	19 6	0 27	1 35	1 43	2.1	16 12	3.0
35	4 55	19 18	0 29	1 45	1 31	2.0	16 26	3.1
40	4 40	19 32	0 32	1 59	1 17	1.8	16 43	3.2
45	4 23	19 49	0 36	2 25	1 0	1.7	17 3	3.3
50	4 2	20 10	0 43	:::	0 40	1.4	17 27	3.5
55	3 34	20 38	0 55	:::	0 14	1.1	18 1	3.8
60	2 54	21 18	1 26	:::	23 46	1.2	18 52	4.5
S								

SUNCE				MESEC					
UT	e = T <sub>p</sub> - UT	Δ/24	r	Prolaz	Δ/24	π <sub>♃</sub>	r		
h	min	s	s	'	h min	min	'		
00	- 6	9.5	-1.1	16.3	T <sub>m</sub>	8 54	2.6	59.7	16.3
12	- 6	22.4	T <sub>m☉</sub>	12 h 6.4 min	Starost	25.9 d	Faza	☉	
PLANETE									
Pl.	T <sub>m</sub>	π	360-α	Vel.	Pl.	T <sub>m</sub>	π	360-α	Vel.
♀	h min	'	°		♃	h min	'	°	
♁	10 39	.1	94	-3.8	♃	6 0	.0	163	-1.9
♂	9 20	.1	113	1.5	♄	0 39	.0	244	-2

UT	SUNCE		PROLEĆ. TAČKA S <sub>γ</sub>	VENERA		MARS									
	S <sub>☉</sub>	δ <sub>☉</sub>		S <sub>♀</sub>	δ <sub>♀</sub>	S <sub>♂</sub>	δ <sub>♂</sub>								
h	°	'	°	'	°	'	°	'							
0	178	21.1	-22	15.4	107	38.5	199	57.8	-22	58.8	220	8.3	-21	44.9	
2	208	20.6	-22	14.7	137	43.4	229	56.0	-22	59.1	250	9.6	-21	45.5	
4	238	20.1	-22	14.1	167	48.3	259	54.1	-22	59.4	280	10.8	-21	46.1	
6	268	19.5	-22	13.4	197	53.2	289	52.2	-22	59.7	310	12.1	-21	46.6	
8	298	19.0	-22	12.7	227	58.2	319	50.3	-22	60.0	340	13.3	-21	47.2	
10	328	18.5	-22	12.0	258	3.1	349	48.5	-23	.3	10	14.6	-21	47.8	
12	358	18.0	-22	11.3	288	8.0	19	46.6	-23	.6	40	15.8	-21	48.4	
14	28	17.4	-22	10.6	318	13.0	49	44.7	-23	.8	70	17.1	-21	48.9	
16	58	16.9	-22	9.9	348	17.9	79	42.8	-23	1.1	100	18.3	-21	49.5	
18	88	16.4	-22	9.2	18	22.8	109	41.0	-23	1.4	130	19.6	-21	50.1	
20	118	15.9	-22	8.5	48	27.7	139	39.1	-23	1.7	160	20.8	-21	50.7	
22	148	15.3	-22	7.8	78	32.7	169	37.2	-23	1.9	190	22.1	-21	51.2	
Δ		-3		3				-9		-1		6			-3

UT	MESEC				JUPITER		SATURN								
	S <sub>♃</sub>	Δ	δ <sub>♃</sub>	Δ	S <sub>♃</sub>	δ <sub>♃</sub>	S <sub>♄</sub>	δ <sub>♄</sub>							
h	°	'	°	'	°	'	°	'							
0	217	16.0	30	-25	43.0	-71	270	38.5	-5	47.7	351	22.0	21	14.6	
2	246	.0	28	-25	57.2	-67	300	43.0	-5	47.8	21	27.4	21	14.7	
4	274	43.6	25	-26	10.6	-64	330	47.6	-5	48.0	51	32.7	21	14.8	
6	303	26.6	23	-26	23.4	-60	0	52.2	-5	48.1	81	38.1	21	14.9	
8	332	9.3	21	-26	35.3	-56	30	56.7	-5	48.2	111	43.5	21	15.0	
10	0	51.5	19	-26	46.5	-52	61	1.3	-5	48.3	141	48.8	21	15.0	
12	29	33.2	17	-26	56.9	-48	91	5.9	-5	48.5	171	54.2	21	15.1	
14	58	14.6	15	-27	6.5	-44	121	10.5	-5	48.6	201	59.5	21	15.2	
16	86	55.6	13	-27	15.3	-40	151	15.0	-5	48.7	232	4.9	21	15.3	
18	115	36.3	12	-27	23.3	-36	181	19.6	-5	48.8	262	10.2	21	15.4	
20	144	16.6	10	-27	30.4	-31	211	24.2	-5	48.9	292	15.6	21	15.4	
22	172	56.6	9	-27	36.7	-27	241	28.8	-5	49.1	322	21.0	21	15.5	
Δ								23		-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	8 57	15 17	0 55	2 41	7 55	4.0	11 52	1.9
55	8 22	15 52	0 44	2 15	6 52	3.5	12 55	2.4
50	7 57	16 17	0 38	1 58	6 13	3.3	13 34	2.5
45	7 38	16 36	0 33	1 45	5 46	3.2	14 3	2.6
40	7 22	16 52	0 30	1 37	5 24	3.1	14 25	2.6
35	7 9	17 5	0 28	1 30	5 6	3.0	14 44	2.7
30	6 57	17 17	0 26	1 25	4 50	3.0	14 60	2.7
20	6 37	17 37	0 24	1 18	4 24	2.9	15 27	2.8
10	6 20	17 54	0 23	1 15	4 2	2.8	15 50	2.8
0	6 3	18 11	0 22	1 14	3 41	2.8	16 12	2.8
10	5 47	18 27	0 23	1 17	3 20	2.7	16 34	2.8
20	5 29	18 45	0 24	1 23	2 58	2.6	16 57	2.9
30	5 8	19 6	0 27	1 35	2 33	2.5	17 25	2.9
35	4 56	19 18	0 29	1 44	2 18	2.4	17 41	2.9
40	4 41	19 32	0 32	1 59	2 1	2.4	17 60	2.9
45	4 25	19 49	0 36	2 24	1 40	2.3	18 22	2.9
50	4 4	20 9	0 43	:::	1 14	2.1	18 51	2.9
55	3 36	20 37	0 54	:::	0 40	1.9	19 31	3.0
60	2 56	21 17	1 24	:::	...	.0	20 39	3.0
S								

SUNCE				MESEC					
UT	e = T <sub>p</sub> - UT	Δ/24	r	Prolaz	Δ/24	π <sub>♃</sub>	r		
h	min	s	s	'	h min	min	'		
00	- 6	35.3	-1.1	16.3	T <sub>m</sub>	9 56	2.8	60.5	16.5
12	- 6	48.0	T <sub>m☉</sub>	12 h 6.8 min	Starost	26.9 d	Faza	☉	



UT	SUNCE				PROLEĆ. TAČKA S <sub>γ</sub>	VENERA				MARS					
	S <sub>☉</sub>		δ <sub>☉</sub>			S <sub>♀</sub>		δ <sub>♀</sub>		S <sub>♂</sub>		δ <sub>♂</sub>			
h	°	'	°	'	°	'	°	'	°	'	°	'			
0	178	14.8	-22	7.1	108	37.6	199	35.4	-23	2.2	220	23.3	-21	51.8	
2	208	14.3	-22	6.4	138	42.5	229	33.5	-23	2.4	250	24.6	-21	52.4	
4	238	13.8	-22	5.7	168	47.4	259	31.6	-23	2.7	280	25.8	-21	52.9	
6	268	13.2	-22	5.0	198	52.4	289	29.7	-23	2.9	310	27.1	-21	53.5	
8	298	12.7	-22	4.3	228	57.3	319	27.8	-23	3.2	340	28.3	-21	54.0	
10	328	12.2	-22	3.6	259	2.2	349	26.0	-23	3.4	10	29.6	-21	54.6	
12	358	11.7	-22	2.9	289	7.2	19	24.1	-23	3.6	40	30.8	-21	55.2	
14	28	11.2	-22	2.1	319	12.1	49	22.2	-23	3.9	70	32.0	-21	55.7	
16	58	10.7	-22	1.4	349	17.0	79	20.3	-23	4.1	100	33.3	-21	56.3	
18	88	10.2	-22	.7	19	21.9	109	18.5	-23	4.3	130	34.5	-21	56.8	
20	118	9.6	-21	59.9	49	26.9	139	16.6	-23	4.5	160	35.8	-21	57.4	
22	148	9.1	-21	59.2	79	31.8	169	14.7	-23	4.7	190	37.0	-21	57.9	
Δ		-3		4				-9		-1			6		-3

UT	MESEC				JUPITER				SATURN							
	S <sub>♃</sub>		Δ		δ <sub>♃</sub>		Δ		S <sub>♃</sub>		δ <sub>♃</sub>		S <sub>♄</sub>		δ <sub>♄</sub>	
h	°	'	°	'	°	'	°	'	°	'	°	'	°	'	°	'
0	201	36.3	7	-27	42.1	-23	271	33.3	-5	49.2	352	26.3	21	15.6		
2	230	15.8	6	-27	46.6	-18	301	37.9	-5	49.3	22	31.7	21	15.7		
4	258	55.1	5	-27	50.3	-14	331	42.5	-5	49.4	52	37.0	21	15.8		
6	287	34.2	5	-27	53.1	-10	1	47.1	-5	49.5	82	42.4	21	15.8		
8	316	13.1	4	-27	55.0	-5	31	51.7	-5	49.7	112	47.8	21	15.9		
10	344	51.9	3	-27	56.1	-1	61	56.3	-5	49.8	142	53.1	21	16.0		
12	13	30.5	3	-27	56.2	4	92	.8	-5	49.9	172	58.5	21	16.1		
14	42	9.2	3	-27	55.4	8	122	5.4	-5	50.0	203	3.8	21	16.2		
16	70	47.7	3	-27	53.7	13	152	10.0	-5	50.1	233	9.2	21	16.2		
18	99	26.3	3	-27	51.2	17	182	14.6	-5	50.3	263	14.6	21	16.3		
20	128	4.9	3	-27	47.7	22	212	19.2	-5	50.4	293	19.9	21	16.4		
22	156	43.5	4	-27	43.3	26	242	23.8	-5	50.5	323	25.3	21	16.5		
Δ								23		-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	8 56	15 19	0 55	2 40	9 30	1.9	12 37	4.0
55	8 21	15 54	0 44	2 14	8 15	2.4	13 52	3.5
50	7 56	16 18	0 38	1 57	7 32	2.6	14 35	3.3
45	7 37	16 37	0 33	1 45	7 2	2.6	15 5	3.2
40	7 22	16 53	0 30	1 36	6 38	2.7	15 29	3.1
35	7 9	17 6	0 28	1 30	6 19	2.7	15 48	3.1
30	6 57	17 18	0 26	1 25	6 2	2.7	16 5	3.0
20	6 37	17 37	0 24	1 18	5 34	2.8	16 33	3.0
10	6 20	17 55	0 23	1 15	5 10	2.8	16 57	2.9
0	6 4	18 11	0 22	1 14	4 47	2.8	17 20	2.8
10	5 47	18 27	0 23	1 17	4 25	2.9	17 42	2.7
20	5 29	18 45	0 24	1 23	4 1	2.9	18 6	2.7
30	5 9	19 6	0 27	1 34	3 33	2.9	18 34	2.6
35	4 56	19 18	0 29	1 44	3 17	2.9	18 50	2.5
40	4 42	19 32	0 32	1 59	2 58	2.9	19 9	2.4
45	4 26	19 48	0 36	2 23	2 35	2.9	19 32	2.3
50	4 5	20 9	0 43	:::	2 5	2.9	20 2	2.2
55	3 38	20 36	0 54	:::	1 25	3.0	20 43	1.9
60	2 58	21 15	1 23	:::	0 16	3.0	21 51	1.2

SUNCE				MESEC					
UT	e = T <sub>p</sub> - UT	Δ/24	r	Prolaz	Δ/24	π <sub>♃</sub>	r		
h	min	s	s	h min	min	'	'		
00	- 7	.6	-1.0	16.3	T <sub>m</sub>	11 3	2.8	61.1	16.7
12	- 7	13.0	T <sub>m☉</sub>	12 h 7.2 min	Starost	27.9 d	Faza ●		

PLANETE									
Pl.	T <sub>m</sub>	π	360-α	Vel.	Pl.	T <sub>m</sub>	π	360-α	Vel.
♀	h min	'	°		♃	h min	'	°	
♂	10 42	.1	91	-3.8	♄	5 53	.0	163	-1.9
	9 18	.1	112	1.5	♅	0 30	.0	244	-2.2

UT	SUNCE				PROLEĆ. TAČKA S <sub>γ</sub>	VENERA				MARS					
	S <sub>☉</sub>		δ <sub>☉</sub>			S <sub>♀</sub>		δ <sub>♀</sub>		S <sub>♂</sub>		δ <sub>♂</sub>			
h	°	'	°	'	°	'	°	'	°	'	°	'			
0	178	8.6	-21	58.5	109	36.7	199	12.8	-23	4.9	220	38.2	-21	58.5	
2	208	8.1	-21	57.7	139	41.7	229	10.9	-23	5.1	250	39.5	-21	59.0	
4	238	7.6	-21	57.0	169	46.6	259	9.1	-23	5.3	280	40.7	-21	59.6	
6	268	7.1	-21	56.2	199	51.5	289	7.2	-23	5.5	310	41.9	-22	.1	
8	298	6.6	-21	55.5	229	56.4	319	5.3	-23	5.7	340	43.2	-22	.7	
10	328	6.1	-21	54.7	260	1.4	349	3.4	-23	5.8	10	44.4	-22	1.2	
12	358	5.6	-21	53.9	290	6.3	19	1.5	-23	6.0	40	45.6	-22	1.8	
14	28	5.1	-21	53.2	320	11.2	48	59.6	-23	6.2	70	46.9	-22	2.3	
16	58	4.6	-21	52.4	350	16.2	78	57.8	-23	6.3	100	48.1	-22	2.9	
18	88	4.1	-21	51.7	20	21.1	108	55.9	-23	6.5	130	49.3	-22	3.4	
20	118	3.6	-21	50.9	50	26.0	138	54.0	-23	6.7	160	50.6	-22	3.9	
22	148	3.1	-21	50.1	80	30.9	168	52.1	-23	6.8	190	51.8	-22	4.5	
Δ		-3		4				-9		-1			6		-3

UT	MESEC				JUPITER				SATURN							
	S <sub>♃</sub>		Δ		δ <sub>♃</sub>		Δ		S <sub>♃</sub>		δ <sub>♃</sub>		S <sub>♄</sub>		δ <sub>♄</sub>	
h	°	'	°	'	°	'	°	'	°	'	°	'	°	'	°	'
0	185	22.2	4	-27	38.0	31	272	28.4	-5	50.6	353	30.6	21	16.6		
2	214	1.0	5	-27	31.9	35	302	33.0	-5	50.7	23	36.0	21	16.6		
4	242	40.0	6	-27	24.8	40	332	37.6	-5	50.8	53	41.4	21	16.7		
6	271	19.1	7	-27	16.9	44	2	42.2	-5	50.9	83	46.7	21	16.8		
8	299	58.5	8	-27	8.1	48	32	46.8	-5	51.1	113	52.1	21	16.9		
10	328	38.0	9	-26	58.4	53	62	51.4	-5	51.2	143	57.4	21	17.0		
12	357	17.9	11	-26	47.9	57	92	56.0	-5	51.3	174	2.8	21	17.1		
14	25	58.0	12	-26	36.5	61	123	.6	-5	51.4	204	8.2	21	17.1		
16	54	38.4	14	-26	24.3	65	153	5.2	-5	51.5	234	13.5	21	17.2		
18	83	19.1	15	-26	11.3	69	183	9.8	-5	51.6	264	18.9	21	17.3		
20	112	.2	17	-25	57.5	73	213	14.4	-5	51.7	294	24.2	21	17.4		
22	140	41.6	19	-25	42.8	77	243	19.0	-5	51.8	324	29.6	21	17.5		
Δ								23		-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	8 54	15 21	0 54	2 40	10 17	.7	14 13	5.0
55	8 20	15 55	0 44	2 14	9 13	1.5	15 16	4.2
50	7 56	16 20	0 37	1 57	8 33	1.8	15 54	3.8
45	7 37	16 39	0 33	1 45	8 5	2.0	16 22	3.6
40	7 22	16 54	0 30	1 36	7 42	2.2	16 44	3.4
35	7 8	17 7	0 28	1 30	7 24	2.3	17 2	3.3
30	6 57	17 18	0 26	1 25	7 8	2.4	17 18	3.1
20	6 37	17 38	0 24	1 18	6 41	2.5	17 44	3.0
10	6 20	17 55	0 23	1 15	6 17	2.6	18 6	2.8
0	6 4	18 11	0 22	1 14	5 55	2.7	18 27	2.7
10	5 48	18 28	0 23	1 17	5 33	2.9	18 48	2.5
20	5 30	18 45	0 24	1 23	5 10	3.0	19 10	2.4
30	5 9	19 6	0 27	1 34	4 43	3.1	19 35	2.2
35	4 57	19 18	0 29	1 44	4 27	3.2	19 50	2.1
40	4 43	19 31	0 32	1 58	4 8	3.3	20 8	1.9
45	4 27	19 48	0 36	2 22	3 45	3.4	20 28	1.7
50	4 6	20 8	0 42	3 37	3 16	3.6	20 54	1.5
55	3 39	20 35	0 54	:::	2 36	3.9	21 28	1.1
60	3 0	21 14	1 21	:::	1 28	4.6	22 20	.4

SUNCE				MESEC			
UT	e = T <sub>p</sub> - UT	Δ/24	r	Prolaz	Δ/24	π <sub>♃</sub>	r
h	min	s	s	h min	min	'	'
00	- 7	25.4	-1.0	16.3	T <sub>m</sub>	1	

UT	SUNCE				PROLEĆ. TAČKA S <sub>γ</sub>	VENERA				MARS					
	S <sub>☉</sub>		δ <sub>☉</sub>			S <sub>♀</sub>		δ <sub>♀</sub>		S <sub>♂</sub>		δ <sub>♂</sub>			
h	°	'	°	'	°	'	°	'	°	'	°	'			
0	178	2.6	-21	49.3	110	35.9	198	50.2	-23	6.9	220	53.0	-22	5.0	
2	208	2.1	-21	48.6	140	40.8	228	48.3	-23	7.1	250	54.3	-22	5.5	
4	238	1.6	-21	47.8	170	45.7	258	46.5	-23	7.2	280	55.5	-22	6.1	
6	268	1.1	-21	47.0	200	50.7	288	44.6	-23	7.3	310	56.7	-22	6.6	
8	298	.6	-21	46.2	230	55.6	318	42.7	-23	7.5	340	57.9	-22	7.1	
10	328	.1	-21	45.4	261	.5	348	40.8	-23	7.6	10	59.2	-22	7.7	
12	357	59.6	-21	44.6	291	5.4	18	38.9	-23	7.7	41	.4	-22	8.2	
14	27	59.1	-21	43.8	321	10.4	48	37.0	-23	7.8	71	1.6	-22	8.7	
16	57	58.6	-21	43.0	351	15.3	78	35.1	-23	7.9	101	2.8	-22	9.2	
18	87	58.1	-21	42.2	21	20.2	108	33.3	-23	8.0	131	4.1	-22	9.8	
20	117	57.6	-21	41.4	51	25.2	138	31.4	-23	8.1	161	5.3	-22	10.3	
22	147	57.2	-21	40.6	81	30.1	168	29.5	-23	8.2	191	6.5	-22	10.8	
Δ		-2		4				-9		-1			6		-3

UT	MESEC				JUPITER				SATURN							
	S <sub>♃</sub>		Δ		δ <sub>♃</sub>		Δ		S <sub>♃</sub>		δ <sub>♃</sub>		S <sub>♄</sub>		δ <sub>♄</sub>	
h	°	'	°	'	°	'	°	'	°	'	°	'	°	'	°	'
0	169	23.5	21	-25	27.4	81	273	23.6	-5	51.9	354	35.0	21	17.5		
2	198	5.7	23	-25	11.2	85	303	28.2	-5	52.1	24	40.3	21	17.6		
4	226	48.4	26	-24	54.3	88	333	32.8	-5	52.2	54	45.7	21	17.7		
6	255	31.6	28	-24	36.6	92	3	37.4	-5	52.3	84	51.1	21	17.8		
8	284	15.2	30	-24	18.2	95	33	42.0	-5	52.4	114	56.4	21	17.9		
10	312	59.2	33	-23	59.1	99	63	46.6	-5	52.5	145	1.8	21	17.9		
12	341	43.8	35	-23	39.3	102	93	51.2	-5	52.6	175	7.1	21	18.0		
14	10	28.9	38	-23	18.9	105	123	55.8	-5	52.7	205	12.5	21	18.1		
16	39	14.4	40	-22	57.8	109	154	.5	-5	52.8	235	17.9	21	18.2		
18	68	.5	43	-22	36.1	112	184	5.1	-5	52.9	265	23.2	21	18.3		
20	96	47.1	46	-22	13.7	115	214	9.7	-5	53.0	295	28.6	21	18.3		
22	125	34.2	48	-21	50.8	117	244	14.3	-5	53.1	325	34.0	21	18.4		
Δ								23		-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	8 53	15 23	0 54	2 39	10 32	.2	16 13	4.9
55	8 20	15 57	0 44	2 14	9 47	.9	16 56	4.2
50	7 55	16 21	0 37	1 57	9 17	1.2	17 25	3.8
45	7 37	16 40	0 33	1 45	8 53	1.5	17 48	3.6
40	7 21	16 55	0 30	1 36	8 34	1.7	18 5	3.4
35	7 8	17 8	0 28	1 29	8 18	1.8	18 20	3.2
30	6 57	17 19	0 26	1 24	8 5	2.0	18 33	3.1
20	6 38	17 39	0 24	1 18	7 41	2.2	18 55	2.8
10	6 20	17 56	0 23	1 15	7 20	2.4	19 14	2.6
0	6 4	18 12	0 22	1 14	7 1	2.5	19 31	2.4
10	5 48	18 28	0 23	1 17	6 42	2.7	19 48	2.2
20	5 31	18 45	0 24	1 22	6 21	2.9	20 6	2.0
30	5 10	19 6	0 27	1 34	5 57	3.1	20 27	1.8
35	4 58	19 17	0 29	1 43	5 43	3.2	20 40	1.7
40	4 45	19 31	0 32	1 58	5 27	3.4	20 53	1.5
45	4 28	19 47	0 36	2 22	5 7	3.6	21 10	1.3
50	4 8	20 8	0 42	3 29	4 43	3.9	21 30	1.1
55	3 41	20 34	0 53	:::	4 9	4.2	21 55	.7
60	3 2	21 12	1 20	:::	3 19	4.9	22 31	.2
S								

SUNCE				MESEC					
UT	e = T <sub>p</sub> - UT	Δ/24	r	Prolaz	Δ/24	π <sub>☾</sub>	r		
h	min	s	s	h min	min	'	'		
00	- 7 49.5	-1.0	16.3	T <sub>m</sub>	13 16	2.5	61.4	16.7	
12	- 8 1.4	T <sub>m☉</sub>	12 h 8.0 min	Starost	.5 d	Faza	●		
PLANETE									
Pl.	T <sub>m</sub>	π	360-α	Vel.	Pl.	T <sub>m</sub>	π	360-α	Vel.
♀	h min	'	°		♀	h min	'	°	
♂	10 45	.1	88	-3.8	♃	5 46	.0	163	-1.9
	9 16	.1	110	1.5	♄	0 22	.0	244	-2.2

UT	SUNCE				PROLEĆ. TAČKA S <sub>γ</sub>	VENERA				MARS					
	S <sub>☉</sub>		δ <sub>☉</sub>			S <sub>♀</sub>		δ <sub>♀</sub>		S <sub>♂</sub>		δ <sub>♂</sub>			
h	°	'	°	'	°	'	°	'	°	'	°	'			
0	177	56.7	-21	39.8	111	35.0	198	27.6	-23	8.3	221	7.7	-22	11.3	
2	207	56.2	-21	39.0	141	39.9	228	25.7	-23	8.3	251	9.0	-22	11.8	
4	237	55.7	-21	38.2	171	44.9	258	23.8	-23	8.4	281	10.2	-22	12.4	
6	267	55.2	-21	37.3	201	49.8	288	21.9	-23	8.5	311	11.4	-22	12.9	
8	297	54.7	-21	36.5	231	54.7	318	20.0	-23	8.5	341	12.6	-22	13.4	
10	327	54.3	-21	35.7	261	59.7	348	18.2	-23	8.6	11	13.8	-22	13.9	
12	357	53.8	-21	34.9	292	4.6	18	16.3	-23	8.6	41	15.1	-22	14.4	
14	27	53.3	-21	34.0	322	9.5	48	14.4	-23	8.7	71	16.3	-22	14.9	
16	57	52.8	-21	33.2	352	14.4	78	12.5	-23	8.7	101	17.5	-22	15.4	
18	87	52.3	-21	32.4	22	19.4	108	10.6	-23	8.8	131	18.7	-22	15.9	
20	117	51.9	-21	31.5	52	24.3	138	8.7	-23	8.8	161	19.9	-22	16.4	
22	147	51.4	-21	30.7	82	29.2	168	6.8	-23	8.8	191	21.1	-22	16.9	
Δ		-2		4				-9		0			6		-3

UT	MESEC				JUPITER				SATURN							
	S <sub>♃</sub>		Δ		δ <sub>♃</sub>		Δ		S <sub>♃</sub>		δ <sub>♃</sub>		S <sub>♄</sub>		δ <sub>♄</sub>	
h	°	'	°	'	°	'	°	'	°	'	°	'	°	'	°	'
0	154	21.9	51	-21	27.3	120	274	18.9	-5	53.2	355	39.3	21	18.5		
2	183	10.1	54	-21	3.3	123	304	23.5	-5	53.3	25	44.7	21	18.6		
4	211	58.8	56	-20	38.7	125	334	28.2	-5	53.4	55	50.0	21	18.7		
6	240	48.1	59	-20	13.6	128	4	32.8	-5	53.5	85	55.4	21	18.7		
8	269	37.9	62	-19	48.0	130	34	37.4	-5	53.6	116	.8	21	18.8		
10	298	28.3	64	-19	21.9	133	64	42.0	-5	53.7	146	6.1	21	18.9		
12	327	19.2	67	-18	55.4	135	94	46.7	-5	53.8	176	11.5	21	19.0		
14	356	10.6	70	-18	28.4	137	124	51.3	-5	53.9	206	16.8	21	19.1		
16	25	2.6	72	-18	1.1	139	154	55.9	-5	54.0	236	22.2	21	19.1		
18	53	55.1	75	-17	33.3	141	185	.5	-5	54.1	266	27.6	21	19.2		
20	82	48.1	78	-17	5.1	143	215	5.2	-5	54.2	296	32.9	21	19.3		
22	111	41.6	80	-16	36.6	144	245	9.8	-5	54.3	326	38.3	21	19.4		
Δ								23		-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	8 52	15 25	0 54	2 39	10 38	.1	18 10	4.5
55	8 19	15 59	0 44	2 13	10 8	.6	18 38	4.0
50	7 55	16 22	0 37	1 57	9 46	.9	18 58	3.7
45	7 36	16 41	0 33	1 45	9 29	1.1	19 13	3.4
40	7 21	16 56	0 30	1 36	9 15	1.3	19 26	3.2
35	7 8	17 9	0 28	1 29	9 3	1.5	19 37	3.0
30	6 57	17 20	0 26	1 24	8 52	1.6	19 46	2.9
20	6 38	17 39	0 24	1 18	8 33	1.9	20 2	2.6
10	6 21	17 56	0 23	1 14	8 17	2.1	20 16	2.4
0	6 5	18 12	0 22	1 14	8 2	2.3	20 29	2.2
10	5 49	18 28	0 23	1 16	7 47	2.5	20 42	2.0
20	5 31	18 45	0 24	1 22	7 31	2.7	20 55	1.8
30	5 11	19 5	0 27	1 34	7 12	3.0	21 11	1.5
35	4 59	19 17	0 29	1 43	7 1	3.1	21 19	1.4
40	4 46	19 31	0 32	1 57	6 48	3.3	21 29	1.2
45	4 29	19 47	0 36	2 21	6 33	3.5	21 41	1.0
50	4 9	20 7	0 42	3 23	6 15	3.8	21 55	.8
55	3 43	20 33	0 53	:::	5 51	4.1	22 12	.5
60	3 5	21 11	1 18	:::	5 17	4.7	22 35	.1
S								

SUNCE				MESEC			
UT	e = T <sub>p</sub> - UT	Δ/24	r	Prolaz	Δ/24	π <sub>☾</sub>	r
h	min	s					

UT	SUNCE		PROLEĆ. TAČKA S <sub>γ</sub>	VENERA		MARS	
	S <sub>☉</sub>	δ <sub>☉</sub>		S <sub>♀</sub>	δ <sub>♀</sub>	S <sub>♂</sub>	δ <sub>♂</sub>
h	° / ' / "	° / ' / "	° / ' / "	° / ' / "	° / ' / "	° / ' / "	° / ' / "
0	177 50.9	-21 29.8	112 34.1	198 4.9	-23 8.9	221 22.4	-22 17.5
2	207 50.5	-21 29.0	142 39.1	228 3.1	-23 8.9	251 23.6	-22 18.0
4	237 50.0	-21 28.1	172 44.0	258 1.2	-23 8.9	281 24.8	-22 18.5
6	267 49.5	-21 27.3	202 48.9	287 59.3	-23 8.9	311 26.0	-22 19.0
8	297 49.0	-21 26.4	232 53.9	317 57.4	-23 8.9	341 27.2	-22 19.5
10	327 48.6	-21 25.6	262 58.8	347 55.5	-23 8.9	11 28.4	-22 19.9
12	357 48.1	-21 24.7	293 3.7	17 53.6	-23 8.9	41 29.6	-22 20.4
14	27 47.7	-21 23.8	323 8.6	47 51.7	-23 8.9	71 30.8	-22 20.9
16	57 47.2	-21 23.0	353 13.6	77 49.8	-23 8.9	101 32.0	-22 21.4
18	87 46.7	-21 22.1	23 18.5	107 48.0	-23 8.8	131 33.3	-22 21.9
20	117 46.3	-21 21.2	53 23.4	137 46.1	-23 8.8	161 34.5	-22 22.4
22	147 45.8	-21 20.3	83 28.4	167 44.2	-23 8.8	191 35.7	-22 22.9
Δ	-2	4		-9	0	6	-2

φ	SUNCE		TRAJANJE SUMRAKA		MESEC			
	IZLAZ	ZALAZ	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 28	0 53	2 38	10 40	.0	19 58	4.2
55	8 18	16 0	0 43	2 13	10 22	.4	20 14	3.8
50	7 54	16 24	0 37	1 56	10 8	.7	20 26	3.5
45	7 36	16 42	0 33	1 45	9 56	.9	20 35	3.2
40	7 21	16 57	0 30	1 36	9 47	1.1	20 43	3.0
35	7 8	17 10	0 28	1 29	9 39	1.3	20 50	2.9
30	6 57	17 21	0 26	1 24	9 31	1.4	20 55	2.7
20	6 38	17 40	0 24	1 18	9 19	1.7	21 5	2.4
10	6 21	17 57	0 23	1 14	9 8	1.9	21 14	2.2
0	6 5	18 12	0 22	1 14	8 58	2.1	21 22	2.0
10	5 49	18 28	0 23	1 16	8 47	2.3	21 30	1.8
20	5 32	18 45	0 24	1 22	8 36	2.5	21 38	1.6
30	5 12	19 5	0 27	1 34	8 23	2.8	21 47	1.4
35	5 0	19 17	0 29	1 43	8 16	2.9	21 53	1.2
40	4 47	19 30	0 32	1 57	8 7	3.1	21 59	1.1
45	4 31	19 47	0 36	2 20	7 57	3.3	22 6	.9
50	4 11	20 6	0 42	3 18	7 45	3.6	22 14	.6
55	3 44	20 32	0 52	:::	7 30	3.9	22 24	.4
60	3 7	21 9	1 17	:::	7 10	4.3	22 37	.0
S								

UT	MESEC				JUPITER		SATURN	
	S <sub>♃</sub>	Δ	δ <sub>♃</sub>	Δ	S <sub>♃</sub>	δ <sub>♃</sub>	S <sub>♄</sub>	δ <sub>♄</sub>
h	° / ' / "	° / ' / "	° / ' / "	° / ' / "	° / ' / "	° / ' / "	° / ' / "	° / ' / "
0	140 35.7	83 -16	7.8	146	275 14.4	-5 54.4	356 43.7	21 19.5
2	169 30.2	85 -15	38.6	147	305 19.1	-5 54.5	26 49.0	21 19.6
4	198 25.3	88 -15	9.1	149	335 23.7	-5 54.6	56 54.4	21 19.6
6	227 20.8	90 -14	39.4	150	5 28.3	-5 54.7	86 59.7	21 19.7
8	256 16.9	92 -14	9.3	151	35 33.0	-5 54.8	117 5.1	21 19.8
10	285 13.4	95 -13	39.1	153	65 37.6	-5 54.9	147 10.5	21 19.9
12	314 10.3	97 -13	8.5	154	95 42.3	-5 55.0	177 15.8	21 20.0
14	343 7.7	99 -12	37.8	155	125 46.9	-5 55.1	207 21.2	21 20.0
16	12 5.6	101 -12	6.8	156	155 51.5	-5 55.2	237 26.6	21 20.1
18	41 3.9	104 -11	35.7	157	185 56.2	-5 55.3	267 31.9	21 20.2
20	70 2.6	106 -11	4.4	157	216 .8	-5 55.4	297 37.3	21 20.3
22	99 1.7	108 -10	32.9	158	246 5.5	-5 55.5	327 42.7	21 20.4
Δ					23	0	27	0

SUNCE				MESEC					
UT	e = T <sub>p</sub> - UT	Δ/24	r	Prolaz	Δ/24	π <sub>☾</sub>	r		
h	min s	s	'	h min	min	'	'		
00	- 8 36.1	-.9	16.3	T <sub>m</sub>	15 10	2.0	60.4 16.5		
12	- 8 47.3	T <sub>m☉</sub>	12 h 8.8 min	Starost	2.5 d	Faza	☉		
PLANETE									
Pl.	T <sub>m</sub>	π	360-α	Vel.	Pl.	T <sub>m</sub>	π	360-α	Vel.
♀	h min	'	°		♃	h min	'	°	
♂	10 48	.1	86	-3.8	♄	5 38	.0	163	-1.9
	9 14	.1	109	1.5	♅	0 13	.0	244	-2.2

UT	SUNCE		PROLEĆ. TAČKA S <sub>γ</sub>	VENERA		MARS	
	S <sub>☉</sub>	δ <sub>☉</sub>		S <sub>♀</sub>	δ <sub>♀</sub>	S <sub>♂</sub>	δ <sub>♂</sub>
h	° / ' / "	° / ' / "	° / ' / "	° / ' / "	° / ' / "	° / ' / "	° / ' / "
0	177 45.3	-21 19.4	113 33.3	197 42.3	-23 8.8	221 36.9	-22 23.4
2	207 44.9	-21 18.6	143 38.2	227 40.4	-23 8.7	251 38.1	-22 23.9
4	237 44.4	-21 17.7	173 43.1	257 38.5	-23 8.7	281 39.3	-22 24.4
6	267 44.0	-21 16.8	203 48.1	287 36.6	-23 8.6	311 40.5	-22 24.8
8	297 43.5	-21 15.9	233 53.0	317 34.7	-23 8.6	341 41.7	-22 25.3
10	327 43.1	-21 15.0	263 57.9	347 32.9	-23 8.5	11 42.9	-22 25.8
12	357 42.6	-21 14.1	294 2.9	17 31.0	-23 8.4	41 44.1	-22 26.3
14	27 42.2	-21 13.2	324 7.8	47 29.1	-23 8.4	71 45.3	-22 26.8
16	57 41.7	-21 12.3	354 12.7	77 27.2	-23 8.3	101 46.5	-22 27.2
18	87 41.3	-21 11.4	24 17.6	107 25.3	-23 8.2	131 47.7	-22 27.7
20	117 40.8	-21 10.5	54 22.6	137 23.4	-23 8.1	161 48.9	-22 28.2
22	147 40.4	-21 9.6	84 27.5	167 21.5	-23 8.0	191 50.1	-22 28.6
Δ	-2	4		-9	0	6	-2

φ	SUNCE		TRAJANJE SUMRAKA		MESEC			
	IZLAZ	ZALAZ	GRAĐ.	ASTR.	IZLAZ	Δ/24	ZALAZ	Δ/24
N	h min	h min	h min	h min	h min	min	h min	min
60	8 49	15 30	0 53	2 38	10 41	.0	21 39	3.9
55	8 17	16 2	0 43	2 13	10 32	.3	21 45	3.6
50	7 53	16 25	0 37	1 56	10 24	.6	21 49	3.3
45	7 35	16 43	0 33	1 44	10 19	.8	21 53	3.1
40	7 20	16 58	0 30	1 36	10 14	1.0	21 56	2.9
35	7 8	17 11	0 28	1 29	10 9	1.2	21 58	2.7
30	6 57	17 22	0 26	1 24	10 6	1.3	22 0	2.6
20	6 38	17 41	0 24	1 18	9 59	1.5	22 4	2.3
10	6 21	17 57	0 22	1 14	9 53	1.7	22 7	2.1
0	6 5	18 13	0 22	1 14	9 48	1.9	22 10	1.9
10	5 50	18 29	0 23	1 16	9 42	2.2	22 13	1.7
20	5 33	18 46	0 24	1 22	9 37	2.4	22 16	1.5
30	5 13	19 5	0 27	1 33	9 30	2.6	22 20	1.3
35	5 1	19 17	0 29	1 43	9 26	2.8	22 22	1.1
40	4 48	19 30	0 32	1 56	9 22	2.9	22 24	1.0
45	4 32	19 46	0 36	2 19	9 17	3.1	22 27	.8
50	4 12	20 6	0 42	3 14	9 11	3.4	22 30	.6
55	3 46	20 31	0 52	:::	9 3	3.6	22 33	.3
60	3 9	21 8	1 15	:::	8 53	4.0	22 38	.0
S								

UT	MESEC				JUPITER		SATURN	
	S <sub>♃</sub>	Δ	δ <sub>♃</sub>	Δ	S <sub>♃</sub>	δ <sub>♃</sub>	S <sub>♄</sub>	δ <sub>♄</sub>
h	° / ' / "	° / ' / "	° / ' / "	° / ' / "	° / ' / "	° / ' / "	° / ' / "	° / ' / "
0	128 1.3	110 -10	1.3	159	276 10.1	-5 55.6	357 48.0	21 20.4
2	157 1.2	112 -9	29.6	159	306 14.8	-5 55.7	27 53.4	21 20.5
4	186 1.5	113 -8	57.8	160	336 19.4	-5 55.8	57 58.7	21 20.6
6	215 2.2	115 -8	25.8	160	6 24.1	-5 55.8	88 4.1	21 20.7
8	244 3.2	117 -7	53.8	160	36 28.7	-5 55.9	118 9.5	21 20.8
10	273 4.6	119 -7	21.7	161	66 33.4	-5 56.0	148 14.8	21 20.8
12	302 6.3	120 -6	49.6	161	96 38.0	-5 56.1	178 20.2	21 20.9
14	331 8.3	122 -6	17.4	161	126 42.7	-5 56.2	208 25.6	21 21.0
16	0 10.6	123 -5	45.1	161	156 47.3	-5 56.3	238 30.9	21 21.1
18	29 13.3	125 -5	12.9	161	186 52.0	-5 56.4	268 36.3	21 21.2
20	58 16.2	126 -4	40.6	161	216 56.6	-5 56.5	298 41.6	21 21.2
22	87 19.4	127 -4	8.4	161	247 1.3	-5 56.6	328 47.0	21 21.3
Δ					23	0	27	0

SUNCE				MESEC					
UT	e = T <sub>p</sub> - UT	Δ/24	r	Prolaz	Δ/24	π <sub>☾</sub>	r		
h	min s	s	'	h min	min	'	'		
00	- 8 58.4	-.9	16.3	T <sub>m</sub>	15 59	1.9	59.6 16.2		
12	- 9 9.3	T <sub>m☉</sub>	12 h 9.2 min	Starost	3.5 d	Faza	☉		
PLANETE									
Pl.	T <sub>m</sub>	π	360-α	Vel.	Pl.	T <sub>m</sub>	π	360-α	Vel.
♀	h min	'	°		♃	h min	'	°	
♂	10 50	.1	84	-3.8	♄	5 34	.0	163	-1.9
	9 13	.1	108	1.5	♅	0 9	.0	244	-2.2

UT	SUNCE				PROLEĆ. TAČKA S <sub>γ</sub>	VENERA				MARS					
	S <sub>☉</sub>		δ <sub>☉</sub>			S <sub>♀</sub>		δ <sub>♀</sub>		S <sub>♂</sub>		δ <sub>♂</sub>			
h	°	'	°	'	°	'	°	'	°	'	°	'			
0	177	39.9	-21	8.7	114	32.4	197	19.6	-23	7.9	221	51.3	-22	29.1	
2	207	39.5	-21	7.7	144	37.4	227	17.8	-23	7.8	251	52.5	-22	29.6	
4	237	39.0	-21	6.8	174	42.3	257	15.9	-23	7.7	281	53.7	-22	30.1	
6	267	38.6	-21	5.9	204	47.2	287	14.0	-23	7.6	311	54.9	-22	30.5	
8	297	38.2	-21	5.0	234	52.1	317	12.1	-23	7.5	341	56.1	-22	31.0	
10	327	37.7	-21	4.0	264	57.1	347	10.2	-23	7.4	11	57.3	-22	31.4	
12	357	37.3	-21	3.1	295	2.0	17	8.3	-23	7.3	41	58.5	-22	31.9	
14	27	36.9	-21	2.2	325	6.9	47	6.4	-23	7.1	71	59.7	-22	32.4	
16	57	36.4	-21	1.2	355	11.9	77	4.6	-23	7.0	102	.9	-22	32.8	
18	87	36.0	-21	.3	25	16.8	107	2.7	-23	6.9	132	2.1	-22	33.3	
20	117	35.6	-20	59.4	55	21.7	137	.8	-23	6.7	162	3.3	-22	33.7	
22	147	35.1	-20	58.4	85	26.6	166	58.9	-23	6.6	192	4.5	-22	34.2	
Δ		-2		5				-9		1			6		-2

φ	SUNCE		TRAJANJE SUMRAKA		MESEC			
	IZLAZ	ZALAZ	GRAD.	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 32	0 53	2 37	10 41	.0	23 13	3.8
55	8 16	16 4	0 43	2 12	10 40	.3	23 10	3.5
50	7 53	16 27	0 37	1 56	10 39	.6	23 8	3.2
45	7 35	16 45	0 33	1 44	10 38	.8	23 6	3.0
40	7 20	16 59	0 30	1 36	10 38	.9	23 5	2.8
35	7 8	17 12	0 28	1 29	10 37	1.1	23 3	2.6
30	6 57	17 23	0 26	1 24	10 37	1.2	23 2	2.5
20	6 38	17 41	0 24	1 17	10 36	1.5	22 60	2.2
10	6 21	17 58	0 22	1 14	10 35	1.7	22 58	2.0
0	6 6	18 13	0 22	1 14	10 35	1.9	22 56	1.9
10	5 50	18 29	0 23	1 16	10 34	2.1	22 54	1.7
20	5 33	18 46	0 24	1 22	10 34	2.3	22 52	1.5
30	5 14	19 5	0 27	1 33	10 33	2.5	22 50	1.2
35	5 2	19 17	0 29	1 42	10 33	2.7	22 49	1.1
40	4 49	19 30	0 32	1 56	10 32	2.8	22 47	1.0
45	4 33	19 45	0 36	2 18	10 32	3.0	22 46	.8
50	4 14	20 5	0 41	3 10	10 31	3.2	22 43	.6
55	3 48	20 30	0 51	:::	10 31	3.5	22 41	.3
60	3 12	21 6	1 14	:::	10 30	3.9	22 38	.0
S								

UT	MESEC				JUPITER				SATURN							
	S <sub>♃</sub>		Δ		δ <sub>♃</sub>		Δ		S <sub>♃</sub>		δ <sub>♃</sub>		S <sub>♄</sub>		δ <sub>♄</sub>	
h	°	'	°	'	°	'	°	'	°	'	°	'	°	'	°	'
0	116	22.9	129	-3	36.1	161	277	6.0	-5	56.6	358	52.4	21	21.4		
2	145	26.6	130	-3	3.9	161	307	10.6	-5	56.7	28	57.7	21	21.5		
4	174	30.5	131	-2	31.7	161	337	15.3	-5	56.8	59	3.1	21	21.6		
6	203	34.7	132	-1	59.6	160	7	19.9	-5	56.9	89	8.5	21	21.6		
8	232	39.1	133	-1	27.5	160	37	24.6	-5	57.0	119	13.8	21	21.7		
10	261	43.7	134	-0	55.4	160	67	29.3	-5	57.1	149	19.2	21	21.8		
12	290	48.5	135	-0	23.5	159	97	33.9	-5	57.2	179	24.5	21	21.9		
14	319	53.4	136	0	8.4	159	127	38.6	-5	57.2	209	29.9	21	22.0		
16	348	58.6	137	0	40.1	158	157	43.3	-5	57.3	239	35.3	21	22.0		
18	18	3.9	137	1	11.8	158	187	48.0	-5	57.4	269	40.6	21	22.1		
20	47	9.3	138	1	43.4	157	217	52.6	-5	57.5	299	46.0	21	22.2		
22	76	14.9	139	2	14.8	157	247	57.3	-5	57.6	329	51.4	21	22.3		
Δ								23		0			27		0	

SUNCE				MESEC					
UT	e = T <sub>p</sub> - UT	Δ/24	r	Prolaz	Δ/24	π <sub>♃</sub>	r		
h	min	s	s	h min	min	'	'		
00	-9	20.1	-9	16.3	T <sub>m</sub>	16 45	1.9	58.6	16.0
12	-9	30.6	T <sub>m☉</sub>	12 h 9.5 min	Starost	4.5 d	Faza	☉	

PLANETE									
Pl.	T <sub>m</sub>	π	360-α	Vel.	Pl.	T <sub>m</sub>	π	360-α	Vel.
♃	h min	'	°		♃	h min	'	°	
♄	10 51	.1	83	-3.8	♄	5 31	.0	163	-1.9
♅	9 12	.1	107	1.5	♅	0 4	.0	244	-2.2

UT	SUNCE				PROLEĆ. TAČKA S <sub>γ</sub>	VENERA				MARS					
	S <sub>☉</sub>		δ <sub>☉</sub>			S <sub>♀</sub>		δ <sub>♀</sub>		S <sub>♂</sub>		δ <sub>♂</sub>			
h	°	'	°	'	°	'	°	'	°	'	°	'			
0	177	34.7	-20	57.5	115	31.6	196	57.0	-23	6.4	222	5.6	-22	34.7	
2	207	34.3	-20	56.5	145	36.5	226	55.1	-23	6.2	252	6.8	-22	35.1	
4	237	33.8	-20	55.6	175	41.4	256	53.3	-23	6.1	282	8.0	-22	35.6	
6	267	33.4	-20	54.6	205	46.3	286	51.4	-23	5.9	312	9.2	-22	36.0	
8	297	33.0	-20	53.6	235	51.3	316	49.5	-23	5.7	342	10.4	-22	36.5	
10	327	32.6	-20	52.7	265	56.2	346	47.6	-23	5.6	12	11.6	-22	36.9	
12	357	32.1	-20	51.7	296	1.1	16	45.7	-23	5.4	42	12.8	-22	37.3	
14	27	31.7	-20	50.7	326	6.1	46	43.8	-23	5.2	72	14.0	-22	37.8	
16	57	31.3	-20	49.8	356	11.0	76	42.0	-23	5.0	102	15.2	-22	38.2	
18	87	30.9	-20	48.8	26	15.9	106	40.1	-23	4.8	132	16.3	-22	38.7	
20	117	30.5	-20	47.8	56	20.8	136	38.2	-23	4.6	162	17.5	-22	39.1	
22	147	30.0	-20	46.9	86	25.8	166	36.3	-23	4.4	192	18.7	-22	39.6	
Δ		-2		5				-9		1			6		-2

φ	SUNCE		TRAJANJE SUMRAKA		MESEC			
	IZLAZ	ZALAZ	GRAD.	ASTR.	IZLAZ	Δ/24	ZALAZ	Δ/24
N	h min	h min	h min	h min	h min	min	h min	min
60	8 46	15 34	0 52	2 36	10 40	.0	...	.0
55	8 15	16 6	0 43	2 12	10 47	.3	...	.0
50	7 52	16 28	0 37	1 56	10 52	.6	...	.0
45	7 34	16 46	0 33	1 44	10 57	.8	...	.0
40	7 20	17 0	0 30	1 35	11 0	1.0	...	.0
35	7 7	17 13	0 27	1 29	11 3	1.1	...	.0
30	6 57	17 23	0 26	1 24	11 6	1.2	...	.0
20	6 38	17 42	0 24	1 17	11 11	1.5	23 54	2.2
10	6 22	17 58	0 22	1 14	11 15	1.7	23 47	2.0
0	6 6	18 14	0 22	1 14	11 20	1.8	23 41	1.9
10	5 51	18 29	0 23	1 16	11 24	2.0	23 34	1.7
20	5 34	18 46	0 24	1 22	11 28	2.2	23 27	1.5
30	5 15	19 5	0 27	1 33	11 33	2.5	23 20	1.3
35	5 3	19 16	0 29	1 42	11 36	2.6	23 15	1.1
40	4 50	19 29	0 31	1 55	11 40	2.7	23 10	1.0
45	4 34	19 45	0 35	2 17	11 44	2.9	23 4	.8
50	4 15	20 4	0 41	3 6	11 49	3.1	22 57	.6
55	3 50	20 29	0 51	:::	11 54	3.4	22 49	.4
60	3 14	21 4	1 13	:::	12 2	3.8	22 38	.0
S								

UT	MESEC				JUPITER				SATURN							
	S <sub>♃</sub>		Δ		δ <sub>♃</sub>		Δ		S <sub>♃</sub>		δ <sub>♃</sub>		S <sub>♄</sub>		δ <sub>♄</sub>	
h	°	'	°	'	°	'	°	'	°	'	°	'	°	'	°	'
0	105	20.6	139	2	46.1	156	278	2.0	-5	57.6	359	56.7	21	22.4		
2	134	26.5	140	3	17.3	155	308	6.6	-5	57.7	30	2.1	21	22.4		
4	163	32.4	140	3	48.3	154	338	11.3	-5	57.8	60	7.4	21	22.5		
6	192	38.4	141	4	19.2	154	8	16.0	-5	57.9	90	12.8	21	22.6		
8	221	44.5	141	4	49.9	153	38	20.7	-5	58.0	120	18.2	21	22.7		
10	250	50.7	141	5	20.4	152	68	25.4	-5	58.0	150	23.5	21	22.8		
12	279	57.0	141	5	50.8	151	98	30.0	-5	58.1	180	28.9	21	22.8		
14	309	3.3	142	6	21.0	150	128	34.7	-5	58.2	210	34.3	21	22.9		
16	338	9.6	142	6	51.0	149	158	39.4	-5	58.3	240	39.6	21	23.0		
18	7	16.0	142	7	20.8	148	188	44.1	-5	58.4	270	45.0	21	23.1		
20	36	22.4	142	7	50.4	147	218	48.8	-5	58.4	300	50.3	21	23.2		
22	65	28.8	142	8	19.8	146	248	53.5	-5	58.5	330	55.7	21	23.2		
Δ								23		0			27		0	

SUNCE				MESEC			
UT	e = T <sub>p</sub> - UT	Δ/24	r	Prolaz	Δ/24	π <sub>♃</sub>	

UT	SUNCE		PROLEĆ. TAČKA S <sub>γ</sub>	VENERA		MARS	
	S <sub>☉</sub>	δ <sub>☉</sub>		S <sub>♀</sub>	δ <sub>♀</sub>	S <sub>♂</sub>	δ <sub>♂</sub>
h	° / ' / "	° / ' / "	° / ' / "	° / ' / "	° / ' / "	° / ' / "	° / ' / "
0	177 29.6	-20 45.9	116 30.7	196 34.4	-23 4.2	222 19.9	-22 40.0
2	207 29.2	-20 44.9	146 35.6	226 32.6	-23 3.9	252 21.1	-22 40.4
4	237 28.8	-20 43.9	176 40.6	256 30.7	-23 3.7	282 22.3	-22 40.9
6	267 28.4	-20 42.9	206 45.5	286 28.8	-23 3.5	312 23.5	-22 41.3
8	297 28.0	-20 41.9	236 50.4	316 26.9	-23 3.3	342 24.6	-22 41.7
10	327 27.6	-20 40.9	266 55.3	346 25.0	-23 3.0	12 25.8	-22 42.2
12	357 27.2	-20 39.9	297 .3	16 23.2	-23 2.8	42 27.0	-22 42.6
14	27 26.8	-20 38.9	327 5.2	46 21.3	-23 2.5	72 28.2	-22 43.0
16	57 26.4	-20 37.9	357 10.1	76 19.4	-23 2.3	102 29.4	-22 43.4
18	87 25.9	-20 36.9	27 15.1	106 17.5	-23 2.0	132 30.5	-22 43.9
20	117 25.5	-20 35.9	57 20.0	136 15.7	-23 1.8	162 31.7	-22 44.3
22	147 25.1	-20 34.9	87 24.9	166 13.8	-23 1.5	192 32.9	-22 44.7
Δ	-2	5		-9	1	6	-2

φ	SUNCE		TRAJANJE SUMRAKA		MESEC			
	IZLAZ	ZALAZ	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	15 37	0 52	2 36	10 41	.0	0 46	3.8
55	8 13	16 7	0 43	2 12	10 55	.4	0 34	3.4
50	7 51	16 30	0 37	1 55	11 6	.7	0 25	3.1
45	7 34	16 47	0 33	1 44	11 16	.9	0 18	2.9
40	7 19	17 2	0 30	1 35	11 23	1.0	0 12	2.7
35	7 7	17 14	0 27	1 29	11 30	1.2	0 6	2.6
30	6 56	17 24	0 26	1 24	11 36	1.3	0 2	2.4
20	6 38	17 43	0 24	1 17	11 46	1.5	...	.0
10	6 22	17 59	0 22	1 14	11 55	1.7	...	.0
0	6 7	18 14	0 22	1 14	12 4	1.9	...	.0
10	5 51	18 29	0 23	1 16	12 12	2.0	...	.0
20	5 35	18 46	0 24	1 22	12 22	2.2	...	.0
30	5 15	19 5	0 27	1 33	12 32	2.4	23 50	1.4
35	5 4	19 16	0 29	1 41	12 39	2.6	23 42	1.2
40	4 51	19 29	0 31	1 55	12 46	2.7	23 34	1.1
45	4 36	19 44	0 35	2 16	12 54	2.9	23 24	.9
50	4 17	20 3	0 41	3 3	13 4	3.1	23 12	.7
55	3 52	20 28	0 51	:::	13 17	3.4	22 57	.5
60	3 17	21 2	1 12	:::	13 33	3.8	22 38	.1

UT	MESEC				JUPITER		SATURN	
	S <sub>♃</sub>	Δ	δ <sub>♃</sub>	Δ	S <sub>♃</sub>	δ <sub>♃</sub>	S <sub>♄</sub>	δ <sub>♄</sub>
h	° / ' / "	° / ' / "	° / ' / "	° / ' / "	° / ' / "	° / ' / "	° / ' / "	° / ' / "
0	94 35.2	142 8	48.9	145	278 58.1	-5 58.6	1 1.1	21 23.3
2	123 41.6	142 9	17.9	144	309 2.8	-5 58.7	31 6.4	21 23.4
4	152 48.0	142 9	46.6	142	339 7.5	-5 58.7	61 11.8	21 23.5
6	181 54.4	142 10	15.0	141	9 12.2	-5 58.8	91 17.1	21 23.5
8	211 .7	142 10	43.3	140	39 16.9	-5 58.9	121 22.5	21 23.6
10	240 7.0	141 11	11.2	139	69 21.6	-5 58.9	151 27.9	21 23.7
12	269 13.3	141 11	39.0	137	99 26.3	-5 59.0	181 33.2	21 23.8
14	298 19.5	141 12	6.4	136	129 31.0	-5 59.1	211 38.6	21 23.9
16	327 25.6	140 12	33.6	135	159 35.7	-5 59.2	241 43.9	21 23.9
18	356 31.7	140 13	.5	133	189 40.4	-5 59.2	271 49.3	21 24.0
20	25 37.7	140 13	27.1	132	219 45.1	-5 59.3	301 54.7	21 24.1
22	54 43.6	139 13	53.5	130	249 49.8	-5 59.4	332 .0	21 24.2
Δ					23	0	27	0

SUNCE				MESEC			
UT	e = T <sub>p</sub> - UT	Δ/24	r	Prolaz	Δ/24	π <sub>☾</sub>	r
h	min s	s / ' / "	h min	h min	min	' / "	' / "
00	-10 1.3	-.8	16.3	T <sub>m</sub>	18 14	1.9	56.7 15.5
12	-10 11.1	T <sub>m☉</sub>	12 h 10.2 min	Starost	6.5 d	Faza	☉

PLANETE									
Pl.	T <sub>m</sub>	π	360-α	Vel.	Pl.	T <sub>m</sub>	π	360-α	Vel.
h min	' / "	°	°	°	h min	' / "	°	°	°
♀	10 54	.1	80	-3.8	♃	5 23	.0	162	-1.9
♂	9 10	.1	106	1.5	♄	23 52	.0	245	-2.2

UT	SUNCE		PROLEĆ. TAČKA S <sub>γ</sub>	VENERA		MARS	
	S <sub>☉</sub>	δ <sub>☉</sub>		S <sub>♀</sub>	δ <sub>♀</sub>	S <sub>♂</sub>	δ <sub>♂</sub>
h	° / ' / "	° / ' / "	° / ' / "	° / ' / "	° / ' / "	° / ' / "	° / ' / "
0	177 24.7	-20 33.9	117 29.8	196 11.9	-23 1.2	222 34.1	-22 45.1
2	207 24.3	-20 32.9	147 34.8	226 10.0	-23 .9	252 35.3	-22 45.5
4	237 23.9	-20 31.8	177 39.7	256 8.2	-23 .6	282 36.4	-22 46.0
6	267 23.6	-20 30.8	207 44.6	286 6.3	-23 .4	312 37.6	-22 46.4
8	297 23.2	-20 29.8	237 49.6	316 4.4	-23 .1	342 38.8	-22 46.8
10	327 22.8	-20 28.8	267 54.5	346 2.5	-22 59.8	12 40.0	-22 47.2
12	357 22.4	-20 27.7	297 59.4	16 .7	-22 59.5	42 41.1	-22 47.6
14	27 22.0	-20 26.7	328 4.3	45 58.8	-22 59.2	72 42.3	-22 48.0
16	57 21.6	-20 25.7	358 9.3	75 56.9	-22 58.9	102 43.5	-22 48.4
18	87 21.2	-20 24.6	28 14.2	105 55.1	-22 58.5	132 44.6	-22 48.8
20	117 20.8	-20 23.6	58 19.1	135 53.2	-22 58.2	162 45.8	-22 49.2
22	147 20.4	-20 22.6	88 24.1	165 51.3	-22 57.9	192 47.0	-22 49.7
Δ	-2	5		-9	2	6	-2

φ	SUNCE		TRAJANJE SUMRAKA		MESEC			
	IZLAZ	ZALAZ	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 39	0 52	2 35	10 41	.1	2 17	3.8
55	8 12	16 9	0 42	2 11	11 5	.5	1 56	3.4
50	7 50	16 31	0 37	1 55	11 22	.8	1 40	3.1
45	7 33	16 49	0 33	1 44	11 36	1.0	1 27	2.9
40	7 19	17 3	0 30	1 35	11 48	1.2	1 17	2.7
35	7 7	17 15	0 27	1 29	11 58	1.3	1 8	2.6
30	6 56	17 25	0 26	1 24	12 7	1.4	1 1	2.4
20	6 38	17 43	0 23	1 17	12 22	1.6	0 47	2.2
10	6 22	17 59	0 22	1 14	12 36	1.8	0 36	2.1
0	6 7	18 14	0 22	1 13	12 48	1.9	0 25	1.9
10	5 52	18 29	0 23	1 16	13 1	2.1	0 14	1.7
20	5 35	18 46	0 24	1 21	13 15	2.2	0 3	1.6
30	5 16	19 4	0 27	1 32	13 31	2.4	...	.0
35	5 5	19 15	0 29	1 41	13 40	2.6	...	.0
40	4 52	19 28	0 31	1 54	13 51	2.7	...	.0
45	4 37	19 43	0 35	2 15	14 3	2.9	23 46	1.1
50	4 18	20 2	0 41	2 60	14 19	3.1	23 30	.9
55	3 54	20 26	0 50	:::	14 38	3.4	23 8	.6
60	3 19	21 0	1 10	:::	15 5	3.9	22 39	.1

UT	MESEC				JUPITER		SATURN	
	S <sub>♃</sub>	Δ	δ <sub>♃</sub>	Δ	S <sub>♃</sub>	δ <sub>♃</sub>	S <sub>♄</sub>	δ <sub>♄</sub>
h	° / ' / "	° / ' / "	° / ' / "	° / ' / "	° / ' / "	° / ' / "	° / ' / "	° / ' / "
0	83 49.4	139 14	19.5	129	279 54.5	-5 59.4	2 5.4	21 24.3
2	112 55.1	138 14	45.3	127	309 59.2	-5 59.5	32 10.8	21 24.3
4	142 .7	137 15	10.7	126	340 3.9	-5 59.6	62 16.1	21 24.4
6	171 6.2	137 15	35.9	124	10 8.6	-5 59.7	92 21.5	21 24.5
8	200 11.5	136 16	.7	122	40 13.3	-5 59.7	122 26.8	21 24.6
10	229 16.8	136 16	25.2	121	70 18.0	-5 59.8	152 32.2	21 24.7
12	258 21.9	135 16	49.3	119	100 22.7	-5 59.9	182 37.6	21 24.7
14	287 26.8	134 17	13.1	117	130 27.4	-5 59.9	212 42.9	21 24.8
16	316 31.7	133 17	36.6	116	160 32.1	-5 60.0	242 48.3	21 24.8
18	345 36.3	133 17	59.8	114	190 36.8	-6 .0	272 53.6	21 25.0
20	14 40.9	132 18	22.5	112	220 41.6	-6 .1	302 59.0	21 25.0
22	43 45.2	131 18	45.0	110	250 46.3	-6 .2	333 4.4	21 25.1
Δ					24	0	27	0

SUNCE				MESEC			
UT	e = T <sub>p</sub> - UT	Δ/24	r	Prolaz	Δ/24	π <sub>☾</sub>	r
h	min s	s / ' / "	h min	h min	min	' / "	' / "
00	-10 20.8	-.8	16.3	T <sub>m</sub>	18 59	2.0	55.9 15.2
12	-10 30.3	T <sub>m☉</sub>	12 h 10.5 min	Starost	7.5 d	Faza	☉

PLANETE									
Pl.	T <sub>m</sub>	π	360-α	Vel.	Pl.	T <sub>m</sub>	π	360-α	Vel.
h min	' / "	°	°	°	h min	' / "	°	°	°
♀	10 56	.1	79	-3.8	♃	5 20	.0	162	-1.9
♂	9 9	.1	105	1.5	♄	23 47	.0	245	-2.2

UT	SUNCE				PROLEĆ. TAČKA S <sub>γ</sub>	VENERA				MARS					
	S <sub>☉</sub>		δ <sub>☉</sub>			S <sub>♀</sub>		δ <sub>♀</sub>		S <sub>♂</sub>		δ <sub>♂</sub>			
h	°	'	°	'	°	'	°	'	°	'	°	'			
0	177	20.0	-20	21.5	118	29.0	195	49.5	-22	57.6	222	48.2	-22	50.1	
2	207	19.7	-20	20.5	148	33.9	225	47.6	-22	57.2	252	49.3	-22	50.5	
4	237	19.3	-20	19.4	178	38.8	255	45.7	-22	56.9	282	50.5	-22	50.9	
6	267	18.9	-20	18.4	208	43.8	285	43.9	-22	56.5	312	51.7	-22	51.3	
8	297	18.5	-20	17.3	238	48.7	315	42.0	-22	56.2	342	52.8	-22	51.7	
10	327	18.1	-20	16.2	268	53.6	345	40.1	-22	55.8	12	54.0	-22	52.0	
12	357	17.8	-20	15.2	298	58.6	15	38.3	-22	55.5	42	55.2	-22	52.4	
14	27	17.4	-20	14.1	329	3.5	45	36.4	-22	55.1	72	56.3	-22	52.8	
16	57	17.0	-20	13.0	359	8.4	75	34.5	-22	54.7	102	57.5	-22	53.2	
18	87	16.6	-20	12.0	29	13.3	105	32.7	-22	54.3	132	58.7	-22	53.6	
20	117	16.3	-20	10.9	59	18.3	135	30.8	-22	54.0	162	59.8	-22	54.0	
22	147	15.9	-20	9.8	89	23.2	165	28.9	-22	53.6	193	1.0	-22	54.4	
Δ		-2		5				-9		2			6		-2

UT	MESEC				JUPITER				SATURN						
	S <sub>♃</sub>		Δ	δ <sub>♃</sub>	Δ	S <sub>♃</sub>		δ <sub>♃</sub>		S <sub>♄</sub>		δ <sub>♄</sub>			
h	°	'	°	'	°	'	°	'	°	'	°	'			
0	72	49.4	130	19	7.0	108	280	51.0	-6	.2	3	9.7	21	25.2	
2	101	53.4	129	19	28.7	107	310	55.7	-6	.3	33	15.1	21	25.3	
4	130	57.3	128	19	50.0	105	341	.4	-6	.4	63	20.4	21	25.4	
6	160	1.0	128	20	10.9	103	11	5.1	-6	.4	93	25.8	21	25.4	
8	189	4.5	127	20	31.5	101	41	9.9	-6	.5	123	31.2	21	25.5	
10	218	7.8	126	20	51.6	99	71	14.6	-6	.6	153	36.5	21	25.6	
12	247	11.0	125	21	11.4	97	101	19.3	-6	.6	183	41.9	21	25.7	
14	276	14.0	124	21	30.7	95	131	24.0	-6	.7	213	47.2	21	25.8	
16	305	16.8	123	21	49.7	93	161	28.8	-6	.7	243	52.6	21	25.8	
18	334	19.3	122	22	8.2	91	191	33.5	-6	.8	273	57.9	21	25.9	
20	3	21.8	121	22	26.3	88	221	38.2	-6	.9	304	3.3	21	26.0	
22	32	24.0	120	22	44.0	86	251	42.9	-6	.9	334	8.7	21	26.1	
Δ								24		0			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	8 41	15 41	0 51	2 34	10 44	.2	3 49	3.9
55	8 11	16 11	0 42	2 11	11 17	.7	3 17	3.3
50	7 49	16 33	0 36	1 55	11 42	1.0	2 54	3.0
45	7 32	16 50	0 32	1 44	12 1	1.2	2 36	2.8
40	7 18	17 4	0 29	1 35	12 16	1.4	2 22	2.7
35	7 6	17 16	0 27	1 28	12 29	1.5	2 10	2.5
30	6 56	17 26	0 26	1 24	12 41	1.6	1 59	2.4
20	6 38	17 44	0 23	1 17	13 1	1.7	1 41	2.3
10	6 22	17 60	0 22	1 14	13 18	1.9	1 25	2.1
0	6 7	18 14	0 22	1 13	13 35	2.0	1 10	2.0
10	5 52	18 29	0 23	1 16	13 51	2.1	0 56	1.8
20	5 36	18 45	0 24	1 21	14 9	2.3	0 40	1.7
30	5 17	19 4	0 26	1 32	14 29	2.4	0 23	1.5
35	5 6	19 15	0 28	1 41	14 41	2.5	0 12	1.4
40	4 53	19 28	0 31	1 53	14 55	2.6	0 1	1.3
45	4 38	19 43	0 35	2 14	15 12	2.8	...	.0
50	4 20	20 1	0 41	2 57	15 32	3.0	23 51	1.2
55	3 56	20 25	0 50	:::	15 59	3.3	23 23	.9
60	3 22	20 58	1 9	:::	16 38	3.9	22 43	.3
S								

SUNCE				MESEC					
UT	e = T <sub>p</sub> - UT	Δ/24	r	Prolaz	Δ/24	π <sub>☾</sub>	r		
h	min	s	s	h min	min	'	'		
00	-10 39.6	-.8	16.3	T <sub>m</sub>	19 46	2.0	55.3 15.1		
12	-10 48.7	T <sub>m☉</sub>	12 h 10.8 min	Starost	8.5 d	Faza	☉		
PLANETE									
Pl.	T <sub>m</sub>	π	360-α	Vel.	Pl.	T <sub>m</sub>	π	360-α	Vel.
♀	h min	'	°		♃	h min	'	°	
♂	10 57	.1	77	-3.8	♄	5 16	.0	162	-1.9
	9 8	.1	104	1.5	♅	23 43	.0	245	-2

UT	SUNCE				PROLEĆ. TAČKA S <sub>γ</sub>	VENERA				MARS					
	S <sub>☉</sub>		δ <sub>☉</sub>			S <sub>♀</sub>		δ <sub>♀</sub>		S <sub>♂</sub>		δ <sub>♂</sub>			
h	°	'	°	'	°	'	°	'	°	'	°	'			
0	177	15.5	-20	8.7	119	28.1	195	27.1	-22	53.2	223	2.2	-22	54.8	
2	207	15.2	-20	7.7	149	33.0	225	25.2	-22	52.8	253	3.3	-22	55.2	
4	237	14.8	-20	6.6	179	38.0	255	23.4	-22	52.4	283	4.5	-22	55.5	
6	267	14.4	-20	5.5	209	42.9	285	21.5	-22	52.0	313	5.6	-22	55.9	
8	297	14.1	-20	4.4	239	47.8	315	19.6	-22	51.6	343	6.8	-22	56.3	
10	327	13.7	-20	3.3	269	52.8	345	17.8	-22	51.2	13	8.0	-22	56.7	
12	357	13.3	-20	2.2	299	57.7	15	15.9	-22	50.7	43	9.1	-22	57.1	
14	27	13.0	-20	1.1	330	2.6	45	14.1	-22	50.3	73	10.3	-22	57.4	
16	57	12.6	-20	.0	0	7.5	75	12.2	-22	49.9	103	11.5	-22	57.8	
18	87	12.3	-19	58.9	30	12.5	105	10.4	-22	49.5	133	12.6	-22	58.2	
20	117	11.9	-19	57.8	60	17.4	135	8.5	-22	49.0	163	13.8	-22	58.6	
22	147	11.6	-19	56.7	90	22.3	165	6.7	-22	48.6	193	14.9	-22	58.9	
Δ		-2		5				-9		2			6		-2

UT	MESEC				JUPITER				SATURN						
	S <sub>♃</sub>		Δ	δ <sub>♃</sub>	Δ	S <sub>♃</sub>		δ <sub>♃</sub>		S <sub>♄</sub>		δ <sub>♄</sub>			
h	°	'	°	'	°	'	°	'	°	'	°	'			
0	61	26.0	119	23	1.2	84	281	47.7	-6	1.0	4	14.0	21	26.1	
2	90	27.8	118	23	18.0	82	311	52.4	-6	1.0	34	19.4	21	26.2	
4	119	29.5	117	23	34.4	80	341	57.1	-6	1.1	64	24.7	21	26.3	
6	148	31.0	116	23	50.3	77	12	1.9	-6	1.1	94	30.1	21	26.4	
8	177	32.2	115	24	5.8	75	42	6.6	-6	1.2	124	35.5	21	26.5	
10	206	33.3	115	24	20.8	73	72	11.3	-6	1.3	154	40.8	21	26.5	
12	235	34.3	114	24	35.3	70	102	16.1	-6	1.3	184	46.2	21	26.6	
14	264	35.0	113	24	49.4	68	132	20.8	-6	1.4	214	51.5	21	26.7	
16	293	35.5	112	25	3.0	66	162	25.5	-6	1.4	244	56.9	21	26.8	
18	322	35.9	111	25	16.1	63	192	30.3	-6	1.5	275	2.2	21	26.8	
20	351	36.1	110	25	28.8	61	222	35.0	-6	1.5	305	7.6	21	26.9	
22	20	36.1	109	25	40.9	58	252	39.8	-6	1.6	335	13.0	21	27.0	
Δ								24		0			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	8 39	15 44	0 51	2 34	10 49	.5	5 22	3.8
55	8 10	16 13	0 42	2 11	11 35	1.1	4 37	3.2
50	7 48	16 34	0 36	1 55	12 6	1.4	4 7	2.9
45	7 31	16 51	0 32	1 43	12 30	1.5	3 44	2.7
40	7 18	17 5	0 29	1 35	12 49	1.6	3 26	2.6
35	7 6	17 17	0 27	1 28	13 5	1.7	3 11	2.5
30	6 56	17 27	0 26	1 23	13 19	1.8	2 57	2.4
20	6 38	17 45	0 23	1 17	13 43	1.9	2 35	2.3
10	6 22	18 0	0 22	1 14	14 3	2.0	2 16	2.2
0	6 7	18 15	0 22	1 13	14 23	2.1	1 58	2.0
10	5 53	18 29	0 22	1 15	14 42	2.2	1 40	1.9
20	5 37	18 45	0 24	1 21	15 3	2.3	1 21	1.8
30	5 18	19 4	0 26	1 32	15 28	2.4	0 58	1.7
35	5 7	19 15	0 28	1 40	15 42	2.4	0 46	1.6
40	4 55	19 27	0 31	1 53	15 59	2.5	0 31	1.5
45	4 40	19 42	0 35	2 13	16 19	2.6	0 13	1.4
50	4 21	19 60	0 40	2 54	16 44	2.8	...	.0
55	3 58	20 23	0 49	:::	17 18	3.0	23 45	1.3
60	3 24	20 56	1 8	:::	18 11	3.6	22 50	.8
S								

SUNCE				MESEC			
UT	e = T <sub>p</sub> - UT	Δ/24	r	Prolaz	Δ/24	π <sub>☾</sub>	r
h	min	s	s	h min	min	'	'
00	-10 57.7	-.7	16.3				

UT	SUNCE				PROLEĆ. TAČKA S <sub>γ</sub>	VENERA				MARS				
	S <sub>☉</sub>		δ <sub>☉</sub>			S <sub>♀</sub>		δ <sub>♀</sub>		S <sub>♂</sub>		δ <sub>♂</sub>		
0	177	11.2	-19	55.6	120	27.3	195	4.8	-22	48.1	223	16.1	-22	59.3
2	207	10.9	-19	54.5	150	32.2	225	2.9	-22	47.7	253	17.2	-22	59.7
4	237	10.5	-19	53.4	180	37.1	255	1.1	-22	47.2	283	18.4	-23	.0
6	267	10.2	-19	52.3	210	42.0	284	59.2	-22	46.7	313	19.6	-23	.4
8	297	9.8	-19	51.1	240	47.0	314	57.4	-22	46.3	343	20.7	-23	.8
10	327	9.5	-19	50.0	270	51.9	344	55.5	-22	45.8	13	21.9	-23	1.1
12	357	9.1	-19	48.9	300	56.8	14	53.7	-22	45.3	43	23.0	-23	1.5
14	27	8.8	-19	47.8	331	1.8	44	51.9	-22	44.8	73	24.2	-23	1.8
16	57	8.4	-19	46.6	1	6.7	74	50.0	-22	44.4	103	25.3	-23	2.2
18	87	8.1	-19	45.5	31	11.6	104	48.2	-22	43.9	133	26.5	-23	2.6
20	117	7.8	-19	44.4	61	16.5	134	46.3	-22	43.4	163	27.6	-23	2.9
22	147	7.4	-19	43.2	91	21.5	164	44.5	-22	42.9	193	28.8	-23	3.3
Δ		-2		6				-9		2		6		-2

φ	SUNCE		TRAJANJE SUMRAKA		MESEC			
	IZLAZ	ZALAZ	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 37	15 46	0 51	2 33	11 1	1.2	6 53	3.2
55	8 8	16 15	0 42	2 10	12 2	1.6	5 53	2.8
50	7 47	16 36	0 36	1 54	12 39	1.8	5 16	2.6
45	7 31	16 53	0 32	1 43	13 7	1.9	4 49	2.5
40	7 17	17 6	0 29	1 35	13 28	1.9	4 28	2.4
35	7 5	17 18	0 27	1 28	13 46	2.0	4 10	2.4
30	6 55	17 28	0 26	1 23	14 2	2.0	3 55	2.3
20	6 38	17 45	0 23	1 17	14 29	2.1	3 29	2.2
10	6 22	18 1	0 22	1 14	14 51	2.1	3 7	2.2
0	6 8	18 15	0 22	1 13	15 13	2.1	2 47	2.1
10	5 53	18 30	0 22	1 15	15 34	2.2	2 26	2.1
20	5 37	18 45	0 24	1 21	15 57	2.2	2 4	2.0
30	5 19	19 4	0 26	1 32	16 24	2.2	1 39	1.9
35	5 8	19 14	0 28	1 40	16 40	2.3	1 24	1.8
40	4 56	19 26	0 31	1 52	16 59	2.3	1 7	1.8
45	4 41	19 41	0 35	2 12	17 21	2.3	0 46	1.7
50	4 23	19 59	0 40	2 51	17 50	2.4	0 20	1.6
55	3 60	20 22	0 49	:::	18 30	2.5	...	.0
60	3 27	20 54	1 7	:::	19 37	2.7	23 9	1.7

UT	MESEC				JUPITER				SATURN					
	S <sub>♃</sub>		Δ		S <sub>♃</sub>		δ <sub>♃</sub>		S <sub>♄</sub>		δ <sub>♄</sub>			
h	°	'	°	'	°	'	°	'	°	'	°	'		
0	49	36.0	109	25	52.6	56	282	44.5	-6	1.6	5	18.3	21	27.1
2	78	35.7	108	26	3.8	53	312	49.3	-6	1.7	35	23.7	21	27.2
4	107	35.3	107	26	14.4	51	342	54.0	-6	1.7	65	29.0	21	27.2
6	136	34.7	106	26	24.6	48	12	58.7	-6	1.8	95	34.4	21	27.3
8	165	34.0	106	26	34.3	46	43	3.5	-6	1.8	125	39.7	21	27.4
10	194	33.1	105	26	43.4	43	73	8.2	-6	1.9	155	45.1	21	27.5
12	223	32.1	104	26	52.1	41	103	13.0	-6	1.9	185	50.5	21	27.5
14	252	31.0	104	27	.2	38	133	17.7	-6	2.0	215	55.8	21	27.6
16	281	29.7	103	27	7.8	35	163	22.5	-6	2.0	246	1.2	21	27.7
18	310	28.4	103	27	14.9	33	193	27.2	-6	2.1	276	6.5	21	27.8
20	339	26.9	102	27	21.4	30	223	32.0	-6	2.1	306	11.9	21	27.8
22	8	25.3	102	27	27.5	28	253	36.8	-6	2.2	336	17.2	21	27.9
Δ							24			0		27		0

SUNCE				MESEC					
UT	e = T <sub>p</sub> - UT	Δ/24	r	Prolaz	Δ/24	π <sub>☉</sub>	r		
h	min	s	s	h min	min	'	'		
00	-11	15.0	-.7	16.3	T <sub>m</sub>	21 25	2.1	54.4	14.8
12	-11	23.3	T <sub>m☉</sub>	12 h 11.4 min	Starost	10.5 d	Faza	☉	

PLANETE									
Pl.	T <sub>m</sub>	π	360-α	Vel.	Pl.	T <sub>m</sub>	π	360-α	Vel.
h min	'	°	°	°	h min	'	°	°	°
♀	11 0	.1	75	-3.8	♃	5 8	.0	162	-2.0
♂	9 7	.1	103	1.5	♄	23 35	.0	245	-2.2

UT	SUNCE				PROLEĆ. TAČKA S <sub>γ</sub>	VENERA				MARS				
	S <sub>☉</sub>		δ <sub>☉</sub>			S <sub>♀</sub>		δ <sub>♀</sub>		S <sub>♂</sub>		δ <sub>♂</sub>		
h	°	'	°	'	°	'	°	'	°	'	°	'		
0	177	7.1	-19	42.1	121	26.4	194	42.6	-22	42.4	223	29.9	-23	3.6
2	207	6.7	-19	41.0	151	31.3	224	40.8	-22	41.8	253	31.1	-23	4.0
4	237	6.4	-19	39.8	181	36.3	254	38.9	-22	41.3	283	32.2	-23	4.3
6	267	6.1	-19	38.7	211	41.2	284	37.1	-22	40.8	313	33.4	-23	4.7
8	297	5.7	-19	37.5	241	46.1	314	35.3	-22	40.3	343	34.5	-23	5.0
10	327	5.4	-19	36.4	271	51.0	344	33.4	-22	39.8	13	35.7	-23	5.4
12	357	5.1	-19	35.2	301	56.0	14	31.6	-22	39.2	43	36.8	-23	5.7
14	27	4.8	-19	34.1	332	.9	44	29.8	-22	38.7	73	38.0	-23	6.0
16	57	4.4	-19	32.9	2	5.8	74	27.9	-22	38.1	103	39.1	-23	6.4
18	87	4.1	-19	31.7	32	10.8	104	26.1	-22	37.6	133	40.3	-23	6.7
20	117	3.8	-19	30.6	62	15.7	134	24.2	-22	37.0	163	41.4	-23	7.1
22	147	3.5	-19	29.4	92	20.6	164	22.4	-22	36.5	193	42.5	-23	7.4
Δ		-2		6				-9		3		6		-2

φ	SUNCE		TRAJANJE SUMRAKA		MESEC			
	IZLAZ	ZALAZ	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 35	15 49	0 50	2 33	11 30	2.4	8 10	2.1
55	8 7	16 17	0 42	2 10	12 41	2.3	6 59	2.1
50	7 46	16 38	0 36	1 54	13 22	2.3	6 18	2.2
45	7 30	16 54	0 32	1 43	13 52	2.2	5 49	2.2
40	7 16	17 7	0 29	1 34	14 15	2.2	5 26	2.2
35	7 5	17 19	0 27	1 28	14 34	2.2	5 7	2.2
30	6 55	17 29	0 26	1 23	14 50	2.2	4 51	2.2
20	6 38	17 46	0 23	1 17	15 18	2.2	4 23	2.2
10	6 22	18 1	0 22	1 14	15 42	2.2	3 59	2.1
0	6 8	18 15	0 22	1 13	16 4	2.1	3 37	2.1
10	5 54	18 30	0 22	1 15	16 26	2.1	3 15	2.1
20	5 38	18 45	0 24	1 21	16 50	2.1	2 52	2.1
30	5 20	19 3	0 26	1 31	17 18	2.1	2 24	2.1
35	5 9	19 14	0 28	1 40	17 35	2.0	2 8	2.1
40	4 57	19 26	0 31	1 52	17 54	2.0	1 49	2.1
45	4 42	19 40	0 35	2 11	18 17	2.0	1 27	2.1
50	4 25	19 58	0 40	2 49	18 47	1.9	0 58	2.0
55	4 2	20 21	0 49	:::	19 29	1.8	0 17	2.0
60	3 29	20 52	1 6	:::	20 43	1.4	23 50	3.0

UT	MESEC				JUPITER				SATURN					
	S <sub>♃</sub>		Δ		S <sub>♃</sub>		δ <sub>♃</sub>		S <sub>♄</sub>		δ <sub>♄</sub>			
h	°	'	°	'	°	'	°	'	°	'	°	'		
0	37	23.7	101	27	33.0	25	283	41.5	-6	2.2	6	22.6	21	28.0
2	66	22.0	101	27	37.9	22	313	46.3	-6	2.3	36	27.9	21	28.1
4	95	20.2	101	27	42.3	19	343	51.0	-6	2.3	66	33.3	21	28.2
6	124	18.3	100	27	46.2	17	13	55.8	-6	2.3	96	38.6	21	28.2
8	153	16.4	100	27	49.6	14	44	.6	-6	2.4	126	44.0	21	28.3
10	182	14.5	100	27	52.4	11	74	5.3	-6	2.4	156	49.4	21	28.4
12	211	12.5	100	27	54.7	9	104	10.1	-6	2.5	186	54.7	21	28.5
14	240	10.5	100	27	56.4	6	134	14.9	-6	2.5	217	.1	21	28.5
16	269	8.5	100	27	57.6	3	164	19.6	-6	2.6	247	5.4	21	28.6
18	298	6.4	100	27	58.2	1	194	24.4	-6	2.6	277	10.8	21	28.7
20	327	4.4	100	27	58.4	-2	224	29.2	-6	2.6	307	16.1	21	28.8
22	356	2.4	100	27	57.9	-5	254	33.9	-6	2.7	337	21.5	21	28.8
Δ							24			0		27		0

SUNCE				MESEC					
UT	e = T <sub>p</sub> - UT	Δ/24	r	Prolaz	Δ/24	π <sub>☉</sub>	r		
h	min	s	s	h min	min	'	'		
00	-11	31.5	-.7	16.3	T <sub>m</sub>	22 16	2.1	54.1	14.7
12	-11	39.4	T <sub>m☉</sub>	12 h 11.7 min	Starost	11.5 d	Faza	☉	

PLANETE							
Pl.	T <sub>m</sub>	π					

UT	SUNCE				PROLEĆ. TAČKA S <sub>γ</sub>	VENERA				MARS				
	S <sub>☉</sub>		δ <sub>☉</sub>			S <sub>♀</sub>		δ <sub>♀</sub>		S <sub>♂</sub>		δ <sub>♂</sub>		
h	°	'	°	'	°	'	°	'	°	'	°	'		
0	177	3.1	-19	28.2	122	25.5	194	20.6	-22	35.9	223	43.7	-23	7.7
2	207	2.8	-19	27.1	152	30.5	224	18.8	-22	35.3	253	44.8	-23	8.1
4	237	2.5	-19	25.9	182	35.4	254	16.9	-22	34.8	283	46.0	-23	8.4
6	267	2.2	-19	24.7	212	40.3	284	15.1	-22	34.2	313	47.1	-23	8.7
8	297	1.9	-19	23.5	242	45.2	314	13.3	-22	33.6	343	48.3	-23	9.1
10	327	1.6	-19	22.3	272	50.2	344	11.4	-22	33.0	373	49.4	-23	9.4
12	357	1.2	-19	21.2	302	55.1	14	9.6	-22	32.4	43	50.5	-23	9.7
14	27	.9	-19	20.0	333	.0	44	7.8	-22	31.8	73	51.7	-23	10.0
16	57	.6	-19	18.8	3	5.0	74	6.0	-22	31.2	103	52.8	-23	10.4
18	87	.3	-19	17.6	33	9.9	104	4.1	-22	30.6	133	54.0	-23	10.7
20	117	.0	-19	16.4	63	14.8	134	2.3	-22	30.0	163	55.1	-23	11.0
22	146	59.7	-19	15.2	93	19.7	164	.5	-22	29.4	193	56.2	-23	11.3
Δ		-2		6				-9		3		6		-2

φ	SUNCE		TRAJANJE SUMRAKA		MESEC			
	IZLAZ	ZALAZ	GRAĐ.	ASTR.	IZLAZ	Δ/24	ZALAZ	Δ/24
N	h min	h min	h min	h min	h min	min	h min	min
60	8 33	15 51	0 50	2 32	12 27	3.4	8 60	1.0
55	8 6	16 19	0 42	2 9	13 36	2.8	7 50	1.5
50	7 45	16 39	0 36	1 54	14 16	2.6	7 10	1.7
45	7 29	16 55	0 32	1 43	14 45	2.5	6 41	1.8
40	7 16	17 8	0 29	1 34	15 8	2.4	6 18	1.9
35	7 5	17 20	0 27	1 28	15 27	2.4	5 59	1.9
30	6 55	17 29	0 25	1 23	15 43	2.3	5 42	1.9
20	6 38	17 46	0 23	1 17	16 10	2.2	5 15	2.0
10	6 23	18 1	0 22	1 13	16 33	2.2	4 51	2.1
0	6 8	18 16	0 22	1 13	16 55	2.1	4 29	2.1
10	5 54	18 30	0 22	1 15	17 17	2.0	4 7	2.2
20	5 39	18 45	0 24	1 21	17 40	1.9	3 43	2.2
30	5 21	19 3	0 26	1 31	18 7	1.8	3 15	2.3
35	5 10	19 13	0 28	1 39	18 23	1.8	2 59	2.3
40	4 58	19 25	0 31	1 51	18 42	1.7	2 39	2.3
45	4 44	19 39	0 34	2 10	19 4	1.6	2 16	2.4
50	4 26	19 57	0 40	2 46	19 33	1.5	1 46	2.5
55	4 4	20 19	0 48	:::	20 12	1.2	1 4	2.6
60	3 32	20 50	1 5	:::	21 17	.6	...	2.0
S								

UT	MESEC				JUPITER				SATURN							
	S <sub>♃</sub>		Δ		δ <sub>♃</sub>		Δ		S <sub>♃</sub>		δ <sub>♃</sub>		S <sub>♄</sub>		δ <sub>♄</sub>	
h	°	'	°	'	°	'	°	'	°	'	°	'	°	'	°	'
0	25	.4	100	27	56.9	-8	284	38.7	-6	2.7	7	26.8	21	28.9		
2	53	58.4	100	27	55.4	-10	314	43.5	-6	2.8	37	32.2	21	29.0		
4	82	56.5	101	27	53.4	-13	344	48.3	-6	2.8	67	37.5	21	29.1		
6	111	54.6	101	27	50.8	-16	14	53.0	-6	2.8	97	42.9	21	29.2		
8	140	52.8	101	27	47.6	-18	44	57.8	-6	2.9	127	48.2	21	29.2		
10	169	51.1	102	27	44.0	-21	75	2.6	-6	2.9	157	53.6	21	29.3		
12	198	49.4	102	27	39.8	-24	105	7.4	-6	3.0	187	58.9	21	29.4		
14	227	47.9	103	27	35.0	-26	135	12.1	-6	3.0	218	4.3	21	29.5		
16	256	46.4	103	27	29.8	-29	165	16.9	-6	3.0	248	9.6	21	29.5		
18	285	45.0	104	27	24.0	-32	195	21.7	-6	3.1	278	15.0	21	29.6		
20	314	43.8	104	27	17.7	-34	225	26.5	-6	3.1	308	20.3	21	29.7		
22	343	42.6	105	27	10.8	-37	255	31.3	-6	3.1	338	25.7	21	29.8		
Δ							24			0		27			0	

SUNCE				MESEC					
UT	e = T <sub>p</sub> - UT	Δ/24	r	Prolaz	Δ/24	π <sub>☾</sub>	r		
h	min	s	'	h min	min	'	'		
00	-11 47.3	-.6	16.3	T <sub>m</sub>	23 7	2.1	54.0 14.7		
12	-11 54.7	T <sub>m☉</sub>	12 h 11.9 min	Starost	12.5 d	Faza	☉		
PLANETE									
Pl.	T <sub>m</sub>	π	360-α	Vel.	Pl.	T <sub>m</sub>	π	360-α	Vel.
♀	h min	'	°		♃	h min	'	°	
♂	11 3	.1	72	-3.8	♄	5 1	.0	162	-2.0
	9 5	.1	101	1.4	♅	23 26	.0	245	-2.2

UT	SUNCE				PROLEĆ. TAČKA S <sub>γ</sub>	VENERA				MARS				
	S <sub>☉</sub>		δ <sub>☉</sub>			S <sub>♀</sub>		δ <sub>♀</sub>		S <sub>♂</sub>		δ <sub>♂</sub>		
h	°	'	°	'	°	'	°	'	°	'	°	'		
0	176	59.4	-19	14.0	123	24.7	193	58.7	-22	28.8	223	57.4	-23	11.6
2	206	59.1	-19	12.8	153	29.6	223	56.9	-22	28.1	253	58.5	-23	11.9
4	236	58.8	-19	11.6	183	34.5	253	55.0	-22	27.5	283	59.7	-23	12.3
6	266	58.5	-19	10.4	213	39.5	283	53.2	-22	26.9	314	.8	-23	12.6
8	296	58.2	-19	9.2	243	44.4	313	51.4	-22	26.2	344	1.9	-23	12.9
10	326	57.9	-19	8.0	273	49.3	343	49.6	-22	25.6	373	3.1	-23	13.2
12	356	57.6	-19	6.8	303	54.2	13	47.8	-22	24.9	44	4.2	-23	13.5
14	26	57.3	-19	5.5	333	59.2	43	46.0	-22	24.3	74	5.3	-23	13.8
16	56	57.0	-19	4.3	4	4.1	73	44.2	-22	23.6	104	6.5	-23	14.1
18	86	56.7	-19	3.1	34	9.0	103	42.3	-22	22.9	134	7.6	-23	14.4
20	116	56.4	-19	1.9	64	14.0	133	40.5	-22	22.3	164	8.7	-23	14.7
22	146	56.2	-19	.7	94	18.9	163	38.7	-22	21.6	194	9.9	-23	15.0
Δ		-1		6				-9		3		6		-2

φ	SUNCE		TRAJANJE SUMRAKA		MESEC			
	IZLAZ	ZALAZ	GRAĐ.	ASTR.	IZLAZ	Δ/24	ZALAZ	Δ/24
N	h min	h min	h min	h min	h min	min	h min	min
60	8 31	15 54	0 50	2 31	13 48	3.8	9 23	.4
55	8 4	16 21	0 41	2 9	14 44	3.2	8 26	1.0
50	7 44	16 41	0 36	1 54	15 20	2.9	7 50	1.3
45	7 28	16 57	0 32	1 42	15 46	2.7	7 23	1.4
40	7 15	17 10	0 29	1 34	16 7	2.6	7 2	1.6
35	7 4	17 21	0 27	1 28	16 24	2.5	6 44	1.6
30	6 54	17 30	0 25	1 23	16 39	2.4	6 29	1.7
20	6 37	17 47	0 23	1 16	17 4	2.2	6 3	1.9
10	6 23	18 2	0 22	1 13	17 25	2.1	5 41	2.0
0	6 9	18 16	0 22	1 13	17 45	2.0	5 20	2.0
10	5 54	18 30	0 22	1 15	18 5	1.9	4 59	2.1
20	5 39	18 45	0 24	1 20	18 27	1.8	4 36	2.2
30	5 22	19 2	0 26	1 31	18 51	1.6	4 9	2.4
35	5 11	19 13	0 28	1 39	19 6	1.5	3 54	2.4
40	4 59	19 24	0 31	1 51	19 23	1.4	3 36	2.5
45	4 45	19 38	0 34	2 9	19 43	1.3	3 14	2.6
50	4 28	19 55	0 39	2 44	20 8	1.1	2 45	2.8
55	4 6	20 17	0 48	:::	20 41	.8	2 7	3.1
60	3 35	20 48	1 4	:::	21 32	.3	1 2	3.7
S								

UT	MESEC				JUPITER				SATURN							
	S <sub>♃</sub>		Δ		δ <sub>♃</sub>		Δ		S <sub>♃</sub>		δ <sub>♃</sub>		S <sub>♄</sub>		δ <sub>♄</sub>	
h	°	'	°	'	°	'	°	'	°	'	°	'	°	'	°	'
0	12	41.6	106	27	3.5	-39	285	36.1	-6	3.2	8	31.0	21	29.8		
2	41	40.8	106	26	55.6	-42	315	40.8	-6	3.2	38	36.4	21	29.9		
4	70	40.0	107	26	47.2	-44	345	45.6	-6	3.2	68	41.7	21	30.0		
6	99	39.5	108	26	38.4	-47	15	50.4	-6	3.3	98	47.1	21	30.1		
8	128	39.1	109	26	29.0	-49	45	55.2	-6	3.3	128	52.4	21	30.1		
10	157	38.9	110	26	19.1	-52	76	.0	-6	3.3	158	57.8	21	30.2		
12	186	38.8	111	26	8.7	-54	106	4.8	-6	3.4	189	3.1	21	30.3		
14	215	38.9	112	25	57.8	-57	136	9.6	-6	3.4	219	8.5	21	30.4		
16	244	39.2	112	25	46.5	-59	166	14.4	-6	3.4	249	13.8	21	30.4		
18	273	39.7	113	25	34.7	-62	196	19.2	-6	3.5	279	19.2	21	30.5		
20	302	40.4	114	25	22.4	-64	226	24.0	-6	3.5	309	24.5	21	30.6		
22	331	41.3	115	25	9.6	-66	256	28.8	-6	3.5	339	29.9	21	30.7		
Δ							24			0		27			0	

SUNCE				MESEC			
UT	e = T <sub>p</sub> - UT	Δ/24	r	Prolaz	Δ/24	π <sub>☾</sub>	r
h	min	s	'	h min	min	'	'



UT	SUNCE		PROLEĆ. TAČKA S <sub>γ</sub>	VENERA		MARS	
	S <sub>☉</sub>	δ <sub>☉</sub>		S <sub>♀</sub>	δ <sub>♀</sub>	S <sub>♂</sub>	δ <sub>♂</sub>
h	° / ' / "	° / ' / "	° / ' / "	° / ' / "	° / ' / "	° / ' / "	° / ' / "
0	176 55.9	-18 59.4	124 23.8	193 36.9	-22 20.9	224 11.0	-23 15.3
2	206 55.6	-18 58.2	154 28.7	223 35.1	-22 20.2	254 12.1	-23 15.6
4	236 55.3	-18 57.0	184 33.7	253 33.3	-22 19.5	284 13.3	-23 15.9
6	266 55.0	-18 55.7	214 38.6	283 31.5	-22 18.9	314 14.4	-23 16.2
8	296 54.7	-18 54.5	244 43.5	313 29.7	-22 18.2	344 15.5	-23 16.5
10	326 54.4	-18 53.2	274 48.5	343 27.9	-22 17.5	14 16.6	-23 16.8
12	356 54.2	-18 52.0	304 53.4	13 26.1	-22 16.7	44 17.8	-23 17.1
14	26 53.9	-18 50.8	334 58.3	43 24.3	-22 16.0	74 18.9	-23 17.4
16	56 53.6	-18 49.5	5 3.2	73 22.5	-22 15.3	104 20.0	-23 17.7
18	86 53.3	-18 48.3	35 8.2	103 20.7	-22 14.6	134 21.2	-23 18.0
20	116 53.1	-18 47.0	65 13.1	133 18.9	-22 13.9	164 22.3	-23 18.2
22	146 52.8	-18 45.8	95 18.0	163 17.1	-22 13.1	194 23.4	-23 18.5
Δ	-1	6		-9	4	6	-1

UT	MESEC				JUPITER		SATURN	
	S <sub>♃</sub>	Δ	δ <sub>♃</sub>	Δ	S <sub>♃</sub>	δ <sub>♃</sub>	S <sub>♄</sub>	δ <sub>♄</sub>
h	° / ' / "	° / ' / "	° / ' / "	° / ' / "	° / ' / "	° / ' / "	° / ' / "	° / ' / "
0	0 42.4	117	24 56.3	-68	286 33.6	-6 3.6	9 35.2	21 30.7
2	29 43.7	118	24 42.7	-71	316 38.4	-6 3.6	39 40.6	21 30.8
4	58 45.2	119	24 28.5	-73	346 43.2	-6 3.6	69 45.9	21 30.9
6	87 47.0	120	24 13.9	-75	16 48.0	-6 3.6	99 51.3	21 31.0
8	116 48.9	121	23 58.9	-77	46 52.8	-6 3.7	129 56.6	21 31.0
10	145 51.1	122	23 43.4	-79	76 57.6	-6 3.7	160 2.0	21 31.1
12	174 53.5	123	23 27.5	-82	107 2.4	-6 3.7	190 7.3	21 31.2
14	203 56.2	124	23 11.2	-84	137 7.2	-6 3.7	220 12.7	21 31.3
16	232 59.0	125	22 54.4	-86	167 12.0	-6 3.8	250 18.0	21 31.3
18	262 2.1	127	22 37.3	-88	197 16.9	-6 3.8	280 23.4	21 31.4
20	291 5.4	128	22 19.7	-90	227 21.7	-6 3.8	310 28.7	21 31.5
22	320 9.0	129	22 1.8	-92	257 26.5	-6 3.8	340 34.1	21 31.6
Δ					24	0	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	8 29	15 56	0 49	2 31	15 18	3.8	9 34	.2
55	8 3	16 23	0 41	2 9	16 0	3.3	8 50	.7
50	7 43	16 43	0 36	1 53	16 29	3.0	8 21	1.0
45	7 27	16 58	0 32	1 42	16 51	2.8	7 58	1.2
40	7 14	17 11	0 29	1 34	17 8	2.6	7 39	1.3
35	7 3	17 22	0 27	1 28	17 23	2.5	7 24	1.4
30	6 54	17 31	0 25	1 23	17 36	2.4	7 11	1.5
20	6 37	17 48	0 23	1 16	17 57	2.2	6 48	1.7
10	6 23	18 2	0 22	1 13	18 16	2.0	6 28	1.8
0	6 9	18 16	0 22	1 13	18 33	1.9	6 9	2.0
10	5 55	18 30	0 22	1 15	18 51	1.8	5 50	2.1
20	5 40	18 45	0 24	1 20	19 9	1.6	5 30	2.2
30	5 22	19 2	0 26	1 30	19 30	1.4	5 6	2.4
35	5 12	19 12	0 28	1 39	19 43	1.3	4 52	2.5
40	5 1	19 24	0 31	1 50	19 57	1.2	4 36	2.6
45	4 47	19 37	0 34	2 8	20 13	1.0	4 17	2.8
50	4 30	19 54	0 39	2 42	20 34	.8	3 53	3.0
55	4 8	20 16	0 47	:::	21 1	.6	3 20	3.3
60	3 37	20 46	1 3	:::	21 38	.1	2 31	3.8
S								

SUNCE				MESEC			
UT	e = T <sub>p</sub> - UT	Δ/24	r	Prolaz	Δ/24	π <sub>♃</sub>	r
h	min s	s	'	h min	min	'	'
00	-12 16.4	-.6	16.3	T <sub>m</sub>	1.0	54.0	14.7
12	-12 23.1	T <sub>m☉</sub> 12 h 12.4 min	Starost 14.5 d	Faza ☉			

PLANETE									
Pl.	T <sub>m</sub>	π	360-α	Vel.	Pl.	T <sub>m</sub>	π	360-α	Vel.
♀	h min	'	°		♃	h min	'	°	
♂	11 6	.1	69	-3.8	♄	4 53	.0	162	-2.0
♂	9 3	.1	100	1.4	♅	23 17	.0	245	-2.2

UT	SUNCE		PROLEĆ. TAČKA S <sub>γ</sub>	VENERA		MARS	
	S <sub>☉</sub>	δ <sub>☉</sub>		S <sub>♀</sub>	δ <sub>♀</sub>	S <sub>♂</sub>	δ <sub>♂</sub>
h	° / ' / "	° / ' / "	° / ' / "	° / ' / "	° / ' / "	° / ' / "	° / ' / "
0	176 52.5	-18 44.5	125 23.0	193 15.3	-22 12.4	224 24.5	-23 18.8
2	206 52.3	-18 43.2	155 27.9	223 13.5	-22 11.7	254 25.7	-23 19.1
4	236 52.0	-18 42.0	185 32.8	253 11.7	-22 10.9	284 26.8	-23 19.4
6	266 51.7	-18 40.7	215 37.7	283 9.9	-22 10.2	314 27.9	-23 19.6
8	296 51.5	-18 39.4	245 42.7	313 8.2	-22 9.4	344 29.0	-23 19.9
10	326 51.2	-18 38.2	275 47.6	343 6.4	-22 8.7	14 30.2	-23 20.2
12	356 50.9	-18 36.9	305 52.5	13 4.6	-22 7.9	44 31.3	-23 20.5
14	26 50.7	-18 35.6	335 57.5	43 2.8	-22 7.1	74 32.4	-23 20.7
16	56 50.4	-18 34.4	6 2.4	73 1.0	-22 6.4	104 33.5	-23 21.0
18	86 50.1	-18 33.1	36 7.3	102 59.2	-22 5.6	134 34.6	-23 21.3
20	116 49.9	-18 31.8	66 12.2	132 57.4	-22 4.8	164 35.8	-23 21.5
22	146 49.6	-18 30.5	96 17.2	162 55.7	-22 4.0	194 36.9	-23 21.8
Δ	-1	6		-9	4	6	-1

UT	MESEC				JUPITER		SATURN	
	S <sub>♃</sub>	Δ	δ <sub>♃</sub>	Δ	S <sub>♃</sub>	δ <sub>♃</sub>	S <sub>♄</sub>	δ <sub>♄</sub>
h	° / ' / "	° / ' / "	° / ' / "	° / ' / "	° / ' / "	° / ' / "	° / ' / "	° / ' / "
0	349 12.8	130	21 43.4	-94	287 31.3	-6 3.9	10 39.4	21 31.6
2	18 16.8	131	21 24.7	-96	317 36.1	-6 3.9	40 44.7	21 31.7
4	47 21.0	132	21 5.6	-97	347 40.9	-6 3.9	70 50.1	21 31.8
6	76 25.5	133	20 46.1	-99	17 45.7	-6 3.9	100 55.4	21 31.9
8	105 30.2	135	20 26.3	-101	47 50.6	-6 3.9	131 .8	21 31.9
10	134 35.1	136	20 6.1	-103	77 55.4	-6 4.0	161 6.1	21 32.0
12	163 40.2	137	19 45.5	-104	108 .2	-6 4.0	191 11.5	21 32.1
14	192 45.6	138	19 24.6	-106	138 5.0	-6 4.0	221 16.8	21 32.2
16	221 51.2	139	19 3.4	-108	168 9.9	-6 4.0	251 22.2	21 32.2
18	250 57.0	140	18 41.8	-109	198 14.7	-6 4.0	281 27.5	21 32.3
20	280 3.0	141	18 20.0	-111	228 19.5	-6 4.1	311 32.8	21 32.4
22	309 9.2	142	17 57.8	-113	258 24.3	-6 4.1	341 38.2	21 32.5
Δ					24	0	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	8 27	15 59	0 49	2 30	16 49	3.7	9 38	.1
55	8 1	16 25	0 41	2 8	17 19	3.3	9 7	.5
50	7 42	16 44	0 36	1 53	17 41	3.0	8 43	.7
45	7 26	16 59	0 32	1 42	17 57	2.8	8 25	.9
40	7 14	17 12	0 29	1 34	18 11	2.6	8 11	1.1
35	7 3	17 23	0 27	1 28	18 23	2.5	7 58	1.2
30	6 53	17 32	0 25	1 23	18 33	2.3	7 47	1.3
20	6 37	17 48	0 23	1 16	18 50	2.1	7 28	1.5
10	6 23	18 3	0 22	1 13	19 5	2.0	7 11	1.7
0	6 9	18 16	0 22	1 13	19 19	1.8	6 56	1.9
10	5 55	18 30	0 22	1 15	19 33	1.7	6 40	2.0
20	5 40	18 44	0 24	1 20	19 48	1.5	6 23	2.2
30	5 23	19 1	0 26	1 30	20 4	1.3	6 3	2.4
35	5 13	19 11	0 28	1 38	20 14	1.2	5 52	2.5
40	5 2	19 23	0 30	1 50	20 25	1.0	5 39	2.6
45	4 48	19 36	0 34	2 7	20 38	.9	5 23	2.8
50	4 31	19 53	0 39	2 40	20 54	.7	5 4	3.0
55	4 10	20 14	0 47	:::	21 14	.4	4 38	3.3
60	3 40	20 43	1 2	:::	21 40	.0	4 2	3.8
S								

SUNCE				MESEC				
UT	e = T <sub>p</sub> - UT	Δ/24	r	Prolaz	Δ/24	π <sub>♃</sub>	r	
h	min s	s	'	h min	min	'	'	
00	-12 29.7	-.5	16.3	T <sub>m</sub>	0 45	1.9	54.2	14.8
12	-12 36.0	T <sub>m☉</sub> 12 h 12.6 min	Starost 15.5 d	Faza ☉				

PLANETE									
Pl.	T <sub>m</sub>	π	360-α	Vel.	Pl.	T <sub>m</sub>	π	360-α	Vel.
♀	h min	'	°		♃	h min	'	°	
♂	11 8	.1	68	-3.8	♄	4 49	.0	162	-2.0
♂	9 2	.1	99	1.4	♅	23 13	.0	245	-2.2

UT	SUNCE		PROLEĆ. TAČKA S <sub>γ</sub>	VENERA		MARS	
	S <sub>☉</sub>	δ <sub>☉</sub>		S <sub>♀</sub>	δ <sub>♀</sub>	S <sub>♂</sub>	δ <sub>♂</sub>
h	°	'	°	'	'	°	'
0	176 49.4	-18 29.2	126 22.1	192 53.9	-22 3.2	224 38.0	-23 22.1
2	206 49.1	-18 27.9	156 27.0	222 52.1	-22 2.4	254 39.1	-23 22.3
4	236 48.9	-18 26.6	186 31.9	252 50.3	-22 1.6	284 40.2	-23 22.6
6	266 48.6	-18 25.4	216 36.9	282 48.6	-22 .8	314 41.4	-23 22.9
8	296 48.4	-18 24.1	246 41.8	312 46.8	-22 .0	344 42.5	-23 23.1
10	326 48.1	-18 22.8	276 46.7	342 45.0	-21 59.2	14 43.6	-23 23.4
12	356 47.9	-18 21.5	306 51.7	12 43.2	-21 58.4	44 44.7	-23 23.6
14	26 47.6	-18 20.2	336 56.6	42 41.5	-21 57.5	74 45.8	-23 23.9
16	56 47.4	-18 18.9	7 1.5	72 39.7	-21 56.7	104 47.0	-23 24.1
18	86 47.2	-18 17.6	37 6.4	102 37.9	-21 55.9	134 48.1	-23 24.4
20	116 46.9	-18 16.2	67 11.4	132 36.2	-21 55.0	164 49.2	-23 24.6
22	146 46.7	-18 14.9	97 16.3	162 34.4	-21 54.2	194 50.3	-23 24.9
Δ	-1	7		-9	4	6	-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 25	16 1	0 49	2 30	18 18	3.6	9 40	.0
55	7 59	16 27	0 41	2 8	18 38	3.2	9 18	.4
50	7 40	16 46	0 35	1 53	18 52	3.0	9 1	.6
45	7 25	17 1	0 32	1 42	19 4	2.8	8 48	.8
40	7 13	17 13	0 29	1 34	19 14	2.6	8 37	1.0
35	7 2	17 24	0 27	1 27	19 22	2.4	8 28	1.1
30	6 53	17 33	0 25	1 23	19 29	2.3	8 19	1.2
20	6 37	17 49	0 23	1 16	19 42	2.1	8 5	1.4
10	6 23	18 3	0 22	1 13	19 52	1.9	7 52	1.6
0	6 9	18 16	0 22	1 12	20 2	1.7	7 40	1.8
10	5 56	18 30	0 22	1 15	20 12	1.6	7 28	1.9
20	5 41	18 44	0 24	1 20	20 23	1.4	7 15	2.1
30	5 24	19 1	0 26	1 30	20 35	1.2	7 0	2.3
35	5 14	19 11	0 28	1 38	20 42	1.1	6 52	2.5
40	5 3	19 22	0 30	1 49	20 50	.9	6 42	2.6
45	4 50	19 35	0 34	2 6	20 59	.8	6 30	2.8
50	4 33	19 52	0 39	2 37	21 10	.6	6 15	3.0
55	4 12	20 12	0 47	:::	21 24	.3	5 57	3.3
60	3 43	20 41	1 1	:::	21 41	.0	5 33	3.6
S								

UT	MESEC				JUPITER			SATURN		
	S <sub>♃</sub>	Δ	δ <sub>♃</sub>	Δ	S <sub>♃</sub>	δ <sub>♃</sub>	Δ	S <sub>♄</sub>	δ <sub>♄</sub>	Δ
h	°	'	°	'	°	'	°	'	°	'
0	338 15.7	143	17 35.2	-114	288 29.2	-6 4.1		11 43.5	21 32.5	
2	7 22.3	144	17 12.4	-116	318 34.0	-6 4.1		41 48.9	21 32.6	
4	36 29.1	145	16 49.3	-117	348 38.8	-6 4.1		71 54.2	21 32.7	
6	65 36.2	146	16 25.9	-118	18 43.7	-6 4.1		101 59.5	21 32.8	
8	94 43.4	147	16 2.2	-120	48 48.5	-6 4.2		132 4.9	21 32.8	
10	123 50.8	148	15 38.3	-121	78 53.3	-6 4.2		162 10.2	21 32.9	
12	152 58.4	149	15 14.0	-122	108 58.2	-6 4.2		192 15.6	21 33.0	
14	182 6.1	150	14 49.5	-124	139 3.0	-6 4.2		222 20.9	21 33.0	
16	211 14.1	150	14 24.8	-125	169 7.9	-6 4.2		252 26.2	21 33.1	
18	240 22.2	151	13 59.8	-126	199 12.7	-6 4.2		282 31.6	21 33.2	
20	269 30.4	152	13 34.5	-127	229 17.5	-6 4.2		312 36.9	21 33.3	
22	298 38.8	153	13 9.0	-129	259 22.4	-6 4.2		342 42.3	21 33.3	
Δ					24	0		27	0	

SUNCE				MESEC					
UT	e = T <sub>p</sub> - UT	Δ/24	r	Prolaz	Δ/24	π <sub>☉</sub>	r		
h	min	s	'	h min	min	'	'		
00	-12 42.3	- .5	16.3	T <sub>m</sub>	1 30	1.8	54.4 14.8		
12	-12 48.2	T <sub>m☉</sub>	12 h 12.8 min	Starost	16.5 d	Faza	☉		
PLANETE									
Pl.	T <sub>m</sub>	π	360-α	Vel.	Pl.	T <sub>m</sub>	π	360-α	Vel.
♀	h min	'	°		♃	h min	'	°	
♁	11 9	.1	67	-3.8	♃	4 45	.0	162	-2.0
♂	9 1	.1	98	1.4	♄	23 9	.0	245	-2.2

UT	SUNCE		PROLEĆ. TAČKA S <sub>γ</sub>	VENERA		MARS	
	S <sub>☉</sub>	δ <sub>☉</sub>		S <sub>♀</sub>	δ <sub>♀</sub>	S <sub>♂</sub>	δ <sub>♂</sub>
h	°	'	°	'	'	°	'
0	176 46.4	-18 13.6	127 21.2	192 32.6	-21 53.4	224 51.4	-23 25.1
2	206 46.2	-18 12.3	157 26.2	222 30.9	-21 52.5	254 52.5	-23 25.4
4	236 46.0	-18 11.0	187 31.1	252 29.1	-21 51.6	284 53.6	-23 25.6
6	266 45.7	-18 9.7	217 36.0	282 27.4	-21 50.8	314 54.8	-23 25.9
8	296 45.5	-18 8.3	247 40.9	312 25.6	-21 49.9	344 55.9	-23 26.1
10	326 45.3	-18 7.0	277 45.9	342 23.9	-21 49.1	14 57.0	-23 26.3
12	356 45.0	-18 5.7	307 50.8	12 22.1	-21 48.2	44 58.1	-23 26.6
14	26 44.8	-18 4.4	337 55.7	42 20.3	-21 47.3	74 59.2	-23 26.8
16	56 44.6	-18 3.0	8 .7	72 18.6	-21 46.4	105 .3	-23 27.0
18	86 44.4	-18 1.7	38 5.6	102 16.8	-21 45.5	135 1.4	-23 27.3
20	116 44.1	-18 .4	68 10.5	132 15.1	-21 44.6	165 2.5	-23 27.5
22	146 43.9	-17 59.0	98 15.4	162 13.3	-21 43.7	195 3.6	-23 27.7
Δ	-1	7		-9	4	6	-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	16 4	0 49	2 29	19 44	3.6	9 40	.0
55	7 58	16 29	0 41	2 7	19 55	3.2	9 27	.3
50	7 39	16 48	0 35	1 53	20 4	3.0	9 16	.5
45	7 24	17 2	0 32	1 42	20 10	2.8	9 8	.7
40	7 12	17 14	0 29	1 33	20 16	2.6	9 0	.9
35	7 2	17 25	0 27	1 27	20 21	2.4	8 54	1.0
30	6 52	17 34	0 25	1 22	20 25	2.3	8 49	1.2
20	6 37	17 50	0 23	1 16	20 32	2.1	8 39	1.4
10	6 23	18 3	0 22	1 13	20 38	1.9	8 31	1.5
0	6 9	18 17	0 22	1 12	20 44	1.7	8 23	1.7
10	5 56	18 30	0 22	1 14	20 50	1.5	8 15	1.9
20	5 42	18 44	0 23	1 20	20 56	1.3	8 6	2.1
30	5 25	19 0	0 26	1 30	21 4	1.1	7 56	2.3
35	5 15	19 10	0 28	1 37	21 8	1.0	7 50	2.4
40	5 4	19 21	0 30	1 49	21 12	.9	7 44	2.6
45	4 51	19 34	0 34	2 5	21 17	.7	7 36	2.8
50	4 35	19 50	0 39	2 35	21 24	.5	7 27	3.0
55	4 14	20 11	0 46	:::	21 31	.3	7 15	3.2
60	3 46	20 39	1 0	:::	21 41	.0	6 60	3.6
S								

UT	MESEC				JUPITER			SATURN		
	S <sub>♃</sub>	Δ	δ <sub>♃</sub>	Δ	S <sub>♃</sub>	δ <sub>♃</sub>	Δ	S <sub>♄</sub>	δ <sub>♄</sub>	Δ
h	°	'	°	'	°	'	°	'	°	'
0	327 47.4	153	12 43.3	-130	289 27.2	-6 4.3		12 47.6	21 33.4	
2	356 56.1	154	12 17.4	-131	319 32.1	-6 4.3		42 52.9	21 33.5	
4	26 4.9	155	11 51.2	-132	349 36.9	-6 4.3		72 58.3	21 33.6	
6	55 13.8	155	11 24.9	-133	19 41.8	-6 4.3		103 3.6	21 33.6	
8	84 22.9	156	10 58.3	-134	49 46.6	-6 4.3		133 9.0	21 33.7	
10	113 32.1	156	10 31.5	-135	79 51.5	-6 4.3		163 14.3	21 33.8	
12	142 41.4	157	10 4.6	-136	109 56.3	-6 4.3		193 19.6	21 33.9	
14	171 50.8	157	9 37.5	-137	140 1.2	-6 4.3		223 25.0	21 33.9	
16	201 .3	158	9 10.1	-137	170 6.0	-6 4.3		253 30.3	21 34.0	
18	230 9.8	158	8 42.7	-138	200 10.9	-6 4.3		283 35.6	21 34.1	
20	259 19.5	159	8 15.0	-139	230 15.7	-6 4.3		313 41.0	21 34.1	
22	288 29.2	159	7 47.2	-140	260 20.6	-6 4.3		343 46.3	21 34.2	
Δ					24	0		27	0	

SUNCE				MESEC					
UT	e = T <sub>p</sub> - UT	Δ/24	r	Prolaz	Δ/24	π <sub>☉</sub>	r		
h	min	s	'	h min	min	'	'		
00	-12 54.1	- .5	16.3	T <sub>m</sub>	2 13	1.7	54.7 14.9		
12	-12 59.5	T <sub>m☉</sub>	12 h 13.0 min	Starost	17.5 d	Faza	☉		
PLANETE									
Pl.	T <sub>m</sub>	π	360-α	Vel.	Pl.	T <sub>m</sub>	π	360-α	Vel.
♀	h min	'	°		♃	h min	'	°	
♁	11 10	.1	65	-3.8	♃	4 41	.0	162	-2.0
♂	9 0	.1	98	1.4	♄	23 5	.0	245	-2.2

UT	SUNCE		PROLEĆ. TAČKA S <sub>γ</sub>	VENERA		MARS									
	S <sub>☉</sub>	δ <sub>☉</sub>		S <sub>♀</sub>	δ <sub>♀</sub>	S <sub>♂</sub>	δ <sub>♂</sub>								
h	°	'	°	'	°	'	°	'							
0	176	43.7	-17	57.7	128	20.4	192	11.6	-21	42.8	225	4.8	-23	28.0	
2	206	43.5	-17	56.3	158	25.3	222	9.9	-21	41.9	255	5.9	-23	28.2	
4	236	43.3	-17	55.0	188	30.2	252	8.1	-21	41.0	285	7.0	-23	28.4	
6	266	43.0	-17	53.7	218	35.2	282	6.4	-21	40.1	315	8.1	-23	28.6	
8	296	42.8	-17	52.3	248	40.1	312	4.6	-21	39.2	345	9.2	-23	28.9	
10	326	42.6	-17	51.0	278	45.0	342	2.9	-21	38.3	15	10.3	-23	29.1	
12	356	42.4	-17	49.6	308	49.9	12	1.2	-21	37.3	45	11.4	-23	29.3	
14	26	42.2	-17	48.2	338	54.9	41	59.4	-21	36.4	75	12.5	-23	29.5	
16	56	42.0	-17	46.9	8	59.8	71	57.7	-21	35.5	105	13.6	-23	29.7	
18	86	41.8	-17	45.5	39	4.7	101	55.9	-21	34.5	135	14.7	-23	29.9	
20	116	41.6	-17	44.2	69	9.7	131	54.2	-21	33.6	165	15.8	-23	30.2	
22	146	41.4	-17	42.8	99	14.6	161	52.5	-21	32.6	195	16.9	-23	30.4	
Δ		-1		7				-9		5			6		-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	16 7	0 48	2 28	21 9	3.6	9 40	.0
55	7 56	16 31	0 40	2 7	21 12	3.3	9 34	.3
50	7 38	16 49	0 35	1 52	21 15	3.0	9 29	.5
45	7 23	17 4	0 32	1 41	21 16	2.8	9 25	.7
40	7 11	17 16	0 29	1 33	21 18	2.6	9 22	.9
35	7 1	17 26	0 27	1 27	21 19	2.5	9 19	1.0
30	6 52	17 35	0 25	1 22	21 20	2.3	9 16	1.1
20	6 36	17 50	0 23	1 16	21 22	2.1	9 12	1.3
10	6 23	18 4	0 22	1 13	21 24	1.9	9 8	1.5
0	6 10	18 17	0 22	1 12	21 26	1.7	9 4	1.7
10	5 57	18 30	0 22	1 14	21 27	1.6	9 0	1.9
20	5 42	18 44	0 23	1 19	21 29	1.4	8 56	2.1
30	5 26	18 60	0 26	1 29	21 31	1.1	8 52	2.3
35	5 16	19 9	0 28	1 37	21 32	1.0	8 49	2.5
40	5 5	19 20	0 30	1 48	21 33	.9	8 46	2.6
45	4 52	19 33	0 34	2 5	21 34	.7	8 42	2.8
50	4 37	19 49	0 38	2 34	21 36	.5	8 38	3.0
55	4 16	20 9	0 46	:::	21 38	.3	8 33	3.2
60	3 48	20 36	0 59	:::	21 41	.0	8 26	3.6
S								

UT	MESEC				JUPITER		SATURN								
	S <sub>♃</sub>	Δ	δ <sub>♃</sub>	Δ	S <sub>♃</sub>	δ <sub>♃</sub>	S <sub>♄</sub>	δ <sub>♄</sub>							
h	°	'	°	'	°	'	°	'							
0	317	39.0	159	7	19.2	-141	290	25.4	-6	4.3	13	51.7	21	34.3	
2	346	48.8	159	6	51.1	-141	320	30.3	-6	4.4	43	57.0	21	34.4	
4	15	58.7	160	6	22.9	-142	350	35.2	-6	4.4	74	2.3	21	34.4	
6	45	8.6	160	5	54.5	-143	20	40.0	-6	4.4	104	7.7	21	34.5	
8	74	18.5	160	5	26.0	-143	50	44.9	-6	4.4	134	13.0	21	34.6	
10	103	28.5	160	4	57.4	-144	80	49.8	-6	4.4	164	18.3	21	34.6	
12	132	38.4	160	4	28.7	-144	110	54.6	-6	4.4	194	23.7	21	34.7	
14	161	48.4	160	3	59.8	-145	140	59.5	-6	4.4	224	29.0	21	34.8	
16	190	58.4	160	3	30.9	-145	171	4.4	-6	4.4	254	34.3	21	34.9	
18	220	8.3	160	3	1.8	-146	201	9.2	-6	4.4	284	39.7	21	34.9	
20	249	18.3	159	2	32.7	-146	231	14.1	-6	4.4	314	45.0	21	35.0	
22	278	28.2	159	2	3.5	-146	261	19.0	-6	4.4	344	50.3	21	35.1	
Δ							24			0			27		0

SUNCE				MESEC					
UT	e = T <sub>p</sub> - UT	Δ/24	r	Prolaz	Δ/24	π <sub>♃</sub>	r		
h	min	s	s	h min	min	'	'		
00	-13	5.0	.4	16.3	T <sub>m</sub>	2 54	1.7	55.1	15.0
12	-13	10.1	T <sub>m☉</sub>	12 h 13.2 min	Starost	18.5 d	Faza	☉	
PLANETE									
Pl.	T <sub>m</sub>	π	360-α	Vel.	Pl.	T <sub>m</sub>	π	360-α	Vel.
♀	h min	'	°		♃	h min	'	°	
♂	11 12	.1	64	-3.8	♃	4 38	.0	162	-2.0
	8 59	.1	97	1.4	♄	23 0	.0	246	-2.2

UT	SUNCE		PROLEĆ. TAČKA S <sub>γ</sub>	VENERA		MARS									
	S <sub>☉</sub>	δ <sub>☉</sub>		S <sub>♀</sub>	δ <sub>♀</sub>	S <sub>♂</sub>	δ <sub>♂</sub>								
h	°	'	°	'	°	'	°	'							
0	176	41.2	-17	41.4	129	19.5	191	50.8	-21	31.7	225	18.0	-23	30.6	
2	206	41.0	-17	40.1	159	24.4	221	49.0	-21	30.7	255	19.1	-23	30.8	
4	236	40.8	-17	38.7	189	29.4	251	47.3	-21	29.7	285	20.2	-23	31.0	
6	266	40.6	-17	37.3	219	34.3	281	45.6	-21	28.8	315	21.3	-23	31.2	
8	296	40.4	-17	35.9	249	39.2	311	43.9	-21	27.8	345	22.4	-23	31.4	
10	326	40.2	-17	34.6	279	44.1	341	42.1	-21	26.8	15	23.5	-23	31.6	
12	356	40.0	-17	33.2	309	49.1	11	40.4	-21	25.8	45	24.6	-23	31.8	
14	26	39.8	-17	31.8	339	54.0	41	38.7	-21	24.8	75	25.7	-23	32.0	
16	56	39.6	-17	30.4	9	58.9	71	37.0	-21	23.8	105	26.8	-23	32.2	
18	86	39.4	-17	29.0	40	3.9	101	35.3	-21	22.8	135	27.9	-23	32.4	
20	116	39.2	-17	27.6	70	8.8	131	33.6	-21	21.8	165	29.0	-23	32.6	
22	146	39.0	-17	26.3	100	13.7	161	31.8	-21	20.8	195	30.1	-23	32.8	
Δ		-1		7				-9		5			6		-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 18	16 9	0 48	2 28	22 36	3.7	9 39	.0
55	7 54	16 33	0 40	2 7	22 31	3.4	9 40	.3
50	7 36	16 51	0 35	1 52	22 27	3.1	9 41	.5
45	7 22	17 5	0 31	1 41	22 24	2.9	9 42	.7
40	7 10	17 17	0 29	1 33	22 21	2.7	9 43	.9
35	7 0	17 27	0 27	1 27	22 19	2.6	9 43	1.0
30	6 51	17 36	0 25	1 22	22 17	2.4	9 43	1.2
20	6 36	17 51	0 23	1 16	22 13	2.2	9 44	1.4
10	6 23	18 4	0 22	1 13	22 10	2.0	9 45	1.6
0	6 10	18 17	0 22	1 12	22 7	1.8	9 45	1.8
10	5 57	18 30	0 22	1 14	22 4	1.6	9 46	1.9
20	5 43	18 43	0 23	1 19	22 1	1.4	9 47	2.1
30	5 27	18 59	0 26	1 29	21 58	1.2	9 47	2.4
35	5 17	19 9	0 28	1 37	21 56	1.1	9 48	2.5
40	5 7	19 19	0 30	1 47	21 54	.9	9 48	2.7
45	4 54	19 32	0 33	2 4	21 52	.8	9 49	2.8
50	4 38	19 47	0 38	2 32	21 49	.6	9 49	3.0
55	4 18	20 7	0 46	:::	21 45	.3	9 50	3.3
60	3 51	20 34	0 59	:::	21 40	.0	9 51	3.7
S								

UT	MESEC				JUPITER		SATURN								
	S <sub>♃</sub>	Δ	δ <sub>♃</sub>	Δ	S <sub>♃</sub>	δ <sub>♃</sub>	S <sub>♄</sub>	δ <sub>♄</sub>							
h	°	'	°	'	°	'	°	'							
0	307	38.0	159	1	34.3	-147	291	23.9	-6	4.4	14	55.7	21	35.2	
2	336	47.8	159	1	4.9	-147	321	28.7	-6	4.4	45	1.0	21	35.2	
4	5	57.5	158	0	35.5	-147	351	33.6	-6	4.4	75	6.3	21	35.3	
6	35	7.2	158	0	6.1	-147	21	38.5	-6	4.4	105	11.7	21	35.4	
8	64	16.8	157	-0	23.4	-148	51	43.4	-6	4.4	135	17.0	21	35.4	
10	93	26.3	157	-0	53.0	-148	81	48.2	-6	4.4	165	22.3	21	35.5	
12	122	35.7	156	-1	22.6	-148	111	53.1	-6	4.4	195	27.6	21	35.6	
14	151	45.0	156	-1	52.2	-148	141	58.0	-6	4.3	225	33.0	21	35.6	
16	180	54.1	155	-2	21.8	-148	172	2.9	-6	4.3	255	38.3	21	35.7	
18	210	3.2	154	-2	51.4	-148	202	7.8	-6	4.3	285	43.6	21	35.8	
20	239	12.1	154	-3	21.0	-148	232	12.7	-6	4.3	315	49.0	21	35.9	
22	268	20.8	153	-3	50.7	-148	262	17.5	-6	4.3	345	54.3	21	35.9	
Δ							24			0			27		0

SUNCE				MESEC					
UT	e = T <sub>p</sub> - UT	Δ/24	r	Prolaz	Δ/24	π <sub>♃</sub>	r		
h	min	s	s	h min	min	'	'		
00	-13	15.2	.4	16.3	T <sub>m</sub>	3 35	1.8	55.6	15.1
12	-13	19.9	T <sub>m☉</sub>	12 h 13.3 min	Starost	19.5 d	Faza	☉	

UT	SUNCE		PROLEĆ. TAČKA S <sub>γ</sub>	VENERA		MARS	
	S <sub>☉</sub>	δ <sub>☉</sub>		S <sub>♀</sub>	δ <sub>♀</sub>	S <sub>♂</sub>	δ <sub>♂</sub>
h	° / ' / "	° / ' / "	° / ' / "	° / ' / "	° / ' / "	° / ' / "	° / ' / "
0	176 38.8 -17 24.9		130 18.6	191 30.1 -21 19.8	225 31.2 -23 33.0		
2	206 38.6 -17 23.5		160 23.6	221 28.4 -21 18.8	255 32.3 -23 33.2		
4	236 38.5 -17 22.1		190 28.5	251 26.7 -21 17.8	285 33.4 -23 33.4		
6	266 38.3 -17 20.7		220 33.4	281 25.0 -21 16.8	315 34.5 -23 33.6		
8	296 38.1 -17 19.3		250 38.4	311 23.3 -21 15.7	345 35.6 -23 33.7		
10	326 37.9 -17 17.9		280 43.3	341 21.6 -21 14.7	15 36.7 -23 33.9		
12	356 37.7 -17 16.5		310 48.2	11 19.9 -21 13.7	45 37.8 -23 34.1		
14	26 37.6 -17 15.1		340 53.1	41 18.2 -21 12.6	75 38.9 -23 34.3		
16	56 37.4 -17 13.6		10 58.1	71 16.5 -21 11.6	105 40.0 -23 34.5		
18	86 37.2 -17 12.2		41 3.0	101 14.8 -21 10.5	135 41.1 -23 34.7		
20	116 37.0 -17 10.8		71 7.9	131 13.1 -21 9.5	165 42.2 -23 34.8		
22	146 36.9 -17 9.4		101 12.9	161 11.4 -21 8.4	195 43.3 -23 35.0		
Δ	-1	7		-9	5	5	-1

UT	MESEC				JUPITER		SATURN	
	S <sub>♃</sub>	Δ	δ <sub>♃</sub>	Δ	S <sub>♃</sub>	δ <sub>♃</sub>	S <sub>♄</sub>	δ <sub>♄</sub>
h	° / ' / "	° / ' / "	° / ' / "	° / ' / "	° / ' / "	° / ' / "	° / ' / "	° / ' / "
0	297 29.4 152 - 4 20.3 -148				292 22.4 - 6 4.3	15 59.6 21 36.0		
2	326 37.8 151 - 4 49.9 -148				322 27.3 - 6 4.3	46 4.9 21 36.1		
4	355 46.1 150 - 5 19.5 -148				352 32.2 - 6 4.3	76 10.3 21 36.1		
6	24 54.1 149 - 5 49.0 -147				22 37.1 - 6 4.3	106 15.6 21 36.2		
8	54 2.0 148 - 6 18.5 -147				52 42.0 - 6 4.3	136 20.9 21 36.3		
10	83 9.6 147 - 6 47.9 -147				82 46.9 - 6 4.3	166 26.2 21 36.4		
12	112 17.0 146 - 7 17.3 -147				112 51.8 - 6 4.3	196 31.6 21 36.4		
14	141 24.2 145 - 7 46.7 -146				142 56.7 - 6 4.3	226 36.9 21 36.5		
16	170 31.1 143 - 8 15.9 -146				173 1.6 - 6 4.2	256 42.2 21 36.6		
18	199 37.8 142 - 8 45.1 -145				203 6.5 - 6 4.2	286 47.6 21 36.6		
20	228 44.2 141 - 9 14.1 -145				233 11.4 - 6 4.2	316 52.9 21 36.7		
22	257 50.3 139 - 9 43.1 -144				263 16.3 - 6 4.2	346 58.2 21 36.8		
Δ					24	0	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	8 16	16 12	0 48	2 27	. . . .	.0	9 39	.0
55	7 53	16 35	0 40	2 6	23 52	3.6	9 47	.3
50	7 35	16 53	0 35	1 52	23 41	3.3	9 54	.6
45	7 21	17 6	0 31	1 41	23 33	3.0	9 59	.8
40	7 9	17 18	0 29	1 33	23 26	2.8	10 4	1.0
35	6 60	17 28	0 27	1 27	23 20	2.7	10 8	1.1
30	6 51	17 36	0 25	1 22	23 15	2.6	10 11	1.3
20	6 36	17 51	0 23	1 16	23 6	2.3	10 17	1.5
10	6 23	18 5	0 22	1 13	22 58	2.1	10 23	1.7
0	6 10	18 17	0 22	1 12	22 51	1.9	10 28	1.9
10	5 57	18 30	0 22	1 14	22 43	1.8	10 33	2.0
20	5 44	18 43	0 23	1 19	22 36	1.6	10 38	2.2
30	5 28	18 59	0 26	1 29	22 27	1.3	10 44	2.5
35	5 19	19 8	0 28	1 36	22 22	1.2	10 48	2.6
40	5 8	19 18	0 30	1 47	22 16	1.1	10 52	2.8
45	4 55	19 31	0 33	2 3	22 10	.9	10 57	3.0
50	4 40	19 46	0 38	2 30	22 2	.7	11 2	3.2
55	4 20	20 5	0 45	:::	21 52	.4	11 9	3.5
60	3 54	20 31	0 58	:::	21 40	.0	11 19	3.8

SUNCE				MESEC			
UT	e = T <sub>p</sub> - UT	Δ/24	r	Prolaz	Δ/24	π <sub>♃</sub>	r
h	min s	s / ' / "		h min	min	' / "	
00	-13 24.5	-.4	16.3	T <sub>m</sub>	4 17	1.8	56.1 15.3
12	-13 28.8	T <sub>m☉</sub>	12 h 13.5 min	Starost	20.5 d	Faza	☉

PLANETE									
Pl.	T <sub>m</sub>	π	360-α	Vel.	Pl.	T <sub>m</sub>	π	360-α	Vel.
h	h min	' / "	°		h min	' / "	°		
♀	11 15	.1	61	-3.8	♃	4 30	.0	162	-2.0
♂	8 58	.1	95	1.4	♄	22 52	.0	246	-2.2

1. FEBRUAR

UTORAK

UT	SUNCE		PROLEĆ. TAČKA S <sub>γ</sub>	VENERA		MARS	
	S <sub>☉</sub>	δ <sub>☉</sub>		S <sub>♀</sub>	δ <sub>♀</sub>	S <sub>♂</sub>	δ <sub>♂</sub>
h	° / ' / "	° / ' / "	° / ' / "	° / ' / "	° / ' / "	° / ' / "	° / ' / "
0	176 36.7 -17 8.0		131 17.8	191 9.7 -21 7.4	225 44.4 -23 35.2		
2	206 36.5 -17 6.6		161 22.7	221 8.0 -21 6.3	255 45.5 -23 35.4		
4	236 36.4 -17 5.1		191 27.6	251 6.4 -21 5.2	285 46.6 -23 35.5		
6	266 36.2 -17 3.7		221 32.6	281 4.7 -21 4.1	315 47.7 -23 35.7		
8	296 36.0 -17 2.3		251 37.5	311 3.0 -21 3.1	345 48.8 -23 35.9		
10	326 35.9 -17 .9		281 42.4	341 1.3 -21 2.0	15 49.9 -23 36.0		
12	356 35.7 -16 59.4		311 47.4	10 59.6 -21 .9	45 50.9 -23 36.2		
14	26 35.5 -16 58.0		341 52.3	40 57.9 -20 59.8	75 52.0 -23 36.4		
16	56 35.4 -16 56.6		11 57.2	70 56.3 -20 58.7	105 53.1 -23 36.5		
18	86 35.2 -16 55.1		42 2.1	100 54.6 -20 57.6	135 54.2 -23 36.7		
20	116 35.1 -16 53.7		72 7.1	130 52.9 -20 56.5	165 55.3 -23 36.8		
22	146 34.9 -16 52.2		102 12.0	160 51.2 -20 55.4	195 56.4 -23 37.0		
Δ	-1	7		-8	5	5	-1

UT	MESEC				JUPITER		SATURN	
	S <sub>♃</sub>	Δ	δ <sub>♃</sub>	Δ	S <sub>♃</sub>	δ <sub>♃</sub>	S <sub>♄</sub>	δ <sub>♄</sub>
h	° / ' / "	° / ' / "	° / ' / "	° / ' / "	° / ' / "	° / ' / "	° / ' / "	° / ' / "
0	286 56.2 138 -10 12.0 -144				293 21.2 - 6 4.2	17 3.5 21 36.8		
2	316 1.8 136 -10 40.7 -143				323 26.1 - 6 4.2	47 8.8 21 36.9		
4	345 7.0 135 -11 9.3 -142				353 31.0 - 6 4.2	77 14.2 21 37.0		
6	14 11.9 133 -11 37.8 -142				23 35.9 - 6 4.2	107 19.5 21 37.1		
8	43 16.5 131 -12 6.1 -141				53 40.8 - 6 4.1	137 24.8 21 37.1		
10	72 20.8 130 -12 34.3 -140				83 45.7 - 6 4.1	167 30.1 21 37.2		
12	101 24.7 128 -13 2.3 -139				113 50.6 - 6 4.1	197 35.5 21 37.3		
14	130 28.2 126 -13 30.1 -138				143 55.5 - 6 4.1	227 40.8 21 37.3		
16	159 31.4 124 -13 57.8 -137				174 .5 - 6 4.1	257 46.1 21 37.4		
18	188 34.2 122 -14 25.2 -136				204 5.4 - 6 4.1	287 51.4 21 37.5		
20	217 36.6 120 -14 52.4 -135				234 10.3 - 6 4.0	317 56.7 21 37.5		
22	246 38.6 118 -15 19.4 -134				264 15.2 - 6 4.0	348 2.1 21 37.6		
Δ					25	0	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	8 14	16 14	0 47	2 27	0 7	4.0	9 39	.0
55	7 51	16 37	0 40	2 6	. . . .	.0	9 55	.4
50	7 34	16 54	0 35	1 52	. . . .	.0	10 8	.7
45	7 20	17 8	0 31	1 41	. . . .	.0	10 19	1.0
40	7 9	17 19	0 29	1 33	. . . .	.0	10 27	1.1
35	6 59	17 29	0 27	1 27	. . . .	.0	10 35	1.3
30	6 50	17 37	0 25	1 22	. . . .	.0	10 41	1.4
20	6 36	17 52	0 23	1 16	. . . .	.0	10 53	1.6
10	6 22	18 5	0 22	1 12	23 49	2.3	11 3	1.8
0	6 10	18 17	0 22	1 12	23 37	2.1	11 12	2.0
10	5 58	18 29	0 22	1 14	23 25	1.9	11 22	2.2
20	5 44	18 43	0 23	1 19	23 13	1.8	11 32	2.4
30	5 29	18 58	0 26	1 28	22 59	1.5	11 44	2.6
35	5 20	19 7	0 27	1 36	22 51	1.4	11 51	2.8
40	5 9	19 17	0 30	1 46	22 42	1.3	11 58	2.9
45	4 57	19 30	0 33	2 2	22 31	1.1	12 8	3.1
50	4 42	19 44	0 38	2 28	22 18	.9	12 19	3.3
55	4 23	20 3	0 45	3 48	22 2	.6	12 32	3.7
60	3 57	20 29	0 57	:::	21 41	.1	12 51	4.1

SUNCE				MESEC			
UT	e = T <sub>p</sub> - UT	Δ/24	r	Prolaz	Δ/24	π <sub>♃</sub>	r
h	min s	s / ' / "		h min	min	' / "	
00	-13 33.1	-.3	16.3	T <sub>m</sub>	5 1	2.0	56.8 15.5
12	-13 37.0	T <sub>m☉</sub>	12 h 13.6 min	Starost	21.5 d	Faza	☉

PLANETE									
Pl.	T <sub>m</sub>	π	360-α	Vel.	Pl.	T <sub>m</sub>	π	360-α	Vel.
h	h min	' / "	°		h min	' / "	°		
♀	11 16	.1	60	-3.8	♃	4 26	.0	162	-2.0
♂	8 57	.1	94	1.4	♄	22 48	.0	246	-2.2

UT	SUNCE		PROLEĆ. TAČKA S <sub>γ</sub>	VENERA		MARS	
	S <sub>☉</sub>	δ <sub>☉</sub>		S <sub>♀</sub>	δ <sub>♀</sub>	S <sub>♂</sub>	δ <sub>♂</sub>
h	° / ' / "	° / ' / "	° / ' / "	° / ' / "	° / ' / "	° / ' / "	° / ' / "
0	176 34.7 -16 50.8		132 16.9	190 49.6 -20 54.3	225 57.5 -23 37.1		
2	206 34.6 -16 49.4		162 21.9	220 47.9 -20 53.1	255 58.6 -23 37.3		
4	236 34.4 -16 47.9		192 26.8	250 46.2 -20 52.0	285 59.7 -23 37.5		
6	266 34.3 -16 46.5		222 31.7	280 44.6 -20 50.9	316 .8 -23 37.6		
8	296 34.1 -16 45.0		252 36.6	310 42.9 -20 49.8	346 1.8 -23 37.8		
10	326 34.0 -16 43.6		282 41.6	340 41.2 -20 48.6	16 2.9 -23 37.9		
12	356 33.9 -16 42.1		312 46.5	10 39.6 -20 47.5	46 4.0 -23 38.1		
14	26 33.7 -16 40.6		342 51.4	40 37.9 -20 46.3	76 5.1 -23 38.2		
16	56 33.6 -16 39.2		12 56.4	70 36.2 -20 45.2	106 6.2 -23 38.3		
18	86 33.4 -16 37.7		43 1.3	100 34.6 -20 44.0	136 7.3 -23 38.5		
20	116 33.3 -16 36.3		73 6.2	130 32.9 -20 42.9	166 8.4 -23 38.6		
22	146 33.1 -16 34.8		103 11.1	160 31.3 -20 41.7	196 9.4 -23 38.8		
Δ	-1 7			-8 6	5 -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 11	16 17	0 47	2 26	1 43	4.3	9 40	.1
55	7 49	16 39	0 40	2 6	1 18	3.8	10 6	.7
50	7 32	16 56	0 35	1 51	1 0	3.4	10 26	1.0
45	7 19	17 9	0 31	1 41	0 46	3.2	10 42	1.2
40	7 8	17 20	0 29	1 33	0 35	3.0	10 55	1.4
35	6 58	17 30	0 27	1 27	0 25	2.8	11 6	1.5
30	6 50	17 38	0 25	1 22	0 16	2.7	11 15	1.7
20	6 35	17 53	0 23	1 16	0 2	2.5	11 32	1.9
10	6 22	18 5	0 22	1 12	...	.0	11 47	2.1
0	6 10	18 17	0 22	1 12	...	.0	12 1	2.2
10	5 58	18 29	0 22	1 14	...	.0	12 15	2.4
20	5 45	18 42	0 23	1 19	23 55	2.0	12 30	2.6
30	5 30	18 58	0 26	1 28	23 36	1.8	12 47	2.8
35	5 21	19 6	0 27	1 36	23 25	1.7	12 57	2.9
40	5 10	19 16	0 30	1 46	23 12	1.6	13 8	3.1
45	4 58	19 28	0 33	2 1	22 57	1.4	13 22	3.2
50	4 44	19 43	0 38	2 27	22 38	1.2	13 39	3.5
55	4 25	20 1	0 44	3 35	22 15	.9	14 0	3.8
60	3 59	20 26	0 56	:::	21 43	.3	14 30	4.4
S								

UT	MESEC				JUPITER		SATURN	
	S <sub>♃</sub>	Δ	δ <sub>♃</sub>	Δ	S <sub>♃</sub>	δ <sub>♃</sub>	S <sub>♄</sub>	δ <sub>♄</sub>
h	° / ' / "	° / ' / "	° / ' / "	° / ' / "	° / ' / "	° / ' / "	° / ' / "	° / ' / "
0	275 40.2 116 -15 46.2 -133		294 20.1 -6 4.0	18 7.4 21 37.7				
2	304 41.3 114 -16 12.7 -131		324 25.0 -6 4.0	48 12.7 21 37.7				
4	333 42.1 111 -16 38.9 -130		354 30.0 -6 4.0	78 18.0 21 37.8				
6	2 42.4 109 -17 4.9 -129		24 34.9 -6 3.9	108 23.3 21 37.9				
8	31 42.2 107 -17 30.6 -127		54 39.8 -6 3.9	138 28.7 21 38.0				
10	60 41.6 105 -17 56.0 -125		84 44.7 -6 3.9	168 34.0 21 38.0				
12	89 40.5 102 -18 21.1 -124		114 49.7 -6 3.9	198 39.3 21 38.1				
14	118 39.0 100 -18 45.9 -122		144 54.6 -6 3.9	228 44.6 21 38.2				
16	147 36.9 97 -19 10.3 -120		174 59.5 -6 3.8	258 49.9 21 38.2				
18	176 34.4 95 -19 34.4 -119		205 4.4 -6 3.8	288 55.2 21 38.3				
20	205 31.4 92 -19 58.1 -117		235 9.4 -6 3.8	319 .6 21 38.4				
22	234 27.9 90 -20 21.5 -115		265 14.3 -6 3.8	349 5.9 21 38.4				
Δ			25 0	27 0				

SUNCE				MESEC					
UT	e = T <sub>p</sub> - UT	Δ/24	r	Prolaz	Δ/24	π <sub>♃</sub>	r		
h	min s	s / ' / "		h min	min	' / "	' / "		
00	-13 40.8	-.3	16.3	T <sub>m</sub>	5 49	2.2	57.6 15.7		
12	-13 44.3	T <sub>m☉</sub> 12 h 13.7 min		Starost 22.5 d	Faza ☉				
PLANETE									
Pl.	T <sub>m</sub>	π	360-α	Vel.	Pl.	T <sub>m</sub>	π	360-α	Vel.
♀	h min / ' / "	.	°		♃	h min / ' / "	.	°	
♁	11 17	.1	59	-3.8	♃	4 22	.0	162	-2.0
♂	8 56	.1	94	1.4	♄	22 43	.0	246	-2.2

UT	SUNCE		PROLEĆ. TAČKA S <sub>γ</sub>	VENERA		MARS	
	S <sub>☉</sub>	δ <sub>☉</sub>		S <sub>♀</sub>	δ <sub>♀</sub>	S <sub>♂</sub>	δ <sub>♂</sub>
h	° / ' / "	° / ' / "	° / ' / "	° / ' / "	° / ' / "	° / ' / "	° / ' / "
0	176 33.0 -16 33.3		133 16.1	190 29.6 -20 40.5	226 10.5 -23 38.9		
2	206 32.9 -16 31.9		163 21.0	220 28.0 -20 39.4	256 11.6 -23 39.0		
4	236 32.7 -16 30.4		193 25.9	250 26.3 -20 38.2	286 12.7 -23 39.2		
6	266 32.6 -16 28.9		223 30.8	280 24.7 -20 37.0	316 13.8 -23 39.3		
8	296 32.5 -16 27.4		253 35.8	310 23.0 -20 35.8	346 14.9 -23 39.4		
10	326 32.3 -16 26.0		283 40.7	340 21.4 -20 34.6	16 15.9 -23 39.6		
12	356 32.2 -16 24.5		313 45.6	10 19.8 -20 33.4	46 17.0 -23 39.7		
14	26 32.1 -16 23.0		343 50.6	40 18.1 -20 32.2	76 18.1 -23 39.8		
16	56 32.0 -16 21.5		13 55.5	70 16.5 -20 31.0	106 19.2 -23 39.9		
18	86 31.8 -16 20.0		44 .4	100 14.8 -20 29.8	136 20.3 -23 40.1		
20	116 31.7 -16 18.5		74 5.3	130 13.2 -20 28.6	166 21.4 -23 40.2		
22	146 31.6 -16 17.0		104 10.3	160 11.6 -20 27.4	196 22.4 -23 40.3		
Δ	-1 7			-8 6	5 -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	16 20	0 47	2 26	3 27	4.6	9 43	.4
55	7 47	16 41	0 40	2 5	2 49	3.9	10 22	1.1
50	7 31	16 58	0 35	1 51	2 23	3.5	10 50	1.4
45	7 17	17 11	0 31	1 41	2 3	3.3	11 11	1.6
40	7 7	17 22	0 28	1 33	1 47	3.1	11 28	1.8
35	6 57	17 31	0 26	1 26	1 33	3.0	11 43	1.9
30	6 49	17 39	0 25	1 22	1 21	2.9	11 55	2.0
20	6 35	17 53	0 23	1 15	1 1	2.7	12 17	2.2
10	6 22	18 6	0 22	1 12	0 44	2.5	12 36	2.3
0	6 10	18 17	0 22	1 12	0 28	2.3	12 54	2.5
10	5 58	18 29	0 22	1 14	0 12	2.2	13 12	2.6
20	5 45	18 42	0 23	1 19	...	.0	13 31	2.7
30	5 30	18 57	0 26	1 28	...	.0	13 54	2.9
35	5 22	19 6	0 27	1 35	...	.0	14 7	3.0
40	5 12	19 15	0 30	1 45	23 50	2.0	14 22	3.1
45	4 60	19 27	0 33	2 0	23 31	1.9	14 40	3.3
50	4 45	19 41	0 37	2 25	23 7	1.7	15 3	3.5
55	4 27	19 59	0 44	3 26	22 35	1.4	15 33	3.8
60	4 2	20 24	0 56	:::	21 49	.7	16 17	4.5
S								

UT	MESEC				JUPITER		SATURN	
	S <sub>♃</sub>	Δ	δ <sub>♃</sub>	Δ	S <sub>♃</sub>	δ <sub>♃</sub>	S <sub>♄</sub>	δ <sub>♄</sub>
h	° / ' / "	° / ' / "	° / ' / "	° / ' / "	° / ' / "	° / ' / "	° / ' / "	° / ' / "
0	263 23.8 87 -20 44.4 -113		295 19.2 -6 3.7	19 11.2 21 38.5				
2	292 19.3 85 -21 6.9 -111		325 24.2 -6 3.7	49 16.5 21 38.6				
4	321 14.2 82 -21 29.1 -108		355 29.1 -6 3.7	79 21.8 21 38.6				
6	350 8.6 79 -21 50.7 -106		25 34.0 -6 3.7	109 27.1 21 38.7				
8	19 2.5 77 -22 12.0 -104		55 39.0 -6 3.6	139 32.4 21 38.8				
10	47 55.9 74 -22 32.7 -101		85 43.9 -6 3.6	169 37.8 21 38.8				
12	76 48.7 72 -22 53.0 -99		115 48.9 -6 3.6	199 43.1 21 38.9				
14	105 41.0 69 -23 12.8 -96		145 53.8 -6 3.5	229 48.4 21 39.0				
16	134 32.8 66 -23 32.1 -94		175 58.7 -6 3.5	259 53.7 21 39.0				
18	163 24.0 64 -23 50.8 -91		206 3.7 -6 3.5	289 59.0 21 39.1				
20	192 14.7 61 -24 9.0 -88		236 8.6 -6 3.5	320 4.3 21 39.2				
22	221 4.9 58 -24 26.6 -85		266 13.6 -6 3.4	350 9.6 21 39.2				
Δ			25 0	27 0				

SUNCE				MESEC					
UT	e = T <sub>p</sub> - UT	Δ/24	r	Prolaz	Δ/24	π <sub>♃</sub>	r		
h	min s	s / ' / "		h min	min	' / "	' / "		
00	-13 47.8	-.3	16.3	T <sub>m</sub>	6 41	2.4	58.4 15.9		
12	-13 50.9	T <sub>m☉</sub> 12 h 13.9 min		Starost 23.5 d	Faza ☉				
PLANETE									
Pl.	T <sub>m</sub>	π	360-α	Vel.	Pl.	T <sub>m</sub>	π	360-α	Vel.
♀	h min / ' / "	.	°		♃	h min / ' / "	.	°	
♁	11 19	.1	57	-3.8	♃	4 18	.0	162	-2.0
♂	8 55	.1	93	1.4	♄	22 39	.0	246	-2.2

4. FEBRUAR

2005.

PETAK

UT	SUNCE				PROLEĆ. TAČKA S <sub>γ</sub>	VENERA				MARS					
	S <sub>☉</sub>		δ <sub>☉</sub>			S <sub>♀</sub>		δ <sub>♀</sub>		S <sub>♂</sub>		δ <sub>♂</sub>			
h	°	'	°	'	°	'	°	'	°	'	°	'			
0	176	31.5	-16	15.6	134	15.2	190	10.0	-20	26.2	226	23.5	-23	40.4	
2	206	31.3	-16	14.1	164	20.1	220	8.3	-20	25.0	256	24.6	-23	40.5	
4	236	31.2	-16	12.6	194	25.1	250	6.7	-20	23.7	286	25.7	-23	40.7	
6	266	31.1	-16	11.1	224	30.0	280	5.1	-20	22.5	316	26.8	-23	40.8	
8	296	31.0	-16	9.6	254	34.9	310	3.4	-20	21.3	346	27.8	-23	40.9	
10	326	30.9	-16	8.1	284	39.8	340	1.8	-20	20.0	376	28.9	-23	41.0	
12	356	30.8	-16	6.6	314	44.8	370	.2	-20	18.8	406	30.0	-23	41.1	
14	26	30.7	-16	5.1	344	49.7	39	58.6	-20	17.6	436	31.1	-23	41.2	
16	56	30.5	-16	3.5	14	54.6	69	57.0	-20	16.3	466	32.2	-23	41.3	
18	86	30.4	-16	2.0	44	59.6	99	55.4	-20	15.0	496	33.2	-23	41.4	
20	116	30.3	-16	.5	75	4.5	129	53.7	-20	13.8	526	34.3	-23	41.5	
22	146	30.2	-15	59.0	105	9.4	159	52.1	-20	12.5	556	35.4	-23	41.6	
Δ		-1		8				-8		6			5		-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 6	16 22	0 46	2 25	5 18	4.4	9 51	1.1
55	7 45	16 44	0 39	2 5	4 22	3.6	10 47	1.8
50	7 29	16 59	0 35	1 51	3 47	3.4	11 23	2.1
45	7 16	17 12	0 31	1 40	3 22	3.2	11 50	2.2
40	7 6	17 23	0 28	1 32	3 1	3.1	12 11	2.3
35	6 56	17 32	0 26	1 26	2 44	3.0	12 29	2.4
30	6 48	17 40	0 25	1 22	2 30	2.9	12 44	2.4
20	6 34	17 54	0 23	1 15	2 5	2.8	13 10	2.5
10	6 22	18 6	0 22	1 12	1 44	2.7	13 32	2.6
0	6 10	18 17	0 22	1 12	1 24	2.6	13 53	2.7
10	5 59	18 29	0 22	1 13	1 5	2.5	14 14	2.7
20	5 46	18 42	0 23	1 18	0 44	2.4	14 37	2.8
30	5 31	18 56	0 26	1 28	0 20	2.2	15 3	2.9
35	5 23	19 5	0 27	1 35	0 6	2.1	15 18	2.9
40	5 13	19 14	0 30	1 45	...	.0	15 36	3.0
45	5 1	19 26	0 33	1 59	...	.0	15 58	3.0
50	4 47	19 40	0 37	2 23	23 48	2.5	16 26	3.1
55	4 29	19 57	0 44	3 19	23 6	2.3	17 4	3.3
60	4 5	20 21	0 55	4 11	22 9	1.9	18 6	3.8
S								

UT	MESEC				JUPITER				SATURN							
	S <sub>♃</sub>		Δ		δ <sub>♃</sub>		Δ		S <sub>♃</sub>		δ <sub>♃</sub>		S <sub>♄</sub>		δ <sub>♄</sub>	
h	°	'	°	'	°	'	°	'	°	'	°	'	°	'	°	'
0	249	54.6	56	-24	43.7	-82	296	18.5	-6	3.4	20	14.9	21	39.3		
2	278	43.7	53	-25	.2	-79	326	23.5	-6	3.4	50	20.2	21	39.4		
4	307	32.4	51	-25	16.0	-76	356	28.4	-6	3.3	80	25.6	21	39.4		
6	336	20.5	48	-25	31.3	-73	26	33.4	-6	3.3	110	30.9	21	39.5		
8	5	8.1	46	-25	45.9	-70	56	38.3	-6	3.3	140	36.2	21	39.6		
10	33	55.3	43	-25	59.8	-66	86	43.3	-6	3.2	170	41.5	21	39.6		
12	62	41.9	41	-26	13.1	-63	116	48.2	-6	3.2	200	46.8	21	39.7		
14	91	28.1	39	-26	25.7	-60	146	53.2	-6	3.2	230	52.1	21	39.8		
16	120	13.8	36	-26	37.6	-56	176	58.1	-6	3.1	260	57.4	21	39.8		
18	148	59.1	34	-26	48.8	-52	207	3.1	-6	3.1	291	2.7	21	39.9		
20	177	44.0	32	-26	59.3	-49	237	8.1	-6	3.1	321	8.0	21	40.0		
22	206	28.4	30	-27	9.0	-45	267	13.0	-6	3.0	351	13.3	21	40.0		
Δ								25		0			27		0	

SUNCE				MESEC					
UT	e = T <sub>p</sub> - UT	Δ/24	r	Prolaz	Δ/24	π <sub>☾</sub>	r		
h	min	s	'	h min	min	'	'		
00	-13 54.0	-.2	16.3	T <sub>m</sub>	7 39	2.6	59.2	16.1	
12	-13 56.7	T <sub>m☉</sub>	12 h 13.9 min	Starost	24.5 d	Faza	☉		
PLANETE									
Pl.	T <sub>m</sub>	π	360-α	Vel.	Pl.	T <sub>m</sub>	π	360-α	Vel.
♀	h min	'	°		♃	h min	'	°	
♂	11 20	.1	56	-3.8	♄	4 14	.0	162	-2.0
	8 54	.1	92	1.4	♅	22 35	.0	246	-.2

5. FEBRUAR

SUBOTA

UT	SUNCE				PROLEĆ. TAČKA S <sub>γ</sub>	VENERA				MARS					
	S <sub>☉</sub>		δ <sub>☉</sub>			S <sub>♀</sub>		δ <sub>♀</sub>		S <sub>♂</sub>		δ <sub>♂</sub>			
h	°	'	°	'	°	'	°	'	°	'	°	'			
0	176	30.1	-15	57.5	135	14.3	189	50.5	-20	11.3	226	36.5	-23	41.7	
2	206	30.0	-15	56.0	165	19.3	219	48.9	-20	10.0	256	37.5	-23	41.8	
4	236	29.9	-15	54.5	195	24.2	249	47.3	-20	8.7	286	38.6	-23	41.9	
6	266	29.8	-15	52.9	225	29.1	279	45.7	-20	7.4	316	39.7	-23	42.0	
8	296	29.7	-15	51.4	255	34.1	309	44.1	-20	6.1	346	40.8	-23	42.1	
10	326	29.6	-15	49.9	285	39.0	339	42.5	-20	4.8	376	41.8	-23	42.2	
12	356	29.5	-15	48.4	315	43.9	369	40.9	-20	3.6	406	42.9	-23	42.3	
14	26	29.4	-15	46.8	345	48.8	39	39.3	-20	2.3	436	44.0	-23	42.4	
16	56	29.3	-15	45.3	15	53.8	69	37.7	-20	1.0	466	45.1	-23	42.5	
18	86	29.2	-15	43.8	45	58.7	99	36.1	-19	59.7	496	46.1	-23	42.6	
20	116	29.1	-15	42.2	76	3.6	129	34.5	-19	58.3	526	47.2	-23	42.7	
22	146	29.1	-15	40.7	106	8.6	159	33.0	-19	57.0	556	48.3	-23	42.7	
Δ		0		8				-8		6			5		0

φ	SUNCE		TRAJANJE SUMRAKA		MESEC			
	IZLAZ	ZALAZ	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	16 25	0 46	2 25	7 3	2.9	10 17	2.9
55	7 43	16 46	0 39	2 5	5 50	2.9	11 30	2.9
50	7 27	17 1	0 34	1 51	5 8	2.8	12 12	2.9
45	7 15	17 14	0 31	1 40	4 38	2.8	12 43	2.9
40	7 5	17 24	0 28	1 32	4 15	2.8	13 6	2.8
35	6 56	17 33	0 26	1 26	3 56	2.8	13 26	2.8
30	6 48	17 41	0 25	1 21	3 39	2.8	13 42	2.8
20	6 34	17 54	0 23	1 15	3 12	2.8	14 10	2.8
10	6 22	18 6	0 22	1 12	2 48	2.8	14 35	2.8
0	6 11	18 18	0 21	1 11	2 26	2.7	14 57	2.8
10	5 59	18 29	0 22	1 13	2 4	2.7	15 20	2.7
20	5 47	18 41	0 23	1 18	1 41	2.7	15 44	2.7
30	5 32	18 56	0 25	1 27	1 14	2.6	16 12	2.7
35	5 24	19 4	0 27	1 34	0 58	2.6	16 28	2.6
40	5 14	19 13	0 29	1 44	0 39	2.6	16 48	2.6
45	5 3	19 25	0 33	1 59	0 17	2.5	17 11	2.6
50	4 49	19 38	0 37	2 22	...	.0	17 41	2.5
55	4 31	19 55	0 43	3 14	...	.0	18 23	2.3
60	4 8	20 19	0 54	4 11	22 53	3.9	19 36	1.9
S								

UT	MESEC				JUPITER				SATURN							
	S <sub>♃</sub>		Δ		δ <sub>♃</sub>		Δ		S <sub>♃</sub>		δ <sub>♃</sub>		S <sub>♄</sub>		δ <sub>♄</sub>	
h	°	'	°	'	°	'	°	'	°	'	°	'	°	'	°	'
0	235	12.4	28	-27	18.0	-41	297	18.0	-6	3.0	21	18.6	21	40.1		
2	263	56.1	26	-27	26.2	-37	327	23.0	-6	3.0	51	23.9	21	40.2		
4	292	39.4	25	-27	33.6	-33	357	27.9	-6	2.9	81	29.2	21	40.2		
6	321	22.3	23	-27	40.3	-29	27	32.9	-6	2.9	111	34.5	21	40.3		
8	350	4.9	22	-27	46.2	-25	57	37.9	-6	2.8	141	39.8	21	40.4		
10	18	47.3	20	-27	51.2	-21	87	42.8	-6	2.8	171	45.1	21	40.4		
12	47	29.3	19	-27	55.5	-17	117	47.8	-6	2.8	201	50.4	21	40.5		
14	76	11.1	18	-27	58.9	-13	147	52.8	-6	2.7	231	55.7	21	40.6		
16	104	52.7	17	-28	1.5	-9	177	57.7	-6	2.7	262	1.0	21	40.6		
18	133	34.0	16	-28	3.2	-5	208	2.7	-6	2.6	292	6.3	21	40.7		
20	162	15.2	15	-28	4.1	0	238	7.7	-6	2.6	322	11.6	21	40.8		
22	190	56.2	14	-28	4.2	4	268	12.7	-6	2.6	352	16.9	21	40.8		
Δ								25		0			27		0	

SUNCE				MESEC			
UT	e = T <sub>p</sub> - UT	Δ/24	r	Prolaz	Δ/24	π <sub>☾</sub>	r
h</							

UT	SUNCE		PROLEĆ. TAČKA S <sub>γ</sub>	VENERA		MARS								
	S <sub>☉</sub>	δ <sub>☉</sub>		S <sub>♀</sub>	δ <sub>♀</sub>	S <sub>♂</sub>	δ <sub>♂</sub>							
h	°	'	°	'	'	°	'							
0	176	29.0	-15	39.2	136	13.5	189	31.4	-19	55.7	226	49.4	-23	42.8
2	206	28.9	-15	37.6	166	18.4	219	29.8	-19	54.4	256	50.4	-23	42.9
4	236	28.8	-15	36.1	196	23.3	249	28.2	-19	53.1	286	51.5	-23	43.0
6	266	28.7	-15	34.5	226	28.3	279	26.6	-19	51.7	316	52.6	-23	43.1
8	296	28.6	-15	33.0	256	33.2	309	25.0	-19	50.4	346	53.7	-23	43.1
10	326	28.5	-15	31.5	286	38.1	339	23.5	-19	49.1	16	54.7	-23	43.2
12	356	28.5	-15	29.9	316	43.0	9	21.9	-19	47.7	46	55.8	-23	43.3
14	26	28.4	-15	28.4	346	48.0	39	20.3	-19	46.4	76	56.9	-23	43.4
16	56	28.3	-15	26.8	16	52.9	69	18.7	-19	45.0	106	57.9	-23	43.4
18	86	28.2	-15	25.2	46	57.8	99	17.2	-19	43.7	136	59.0	-23	43.5
20	116	28.2	-15	23.7	77	2.8	129	15.6	-19	42.3	167	.1	-23	43.6
22	146	28.1	-15	22.1	107	7.7	159	14.0	-19	41.0	197	1.2	-23	43.6
Δ		0		8				-8		7		5		0

φ	SUNCE		TRAJANJE SUMRAKA		MESEC			
	IZLAZ	ZALAZ	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	16 28	0 46	2 24	8 12	1.1	11 26	4.7
55	7 41	16 48	0 39	2 4	6 59	1.9	12 39	3.9
50	7 26	17 3	0 34	1 50	6 16	2.1	13 21	3.6
45	7 14	17 15	0 31	1 40	5 46	2.3	13 51	3.4
40	7 4	17 25	0 28	1 32	5 23	2.4	14 14	3.2
35	6 55	17 34	0 26	1 26	5 3	2.5	14 33	3.2
30	6 47	17 41	0 25	1 21	4 46	2.5	14 50	3.1
20	6 34	17 55	0 23	1 15	4 18	2.6	15 17	2.9
10	6 22	18 6	0 22	1 12	3 54	2.7	15 41	2.8
0	6 11	18 18	0 21	1 11	3 32	2.8	16 3	2.7
10	5 59	18 29	0 22	1 13	3 9	2.8	16 25	2.6
20	5 47	18 41	0 23	1 18	2 45	2.9	16 49	2.5
30	5 33	18 55	0 25	1 27	2 17	3.0	17 16	2.3
35	5 25	19 3	0 27	1 34	2 0	3.0	17 32	2.2
40	5 15	19 12	0 29	1 44	1 41	3.1	17 50	2.1
45	5 4	19 23	0 32	1 58	1 17	3.1	18 13	2.0
50	4 51	19 37	0 37	2 20	0 47	3.3	18 41	1.8
55	4 34	19 53	0 43	3 9	0 6	3.4	19 19	1.4
60	4 10	20 16	0 54	:::	...	.0	20 22	.7
S								

UT	MESEC				JUPITER			SATURN							
	S <sub>♃</sub>	Δ	δ <sub>♃</sub>	Δ	S <sub>♃</sub>	δ <sub>♃</sub>	Δ	S <sub>♄</sub>	δ <sub>♄</sub>	Δ					
h	°	'	°	'	°	'	°	'	°	'					
0	219	37.1	14	-28	3.4	8	298	17.6	-6	2.5	22	22.2	21	40.9	
2	248	17.8	13	-28	1.8	13	328	22.6	-6	2.5	52	27.5	21	41.0	
4	276	58.5	13	-27	59.2	17	358	27.6	-6	2.4	82	32.8	21	41.0	
6	305	39.2	13	-27	55.9	21	28	32.6	-6	2.4	112	38.1	21	41.1	
8	334	19.8	13	-27	51.6	25	58	37.6	-6	2.3	142	43.4	21	41.2	
10	3	.4	13	-27	46.5	30	88	42.5	-6	2.3	172	48.7	21	41.2	
12	31	41.1	14	-27	40.6	34	118	47.5	-6	2.2	202	54.0	21	41.3	
14	60	21.8	14	-27	33.8	38	148	52.5	-6	2.2	232	59.3	21	41.3	
16	89	2.6	15	-27	26.1	43	178	57.5	-6	2.1	263	4.6	21	41.4	
18	117	43.5	15	-27	17.6	47	209	2.5	-6	2.1	293	9.9	21	41.5	
20	146	24.5	16	-27	8.2	51	239	7.5	-6	2.1	323	15.2	21	41.5	
22	175	5.7	17	-26	58.0	55	269	12.5	-6	2.0	353	20.5	21	41.6	
Δ								25		0			26		0

SUNCE				MESEC					
UT	e = T <sub>p</sub> - UT	Δ/24	r	Prolaz	Δ/24	π <sub>☾</sub>	r		
h	min	s	s	h min	min	'	'		
00	-14	3.9	- .2	16.2	T <sub>m</sub>	9 47	2.7	60.6	16.5
12	-14	5.9	T <sub>m☉</sub>	12 h 14.1 min	Starost	26.5 d	Faza	●	
PLANETE									
Pl.	T <sub>m</sub>	π	360-α	Vel.	Pl.	T <sub>m</sub>	π	360-α	Vel.
♀	h min	'	°		♃	h min	'	°	
♂	11 23	.1	53	-3.8	♄	4 6	.0	162	-2.1
	8 52	.1	91	1.4	♅	22 27	.0	246	- .2

UT	SUNCE		PROLEĆ. TAČKA S <sub>γ</sub>	VENERA		MARS								
	S <sub>☉</sub>	δ <sub>☉</sub>		S <sub>♀</sub>	δ <sub>♀</sub>	S <sub>♂</sub>	δ <sub>♂</sub>							
h	°	'	°	'	'	°	'							
0	176	28.0	-15	20.6	137	12.6	189	12.5	-19	39.6	227	2.2	-23	43.7
2	206	27.9	-15	19.0	167	17.5	219	10.9	-19	38.2	257	3.3	-23	43.8
4	236	27.9	-15	17.4	197	22.5	249	9.4	-19	36.8	287	4.4	-23	43.8
6	266	27.8	-15	15.9	227	27.4	279	7.8	-19	35.5	317	5.4	-23	43.9
8	296	27.7	-15	14.3	257	32.3	309	6.2	-19	34.1	347	6.5	-23	43.9
10	326	27.7	-15	12.7	287	37.3	339	4.7	-19	32.7	17	7.6	-23	44.0
12	356	27.6	-15	11.2	317	42.2	9	3.1	-19	31.3	47	8.6	-23	44.0
14	26	27.6	-15	9.6	347	47.1	39	1.6	-19	29.9	77	9.7	-23	44.1
16	56	27.5	-15	8.0	17	52.0	69	.0	-19	28.5	107	10.8	-23	44.1
18	86	27.4	-15	6.5	47	57.0	98	58.5	-19	27.1	137	11.8	-23	44.2
20	116	27.4	-15	4.9	78	1.9	128	56.9	-19	25.7	167	12.9	-23	44.2
22	146	27.3	-15	3.3	108	6.8	158	55.4	-19	24.3	197	14.0	-23	44.3
Δ		0		8				-8		7		5		0

φ	SUNCE		TRAJANJE SUMRAKA		MESEC			
	IZLAZ	ZALAZ	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 59	16 30	0 46	2 24	8 38	.4	13 18	5.0
55	7 39	16 50	0 39	2 4	7 43	1.1	14 12	4.3
50	7 24	17 5	0 34	1 50	7 7	1.5	14 46	3.9
45	7 12	17 17	0 31	1 40	6 41	1.7	15 12	3.6
40	7 2	17 26	0 28	1 32	6 20	1.9	15 32	3.4
35	6 54	17 35	0 26	1 26	6 2	2.0	15 49	3.2
30	6 46	17 42	0 25	1 21	5 47	2.2	16 3	3.1
20	6 33	17 55	0 23	1 15	5 21	2.3	16 28	2.9
10	6 22	18 7	0 22	1 12	4 59	2.5	16 49	2.7
0	6 11	18 18	0 21	1 11	4 38	2.6	17 8	2.6
10	5 60	18 29	0 22	1 13	4 17	2.8	17 28	2.4
20	5 48	18 40	0 23	1 18	3 54	2.9	17 48	2.2
30	5 34	18 54	0 25	1 27	3 28	3.1	18 12	2.0
35	5 26	19 2	0 27	1 34	3 13	3.2	18 26	1.8
40	5 17	19 11	0 29	1 43	2 55	3.4	18 41	1.7
45	5 6	19 22	0 32	1 57	2 33	3.5	19 0	1.5
50	4 52	19 35	0 37	2 19	2 6	3.8	19 23	1.2
55	4 36	19 51	0 43	3 4	1 28	4.1	19 54	.9
60	4 13	20 13	0 53	:::	0 27	4.9	20 38	.3
S								

UT	MESEC				JUPITER			SATURN							
	S <sub>♃</sub>	Δ	δ <sub>♃</sub>	Δ	S <sub>♃</sub>	δ <sub>♃</sub>	Δ	S <sub>♄</sub>	δ <sub>♄</sub>	Δ					
h	°	'	°	'	°	'	°	'	°	'					
0	203	47.1	18	-26	46.9	59	299	17.5	-6	2.0	23	25.8	21	41.7	
2	232	28.7	19	-26	35.0	63	329	22.5	-6	1.9	53	31.1	21	41.7	
4	261	10.5	20	-26	22.3	67	359	27.5	-6	1.9	83	36.4	21	41.8	
6	289	52.6	22	-26	8.8	71	29	32.5	-6	1.8	113	41.7	21	41.9	
8	318	34.9	23	-25	54.5	75	59	37.4	-6	1.8	143	47.0	21	41.9	
10	347	17.5	25	-25	39.5	79	89	42.4	-6	1.7	173	52.3	21	42.0	
12	16	.5	26	-25	23.6	83	119	47.4	-6	1.7	203	57.6	21	42.1	
14	44	43.7	28	-25	7.0	87	149	52.4	-6	1.6	234	2.9	21	42.1	
16	73	27.4	30	-24	49.6	91	179	57.5	-6	1.5	264	8.1	21	42.2	
18	102	11.3	32	-24	31.5	94	210	2.5	-6	1.5	294	13.4	21	42.2	
20	130	55.7	34	-24	12.6	98	240	7.5	-6	1.4	324	18.7	21	42.3	
22	159	40.5	36	-23	53.1	101	270	12.5	-6	1.4	354	24.0	21	42.4	
Δ								25		0			26		0

SUNCE				MESEC					
UT	e = T <sub>p</sub> - UT	Δ/24	r	Prolaz	Δ/24	π <sub>☾</sub>	r		
h	min	s	s	h min	min	'	'		
00	-14	7.8	- .1	16.2	T <sub>m</sub>	10 53	2.6	61.0	16.6
12	-14	9.3	T <sub>m☉</sub>	12 h 14.2 min	Starost	27.5 d	Faza		

UT	SUNCE				PROLEĆ. TAČKA S <sub>γ</sub>	VENERA				MARS				
	S <sub>☉</sub>		δ <sub>☉</sub>			S <sub>♀</sub>		δ <sub>♀</sub>		S <sub>♂</sub>		δ <sub>♂</sub>		
h	°	'	°	'	°	'	°	'	°	'	°	'		
0	176	27.3	-15	1.7	138	11.8	188	53.9	-19	22.9	227	15.0	-23	44.3
2	206	27.2	-15	.1	168	16.7	218	52.3	-19	21.5	257	16.1	-23	44.4
4	236	27.2	-14	58.5	198	21.6	248	50.8	-19	20.0	287	17.2	-23	44.4
6	266	27.1	-14	57.0	228	26.5	278	49.3	-19	18.6	317	18.2	-23	44.5
8	296	27.1	-14	55.4	258	31.5	308	47.7	-19	17.2	347	19.3	-23	44.5
10	326	27.0	-14	53.8	288	36.4	338	46.2	-19	15.8	17	20.4	-23	44.5
12	356	27.0	-14	52.2	318	41.3	8	44.7	-19	14.3	47	21.4	-23	44.6
14	26	26.9	-14	50.6	348	46.3	38	43.1	-19	12.9	77	22.5	-23	44.6
16	56	26.9	-14	49.0	18	51.2	68	41.6	-19	11.4	107	23.6	-23	44.6
18	86	26.8	-14	47.4	48	56.1	98	40.1	-19	10.0	137	24.6	-23	44.7
20	116	26.8	-14	45.8	79	1.0	128	38.6	-19	8.5	167	25.7	-23	44.7
22	146	26.7	-14	44.2	109	6.0	158	37.1	-19	7.1	197	26.8	-23	44.7
Δ		0		8				-8		7		5		0

φ	SUNCE		TRAJANJE SUMRAKA		MESEC			
	IZLAZ	ZALAZ	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 56	16 33	0 45	2 23	8 47	.1	15 19	4.8
55	7 37	16 52	0 39	2 4	8 10	.7	15 54	4.2
50	7 23	17 6	0 34	1 50	7 43	1.0	16 19	3.8
45	7 11	17 18	0 31	1 40	7 22	1.3	16 38	3.6
40	7 1	17 28	0 28	1 32	7 5	1.5	16 54	3.3
35	6 53	17 36	0 26	1 26	6 51	1.7	17 7	3.2
30	6 46	17 43	0 25	1 21	6 39	1.8	17 18	3.0
20	6 33	17 56	0 23	1 15	6 17	2.1	17 38	2.8
10	6 21	18 7	0 22	1 12	5 59	2.3	17 54	2.5
0	6 11	18 18	0 21	1 11	5 41	2.4	18 10	2.3
10	5 60	18 28	0 22	1 13	5 24	2.6	18 25	2.1
20	5 48	18 40	0 23	1 18	5 5	2.8	18 41	1.9
30	5 35	18 53	0 25	1 27	4 43	3.1	18 59	1.7
35	5 27	19 1	0 27	1 33	4 30	3.2	19 10	1.5
40	5 18	19 10	0 29	1 43	4 15	3.4	19 22	1.4
45	5 7	19 20	0 32	1 56	3 58	3.6	19 36	1.2
50	4 54	19 33	0 36	2 18	3 36	3.9	19 53	.9
55	4 38	19 49	0 43	3 0	3 7	4.3	20 15	.6
60	4 16	20 11	0 52	3 58	2 24	4.9	20 44	.1
S								

UT	MESEC				JUPITER				SATURN							
	S <sub>♃</sub>		Δ		δ <sub>♃</sub>		Δ		S <sub>♃</sub>		δ <sub>♃</sub>		S <sub>♄</sub>		δ <sub>♄</sub>	
h	°	'	°	'	°	'	°	'	°	'	°	'	°	'	°	'
0	188	25.6	38	-23	32.9	105	300	17.5	-6	1.3	24	29.3	21	42.4		
2	217	11.2	40	-23	12.0	108	330	22.5	-6	1.3	54	34.6	21	42.5		
4	245	57.2	42	-22	50.4	111	0	27.5	-6	1.2	84	39.9	21	42.6		
6	274	43.6	44	-22	28.2	114	30	32.5	-6	1.2	114	45.2	21	42.6		
8	303	30.5	47	-22	5.3	117	60	37.5	-6	1.1	144	50.5	21	42.7		
10	332	17.8	49	-21	41.9	120	90	42.5	-6	1.1	174	55.7	21	42.7		
12	1	5.6	51	-21	17.8	123	120	47.5	-6	1.0	205	1.0	21	42.8		
14	29	53.9	54	-20	53.2	126	150	52.6	-6	.9	235	6.3	21	42.9		
16	58	42.6	56	-20	28.1	128	180	57.6	-6	.9	265	11.6	21	42.9		
18	87	31.7	58	-20	2.4	131	211	2.6	-6	.8	295	16.9	21	43.0		
20	116	21.4	61	-19	36.1	134	241	7.6	-6	.8	325	22.2	21	43.1		
22	145	11.5	63	-19	9.4	136	271	12.6	-6	.7	355	27.4	21	43.1		
Δ								25		0		26		0		

SUNCE				MESEC					
UT	e = T <sub>p</sub> - UT	Δ/24	r	Prolaz	Δ/24	π <sub>☾</sub>	r		
h	min	s	s	h min	min	'	'		
00	-14	10.8	.1	16.2	T <sub>m</sub>	11 55	2.4	61.1	16.7
12	-14	11.9	T <sub>m☉</sub>	12 h 14.2 min	Starost	28.5 d	Faza	●	
PLANETE									
Pl.	T <sub>m</sub>	π	360-α	Vel.	Pl.	T <sub>m</sub>	π	360-α	Vel.
♀	h min	'	°		♃	h min	'	°	
♂	11 25	.1	51	-3.8	♄	3 58	.0	162	-2.1
	8 51	.1	89	1.3	♅	22 18	.0	246	-2.2

9. FEBRUAR

SREDA

UT	SUNCE				PROLEĆ. TAČKA S <sub>γ</sub>	VENERA				MARS				
	S <sub>☉</sub>		δ <sub>☉</sub>			S <sub>♀</sub>		δ <sub>♀</sub>		S <sub>♂</sub>		δ <sub>♂</sub>		
h	°	'	°	'	°	'	°	'	°	'	°	'		
0	176	26.7	-14	42.6	139	10.9	188	35.5	-19	5.6	227	27.8	-23	44.8
2	206	26.7	-14	41.0	169	15.8	218	34.0	-19	4.2	257	28.9	-23	44.8
4	236	26.6	-14	39.4	199	20.8	248	32.5	-19	2.7	287	30.0	-23	44.8
6	266	26.6	-14	37.8	229	25.7	278	31.0	-19	1.2	317	31.0	-23	44.8
8	296	26.6	-14	36.2	259	30.6	308	29.5	-18	59.7	347	32.1	-23	44.8
10	326	26.5	-14	34.6	289	35.5	338	28.0	-18	58.3	17	33.2	-23	44.9
12	356	26.5	-14	32.9	319	40.5	8	26.5	-18	56.8	47	34.2	-23	44.9
14	26	26.5	-14	31.3	349	45.4	38	25.0	-18	55.3	77	35.3	-23	44.9
16	56	26.4	-14	29.7	19	50.3	68	23.5	-18	53.8	107	36.3	-23	44.9
18	86	26.4	-14	28.1	49	55.3	98	22.0	-18	52.3	137	37.4	-23	44.9
20	116	26.4	-14	26.5	80	.2	128	20.5	-18	50.8	167	38.5	-23	44.9
22	146	26.4	-14	24.9	110	5.1	158	19.0	-18	49.3	197	39.5	-23	44.9
Δ		0		8				-8		7		5		0

φ	SUNCE		TRAJANJE SUMRAKA		MESEC			
	IZLAZ	ZALAZ	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	16 36	0 45	2 23	8 50	.0	17 14	4.5
55	7 35	16 54	0 39	2 4	8 26	.5	17 35	4.0
50	7 21	17 8	0 34	1 50	8 8	.8	17 51	3.7
45	7 10	17 19	0 31	1 39	7 53	1.0	18 4	3.4
40	7 0	17 29	0 28	1 32	7 41	1.2	18 14	3.2
35	6 52	17 37	0 26	1 26	7 31	1.4	18 23	3.0
30	6 45	17 44	0 25	1 21	7 22	1.6	18 31	2.9
20	6 32	17 56	0 23	1 15	7 6	1.8	18 44	2.6
10	6 21	18 7	0 22	1 12	6 53	2.0	18 55	2.4
0	6 11	18 18	0 21	1 11	6 40	2.2	19 6	2.2
10	6 0	18 28	0 22	1 13	6 27	2.5	19 16	1.9
20	5 49	18 39	0 23	1 17	6 13	2.7	19 27	1.7
30	5 36	18 53	0 25	1 26	5 57	2.9	19 40	1.5
35	5 28	19 0	0 27	1 33	5 48	3.1	19 47	1.3
40	5 19	19 9	0 29	1 42	5 37	3.3	19 55	1.2
45	5 9	19 19	0 32	1 56	5 24	3.5	20 4	1.0
50	4 56	19 31	0 36	2 16	5 9	3.8	20 15	.7
55	4 40	19 47	0 42	2 57	4 49	4.1	20 29	.4
60	4 19	20 8	0 52	3 58	4 22	4.6	20 47	.0
S								

UT	MESEC				JUPITER				SATURN							
	S <sub>♃</sub>		Δ		δ <sub>♃</sub>		Δ		S <sub>♃</sub>		δ <sub>♃</sub>		S <sub>♄</sub>		δ <sub>♄</sub>	
h	°	'	°	'	°	'	°	'	°	'	°	'	°	'	°	'
0	174	2.1	65	-18	42.2	138	301	17.7	-6	.6	25	32.7	21	43.2		
2	202	53.1	68	-18	14.6	140	331	22.7	-6	.6	55	38.0	21	43.2		
4	231	44.7	70	-17	46.5	143	1	27.7	-6	.5	85	43.3	21	43.3		
6	260	36.7	72	-17	17.9	145	31	32.7	-6	.5	115	48.6	21	43.4		
8	289	29.1	75	-16	49.0	147	61	37.8	-6	.4	145	53.9	21	43.4		
10	318	22.0	77	-16	19.7	148	91	42.8	-6	.3	175	59.1	21	43.5		
12	347	15.4	79	-15	50.0	150	121	47.8	-6	.3	206	4.4	21	43.6		
14	16	9.2	81	-15	20.0	152	151	52.8	-6	.2	236	9.7	21	43.6		
16	45	3.5	84	-14	49.6	153	181	57.9	-6	.1	266	15.0	21	43.7		
18	73	58.2	86	-14	18.9	155	212	2.9	-6	.1	296	20.2	21	43.7		
20	102	53.3	88	-13	48.0	156	242	7.9	-6	.0	326	25.5	21	43.8		
22	131	48.9	90	-13	16.7	158	272	13.0	-5	59.9	356	30.8	21	43.9		
Δ								25		0		26		0		

SUNCE				MESEC			
UT	e = T <sub>p</sub> - UT	Δ/24	r	Prolaz	Δ/24	π <sub>☾</sub>	r
h	min	s</					



UT	SUNCE		PROLEĆ. TAČKA S <sub>γ</sub>	VENERA		MARS	
	S <sub>☉</sub>	δ <sub>☉</sub>		S <sub>♀</sub>	δ <sub>♀</sub>	S <sub>♂</sub>	δ <sub>♂</sub>
h	° / ' / "	° / ' / "	° / ' / "	° / ' / "	° / ' / "	° / ' / "	° / ' / "
0	176 26.3 -14 23.2		140 10.0	188 17.5 -18 47.8		227 40.6 -23 45.0	
2	206 26.3 -14 21.6		170 15.0	218 16.0 -18 46.3		257 41.7 -23 45.0	
4	236 26.3 -14 20.0		200 19.9	248 14.5 -18 44.8		287 42.7 -23 45.0	
6	266 26.3 -14 18.4		230 24.8	278 13.0 -18 43.3		317 43.8 -23 45.0	
8	296 26.3 -14 16.7		260 29.7	308 11.5 -18 41.7		347 44.8 -23 45.0	
10	326 26.3 -14 15.1		290 34.7	338 10.1 -18 40.2		17 45.9 -23 45.0	
12	356 26.2 -14 13.5		320 39.6	8 8.6 -18 38.7		47 47.0 -23 45.0	
14	26 26.2 -14 11.8		350 44.5	38 7.1 -18 37.1		77 48.0 -23 45.0	
16	56 26.2 -14 10.2		20 49.5	68 5.6 -18 35.6		107 49.1 -23 45.0	
18	86 26.2 -14 8.6		50 54.4	98 4.1 -18 34.1		137 50.1 -23 45.0	
20	116 26.2 -14 6.9		80 59.3	128 2.7 -18 32.5		167 51.2 -23 44.9	
22	146 26.2 -14 5.3		111 4.2	158 1.2 -18 31.0		197 52.3 -23 44.9	
Δ	0	8		-7	8	5	0

φ	SUNCE		TRAJANJE SUMRAKA		MESEC			
	IZLAZ	ZALAZ	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 51	16 38	0 45	2 23	8 51	.0	19 1	4.2
55	7 33	16 56	0 38	2 3	8 38	.4	19 11	3.8
50	7 19	17 10	0 34	1 50	8 27	.7	19 19	3.5
45	7 8	17 21	0 31	1 39	8 18	.9	19 26	3.2
40	6 59	17 30	0 28	1 32	8 11	1.1	19 31	3.0
35	6 51	17 38	0 26	1 26	8 5	1.2	19 36	2.9
30	6 44	17 45	0 25	1 21	7 59	1.4	19 40	2.7
20	6 32	17 57	0 23	1 15	7 50	1.6	19 46	2.5
10	6 21	18 8	0 22	1 12	7 42	1.9	19 52	2.2
0	6 11	18 18	0 21	1 11	7 34	2.1	19 58	2.0
10	6 0	18 28	0 22	1 13	7 26	2.3	20 3	1.8
20	5 49	18 39	0 23	1 17	7 17	2.5	20 9	1.6
30	5 36	18 52	0 25	1 26	7 7	2.8	20 15	1.3
35	5 29	18 59	0 27	1 33	7 2	2.9	20 18	1.2
40	5 20	19 8	0 29	1 42	6 55	3.1	20 22	1.0
45	5 10	19 18	0 32	1 55	6 48	3.3	20 27	.8
50	4 58	19 30	0 36	2 15	6 39	3.6	20 33	.6
55	4 42	19 45	0 42	2 53	6 27	3.9	20 39	.3
60	4 21	20 5	0 51	: : :	6 12	4.3	20 48	.0
S								

UT	MESEC				JUPITER		SATURN	
	S <sub>♃</sub>	Δ	δ <sub>♃</sub>	Δ	S <sub>♃</sub>	δ <sub>♃</sub>	S <sub>♄</sub>	δ <sub>♄</sub>
h	° / ' / "	° / ' / "	° / ' / "	° / ' / "	° / ' / "	° / ' / "	° / ' / "	° / ' / "
0	160 44.9 92 -12 45.2	159	302 18.0 - 5 59.9		26 36.1	21 43.9		
2	189 41.2 94 -12 13.5	160	332 23.1 - 5 59.8		56 41.4	21 44.0		
4	218 38.0 96 -11 41.5	161	2 28.1 - 5 59.7		86 46.6	21 44.0		
6	247 35.2 98 -11 9.3	162	32 33.1 - 5 59.7		116 51.9	21 44.1		
8	276 32.8 100 -10 36.9	163	62 38.2 - 5 59.6		146 57.2	21 44.2		
10	305 30.7 102 -10 4.4	163	92 43.2 - 5 59.5		177 2.5	21 44.2		
12	334 29.0 103 - 9 31.7	164	122 48.3 - 5 59.5		207 7.7	21 44.3		
14	3 27.7 105 - 8 58.9	165	152 53.3 - 5 59.4		237 13.0	21 44.3		
16	32 26.7 107 - 8 25.9	165	182 58.4 - 5 59.3		267 18.3	21 44.4		
18	61 26.0 108 - 7 52.8	166	213 3.4 - 5 59.3		297 23.5	21 44.5		
20	90 25.7 110 - 7 19.6	166	243 8.5 - 5 59.2		327 28.8	21 44.5		
22	119 25.7 111 - 6 46.4	167	273 13.5 - 5 59.1		357 34.1	21 44.6		
Δ			25	0	26	0		

SUNCE				MESEC					
UT	e = T <sub>p</sub> - UT	Δ/24	r	Prolaz	Δ/24	π <sub>☾</sub>	r		
h	min s	s	'	h min	min	'	'		
00	-14 14.4	.0	16.2	T <sub>m</sub>	13 46	2.0	60.5 16.5		
12	-14 14.8	T <sub>m☉</sub>	12 h 14.3 min	Starost	1.1 d	Faza	●		
PLANETE									
Pl.	T <sub>m</sub>	π	360-α	Vel.	Pl.	T <sub>m</sub>	π	360-α	Vel.
♀	h min	'	°		♃	h min	'	°	
♂	11 27	.1	48	-3.8	♄	3 50	.0	162	-2.1
	8 49	.1	88	1.3	♅	22 10	.0	246	-2.2

UT	SUNCE		PROLEĆ. TAČKA S <sub>γ</sub>	VENERA		MARS	
	S <sub>☉</sub>	δ <sub>☉</sub>		S <sub>♀</sub>	δ <sub>♀</sub>	S <sub>♂</sub>	δ <sub>♂</sub>
h	° / ' / "	° / ' / "	° / ' / "	° / ' / "	° / ' / "	° / ' / "	° / ' / "
0	176 26.2 -14 3.6		141 9.2	187 59.7 -18 29.4		227 53.3 -23 44.9	
2	206 26.2 -14 2.0		171 14.1	217 58.3 -18 27.9		257 54.4 -23 44.9	
4	236 26.2 -14 .3		201 19.0	247 56.8 -18 26.3		287 55.4 -23 44.9	
6	266 26.2 -13 58.7		231 24.0	277 55.3 -18 24.8		317 56.5 -23 44.9	
8	296 26.2 -13 57.0		261 28.9	307 53.9 -18 23.2		347 57.6 -23 44.9	
10	326 26.2 -13 55.4		291 33.8	337 52.4 -18 21.6		17 58.6 -23 44.9	
12	356 26.2 -13 53.7		321 38.7	7 51.0 -18 20.0		47 59.7 -23 44.8	
14	26 26.2 -13 52.1		351 43.7	37 49.5 -18 18.5		78 .7 -23 44.8	
16	56 26.2 -13 50.4		21 48.6	67 48.1 -18 16.9		108 1.8 -23 44.8	
18	86 26.2 -13 48.8		51 53.5	97 46.6 -18 15.3		138 2.9 -23 44.8	
20	116 26.2 -13 47.1		81 58.5	127 45.2 -18 13.7		168 3.9 -23 44.7	
22	146 26.2 -13 45.5		112 3.4	157 43.7 -18 12.1		198 5.0 -23 44.7	
Δ	0	8		-7	8	5	0

φ	SUNCE		TRAJANJE SUMRAKA		MESEC			
	IZLAZ	ZALAZ	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 49	16 41	0 45	2 22	8 51	.0	20 41	4.0
55	7 31	16 58	0 38	2 3	8 46	.3	20 42	3.6
50	7 18	17 12	0 34	1 49	8 43	.6	20 43	3.3
45	7 7	17 22	0 30	1 39	8 40	.8	20 44	3.1
40	6 58	17 31	0 28	1 31	8 37	1.0	20 44	2.9
35	6 50	17 39	0 26	1 25	8 35	1.2	20 44	2.8
30	6 43	17 46	0 25	1 21	8 33	1.3	20 45	2.6
20	6 31	17 57	0 23	1 15	8 29	1.5	20 45	2.4
10	6 21	18 8	0 22	1 11	8 26	1.8	20 46	2.1
0	6 11	18 18	0 21	1 11	8 23	2.0	20 46	1.9
10	6 1	18 28	0 22	1 13	8 21	2.2	20 46	1.7
20	5 50	18 38	0 23	1 17	8 18	2.4	20 47	1.5
30	5 37	18 51	0 25	1 26	8 14	2.7	20 47	1.3
35	5 30	18 58	0 27	1 32	8 12	2.8	20 47	1.1
40	5 21	19 6	0 29	1 41	8 10	3.0	20 47	1.0
45	5 12	19 16	0 32	1 54	8 7	3.2	20 47	.8
50	4 60	19 28	0 36	2 14	8 4	3.4	20 47	.6
55	4 44	19 43	0 42	2 50	8 0	3.7	20 48	.3
60	4 24	20 3	0 51	: : :	7 55	4.1	20 48	.0
S								

UT	MESEC				JUPITER		SATURN	
	S <sub>♃</sub>	Δ	δ <sub>♃</sub>	Δ	S <sub>♃</sub>	δ <sub>♃</sub>	S <sub>♄</sub>	δ <sub>♄</sub>
h	° / ' / "	° / ' / "	° / ' / "	° / ' / "	° / ' / "	° / ' / "	° / ' / "	° / ' / "
0	148 25.9 113 - 6 13.1	167	303 18.6 - 5 59.0		27 39.4	21 44.6		
2	177 26.5 114 - 5 39.7	167	333 23.6 - 5 59.0		57 44.6	21 44.7		
4	206 27.4 116 - 5 6.3	167	3 28.7 - 5 58.9		87 49.9	21 44.8		
6	235 28.5 117 - 4 32.9	167	33 33.7 - 5 58.8		117 55.2	21 44.8		
8	264 29.9 118 - 3 59.4	167	63 38.8 - 5 58.7		148 .4	21 44.9		
10	293 31.5 119 - 3 26.0	167	93 43.8 - 5 58.7		178 5.7	21 44.9		
12	322 33.4 121 - 2 52.6	167	123 48.9 - 5 58.6		208 11.0	21 45.0		
14	351 35.5 122 - 2 19.2	167	153 54.0 - 5 58.5		238 16.2	21 45.1		
16	20 37.9 123 - 1 45.9	166	183 59.0 - 5 58.4		268 21.5	21 45.1		
18	49 40.4 124 - 1 12.6	166	214 4.1 - 5 58.4		298 26.8	21 45.2		
20	78 43.1 125 - 0 39.4	166	244 9.1 - 5 58.3		328 32.0	21 45.2		
22	107 46.1 125 - 0 6.2	165	274 14.2 - 5 58.2		358 37.3	21 45.3		
Δ			25	0	26	0		

SUNCE				MESEC					
UT	e = T <sub>p</sub> - UT	Δ/24	r	Prolaz	Δ/24	π <sub>☾</sub>	r		
h	min s	s	'	h min	min	'	'		
00	-14 15.1	.0	16.2	T <sub>m</sub>	14 35	2.0	59.7 16.3		
12	-14 15.0	T <sub>m☉</sub>	12 h 14.3 min	Starost	2.1 d	Faza	●		
PLANETE									
Pl.	T <sub>m</sub>	π	360-α	Vel.	Pl.	T <sub>m</sub>	π	360-α	Vel.
♀	h min	'	°		♃	h min	'	°	
♂	11 29	.1	47	-3.8	♄	3 46	.0	162	-2.1
	8 48	.1	87	1.3	♅	22 5	.0	247	-2.2

UT	SUNCE				PROLEĆ. TAČKA S <sub>γ</sub>	VENERA				MARS					
	S <sub>☉</sub>		δ <sub>☉</sub>			S <sub>♀</sub>		δ <sub>♀</sub>		S <sub>♂</sub>		δ <sub>♂</sub>			
h	°	'	°	'	°	'	°	'	°	'	°	'			
0	176	26.2	-13	43.8	142	8.3	187	42.3	-18	10.5	228	6.0	-23	44.7	
2	206	26.2	-13	42.1	172	13.2	217	40.8	-18	8.9	258	7.1	-23	44.6	
4	236	26.2	-13	40.5	202	18.2	247	39.4	-18	7.3	288	8.1	-23	44.6	
6	266	26.3	-13	38.8	232	23.1	277	38.0	-18	5.7	318	9.2	-23	44.6	
8	296	26.3	-13	37.1	262	28.0	307	36.5	-18	4.1	348	10.3	-23	44.5	
10	326	26.3	-13	35.5	292	33.0	337	35.1	-18	2.5	18	11.3	-23	44.5	
12	356	26.3	-13	33.8	322	37.9	7	33.7	-18	.9	48	12.4	-23	44.5	
14	26	26.3	-13	32.1	352	42.8	37	32.2	-17	59.3	78	13.4	-23	44.4	
16	56	26.4	-13	30.5	22	47.7	67	30.8	-17	57.6	108	14.5	-23	44.4	
18	86	26.4	-13	28.8	52	52.7	97	29.4	-17	56.0	138	15.5	-23	44.3	
20	116	26.4	-13	27.1	82	57.6	127	28.0	-17	54.4	168	16.6	-23	44.3	
22	146	26.4	-13	25.4	113	2.5	157	26.5	-17	52.8	198	17.7	-23	44.2	
Δ		0		8				-7		8			5		0

φ	SUNCE		TRAJANJE SUMRAKA		MESEC			
	IZLAZ	ZALAZ	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 46	16 43	0 45	2 22	8 51	.0	22 18	3.9
55	7 29	17 0	0 38	2 3	8 54	.3	22 10	3.6
50	7 16	17 13	0 34	1 49	8 57	.6	22 3	3.3
45	7 5	17 24	0 30	1 39	8 59	.8	21 58	3.0
40	6 57	17 32	0 28	1 31	9 1	1.0	21 54	2.8
35	6 49	17 40	0 26	1 25	9 2	1.1	21 51	2.7
30	6 42	17 46	0 25	1 21	9 4	1.3	21 47	2.5
20	6 31	17 58	0 23	1 15	9 6	1.5	21 42	2.3
10	6 21	18 8	0 22	1 11	9 8	1.7	21 37	2.1
0	6 11	18 18	0 21	1 11	9 11	1.9	21 32	1.9
10	6 1	18 27	0 22	1 12	9 13	2.1	21 28	1.7
20	5 50	18 38	0 23	1 17	9 15	2.3	21 23	1.5
30	5 38	18 50	0 25	1 26	9 18	2.6	21 17	1.3
35	5 31	18 57	0 27	1 32	9 19	2.7	21 14	1.2
40	5 23	19 5	0 29	1 41	9 21	2.9	21 11	1.0
45	5 13	19 15	0 32	1 54	9 23	3.1	21 7	.8
50	5 1	19 26	0 36	2 13	9 26	3.3	21 2	.6
55	4 47	19 41	0 41	2 47	9 29	3.6	20 55	.3
60	4 27	19 60	0 50	: : :	9 33	4.0	20 48	.0
S								

UT	MESEC				JUPITER				SATURN						
	S <sub>♃</sub>		Δ	δ <sub>♃</sub>	Δ	S <sub>♃</sub>		δ <sub>♃</sub>	S <sub>♄</sub>		δ <sub>♄</sub>				
h	°	'	°	'	°	'	°	'	°	'	°	'			
0	136	49.1	126	0	26.8	165	304	19.3	-5	58.1	28	42.6	21	45.4	
2	165	52.4	127	0	59.8	164	334	24.3	-5	58.0	58	47.8	21	45.4	
4	194	55.8	128	1	32.6	164	4	29.4	-5	58.0	88	53.1	21	45.5	
6	223	59.4	128	2	5.4	163	34	34.5	-5	57.9	118	58.3	21	45.5	
8	253	3.1	129	2	37.9	162	64	39.5	-5	57.8	149	3.6	21	45.6	
10	282	6.9	130	3	10.4	161	94	44.6	-5	57.7	179	8.9	21	45.6	
12	311	10.8	130	3	42.7	161	124	49.7	-5	57.6	209	14.1	21	45.7	
14	340	14.9	131	4	14.8	160	154	54.8	-5	57.6	239	19.4	21	45.8	
16	9	19.0	131	4	46.8	159	184	59.8	-5	57.5	269	24.6	21	45.8	
18	38	23.2	131	5	18.6	158	215	4.9	-5	57.4	299	29.9	21	45.9	
20	67	27.5	132	5	50.1	157	245	10.0	-5	57.3	329	35.2	21	45.9	
22	96	31.9	132	6	21.5	156	275	15.1	-5	57.2	359	40.4	21	46.0	
Δ								25		0			26		0

SUNCE				MESEC					
UT	e = T <sub>p</sub> - UT	Δ/24	r	Prolaz	Δ/24	π <sub>☾</sub>	r		
h	min	s	'	h min	min	'	'		
00	-14	14.9	.0	16.2	T <sub>m</sub>	15 22	1.9	58.9	16.0
12	-14	14.5	T <sub>m☉</sub>	12 h 14.2 min	Starost	3.1 d	Faza	☉	
PLANETE									
Pl.	T <sub>m</sub>	π	360-α	Vel.	Pl.	T <sub>m</sub>	π	360-α	Vel.
♀	h min	'	°		♃	h min	'	°	
♂	11 30	.1	46	-3.8	♄	3 42	.0	162	-2.1
	8 47	.1	86	1.3	♅	22 1	.0	247	-2.2

UT	SUNCE				PROLEĆ. TAČKA S <sub>γ</sub>	VENERA				MARS					
	S <sub>☉</sub>		δ <sub>☉</sub>			S <sub>♀</sub>		δ <sub>♀</sub>		S <sub>♂</sub>		δ <sub>♂</sub>			
h	°	'	°	'	°	'	°	'	°	'	°	'			
0	176	26.4	-13	23.7	143	7.5	187	25.1	-17	51.1	228	18.7	-23	44.2	
2	206	26.5	-13	22.1	173	12.4	217	23.7	-17	49.5	258	19.8	-23	44.2	
4	236	26.5	-13	20.4	203	17.3	247	22.3	-17	47.8	288	20.8	-23	44.1	
6	266	26.5	-13	18.7	233	22.2	277	20.9	-17	46.2	318	21.9	-23	44.0	
8	296	26.6	-13	17.0	263	27.2	307	19.5	-17	44.5	348	22.9	-23	44.0	
10	326	26.6	-13	15.3	293	32.1	337	18.0	-17	42.9	18	24.0	-23	43.9	
12	356	26.6	-13	13.6	323	37.0	7	16.6	-17	41.2	48	25.1	-23	43.9	
14	26	26.7	-13	11.9	353	41.9	37	15.2	-17	39.6	78	26.1	-23	43.8	
16	56	26.7	-13	10.2	23	46.9	67	13.8	-17	37.9	108	27.2	-23	43.8	
18	86	26.7	-13	8.6	53	51.8	97	12.4	-17	36.2	138	28.2	-23	43.7	
20	116	26.8	-13	6.9	83	56.7	127	11.0	-17	34.6	168	29.3	-23	43.6	
22	146	26.8	-13	5.2	114	1.7	157	9.6	-17	32.9	198	30.3	-23	43.6	
Δ		0		8				-7		8			5		0

φ	SUNCE		TRAJANJE SUMRAKA		MESEC			
	IZLAZ	ZALAZ	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 43	16 46	0 44	2 21	8 51	.0	23 52	3.9
55	7 27	17 3	0 38	2 3	8 52	.4	23 35	3.5
50	7 14	17 15	0 34	1 49	9 11	.6	23 22	3.2
45	7 4	17 25	0 30	1 39	9 18	.9	23 11	3.0
40	6 55	17 34	0 28	1 31	9 24	1.0	23 2	2.8
35	6 48	17 41	0 26	1 25	9 30	1.2	22 55	2.6
30	6 42	17 47	0 25	1 21	9 34	1.3	22 49	2.5
20	6 30	17 58	0 23	1 14	9 42	1.5	22 37	2.3
10	6 20	18 8	0 22	1 11	9 50	1.7	22 27	2.1
0	6 11	18 18	0 21	1 11	9 57	1.9	22 18	1.9
10	6 1	18 27	0 22	1 12	10 3	2.1	22 9	1.8
20	5 51	18 37	0 23	1 17	10 11	2.3	21 59	1.6
30	5 39	18 49	0 25	1 25	10 20	2.5	21 48	1.4
35	5 32	18 56	0 27	1 32	10 25	2.7	21 42	1.2
40	5 24	19 4	0 29	1 41	10 30	2.8	21 35	1.1
45	5 14	19 13	0 32	1 53	10 37	3.0	21 26	.9
50	5 3	19 24	0 36	2 12	10 45	3.2	21 16	.7
55	4 49	19 38	0 41	2 45	10 55	3.5	21 4	.4
60	4 30	19 57	0 50	: : :	11 8	3.9	20 48	.0
S								

UT	MESEC				JUPITER				SATURN						
	S <sub>♃</sub>		Δ	δ <sub>♃</sub>	Δ	S <sub>♃</sub>		δ <sub>♃</sub>	S <sub>♄</sub>		δ <sub>♄</sub>				
h	°	'	°	'	°	'	°	'	°	'	°	'			
0	125	36.3	132	6	52.7	155	305	20.2	-5	57.1	29	45.7	21	46.1	
2	154	40.7	132	7	23.7	154	335	25.2	-5	57.1	59	50.9	21	46.1	
4	183	45.2	133	7	54.4	153	5	30.3	-5	57.0	89	56.2	21	46.2	
6	212	49.7	133	8	24.9	151	35	35.4	-5	56.9	120	1.4	21	46.2	
8	241	54.2	133	8	55.2	150	65	40.5	-5	56.8	150	6.7	21	46.3	
10	270	58.8	133	9	25.2	149	95	45.6	-5	56.7	180	12.0	21	46.3	
12	300	3.3	133	9	55.0	147	125	50.7	-5	56.6	210	17.2	21	46.4	
14	329	7.9	133	10	24.4	146	155	55.8	-5	56.5	240	22.5	21	46.4	
16	358	12.4	132	10	53.7	145	186	.8	-5	56.5	270	27.7	21	46.5	
18	27	16.9	132	11	22.6	143	216	5.9	-5	56.4	300	33.0	21	46.6	
20	56	21.3	132	11	51.3	142	246	11.0	-5	56.3	330	38.2	21	46.6	
22	85	25.8	132	12	19.6	140	276	16.1	-5	56.2	0	43.5	21	46.7	
Δ								25		0			26		0

SUNCE				MESEC			
UT	e = T <sub>p</sub> - UT	Δ/24	r	Prolaz	Δ/24	π <sub>☾</sub>	r
h	min	s	'</				

UT	SUNCE				PROLEĆ. TAČKA S <sub>γ</sub>	VENERA				MARS				
	S <sub>☉</sub>		δ <sub>☉</sub>			S <sub>♀</sub>		δ <sub>♀</sub>		S <sub>♂</sub>		δ <sub>♂</sub>		
h	°	'	°	'	°	'	°	'	°	'	°	'		
0	176	26.9	-13	3.5	144	6.6	187	8.2	-17	31.2	228	31.4	-23	43.5
2	206	26.9	-13	1.8	174	11.5	217	6.9	-17	29.5	258	32.4	-23	43.4
4	236	27.0	-13	.1	204	16.4	247	5.5	-17	27.8	288	33.5	-23	43.4
6	266	27.0	-12	58.4	234	21.4	277	4.1	-17	26.1	318	34.5	-23	43.3
8	296	27.0	-12	56.7	264	26.3	307	2.7	-17	24.4	348	35.6	-23	43.2
10	326	27.1	-12	55.0	294	31.2	337	1.3	-17	22.7	378	36.7	-23	43.1
12	356	27.1	-12	53.2	324	36.2	6	59.9	-17	21.0	408	37.7	-23	43.1
14	26	27.2	-12	51.5	354	41.1	36	58.5	-17	19.3	438	38.8	-23	43.0
16	56	27.2	-12	49.8	24	46.0	66	57.2	-17	17.6	468	39.8	-23	42.9
18	86	27.3	-12	48.1	54	50.9	96	55.8	-17	15.9	498	40.9	-23	42.8
20	116	27.4	-12	46.4	84	55.9	126	54.4	-17	14.2	528	41.9	-23	42.7
22	146	27.4	-12	44.7	115	.8	156	53.0	-17	12.5	558	43.0	-23	42.7
Δ		0		9				-7		9		5		0

φ	SUNCE		TRAJANJE SUMRAKA		MESEC			
	IZLAZ	ZALAZ	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 41	16 49	0 44	2 21	8 51	.1	. . . .	.0
55	7 25	17 5	0 38	2 2	9 11	.5	. . . .	.0
50	7 12	17 17	0 34	1 49	9 26	.8	. . . .	.0
45	7 2	17 27	0 30	1 39	9 39	1.0	. . . .	.0
40	6 54	17 35	0 28	1 31	9 49	1.1	. . . .	.0
35	6 47	17 42	0 26	1 25	9 58	1.3	23 59	2.6
30	6 41	17 48	0 24	1 21	10 6	1.4	23 49	2.5
20	6 30	17 59	0 23	1 14	10 19	1.6	23 32	2.3
10	6 20	18 8	0 21	1 11	10 31	1.8	23 18	2.1
0	6 11	18 18	0 21	1 10	10 42	2.0	23 5	2.0
10	6 1	18 27	0 22	1 12	10 54	2.1	22 51	1.8
20	5 51	18 37	0 23	1 17	11 6	2.3	22 37	1.7
30	5 40	18 48	0 25	1 25	11 20	2.5	22 21	1.5
35	5 33	18 55	0 27	1 31	11 28	2.6	22 11	1.4
40	5 25	19 3	0 29	1 40	11 38	2.8	22 1	1.2
45	5 16	19 12	0 31	1 52	11 49	3.0	21 48	1.1
50	5 5	19 22	0 35	2 10	12 2	3.2	21 33	.8
55	4 51	19 36	0 41	2 42	12 20	3.5	21 14	.6
60	4 32	19 54	0 49	: : :	12 43	4.0	20 48	.1
S								

UT	MESEC				JUPITER				SATURN							
	S <sub>♃</sub>		Δ		δ <sub>♃</sub>		Δ		S <sub>♃</sub>		δ <sub>♃</sub>		S <sub>♄</sub>		δ <sub>♄</sub>	
h	°	'	°	'	°	'	°	'	°	'	°	'	°	'	°	'
0	114	30.2	132	12	47.7	139	306	21.2	-5	56.1	30	48.7	21	46.7		
2	143	34.5	131	13	15.4	137	336	26.3	-5	56.0	60	54.0	21	46.8		
4	172	38.7	131	13	42.9	136	6	31.4	-5	55.9	90	59.2	21	46.8		
6	201	42.9	131	14	10.0	134	36	36.5	-5	55.8	121	4.5	21	46.9		
8	230	47.1	130	14	36.8	132	66	41.6	-5	55.7	151	9.7	21	47.0		
10	259	51.1	130	15	3.2	131	96	46.7	-5	55.6	181	15.0	21	47.0		
12	288	55.0	129	15	29.4	129	126	51.8	-5	55.6	211	20.2	21	47.1		
14	317	58.9	129	15	55.1	127	156	56.9	-5	55.5	241	25.5	21	47.1		
16	347	2.6	128	16	20.5	125	187	2.0	-5	55.4	271	30.7	21	47.2		
18	16	6.3	128	16	45.6	123	217	7.1	-5	55.3	301	35.9	21	47.2		
20	45	9.8	127	17	10.3	122	247	12.2	-5	55.2	331	41.2	21	47.3		
22	74	13.3	127	17	34.6	120	277	17.3	-5	55.1	361	46.4	21	47.3		
Δ							26			0		26			0	

SUNCE				MESEC					
UT	e = T <sub>p</sub> - UT	Δ/24	r	Prolaz	Δ/24	π <sub>☉</sub>	r		
h	min	s	'	h min	min	'	'		
00	-14	12.4	.1	16.2	T <sub>m</sub>	16 53	2.0	57.0	15.5
12	-14	11.2	T <sub>m☉</sub>	12 h 14.2 min	Starost	5.1 d	Faza	☉	
PLANETE									
Pl.	T <sub>m</sub>	π	360-α	Vel.	Pl.	T <sub>m</sub>	π	360-α	Vel.
♀	h min	'	°		♃	h min	'	°	
♂	11 32	.1	43	-3.8	♃	3 34	.0	162	-2.1
	8 46	.1	84	1.3	♄	21 53	.0	247	-2.2

UT	SUNCE				PROLEĆ. TAČKA S <sub>γ</sub>	VENERA				MARS				
	S <sub>☉</sub>		δ <sub>☉</sub>			S <sub>♀</sub>		δ <sub>♀</sub>		S <sub>♂</sub>		δ <sub>♂</sub>		
h	°	'	°	'	°	'	°	'	°	'	°	'		
0	176	27.5	-12	43.0	145	5.7	186	51.7	-17	10.8	228	44.0	-23	42.6
2	206	27.5	-12	41.3	175	10.7	216	50.3	-17	9.1	258	45.1	-23	42.5
4	236	27.6	-12	39.5	205	15.6	246	48.9	-17	7.3	288	46.1	-23	42.4
6	266	27.6	-12	37.8	235	20.5	276	47.6	-17	5.6	318	47.2	-23	42.3
8	296	27.7	-12	36.1	265	25.4	306	46.2	-17	3.9	348	48.2	-23	42.2
10	326	27.8	-12	34.4	295	30.4	336	44.9	-17	2.1	378	49.3	-23	42.1
12	356	27.8	-12	32.7	325	35.3	6	43.5	-17	.4	408	50.4	-23	42.0
14	26	27.9	-12	30.9	355	40.2	36	42.1	-16	58.6	438	51.4	-23	41.9
16	56	28.0	-12	29.2	25	45.2	66	40.8	-16	56.9	468	52.5	-23	41.8
18	86	28.0	-12	27.5	55	50.1	96	39.4	-16	55.1	498	53.5	-23	41.7
20	116	28.1	-12	25.7	85	55.0	126	38.1	-16	53.4	528	54.6	-23	41.6
22	146	28.2	-12	24.0	115	59.9	156	36.7	-16	51.6	558	55.6	-23	41.5
Δ		0		9				-7		9		5		0

φ	SUNCE		TRAJANJE SUMRAKA		MESEC			
	IZLAZ	ZALAZ	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 38	16 51	0 44	2 21	8 52	.2	1 29	4.0
55	7 22	17 7	0 38	2 2	9 22	.7	1 0	3.5
50	7 11	17 19	0 33	1 49	9 45	1.0	0 39	3.1
45	7 1	17 28	0 30	1 39	10 2	1.2	0 23	2.9
40	6 53	17 36	0 28	1 31	10 16	1.3	0 10	2.7
35	6 46	17 43	0 26	1 25	10 29	1.4	. . . .	.0
30	6 40	17 49	0 24	1 20	10 39	1.5	. . . .	.0
20	6 29	17 59	0 22	1 14	10 58	1.7	. . . .	.0
10	6 20	18 9	0 21	1 11	11 14	1.9	. . . .	.0
0	6 11	18 18	0 21	1 10	11 29	2.0	23 52	2.1
10	6 2	18 27	0 22	1 12	11 45	2.2	23 35	1.9
20	5 52	18 36	0 23	1 16	12 1	2.3	23 17	1.8
30	5 40	18 47	0 25	1 25	12 20	2.5	22 56	1.6
35	5 34	18 54	0 26	1 31	12 32	2.6	22 44	1.5
40	5 26	19 1	0 29	1 40	12 44	2.7	22 30	1.4
45	5 17	19 10	0 31	1 52	12 60	2.9	22 14	1.3
50	5 7	19 21	0 35	2 9	13 19	3.1	21 53	1.1
55	4 53	19 34	0 41	2 40	13 43	3.4	21 27	.8
60	4 35	19 51	0 49	: : :	14 18	4.0	20 50	.2
S								

UT	MESEC				JUPITER				SATURN							
	S <sub>♃</sub>		Δ		δ <sub>♃</sub>		Δ		S <sub>♃</sub>		δ <sub>♃</sub>		S <sub>♄</sub>		δ <sub>♄</sub>	
h	°	'	°	'	°	'	°	'	°	'	°	'	°	'	°	'
0	103	16.6	126	17	58.6	118	307	22.5	-5	55.0	31	51.7	21	47.4		
2	132	19.7	125	18	22.1	116	337	27.6	-5	54.9	61	56.9	21	47.5		
4	161	22.8	125	18	45.3	114	7	32.7	-5	54.8	92	2.2	21	47.5		
6	190	25.7	124	19	8.1	112	37	37.8	-5	54.7	122	7.4	21	47.6		
8	219	28.5	123	19	30.5	110	67	42.9	-5	54.6	152	12.6	21	47.6		
10	248	31.1	122	19	52.4	108	97	48.0	-5	54.5	182	17.9	21	47.7		
12	277	33.6	122	20	14.0	106	127	53.1	-5	54.4	212	23.1	21	47.7		
14	306	35.9	121	20	35.1	104	157	58.3	-5	54.3	242	28.4	21	47.8		
16	335	38.1	120	20	55.9	102	188	3.4	-5	54.2	272	33.6	21	47.8		
18	4	40.2	119	21	16.2	99	218	8.5	-5	54.1	302	38.8	21	47.9		
20	33	42.1	119	21	36.0	97	248	13.6	-5	54.0	332	44.1	21	47.9		
22	62	43.8	118	21	55.5	95	278	18.7	-5	53.9	362	49.3	21	48.0		
Δ							26			0		26			0	

SUNCE				MESEC			
UT	e = T <sub>p</sub>						

UT	SUNCE				PROLEĆ. TAČKA		VENERA				MARS			
	$S_{\odot}$		$\delta_{\odot}$		$S_{\Upsilon}$		$S_{\zeta}$		$\delta_{\zeta}$		$S_{\sigma}$		$\delta_{\sigma}$	
h	°	'	°	'	°	'	°	'	°	'	°	'	°	'
0	176	28.3	-12	22.3	146	4.9	186	35.4	-16	49.9	228	56.7	-23	41.4
2	206	28.3	-12	20.6	176	9.8	216	34.1	-16	48.1	258	57.7	-23	41.3
4	236	28.4	-12	18.8	206	14.7	246	32.7	-16	46.3	288	58.8	-23	41.2
6	266	28.5	-12	17.1	236	19.7	276	31.4	-16	44.6	318	59.8	-23	41.1
8	296	28.6	-12	15.3	266	24.6	306	30.0	-16	42.8	349	.9	-23	41.0
10	326	28.6	-12	13.6	296	29.5	336	28.7	-16	41.0	19	1.9	-23	40.9
12	356	28.7	-12	11.9	326	34.4	6	27.4	-16	39.2	49	3.0	-23	40.8
14	26	28.8	-12	10.1	356	39.4	36	26.1	-16	37.5	79	4.0	-23	40.7
16	56	28.9	-12	8.4	26	44.3	66	24.7	-16	35.7	109	5.1	-23	40.5
18	86	29.0	-12	6.6	56	49.2	96	23.4	-16	33.9	139	6.1	-23	40.4
20	116	29.1	-12	4.9	86	54.2	126	22.1	-16	32.1	169	7.2	-23	40.3
22	146	29.1	-12	3.1	116	59.1	156	20.8	-16	30.3	199	8.2	-23	40.2
$\Delta$	0		9				-7		9		5		1	

UT	MESEC				JUPITER				SATURN					
	$S_{\zeta}$		$\Delta$	$\delta_{\zeta}$	$\Delta$	$S_{\mu}$		$\delta_{\mu}$		$S_{\eta}$		$\delta_{\eta}$		
h	°	'	°	'	°	'	°	'	°	'	°	'	°	'
0	91	45.4	117	22	14.4	93	308	23.9	-5	53.8	32	54.5	21	48.1
2	120	46.8	116	22	33.0	90	338	29.0	-5	53.7	62	59.8	21	48.1
4	149	48.0	116	22	51.1	88	8	34.1	-5	53.6	93	5.0	21	48.2
6	178	49.1	115	23	8.7	86	38	39.2	-5	53.5	123	10.2	21	48.2
8	207	50.1	114	23	25.9	84	68	44.4	-5	53.4	153	15.5	21	48.3
10	236	50.9	113	23	42.6	81	98	49.5	-5	53.3	183	20.7	21	48.3
12	265	51.5	112	23	58.8	79	128	54.6	-5	53.2	213	25.9	21	48.4
14	294	52.0	112	24	14.6	76	158	59.8	-5	53.1	243	31.2	21	48.4
16	323	52.3	111	24	29.8	74	189	4.9	-5	53.0	273	36.4	21	48.5
18	352	52.4	110	24	44.6	72	219	10.0	-5	52.9	303	41.6	21	48.5
20	21	52.5	109	24	58.9	69	249	15.2	-5	52.8	333	46.9	21	48.6
22	50	52.3	109	25	12.7	67	279	20.3	-5	52.7	3	52.1	21	48.6
$\Delta$							26		1		26		0	

$\varphi$	SUNCE		TRAJANJE SUMRAKA		MESEC			
	IZLAZ	ZALAZ	GRAĐ.	ASTR.	IZLAZ	$\Delta/24$	ZALAZ	$\Delta/24$
N	h min	h min	h min	h min	h min	min	h min	min
60	7 35	16 54	0 44	2 21	8 56	.4	3 4	3.9
55	7 20	17 9	0 38	2 2	9 38	1.0	2 23	3.3
50	7 9	17 20	0 33	1 49	10 7	1.2	1 55	3.0
45	6 59	17 29	0 30	1 38	10 30	1.4	1 33	2.8
40	6 52	17 37	0 28	1 31	10 48	1.6	1 16	2.7
35	6 45	17 44	0 26	1 25	11 3	1.7	1 2	2.5
30	6 39	17 50	0 24	1 20	11 16	1.7	0 49	2.5
20	6 29	17 60	0 22	1 14	11 39	1.9	0 28	2.3
10	6 19	18 9	0 21	1 11	11 59	2.0	0 9	2.2
0	6 11	18 17	0 21	1 10	12 18	2.1	...	.0
10	6 2	18 26	0 22	1 12	12 36	2.2	...	.0
20	5 52	18 36	0 23	1 16	12 56	2.3	...	.0
30	5 41	18 46	0 25	1 25	13 20	2.4	23 36	1.8
35	5 35	18 53	0 26	1 31	13 34	2.5	23 21	1.8
40	5 27	19 0	0 28	1 39	13 50	2.6	23 4	1.7
45	5 19	19 9	0 31	1 51	14 9	2.7	22 44	1.6
50	5 8	19 19	0 35	2 8	14 33	2.9	22 19	1.4
55	4 55	19 32	0 40	2 38	15 5	3.2	21 46	1.2
60	4 38	19 49	0 49	:::	15 54	3.8	20 56	.5
S								

SUNCE				MESEC					
UT	$e = T_p - UT$	$\Delta/24$	r	Prolaz	$\Delta/24$	$\pi_{\zeta}$	r		
h	min	s	s	h min	min	'	'		
00	-14	6.8	.2	16.2	$T_m$ 18 29	2.1	55.4	15.1	
12	-14	4.8	$T_{m\odot}$ 12 h 14.1 min	Starost 7.1 d	Faza ☉				
PLANETE									
Pl.	$T_m$	$\pi$	$360-\alpha$	Vel.	Pl.	$T_m$	$\pi$	$360-\alpha$	Vel.
♀	h min	'	°		♀	h min	'	°	
♂	11 34	.1	41	-3.8	♂	3 26	.0	162	-2.1
♂	8 44	.1	83	1.3	♂	21 45	.0	247	-2.2

UT	SUNCE				PROLEĆ. TAČKA		VENERA				MARS			
	$S_{\odot}$		$\delta_{\odot}$		$S_{\Upsilon}$		$S_{\zeta}$		$\delta_{\zeta}$		$S_{\sigma}$		$\delta_{\sigma}$	
h	°	'	°	'	°	'	°	'	°	'	°	'	°	'
0	176	29.2	-12	1.4	147	4.0	186	19.4	-16	28.5	229	9.3	-23	40.1
2	206	29.3	-11	59.6	177	8.9	216	18.1	-16	26.7	259	10.3	-23	39.9
4	236	29.4	-11	57.9	207	13.9	246	16.8	-16	24.9	289	11.4	-23	39.8
6	266	29.5	-11	56.1	237	18.8	276	15.5	-16	23.1	319	12.5	-23	39.7
8	296	29.6	-11	54.4	267	23.7	306	14.2	-16	21.3	349	13.5	-23	39.5
10	326	29.7	-11	52.6	297	28.6	336	12.9	-16	19.4	19	14.6	-23	39.4
12	356	29.8	-11	50.9	327	33.6	6	11.6	-16	17.6	49	15.6	-23	39.3
14	26	29.9	-11	49.1	357	38.5	36	10.3	-16	15.8	79	16.7	-23	39.1
16	56	30.0	-11	47.4	27	43.4	66	8.9	-16	14.0	109	17.7	-23	39.0
18	86	30.1	-11	45.6	57	48.4	96	7.6	-16	12.2	139	18.8	-23	38.9
20	116	30.2	-11	43.8	87	53.3	126	6.3	-16	10.3	169	19.8	-23	38.7
22	146	30.3	-11	42.1	117	58.2	156	5.1	-16	8.5	199	20.9	-23	38.6
$\Delta$	0		9				-7		9		5		1	

UT	MESEC				JUPITER				SATURN					
	$S_{\zeta}$		$\Delta$	$\delta_{\zeta}$	$\Delta$	$S_{\mu}$		$\delta_{\mu}$		$S_{\eta}$		$\delta_{\eta}$		
h	°	'	°	'	°	'	°	'	°	'	°	'	°	'
0	79	52.0	108	25	26.1	64	309	25.4	-5	52.6	33	57.3	21	48.7
2	108	51.6	107	25	38.9	62	339	30.6	-5	52.5	64	2.6	21	48.7
4	137	51.1	107	25	51.2	59	9	35.7	-5	52.3	94	7.8	21	48.8
6	166	50.4	106	26	3.0	57	39	40.9	-5	52.2	124	13.0	21	48.8
8	195	49.5	105	26	14.3	54	69	46.0	-5	52.1	154	18.2	21	48.9
10	224	48.6	105	26	25.1	51	99	51.1	-5	52.0	184	23.5	21	49.0
12	253	47.5	104	26	35.3	49	129	56.3	-5	51.9	214	28.7	21	49.0
14	282	46.3	103	26	45.1	46	160	1.4	-5	51.8	244	33.9	21	49.1
16	311	45.0	103	26	54.3	44	190	6.6	-5	51.7	274	39.1	21	49.1
18	340	43.6	102	27	3.0	41	220	11.7	-5	51.6	304	44.4	21	49.2
20	9	42.1	102	27	11.2	38	250	16.9	-5	51.5	334	49.6	21	49.2
22	38	40.5	102	27	18.8	36	280	22.0	-5	51.4	4	54.8	21	49.3
$\Delta$							26		1		26		0	

$\varphi$	SUNCE		TRAJANJE SUMRAKA		MESEC			
	IZLAZ	ZALAZ	GRAĐ.	ASTR.	IZLAZ	$\Delta/24$	ZALAZ	$\Delta/24$
N	h min	h min	h min	h min	h min	min	h min	min
60	7 32	16 57	0 44	2 20	9 5	.9	4 38	3.5
55	7 18	17 11	0 38	2 2	10 1	1.4	3 42	2.9
50	7 7	17 22	0 33	1 48	10 37	1.6	3 6	2.7
45	6 58	17 31	0 30	1 38	11 4	1.8	2 40	2.6
40	6 50	17 38	0 28	1 31	11 25	1.8	2 20	2.5
35	6 44	17 45	0 26	1 25	11 43	1.9	2 3	2.4
30	6 38	17 50	0 24	1 20	11 58	1.9	1 48	2.4
20	6 28	18 0	0 22	1 14	12 24	2.0	1 23	2.3
10	6 19	18 9	0 21	1 11	12 47	2.1	1 1	2.2
0	6 11	18 17	0 21	1 10	13 8	2.1	0 41	2.1
10	6 2	18 26	0 21	1 12	13 29	2.2	0 22	2.0
20	5 53	18 35	0 23	1 16	13 51	2.2	0 0	1.9
30	5 42	18 46	0 25	1 24	14 18	2.3	...	.0
35	5 36	18 52	0 26	1 30	14 33	2.3	...	.0
40	5 29	18 59	0 28	1 39	14 52	2.4	23 45	2.0
45	5 20	19 7	0 31	1 50	15 14	2.4	23 23	1.9
50	5 10	19 17	0 35	2 7	15 42	2.5	22 54	1.9
55	4 57	19 29	0 40	2 36	16 21	2.7	22 14	1.8
60	4 41	19 46	0 48	3 54	17 26	3.1	21 9	1.3
S								

SUNCE				MESEC			
UT	$e = T_p - UT$	$\Delta/24$ </					

UT	SUNCE		PROLEĆ. TAČKA S <sub>γ</sub>	VENERA		MARS	
	S <sub>☉</sub>	δ <sub>☉</sub>		S <sub>♀</sub>	δ <sub>♀</sub>	S <sub>♂</sub>	δ <sub>♂</sub>
h	° / ' / "	° / ' / "	° / ' / "	° / ' / "	° / ' / "	° / ' / "	° / ' / "
0	176 30.4 -11 40.3		148 3.1	186 3.8 -16 6.6	229 21.9 -23 38.5		
2	206 30.5 -11 38.6		178 8.1	216 2.5 -16 4.8	259 23.0 -23 38.3		
4	236 30.6 -11 36.8		208 13.0	246 1.2 -16 3.0	289 24.0 -23 38.2		
6	266 30.7 -11 35.0		238 17.9	275 59.9 -16 1.1	319 25.1 -23 38.0		
8	296 30.8 -11 33.3		268 22.9	305 58.6 -15 59.3	349 26.1 -23 37.9		
10	326 30.9 -11 31.5		298 27.8	335 57.3 -15 57.4	19 27.2 -23 37.7		
12	356 31.0 -11 29.7		328 32.7	5 56.0 -15 55.6	49 28.2 -23 37.6		
14	26 31.1 -11 27.9		358 37.6	35 54.7 -15 53.7	79 29.3 -23 37.4		
16	56 31.2 -11 26.2		28 42.6	65 53.5 -15 51.8	109 30.3 -23 37.3		
18	86 31.4 -11 24.4		58 47.5	95 52.2 -15 50.0	139 31.4 -23 37.1		
20	116 31.5 -11 22.6		88 52.4	125 50.9 -15 48.1	169 32.4 -23 37.0		
22	146 31.6 -11 20.8		118 57.4	155 49.6 -15 46.2	199 33.5 -23 36.8		
Δ	1	9		-6	9	5	1

UT	MESEC				JUPITER		SATURN	
	S <sub>♃</sub>	Δ	δ <sub>♃</sub>	Δ	S <sub>♃</sub>	δ <sub>♃</sub>	S <sub>♄</sub>	δ <sub>♄</sub>
h	° / ' / "	° / ' / "	° / ' / "	° / ' / "	° / ' / "	° / ' / "	° / ' / "	° / ' / "
0	67 38.8 101	27 25.9	33	310 27.2 - 5 51.2	35 .0	21 49.3		
2	96 37.1 101	27 32.5	30	340 32.3 - 5 51.1	65 5.2	21 49.4		
4	125 35.2 101	27 38.5	27	10 37.5 - 5 51.0	95 10.5	21 49.4		
6	154 33.3 100	27 44.0	25	40 42.6 - 5 50.9	125 15.7	21 49.5		
8	183 31.4 100	27 49.0	22	70 47.8 - 5 50.8	155 20.9	21 49.5		
10	212 29.4 100	27 53.4	19	100 53.0 - 5 50.7	185 26.1	21 49.6		
12	241 27.3 100	27 57.2	17	130 58.1 - 5 50.6	215 31.3	21 49.6		
14	270 25.3 99	28 .6	14	161 3.3 - 5 50.4	245 36.5	21 49.7		
16	299 23.2 99	28 3.3	11	191 8.4 - 5 50.3	275 41.8	21 49.7		
18	328 21.0 99	28 5.6	8	221 13.6 - 5 50.2	305 47.0	21 49.8		
20	357 18.9 99	28 7.3	6	251 18.8 - 5 50.1	335 52.2	21 49.8		
22	26 16.8 99	28 8.4	3	281 23.9 - 5 50.0	5 57.4	21 49.9		
Δ				26	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	7 30	16 59	0 43	2 20	9 26	2.0	6 2	2.5
55	7 16	17 13	0 37	2 2	10 36	2.1	4 52	2.4
50	7 5	17 24	0 33	1 48	11 17	2.1	4 12	2.3
45	6 56	17 32	0 30	1 38	11 46	2.1	3 43	2.3
40	6 49	17 39	0 28	1 31	12 9	2.1	3 20	2.3
35	6 43	17 46	0 26	1 25	12 28	2.1	3 1	2.2
30	6 37	17 51	0 24	1 20	12 45	2.1	2 45	2.2
20	6 27	18 1	0 22	1 14	13 13	2.1	2 17	2.2
10	6 19	18 9	0 21	1 11	13 36	2.1	1 54	2.2
0	6 11	18 17	0 21	1 10	13 59	2.1	1 32	2.1
10	6 2	18 26	0 21	1 12	14 21	2.1	1 10	2.1
20	5 53	18 34	0 23	1 16	14 45	2.1	0 47	2.1
30	5 43	18 45	0 25	1 24	15 13	2.1	0 20	2.0
35	5 37	18 51	0 26	1 30	15 30	2.1	0 4	2.0
40	5 30	18 57	0 28	1 38	15 49	2.1	...	.0
45	5 22	19 5	0 31	1 50	16 12	2.1	...	.0
50	5 12	19 15	0 35	2 6	16 43	2.1	23 39	2.3
55	4 60	19 27	0 40	2 34	17 25	2.0	22 56	2.4
60	4 43	19 43	0 48	3 42	18 41	1.8	21 40	2.6

SUNCE				MESEC			
UT	e = T <sub>p</sub> - UT	Δ/24	r	Prolaz	Δ/24	π <sub>♃</sub>	r
h	min s	s	'	h min	min	'	'
00	-13 58.3	.2	16.2	T <sub>m</sub>	20 11	2.1	54.4 14.8
12	-13 55.6	T <sub>m☉</sub>	12 h 13.9 min	Starost	9.1 d	Faza ☉	

PLANETE									
Pl.	T <sub>m</sub>	π	360-α	Vel.	Pl.	T <sub>m</sub>	π	360-α	Vel.
h	min	'	°		h	min	'	°	
♀	11 36	.1	38	-3.8	♃	3 18	.0	162	-2.1
♂	8 42	.1	81	1.3	♄	21 36	.0	247	-1.1

UT	SUNCE		PROLEĆ. TAČKA S <sub>γ</sub>	VENERA		MARS	
	S <sub>☉</sub>	δ <sub>☉</sub>		S <sub>♀</sub>	δ <sub>♀</sub>	S <sub>♂</sub>	δ <sub>♂</sub>
h	° / ' / "	° / ' / "	° / ' / "	° / ' / "	° / ' / "	° / ' / "	° / ' / "
0	176 31.7 -11 19.1		149 2.3	185 48.4 -15 44.4	229 34.5 -23 36.6		
2	206 31.8 -11 17.3		179 7.2	215 47.1 -15 42.5	259 35.6 -23 36.5		
4	236 31.9 -11 15.5		209 12.1	245 45.8 -15 40.6	289 36.6 -23 36.3		
6	266 32.1 -11 13.7		239 17.1	275 44.6 -15 38.7	319 37.7 -23 36.1		
8	296 32.2 -11 11.9		269 22.0	305 43.3 -15 36.8	349 38.7 -23 36.0		
10	326 32.3 -11 10.1		299 26.9	335 42.1 -15 34.9	19 39.8 -23 35.8		
12	356 32.4 -11 8.4		329 31.9	5 40.8 -15 33.1	49 40.8 -23 35.6		
14	26 32.6 -11 6.6		359 36.8	35 39.5 -15 31.2	79 41.9 -23 35.5		
16	56 32.7 -11 4.8		29 41.7	65 38.3 -15 29.3	109 42.9 -23 35.3		
18	86 32.8 -11 3.0		59 46.6	95 37.0 -15 27.4	139 44.0 -23 35.1		
20	116 32.9 -11 1.2		89 51.6	125 35.8 -15 25.5	169 45.0 -23 34.9		
22	146 33.1 -10 59.4		119 56.5	155 34.5 -15 23.5	199 46.1 -23 34.8		
Δ	1	9		-6	9	5	1

UT	MESEC				JUPITER		SATURN	
	S <sub>♃</sub>	Δ	δ <sub>♃</sub>	Δ	S <sub>♃</sub>	δ <sub>♃</sub>	S <sub>♄</sub>	δ <sub>♄</sub>
h	° / ' / "	° / ' / "	° / ' / "	° / ' / "	° / ' / "	° / ' / "	° / ' / "	° / ' / "
0	55 14.7 99	28 9.0	0	311 29.1 - 5 49.9	36 2.6	21 49.9		
2	84 12.6 100	28 9.1	-2	341 34.3 - 5 49.7	66 7.8	21 50.0		
4	113 10.5 100	28 8.6	-5	11 39.4 - 5 49.6	96 13.0	21 50.0		
6	142 8.5 100	28 7.6	-8	41 44.6 - 5 49.5	126 18.3	21 50.1		
8	171 6.5 100	28 6.0	-11	71 49.8 - 5 49.4	156 23.5	21 50.1		
10	200 4.5 101	28 3.9	-13	101 54.9 - 5 49.3	186 28.7	21 50.2		
12	229 2.6 101	28 1.2	-16	132 .1 - 5 49.2	216 33.9	21 50.2		
14	258 .8 101	27 58.0	-19	162 5.3 - 5 49.0	246 39.1	21 50.3		
16	286 59.1 102	27 54.3	-21	192 10.5 - 5 48.9	276 44.3	21 50.3		
18	315 57.4 102	27 50.0	-24	222 15.6 - 5 48.8	306 49.5	21 50.4		
20	344 55.9 103	27 45.2	-27	252 20.8 - 5 48.7	336 54.7	21 50.4		
22	13 54.4 103	27 39.9	-29	282 26.0 - 5 48.5	6 59.9	21 50.5		
Δ				26	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	7 27	17 2	0 43	2 20	10 13	3.2	7 2	1.2
55	7 13	17 15	0 37	2 1	11 26	2.7	5 49	1.7
50	7 3	17 25	0 33	1 48	12 7	2.5	5 7	1.8
45	6 55	17 34	0 30	1 38	12 37	2.4	4 37	1.9
40	6 48	17 41	0 28	1 31	13 1	2.4	4 14	2.0
35	6 42	17 47	0 26	1 25	13 20	2.3	3 55	2.0
30	6 36	17 52	0 24	1 20	13 36	2.3	3 38	2.0
20	6 27	18 1	0 22	1 14	14 4	2.2	3 10	2.1
10	6 18	18 9	0 21	1 11	14 28	2.2	2 46	2.1
0	6 10	18 17	0 21	1 10	14 50	2.1	2 24	2.1
10	6 2	18 25	0 21	1 12	15 12	2.0	2 1	2.2
20	5 54	18 34	0 23	1 16	15 36	2.0	1 37	2.2
30	5 44	18 44	0 25	1 24	16 4	1.9	1 9	2.2
35	5 38	18 49	0 26	1 30	16 20	1.9	0 52	2.2
40	5 31	18 56	0 28	1 38	16 39	1.8	0 33	2.3
45	5 23	19 4	0 31	1 49	17 3	1.7	0 9	2.3
50	5 14	19 13	0 35	2 5	17 32	1.6	...	.0
55	5 2	19 25	0 40	2 32	18 13	1.4	23 54	2.9
60	4 46	19 40	0 47	3 33	19 24	.8	22 44	3.6

SUNCE				MESEC			
UT	e = T <sub>p</sub> - UT	Δ/24	r	Prolaz	Δ/24	π <sub>♃</sub>	r
h	min s	s	'	h min	min	'	'
00	-13 53.0	.2	16.2	T <sub>m</sub>	21 2	2.1	54.1 14.7
12	-13 50.0	T <sub>m☉</sub>	12 h 13.8 min	Starost	10.1 d	Faza ☉	

PLANETE									
Pl.	T <sub>m</sub>	π	360-α	Vel.	Pl.	T <sub>m</sub>	π	360-α	Vel.
h	min	'	°		h	min	'	°	
♀	11 37	.1	37	-3.8	♃	3 14	.0	162	-2.1
♂	8 41	.1	81	1.3	♄	21 32	.0	247	-1.1

UT	SUNCE		PROLEĆ. TAČKA S <sub>γ</sub>	VENERA		MARS	
	S <sub>☉</sub>	δ <sub>☉</sub>		S <sub>♀</sub>	δ <sub>♀</sub>	S <sub>♂</sub>	δ <sub>♂</sub>
h	°	'	°	'	'	°	'
0	176 33.2	-10 57.6	150 1.4	185 33.3	-15 21.6	229 47.1	-23 34.6
2	206 33.3	-10 55.8	180 6.4	215 32.0	-15 19.7	259 48.2	-23 34.4
4	236 33.5	-10 54.0	210 11.3	245 30.8	-15 17.8	289 49.2	-23 34.2
6	266 33.6	-10 52.2	240 16.2	275 29.6	-15 15.9	319 50.3	-23 34.0
8	296 33.7	-10 50.4	270 21.1	305 28.3	-15 14.0	349 51.3	-23 33.9
10	326 33.9	-10 48.6	300 26.1	335 27.1	-15 12.0	19 52.4	-23 33.7
12	356 34.0	-10 46.8	330 31.0	5 25.9	-15 10.1	49 53.4	-23 33.5
14	26 34.2	-10 45.0	0 35.9	35 24.6	-15 8.2	79 54.5	-23 33.3
16	56 34.3	-10 43.2	30 40.9	65 23.4	-15 6.2	109 55.5	-23 33.1
18	86 34.4	-10 41.4	60 45.8	95 22.2	-15 4.3	139 56.6	-23 32.9
20	116 34.6	-10 39.6	90 50.7	125 20.9	-15 2.4	169 57.6	-23 32.7
22	146 34.7	-10 37.8	120 55.6	155 19.7	-15 .4	199 58.7	-23 32.5
Δ	1	9		-6	10	5	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	17 4	0 43	2 20	11 29	3.7	7 32	.5
55	7 11	17 17	0 37	2 1	12 31	3.1	6 29	1.1
50	7 1	17 27	0 33	1 48	13 8	2.8	5 51	1.4
45	6 53	17 35	0 30	1 38	13 36	2.7	5 23	1.5
40	6 46	17 42	0 28	1 30	13 58	2.5	5 1	1.6
35	6 40	17 47	0 26	1 25	14 16	2.5	4 42	1.7
30	6 35	17 53	0 24	1 20	14 31	2.4	4 26	1.8
20	6 26	18 2	0 22	1 14	14 57	2.2	3 60	1.9
10	6 18	18 10	0 21	1 11	15 20	2.1	3 36	2.0
0	6 10	18 17	0 21	1 10	15 41	2.0	3 15	2.1
10	6 3	18 25	0 21	1 11	16 1	1.9	2 53	2.2
20	5 54	18 33	0 23	1 16	16 24	1.8	2 30	2.2
30	5 44	18 43	0 25	1 24	16 50	1.7	2 2	2.3
35	5 39	18 48	0 26	1 30	17 5	1.6	1 46	2.4
40	5 32	18 55	0 28	1 38	17 22	1.5	1 27	2.5
45	5 25	19 2	0 31	1 49	17 44	1.4	1 4	2.6
50	5 15	19 11	0 34	2 5	18 10	1.2	0 35	2.7
55	5 4	19 22	0 39	2 30	18 46	.9	...	.0
60	4 49	19 37	0 47	3 26	19 42	.3	...	.0
S								

UT	MESEC				JUPITER		SATURN	
	S <sub>♃</sub>	Δ	δ <sub>♃</sub>	Δ	S <sub>♃</sub>	δ <sub>♃</sub>	S <sub>♄</sub>	δ <sub>♄</sub>
h	°	'	°	'	°	'	°	'
0	42 53.1	104	27 34.0	-32	312 31.2	-5 48.4	37 5.1	21 50.5
2	71 51.8	104	27 27.7	-34	342 36.3	-5 48.3	67 10.3	21 50.6
4	100 50.7	105	27 20.8	-37	12 41.5	-5 48.2	97 15.5	21 50.6
6	129 49.7	106	27 13.3	-40	42 46.7	-5 48.1	127 20.7	21 50.7
8	158 48.9	107	27 5.4	-42	72 51.9	-5 47.9	157 25.9	21 50.7
10	187 48.2	107	26 56.9	-45	102 57.1	-5 47.8	187 31.1	21 50.8
12	216 47.7	108	26 48.0	-47	133 2.3	-5 47.7	217 36.3	21 50.8
14	245 47.3	109	26 38.5	-50	163 7.5	-5 47.5	247 41.5	21 50.9
16	274 47.1	110	26 28.6	-52	193 12.6	-5 47.4	277 46.7	21 50.9
18	303 47.0	111	26 18.1	-55	223 17.8	-5 47.3	307 51.9	21 50.9
20	332 47.1	112	26 7.2	-57	253 23.0	-5 47.2	337 57.1	21 51.0
22	1 47.4	112	25 55.7	-60	283 28.2	-5 47.0	8 2.3	21 51.0
Δ					26	1	26	0

SUNCE				MESEC					
UT	e = T <sub>p</sub> - UT	Δ/24	r	Prolaz	Δ/24	π <sub>☉</sub>	r		
h	min	s	'	h min	min	'	'		
00	-13 47.0	.3	16.2	T <sub>m</sub>	21 53	2.0	54.0 14.7		
12	-13 43.7	T <sub>m☉</sub>	12 h 13.7 min	Starost	11.1 d	Faza	☉		
PLANETE									
Pl.	T <sub>m</sub>	π	360-α	Vel.	Pl.	T <sub>m</sub>	π	360-α	Vel.
♀	h min	'	°	36	-3.8	♀	h min	'	°
♂	8 41	.1	80	1.3	♂	21 28	.0	162	-2.2
					♄	247	.0	247	-1.1

UT	SUNCE		PROLEĆ. TAČKA S <sub>γ</sub>	VENERA		MARS	
	S <sub>☉</sub>	δ <sub>☉</sub>		S <sub>♀</sub>	δ <sub>♀</sub>	S <sub>♂</sub>	δ <sub>♂</sub>
h	°	'	°	'	'	°	'
0	176 34.9	-10 36.0	151 .6	185 18.5	-14 58.5	229 59.7	-23 32.3
2	206 35.0	-10 34.2	181 5.5	215 17.3	-14 56.5	260 .8	-23 32.1
4	236 35.2	-10 32.4	211 10.4	245 16.0	-14 54.6	290 1.8	-23 31.9
6	266 35.3	-10 30.6	241 15.3	275 14.8	-14 52.6	320 2.9	-23 31.7
8	296 35.5	-10 28.8	271 20.3	305 13.6	-14 50.7	350 3.9	-23 31.5
10	326 35.6	-10 27.0	301 25.2	335 12.4	-14 48.7	20 5.0	-23 31.3
12	356 35.8	-10 25.2	331 30.1	5 11.2	-14 46.8	50 6.0	-23 31.1
14	26 35.9	-10 23.3	1 35.1	35 10.0	-14 44.8	80 7.1	-23 30.9
16	56 36.1	-10 21.5	31 40.0	65 8.8	-14 42.8	110 8.1	-23 30.7
18	86 36.2	-10 19.7	61 44.9	95 7.6	-14 40.9	140 9.2	-23 30.5
20	116 36.4	-10 17.9	91 49.8	125 6.4	-14 38.9	170 10.2	-23 30.3
22	146 36.5	-10 16.1	121 54.8	155 5.2	-14 36.9	200 11.3	-23 30.0
Δ	1	9		-6	10	5	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	17 7	0 43	2 20	12 58	3.8	7 45	.2
55	7 9	17 19	0 37	2 1	13 45	3.3	6 56	.7
50	6 59	17 29	0 33	1 48	14 17	3.0	6 24	1.0
45	6 51	17 36	0 30	1 38	14 40	2.8	5 60	1.2
40	6 45	17 43	0 27	1 30	14 59	2.6	5 40	1.4
35	6 39	17 48	0 26	1 25	15 15	2.5	5 24	1.5
30	6 34	17 53	0 24	1 20	15 28	2.4	5 10	1.6
20	6 26	18 2	0 22	1 14	15 51	2.2	4 45	1.7
10	6 18	18 10	0 21	1 11	16 11	2.1	4 24	1.9
0	6 10	18 17	0 21	1 10	16 29	1.9	4 4	2.0
10	6 3	18 24	0 21	1 11	16 48	1.8	3 45	2.1
20	5 55	18 32	0 22	1 16	17 7	1.7	3 23	2.2
30	5 45	18 42	0 25	1 23	17 30	1.5	2 59	2.4
35	5 40	18 47	0 26	1 29	17 43	1.4	2 44	2.5
40	5 33	18 53	0 28	1 37	17 58	1.3	2 27	2.6
45	5 26	19 0	0 31	1 48	18 16	1.1	2 6	2.7
50	5 17	19 9	0 34	2 4	18 39	.9	1 41	2.9
55	5 6	19 20	0 39	2 29	19 8	.6	1 5	3.2
60	4 51	19 34	0 47	3 21	19 50	.1	0 10	3.9
S								

UT	MESEC				JUPITER		SATURN	
	S <sub>♃</sub>	Δ	δ <sub>♃</sub>	Δ	S <sub>♃</sub>	δ <sub>♃</sub>	S <sub>♄</sub>	δ <sub>♄</sub>
h	°	'	°	'	°	'	°	'
0	30 47.9	113	25 43.8	-62	313 33.4	-5 46.9	38 7.5	21 51.1
2	59 48.6	114	25 31.4	-64	343 38.6	-5 46.8	68 12.7	21 51.1
4	88 49.5	115	25 18.5	-67	13 43.8	-5 46.7	98 17.9	21 51.2
6	117 50.5	116	25 5.2	-69	43 49.0	-5 46.5	128 23.1	21 51.2
8	146 51.8	117	24 51.4	-71	73 54.2	-5 46.4	158 28.3	21 51.3
10	175 53.3	118	24 37.1	-74	103 59.4	-5 46.3	188 33.5	21 51.3
12	204 54.9	119	24 22.4	-76	134 4.6	-5 46.1	218 38.7	21 51.4
14	233 56.8	120	24 7.2	-78	164 9.8	-5 46.0	248 43.9	21 51.4
16	262 58.9	122	23 51.6	-80	194 15.0	-5 45.9	278 49.1	21 51.5
18	292 1.2	123	23 35.6	-82	224 20.2	-5 45.7	308 54.3	21 51.5
20	321 3.8	124	23 19.1	-84	254 25.4	-5 45.6	338 59.5	21 51.6
22	350 6.5	125	23 2.3	-87	284 30.6	-5 45.5	9 4.7	21 51.6
Δ					26	1	26	0

SUNCE				MESEC					
UT	e = T <sub>p</sub> - UT	Δ/24	r	Prolaz	Δ/24	π <sub>☉</sub>	r		
h	min	s	'	h min	min	'	'		
00	-13 40.3	.3	16.2	T <sub>m</sub>	22 41	1.9	54.1 14.7		
12	-13 36.7	T <sub>m☉</sub>	12 h 13.6 min	Starost	12.1 d	Faza	☉		
PLANETE									
Pl.	T <sub>m</sub>	π	360-α	Vel.	Pl.	T <sub>m</sub>	π	360-α	Vel.
♀	h min	'	°	34	-3.8	♀	h min	'	°
♂	8 40	.1	79	1.2	♂	21 24	.0	163	-2.2
					♄	247	.0	247	-1.1

UT	SUNCE				PROLEĆ. TAČKA S <sub>γ</sub>	VENERA				MARS				
	S <sub>☉</sub>		δ <sub>☉</sub>			S <sub>♀</sub>		δ <sub>♀</sub>		S <sub>♂</sub>		δ <sub>♂</sub>		
h	°	'	°	'	°	'	°	'	°	'	°	'		
0	176	36.7	-10	14.3	151	59.7	185	4.0	-14	34.9	230	12.3	-23	29.8
2	206	36.9	-10	12.4	182	4.6	215	2.8	-14	32.9	260	13.4	-23	29.6
4	236	37.0	-10	10.6	212	9.6	245	1.6	-14	31.0	290	14.4	-23	29.4
6	266	37.2	-10	8.8	242	14.5	275	.4	-14	29.0	320	15.5	-23	29.2
8	296	37.3	-10	7.0	272	19.4	304	59.2	-14	27.0	350	16.5	-23	28.9
10	326	37.5	-10	5.1	302	24.3	334	58.0	-14	25.0	20	17.6	-23	28.7
12	356	37.7	-10	3.3	332	29.3	4	56.8	-14	23.0	50	18.6	-23	28.5
14	26	37.8	-10	1.5	2	34.2	34	55.6	-14	21.0	80	19.7	-23	28.3
16	56	38.0	-9	59.7	32	39.1	64	54.5	-14	19.0	110	20.7	-23	28.0
18	86	38.2	-9	57.8	62	44.1	94	53.3	-14	17.0	140	21.8	-23	27.8
20	116	38.3	-9	56.0	92	49.0	124	52.1	-14	15.0	170	22.8	-23	27.6
22	146	38.5	-9	54.2	122	53.9	154	50.9	-14	13.0	200	23.9	-23	27.3
Δ	1	9					-6	10			5	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 18	17 10	0 43	2 19	14 30	3.8	7 50	.1
55	7 7	17 21	0 37	2 1	15 4	3.3	7 14	.5
50	6 57	17 30	0 33	1 48	15 28	3.0	6 49	.8
45	6 50	17 38	0 30	1 38	15 47	2.8	6 29	1.0
40	6 44	17 44	0 27	1 30	16 2	2.6	6 13	1.2
35	6 38	17 49	0 26	1 24	16 15	2.5	5 59	1.3
30	6 33	17 54	0 24	1 20	16 26	2.4	5 47	1.4
20	6 25	18 2	0 22	1 14	16 44	2.2	5 27	1.6
10	6 17	18 10	0 21	1 11	17 1	2.0	5 9	1.7
0	6 10	18 17	0 21	1 10	17 16	1.9	4 52	1.9
10	6 3	18 24	0 21	1 11	17 31	1.7	4 35	2.0
20	5 55	18 32	0 22	1 15	17 47	1.5	4 17	2.2
30	5 46	18 41	0 25	1 23	18 6	1.3	3 56	2.4
35	5 41	18 46	0 26	1 29	18 16	1.2	3 44	2.5
40	5 34	18 52	0 28	1 37	18 29	1.1	3 29	2.6
45	5 27	18 59	0 31	1 48	18 43	.9	3 12	2.8
50	5 19	19 7	0 34	2 3	19 0	.7	2 51	3.0
55	5 8	19 18	0 39	2 27	19 22	.4	2 23	3.3
60	4 54	19 31	0 46	3 15	19 53	.0	1 43	3.8
S								

UT	MESEC				JUPITER				SATURN							
	S <sub>♃</sub>		Δ		δ <sub>♃</sub>		Δ		S <sub>♃</sub>		δ <sub>♃</sub>		S <sub>♄</sub>		δ <sub>♄</sub>	
h	°	'	°	'	°	'	°	'	°	'	°	'	°	'	°	'
0	19	9.5	126	22	44.9	-89	314	35.8	-5	45.3	39	9.9	21	51.7		
2	48	12.6	127	22	27.2	-91	344	41.0	-5	45.2	69	15.1	21	51.7		
4	77	16.0	128	22	9.1	-93	14	46.2	-5	45.1	99	20.2	21	51.7		
6	106	19.6	129	21	50.6	-95	44	51.4	-5	44.9	129	25.4	21	51.8		
8	135	23.5	130	21	31.7	-96	74	56.6	-5	44.8	159	30.6	21	51.8		
10	164	27.5	131	21	12.4	-98	105	1.9	-5	44.7	189	35.8	21	51.9		
12	193	31.8	132	20	52.7	-100	135	7.1	-5	44.5	219	41.0	21	51.9		
14	222	36.3	133	20	32.6	-102	165	12.3	-5	44.4	249	46.2	21	52.0		
16	251	41.0	135	20	12.2	-104	195	17.5	-5	44.3	279	51.4	21	52.0		
18	280	45.9	136	19	51.4	-106	225	22.7	-5	44.1	309	56.5	21	52.1		
20	309	51.0	137	19	30.3	-107	255	27.9	-5	44.0	340	1.7	21	52.1		
22	338	56.3	138	19	8.8	-109	285	33.2	-5	43.8	10	6.9	21	52.2		
Δ							26	1			26	0				

SUNCE				MESEC					
UT	e = T <sub>p</sub> - UT	Δ/24	r	Prolaz	Δ/24	π <sub>☉</sub>	r		
h	min	s	s	h min	min	'	'		
00	-13 33.0	.3	16.2	T <sub>m</sub>	23 27	1.8	54.2 14.8		
12	-13 29.0	T <sub>m☉</sub>	12 h 13.5 min	Starost	13.1 d	Faza	☉		
PLANETE									
Pl.	T <sub>m</sub>	π	360-α	Vel.	Pl.	T <sub>m</sub>	π	360-α	Vel.
♀	h min	'	°	°	♃	h min	'	°	°
♂	11 40	.1	33	-3.8	♄	3 1	.0	163	-2.2
	8 39	.1	78	1.2	♅	21 20	.0	247	-1.1

UT	SUNCE				PROLEĆ. TAČKA S <sub>γ</sub>	VENERA				MARS				
	S <sub>☉</sub>		δ <sub>☉</sub>			S <sub>♀</sub>		δ <sub>♀</sub>		S <sub>♂</sub>		δ <sub>♂</sub>		
h	°	'	°	'	°	'	°	'	°	'	°	'		
0	176	38.7	-9	52.3	152	58.8	184	49.7	-14	11.0	230	24.9	-23	27.1
2	206	38.9	-9	50.5	183	3.8	214	48.6	-14	9.0	260	26.0	-23	26.9
4	236	39.0	-9	48.7	213	8.7	244	47.4	-14	6.9	290	27.0	-23	26.6
6	266	39.2	-9	46.8	243	13.6	274	46.2	-14	4.9	320	28.1	-23	26.4
8	296	39.4	-9	45.0	273	18.6	304	45.1	-14	2.9	350	29.1	-23	26.2
10	326	39.6	-9	43.2	303	23.5	334	43.9	-14	.9	20	30.2	-23	25.9
12	356	39.7	-9	41.3	333	28.4	4	42.7	-13	58.8	50	31.2	-23	25.7
14	26	39.9	-9	39.5	3	33.3	34	41.6	-13	56.8	80	32.3	-23	25.4
16	56	40.1	-9	37.6	33	38.3	64	40.4	-13	54.8	110	33.3	-23	25.2
18	86	40.3	-9	35.8	63	43.2	94	39.3	-13	52.7	140	34.4	-23	24.9
20	116	40.5	-9	34.0	93	48.1	124	38.1	-13	50.7	170	35.4	-23	24.7
22	146	40.6	-9	32.1	123	53.1	154	36.9	-13	48.7	200	36.5	-23	24.4
Δ	1	9					-6	10			5	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 16	17 12	0 43	2 19	16 1	3.7	7 52	.0
55	7 4	17 23	0 37	2 1	16 24	3.3	7 27	.4
50	6 55	17 32	0 33	1 48	16 41	3.0	7 8	.6
45	6 48	17 39	0 30	1 38	16 54	2.8	6 53	.8
40	6 42	17 45	0 27	1 30	17 5	2.6	6 41	1.0
35	6 37	17 50	0 26	1 24	17 15	2.5	6 30	1.1
30	6 32	17 55	0 24	1 20	17 23	2.4	6 21	1.3
20	6 24	18 3	0 22	1 14	17 37	2.1	6 5	1.5
10	6 17	18 10	0 21	1 10	17 49	2.0	5 51	1.6
0	6 10	18 17	0 21	1 10	18 0	1.8	5 38	1.8
10	6 3	18 24	0 21	1 11	18 12	1.6	5 24	2.0
20	5 55	18 31	0 22	1 15	18 24	1.4	5 10	2.2
30	5 47	18 40	0 24	1 23	18 37	1.2	4 53	2.4
35	5 41	18 45	0 26	1 29	18 45	1.1	4 44	2.5
40	5 36	18 50	0 28	1 37	18 54	1.0	4 33	2.6
45	5 29	18 57	0 31	1 47	19 5	.8	4 19	2.8
50	5 21	19 5	0 34	2 2	19 17	.6	4 3	3.0
55	5 10	19 15	0 39	2 25	19 33	.3	3 43	3.3
60	4 57	19 28	0 46	3 11	19 53	.0	3 15	3.7
S								

UT	MESEC				JUPITER				SATURN							
	S <sub>♃</sub>		Δ		δ <sub>♃</sub>		Δ		S <sub>♃</sub>		δ <sub>♃</sub>		S <sub>♄</sub>		δ <sub>♄</sub>	
h	°	'	°	'	°	'	°	'	°	'	°	'	°	'	°	'
0	8	1.8	139	18	47.0	-111	315	38.4	-5	43.7	40	12.1	21	52.2		
2	37	7.5	140	18	24.8	-112	345	43.6	-5	43.6	70	17.3	21	52.2		
4	66	13.5	141	18	2.3	-114	15	48.8	-5	43.4	100	22.4	21	52.3		
6	95	19.6	142	17	39.5	-116	45	54.0	-5	43.3	130	27.6	21	52.3		
8	124	25.9	142	17	16.4	-117	75	59.3	-5	43.1	160	32.8	21	52.4		
10	153	32.4	143	16	52.9	-119	106	4.5	-5	43.0	190	38.0	21	52.4		
12	182	39.1	144	16	29.2	-120	136	9.7	-5	42.9	220	43.2	21	52.5		
14	211	45.9	145	16	5.2	-122	166	14.9	-5	42.7	250	48.3	21	52.5		
16	240	53.0	146	15	40.9	-123	196	20.2	-5	42.6	280	53.5	21	52.6		
18	270	.2	147	15	16.3	-124	226	25.4	-5	42.4	310	58.7	21	52.6		
20	299	7.5	148	14	51.4	-126	256	30.6	-5	42.3	341	3.9	21	52.6		
22	328	15.1	148	14	26.3	-127	286	35.9	-5	42.2	11	9.0	21	52.7		
Δ							26	1			26	0				

SUNCE				MESEC			
UT	e = T <sub>p</sub> - UT	Δ/24	r	Prolaz	Δ/24		

UT	SUNCE		PROLEĆ. TAČKA S <sub>γ</sub>	VENERA		MARS	
	S <sub>☉</sub>	δ <sub>☉</sub>		S <sub>♀</sub>	δ <sub>♀</sub>	S <sub>♂</sub>	δ <sub>♂</sub>
h	° / ' / "	° / ' / "	° / ' / "	° / ' / "	° / ' / "	° / ' / "	° / ' / "
0	176 40.8 - 9 30.3		153 58.0	184 35.8 -13 46.6	230 37.5 -23 24.2		
2	206 41.0 - 9 28.4		184 2.9	214 34.6 -13 44.6	260 38.6 -23 23.9		
4	236 41.2 - 9 26.6		214 7.8	244 33.5 -13 42.5	290 39.7 -23 23.7		
6	266 41.4 - 9 24.7		244 12.8	274 32.3 -13 40.5	320 40.7 -23 23.4		
8	296 41.6 - 9 22.9		274 17.7	304 31.2 -13 38.4	350 41.8 -23 23.1		
10	326 41.8 - 9 21.0		304 22.6	334 30.1 -13 36.4	20 42.8 -23 22.9		
12	356 42.0 - 9 19.2		334 27.5	4 28.9 -13 34.3	50 43.9 -23 22.6		
14	26 42.2 - 9 17.3		4 32.5	34 27.8 -13 32.2	80 44.9 -23 22.4		
16	56 42.3 - 9 15.5		34 37.4	64 26.6 -13 30.2	110 46.0 -23 22.1		
18	86 42.5 - 9 13.6		64 42.3	94 25.5 -13 28.1	140 47.0 -23 21.8		
20	116 42.7 - 9 11.8		94 47.3	124 24.4 -13 26.0	170 48.1 -23 21.6		
22	146 42.9 - 9 9.9		124 52.2	154 23.2 -13 24.0	200 49.1 -23 21.3		
Δ	1	9		-6	10	5	1

UT	MESEC				JUPITER		SATURN	
	S <sub>♃</sub>	Δ	δ <sub>♃</sub>	Δ	S <sub>♃</sub>	δ <sub>♃</sub>	S <sub>♄</sub>	δ <sub>♄</sub>
h	° / ' / "	° / ' / "	° / ' / "	° / ' / "	° / ' / "	° / ' / "	° / ' / "	° / ' / "
0	357 22.8 149	14	.9	-128	316 41.1 - 5 42.0	41 14.2	21 52.7	
2	26 30.6 150	13	35.2	-129	346 46.3 - 5 41.9	71 19.4	21 52.8	
4	55 38.6 151	13	9.3	-131	16 51.6 - 5 41.7	101 24.6	21 52.8	
6	84 46.7 151	12	43.2	-132	46 56.8 - 5 41.6	131 29.7	21 52.9	
8	113 55.0 152	12	16.9	-133	77 2.0 - 5 41.4	161 34.9	21 52.9	
10	143 3.3 153	11	50.3	-134	107 7.3 - 5 41.3	191 40.1	21 52.9	
12	172 11.8 153	11	23.5	-135	137 12.5 - 5 41.1	221 45.2	21 53.0	
14	201 20.5 154	10	56.4	-136	167 17.8 - 5 41.0	251 50.4	21 53.0	
16	230 29.2 154	10	29.2	-137	197 23.0 - 5 40.8	281 55.6	21 53.1	
18	259 38.0 155	10	1.8	-138	227 28.2 - 5 40.7	312 .7	21 53.1	
20	288 46.9 155	9	34.2	-139	257 33.5 - 5 40.5	342 5.9	21 53.2	
22	317 55.9 155	9	6.4	-140	287 38.7 - 5 40.4	12 11.1	21 53.2	
Δ					26	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	7 13	17 15	0 42	2 19	17 29	3.6	7 52	.0
55	7 2	17 25	0 37	2 1	17 43	3.3	7 36	.3
50	6 53	17 34	0 33	1 48	17 53	3.0	7 24	.6
45	6 47	17 41	0 30	1 38	18 1	2.8	7 14	.8
40	6 41	17 46	0 27	1 30	18 8	2.6	7 5	.9
35	6 36	17 51	0 26	1 24	18 14	2.5	6 58	1.1
30	6 31	17 56	0 24	1 20	18 19	2.3	6 51	1.2
20	6 23	18 3	0 22	1 14	18 28	2.1	6 40	1.4
10	6 17	18 10	0 21	1 10	18 36	1.9	6 30	1.6
0	6 10	18 17	0 21	1 10	18 43	1.7	6 21	1.8
10	6 3	18 23	0 21	1 11	18 50	1.6	6 12	1.9
20	5 56	18 30	0 22	1 15	18 58	1.4	6 2	2.1
30	5 47	18 39	0 24	1 23	19 7	1.2	5 50	2.3
35	5 42	18 43	0 26	1 29	19 12	1.0	5 43	2.5
40	5 37	18 49	0 28	1 36	19 17	.9	5 36	2.6
45	5 30	18 55	0 30	1 47	19 24	.7	5 27	2.8
50	5 22	19 3	0 34	2 1	19 31	.5	5 16	3.0
55	5 12	19 13	0 39	2 24	19 41	.3	5 2	3.3
60	4 59	19 25	0 46	3 7	19 53	.0	4 44	3.6
S								

SUNCE				MESEC					
UT	e = T <sub>p</sub> - UT	Δ/24	r	Prolaz	Δ/24	π <sub>♃</sub>	r		
h	min s	s	'	h min	min	'	'		
00	-13 16.5	.4	16.2	T <sub>m</sub>	0 11	1.8	54.8 14.9		
12	-13 11.9	T <sub>m☉</sub>	12 h 13.2 min	Starost	15.1 d	Faza	☉		
PLANETE									
Pl.	T <sub>m</sub>	π	360-α	Vel.	Pl.	T <sub>m</sub>	π	360-α	Vel.
♀	h min	'	°		♃	h min	'	°	
♂	11 42	.1	31	-3.8	♄	2 53	.0	163	-2.2
	8 37	.1	77	1.2	♅	21 11	.0	247	-1.1

UT	SUNCE		PROLEĆ. TAČKA S <sub>γ</sub>	VENERA		MARS	
	S <sub>☉</sub>	δ <sub>☉</sub>		S <sub>♀</sub>	δ <sub>♀</sub>	S <sub>♂</sub>	δ <sub>♂</sub>
h	° / ' / "	° / ' / "	° / ' / "	° / ' / "	° / ' / "	° / ' / "	° / ' / "
0	176 43.1 - 9 8.0		154 57.1	184 22.1 -13 21.9	230 50.2 -23 21.0		
2	206 43.3 - 9 6.2		185 2.0	214 21.0 -13 19.8	260 51.2 -23 20.7		
4	236 43.5 - 9 4.3		215 7.0	244 19.9 -13 17.7	290 52.3 -23 20.5		
6	266 43.7 - 9 2.5		245 11.9	274 18.7 -13 15.7	320 53.3 -23 20.2		
8	296 43.9 - 9 .6		275 16.8	304 17.6 -13 13.6	350 54.4 -23 19.9		
10	326 44.1 - 8 58.8		305 21.8	334 16.5 -13 11.5	20 55.4 -23 19.6		
12	356 44.3 - 8 56.9		335 26.7	4 15.4 -13 9.4	50 56.5 -23 19.4		
14	26 44.5 - 8 55.0		5 31.6	34 14.3 -13 7.3	80 57.5 -23 19.1		
16	56 44.7 - 8 53.2		35 36.5	64 13.1 -13 5.2	110 58.6 -23 18.8		
18	86 44.9 - 8 51.3		65 41.5	94 12.0 -13 3.1	140 59.6 -23 18.5		
20	116 45.1 - 8 49.4		95 46.4	124 10.9 -13 1.0	171 .7 -23 18.2		
22	146 45.4 - 8 47.6		125 51.3	154 9.8 -12 58.9	201 1.7 -23 17.9		
Δ	1	9		-6	10	5	1

UT	MESEC				JUPITER		SATURN	
	S <sub>♃</sub>	Δ	δ <sub>♃</sub>	Δ	S <sub>♃</sub>	δ <sub>♃</sub>	S <sub>♄</sub>	δ <sub>♄</sub>
h	° / ' / "	° / ' / "	° / ' / "	° / ' / "	° / ' / "	° / ' / "	° / ' / "	° / ' / "
0	347 5.0 156	8	38.5	-141	317 44.0 - 5 40.3	42 16.2	21 53.2	
2	16 14.2 156	8	10.3	-141	347 49.2 - 5 40.1	72 21.4	21 53.3	
4	45 23.4 156	7	42.0	-142	17 54.5 - 5 40.0	102 26.6	21 53.3	
6	74 32.7 157	7	13.6	-143	47 59.7 - 5 39.8	132 31.7	21 53.4	
8	103 42.0 157	6	45.0	-144	78 5.0 - 5 39.7	162 36.9	21 53.4	
10	132 51.4 157	6	16.3	-144	108 10.2 - 5 39.5	192 42.0	21 53.5	
12	162 .8 157	5	47.4	-145	138 15.5 - 5 39.3	222 47.2	21 53.5	
14	191 10.3 157	5	18.4	-146	168 20.7 - 5 39.2	252 52.4	21 53.5	
16	220 19.8 157	4	49.3	-146	198 26.0 - 5 39.0	282 57.5	21 53.6	
18	249 29.2 157	4	20.0	-147	228 31.2 - 5 38.9	313 2.7	21 53.6	
20	278 38.7 157	3	50.7	-147	258 36.5 - 5 38.7	343 7.8	21 53.7	
22	307 48.2 157	3	21.3	-148	288 41.8 - 5 38.6	13 13.0	21 53.7	
Δ					26	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	7 10	17 17	0 42	2 19	18 56	3.6	7 52	.0
55	6 59	17 28	0 37	2 1	19 1	3.3	7 43	.3
50	6 51	17 35	0 33	1 48	19 5	3.0	7 37	.5
45	6 45	17 42	0 30	1 38	19 8	2.8	7 32	.7
40	6 39	17 47	0 27	1 30	19 11	2.6	7 27	.9
35	6 34	17 52	0 26	1 24	19 13	2.5	7 23	1.0
30	6 30	17 56	0 24	1 20	19 15	2.4	7 20	1.1
20	6 23	18 4	0 22	1 14	19 19	2.1	7 14	1.4
10	6 16	18 10	0 21	1 10	19 22	1.9	7 8	1.6
0	6 10	18 16	0 21	1 10	19 25	1.7	7 3	1.7
10	6 3	18 23	0 21	1 11	19 28	1.6	6 58	1.9
20	5 56	18 30	0 22	1 15	19 31	1.4	6 53	2.1
30	5 48	18 38	0 24	1 23	19 34	1.1	6 46	2.3
35	5 43	18 42	0 26	1 28	19 36	1.0	6 43	2.5
40	5 38	18 47	0 28	1 36	19 38	.9	6 39	2.6
45	5 32	18 54	0 30	1 46	19 41	.7	6 34	2.8
50	5 24	19 1	0 34	2 1	19 44	.5	6 28	3.0
55	5 14	19 10	0 38	2 23	19 48	.3	6 21	3.3
60	5 2	19 23	0 45	3 4	19 53	.0	6 11	3.6
S								

SUNCE				MESEC					
UT	e = T <sub>p</sub> - UT	Δ/24	r	Prolaz	Δ/24	π <sub>♃</sub>	r		
h	min s	s	'	h min	min	'	'		
00	-13 7.3	.4	16.2	T <sub>m</sub>	0 53	1.8	55.2 15.0		
12	-13 2.4	T <sub>m☉</sub>	12 h 13.0 min	Starost	16.1 d	Faza	☉		
PLANETE									
Pl.	T <sub>m</sub>	π	360-α	Vel.	Pl.	T <sub>m</sub>	π	360-α	Vel.
♀	h min	'	°		♃	h min	'	°	
♂	11 43	.1	29	-3.8	♄	2 49	.0	163	-2.2
	8 36	.1	76	1.2	♅	21 7	.0	247	-1.1



UT	SUNCE		PROLEĆ. TAČKA S <sub>γ</sub>	VENERA		MARS	
	S <sub>☉</sub>	δ <sub>☉</sub>		S <sub>♀</sub>	δ <sub>♀</sub>	S <sub>♂</sub>	δ <sub>♂</sub>
h	°	'	°	'	'	°	'
0	176 45.6	- 8 45.7	155 56.3	184 8.7	-12 56.8	231 2.8	-23 17.6
2	206 45.8	- 8 43.8	186 1.2	214 7.6	-12 54.7	261 3.8	-23 17.3
4	236 46.0	- 8 42.0	216 6.1	244 6.5	-12 52.6	291 4.9	-23 17.0
6	266 46.2	- 8 40.1	246 11.0	274 5.4	-12 50.5	321 6.0	-23 16.8
8	296 46.4	- 8 38.2	276 16.0	304 4.3	-12 48.4	351 7.0	-23 16.5
10	326 46.6	- 8 36.3	306 20.9	334 3.2	-12 46.3	21 8.1	-23 16.2
12	356 46.8	- 8 34.5	336 25.8	4 2.1	-12 44.1	51 9.1	-23 15.9
14	26 47.1	- 8 32.6	6 30.8	34 1.0	-12 42.0	81 10.2	-23 15.6
16	56 47.3	- 8 30.7	36 35.7	63 59.9	-12 39.9	111 11.2	-23 15.3
18	86 47.5	- 8 28.9	66 40.6	93 58.8	-12 37.8	141 12.3	-23 15.0
20	116 47.7	- 8 27.0	96 45.5	123 57.7	-12 35.6	171 13.3	-23 14.6
22	146 47.9	- 8 25.1	126 50.5	153 56.6	-12 33.5	201 14.4	-23 14.3
Δ	1	9		-5	11	5	2

φ	SUNCE		TRAJANJE SUMRAKA		MESEC			
	IZLAZ	ZALAZ	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 7	17 20	0 42	2 19	20 22	3.7	7 51	.0
55	6 57	17 30	0 37	2 1	20 20	3.4	7 50	.3
50	6 49	17 37	0 33	1 48	20 17	3.1	7 49	.5
45	6 43	17 43	0 30	1 38	20 16	2.9	7 49	.7
40	6 38	17 49	0 27	1 30	20 14	2.7	7 48	.9
35	6 33	17 53	0 25	1 24	20 13	2.5	7 47	1.0
30	6 29	17 57	0 24	1 20	20 12	2.4	7 47	1.1
20	6 22	18 4	0 22	1 13	20 10	2.2	7 46	1.4
10	6 16	18 10	0 21	1 10	20 8	2.0	7 45	1.6
0	6 10	18 16	0 21	1 9	20 7	1.8	7 45	1.8
10	6 3	18 22	0 21	1 11	20 5	1.6	7 44	1.9
20	5 57	18 29	0 22	1 15	20 3	1.4	7 43	2.1
30	5 49	18 36	0 24	1 22	20 2	1.2	7 42	2.4
35	5 44	18 41	0 26	1 28	20 1	1.1	7 42	2.5
40	5 39	18 46	0 28	1 36	19 59	.9	7 41	2.7
45	5 33	18 52	0 30	1 46	19 58	.7	7 41	2.8
50	5 26	18 59	0 34	1 60	19 56	.5	7 40	3.0
55	5 17	19 8	0 38	2 21	19 54	.3	7 39	3.3
60	5 5	19 20	0 45	3 0	19 52	.0	7 38	3.7
S								

UT	MESEC				JUPITER		SATURN	
	S <sub>♃</sub>	Δ	δ <sub>♃</sub>	Δ	S <sub>♃</sub>	δ <sub>♃</sub>	S <sub>♄</sub>	δ <sub>♄</sub>
h	°	'	°	'	'	°	'	'
0	336 57.7	157	2 51.8	-148	318 47.0	- 5 38.4	43 18.1	21 53.7
2	6 7.1	157	2 22.2	-148	348 52.3	- 5 38.3	73 23.3	21 53.8
4	35 16.5	157	1 52.5	-149	18 57.5	- 5 38.1	103 28.5	21 53.8
6	64 25.9	157	1 22.8	-149	49 2.8	- 5 38.0	133 33.6	21 53.9
8	93 35.3	156	0 53.0	-149	79 8.1	- 5 37.8	163 38.8	21 53.9
10	122 44.5	156	0 23.1	-149	109 13.3	- 5 37.7	193 43.9	21 54.0
12	151 53.8	156	- 0 6.8	-150	139 18.6	- 5 37.5	223 49.1	21 54.0
14	181 2.9	155	- 0 36.7	-150	169 23.9	- 5 37.3	253 54.2	21 54.0
16	210 12.0	155	- 1 6.7	-150	199 29.1	- 5 37.2	283 59.4	21 54.1
18	239 21.0	154	- 1 36.7	-150	229 34.4	- 5 37.0	314 4.5	21 54.1
20	268 29.9	154	- 2 6.7	-150	259 39.7	- 5 36.9	344 9.7	21 54.2
22	297 38.6	153	- 2 36.7	-150	289 44.9	- 5 36.7	14 14.8	21 54.2
Δ					26	1	26	0

SUNCE				MESEC					
UT	e = T <sub>p</sub> - UT	Δ/24	r	Prolaz	Δ/24	π <sub>☾</sub>	r		
h	min	s	'	h min	min	'	'		
00	-12 57.6	.4	16.2	T <sub>m</sub>	1 35	1.7	55.6 15.1		
12	-12 52.4	T <sub>m☉</sub>	12 h 12.9 min	Starost	17.1 d	Faza	☉		
PLANETE									
Pl.	T <sub>m</sub>	π	360-α	Vel.	Pl.	T <sub>m</sub>	π	360-α	Vel.
♀	h min	'	°		♃	h min	'	°	
♁	11 44	.1	28	-3.8	♃	2 44	.0	163	-2.2
♂	8 36	.1	75	1.2	♄	21 3	.0	247	-1.1

UT	SUNCE		PROLEĆ. TAČKA S <sub>γ</sub>	VENERA		MARS	
	S <sub>☉</sub>	δ <sub>☉</sub>		S <sub>♀</sub>	δ <sub>♀</sub>	S <sub>♂</sub>	δ <sub>♂</sub>
h	°	'	°	'	'	°	'
0	176 48.1	- 8 23.2	156 55.4	183 55.6	-12 31.4	231 15.4	-23 14.0
2	206 48.4	- 8 21.3	187 .3	213 54.5	-12 29.2	261 16.5	-23 13.7
4	236 48.6	- 8 19.5	217 5.3	243 53.4	-12 27.1	291 17.5	-23 13.4
6	266 48.8	- 8 17.6	247 10.2	273 52.3	-12 25.0	321 18.6	-23 13.1
8	296 49.0	- 8 15.7	277 15.1	303 51.2	-12 22.8	351 19.6	-23 12.8
10	326 49.3	- 8 13.8	307 20.0	333 50.2	-12 20.7	21 20.7	-23 12.5
12	356 49.5	- 8 11.9	337 25.0	3 49.1	-12 18.5	51 21.8	-23 12.1
14	26 49.7	- 8 10.0	7 29.9	33 48.0	-12 16.4	81 22.8	-23 11.8
16	56 49.9	- 8 8.2	37 34.8	63 46.9	-12 14.2	111 23.9	-23 11.5
18	86 50.2	- 8 6.3	67 39.8	93 45.9	-12 12.1	141 24.9	-23 11.2
20	116 50.4	- 8 4.4	97 44.7	123 44.8	-12 9.9	171 26.0	-23 10.9
22	146 50.6	- 8 2.5	127 49.6	153 43.7	-12 7.8	201 27.0	-23 10.5
Δ	1	9		-5	11	5	2

φ	SUNCE		TRAJANJE SUMRAKA		MESEC			
	IZLAZ	ZALAZ	GRAĐ.	ASTR.	IZLAZ	Δ/24	ZALAZ	Δ/24
N	h min	h min	h min	h min	h min	min	h min	min
60	7 4	17 22	0 42	2 19	21 52	3.9	7 50	.0
55	6 55	17 32	0 37	2 1	21 40	3.5	7 57	.3
50	6 47	17 39	0 33	1 48	21 32	3.2	8 2	.6
45	6 41	17 45	0 30	1 38	21 25	3.0	8 6	.8
40	6 36	17 50	0 27	1 30	21 19	2.8	8 9	.9
35	6 32	17 54	0 25	1 24	21 14	2.6	8 12	1.1
30	6 28	17 58	0 24	1 20	21 10	2.5	8 15	1.2
20	6 21	18 4	0 22	1 13	21 2	2.3	8 19	1.4
10	6 15	18 10	0 21	1 10	20 56	2.1	8 23	1.6
0	6 9	18 16	0 21	1 9	20 50	1.9	8 27	1.8
10	6 3	18 22	0 21	1 11	20 44	1.7	8 31	2.0
20	5 57	18 28	0 22	1 15	20 37	1.5	8 35	2.2
30	5 50	18 35	0 24	1 22	20 30	1.3	8 39	2.5
35	5 45	18 40	0 26	1 28	20 26	1.1	8 42	2.6
40	5 40	18 44	0 28	1 35	20 21	1.0	8 45	2.7
45	5 34	18 50	0 30	1 45	20 16	.8	8 49	2.9
50	5 27	18 57	0 34	1 59	20 9	.6	8 53	3.1
55	5 19	19 6	0 38	2 20	20 1	.4	8 58	3.4
60	5 7	19 17	0 45	2 57	19 51	.0	9 5	3.8
S								

UT	MESEC				JUPITER		SATURN	
	S <sub>♃</sub>	Δ	δ <sub>♃</sub>	Δ	S <sub>♃</sub>	δ <sub>♃</sub>	S <sub>♄</sub>	δ <sub>♄</sub>
h	°	'	°	'	'	°	'	'
0	326 47.3	153 - 3	6.7	-150	319 50.2	- 5 36.6	44 20.0	21 54.2
2	355 55.8	152 - 3	36.7	-150	349 55.5	- 5 36.4	74 25.1	21 54.3
4	25 4.2	151 - 4	6.6	-150	20 .7	- 5 36.2	104 30.3	21 54.3
6	54 12.5	150 - 4	36.6	-150	50 6.0	- 5 36.1	134 35.4	21 54.4
8	83 20.6	150 - 5	6.5	-149	80 11.3	- 5 35.9	164 40.6	21 54.4
10	112 28.5	149 - 5	36.4	-149	110 16.6	- 5 35.8	194 45.7	21 54.4
12	141 36.3	148 - 6	6.2	-149	140 21.8	- 5 35.6	224 50.8	21 54.5
14	170 43.8	147 - 6	36.0	-148	170 27.1	- 5 35.4	254 56.0	21 54.5
16	199 51.2	146 - 7	5.6	-148	200 32.4	- 5 35.3	285 1.1	21 54.5
18	228 58.4	145 - 7	35.3	-148	230 37.7	- 5 35.1	315 6.3	21 54.6
20	258 5.4	144 - 8	4.8	-147	260 43.0	- 5 34.9	345 11.4	21 54.6
22	287 12.2	143 - 8	34.2	-147	290 48.3	- 5 34.8	15 16.5	21 54.7
Δ					26	1	26	0

SUNCE				MESEC					
UT	e = T <sub>p</sub> - UT	Δ/24	r	Prolaz	Δ/24	π <sub>☾</sub>	r		
h	min	s	'	h min	min	'	'		
00	-12 47.3	.5	16.2	T <sub>m</sub>	2 17	1.8	56.1 15.3		
12	-12 41.8	T <sub>m☉</sub>	12 h 12.7 min	Starost	18.1 d	Faza	☉		
PLANETE									
Pl.	T <sub>m</sub>	π	360-α	Vel.	Pl.	T <sub>m</sub>	π	360-α	Vel.
♀	h min	'	°		♃	h min	'	°	
♁	11 45	.1	27	-3.8	♃	2 40	.0	163	-2.2
♂	8 35	.1	74	1.2	♄	20 59	.0	247	-1.1

UT	SUNCE		PROLEĆ. TAČKA S <sub>γ</sub>	VENERA		MARS	
	S <sub>☉</sub>	δ <sub>☉</sub>		S <sub>♀</sub>	δ <sub>♀</sub>	S <sub>♂</sub>	δ <sub>♂</sub>
h	°	'	°	°	'	°	'
0	176 50.9	- 8 .6	157 54.5	183 42.7	-12 5.6	231 28.1	-23 10.2
2	206 51.1	- 7 58.7	187 59.5	213 41.6	-12 3.4	261 29.1	-23 9.9
4	236 51.3	- 7 56.8	218 4.4	243 40.5	-12 1.3	291 30.2	-23 9.5
6	266 51.5	- 7 54.9	248 9.3	273 39.5	-11 59.1	321 31.2	-23 9.2
8	296 51.8	- 7 53.1	278 14.2	303 38.4	-11 56.9	351 32.3	-23 8.9
10	326 52.0	- 7 51.2	308 19.2	333 37.4	-11 54.8	21 33.4	-23 8.5
12	356 52.3	- 7 49.3	338 24.1	3 36.3	-11 52.6	51 34.4	-23 8.2
14	26 52.5	- 7 47.4	8 29.0	33 35.3	-11 50.4	81 35.5	-23 7.9
16	56 52.7	- 7 45.5	38 34.0	63 34.2	-11 48.2	111 36.5	-23 7.5
18	86 53.0	- 7 43.6	68 38.9	93 33.2	-11 46.0	141 37.6	-23 7.2
20	116 53.2	- 7 41.7	98 43.8	123 32.1	-11 43.9	171 38.6	-23 6.8
22	146 53.4	- 7 39.8	128 48.7	153 31.1	-11 41.7	201 39.7	-23 6.5
Δ	1	9		-5	11	5	2

φ	SUNCE		TRAJANJE SUMRAKA		MESEC			
	IZLAZ	ZALAZ	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	17 25	0 42	2 19	23 26	4.2	7 50	.0
55	6 52	17 34	0 37	2 1	23 5	3.7	8 4	.4
50	6 45	17 41	0 33	1 48	22 49	3.4	8 15	.7
45	6 40	17 46	0 30	1 38	22 36	3.1	8 24	.9
40	6 35	17 51	0 27	1 30	22 26	2.9	8 32	1.1
35	6 31	17 55	0 25	1 24	22 17	2.8	8 38	1.2
30	6 27	17 58	0 24	1 20	22 10	2.6	8 44	1.3
20	6 21	18 5	0 22	1 13	21 57	2.4	8 54	1.6
10	6 15	18 10	0 21	1 10	21 45	2.2	9 3	1.8
0	6 9	18 16	0 21	1 9	21 35	2.0	9 11	2.0
10	6 4	18 21	0 21	1 11	21 24	1.9	9 19	2.1
20	5 57	18 27	0 22	1 15	21 13	1.7	9 28	2.3
30	5 50	18 34	0 24	1 22	21 1	1.4	9 38	2.6
35	5 46	18 38	0 26	1 28	20 53	1.3	9 44	2.7
40	5 41	18 43	0 28	1 35	20 45	1.2	9 51	2.9
45	5 36	18 48	0 30	1 45	20 36	1.0	9 59	3.0
50	5 29	18 55	0 33	1 58	20 24	.8	10 9	3.3
55	5 21	19 3	0 38	2 19	20 10	.5	10 21	3.6
60	5 10	19 14	0 45	2 55	19 51	.0	10 36	4.0
S								

UT	MESEC				JUPITER		SATURN	
	S <sub>♃</sub>	Δ	δ <sub>♃</sub>	Δ	S <sub>♃</sub>	δ <sub>♃</sub>	S <sub>♄</sub>	δ <sub>♄</sub>
h	°	'	°	'	°	'	°	'
0	316 18.7	141 - 9	3.5	-146	320 53.5	- 5 34.6	45 21.7	21 54.7
2	345 25.0	140 - 9	32.7	-145	350 58.8	- 5 34.5	75 26.8	21 54.7
4	14 31.0	139 -10	1.8	-145	21 4.1	- 5 34.3	105 32.0	21 54.8
6	43 36.8	138 -10	30.8	-144	51 9.4	- 5 34.1	135 37.1	21 54.8
8	72 42.4	136 -10	59.6	-143	81 14.7	- 5 34.0	165 42.2	21 54.9
10	101 47.6	135 -11	28.3	-142	111 20.0	- 5 33.8	195 47.4	21 54.9
12	130 52.6	133 -11	56.8	-142	141 25.3	- 5 33.6	225 52.5	21 54.9
14	159 57.2	132 -12	25.1	-141	171 30.5	- 5 33.5	255 57.6	21 55.0
16	189 1.6	130 -12	53.2	-140	201 35.8	- 5 33.3	286 2.8	21 55.0
18	218 5.6	129 -13	21.2	-139	231 41.1	- 5 33.1	316 7.9	21 55.0
20	247 9.3	127 -13	48.9	-138	261 46.4	- 5 33.0	346 13.0	21 55.1
22	276 12.7	125 -14	16.5	-137	291 51.7	- 5 32.8	16 18.2	21 55.1
Δ					26	1	26	0

SUNCE				MESEC					
UT	e = T <sub>p</sub> - UT	Δ/24	r	Prolaz	Δ/24	π <sub>☾</sub>	r		
h	min	s	s	h min	min	'	'		
00	-12 36.4	.5	16.2	T <sub>m</sub>	3 0	1.9	56.6 15.4		
12	-12 30.7	T <sub>m☉</sub>	12 h 12.5 min	Starost	19.1 d	Faza	☉		
PLANETE									
Pl.	T <sub>m</sub>	π	360-α	Vel.	Pl.	T <sub>m</sub>	π	360-α	Vel.
♀	h min	'	°		♃	h min	'	°	
♁	11 46	.1	26	-3.8	♃	2 36	.0	163	-2.2
♂	8 34	.1	74	1.2	♄	20 55	.0	247	-1.1

1. MART

UTORAK

UT	SUNCE		PROLEĆ. TAČKA S <sub>γ</sub>	VENERA		MARS	
	S <sub>☉</sub>	δ <sub>☉</sub>		S <sub>♀</sub>	δ <sub>♀</sub>	S <sub>♂</sub>	δ <sub>♂</sub>
h	°	'	°	°	'	°	'
0	176 53.7	- 7 37.9	158 53.7	183 30.0	-11 39.5	231 40.7	-23 6.2
2	206 53.9	- 7 36.0	188 58.6	213 29.0	-11 37.3	261 41.8	-23 5.8
4	236 54.2	- 7 34.1	219 3.5	243 27.9	-11 35.1	291 42.9	-23 5.5
6	266 54.4	- 7 32.2	249 8.5	273 26.9	-11 32.9	321 43.9	-23 5.1
8	296 54.7	- 7 30.3	279 13.4	303 25.9	-11 30.7	351 45.0	-23 4.8
10	326 54.9	- 7 28.4	309 18.3	333 24.8	-11 28.5	21 46.0	-23 4.4
12	356 55.2	- 7 26.5	339 23.2	3 23.8	-11 26.3	51 47.1	-23 4.1
14	26 55.4	- 7 24.6	9 28.2	33 22.8	-11 24.1	81 48.1	-23 3.7
16	56 55.6	- 7 22.7	39 33.1	63 21.7	-11 21.9	111 49.2	-23 3.3
18	86 55.9	- 7 20.8	69 38.0	93 20.7	-11 19.7	141 50.3	-23 3.0
20	116 56.1	- 7 18.9	99 43.0	123 19.7	-11 17.5	171 51.3	-23 2.6
22	146 56.4	- 7 17.0	129 47.9	153 18.7	-11 15.3	201 52.4	-23 2.3
Δ	1	10		-5	11	5	2

φ	SUNCE		TRAJANJE SUMRAKA		MESEC			
	IZLAZ	ZALAZ	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	17 27	0 42	2 19	...	.0	7 50	.1
55	6 50	17 36	0 36	2 1	...	.0	8 13	.6
50	6 43	17 42	0 32	1 48	...	.0	8 31	.9
45	6 38	17 47	0 29	1 38	23 51	3.2	8 45	1.1
40	6 33	17 52	0 27	1 30	23 36	3.0	8 57	1.3
35	6 29	17 56	0 25	1 24	23 24	2.9	9 7	1.4
30	6 26	17 59	0 24	1 20	23 13	2.8	9 16	1.6
20	6 20	18 5	0 22	1 13	22 55	2.6	9 31	1.8
10	6 14	18 10	0 21	1 10	22 39	2.4	9 45	2.0
0	6 9	18 16	0 21	1 9	22 24	2.2	9 58	2.1
10	6 4	18 21	0 21	1 11	22 9	2.1	10 10	2.3
20	5 58	18 27	0 22	1 15	21 53	1.9	10 24	2.5
30	5 51	18 33	0 24	1 22	21 35	1.7	10 40	2.7
35	5 47	18 37	0 26	1 27	21 25	1.6	10 49	2.8
40	5 42	18 41	0 28	1 35	21 13	1.4	10 60	3.0
45	5 37	18 47	0 30	1 44	20 59	1.3	11 12	3.2
50	5 31	18 53	0 33	1 58	20 42	1.0	11 27	3.4
55	5 23	19 1	0 38	2 18	20 21	.7	11 47	3.7
60	5 12	19 11	0 44	2 52	19 52	.2	12 13	4.3
S								

UT	MESEC				JUPITER		SATURN	
	S <sub>♃</sub>	Δ	δ <sub>♃</sub>	Δ	S <sub>♃</sub>	δ <sub>♃</sub>	S <sub>♄</sub>	δ <sub>♄</sub>
h	°	'	°	'	°	'	°	'
0	305 15.8	124 -14	43.8	-135	321 57.0	- 5 32.6	46 23.3	21 55.1
2	334 18.5	122 -15	10.9	-134	352 2.3	- 5 32.5	76 28.4	21 55.2
4	3 20.8	120 -15	37.7	-133	22 7.6	- 5 32.3	106 33.5	21 55.2
6	32 22.8	118 -16	4.3	-132	52 12.9	- 5 32.1	136 38.7	21 55.3
8	61 24.4	116 -16	30.6	-130	82 18.2	- 5 31.9	166 43.8	21 55.3
10	90 25.7	114 -16	56.6	-129	112 23.5	- 5 31.8	196 48.9	21 55.3
12	119 26.5	112 -17	22.3	-127	142 28.8	- 5 31.6	226 54.1	21 55.4
14	148 26.9	110 -17	47.8	-126	172 34.1	- 5 31.4	256 59.2	21 55.4
16	177 27.0	108 -18	12.9	-124	202 39.4	- 5 31.3	287 4.3	21 55.4
18	206 26.6	106 -18	37.7	-122	232 44.7	- 5 31.1	317 9.4	21 55.5
20	235 25.8	104 -19	2.1	-121	262 50.0	- 5 30.9	347 14.6	21 55.5
22	264 24.6	102 -19	26.2	-119	292 55.3	- 5 30.7	17 19.7	21 55.5
Δ					27	1	26	0

SUNCE				MESEC					
UT	e = T <sub>p</sub> - UT	Δ/24	r	Prolaz	Δ/24	π <sub>☾</sub>	r		
h	min	s	s	h min	min	'	'		
00	-12 25.1	.5	16.2	T <sub>m</sub>	3 46	2.1	57.1 15.6		
12	-12 19.1	T <sub>m☉</sub>	12 h 12.3 min	Starost	20.1 d	Faza	☉		
PLANETE									
Pl.	T <sub>m</sub>	π	360-α	Vel.	Pl.	T <sub>m</sub>	π	360-α	Vel.
♀	h min	'	°		♃	h min	'	°	
♁	11 46	.1	25	-3.8	♃	2 32	.0	163	-2.2
♂	8 33	.1	73	1.2	♄	20 51	.0	247	-1.1

UT	SUNCE		PROLEĆ. TAČKA S <sub>γ</sub>	VENERA		MARS	
	S <sub>☉</sub>	δ <sub>☉</sub>		S <sub>♀</sub>	δ <sub>♀</sub>	S <sub>♂</sub>	δ <sub>♂</sub>
h	° / ' / "	° / ' / "	° / ' / "	° / ' / "	° / ' / "	° / ' / "	° / ' / "
0	176 56.6	- 7 15.1	159 52.8	183 17.6	-11 13.1	231 53.4	-23 1.9
2	206 56.9	- 7 13.1	189 57.7	213 16.6	-11 10.9	261 54.5	-23 1.5
4	236 57.2	- 7 11.2	220 2.7	243 15.6	-11 8.6	291 55.6	-23 1.2
6	266 57.4	- 7 9.3	250 7.6	273 14.6	-11 6.4	321 56.6	-23 .8
8	296 57.7	- 7 7.4	280 12.5	303 13.5	-11 4.2	351 57.7	-23 .4
10	326 57.9	- 7 5.5	310 17.5	333 12.5	-11 2.0	21 58.7	-23 .0
12	356 58.2	- 7 3.6	340 22.4	3 11.5	-10 59.8	51 59.8	-22 59.7
14	26 58.4	- 7 1.7	10 27.3	33 10.5	-10 57.5	82 .8	-22 59.3
16	56 58.7	- 6 59.8	40 32.2	63 9.5	-10 55.3	112 1.9	-22 58.9
18	86 58.9	- 6 57.9	70 37.2	93 8.5	-10 53.1	142 3.0	-22 58.5
20	116 59.2	- 6 55.9	100 42.1	123 7.5	-10 50.8	172 4.0	-22 58.2
22	146 59.5	- 6 54.0	130 47.0	153 6.5	-10 48.6	202 5.1	-22 57.8
Δ	1	10		-5	11	5	2

φ	SUNCE		TRAJANJE SUMRAKA		MESEC			
	IZLAZ	ZALAZ	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 55	17 30	0 42	2 19	1 8	4.5	7 51	.2
55	6 47	17 38	0 36	2 1	0 34	3.8	8 27	.9
50	6 41	17 44	0 32	1 48	0 10	3.4	8 52	1.2
45	6 36	17 49	0 29	1 38	...	.0	9 12	1.4
40	6 32	17 53	0 27	1 30	...	.0	9 28	1.6
35	6 28	17 57	0 25	1 24	...	.0	9 42	1.7
30	6 25	17 60	0 24	1 20	...	.0	9 53	1.8
20	6 19	18 5	0 22	1 13	23 56	2.7	10 14	2.0
10	6 14	18 11	0 21	1 10	23 36	2.5	10 32	2.2
0	6 9	18 15	0 21	1 9	23 17	2.4	10 49	2.3
10	6 4	18 20	0 21	1 11	22 59	2.3	11 5	2.5
20	5 58	18 26	0 22	1 14	22 39	2.2	11 24	2.6
30	5 52	18 32	0 24	1 22	22 16	2.0	11 45	2.8
35	5 48	18 36	0 26	1 27	22 3	1.9	11 57	2.9
40	5 44	18 40	0 28	1 34	21 48	1.8	12 11	3.0
45	5 39	18 45	0 30	1 44	21 29	1.7	12 28	3.2
50	5 32	18 51	0 33	1 57	21 7	1.5	12 49	3.4
55	5 25	18 58	0 38	2 17	20 38	1.1	13 17	3.8
60	5 15	19 8	0 44	2 50	19 56	.4	13 56	4.5
S								

UT	MESEC				JUPITER		SATURN	
	S <sub>♃</sub>	Δ	δ <sub>♃</sub>	Δ	S <sub>♃</sub>	δ <sub>♃</sub>	S <sub>♄</sub>	δ <sub>♄</sub>
h	° / ' / "	° / ' / "	° / ' / "	° / ' / "	° / ' / "	° / ' / "	° / ' / "	° / ' / "
0	293 22.9	100 -19	50.0 -117		323 .6	- 5 30.6	47 24.8	21 55.6
2	322 20.9	97 -20	13.3 -115		353 6.0	- 5 30.4	77 29.9	21 55.6
4	351 18.3	95 -20	36.3 -113		23 11.3	- 5 30.2	107 35.0	21 55.7
6	20 15.4	93 -20	58.8 -111		53 16.6	- 5 30.1	137 40.2	21 55.7
8	49 12.0	91 -21	21.0 -109		83 21.9	- 5 29.9	167 45.3	21 55.7
10	78 8.1	88 -21	42.7 -106		113 27.2	- 5 29.7	197 50.4	21 55.8
12	107 3.8	86 -22	4.0 -104		143 32.5	- 5 29.5	227 55.5	21 55.8
14	135 59.0	84 -22	24.8 -102		173 37.8	- 5 29.4	258 .6	21 55.8
16	164 53.8	82 -22	45.2 -99		203 43.1	- 5 29.2	288 5.7	21 55.9
18	193 48.1	79 -23	5.1 -97		233 48.5	- 5 29.0	318 10.9	21 55.9
20	222 41.9	77 -23	24.4 -94		263 53.8	- 5 28.8	348 16.0	21 55.9
22	251 35.3	75 -23	43.3 -92		293 59.1	- 5 28.6	18 21.1	21 56.0
Δ					27	1	26	0

SUNCE				MESEC					
UT	e = T <sub>p</sub> - UT	Δ/24	r	Prolaz	Δ/24	π <sub>♃</sub>	r		
h	min s	s	'	h min	min	'	'		
00	-12 13.2	.5	16.2	T <sub>m</sub>	4 36	2.3	57.7	15.7	
12	-12 7.1	T <sub>m☉</sub>	12 h 12.1 min	Starost	21.1 d	Faza	☉		
PLANETE									
Pl.	T <sub>m</sub>	π	360-α	Vel.	Pl.	T <sub>m</sub>	π	360-α	Vel.
♀	h min	'	°		♃	h min	'	°	
♂	11 47	.1	23	-3.8	♃	2 28	.0	163	-2.2
	8 32	.1	72	1.2	♄	20 47	.0	248	-1.1

UT	SUNCE		PROLEĆ. TAČKA S <sub>γ</sub>	VENERA		MARS	
	S <sub>☉</sub>	δ <sub>☉</sub>		S <sub>♀</sub>	δ <sub>♀</sub>	S <sub>♂</sub>	δ <sub>♂</sub>
h	° / ' / "	° / ' / "	° / ' / "	° / ' / "	° / ' / "	° / ' / "	° / ' / "
0	176 59.7	- 6 52.1	160 52.0	183 5.5	-10 46.4	232 6.1	-22 57.4
2	207 .0	- 6 50.2	190 56.9	213 4.5	-10 44.1	262 7.2	-22 57.0
4	237 .3	- 6 48.3	221 1.8	243 3.5	-10 41.9	292 8.3	-22 56.6
6	267 .5	- 6 46.4	251 6.7	273 2.5	-10 39.6	322 9.3	-22 56.2
8	297 .8	- 6 44.4	281 11.7	303 1.5	-10 37.4	352 10.4	-22 55.9
10	327 1.0	- 6 42.5	311 16.6	333 .5	-10 35.1	22 11.4	-22 55.5
12	357 1.3	- 6 40.6	341 21.5	2 59.5	-10 32.9	52 12.5	-22 55.1
14	27 1.6	- 6 38.7	11 26.4	32 58.5	-10 30.6	82 13.6	-22 54.7
16	57 1.8	- 6 36.8	41 31.4	62 57.5	-10 28.4	112 14.6	-22 54.3
18	87 2.1	- 6 34.8	71 36.3	92 56.5	-10 26.1	142 15.7	-22 53.9
20	117 2.4	- 6 32.9	101 41.2	122 55.5	-10 23.9	172 16.8	-22 53.5
22	147 2.6	- 6 31.0	131 46.2	152 54.5	-10 21.6	202 17.8	-22 53.1
Δ	1	10		-5	11	5	2

φ	SUNCE		TRAJANJE SUMRAKA		MESEC			
	IZLAZ	ZALAZ	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 52	17 33	0 42	2 19	2 55	4.5	7 57	.6
55	6 45	17 40	0 36	2 1	2 5	3.7	8 47	1.4
50	6 39	17 45	0 32	1 48	1 33	3.4	9 21	1.7
45	6 34	17 50	0 29	1 38	1 9	3.2	9 46	1.9
40	6 30	17 54	0 27	1 30	0 49	3.0	10 6	2.0
35	6 27	17 57	0 25	1 24	0 33	2.9	10 23	2.1
30	6 24	18 0	0 24	1 19	0 19	2.8	10 38	2.2
20	6 18	18 6	0 22	1 13	...	.0	11 3	2.3
10	6 13	18 11	0 21	1 10	...	.0	11 24	2.4
0	6 9	18 15	0 21	1 9	...	.0	11 44	2.5
10	6 4	18 20	0 21	1 10	23 54	2.5	12 5	2.6
20	5 58	18 25	0 22	1 14	23 31	2.5	12 26	2.7
30	5 52	18 31	0 24	1 22	23 5	2.4	12 52	2.8
35	5 49	18 34	0 26	1 27	22 49	2.4	13 7	2.9
40	5 45	18 38	0 28	1 34	22 31	2.3	13 24	2.9
45	5 40	18 43	0 30	1 43	22 9	2.2	13 45	3.0
50	5 34	18 49	0 33	1 57	21 42	2.1	14 11	3.2
55	5 27	18 56	0 38	2 16	21 5	1.9	14 47	3.4
60	5 18	19 5	0 44	2 47	20 7	1.2	15 44	4.1
S								

UT	MESEC				JUPITER		SATURN	
	S <sub>♃</sub>	Δ	δ <sub>♃</sub>	Δ	S <sub>♃</sub>	δ <sub>♃</sub>	S <sub>♄</sub>	δ <sub>♄</sub>
h	° / ' / "	° / ' / "	° / ' / "	° / ' / "	° / ' / "	° / ' / "	° / ' / "	° / ' / "
0	280 28.3	72 -24	1.7 -89		324 4.4	- 5 28.5	48 26.2	21 56.0
2	309 20.7	70 -24	19.5 -86		354 9.7	- 5 28.3	78 31.3	21 56.0
4	338 12.7	68 -24	36.8 -84		24 15.1	- 5 28.1	108 36.4	21 56.1
6	7 4.3	66 -24	53.5 -81		54 20.4	- 5 27.9	138 41.5	21 56.1
8	35 55.4	63 -25	9.6 -78		84 25.7	- 5 27.8	168 46.6	21 56.1
10	64 46.1	61 -25	25.2 -75		114 31.0	- 5 27.6	198 51.7	21 56.2
12	93 36.3	59 -25	40.1 -72		144 36.4	- 5 27.4	228 56.8	21 56.2
14	122 26.1	57 -25	54.4 -69		174 41.7	- 5 27.2	259 2.0	21 56.2
16	151 15.5	55 -26	8.2 -65		204 47.0	- 5 27.0	289 7.1	21 56.3
18	180 4.5	53 -26	21.2 -62		234 52.3	- 5 26.9	319 12.2	21 56.3
20	208 53.0	51 -26	33.7 -59		264 57.7	- 5 26.7	349 17.3	21 56.3
22	237 41.2	49 -26	45.4 -55		295 3.0	- 5 26.5	19 22.4	21 56.4
Δ					27	1	26	0

SUNCE				MESEC					
UT	e = T <sub>p</sub> - UT	Δ/24	r	Prolaz	Δ/24	π <sub>♃</sub>	r		
h	min s	s	'	h min	min	'	'		
00	-12 .9	.5	16.2	T <sub>m</sub>	5 31	2.5	58.3	15.9	
12	-11 54.5	T <sub>m☉</sub>	12 h 11.9 min	Starost	22.1 d	Faza	☉		
PLANETE									
Pl.	T <sub>m</sub>	π	360-α	Vel.	Pl.	T <sub>m</sub>	π	360-α	Vel.
♀	h min	'	°		♃	h min	'	°	
♂	11 48	.1	22	-3.8	♃	2 23	.0	163	-2.2
	8 31	.1	71	1.2	♄	20 43	.0	248	-1.1

UT	SUNCE		PROLEĆ. TAČKA S <sub>γ</sub>	VENERA		MARS					
	S <sub>☉</sub>	δ <sub>☉</sub>		S <sub>♀</sub>	δ <sub>♀</sub>	S <sub>♂</sub>	δ <sub>♂</sub>				
h	°	'	°	'	°	'	°	'			
0	177	2.9 - 6	29.1	161	51.1	182	53.5 -10	19.4	232	18.9 -22	52.7
2	207	3.2 - 6	27.2	191	56.0	212	52.6 -10	17.1	262	19.9 -22	52.3
4	237	3.5 - 6	25.2	222	.9	242	51.6 -10	14.8	292	21.0 -22	51.9
6	267	3.7 - 6	23.3	252	5.9	272	50.6 -10	12.6	322	22.1 -22	51.5
8	297	4.0 - 6	21.4	282	10.8	302	49.6 -10	10.3	352	23.1 -22	51.1
10	327	4.3 - 6	19.4	312	15.7	332	48.6 -10	8.0	2	24.2 -22	50.7
12	357	4.6 - 6	17.5	342	20.7	2	47.7 -10	5.7	52	25.3 -22	50.3
14	27	4.8 - 6	15.6	12	25.6	32	46.7 -10	3.5	82	26.3 -22	49.9
16	57	5.1 - 6	13.7	42	30.5	62	45.7 -10	1.2	112	27.4 -22	49.4
18	87	5.4 - 6	11.7	72	35.4	92	44.7 - 9	58.9	142	28.4 -22	49.0
20	117	5.7 - 6	9.8	102	40.4	122	43.8 - 9	56.6	172	29.5 -22	48.6
22	147	5.9 - 6	7.9	132	45.3	152	42.8 - 9	54.4	202	30.6 -22	48.2
Δ		1	10			-5		11		5	2

φ	SUNCE		TRAJANJE SUMRAKA		MESEC			
	IZLAZ	ZALAZ	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 50	17 35	0 42	2 20	4 43	3.5	8 12	2.0
55	6 43	17 42	0 36	2 1	3 34	3.1	9 21	2.3
50	6 37	17 47	0 32	1 48	2 53	3.0	10 2	2.5
45	6 33	17 51	0 29	1 38	2 24	2.9	10 32	2.5
40	6 29	17 55	0 27	1 30	2 2	2.8	10 55	2.5
35	6 26	17 58	0 25	1 24	1 43	2.8	11 14	2.6
30	6 23	18 1	0 24	1 19	1 27	2.8	11 31	2.6
20	6 18	18 6	0 22	1 13	1 0	2.7	11 58	2.6
10	6 13	18 11	0 21	1 10	0 37	2.6	12 22	2.6
0	6 8	18 15	0 21	1 9	0 15	2.6	12 45	2.6
10	6 4	18 19	0 21	1 10	...	.0	13 7	2.6
20	5 59	18 24	0 22	1 14	...	.0	13 31	2.7
30	5 53	18 30	0 24	1 21	...	.0	13 59	2.7
35	5 50	18 33	0 26	1 27	23 45	2.8	14 15	2.7
40	5 46	18 37	0 27	1 34	23 26	2.8	14 35	2.7
45	5 41	18 41	0 30	1 43	23 2	2.8	14 58	2.7
50	5 36	18 47	0 33	1 56	22 32	2.8	15 28	2.7
55	5 29	18 53	0 37	2 15	21 50	2.9	16 10	2.6
60	5 20	19 2	0 44	2 45	20 37	3.0	17 23	2.5
S								

UT	MESEC				JUPITER		SATURN						
	S <sub>♃</sub>	Δ	δ <sub>♃</sub>	Δ	S <sub>♃</sub>	δ <sub>♃</sub>	S <sub>♄</sub>	δ <sub>♄</sub>					
h	°	'	°	'	°	'	°	'					
0	266	29.0	47	-26	56.5	-52	325	8.3 - 5	26.3	49	27.5	21	56.4
2	295	16.4	45	-27	6.9	-49	355	13.7 - 5	26.1	79	32.6	21	56.4
4	324	3.4	43	-27	16.6	-45	25	19.0 - 5	25.9	109	37.7	21	56.5
6	352	50.1	42	-27	25.6	-41	55	24.3 - 5	25.8	139	42.8	21	56.5
8	21	36.5	40	-27	33.9	-38	85	29.7 - 5	25.6	169	47.9	21	56.5
10	50	22.5	39	-27	41.5	-34	115	35.0 - 5	25.4	199	53.0	21	56.6
12	79	8.3	37	-27	48.3	-30	145	40.3 - 5	25.2	229	58.1	21	56.6
14	107	53.7	36	-27	54.3	-27	175	45.7 - 5	25.0	260	3.2	21	56.6
16	136	38.9	35	-27	59.7	-23	205	51.0 - 5	24.8	290	8.3	21	56.7
18	165	23.9	34	-28	4.2	-19	235	56.4 - 5	24.7	320	13.4	21	56.7
20	194	8.6	32	-28	8.0	-15	266	1.7 - 5	24.5	350	18.5	21	56.7
22	222	53.1	32	-28	11.0	-11	296	7.0 - 5	24.3	20	23.6	21	56.8
Δ								27		1		25	0

SUNCE				MESEC					
UT	e = T <sub>p</sub> - UT	Δ/24	r	Prolaz	Δ/24	π <sub>☉</sub>	r		
h	min	s	s	h min	min	'	'		
00	-11 48.1	.5	16.2	T <sub>m</sub>	6 30	2.6	58.9 16.0		
12	-11 41.5	T <sub>m☉</sub>	12 h 11.7 min	Starost	23.1 d	Faza	☉		
PLANETE									
Pl.	T <sub>m</sub>	π	360-α	Vel.	Pl.	T <sub>m</sub>	π	360-α	Vel.
h	min	'	°	Vel.	h	min	'	°	Vel.
♀	11 49	.1	21	-3.8	♃	2 19	.0	163	-2.2
♂	8 30	.1	70	1.2	♄	20 39	.0	248	-1.1

UT	SUNCE		PROLEĆ. TAČKA S <sub>γ</sub>	VENERA		MARS					
	S <sub>☉</sub>	δ <sub>☉</sub>		S <sub>♀</sub>	δ <sub>♀</sub>	S <sub>♂</sub>	δ <sub>♂</sub>				
h	°	'	°	'	°	'	°	'			
0	177	6.2 - 6	5.9	162	50.2	182	41.8 - 9	52.1	232	31.6 -22	47.8
2	207	6.5 - 6	4.0	192	55.2	212	40.9 - 9	49.8	262	32.7 -22	47.4
4	237	6.8 - 6	2.1	223	.1	242	39.9 - 9	47.5	292	33.8 -22	46.9
6	267	7.1 - 6	.1	253	5.0	272	38.9 - 9	45.2	322	34.8 -22	46.5
8	297	7.3 - 5	58.2	283	9.9	302	38.0 - 9	42.9	352	35.9 -22	46.1
10	327	7.6 - 5	56.3	313	14.9	332	37.0 - 9	40.6	2	37.0 -22	45.7
12	357	7.9 - 5	54.3	343	19.8	2	36.1 - 9	38.3	52	38.0 -22	45.2
14	27	8.2 - 5	52.4	13	24.7	32	35.1 - 9	36.0	82	39.1 -22	44.8
16	57	8.5 - 5	50.5	43	29.7	62	34.1 - 9	33.7	112	40.2 -22	44.4
18	87	8.8 - 5	48.5	73	34.6	92	33.2 - 9	31.4	142	41.2 -22	43.9
20	117	9.0 - 5	46.6	103	39.5	122	32.2 - 9	29.1	172	42.3 -22	43.5
22	147	9.3 - 5	44.7	133	44.4	152	31.3 - 9	26.8	202	43.4 -22	43.1
Δ		1	10			-5		11		5	2

φ	SUNCE		TRAJANJE SUMRAKA		MESEC			
	IZLAZ	ZALAZ	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 47	17 38	0 42	2 20	6 7	1.6	8 59	4.0
55	6 40	17 44	0 36	2 1	4 48	2.2	10 18	3.4
50	6 35	17 49	0 32	1 48	4 5	2.3	11 1	3.2
45	6 31	17 53	0 29	1 38	3 34	2.4	11 32	3.1
40	6 27	17 56	0 27	1 30	3 10	2.5	11 56	3.0
35	6 24	17 59	0 25	1 24	2 50	2.5	12 16	2.9
30	6 22	18 2	0 24	1 19	2 33	2.5	12 33	2.9
20	6 17	18 6	0 22	1 13	2 5	2.6	13 1	2.8
10	6 12	18 11	0 21	1 10	1 40	2.6	13 25	2.7
0	6 8	18 15	0 21	1 9	1 17	2.7	13 48	2.6
10	6 4	18 19	0 21	1 10	0 55	2.7	14 10	2.6
20	5 59	18 23	0 22	1 14	0 30	2.7	14 35	2.5
30	5 54	18 29	0 24	1 21	0 2	2.7	15 3	2.4
35	5 51	18 32	0 26	1 27	...	.0	15 19	2.3
40	5 47	18 35	0 27	1 33	...	.0	15 38	2.2
45	5 43	18 39	0 30	1 43	...	.0	16 2	2.1
50	5 37	18 44	0 33	1 55	23 41	3.5	16 32	2.0
55	5 31	18 51	0 37	2 14	22 60	3.8	17 13	1.7
60	5 23	18 59	0 43	2 43	21 49	4.5	18 24	1.0
S								

UT	MESEC				JUPITER		SATURN						
	S <sub>♃</sub>	Δ	δ <sub>♃</sub>	Δ	S <sub>♃</sub>	δ <sub>♃</sub>	S <sub>♄</sub>	δ <sub>♄</sub>					
h	°	'	°	'	°	'	°	'					
0	251	37.4	31	-28	13.3	-7	326	12.4 - 5	24.1	50	28.7	21	56.8
2	280	21.5	30	-28	14.7	-3	356	17.7 - 5	23.9	80	33.7	21	56.8
4	309	5.5	29	-28	15.4	1	26	23.1 - 5	23.7	110	38.8	21	56.8
6	337	49.4	29	-28	15.2	5	56	28.4 - 5	23.5	140	43.9	21	56.9
8	6	33.1	28	-28	14.3	9	86	33.8 - 5	23.4	170	49.0	21	56.9
10	35	16.8	28	-28	12.6	13	116	39.1 - 5	23.2	200	54.1	21	56.9
12	64	.4	28	-28	10.0	17	146	44.5 - 5	23.0	230	59.2	21	57.0
14	92	43.9	28	-28	6.7	21	176	49.8 - 5	22.8	261	4.3	21	57.0
16	121	27.5	28	-28	2.5	25	206	55.2 - 5	22.6	291	9.4	21	57.0
18	150	11.0	28	-27	57.5	29	237	.5 - 5	22.4	321	14.5	21	57.1
20	178	54.6	28	-27	51.8	33	267	5.9 - 5	22.2	351	19.5	21	57.1
22	207	38.2	28	-27	45.2	37	297	11.2 - 5	22.0	21	24.6	21	57.1
Δ								27		1		25	0

SUNCE				MESEC					
UT	e = T <sub>p</sub> - UT	Δ/24	r	Prolaz	Δ/24	π <sub>☉</sub>	r		
h	min	s	s	h min	min	'	'		
00	-11 34.9	.6	16.2	T <sub>m</sub>	7 33	2.6	59.4 16.2		
12	-11 28.1	T <sub>m☉</sub>	12 h 11.5 min	Starost	24.1 d	Faza	☉		
PLANETE									
Pl.	T <sub>m</sub>	π	360-α	Vel.	Pl.	T <sub>m</sub>	π	360-α	Vel.
h	min	'	°	Vel.	h	min	'	°	Vel.
♀	11 50	.1	20	-3.8	♃	2 15	.0	163	-2.2
♂	8 30	.1	70	1.2	♄	20 35	.0	248	-1.1

UT	SUNCE				PROLEĆ. TAČKA S <sub>γ</sub>	VENERA				MARS				
	S <sub>☉</sub>		δ <sub>☉</sub>			S <sub>♀</sub>		δ <sub>♀</sub>		S <sub>♂</sub>		δ <sub>♂</sub>		
h	°	'	°	'	°	'	°	'	°	'	°	'		
0	177	9.6	-5	42.7	163	49.4	182	30.3	-9	24.5	232	44.4	-22	42.6
2	207	9.9	-5	40.8	193	54.3	212	29.4	-9	22.2	262	45.5	-22	42.2
4	237	10.2	-5	38.8	223	59.2	242	28.4	-9	19.9	292	46.6	-22	41.8
6	267	10.5	-5	36.9	254	4.2	272	27.5	-9	17.6	322	47.6	-22	41.3
8	297	10.8	-5	35.0	284	9.1	302	26.5	-9	15.3	352	48.7	-22	40.9
10	327	11.1	-5	33.0	314	14.0	332	25.6	-9	13.0	22	49.8	-22	40.4
12	357	11.4	-5	31.1	344	18.9	2	24.7	-9	10.7	52	50.8	-22	40.0
14	27	11.7	-5	29.1	14	23.9	32	23.7	-9	8.3	82	51.9	-22	39.5
16	57	11.9	-5	27.2	44	28.8	62	22.8	-9	6.0	112	53.0	-22	39.1
18	87	12.2	-5	25.3	74	33.7	92	21.8	-9	3.7	142	54.1	-22	38.6
20	117	12.5	-5	23.3	104	38.7	122	20.9	-9	1.4	172	55.1	-22	38.2
22	147	12.8	-5	21.4	134	43.6	152	20.0	-8	59.1	202	56.2	-22	37.7
Δ		1		10				-5		12		5		2

φ	SUNCE		TRAJANJE SUMRAKA		MESEC			
	IZLAZ	ZALAZ	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 44	17 40	0 42	2 20	6 45	.5	10 35	4.9
55	6 38	17 46	0 36	2 1	5 40	1.3	11 39	4.0
50	6 33	17 50	0 32	1 48	5 0	1.7	12 18	3.7
45	6 29	17 54	0 29	1 38	4 32	1.9	12 46	3.4
40	6 26	17 57	0 27	1 30	4 9	2.0	13 8	3.3
35	6 23	18 0	0 25	1 24	3 50	2.1	13 26	3.1
30	6 20	18 2	0 24	1 19	3 34	2.2	13 42	3.0
20	6 16	18 7	0 22	1 13	3 7	2.4	14 8	2.8
10	6 12	18 11	0 21	1 10	2 43	2.5	14 30	2.7
0	6 8	18 15	0 21	1 9	2 21	2.6	14 51	2.5
10	6 4	18 18	0 21	1 10	1 59	2.7	15 12	2.4
20	5 60	18 23	0 22	1 14	1 36	2.8	15 34	2.2
30	5 54	18 28	0 24	1 21	1 8	3.0	16 0	2.1
35	5 51	18 30	0 26	1 26	0 52	3.1	16 15	2.0
40	5 48	18 34	0 27	1 33	0 33	3.2	16 32	1.8
45	5 44	18 38	0 30	1 42	0 10	3.3	16 53	1.6
50	5 39	18 42	0 33	1 55	...	...	17 19	1.4
55	5 33	18 48	0 37	2 13	...	...	17 54	1.0
60	5 25	18 56	0 43	2 42	23 37	4.9	18 47	.3
S								

UT	MESEC				JUPITER				SATURN					
	S <sub>♃</sub>		Δ	δ <sub>♃</sub>	Δ	S <sub>♃</sub>		δ <sub>♃</sub>	S <sub>♄</sub>		δ <sub>♄</sub>			
h	°	'	°	'	°	'	°	'	°	'	°	'		
0	236	21.9	29	-27	37.8	41	327	16.6	-5	21.8	51	29.7	21	57.2
2	265	5.6	29	-27	29.6	45	357	21.9	-5	21.7	81	34.8	21	57.2
4	293	49.5	30	-27	20.7	49	27	27.3	-5	21.5	111	39.9	21	57.2
6	322	33.5	31	-27	10.9	53	57	32.6	-5	21.3	141	45.0	21	57.2
8	351	17.7	32	-27	.4	57	87	38.0	-5	21.1	171	50.0	21	57.3
10	20	2.0	33	-26	49.0	60	117	43.4	-5	20.9	201	55.1	21	57.3
12	48	46.5	34	-26	36.9	64	147	48.7	-5	20.7	232	.2	21	57.3
14	77	31.2	35	-26	24.1	68	177	54.1	-5	20.5	262	5.3	21	57.4
16	106	16.2	36	-26	10.5	72	207	59.4	-5	20.3	292	10.4	21	57.4
18	135	1.3	37	-25	56.1	76	238	4.8	-5	20.1	322	15.4	21	57.4
20	163	46.8	39	-25	41.0	79	268	10.2	-5	19.9	352	20.5	21	57.4
22	192	32.5	40	-25	25.1	83	298	15.5	-5	19.7	22	25.6	21	57.5
Δ								27		1		25		0

SUNCE				MESEC					
UT	e = T <sub>p</sub> - UT	Δ/24	r	Prolaz	Δ/24	π <sub>♃</sub>	r		
h	min	s	s	h min	min	'	'		
00	-11	21.3	.6	16.1	T <sub>m</sub>	8 36	2.6	59.9	16.3
12	-11	14.3	T <sub>m☉</sub>	12 h 11.2 min	Starost	25.1 d	Faza	☉	
PLANETE									
Pl.	T <sub>m</sub>	π	360-α	Vel.	Pl.	T <sub>m</sub>	π	360-α	Vel.
♀	h min	'	°		♃	h min	'	°	
♂	11 50	.1	19	-3.8	♄	2 11	.0	163	-2.2
	8 29	.1	69	1.1	♅	20 31	.0	248	-.1

UT	SUNCE				PROLEĆ. TAČKA S <sub>γ</sub>	VENERA				MARS				
	S <sub>☉</sub>		δ <sub>☉</sub>			S <sub>♀</sub>		δ <sub>♀</sub>		S <sub>♂</sub>		δ <sub>♂</sub>		
h	°	'	°	'	°	'	°	'	°	'	°	'		
0	177	13.1	-5	19.4	164	48.5	182	19.0	-8	56.7	232	57.3	-22	37.3
2	207	13.4	-5	17.5	194	53.4	212	18.1	-8	54.4	262	58.3	-22	36.8
4	237	13.7	-5	15.5	224	58.4	242	17.2	-8	52.1	292	59.4	-22	36.4
6	267	14.0	-5	13.6	255	3.3	272	16.2	-8	49.7	323	.5	-22	35.9
8	297	14.3	-5	11.6	285	8.2	302	15.3	-8	47.4	353	1.5	-22	35.5
10	327	14.6	-5	9.7	315	13.1	332	14.4	-8	45.1	23	2.6	-22	35.0
12	357	14.9	-5	7.7	345	18.1	2	13.5	-8	42.7	53	3.7	-22	34.5
14	27	15.2	-5	5.8	15	23.0	32	12.5	-8	40.4	83	4.8	-22	34.1
16	57	15.5	-5	3.9	45	27.9	62	11.6	-8	38.1	113	5.8	-22	33.6
18	87	15.8	-5	1.9	75	32.9	92	10.7	-8	35.7	143	6.9	-22	33.1
20	117	16.1	-5	.0	105	37.8	122	9.8	-8	33.4	173	8.0	-22	32.7
22	147	16.4	-4	58.0	135	42.7	152	8.9	-8	31.0	203	9.1	-22	32.2
Δ		2		10				-5		12		5		2

φ	SUNCE		TRAJANJE SUMRAKA		MESEC			
	IZLAZ	ZALAZ	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	17 43	0 42	2 20	6 58	.2	12 32	4.8
55	6 35	17 48	0 36	2 1	6 12	.8	13 16	4.2
50	6 31	17 52	0 32	1 48	5 40	1.2	13 46	3.8
45	6 27	17 55	0 29	1 38	5 17	1.4	14 8	3.5
40	6 24	17 58	0 27	1 30	4 58	1.6	14 26	3.3
35	6 22	18 1	0 25	1 24	4 41	1.8	14 41	3.1
30	6 19	18 3	0 24	1 19	4 28	1.9	14 54	3.0
20	6 15	18 7	0 22	1 13	4 4	2.1	15 16	2.8
10	6 11	18 11	0 21	1 10	3 43	2.3	15 35	2.6
0	6 8	18 14	0 21	1 9	3 24	2.5	15 52	2.4
10	6 4	18 18	0 21	1 10	3 4	2.6	16 10	2.2
20	5 60	18 22	0 22	1 14	2 44	2.8	16 28	2.0
30	5 55	18 26	0 24	1 21	2 19	3.0	16 50	1.8
35	5 52	18 29	0 25	1 26	2 5	3.2	17 2	1.6
40	5 49	18 32	0 27	1 33	1 49	3.3	17 16	1.5
45	5 45	18 36	0 30	1 42	1 29	3.5	17 32	1.3
50	5 41	18 40	0 33	1 54	1 4	3.8	17 53	1.0
55	5 35	18 46	0 37	2 12	0 30	4.1	18 19	.7
60	5 28	18 53	0 43	2 40	...	...	18 55	.1
S								

UT	MESEC				JUPITER				SATURN					
	S <sub>♃</sub>		Δ	δ <sub>♃</sub>	Δ	S <sub>♃</sub>		δ <sub>♃</sub>	S <sub>♄</sub>		δ <sub>♄</sub>			
h	°	'	°	'	°	'	°	'	°	'	°	'		
0	221	18.5	41	-25	8.6	86	328	20.9	-5	19.5	52	30.7	21	57.5
2	250	4.8	43	-24	51.3	90	358	26.3	-5	19.3	82	35.7	21	57.5
4	278	51.4	45	-24	33.3	93	28	31.6	-5	19.1	112	40.8	21	57.6
6	307	38.3	46	-24	14.7	97	58	37.0	-5	18.9	142	45.9	21	57.6
8	336	25.6	48	-23	55.3	100	88	42.4	-5	18.8	172	51.0	21	57.6
10	5	13.2	50	-23	35.4	103	118	47.7	-5	18.6	202	56.0	21	57.6
12	34	1.1	52	-23	14.7	106	148	53.1	-5	18.4	233	1.1	21	57.7
14	62	49.4	53	-22	53.4	109	178	58.5	-5	18.2	263	6.2	21	57.7
16	91	38.1	55	-22	31.5	112	209	3.8	-5	18.0	293	11.2	21	57.7
18	120	27.2	57	-22	9.0	115	239	9.2	-5	17.8	323	16.3	21	57.8
20	149	16.6	59	-21	46.0	118	269	14.6	-5	17.6	353	21.4	21	57.8
22	178	6.4	61	-21	22.3	121	299	20.0	-5	17.4	23	26.4	21	57.8
Δ								27		1		25		0

SUNCE				MESEC				
UT	e = T <sub>p</sub> - UT	Δ/24	r	Prolaz	Δ/24	π <sub>♃</sub>	r	
h	min	s	s	h min	min	'	'	
00	-11	7.3	.6	16.1	T <sub>m</sub>	9 38	2.4	60.

UT	SUNCE		PROLEĆ. TAČKA S <sub>γ</sub>	VENERA		MARS	
	S <sub>☉</sub>	δ <sub>☉</sub>		S <sub>♀</sub>	δ <sub>♀</sub>	S <sub>♂</sub>	δ <sub>♂</sub>
h	° / ' / "	° / ' / "	° / ' / "	° / ' / "	° / ' / "	° / ' / "	° / ' / "
0	177 16.7 - 4 56.1		165 47.6	182 8.0 - 8 28.7	233 10.1 -22 31.7		
2	207 17.0 - 4 54.1		195 52.6	212 7.0 - 8 26.3	263 11.2 -22 31.2		
4	237 17.3 - 4 52.2		225 57.5	242 6.1 - 8 24.0	293 12.3 -22 30.8		
6	267 17.6 - 4 50.2		256 2.4	272 5.2 - 8 21.6	323 13.4 -22 30.3		
8	297 17.9 - 4 48.2		286 7.4	302 4.3 - 8 19.3	353 14.4 -22 29.8		
10	327 18.3 - 4 46.3		316 12.3	332 3.4 - 8 16.9	23 15.5 -22 29.3		
12	357 18.6 - 4 44.3		346 17.2	2 2.5 - 8 14.6	53 16.6 -22 28.9		
14	27 18.9 - 4 42.4		16 22.1	32 1.6 - 8 12.2	83 17.7 -22 28.4		
16	57 19.2 - 4 40.4		46 27.1	62 .7 - 8 9.9	113 18.7 -22 27.9		
18	87 19.5 - 4 38.5		76 32.0	91 59.8 - 8 7.5	143 19.8 -22 27.4		
20	117 19.8 - 4 36.5		106 36.9	121 58.9 - 8 5.2	173 20.9 -22 26.9		
22	147 20.1 - 4 34.6		136 41.9	151 58.0 - 8 2.8	203 22.0 -22 26.4		
Δ	2 10			-5 12	5 2		

φ	SUNCE		TRAJANJE SUMRAKA		MESEC			
	IZLAZ	ZALAZ	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 38	17 45	0 42	2 20	7 2	.1	14 28	4.6
55	6 33	17 50	0 36	2 1	6 31	.5	14 56	4.1
50	6 29	17 54	0 32	1 48	6 9	.9	15 17	3.7
45	6 25	17 57	0 29	1 38	5 51	1.1	15 33	3.5
40	6 23	17 59	0 27	1 30	5 36	1.3	15 46	3.2
35	6 20	18 2	0 25	1 24	5 24	1.5	15 57	3.1
30	6 18	18 4	0 24	1 19	5 13	1.6	16 6	2.9
20	6 14	18 7	0 22	1 13	4 55	1.9	16 22	2.6
10	6 11	18 11	0 21	1 10	4 38	2.1	16 37	2.4
0	6 7	18 14	0 21	1 9	4 23	2.3	16 50	2.2
10	6 4	18 17	0 21	1 10	4 8	2.5	17 3	2.0
20	6 0	18 21	0 22	1 14	3 51	2.7	17 16	1.8
30	5 56	18 25	0 24	1 21	3 32	3.0	17 32	1.5
35	5 53	18 28	0 25	1 26	3 21	3.1	17 41	1.4
40	5 50	18 31	0 27	1 33	3 8	3.3	17 51	1.2
45	5 47	18 34	0 30	1 42	2 53	3.5	18 3	1.0
50	5 42	18 38	0 33	1 54	2 34	3.8	18 17	.8
55	5 37	18 43	0 37	2 11	2 10	4.1	18 35	.5
60	5 30	18 50	0 43	2 38	1 36	4.7	18 58	.0

UT	MESEC				JUPITER		SATURN	
	S <sub>♃</sub>	Δ	δ <sub>♃</sub>	Δ	S <sub>♃</sub>	δ <sub>♃</sub>	S <sub>♄</sub>	δ <sub>♄</sub>
h	° / ' / "	'	° / ' / "	'	° / ' / "	'	° / ' / "	'
0	206 56.6	63 -20	58.1	124	329 25.3 - 5 17.2		53 31.5	21 57.8
2	235 47.2	65 -20	33.3	127	359 30.7 - 5 17.0		83 36.6	21 57.9
4	264 38.2	67 -20	8.0	129	29 36.1 - 5 16.8		113 41.6	21 57.9
6	293 29.6	69 -19	42.2	132	59 41.5 - 5 16.6		143 46.7	21 57.9
8	322 21.3	71 -19	15.8	134	89 46.8 - 5 16.4		173 51.8	21 58.0
10	351 13.5	73 -18	49.0	136	119 52.2 - 5 16.2		203 56.8	21 58.0
12	20 6.1	75 -18	21.8	139	149 57.6 - 5 16.0		234 1.9	21 58.0
14	48 59.0	77 -17	54.0	141	180 3.0 - 5 15.8		264 6.9	21 58.0
16	77 52.4	79 -17	25.9	143	210 8.4 - 5 15.6		294 12.0	21 58.1
18	106 46.1	81 -16	57.3	145	240 13.7 - 5 15.4		324 17.1	21 58.1
20	135 40.2	82 -16	28.3	147	270 19.1 - 5 15.2		354 22.1	21 58.1
22	164 34.7	84 -15	59.0	149	300 24.5 - 5 15.0		24 27.2	21 58.1
Δ					27 1		25 0	

SUNCE				MESEC			
UT	e = T <sub>p</sub> - UT	Δ/24	r	Prolaz	Δ/24	π <sub>☉</sub>	r
h	min s	s	'	h min	min	'	'
00	-10 52.9	.6	16.1	T <sub>m</sub>	10 36	2.3	60.4 16.4
12	-10 45.5	T <sub>m☉</sub>	12 h 10.8 min	Starost	27.1 d	Faza	●

PLANETE									
Pl.	T <sub>m</sub>	π	360-α	Vel.	Pl.	T <sub>m</sub>	π	360-α	Vel.
♀	h min	'	°		♃	h min	'	°	
♂	11 52	.1	16	-3.8	♄	20 22	.0	164	-2.2
♂	8 27	.1	67	1.1	♄	20 22	.0	248	-1.1

UT	SUNCE		PROLEĆ. TAČKA S <sub>γ</sub>	VENERA		MARS	
	S <sub>☉</sub>	δ <sub>☉</sub>		S <sub>♀</sub>	δ <sub>♀</sub>	S <sub>♂</sub>	δ <sub>♂</sub>
h	° / ' / "	° / ' / "	° / ' / "	° / ' / "	° / ' / "	° / ' / "	° / ' / "
0	177 20.4 - 4 32.6		166 46.8	181 57.1 - 8 .4	233 23.0 -22 25.9		
2	207 20.7 - 4 30.7		196 51.7	211 56.2 - 7 58.1	263 24.1 -22 25.4		
4	237 21.0 - 4 28.7		226 56.6	241 55.3 - 7 55.7	293 25.2 -22 25.0		
6	267 21.4 - 4 26.7		257 1.6	271 54.4 - 7 53.3	323 26.3 -22 24.5		
8	297 21.7 - 4 24.8		287 6.5	301 53.5 - 7 51.0	353 27.3 -22 24.0		
10	327 22.0 - 4 22.8		317 11.4	331 52.6 - 7 48.6	23 28.4 -22 23.5		
12	357 22.3 - 4 20.9		347 16.4	1 51.7 - 7 46.2	53 29.5 -22 23.0		
14	27 22.6 - 4 18.9		17 21.3	31 50.8 - 7 43.8	83 30.6 -22 22.5		
16	57 22.9 - 4 17.0		47 26.2	61 49.9 - 7 41.5	113 31.7 -22 22.0		
18	87 23.2 - 4 15.0		77 31.1	91 49.0 - 7 39.1	143 32.7 -22 21.5		
20	117 23.6 - 4 13.0		107 36.1	121 48.1 - 7 36.7	173 33.8 -22 21.0		
22	147 23.9 - 4 11.1		137 41.0	151 47.2 - 7 34.3	203 34.9 -22 20.5		
Δ	2 10			-4 12	5 2		

φ	SUNCE		TRAJANJE SUMRAKA		MESEC			
	IZLAZ	ZALAZ	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 35	17 48	0 42	2 21	7 3	.0	16 18	4.3
55	6 30	17 52	0 36	2 2	6 44	.4	16 34	3.9
50	6 27	17 55	0 32	1 48	6 30	.7	16 46	3.6
45	6 24	17 58	0 29	1 38	6 18	.9	16 56	3.3
40	6 21	18 1	0 27	1 30	6 8	1.1	17 3	3.1
35	6 19	18 3	0 25	1 24	5 60	1.3	17 10	2.9
30	6 17	18 4	0 24	1 19	5 53	1.4	17 16	2.8
20	6 13	18 8	0 22	1 13	5 40	1.7	17 26	2.5
10	6 10	18 11	0 21	1 10	5 29	1.9	17 35	2.3
0	6 7	18 14	0 21	1 9	5 18	2.1	17 43	2.1
10	6 4	18 17	0 21	1 10	5 8	2.4	17 51	1.9
20	6 1	18 20	0 22	1 14	4 56	2.6	17 59	1.6
30	5 56	18 24	0 24	1 21	4 43	2.8	18 9	1.4
35	5 54	18 26	0 25	1 26	4 36	3.0	18 14	1.2
40	5 51	18 29	0 27	1 33	4 27	3.2	18 20	1.1
45	5 48	18 32	0 30	1 41	4 17	3.4	18 27	.9
50	5 44	18 36	0 33	1 53	4 5	3.6	18 36	.6
55	5 39	18 41	0 37	2 11	3 49	4.0	18 46	.4
60	5 33	18 47	0 43	2 37	3 28	4.4	18 59	.0

UT	MESEC				JUPITER		SATURN	
	S <sub>♃</sub>	Δ	δ <sub>♃</sub>	Δ	S <sub>♃</sub>	δ <sub>♃</sub>	S <sub>♄</sub>	δ <sub>♄</sub>
h	° / ' / "	'	° / ' / "	'	° / ' / "	'	° / ' / "	'
0	193 29.6	86 -15	29.2	150	330 29.9 - 5 14.8		54 32.2	21 58.2
2	222 24.8	88 -14	59.1	152	0 35.3 - 5 14.6		84 37.3	21 58.2
4	251 20.4	90 -14	28.7	154	30 40.7 - 5 14.4		114 42.3	21 58.2
6	280 16.4	92 -13	58.0	155	60 46.1 - 5 14.2		144 47.4	21 58.2
8	309 12.7	93 -13	26.9	157	90 51.4 - 5 13.9		174 52.4	21 58.3
10	338 9.4	95 -12	55.6	158	120 56.8 - 5 13.7		204 57.5	21 58.3
12	7 6.4	97 -12	24.0	159	151 2.2 - 5 13.5		235 2.6	21 58.3
14	36 3.7	98 -11	52.2	160	181 7.6 - 5 13.3		265 7.6	21 58.3
16	65 1.4	100 -11	20.1	162	211 13.0 - 5 13.1		295 12.7	21 58.4
18	93 59.3	101 -10	47.8	163	241 18.4 - 5 12.9		325 17.7	21 58.4
20	122 57.6	103 -10	15.2	164	271 23.8 - 5 12.7		355 22.8	21 58.4
22	151 56.2	104 -9	42.5	164	301 29.2 - 5 12.5		25 27.8	21 58.4
Δ					27 1		25 0	

SUNCE				MESEC			
UT	e = T <sub>p</sub> - UT	Δ/24	r	Prolaz	Δ/24	π <sub>☉</sub>	r
h	min s	s	'	h min	min	'	'
00	-10 38.1	.6	16.1	T <sub>m</sub>	11 31	2.1	60.3 16.4
12	-10 30.6	T <sub>m☉</sub>	12 h 10.5 min	Starost	28.1 d	Faza	●

PLANETE									
Pl.	T <sub>m</sub>	π	360-α	Vel.	Pl.	T <sub>m</sub>	π	360-α	Vel.
♀	h min	'	°		♃	h min	'	°	
♂	11								

UT	SUNCE				PROLEĆ. TAČKA S <sub>γ</sub>	VENERA				MARS				
	S <sub>☉</sub>		δ <sub>☉</sub>			S <sub>♀</sub>		δ <sub>♀</sub>		S <sub>♂</sub>		δ <sub>♂</sub>		
h	°	'	°	'	°	'	°	'	°	'	°	'		
0	177	24.2	- 4	9.1	167	45.9	181	46.3	- 7	32.0	233	36.0	-22	19.9
2	207	24.5	- 4	7.2	197	50.9	211	45.5	- 7	29.6	263	37.1	-22	19.4
4	237	24.8	- 4	5.2	227	55.8	241	44.6	- 7	27.2	293	38.2	-22	18.9
6	267	25.2	- 4	3.2	258	.7	271	43.7	- 7	24.8	323	39.2	-22	18.4
8	297	25.5	- 4	1.3	288	5.6	301	42.8	- 7	22.4	353	40.3	-22	17.9
10	327	25.8	- 3	59.3	318	10.6	331	41.9	- 7	20.0	23	41.4	-22	17.4
12	357	26.1	- 3	57.4	348	15.5	1	41.0	- 7	17.6	53	42.5	-22	16.9
14	27	26.4	- 3	55.4	18	20.4	31	40.2	- 7	15.3	83	43.6	-22	16.4
16	57	26.8	- 3	53.4	48	25.3	61	39.3	- 7	12.9	113	44.6	-22	15.8
18	87	27.1	- 3	51.5	78	30.3	91	38.4	- 7	10.5	143	45.7	-22	15.3
20	117	27.4	- 3	49.5	108	35.2	121	37.5	- 7	8.1	173	46.8	-22	14.8
22	147	27.7	- 3	47.5	138	40.1	151	36.7	- 7	5.7	203	47.9	-22	14.3
Δ		2		10				-4		12		5		3

φ	SUNCE		TRAJANJE SUMRAKA		MESEC			
	IZLAZ	ZALAZ	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 32	17 50	0 41	2 21	7 3	.0	18 2	4.1
55	6 28	17 54	0 36	2 2	6 54	.3	18 8	3.8
50	6 24	17 57	0 32	1 48	6 46	.6	18 12	3.5
45	6 22	17 59	0 29	1 38	6 40	.8	18 15	3.2
40	6 20	18 2	0 27	1 30	6 35	1.0	18 18	3.0
35	6 18	18 3	0 25	1 24	6 31	1.2	18 21	2.8
30	6 16	18 5	0 24	1 19	6 27	1.3	18 23	2.7
20	6 13	18 8	0 22	1 13	6 21	1.6	18 27	2.4
10	6 10	18 11	0 21	1 10	6 15	1.8	18 30	2.2
0	6 7	18 14	0 21	1 9	6 9	2.0	18 33	2.0
10	6 4	18 16	0 21	1 10	6 4	2.2	18 36	1.8
20	6 1	18 19	0 22	1 14	5 58	2.5	18 39	1.6
30	5 57	18 23	0 24	1 21	5 51	2.7	18 42	1.3
35	5 55	18 25	0 25	1 26	5 48	2.9	18 44	1.2
40	5 52	18 28	0 27	1 32	5 43	3.1	18 46	1.0
45	5 49	18 30	0 30	1 41	5 38	3.3	18 48	.8
50	5 46	18 34	0 33	1 53	5 32	3.5	18 51	.6
55	5 41	18 38	0 37	2 10	5 24	3.8	18 55	.3
60	5 35	18 44	0 43	2 36	5 14	4.2	18 59	.0
S								

UT	MESEC				JUPITER				SATURN							
	S <sub>♃</sub>		Δ		δ <sub>♃</sub>		Δ		S <sub>♃</sub>		δ <sub>♃</sub>		S <sub>♄</sub>		δ <sub>♄</sub>	
h	°	'	°	'	°	'	°	'	°	'	°	'	°	'	°	'
0	180	55.1	106	- 9	9.6	165	331	34.6	- 5	12.3	55	32.8	21	58.5		
2	209	54.2	107	- 8	36.6	166	1	40.0	- 5	12.1	85	37.9	21	58.5		
4	238	53.7	109	- 8	3.4	167	31	45.4	- 5	11.9	115	42.9	21	58.5		
6	267	53.4	110	- 7	30.1	167	61	50.8	- 5	11.7	145	48.0	21	58.5		
8	296	53.3	111	- 6	56.6	168	91	56.2	- 5	11.5	175	53.0	21	58.6		
10	325	53.6	112	- 6	23.1	168	122	1.6	- 5	11.3	205	58.1	21	58.6		
12	354	54.0	113	- 5	49.5	168	152	7.0	- 5	11.1	236	3.1	21	58.6		
14	23	54.7	114	- 5	15.8	169	182	12.4	- 5	10.9	266	8.1	21	58.6		
16	52	55.6	115	- 4	42.0	169	212	17.8	- 5	10.6	296	13.2	21	58.7		
18	81	56.7	116	- 4	8.2	169	242	23.2	- 5	10.4	326	18.2	21	58.7		
20	110	58.0	117	- 3	34.4	169	272	28.6	- 5	10.2	356	23.3	21	58.7		
22	139	59.4	118	- 3	.6	169	302	34.0	- 5	10.0	26	28.3	21	58.7		
Δ								27		1		25		0		

SUNCE				MESEC					
UT	e = T <sub>p</sub> - UT	Δ/24	r	Prolaz	Δ/24	π <sub>☾</sub>	r		
h	min	s	s	h min	min	'	'		
00	-10	23.0	.6	16.1	T <sub>m</sub>	12 21	2.0	59.9	16.3
12	-10	15.3	T <sub>m☉</sub>	12 h 10.3 min	Starost	29.1 d	Faza	●	
PLANETE									
Pl.	T <sub>m</sub>	π	360-α	Vel.	Pl.	T <sub>m</sub>	π	360-α	Vel.
♀	h min	'	°		♃	h min	'	°	
♁	11 53	.1	14	-3.8	♃	1 53	.0	164	-2.2
♂	8 25	.1	66	1.1	♄	20 14	.0	248	-1.1

UT	SUNCE				PROLEĆ. TAČKA S <sub>γ</sub>	VENERA				MARS				
	S <sub>☉</sub>		δ <sub>☉</sub>			S <sub>♀</sub>		δ <sub>♀</sub>		S <sub>♂</sub>		δ <sub>♂</sub>		
h	°	'	°	'	°	'	°	'	°	'	°	'		
0	177	28.1	- 3	45.6	168	45.1	181	35.8	- 7	3.3	233	49.0	-22	13.7
2	207	28.4	- 3	43.6	198	50.0	211	34.9	- 7	.9	263	50.1	-22	13.2
4	237	28.7	- 3	41.6	228	54.9	241	34.1	- 6	58.5	293	51.2	-22	12.7
6	267	29.0	- 3	39.7	258	59.8	271	33.2	- 6	56.1	323	52.2	-22	12.2
8	297	29.4	- 3	37.7	289	4.8	301	32.3	- 6	53.7	353	53.3	-22	11.6
10	327	29.7	- 3	35.7	319	9.7	331	31.5	- 6	51.3	23	54.4	-22	11.1
12	357	30.0	- 3	33.8	349	14.6	1	30.6	- 6	48.9	53	55.5	-22	10.6
14	27	30.4	- 3	31.8	19	19.6	31	29.7	- 6	46.5	83	56.6	-22	10.0
16	57	30.7	- 3	29.9	49	24.5	61	28.9	- 6	44.1	113	57.7	-22	9.5
18	87	31.0	- 3	27.9	79	29.4	91	28.0	- 6	41.6	143	58.8	-22	9.0
20	117	31.4	- 3	25.9	109	34.3	121	27.1	- 6	39.2	173	59.9	-22	8.4
22	147	31.7	- 3	23.9	139	39.3	151	26.3	- 6	36.8	204	.9	-22	7.9
Δ		2		10				-4		12		5		3

φ	SUNCE		TRAJANJE SUMRAKA		MESEC			
	IZLAZ	ZALAZ	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 53	0 41	2 21	7 2	.0	19 41	4.1
55	6 25	17 56	0 36	2 2	7 1	.3	19 38	3.7
50	6 22	17 59	0 32	1 48	7 1	.6	19 35	3.4
45	6 20	18 1	0 29	1 38	7 0	.8	19 32	3.1
40	6 18	18 3	0 27	1 30	6 60	1.0	19 31	2.9
35	6 16	18 4	0 25	1 24	6 60	1.1	19 29	2.8
30	6 15	18 6	0 24	1 19	6 59	1.3	19 27	2.6
20	6 12	18 8	0 22	1 13	6 59	1.5	19 25	2.4
10	6 9	18 11	0 21	1 10	6 58	1.8	19 23	2.2
0	6 7	18 13	0 21	1 9	6 58	2.0	19 20	2.0
10	6 4	18 16	0 21	1 10	6 58	2.2	19 18	1.8
20	6 1	18 19	0 22	1 14	6 57	2.4	19 16	1.5
30	5 58	18 22	0 24	1 20	6 57	2.7	19 13	1.3
35	5 56	18 24	0 25	1 26	6 57	2.8	19 12	1.2
40	5 53	18 26	0 27	1 32	6 57	3.0	19 10	1.0
45	5 51	18 29	0 30	1 41	6 56	3.2	19 8	.8
50	5 47	18 32	0 33	1 53	6 56	3.4	19 6	.6
55	5 43	18 36	0 37	2 9	6 56	3.7	19 3	.3
60	5 38	18 41	0 42	2 34	6 55	4.1	18 59	.0
S								

UT	MESEC				JUPITER				SATURN							
	S <sub>♃</sub>		Δ		δ <sub>♃</sub>		Δ		S <sub>♃</sub>		δ <sub>♃</sub>		S <sub>♄</sub>		δ <sub>♄</sub>	
h	°	'	°	'	°	'	°	'	°	'	°	'	°	'	°	'
0	169	1.1	119	- 2	26.8	169	332	39.4	- 5	9.8	56	33.3	21	58.8		
2	198	2.9	120	- 1	52.9	169	2	44.8	- 5	9.6	86	38.4	21	58.8		
4	227	4.9	121	- 1	19.1	169	32	50.2	- 5	9.4	116	43.4	21	58.8		
6	256	7.1	121	- 0	45.4	169	62	55.6	- 5	9.2	146	48.4	21	58.8		
8	285	9.4	122	- 0	11.7	168	93	1.0	- 5	9.0	176	53.5	21	58.8		
10	314	11.8	123	0	22.0	168	123	6.4	- 5	8.8	206	58.5	21	58.9		
12	343	14.4	123	0	55.6	167	153	11.8	- 5	8.5	237	3.5	21	58.9		
14	12	17.0	124	1	29.0	167	183	17.3	- 5	8.3	267	8.6	21	58.9		
16	41	19.8	124	2	2.4	166	213	22.7	- 5	8.1	297	13.6	21	58.9		
18	70	22.6	125	2	35.7	166	243	28.1	- 5	7.9	327	18.6	21	59.0		
20	99	25.6	125	3	8.8	165	273	33.5	- 5	7.7	357	23.7	21	59.0		
22	128	28.6	125	3	41.8	164	303	38.9	- 5	7.5	27	28.7	21	59.0		
Δ								27		1		25		0		

SUNCE				MESEC			
UT	e = T <sub>p</sub> - UT	Δ/24	r	Prolaz</			

UT	SUNCE		PROLEĆ. TAČKA S <sub>γ</sub>	VENERA		MARS	
	S <sub>☉</sub>	δ <sub>☉</sub>		S <sub>♀</sub>	δ <sub>♀</sub>	S <sub>♂</sub>	δ <sub>♂</sub>
h	° / ' / "	° / ' / "	° / ' / "	° / ' / "	° / ' / "	° / ' / "	° / ' / "
0	177 32.0 - 3 22.0		169 44.2	181 25.4 - 6 34.4	234 2.0 -22 7.3		
2	207 32.3 - 3 20.0		199 49.1	211 24.6 - 6 32.0	264 3.1 -22 6.8		
4	237 32.7 - 3 18.0		229 54.1	241 23.7 - 6 29.6	294 4.2 -22 6.2		
6	267 33.0 - 3 16.1		259 59.0	271 22.9 - 6 27.2	324 5.3 -22 5.7		
8	297 33.3 - 3 14.1		290 3.9	301 22.0 - 6 24.8	354 6.4 -22 5.2		
10	327 33.7 - 3 12.1		320 8.8	331 21.2 - 6 22.3	24 7.5 -22 4.6		
12	357 34.0 - 3 10.2		350 13.8	1 20.3 - 6 19.9	54 8.6 -22 4.1		
14	27 34.4 - 3 8.2		20 18.7	31 19.4 - 6 17.5	84 9.7 -22 3.5		
16	57 34.7 - 3 6.2		50 23.6	61 18.6 - 6 15.1	114 10.8 -22 2.9		
18	87 35.0 - 3 4.3		80 28.6	91 17.8 - 6 12.7	144 11.8 -22 2.4		
20	117 35.4 - 3 2.3		110 33.5	121 16.9 - 6 10.2	174 12.9 -22 1.8		
22	147 35.7 - 3 .3		140 38.4	151 16.1 - 6 7.8	204 14.0 -22 1.3		
Δ	2	10		-4	12	5	3

φ	SUNCE		TRAJANJE SUMRAKA		MESEC			
	IZLAZ	ZALAZ	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 55	0 41	2 22	7 2	.0	21 19	4.1
55	6 23	17 58	0 36	2 2	7 9	.3	21 6	3.6
50	6 20	18 0	0 32	1 48	7 15	.6	20 56	3.3
45	6 18	18 2	0 29	1 38	7 20	.8	20 48	3.1
40	6 16	18 4	0 27	1 30	7 24	1.0	20 41	2.9
35	6 15	18 5	0 25	1 24	7 27	1.2	20 36	2.7
30	6 13	18 6	0 24	1 19	7 30	1.3	20 31	2.6
20	6 11	18 9	0 22	1 13	7 36	1.5	20 22	2.4
10	6 9	18 11	0 21	1 10	7 41	1.8	20 14	2.2
0	6 6	18 13	0 21	1 9	7 45	2.0	20 7	2.0
10	6 4	18 15	0 21	1 10	7 50	2.2	20 0	1.8
20	6 1	18 18	0 22	1 14	7 55	2.4	19 53	1.6
30	5 58	18 21	0 24	1 20	8 1	2.6	19 44	1.3
35	5 57	18 22	0 25	1 25	8 4	2.8	19 39	1.2
40	5 54	18 24	0 27	1 32	8 8	2.9	19 34	1.1
45	5 52	18 27	0 29	1 41	8 12	3.1	19 28	.9
50	5 49	18 29	0 33	1 52	8 18	3.3	19 20	.7
55	5 45	18 33	0 37	2 8	8 25	3.6	19 10	.4
60	5 40	18 38	0 42	2 33	8 33	4.1	18 58	.0
S								

UT	MESEC				JUPITER		SATURN	
	S <sub>♃</sub>	Δ	δ <sub>♃</sub>	Δ	S <sub>♃</sub>	δ <sub>♃</sub>	S <sub>♄</sub>	δ <sub>♄</sub>
h	° / ' / "	° / ' / "	° / ' / "	° / ' / "	° / ' / "	° / ' / "	° / ' / "	° / ' / "
0	157 31.7 126	4 14.7	164		333 44.3 - 5 7.3	57 33.7	21 59.0	
2	186 34.8 126	4 47.4	163		3 49.7 - 5 7.1	87 38.7	21 59.0	
4	215 38.0 126	5 20.0	162		33 55.1 - 5 6.8	117 43.8	21 59.1	
6	244 41.2 126	5 52.3	161		64 .6 - 5 6.6	147 48.8	21 59.1	
8	273 44.4 126	6 24.5	160		94 6.0 - 5 6.4	177 53.8	21 59.1	
10	302 47.7 126	6 56.5	159		124 11.4 - 5 6.2	207 58.8	21 59.1	
12	331 51.0 126	7 28.2	158		154 16.8 - 5 6.0	238 3.9	21 59.1	
14	0 54.3 126	7 59.8	157		184 22.2 - 5 5.8	268 8.9	21 59.2	
16	29 57.6 126	8 31.1	155		214 27.7 - 5 5.6	298 13.9	21 59.2	
18	59 .9 126	9 2.1	154		244 33.1 - 5 5.3	328 18.9	21 59.2	
20	88 4.1 126	9 33.0	153		274 38.5 - 5 5.1	358 23.9	21 59.2	
22	117 7.4 126	10 3.5	151		304 43.9 - 5 4.9	28 29.0	21 59.2	
Δ					27	1	25	0

SUNCE				MESEC					
UT	e = T <sub>p</sub> - UT	Δ/24	r	Prolaz	Δ/24	π <sub>♃</sub>	r		
h	min s	s	'	h min	min	'	'		
00	- 9 51.8	.7	16.1	T <sub>m</sub>	13 56	2.0	58.7 16.0		
12	- 9 43.7	T <sub>m☉</sub>	12 h 9.7 min	Starost	1.6 d	Faza ●			
PLANETE									
Pl.	T <sub>m</sub>	π	360-α	Vel.	Pl.	T <sub>m</sub>	π	360-α	Vel.
♀	h min	'	°		♃	h min	'	°	
♂	11 55	.1	12	-3.8	♄	1 45	.0	164	-2.3
	8 24	.1	64	1.1	♅	20 6	.0	248	-1.1

UT	SUNCE		PROLEĆ. TAČKA S <sub>γ</sub>	VENERA		MARS	
	S <sub>☉</sub>	δ <sub>☉</sub>		S <sub>♀</sub>	δ <sub>♀</sub>	S <sub>♂</sub>	δ <sub>♂</sub>
h	° / ' / "	° / ' / "	° / ' / "	° / ' / "	° / ' / "	° / ' / "	° / ' / "
0	177 36.0 - 2 58.4		170 43.3	181 15.2 - 6 5.4	234 15.1 -22 .7		
2	207 36.4 - 2 56.4		200 48.3	211 14.4 - 6 3.0	264 16.2 -22 .2		
4	237 36.7 - 2 54.4		230 53.2	241 13.5 - 6 .5	294 17.3 -21 59.6		
6	267 37.1 - 2 52.4		260 58.1	271 12.7 - 5 58.1	324 18.4 -21 59.0		
8	297 37.4 - 2 50.5		291 3.1	301 11.8 - 5 55.7	354 19.5 -21 58.5		
10	327 37.7 - 2 48.5		321 8.0	331 11.0 - 5 53.2	24 20.6 -21 57.9		
12	357 38.1 - 2 46.5		351 12.9	1 10.2 - 5 50.8	54 21.7 -21 57.3		
14	27 38.4 - 2 44.5		21 17.8	31 9.3 - 5 48.4	84 22.8 -21 56.8		
16	57 38.8 - 2 42.6		51 22.8	61 8.5 - 5 45.9	114 23.9 -21 56.2		
18	87 39.1 - 2 40.6		81 27.7	91 7.6 - 5 43.5	144 25.0 -21 55.6		
20	117 39.4 - 2 38.6		111 32.6	121 6.8 - 5 41.1	174 26.1 -21 55.0		
22	147 39.8 - 2 36.7		141 37.6	151 6.0 - 5 38.6	204 27.2 -21 54.5		
Δ	2	10		-4	12	5	3

φ	SUNCE		TRAJANJE SUMRAKA		MESEC			
	IZLAZ	ZALAZ	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 23	17 57	0 41	2 22	7 1	.0	22 56	4.1
55	6 20	17 60	0 36	2 2	7 17	.4	22 33	3.6
50	6 18	18 2	0 32	1 48	7 30	.7	22 16	3.3
45	6 16	18 3	0 29	1 38	7 40	.9	22 2	3.0
40	6 15	18 5	0 27	1 30	7 48	1.1	21 51	2.9
35	6 13	18 6	0 25	1 24	7 55	1.3	21 41	2.7
30	6 12	18 7	0 24	1 20	8 2	1.4	21 33	2.6
20	6 10	18 9	0 22	1 13	8 13	1.6	21 19	2.4
10	6 8	18 11	0 21	1 10	8 23	1.8	21 6	2.2
0	6 6	18 13	0 21	1 9	8 32	2.0	20 55	2.0
10	6 4	18 15	0 21	1 10	8 41	2.2	20 43	1.8
20	6 2	18 17	0 22	1 14	8 52	2.4	20 31	1.7
30	5 59	18 19	0 24	1 20	9 3	2.6	20 17	1.4
35	5 57	18 21	0 25	1 25	9 10	2.7	20 9	1.3
40	5 56	18 23	0 27	1 32	9 18	2.9	19 59	1.2
45	5 53	18 25	0 29	1 40	9 27	3.1	19 49	1.0
50	5 51	18 27	0 32	1 52	9 38	3.3	19 36	.8
55	5 47	18 30	0 36	2 8	9 52	3.6	19 20	.5
60	5 43	18 35	0 42	2 32	10 11	4.1	18 58	.0
S								

UT	MESEC				JUPITER		SATURN	
	S <sub>♃</sub>	Δ	δ <sub>♃</sub>	Δ	S <sub>♃</sub>	δ <sub>♃</sub>	S <sub>♄</sub>	δ <sub>♄</sub>
h	° / ' / "	° / ' / "	° / ' / "	° / ' / "	° / ' / "	° / ' / "	° / ' / "	° / ' / "
0	146 10.6 126	10 33.8	150		334 49.3 - 5 4.7	58 34.0	21 59.3	
2	175 13.7 126	11 3.8	149		4 54.8 - 5 4.5	88 39.0	21 59.3	
4	204 16.8 125	11 33.5	147		35 .2 - 5 4.3	118 44.0	21 59.3	
6	233 19.9 125	12 3.0	146		65 5.6 - 5 4.0	148 49.0	21 59.3	
8	262 22.9 125	12 32.1	144		95 11.0 - 5 3.8	178 54.0	21 59.3	
10	291 25.8 124	13 .9	142		125 16.5 - 5 3.6	208 59.1	21 59.4	
12	320 28.6 124	13 29.4	141		155 21.9 - 5 3.4	239 4.1	21 59.4	
14	349 31.4 123	13 57.6	139		185 27.3 - 5 3.2	269 9.1	21 59.4	
16	18 34.1 123	14 25.4	137		215 32.8 - 5 2.9	299 14.1	21 59.4	
18	47 36.7 122	14 52.9	136		245 38.2 - 5 2.7	329 19.1	21 59.4	
20	76 39.2 122	15 20.0	134		275 43.6 - 5 2.5	359 24.1	21 59.5	
22	105 41.6 121	15 46.8	132		305 49.0 - 5 2.3	29 29.1	21 59.5	
Δ					27	1	25	0

SUNCE				MESEC					
UT	e = T <sub>p</sub> - UT	Δ/24	r	Prolaz	Δ/24	π <sub>♃</sub>	r		
h	min s	s	'	h min	min	'	'		
00	- 9 35.7	.7	16.1	T <sub>m</sub>	14 43	2.0	57.9 15.8		
12	- 9 27.5	T <sub>m☉</sub>	12 h 9.5 min	Starost	2.6 d	Faza ●			
PLANETE									
Pl.	T <sub>m</sub>	π	360-α	Vel.	Pl.	T <sub>m</sub>	π	360-α	Vel.
♀	h min	'	°		♃	h min	'	°	
♂	11 55	.1	11	-3.8	♄	1 40	.0	164	-2.3
	8 23	.1	64	1.1	♅	20 2	.0	248	-1.1



UT	SUNCE		PROLEĆ. TAČKA S <sub>γ</sub>	VENERA		MARS		
	S <sub>☉</sub>	δ <sub>☉</sub>		S <sub>♀</sub>	δ <sub>♀</sub>	S <sub>♂</sub>	δ <sub>♂</sub>	
h	°	'	°	°	'	°	'	
0	177 40.1	- 2 34.7	171 42.5	181 5.1	- 5 36.2	234 28.3	-21 53.9	
2	207 40.5	- 2 32.7	201 47.4	211 4.3	- 5 33.7	264 29.4	-21 53.3	
4	237 40.8	- 2 30.7	231 52.3	241 3.5	- 5 31.3	294 30.5	-21 52.7	
6	267 41.2	- 2 28.8	261 57.3	271 2.6	- 5 28.9	324 31.6	-21 52.2	
8	297 41.5	- 2 26.8	292 2.2	301 1.8	- 5 26.4	354 32.7	-21 51.6	
10	327 41.9	- 2 24.8	322 7.1	331 1.0	- 5 24.0	24 33.8	-21 51.0	
12	357 42.2	- 2 22.8	352 12.0	1	.2	- 5 21.5	54 34.9	-21 50.4
14	27 42.6	- 2 20.9	22 17.0	30 59.3	- 5 19.1	84 36.0	-21 49.8	
16	57 42.9	- 2 18.9	52 21.9	60 58.5	- 5 16.6	114 37.1	-21 49.2	
18	87 43.2	- 2 16.9	82 26.8	90 57.7	- 5 14.2	144 38.2	-21 48.6	
20	117 43.6	- 2 14.9	112 31.8	120 56.9	- 5 11.7	174 39.3	-21 48.0	
22	147 43.9	- 2 13.0	142 36.7	150 56.0	- 5 9.3	204 40.4	-21 47.5	
Δ	2	10		-4	12	6	3	

φ	SUNCE		TRAJANJE SUMRAKA		MESEC			
	IZLAZ	ZALAZ	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 20	17 60	0 41	2 23	7 2	.1	. . . .	.0
55	6 18	18 2	0 36	2 3	7 27	.6	23 59	3.5
50	6 16	18 3	0 32	1 49	7 47	.9	23 34	3.2
45	6 14	18 5	0 29	1 38	8 2	1.1	23 15	2.9
40	6 13	18 6	0 27	1 30	8 15	1.3	22 59	2.8
35	6 12	18 7	0 25	1 24	8 25	1.4	22 46	2.7
30	6 11	18 8	0 24	1 20	8 35	1.5	22 35	2.5
20	6 9	18 9	0 22	1 13	8 51	1.7	22 15	2.4
10	6 8	18 11	0 21	1 10	9 6	1.9	21 59	2.2
0	6 6	18 12	0 21	1 9	9 20	2.0	21 43	2.1
10	6 4	18 14	0 21	1 10	9 33	2.2	21 27	1.9
20	6 2	18 16	0 22	1 13	9 48	2.4	21 11	1.8
30	5 60	18 18	0 24	1 20	10 5	2.6	20 51	1.6
35	5 58	18 20	0 25	1 25	10 15	2.7	20 40	1.5
40	5 57	18 21	0 27	1 32	10 27	2.8	20 28	1.4
45	5 55	18 23	0 29	1 40	10 41	3.0	20 13	1.2
50	5 52	18 25	0 32	1 51	10 57	3.2	19 54	1.0
55	5 49	18 28	0 36	2 7	11 19	3.6	19 31	.7
60	5 45	18 32	0 42	2 31	11 49	4.1	18 59	.1

UT	MESEC				JUPITER		SATURN	
	S <sub>♃</sub>	Δ	δ <sub>♃</sub>	Δ	S <sub>♃</sub>	δ <sub>♃</sub>	S <sub>♄</sub>	δ <sub>♄</sub>
h	°	'	°	'	°	'	°	'
0	134 43.8	121 16	13.2	130	335 54.5	- 5 2.1	59 34.1	21 59.5
2	163 46.0	120 16	39.2	128	5 59.9	- 5 1.8	89 39.1	21 59.5
4	192 48.0	120 17	4.9	126	36 5.3	- 5 1.6	119 44.1	21 59.5
6	221 50.0	119 17	30.1	124	66 10.8	- 5 1.4	149 49.1	21 59.6
8	250 51.8	118 17	55.0	122	96 16.2	- 5 1.2	179 54.1	21 59.6
10	279 53.4	118 18	19.5	120	126 21.6	- 5 1.0	209 59.1	21 59.6
12	308 55.0	117 18	43.5	118	156 27.1	- 5 5	240 4.2	21 59.6
14	337 56.4	116 19	7.2	116	186 32.5	- 5 5	270 9.2	21 59.6
16	6 57.6	116 19	30.4	114	216 38.0	- 5 3	300 14.2	21 59.6
18	35 58.8	115 19	53.1	112	246 43.4	- 5 1	330 19.2	21 59.7
20	64 59.7	114 20	15.5	110	276 48.8	- 4 59.9	0 24.2	21 59.7
22	94 .6	113 20	37.4	107	306 54.3	- 4 59.6	30 29.2	21 59.7
Δ					27	1	25	0

SUNCE				MESEC				
UT	e = T <sub>p</sub> - UT	Δ/24	r	Prolaz	Δ/24	π <sub>♃</sub>	r	
h	min	s	s	h min	min	'	'	
00	- 9 19.3	.7	16.1	T <sub>m</sub>	15 31	2.1	57.0	15.5
12	- 9 11.0	T <sub>m☉</sub>	12 h 9.2 min	Starost	3.6 d	Faza	☉	

PLANETE									
Pl.	T <sub>m</sub>	π	360-α	Vel.	Pl.	T <sub>m</sub>	π	360-α	Vel.
♀	h min	'	°		♃	h min	'	°	
♂	11 56	.1	9	-3.8	♄	1 36	.0	164	-2.3
♂	8 22	.1	63	1.1	♃	19 58	.0	248	-1.1

UT	SUNCE		PROLEĆ. TAČKA S <sub>γ</sub>	VENERA		MARS	
	S <sub>☉</sub>	δ <sub>☉</sub>		S <sub>♀</sub>	δ <sub>♀</sub>	S <sub>♂</sub>	δ <sub>♂</sub>
h	°	'	°	°	'	°	'
0	177 44.3	- 2 11.0	172 41.6	180 55.2	- 5 6.8	234 41.5	-21 46.9
2	207 44.6	- 2 9.0	202 46.5	210 54.4	- 5 4.4	264 42.6	-21 46.3
4	237 45.0	- 2 7.0	232 51.5	240 53.6	- 5 1.9	294 43.7	-21 45.7
6	267 45.3	- 2 5.1	262 56.4	270 52.8	- 4 59.5	324 44.8	-21 45.1
8	297 45.7	- 2 3.1	293 1.3	300 51.9	- 4 57.0	354 45.9	-21 44.5
10	327 46.0	- 2 1.1	323 6.3	330 51.1	- 4 54.6	24 47.0	-21 43.9
12	357 46.4	- 1 59.1	353 11.2	0 50.3	- 4 52.1	54 48.1	-21 43.3
14	27 46.7	- 1 57.2	23 16.1	30 49.5	- 4 49.6	84 49.2	-21 42.7
16	57 47.1	- 1 55.2	53 21.0	60 48.7	- 4 47.2	114 50.3	-21 42.1
18	87 47.5	- 1 53.2	83 26.0	90 47.9	- 4 44.7	144 51.4	-21 41.5
20	117 47.8	- 1 51.2	113 30.9	120 47.0	- 4 42.3	174 52.5	-21 40.8
22	147 48.2	- 1 49.3	143 35.8	150 46.2	- 4 39.8	204 53.6	-21 40.2
Δ	2	10		-4	12	6	3

φ	SUNCE		TRAJANJE SUMRAKA		MESEC			
	IZLAZ	ZALAZ	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 17	18 2	0 41	2 23	7 4	.2	0 36	4.1
55	6 15	18 4	0 36	2 3	7 41	.8	. . . .	.0
50	6 14	18 5	0 32	1 49	8 8	1.1	. . . .	.0
45	6 13	18 6	0 29	1 38	8 28	1.3	. . . .	.0
40	6 12	18 7	0 27	1 30	8 45	1.5	. . . .	.0
35	6 11	18 8	0 25	1 24	8 59	1.6	23 50	2.5
30	6 10	18 8	0 24	1 20	9 11	1.7	23 36	2.5
20	6 8	18 10	0 22	1 13	9 33	1.9	23 12	2.3
10	6 7	18 11	0 21	1 10	9 51	2.0	22 52	2.2
0	6 6	18 12	0 21	1 9	10 9	2.1	22 33	2.1
10	6 4	18 14	0 21	1 10	10 26	2.2	22 14	2.0
20	6 2	18 15	0 22	1 13	10 45	2.4	21 53	1.9
30	6 0	18 17	0 24	1 20	11 7	2.5	21 30	1.8
35	5 59	18 18	0 25	1 25	11 20	2.6	21 16	1.7
40	5 58	18 20	0 27	1 31	11 35	2.7	21 0	1.6
45	5 56	18 21	0 29	1 40	11 53	2.9	20 42	1.5
50	5 54	18 23	0 32	1 51	12 15	3.1	20 18	1.3
55	5 51	18 25	0 36	2 7	12 44	3.4	19 47	1.0
60	5 48	18 29	0 42	2 30	13 28	4.1	19 2	.3

UT	MESEC				JUPITER		SATURN	
	S <sub>♃</sub>	Δ	δ <sub>♃</sub>	Δ	S <sub>♃</sub>	δ <sub>♃</sub>	S <sub>♄</sub>	δ <sub>♄</sub>
h	°	'	°	'	°	'	°	'
0	123 1.3	113 20	58.8	105	336 59.7	- 4 59.4	60 34.1	21 59.7
2	152 1.8	112 21	19.8	103	7 5.1	- 4 59.2	90 39.1	21 59.7
4	181 2.2	111 21	40.4	100	37 10.6	- 4 59.0	120 44.1	21 59.8
6	210 2.4	110 22	.5	98	67 16.0	- 4 58.7	150 49.1	21 59.8
8	239 2.5	110 22	20.1	96	97 21.5	- 4 58.5	180 54.1	21 59.8
10	268 2.5	109 22	39.2	93	127 26.9	- 4 58.3	210 59.1	21 59.8
12	297 2.3	108 22	57.8	91	157 32.4	- 4 58.1	241 4.1	21 59.8
14	326 1.9	108 23	16.0	88	187 37.8	- 4 57.8	271 9.1	21 59.8
16	355 1.4	107 23	33.7	86	217 43.3	- 4 57.6	301 14.1	21 59.9
18	24 .8	106 23	50.9	83	247 48.7	- 4 57.4	331 19.1	21 59.9
20	53 .0	105 24	7.5	81	277 54.1	- 4 57.2	1 24.1	21 59.9
22	81 59.1	105 24	23.7	78	307 59.6	- 4 56.9	31 29.1	21 59.9
Δ					27	1	25	0

SUNCE				MESEC				
UT	e = T <sub>p</sub> - UT	Δ/24	r	Prolaz	Δ/24	π <sub>♃</sub>	r	
h	min	s	s	h min	min	'	'	
00	- 9 2.6	.7	16.1	T <sub>m</sub>	16 21	2.1	56.2	15.3
12	- 8 54.2	T <sub>m☉</sub>	12 h 8.9 min	Starost	4.6 d	Faza	☉	

PLANETE									
Pl.	T <sub>m</sub>	π	360-α	Vel.	Pl.	T <sub>m</sub>	π	360-α	Vel.
♀	h min	'	°		♃	h min	'	°	
♂	11 57	.1	8	-3.8	♄	1 32	.0	164	-2.3
♂	8 21	.1	62	1.1	♃	19 54	.0	248	-1.1

UT	SUNCE		PROLEĆ. TAČKA S <sub>γ</sub>	VENERA		MARS	
	S <sub>☉</sub>	δ <sub>☉</sub>		S <sub>♀</sub>	δ <sub>♀</sub>	S <sub>♂</sub>	δ <sub>♂</sub>
h	° / ' / "	° / ' / "	° / ' / "	° / ' / "	° / ' / "	° / ' / "	° / ' / "
0	177 48.5 - 1 47.3		173 40.8	180 45.4 - 4 37.3	234 54.7 -21 39.6		
2	207 48.9 - 1 45.3		203 45.7	210 44.6 - 4 34.9	264 55.9 -21 39.0		
4	237 49.2 - 1 43.3		233 50.6	240 43.8 - 4 32.4	294 57.0 -21 38.4		
6	267 49.6 - 1 41.4		263 55.5	270 43.0 - 4 29.9	324 58.1 -21 37.8		
8	297 49.9 - 1 39.4		294 .5	300 42.2 - 4 27.5	354 59.2 -21 37.2		
10	327 50.3 - 1 37.4		324 5.4	330 41.4 - 4 25.0	25 .3 -21 36.6		
12	357 50.6 - 1 35.4		354 10.3	0 40.6 - 4 22.5	55 1.4 -21 35.9		
14	27 51.0 - 1 33.5		24 15.3	30 39.8 - 4 20.1	85 2.5 -21 35.3		
16	57 51.4 - 1 31.5		54 20.2	60 39.0 - 4 17.6	115 3.6 -21 34.7		
18	87 51.7 - 1 29.5		84 25.1	90 38.2 - 4 15.1	145 4.7 -21 34.1		
20	117 52.1 - 1 27.5		114 30.0	120 37.3 - 4 12.7	175 5.8 -21 33.4		
22	147 52.4 - 1 25.5		144 35.0	150 36.5 - 4 10.2	205 7.0 -21 32.8		
Δ	2	10		-4	12	6	3

φ	SUNCE		TRAJANJE SUMRAKA		MESEC			
	IZLAZ	ZALAZ	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	18 5	0 42	2 24	7 10	.6	2 14	3.9
55	6 13	18 6	0 36	2 3	8 1	1.2	1 24	3.2
50	6 12	18 7	0 32	1 49	8 35	1.5	0 51	2.9
45	6 11	18 7	0 29	1 38	9 0	1.6	0 26	2.7
40	6 10	18 8	0 27	1 30	9 20	1.8	0 6	2.6
35	6 9	18 8	0 25	1 24	9 37	1.8	...	.0
30	6 9	18 9	0 24	1 20	9 52	1.9	...	.0
20	6 8	18 10	0 22	1 13	10 17	2.0	...	.0
10	6 6	18 11	0 21	1 10	10 39	2.1	23 45	2.2
0	6 5	18 12	0 21	1 9	10 59	2.2	23 24	2.2
10	6 4	18 13	0 21	1 10	11 20	2.2	23 2	2.1
20	6 3	18 14	0 22	1 13	11 42	2.3	22 40	2.1
30	6 1	18 16	0 24	1 20	12 7	2.4	22 13	2.0
35	5 60	18 17	0 25	1 25	12 22	2.5	21 57	2.0
40	5 59	18 18	0 27	1 31	12 40	2.5	21 39	1.9
45	5 57	18 19	0 29	1 40	13 1	2.6	21 17	1.8
50	5 55	18 21	0 32	1 51	13 28	2.7	20 50	1.7
55	5 53	18 23	0 36	2 6	14 5	3.0	20 12	1.5
60	5 50	18 26	0 42	2 29	15 5	3.6	19 11	.9
S								

UT	MESEC				JUPITER		SATURN	
	S <sub>♃</sub>	Δ	δ <sub>♃</sub>	Δ	S <sub>♃</sub>	δ <sub>♃</sub>	S <sub>♄</sub>	δ <sub>♄</sub>
h	° / ' / "	° / ' / "	° / ' / "	° / ' / "	° / ' / "	° / ' / "	° / ' / "	° / ' / "
0	110 58.0 104	24 39.4	76	338 5.0 - 4 56.7	61 34.1	21 59.9		
2	139 56.8 103	24 54.5	73	8 10.5 - 4 56.5	91 39.0	21 59.9		
4	168 55.5 103	25 9.2	71	38 15.9 - 4 56.3	121 44.0	21 59.9		
6	197 54.1 102	25 23.3	68	68 21.4 - 4 56.0	151 49.0	21 60.0		
8	226 52.5 102	25 36.9	65	98 26.8 - 4 55.8	181 54.0	21 60.0		
10	255 50.8 101	25 49.9	63	128 32.3 - 4 55.6	211 59.0	21 60.0		
12	284 49.0 100	26 2.4	60	158 37.7 - 4 55.4	242 4.0	22 .0		
14	313 47.1 100	26 14.4	57	188 43.2 - 4 55.1	272 8.9	22 .0		
16	342 45.0 99	26 25.9	55	218 48.6 - 4 54.9	302 13.9	22 .0		
18	11 42.9 99	26 36.8	52	248 54.1 - 4 54.7	332 18.9	22 .1		
20	40 40.7 98	26 47.2	49	278 59.5 - 4 54.4	2 23.9	22 .1		
22	69 38.4 98	26 57.0	46	309 5.0 - 4 54.2	32 28.9	22 .1		
Δ				27	1	25	0	

SUNCE				MESEC			
UT	e = T <sub>p</sub> - UT	Δ/24	r	Prolaz	Δ/24	π <sub>♃</sub>	r
h	min s	s	'	h min	min	'	'
00	- 8 45.8	.7	16.1	T <sub>m</sub>	17 11	2.2	55.5 15.1
12	- 8 37.2	T <sub>m☉</sub>	12 h 8.6 min	Starost	5.6 d	Faza	☉

PLANETE									
Pl.	T <sub>m</sub>	π	360-α	Vel.	Pl.	T <sub>m</sub>	π	360-α	Vel.
♀	h min	'	°		♃	h min	'	°	
♂	11 57	.1	7	-3.8	♄	1 27	.0	164	-2.3
♂	8 20	.1	61	1.1	♂	19 50	.0	248	-1.1

UT	SUNCE		PROLEĆ. TAČKA S <sub>γ</sub>	VENERA		MARS	
	S <sub>☉</sub>	δ <sub>☉</sub>		S <sub>♀</sub>	δ <sub>♀</sub>	S <sub>♂</sub>	δ <sub>♂</sub>
h	° / ' / "	° / ' / "	° / ' / "	° / ' / "	° / ' / "	° / ' / "	° / ' / "
0	177 52.8 - 1 23.6		174 39.9	180 35.7 - 4 7.7	235 8.1 -21 32.2		
2	207 53.2 - 1 21.6		204 44.8	210 34.9 - 4 5.2	265 9.2 -21 31.6		
4	237 53.5 - 1 19.6		234 49.8	240 34.1 - 4 2.8	295 10.3 -21 30.9		
6	267 53.9 - 1 17.6		264 54.7	270 33.3 - 4 .3	325 11.4 -21 30.3		
8	297 54.2 - 1 15.7		294 59.6	300 32.5 - 3 57.8	355 12.5 -21 29.7		
10	327 54.6 - 1 13.7		325 4.5	330 31.7 - 3 55.3	25 13.6 -21 29.0		
12	357 55.0 - 1 11.7		355 9.5	0 30.9 - 3 52.9	55 14.8 -21 28.4		
14	27 55.3 - 1 9.7		25 14.4	30 30.2 - 3 50.4	85 15.9 -21 27.8		
16	57 55.7 - 1 7.8		55 19.3	60 29.4 - 3 47.9	115 17.0 -21 27.1		
18	87 56.0 - 1 5.8		85 24.2	90 28.6 - 3 45.4	145 18.1 -21 26.5		
20	117 56.4 - 1 3.8		115 29.2	120 27.8 - 3 43.0	175 19.2 -21 25.8		
22	147 56.8 - 1 1.8		145 34.1	150 27.0 - 3 40.5	205 20.3 -21 25.2		
Δ	2	10		-4	12	6	3

φ	SUNCE		TRAJANJE SUMRAKA		MESEC			
	IZLAZ	ZALAZ	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 11	18 7	0 42	2 24	7 24	1.5	3 47	3.0
55	6 10	18 8	0 36	2 4	8 31	1.8	2 40	2.6
50	6 9	18 8	0 32	1 49	9 11	2.0	2 0	2.5
45	6 9	18 9	0 29	1 39	9 40	2.0	1 32	2.4
40	6 8	18 9	0 27	1 31	10 2	2.0	1 10	2.4
35	6 8	18 9	0 25	1 24	10 21	2.1	0 51	2.3
30	6 8	18 10	0 24	1 20	10 38	2.1	0 35	2.3
20	6 7	18 10	0 22	1 13	11 5	2.1	0 8	2.3
10	6 6	18 11	0 21	1 10	11 29	2.1	...	.0
0	6 5	18 12	0 21	1 9	11 51	2.2	...	.0
10	6 4	18 12	0 21	1 10	12 13	2.2	23 53	2.2
20	6 3	18 13	0 22	1 13	12 37	2.2	23 29	2.2
30	6 2	18 15	0 24	1 20	13 5	2.2	23 1	2.2
35	6 1	18 15	0 25	1 25	13 21	2.2	22 44	2.2
40	5 60	18 16	0 27	1 31	13 40	2.2	22 25	2.2
45	5 59	18 17	0 29	1 39	14 4	2.3	22 1	2.2
50	5 57	18 19	0 32	1 50	14 34	2.3	21 31	2.2
55	5 55	18 20	0 36	2 6	15 16	2.3	20 48	2.2
60	5 53	18 23	0 42	2 28	16 31	2.4	19 33	2.1
S								

UT	MESEC				JUPITER		SATURN	
	S <sub>♃</sub>	Δ	δ <sub>♃</sub>	Δ	S <sub>♃</sub>	δ <sub>♃</sub>	S <sub>♄</sub>	δ <sub>♄</sub>
h	° / ' / "	° / ' / "	° / ' / "	° / ' / "	° / ' / "	° / ' / "	° / ' / "	° / ' / "
0	98 36.0 98	27 6.3	44	339 10.5 - 4 54.0	62 33.8	22 .1		
2	127 33.6 97	27 15.0	41	9 15.9 - 4 53.8	92 38.8	22 .1		
4	156 31.0 97	27 23.2	38	39 21.4 - 4 53.5	122 43.8	22 .1		
6	185 28.5 97	27 30.9	35	69 26.8 - 4 53.3	152 48.8	22 .1		
8	214 25.8 97	27 37.9	33	99 32.3 - 4 53.1	182 53.8	22 .2		
10	243 23.1 96	27 44.5	30	129 37.7 - 4 52.8	212 58.7	22 .2		
12	272 20.4 96	27 50.4	27	159 43.2 - 4 52.6	243 3.7	22 .2		
14	301 17.7 96	27 55.8	24	189 48.7 - 4 52.4	273 8.7	22 .2		
16	330 14.9 96	28 .7	21	219 54.1 - 4 52.2	303 13.6	22 .2		
18	359 12.1 96	28 5.0	19	249 59.6 - 4 51.9	333 18.6	22 .2		
20	28 9.3 96	28 8.7	16	280 5.0 - 4 51.7	3 23.6	22 .2		
22	57 6.5 96	28 11.9	13	310 10.5 - 4 51.5	33 28.6	22 .3		
Δ				27	1	25	0	

SUNCE				MESEC			
UT	e = T <sub>p</sub> - UT	Δ/24	r	Prolaz	Δ/24	π <sub>♃</sub>	r
h	min s	s	'	h min	min	'	'
00	- 8 28.6	.7	16.1	T <sub>m</sub>	18 3	2.2	54.9 15.0
12	- 8 20.0	T <sub>m☉</sub>	12 h 8.3 min	Starost	6.6 d	Faza	☉

PLANETE									
Pl.	T <sub>m</sub>	π	360-α	Vel.	Pl.	T <sub>m</sub>	π	360-α	Vel.
♀	h min	'	°		♃	h min	'	°	
♂	11 58	.1	6	-3.8	♄	1 23	.0	165	-2.3
♂	8 19	.1	60	1.1	♂	19 46	.0	248	-1.1

UT	SUNCE		PROLEĆ. TAČKA S <sub>γ</sub>	VENERA		MARS				
	S <sub>☉</sub>	δ <sub>☉</sub>		S <sub>♀</sub>	δ <sub>♀</sub>	S <sub>♂</sub>	δ <sub>♂</sub>			
h	°	'	°	'	°	'	°	'		
0	177	57.1	- 0	59.8	175	39.0	180	26.2 - 3 38.0	235	21.5 -21 24.6
2	207	57.5	- 0	57.9	205	44.0	210	25.4 - 3 35.5	265	22.6 -21 23.9
4	237	57.9	- 0	55.9	235	48.9	240	24.6 - 3 33.0	295	23.7 -21 23.3
6	267	58.2	- 0	53.9	265	53.8	270	23.8 - 3 30.5	325	24.8 -21 22.6
8	297	58.6	- 0	51.9	295	58.7	300	23.0 - 3 28.1	355	25.9 -21 22.0
10	327	58.9	- 0	50.0	326	3.7	330	22.2 - 3 25.6	25	27.0 -21 21.3
12	357	59.3	- 0	48.0	356	8.6	0	21.4 - 3 23.1	55	28.2 -21 20.7
14	27	59.7	- 0	46.0	26	13.5	30	20.6 - 3 20.6	85	29.3 -21 20.0
16	58	.0	- 0	44.0	56	18.5	60	19.9 - 3 18.1	115	30.4 -21 19.4
18	88	.4	- 0	42.0	86	23.4	90	19.1 - 3 15.6	145	31.5 -21 18.7
20	118	.8	- 0	40.1	116	28.3	120	18.3 - 3 13.1	175	32.6 -21 18.0
22	148	1.1	- 0	38.1	146	33.2	150	17.5 - 3 10.7	205	33.8 -21 17.4
Δ	2	10					-4	12	6	3

φ	SUNCE		TRAJANJE SUMRAKA		MESEC			
	IZLAZ	ZALAZ	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 8	18 10	0 42	2 25	7 59	2.8	4 59	1.7
55	6 7	18 10	0 36	2 4	9 15	2.5	3 43	1.9
50	6 7	18 10	0 32	1 49	9 58	2.4	3 1	2.0
45	6 7	18 10	0 29	1 39	10 28	2.4	2 30	2.1
40	6 7	18 10	0 27	1 31	10 52	2.3	2 7	2.1
35	6 7	18 10	0 25	1 24	11 11	2.3	1 47	2.1
30	6 6	18 10	0 24	1 20	11 28	2.3	1 31	2.1
20	6 6	18 11	0 22	1 13	11 56	2.2	1 3	2.1
10	6 5	18 11	0 21	1 10	12 20	2.2	0 38	2.1
0	6 5	18 11	0 21	1 9	12 43	2.1	0 16	2.2
10	6 4	18 12	0 21	1 10	13 5	2.1	...	.0
20	6 3	18 13	0 22	1 13	13 30	2.1	...	.0
30	6 2	18 13	0 24	1 20	13 58	2.0	23 53	2.3
35	6 2	18 14	0 25	1 25	14 15	2.0	23 37	2.4
40	6 1	18 15	0 27	1 31	14 34	1.9	23 17	2.4
45	5 60	18 15	0 29	1 39	14 58	1.9	22 54	2.5
50	5 59	18 16	0 32	1 50	15 28	1.8	22 23	2.6
55	5 57	18 18	0 36	2 5	16 11	1.6	21 41	2.8
60	5 55	18 19	0 42	2 27	17 28	1.0	20 24	3.4
S								

UT	MESEC				JUPITER		SATURN				
	S <sub>♃</sub>	Δ	δ <sub>♃</sub>	Δ	S <sub>♃</sub>	δ <sub>♃</sub>	S <sub>♄</sub>	δ <sub>♄</sub>			
h	°	'	°	'	°	'	°	'			
0	86	3.7	96	28 14.5	10	340	16.0 - 4 51.2	63	33.5	22	.3
2	115	1.0	96	28 16.6	8	10	21.4 - 4 51.0	93	38.5	22	.3
4	143	58.2	97	28 18.1	5	40	26.9 - 4 50.8	123	43.5	22	.3
6	172	55.5	97	28 19.0	2	70	32.4 - 4 50.5	153	48.4	22	.3
8	201	52.9	97	28 19.4	-1	100	37.8 - 4 50.3	183	53.4	22	.3
10	230	50.3	97	28 19.2	-4	130	43.3 - 4 50.1	213	58.3	22	.3
12	259	47.7	98	28 18.5	-6	160	48.7 - 4 49.8	244	3.3	22	.3
14	288	45.3	98	28 17.2	-9	190	54.2 - 4 49.6	274	8.3	22	.4
16	317	42.9	98	28 15.4	-12	220	59.7 - 4 49.4	304	13.2	22	.4
18	346	40.6	99	28 13.0	-15	251	5.1 - 4 49.2	334	18.2	22	.4
20	15	38.4	99	28 10.1	-17	281	10.6 - 4 48.9	4	23.2	22	.4
22	44	36.2	100	28 6.7	-20	311	16.1 - 4 48.7	34	28.1	22	.4
Δ						27	1	25	0		

SUNCE				MESEC					
UT	e = T <sub>p</sub> - UT	Δ/24	r	Prolaz	Δ/24	π <sub>☾</sub>	r		
h	min	s	s	h min	min	'	'		
00	- 8 11.3	.7	16.1	T <sub>m</sub>	18 55	2.1	54.5 14.8		
12	- 8 2.5	T <sub>m☉</sub>	12 h 8.0 min	Starost	7.6 d	Faza	☉		
PLANETE									
Pl.	T <sub>m</sub>	π	360-α	Vel.	Pl.	T <sub>m</sub>	π	360-α	Vel.
♀	h min	'	°	5 -3.8	♃	h min	'	°	165 -2.3
♂	8 18	.1	60	1.0	♄	19 43	.0	248	-1

UT	SUNCE		PROLEĆ. TAČKA S <sub>γ</sub>	VENERA		MARS				
	S <sub>☉</sub>	δ <sub>☉</sub>		S <sub>♀</sub>	δ <sub>♀</sub>	S <sub>♂</sub>	δ <sub>♂</sub>			
h	°	'	°	'	°	'	°	'		
0	178	1.5	- 0	36.1	176	38.2	180	16.7 - 3 8.2	235	34.9 -21 16.7
2	208	1.9	- 0	34.1	206	43.1	210	15.9 - 3 5.7	265	36.0 -21 16.1
4	238	2.2	- 0	32.2	236	48.0	240	15.1 - 3 3.2	295	37.1 -21 15.4
6	268	2.6	- 0	30.2	266	53.0	270	14.4 - 3 .7	325	38.3 -21 14.7
8	298	3.0	- 0	28.2	296	57.9	300	13.6 - 2 58.2	355	39.4 -21 14.1
10	328	3.3	- 0	26.2	327	2.8	330	12.8 - 2 55.7	25	40.5 -21 13.4
12	358	3.7	- 0	24.3	357	7.7	0	12.0 - 2 53.2	55	41.6 -21 12.7
14	28	4.1	- 0	22.3	27	12.7	30	11.2 - 2 50.7	85	42.8 -21 12.1
16	58	4.5	- 0	20.3	57	17.6	60	10.5 - 2 48.2	115	43.9 -21 11.4
18	88	4.8	- 0	18.3	87	22.5	90	9.7 - 2 45.7	145	45.0 -21 10.7
20	118	5.2	- 0	16.3	117	27.5	120	8.9 - 2 43.2	175	46.1 -21 10.1
22	148	5.6	- 0	14.4	147	32.4	150	8.1 - 2 40.7	205	47.3 -21 9.4
Δ	2	10					-4	12	6	3

φ	SUNCE		TRAJANJE SUMRAKA		MESEC			
	IZLAZ	ZALAZ	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	18 12	0 42	2 26	9 6	3.6	5 39	.7
55	6 5	18 12	0 36	2 4	10 15	3.0	4 30	1.3
50	6 5	18 11	0 32	1 50	10 55	2.8	3 49	1.5
45	6 5	18 11	0 29	1 39	11 24	2.6	3 20	1.7
40	6 5	18 11	0 27	1 31	11 47	2.5	2 57	1.8
35	6 5	18 11	0 25	1 25	12 6	2.4	2 38	1.8
30	6 5	18 11	0 24	1 20	12 22	2.4	2 21	1.9
20	6 5	18 11	0 22	1 13	12 49	2.2	1 54	2.0
10	6 5	18 11	0 21	1 10	13 12	2.2	1 30	2.0
0	6 4	18 11	0 21	1 9	13 34	2.1	1 8	2.1
10	6 4	18 11	0 21	1 10	13 56	2.0	0 45	2.2
20	6 4	18 12	0 22	1 13	14 19	1.9	0 21	2.2
30	6 3	18 12	0 24	1 20	14 46	1.8	...	.0
35	6 2	18 13	0 25	1 25	15 2	1.7	...	.0
40	6 2	18 13	0 27	1 31	15 20	1.6	...	.0
45	6 1	18 14	0 29	1 39	15 42	1.5	23 54	2.7
50	6 0	18 14	0 32	1 50	16 11	1.3	23 26	2.9
55	5 59	18 15	0 36	2 5	16 49	1.0	22 48	3.2
60	5 58	18 16	0 42	2 26	17 53	.4	21 45	3.8
S								

UT	MESEC				JUPITER		SATURN				
	S <sub>♃</sub>	Δ	δ <sub>♃</sub>	Δ	S <sub>♃</sub>	δ <sub>♃</sub>	S <sub>♄</sub>	δ <sub>♄</sub>			
h	°	'	°	'	°	'	°	'			
0	73	34.2	101	28 2.7	-23	341	21.6 - 4 48.5	64	33.1	22	.4
2	102	32.3	101	27 58.1	-25	11	27.0 - 4 48.2	94	38.0	22	.4
4	131	30.6	102	27 53.0	-28	41	32.5 - 4 48.0	124	43.0	22	.4
6	160	28.9	103	27 47.4	-31	71	38.0 - 4 47.8	154	47.9	22	.4
8	189	27.4	103	27 41.3	-33	101	43.4 - 4 47.5	184	52.9	22	.5
10	218	26.1	104	27 34.6	-36	131	48.9 - 4 47.3	214	57.9	22	.5
12	247	24.9	105	27 27.5	-38	161	54.4 - 4 47.1	245	2.8	22	.5
14	276	23.8	106	27 19.8	-41	191	59.8 - 4 46.8	275	7.8	22	.5
16	305	23.0	106	27 11.5	-44	222	5.3 - 4 46.6	305	12.7	22	.5
18	334	22.2	107	27 2.8	-46	252	10.8 - 4 46.3	335	17.7	22	.5
20	3	21.7	108	26 53.6	-49	282	16.3 - 4 46.1	5	22.6	22	.5
22	32	21.3	109	26 43.8	-51	312	21.7 - 4 45.9	35	27.6	22	.5
Δ						27	1	25	0		

SUNCE				MESEC					
UT	e = T <sub>p</sub> - UT	Δ/24	r	Prolaz	Δ/24	π <sub>☾</sub>	r		
h	min	s	s	h min	min	'	'		
00	- 7 53.8	.7	16.1	T <sub>m</sub>	19 46	2.0	54.2 14.8		
12	- 7 44.9	T <sub>m☉</sub>	12 h 7.8 min	Starost	8.6 d	Faza	☉		
PLANETE									
Pl.	T <sub>m</sub>	π	360-α	Vel.	Pl.	T <sub>m</sub>	π	360-α	Vel.
♀	h min	'	°	4 -3.8	♃	h min	'	°	165 -2.3
♂	8 17	.1	59	1.0	♄	19 39	.0	248	-1

UT	SUNCE				PROLEĆ. TAČKA S <sub>γ</sub>	VENERA				MARS				
	S <sub>☉</sub>		δ <sub>☉</sub>			S <sub>♀</sub>		δ <sub>♀</sub>		S <sub>♂</sub>		δ <sub>♂</sub>		
h	°	'	°	'	°	'	°	'	°	'	°	'		
0	178	5.9	-0	12.4	177	37.3	180	7.3	-2	38.2	235	48.4	-21	8.7
2	208	6.3	-0	10.4	207	42.2	210	6.6	-2	35.7	265	49.5	-21	8.0
4	238	6.7	-0	8.4	237	47.2	240	5.8	-2	33.3	295	50.7	-21	7.3
6	268	7.0	-0	6.5	267	52.1	270	5.0	-2	30.8	325	51.8	-21	6.7
8	298	7.4	-0	4.5	297	57.0	300	4.2	-2	28.3	355	52.9	-21	6.0
10	328	7.8	-0	2.5	328	2.0	330	3.5	-2	25.8	25	54.0	-21	5.3
12	358	8.2	-0	.5	358	6.9	0	2.7	-2	23.3	55	55.2	-21	4.6
14	28	8.5	0	1.4	28	11.8	30	1.9	-2	20.8	85	56.3	-21	3.9
16	58	8.9	0	3.4	58	16.7	60	1.1	-2	18.3	115	57.4	-21	3.2
18	88	9.3	0	5.4	88	21.7	90	.4	-2	15.8	145	58.6	-21	2.5
20	118	9.6	0	7.4	118	26.6	119	59.6	-2	13.3	175	59.7	-21	1.9
22	148	10.0	0	9.3	148	31.5	149	58.8	-2	10.8	206	.8	-21	1.2
Δ		2		10				-4		12		6		3

φ	SUNCE		TRAJANJE SUMRAKA		MESEC			
	IZLAZ	ZALAZ	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	18 15	0 42	2 27	10 34	3.9	5 56	.3
55	6 2	18 14	0 36	2 5	11 27	3.3	5 1	.9
50	6 3	18 13	0 32	1 50	12 2	3.0	4 26	1.1
45	6 3	18 12	0 29	1 39	12 27	2.8	3 60	1.3
40	6 4	18 12	0 27	1 31	12 47	2.6	3 39	1.5
35	6 4	18 12	0 25	1 25	13 4	2.5	3 22	1.6
30	6 4	18 11	0 24	1 20	13 18	2.4	3 7	1.7
20	6 4	18 11	0 22	1 13	13 43	2.2	2 41	1.8
10	6 4	18 11	0 21	1 10	14 4	2.1	2 19	1.9
0	6 4	18 11	0 21	1 9	14 23	2.0	1 58	2.0
10	6 4	18 11	0 21	1 10	14 43	1.8	1 37	2.1
20	6 4	18 11	0 22	1 13	15 4	1.7	1 15	2.2
30	6 3	18 11	0 24	1 20	15 28	1.5	0 49	2.4
35	6 3	18 11	0 25	1 24	15 42	1.4	0 33	2.5
40	6 3	18 11	0 27	1 31	15 58	1.3	0 15	2.6
45	6 2	18 12	0 29	1 39	16 18	1.2	...	.0
50	6 2	18 12	0 32	1 49	16 42	1.0	...	.0
55	6 1	18 13	0 36	2 4	17 14	.7	...	.0
60	6 0	18 13	0 41	2 25	18 2	.1	23 17	3.9

UT	MESEC				JUPITER				SATURN							
	S <sub>♃</sub>		Δ		δ <sub>♃</sub>		Δ		S <sub>♃</sub>		δ <sub>♃</sub>		S <sub>♄</sub>		δ <sub>♄</sub>	
h	°	'	°	'	°	'	°	'	°	'	°	'	°	'	°	'
0	61	21.1	110	26	33.6	-54	342	27.2	-4	45.6	65	32.5	22	.5		
2	90	21.2	111	26	22.9	-56	12	32.7	-4	45.4	95	37.5	22	.6		
4	119	21.4	112	26	11.7	-58	42	38.2	-4	45.2	125	42.4	22	.6		
6	148	21.8	113	25	59.9	-61	72	43.6	-4	44.9	155	47.3	22	.6		
8	177	22.3	114	25	47.8	-63	102	49.1	-4	44.7	185	52.3	22	.6		
10	206	23.1	115	25	35.1	-66	132	54.6	-4	44.5	215	57.2	22	.6		
12	235	24.2	116	25	22.0	-68	163	.1	-4	44.2	246	2.2	22	.6		
14	264	25.4	117	25	8.4	-70	193	5.6	-4	44.0	276	7.1	22	.6		
16	293	26.8	118	24	54.3	-73	223	11.0	-4	43.8	306	12.1	22	.6		
18	322	28.4	119	24	39.8	-75	253	16.5	-4	43.5	336	17.0	22	.6		
20	351	30.3	120	24	24.9	-77	283	22.0	-4	43.3	6	21.9	22	.6		
22	20	32.3	121	24	9.5	-79	313	27.5	-4	43.0	36	26.9	22	.6		
Δ								27		1		25		0		

SUNCE				MESEC				
UT	e = T <sub>p</sub> - UT	Δ/24	r	Prolaz	Δ/24	π <sub>☾</sub>	r	
h	min	s	'	h min	min	'	'	
00	- 7 36.1	.7	16.1	T <sub>m</sub>	20 35	2.0	54.2	14.8
12	- 7 27.2	T <sub>m☉</sub>	12 h 7.5 min	Starost	9.6 d	Faza	☉	

PLANETE									
Pl.	T <sub>m</sub>	π	360-α	Vel.	Pl.	T <sub>m</sub>	π	360-α	Vel.
♀	h min	'	°		♃	h min	'	°	
♀	11 60	.1	2	-3.8	♃	1 10	.0	165	-2.3
♂	8 16	.1	58	1.0	♄	19 35	.0	248	-1.1

UT	SUNCE				PROLEĆ. TAČKA S <sub>γ</sub>	VENERA				MARS				
	S <sub>☉</sub>		δ <sub>☉</sub>			S <sub>♀</sub>		δ <sub>♀</sub>		S <sub>♂</sub>		δ <sub>♂</sub>		
h	°	'	°	'	°	'	°	'	°	'	°	'		
0	178	10.4	0	11.3	178	36.5	179	58.0	-2	8.3	236	2.0	-21	.5
2	208	10.8	0	13.3	208	41.4	209	57.3	-2	5.7	266	3.1	-20	59.8
4	238	11.1	0	15.3	238	46.3	239	56.5	-2	3.2	296	4.2	-20	59.1
6	268	11.5	0	17.2	268	51.2	269	55.7	-2	.7	326	5.4	-20	58.4
8	298	11.9	0	19.2	298	56.2	299	55.0	-1	58.2	356	6.5	-20	57.7
10	328	12.3	0	21.2	329	1.1	329	54.2	-1	55.7	26	7.6	-20	57.0
12	358	12.6	0	23.2	359	6.0	359	53.4	-1	53.2	56	8.8	-20	56.3
14	28	13.0	0	25.1	29	10.9	29	52.7	-1	50.7	86	9.9	-20	55.6
16	58	13.4	0	27.1	59	15.9	59	51.9	-1	48.2	116	11.1	-20	54.9
18	88	13.8	0	29.1	89	20.8	89	51.1	-1	45.7	146	12.2	-20	54.2
20	118	14.1	0	31.1	119	25.7	119	50.4	-1	43.2	176	13.3	-20	53.5
22	148	14.5	0	33.0	149	30.7	149	49.6	-1	40.7	206	14.5	-20	52.8
Δ		2		10				-4		13		6		4

φ	SUNCE		TRAJANJE SUMRAKA		MESEC			
	IZLAZ	ZALAZ	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 59	18 17	0 42	2 27	12 6	3.8	6 2	.1
55	5 60	18 16	0 36	2 5	12 45	3.3	5 22	.6
50	6 1	18 15	0 32	1 50	13 12	3.0	4 53	.9
45	6 1	18 14	0 29	1 39	13 33	2.8	4 32	1.1
40	6 2	18 13	0 27	1 31	13 50	2.6	4 14	1.2
35	6 2	18 13	0 25	1 25	14 4	2.5	3 59	1.4
30	6 3	18 12	0 24	1 20	14 16	2.4	3 46	1.5
20	6 3	18 11	0 22	1 13	14 36	2.2	3 24	1.6
10	6 4	18 11	0 21	1 10	14 54	2.0	3 5	1.8
0	6 4	18 10	0 21	1 9	15 11	1.9	2 47	1.9
10	6 4	18 10	0 21	1 10	15 27	1.7	2 28	2.1
20	6 4	18 10	0 22	1 13	15 45	1.6	2 9	2.2
30	6 4	18 10	0 24	1 20	16 5	1.4	1 46	2.4
35	6 4	18 10	0 25	1 24	16 17	1.3	1 33	2.5
40	6 4	18 10	0 27	1 31	16 30	1.1	1 17	2.6
45	6 4	18 10	0 29	1 39	16 46	1.0	0 59	2.8
50	6 3	18 10	0 32	1 49	17 6	.8	0 35	3.0
55	6 3	18 10	0 36	2 4	17 31	.5	0 4	3.3
60	6 3	18 10	0 41	2 25	18 5	.0	...	.0

UT	MESEC				JUPITER				SATURN							
	S <sub>♃</sub>		Δ		δ <sub>♃</sub>		Δ		S <sub>♃</sub>		δ <sub>♃</sub>		S <sub>♄</sub>		δ <sub>♄</sub>	
h	°	'	°	'	°	'	°	'	°	'	°	'	°	'	°	'
0	49	34.6	122	23	53.6	-81	343	33.0	-4	42.8	66	31.8	22	.7		
2	78	37.1	124	23	37.4	-83	13	38.4	-4	42.6	96	36.8	22	.7		
4	107	39.8	125	23	20.7	-86	43	43.9	-4	42.3	126	41.7	22	.7		
6	136	42.8	126	23	3.6	-88	73	49.4	-4	42.1	156	46.6	22	.7		
8	165	45.9	127	22	46.0	-90	103	54.9	-4	41.9	186	51.6	22	.7		
10	194	49.3	128	22	28.1	-92	134	.4	-4	41.6	216	56.5	22	.7		
12	223	52.9	129	22	9.8	-94	164	5.9	-4	41.4	247	1.4	22	.7		
14	252	56.7	130	21	51.0	-96	194	11.3	-4	41.1	277	6.4	22	.7		
16	282	.7	131	21	31.9	-98	224	16.8	-4	40.9	307	11.3	22	.7		
18	311	4.9	132	21	12.4	-99	254	22.3	-4	40.7	337	16.2	22	.7		
20	340	9.4	133	20	52.5	-101	284	27.8	-4	40.4	7	21.2	22	.7		
22	9	14.0	134	20	32.2	-103	314	33.3	-4	40.2	37	26.1	22	.7		
Δ								27		1		25		0		

SUNCE				MESEC				
UT	e = T <sub>p</sub> - UT	Δ/24	r	Prolaz	Δ/24	π <sub>☾</sub>	r	
h	min	s	'	h min	min	'	'	
00	- 7 18.3	.7	16.1	T <sub>m</sub>	21 22	1.9	54.2	14.8
12	- 7 9.3	T <sub>m☉</sub>	12 h 7.2 min	Starost	10.6 d	Faza	☉	

PLANETE							
Pl.	T<						

UT	SUNCE		PROLEĆ. TAČKA S <sub>γ</sub>	VENERA		MARS		
	S <sub>☉</sub>	δ <sub>☉</sub>		S <sub>♀</sub>	δ <sub>♀</sub>	S <sub>♂</sub>	δ <sub>♂</sub>	
h	°	'	°	'	°	'	°	'
0	178 14.9	0 35.0	179 35.6	179 48.8	- 1 38.2	236 15.6	-20 52.1	
2	208 15.3	0 37.0	209 40.5	209 48.1	- 1 35.7	266 16.7	-20 51.3	
4	238 15.6	0 38.9	239 45.4	239 47.3	- 1 33.2	296 17.9	-20 50.6	
6	268 16.0	0 40.9	269 50.4	269 46.5	- 1 30.7	326 19.0	-20 49.9	
8	298 16.4	0 42.9	299 55.3	299 45.8	- 1 28.2	356 20.2	-20 49.2	
10	328 16.8	0 44.9	330 .2	329 45.0	- 1 25.7	26 21.3	-20 48.5	
12	358 17.1	0 46.8	0 5.2	359 44.2	- 1 23.1	56 22.4	-20 47.8	
14	28 17.5	0 48.8	30 10.1	29 43.5	- 1 20.6	86 23.6	-20 47.1	
16	58 17.9	0 50.8	60 15.0	59 42.7	- 1 18.1	116 24.7	-20 46.3	
18	88 18.3	0 52.8	90 19.9	89 41.9	- 1 15.6	146 25.9	-20 45.6	
20	118 18.6	0 54.7	120 24.9	119 41.2	- 1 13.1	176 27.0	-20 44.9	
22	148 19.0	0 56.7	150 29.8	149 40.4	- 1 10.6	206 28.2	-20 44.2	
Δ	2	10		-4	13	6	4	

φ	SUNCE		TRAJANJE SUMRAKA		MESEC			
	IZLAZ	ZALAZ	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 56	18 20	0 42	2 28	13 38	3.7	6 5	.0
55	5 57	18 18	0 36	2 6	14 5	3.3	5 36	.4
50	5 58	18 16	0 32	1 51	14 25	3.0	5 14	.7
45	5 59	18 15	0 29	1 39	14 40	2.8	4 57	.9
40	6 0	18 14	0 27	1 31	14 53	2.6	4 43	1.1
35	6 1	18 13	0 25	1 25	15 4	2.5	4 32	1.2
30	6 2	18 13	0 24	1 20	15 13	2.4	4 21	1.3
20	6 2	18 12	0 22	1 13	15 29	2.2	4 3	1.5
10	6 3	18 11	0 21	1 10	15 43	2.0	3 48	1.7
0	6 4	18 10	0 21	1 9	15 56	1.8	3 33	1.8
10	6 4	18 10	0 21	1 10	16 9	1.6	3 18	2.0
20	6 4	18 9	0 22	1 13	16 23	1.5	3 2	2.2
30	6 5	18 9	0 24	1 20	16 38	1.3	2 44	2.4
35	6 5	18 8	0 25	1 24	16 47	1.1	2 33	2.5
40	6 5	18 8	0 27	1 30	16 58	1.0	2 20	2.6
45	6 5	18 8	0 29	1 38	17 9	.8	2 6	2.8
50	6 5	18 8	0 32	1 49	17 24	.6	1 47	3.0
55	6 5	18 8	0 36	2 3	17 42	.4	1 24	3.3
60	6 5	18 7	0 41	2 24	18 6	.0	0 51	3.8

UT	MESEC				JUPITER		SATURN	
	S <sub>♃</sub>	Δ	δ <sub>♃</sub>	Δ	S <sub>♃</sub>	δ <sub>♃</sub>	S <sub>♄</sub>	δ <sub>♄</sub>
h	°	'	°	'	°	'	°	'
0	38 18.9	135	20 11.5	-105	344 38.8	- 4 39.9	67 31.0	22 .8
2	67 23.9	136	19 50.5	-107	14 44.3	- 4 39.7	97 35.9	22 .8
4	96 29.2	137	19 29.2	-109	44 49.7	- 4 39.5	127 40.9	22 .8
6	125 34.6	138	19 7.5	-110	74 55.2	- 4 39.2	157 45.8	22 .8
8	154 40.2	139	18 45.4	-112	105 .7	- 4 39.0	187 50.7	22 .8
10	183 46.1	140	18 23.0	-114	135 6.2	- 4 38.7	217 55.7	22 .8
12	212 52.1	141	18 .3	-115	165 11.7	- 4 38.5	248 .6	22 .8
14	241 58.3	142	17 37.3	-117	195 17.2	- 4 38.3	278 5.5	22 .8
16	271 4.7	143	17 13.9	-118	225 22.7	- 4 38.0	308 10.4	22 .8
18	300 11.2	144	16 50.2	-120	255 28.2	- 4 37.8	338 15.3	22 .8
20	329 17.9	144	16 26.2	-121	285 33.7	- 4 37.5	8 20.3	22 .8
22	358 24.8	145	16 1.9	-123	315 39.2	- 4 37.3	38 25.2	22 .8
Δ					27	1	25	0

SUNCE				MESEC			
UT	e = T <sub>p</sub> - UT	Δ/24	r	Prolaz	Δ/24	π <sub>☉</sub>	r
h	min	s	s	h min	min	'	'
00	- 7 .3	.8	16.1	T <sub>m</sub>	22 7	1.8	54.5 14.8
12	- 6 51.3	T <sub>m☉</sub>	12 h 6.9 min	Starost	11.6 d	Faza ☉	

PLANETE									
Pl.	T <sub>m</sub>	π	360-α	Vel.	Pl.	T <sub>m</sub>	π	360-α	Vel.
h min	'	°	°	°	h min	'	°	°	°
♀	12 1	.1	0	-3.8	♃	1 1	.0	165	-2.3
♁	8 15	.1	57	1.0	♄	19 27	.0	248	.0

UT	SUNCE		PROLEĆ. TAČKA S <sub>γ</sub>	VENERA		MARS		
	S <sub>☉</sub>	δ <sub>☉</sub>		S <sub>♀</sub>	δ <sub>♀</sub>	S <sub>♂</sub>	δ <sub>♂</sub>	
h	°	'	°	'	°	'	°	'
0	178 19.4	0 58.7	180 34.7	179 39.7	- 1 8.1	236 29.3	-20 43.5	
2	208 19.8	1 .6	210 39.7	209 38.9	- 1 5.6	266 30.4	-20 42.7	
4	238 20.2	1 2.6	240 44.6	239 38.1	- 1 3.1	296 31.6	-20 42.0	
6	268 20.5	1 4.6	270 49.5	269 37.4	- 1 .5	326 32.7	-20 41.3	
8	298 20.9	1 6.6	300 54.4	299 36.6	- 0 58.0	356 33.9	-20 40.5	
10	328 21.3	1 8.5	330 59.4	329 35.8	- 0 55.5	26 35.0	-20 39.8	
12	358 21.7	1 10.5	1 4.3	359 35.1	- 0 53.0	56 36.2	-20 39.1	
14	28 22.0	1 12.5	31 9.2	29 34.3	- 0 50.5	86 37.3	-20 38.3	
16	58 22.4	1 14.4	61 14.2	59 33.6	- 0 48.0	116 38.5	-20 37.6	
18	88 22.8	1 16.4	91 19.1	89 32.8	- 0 45.5	146 39.6	-20 36.9	
20	118 23.2	1 18.4	121 24.0	119 32.0	- 0 43.0	176 40.8	-20 36.1	
22	148 23.6	1 20.3	151 28.9	149 31.3	- 0 40.4	206 41.9	-20 35.4	
Δ	2	10		-4	13	6	4	

φ	SUNCE		TRAJANJE SUMRAKA		MESEC			
	IZLAZ	ZALAZ	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 52	18 22	0 42	2 29	15 8	3.7	6 5	.0
55	5 55	18 20	0 36	2 6	15 25	3.3	5 46	.3
50	5 56	18 18	0 32	1 51	15 38	3.0	5 31	.6
45	5 58	18 16	0 29	1 40	15 48	2.8	5 19	.8
40	5 59	18 15	0 27	1 31	15 56	2.6	5 9	.9
35	5 60	18 14	0 25	1 25	16 4	2.5	5 0	1.1
30	6 0	18 13	0 24	1 20	16 10	2.4	4 53	1.2
20	6 2	18 12	0 22	1 13	16 21	2.1	4 39	1.4
10	6 2	18 11	0 21	1 10	16 30	1.9	4 28	1.6
0	6 3	18 10	0 21	1 9	16 39	1.8	4 17	1.8
10	6 4	18 9	0 21	1 10	16 48	1.6	4 6	2.0
20	6 5	18 8	0 22	1 13	16 58	1.4	3 54	2.1
30	6 5	18 7	0 24	1 20	17 8	1.2	3 41	2.4
35	6 6	18 7	0 25	1 24	17 14	1.0	3 33	2.5
40	6 6	18 7	0 27	1 30	17 21	.9	3 24	2.6
45	6 6	18 6	0 29	1 38	17 29	.7	3 13	2.8
50	6 7	18 6	0 32	1 49	17 39	.5	3 0	3.0
55	6 7	18 5	0 36	2 3	17 51	.3	2 44	3.3
60	6 7	18 4	0 41	2 23	18 6	.0	2 22	3.7

UT	MESEC				JUPITER		SATURN	
	S <sub>♃</sub>	Δ	δ <sub>♃</sub>	Δ	S <sub>♃</sub>	δ <sub>♃</sub>	S <sub>♄</sub>	δ <sub>♄</sub>
h	°	'	°	'	°	'	°	'
0	27 31.9	146	15 37.4	-124	345 44.6	- 4 37.1	68 30.1	22 .8
2	56 39.1	147	15 12.5	-126	15 50.1	- 4 36.8	98 35.0	22 .8
4	85 46.4	147	14 47.4	-127	45 55.6	- 4 36.6	128 39.9	22 .8
6	114 53.9	148	14 21.9	-128	76 1.1	- 4 36.3	158 44.8	22 .9
8	144 1.5	149	13 56.3	-130	106 6.6	- 4 36.1	188 49.8	22 .9
10	173 9.2	149	13 30.3	-131	136 12.1	- 4 35.9	218 54.7	22 .9
12	202 17.1	150	13 4.1	-132	166 17.6	- 4 35.6	248 59.6	22 .9
14	231 25.1	151	12 37.7	-133	196 23.1	- 4 35.4	279 4.5	22 .9
16	260 33.2	151	12 11.0	-135	226 28.6	- 4 35.1	309 9.4	22 .9
18	289 41.4	152	11 44.1	-136	256 34.1	- 4 34.9	339 14.3	22 .9
20	318 49.7	152	11 16.9	-137	286 39.6	- 4 34.6	9 19.2	22 .9
22	347 58.1	152	10 49.6	-138	316 45.1	- 4 34.4	39 24.2	22 .9
Δ					27	1	25	0

SUNCE				MESEC			
UT	e = T <sub>p</sub> - UT	Δ/24	r	Prolaz	Δ/24	π <sub>☉</sub>	r
h	min	s	s	h min	min	'	'
00	- 6 42.2	.8	16.1	T <sub>m</sub>	22 50	1.7	54.8 14.9
12	- 6 33.1	T <sub>m☉</sub>	12 h 6.6 min	Starost	12.6 d	Faza ☉	

PLANETE									
Pl.	T <sub>m</sub>	π	360-α	Vel.	Pl.	T <sub>m</sub>	π	360-α	Vel.
h min	'	°	°	°	h min	'	°	°	°
♀	12 2	.1	359	-3.8	♃	0 57	.0	165	-2.3
♁	8 14	.1	56	1.0	♄	19 23	.0	248	.0

UT	SUNCE		PROLEĆ. TAČKA S <sub>γ</sub>	VENERA		MARS	
	S <sub>☉</sub>	δ <sub>☉</sub>		S <sub>♀</sub>	δ <sub>♀</sub>	S <sub>♂</sub>	δ <sub>♂</sub>
h	° / ' / "	° / ' / "	° / ' / "	° / ' / "	° / ' / "	° / ' / "	° / ' / "
0	178 23.9	1 22.3	181 33.9	179 30.5 - 0	37.9	236 43.1 -20	34.7
2	208 24.3	1 24.3	211 38.8	209 29.8 - 0	35.4	266 44.2 -20	33.9
4	238 24.7	1 26.2	241 43.7	239 29.0 - 0	32.9	296 45.4 -20	33.2
6	268 25.1	1 28.2	271 48.7	269 28.3 - 0	30.4	326 46.5 -20	32.4
8	298 25.5	1 30.2	301 53.6	299 27.5 - 0	27.9	356 47.7 -20	31.7
10	328 25.8	1 32.1	331 58.5	329 26.7 - 0	25.4	26 48.8 -20	30.9
12	358 26.2	1 34.1	2 3.4	359 26.0 - 0	22.8	56 50.0 -20	30.2
14	28 26.6	1 36.1	32 8.4	29 25.2 - 0	20.3	86 51.1 -20	29.4
16	58 27.0	1 38.0	62 13.3	59 24.5 - 0	17.8	116 52.3 -20	28.7
18	88 27.4	1 40.0	92 18.2	89 23.7 - 0	15.3	146 53.4 -20	27.9
20	118 27.7	1 42.0	122 23.1	119 23.0 - 0	12.8	176 54.6 -20	27.2
22	148 28.1	1 43.9	152 28.1	149 22.2 - 0	10.3	206 55.8 -20	26.4
Δ	2	10		-4	13	6	4

φ	SUNCE		TRAJANJE SUMRAKA		MESEC			
	IZLAZ	ZALAZ	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 49	18 24	0 42	2 30	16 35	3.7	6 5	.0
55	5 52	18 22	0 36	2 7	16 44	3.3	5 53	.3
50	5 54	18 19	0 32	1 51	16 50	3.1	5 45	.5
45	5 56	18 18	0 29	1 40	16 55	2.8	5 37	.7
40	5 57	18 16	0 27	1 31	16 60	2.7	5 31	.9
35	5 58	18 15	0 25	1 25	17 3	2.5	5 26	1.0
30	5 59	18 14	0 24	1 20	17 7	2.4	5 22	1.2
20	6 1	18 12	0 22	1 13	17 12	2.1	5 14	1.4
10	6 2	18 11	0 21	1 10	17 17	1.9	5 6	1.6
0	6 3	18 10	0 21	1 9	17 22	1.8	4 60	1.8
10	6 4	18 8	0 21	1 10	17 26	1.6	4 53	1.9
20	6 5	18 7	0 22	1 13	17 31	1.4	4 46	2.1
30	6 6	18 6	0 24	1 19	17 36	1.1	4 37	2.4
35	6 6	18 6	0 25	1 24	17 40	1.0	4 33	2.5
40	6 7	18 5	0 27	1 30	17 43	.9	4 27	2.6
45	6 8	18 4	0 29	1 38	17 47	.7	4 21	2.8
50	6 8	18 3	0 32	1 49	17 52	.5	4 13	3.0
55	6 9	18 2	0 36	2 3	17 58	.3	4 3	3.3
60	6 10	18 1	0 41	2 23	18 5	.0	3 50	3.7

UT	MESEC				JUPITER		SATURN	
	S <sub>♃</sub>	Δ	δ <sub>♃</sub>	Δ	S <sub>♃</sub>	δ <sub>♃</sub>	S <sub>♄</sub>	δ <sub>♄</sub>
h	° / ' / "	' / "	° / ' / "	' / "	° / ' / "	' / "	° / ' / "	' / "
0	17 6.6	153	10 22.0	-139	346 50.6 - 4	34.2	69 29.1	22 .9
2	46 15.2	153	9 54.2	-140	16 56.1 - 4	33.9	99 34.0	22 .9
4	75 23.8	154	9 26.2	-141	47 1.6 - 4	33.7	129 38.9	22 .9
6	104 32.5	154	8 58.0	-142	77 7.1 - 4	33.4	159 43.8	22 .9
8	133 41.3	154	8 29.6	-143	107 12.6 - 4	33.2	189 48.7	22 .9
10	162 50.1	154	8 1.1	-144	137 18.1 - 4	32.9	219 53.6	22 .9
12	191 59.0	154	7 32.4	-144	167 23.6 - 4	32.7	249 58.5	22 .9
14	221 7.9	155	7 3.5	-145	197 29.1 - 4	32.5	280 3.4	22 .9
16	250 16.8	155	6 34.4	-146	227 34.6 - 4	32.2	310 8.3	22 .9
18	279 25.7	155	6 5.2	-147	257 40.1 - 4	32.0	340 13.2	22 .9
20	308 34.7	155	5 35.9	-147	287 45.6 - 4	31.7	10 18.1	22 .9
22	337 43.6	155	5 6.4	-148	317 51.1 - 4	31.5	40 23.0	22 .9
Δ					27	1	25	0

SUNCE				MESEC			
UT	e = T <sub>p</sub> - UT	Δ/24	r	Prolaz	Δ/24	π <sub>☉</sub>	r
h	min s	' / "	' / "	h min	min	' / "	' / "
00	- 6 24.1	.8	16.1	T <sub>m</sub>	23 32	1.8	55.3 15.1
12	- 6 15.0	T <sub>m☉</sub>	12 h 6.3 min	Starost	13.6 d	Faza	☉

PLANETE									
Pl.	T <sub>m</sub>	π	360-α	Vel.	Pl.	T <sub>m</sub>	π	360-α	Vel.
♀	h min	' / "	°	' / "	♃	h min	' / "	°	' / "
♂	12 2	.1	358	-3.8	♃	0 52	.0	165	-2.3
♄	8 13	.1	55	1.0	♄	19 19	.0	248	.0

UT	SUNCE		PROLEĆ. TAČKA S <sub>γ</sub>	VENERA		MARS	
	S <sub>☉</sub>	δ <sub>☉</sub>		S <sub>♀</sub>	δ <sub>♀</sub>	S <sub>♂</sub>	δ <sub>♂</sub>
h	° / ' / "	° / ' / "	° / ' / "	° / ' / "	° / ' / "	° / ' / "	° / ' / "
0	178 28.5	1 45.9	182 33.0	179 21.4 - 0	7.7	236 56.9 -20	25.7
2	208 28.9	1 47.9	212 37.9	209 20.7 - 0	5.2	266 58.1 -20	24.9
4	238 29.3	1 49.8	242 42.9	239 19.9 - 0	2.7	296 59.2 -20	24.1
6	268 29.6	1 51.8	272 47.8	269 19.2 - 0	.2	327 .4 -20	23.4
8	298 30.0	1 53.8	302 52.7	299 18.4 0	2.3	357 1.5 -20	22.6
10	328 30.4	1 55.7	332 57.6	329 17.7 0	4.8	27 2.7 -20	21.9
12	358 30.8	1 57.7	3 2.6	359 16.9 0	7.4	57 3.9 -20	21.1
14	28 31.2	1 59.7	33 7.5	29 16.2 0	9.9	87 5.0 -20	20.3
16	58 31.5	2 1.6	63 12.4	59 15.4 0	12.4	117 6.2 -20	19.6
18	88 31.9	2 3.6	93 17.4	89 14.7 0	14.9	147 7.3 -20	18.8
20	118 32.3	2 5.5	123 22.3	119 13.9 0	17.4	177 8.5 -20	18.0
22	148 32.7	2 7.5	153 27.2	149 13.1 0	19.9	207 9.7 -20	17.3
Δ	2	10		-4	13	6	4

φ	SUNCE		TRAJANJE SUMRAKA		MESEC			
	IZLAZ	ZALAZ	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	18 27	0 42	2 31	18 3	3.7	6 4	.0
55	5 50	18 23	0 37	2 7	18 3	3.4	6 0	.3
50	5 52	18 21	0 32	1 52	18 3	3.1	5 57	.5
45	5 54	18 19	0 29	1 40	18 4	2.9	5 55	.7
40	5 55	18 17	0 27	1 32	18 4	2.7	5 53	.9
35	5 57	18 16	0 25	1 25	18 4	2.6	5 51	1.0
30	5 58	18 14	0 24	1 20	18 4	2.4	5 49	1.2
20	5 60	18 12	0 22	1 14	18 4	2.2	5 47	1.4
10	6 1	18 11	0 21	1 10	18 4	2.0	5 44	1.6
0	6 3	18 9	0 21	1 9	18 4	1.8	5 42	1.8
10	6 4	18 8	0 21	1 10	18 4	1.6	5 39	2.0
20	6 5	18 6	0 22	1 13	18 4	1.4	5 37	2.2
30	6 6	18 5	0 24	1 19	18 4	1.2	5 34	2.4
35	6 7	18 4	0 25	1 24	18 4	1.0	5 32	2.5
40	6 8	18 3	0 27	1 30	18 4	.9	5 30	2.7
45	6 9	18 2	0 29	1 38	18 4	.7	5 28	2.9
50	6 10	18 1	0 32	1 48	18 4	.5	5 26	3.1
55	6 11	17 60	0 36	2 2	18 4	.3	5 22	3.3
60	6 12	17 58	0 41	2 22	18 4	.0	5 18	3.7

UT	MESEC				JUPITER		SATURN	
	S <sub>♃</sub>	Δ	δ <sub>♃</sub>	Δ	S <sub>♃</sub>	δ <sub>♃</sub>	S <sub>♄</sub>	δ <sub>♄</sub>
h	° / ' / "	' / "	° / ' / "	' / "	° / ' / "	' / "	° / ' / "	' / "
0	6 52.6	155	4 36.8	-149	347 56.6 - 4	31.2	70 27.9	22 .9
2	36 1.5	155	4 7.1	-149	18 2.1 - 4	31.0	100 32.8	22 .9
4	65 10.5	154	3 37.2	-150	48 7.6 - 4	30.7	130 37.7	22 1.0
6	94 19.3	154	3 7.3	-150	78 13.1 - 4	30.5	160 42.6	22 1.0
8	123 28.2	154	2 37.2	-151	108 18.6 - 4	30.3	190 47.5	22 1.0
10	152 37.0	154	2 7.1	-151	138 24.1 - 4	30.0	220 52.4	22 1.0
12	181 45.8	153	1 36.9	-151	168 29.6 - 4	29.8	250 57.3	22 1.0
14	210 54.5	153	1 6.6	-152	198 35.1 - 4	29.5	281 2.2	22 1.0
16	240 3.1	153	0 36.2	-152	228 40.6 - 4	29.3	311 7.1	22 1.0
18	269 11.6	152	0 5.8	-152	258 46.1 - 4	29.0	341 12.0	22 1.0
20	298 20.1	152	0 24.7	-153	288 51.6 - 4	28.8	11 16.8	22 1.0
22	327 28.5	151	0 55.2	-153	318 57.1 - 4	28.5	41 21.7	22 1.0
Δ					28	1	24	0

SUNCE				MESEC			
UT	e = T <sub>p</sub> - UT	Δ/24	r	Prolaz	Δ/24	π <sub>☉</sub>	r
h	min s	' / "	' / "	h min	min	' / "	' / "
00	- 6 5.9	.8	16.1	T <sub>m</sub>	...	1.0	55.8 15.2
12	- 5 56.7	T <sub>m☉</sub>	12 h 5.9 min	Starost	14.6 d	Faza	☉

PLANETE									
Pl.	T <sub>m</sub>	π	360-α	Vel.	Pl.	T <sub>m</sub>	π	360-α	Vel.
♀	h min	' / "	°	' / "	♃	h min	' / "	°	' / "
♂	12 3	.1	357	-3.8	♃	0 48	.0	165	-2.3
♄	8 12	.1	54	1.0	♄</				

UT	SUNCE		PROLEĆ. TAČKA S <sub>γ</sub>	VENERA		MARS	
	S <sub>☉</sub>	δ <sub>☉</sub>		S <sub>♀</sub>	δ <sub>♀</sub>	S <sub>♂</sub>	δ <sub>♂</sub>
h	° / ' / "	° / ' / "	° / ' / "	° / ' / "	° / ' / "	° / ' / "	° / ' / "
0	178 33.1	2 9.5	183 32.1	179 12.4	0 22.5	237 10.8	-20 16.5
2	208 33.4	2 11.4	213 37.1	209 11.6	0 25.0	267 12.0	-20 15.7
4	238 33.8	2 13.4	243 42.0	239 10.9	0 27.5	297 13.1	-20 14.9
6	268 34.2	2 15.3	273 46.9	269 10.1	0 30.0	327 14.3	-20 14.2
8	298 34.6	2 17.3	303 51.9	299 9.4	0 32.5	357 15.5	-20 13.4
10	328 35.0	2 19.3	333 56.8	329 8.6	0 35.0	27 16.6	-20 12.6
12	358 35.3	2 21.2	4 1.7	359 7.9	0 37.6	57 17.8	-20 11.8
14	28 35.7	2 23.2	34 6.6	29 7.1	0 40.1	87 19.0	-20 11.1
16	58 36.1	2 25.1	64 11.6	59 6.4	0 42.6	117 20.1	-20 10.3
18	88 36.5	2 27.1	94 16.5	89 5.6	0 45.1	147 21.3	-20 9.5
20	118 36.9	2 29.1	124 21.4	119 4.9	0 47.6	177 22.5	-20 8.7
22	148 37.2	2 31.0	154 26.4	149 4.1	0 50.1	207 23.6	-20 7.9
Δ	2	10		-4	13	6	4

φ	SUNCE		TRAJANJE SUMRAKA		MESEC			
	IZLAZ	ZALAZ	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 29	0 42	2 32	19 33	3.9	6 3	.0
55	5 47	18 25	0 37	2 8	19 25	3.5	6 6	.3
50	5 50	18 22	0 33	1 52	19 18	3.2	6 9	.5
45	5 52	18 20	0 29	1 40	19 13	3.0	6 12	.8
40	5 54	18 18	0 27	1 32	19 9	2.8	6 14	.9
35	5 55	18 17	0 25	1 25	19 5	2.7	6 15	1.1
30	5 57	18 15	0 24	1 20	19 2	2.5	6 17	1.2
20	5 59	18 13	0 22	1 14	18 56	2.3	6 20	1.4
10	6 1	18 11	0 21	1 10	18 51	2.1	6 22	1.6
0	6 2	18 9	0 21	1 9	18 47	1.9	6 24	1.8
10	6 4	18 7	0 21	1 10	18 42	1.7	6 26	2.0
20	6 5	18 6	0 22	1 13	18 38	1.5	6 29	2.2
30	6 7	18 4	0 24	1 19	18 32	1.3	6 32	2.5
35	6 8	18 3	0 25	1 24	18 29	1.1	6 33	2.6
40	6 9	18 2	0 27	1 30	18 26	1.0	6 35	2.8
45	6 10	18 0	0 29	1 38	18 22	.8	6 37	2.9
50	6 11	17 59	0 32	1 48	18 17	.6	6 39	3.2
55	6 13	17 57	0 36	2 2	18 11	.3	6 43	3.4
60	6 15	17 55	0 41	2 22	18 4	.0	6 47	3.8
S								

UT	MESEC				JUPITER		SATURN	
	S <sub>♃</sub>	Δ	δ <sub>♃</sub>	Δ	S <sub>♃</sub>	δ <sub>♃</sub>	S <sub>♄</sub>	δ <sub>♄</sub>
h	° / ' / "	° / ' / "	° / ' / "	° / ' / "	° / ' / "	° / ' / "	° / ' / "	° / ' / "
0	356 36.7	151 - 1	25.7 -153	349 2.6 - 4	28.3	71 26.6	22 1.0	
2	25 44.9	150 - 1	56.3 -153	19 8.1 - 4	28.1	101 31.5	22 1.0	
4	54 52.9	149 - 2	26.9 -153	49 13.6 - 4	27.8	131 36.4	22 1.0	
6	84 .8	149 - 2	57.5 -153	79 19.1 - 4	27.6	161 41.3	22 1.0	
8	113 8.5	148 - 3	28.0 -153	109 24.6 - 4	27.3	191 46.2	22 1.0	
10	142 16.1	147 - 3	58.6 -153	139 30.1 - 4	27.1	221 51.1	22 1.0	
12	171 23.6	146 - 4	29.2 -153	169 35.6 - 4	26.8	251 55.9	22 1.0	
14	200 30.9	146 - 4	59.7 -152	199 41.2 - 4	26.6	282 .8	22 1.0	
16	229 38.0	145 - 5	30.2 -152	229 46.7 - 4	26.3	312 5.7	22 1.0	
18	258 44.9	144 - 6	.7 -152	259 52.2 - 4	26.1	342 10.6	22 1.0	
20	287 51.6	143 - 6	31.1 -152	289 57.7 - 4	25.8	12 15.5	22 1.0	
22	316 58.1	142 - 7	1.4 -151	320 3.2 - 4	25.6	42 20.4	22 1.0	
Δ				28	1	24	0	

SUNCE				MESEC					
UT	e = T <sub>p</sub> - UT	Δ/24	r	Prolaz	Δ/24	π <sub>☾</sub>	r		
h	min s	s	'	h min	min	'	'		
00	- 5 47.6	.8	16.1	T <sub>m</sub>	0 14	1.8	56.3 15.3		
12	- 5 38.5	T <sub>m☉</sub>	12 h 5.6 min	Starost	15.6 d	Faza	☉		
PLANETE									
Pl.	T <sub>m</sub>	π	360-α	Vel.	Pl.	T <sub>m</sub>	π	360-α	Vel.
♀	h min	'	°	°	♀	h min	'	°	°
♂	12 3	.1	356	-3.8	♃	0 44	.0	166	-2.3
	8 11	.1	54	1.0	♄	19 11	.0	248	.0

UT	SUNCE		PROLEĆ. TAČKA S <sub>γ</sub>	VENERA		MARS	
	S <sub>☉</sub>	δ <sub>☉</sub>		S <sub>♀</sub>	δ <sub>♀</sub>	S <sub>♂</sub>	δ <sub>♂</sub>
h	° / ' / "	° / ' / "	° / ' / "	° / ' / "	° / ' / "	° / ' / "	° / ' / "
0	178 37.6	2 33.0	184 31.3	179 3.4	0 52.7	237 24.8	-20 7.1
2	208 38.0	2 34.9	214 36.2	209 2.6	0 55.2	267 26.0	-20 6.3
4	238 38.4	2 36.9	244 41.1	239 1.8	0 57.7	297 27.1	-20 5.6
6	268 38.8	2 38.8	274 46.1	269 1.1	1 .2	327 28.3	-20 4.8
8	298 39.1	2 40.8	304 51.0	299 .3	1 2.7	357 29.5	-20 4.0
10	328 39.5	2 42.8	334 55.9	328 59.6	1 5.2	27 30.6	-20 3.2
12	358 39.9	2 44.7	5 .9	358 58.8	1 7.8	57 31.8	-20 2.4
14	28 40.3	2 46.7	35 5.8	28 58.1	1 10.3	87 33.0	-20 1.6
16	58 40.7	2 48.6	65 10.7	58 57.3	1 12.8	117 34.1	-20 .8
18	88 41.0	2 50.6	95 15.6	88 56.6	1 15.3	147 35.3	-19 60.0
20	118 41.4	2 52.5	125 20.6	118 55.8	1 17.8	177 36.5	-19 59.2
22	148 41.8	2 54.5	155 25.5	148 55.1	1 20.3	207 37.7	-19 58.4
Δ	2	10		-4	13	6	4

φ	SUNCE		TRAJANJE SUMRAKA		MESEC			
	IZLAZ	ZALAZ	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 40	18 32	0 42	2 33	21 7	4.2	6 2	.0
55	5 44	18 27	0 37	2 9	20 49	3.7	6 13	.4
50	5 48	18 24	0 33	1 52	20 36	3.4	6 22	.6
45	5 50	18 21	0 30	1 41	20 25	3.1	6 30	.9
40	5 52	18 19	0 27	1 32	20 16	2.9	6 36	1.0
35	5 54	18 17	0 25	1 25	20 9	2.8	6 41	1.2
30	5 55	18 16	0 24	1 20	20 2	2.6	6 46	1.3
20	5 58	18 13	0 22	1 14	19 51	2.4	6 54	1.5
10	6 0	18 11	0 21	1 10	19 41	2.2	7 1	1.8
0	6 2	18 9	0 21	1 9	19 32	2.0	7 8	1.9
10	6 4	18 7	0 21	1 10	19 23	1.8	7 15	2.1
20	6 6	18 5	0 22	1 13	19 13	1.6	7 22	2.3
30	6 8	18 3	0 24	1 19	19 2	1.4	7 31	2.6
35	6 9	18 1	0 25	1 24	18 56	1.3	7 36	2.7
40	6 10	18 0	0 27	1 30	18 49	1.1	7 41	2.9
45	6 11	17 59	0 29	1 38	18 41	.9	7 48	3.1
50	6 13	17 57	0 32	1 48	18 31	.7	7 55	3.3
55	6 15	17 55	0 36	2 2	18 19	.4	8 5	3.6
60	6 17	17 52	0 41	2 21	18 3	.0	8 18	4.0
S								

UT	MESEC				JUPITER		SATURN	
	S <sub>♃</sub>	Δ	δ <sub>♃</sub>	Δ	S <sub>♃</sub>	δ <sub>♃</sub>	S <sub>♄</sub>	δ <sub>♄</sub>
h	° / ' / "	° / ' / "	° / ' / "	° / ' / "	° / ' / "	° / ' / "	° / ' / "	° / ' / "
0	346 4.4	140 - 7	31.6 -151	350 8.7 - 4	25.3	72 25.2	22 1.0	
2	15 10.5	139 - 8	1.8 -150	20 14.2 - 4	25.1	102 30.1	22 1.0	
4	44 16.4	138 - 8	31.9 -150	50 19.7 - 4	24.9	132 35.0	22 1.0	
6	73 22.0	137 - 9	1.8 -149	80 25.2 - 4	24.6	162 39.9	22 1.0	
8	102 27.3	136 - 9	31.7 -149	110 30.7 - 4	24.4	192 44.7	22 1.0	
10	131 32.5	134 -10	1.4 -148	140 36.2 - 4	24.1	222 49.6	22 1.0	
12	160 37.3	133 -10	31.0 -147	170 41.7 - 4	23.9	252 54.5	22 1.0	
14	189 41.9	131 -11	.4 -146	200 47.3 - 4	23.6	282 59.4	22 1.0	
16	218 46.2	130 -11	29.7 -146	230 52.8 - 4	23.4	313 4.2	22 1.0	
18	247 50.2	128 -11	58.8 -145	260 58.3 - 4	23.1	343 9.1	22 1.0	
20	276 53.8	127 -12	27.7 -144	291 3.8 - 4	22.9	13 14.0	22 1.0	
22	305 57.2	125 -12	56.4 -143	321 9.3 - 4	22.6	43 18.9	22 1.0	
Δ				28	1	24	0	

SUNCE				MESEC					
UT	e = T <sub>p</sub> - UT	Δ/24	r	Prolaz	Δ/24	π <sub>☾</sub>	r		
h	min s	s	'	h min	min	'	'		
00	- 5 29.3	.8	16.1	T <sub>m</sub>	0 57	1.9	56.8 15.5		
12	- 5 20.2	T <sub>m☉</sub>	12 h 5.3 min	Starost	16.6 d	Faza	☉		
PLANETE									
Pl.	T <sub>m</sub>	π	360-α	Vel.	Pl.	T <sub>m</sub>	π	360-α	Vel.
♀	h min	'	°	°	♀	h min	'	°	°
♂	12 4	.1	355	-3.8	♃	0 39	.0	166	-2.3
	8 10	.1	53	1.0	♄	19 7	.0	248	.0

UT	SUNCE		PROLEĆ. TAČKA S <sub>γ</sub>	VENERA		MARS	
	S <sub>☉</sub>	δ <sub>☉</sub>		S <sub>♀</sub>	δ <sub>♀</sub>	S <sub>♂</sub>	δ <sub>♂</sub>
h	° / ' / "	° / ' / "	° / ' / "	° / ' / "	° / ' / "	° / ' / "	° / ' / "
0	178 42.2	2 56.4	185 30.4	178 54.3	1 22.9	237 38.8	-19 57.6
2	208 42.6	2 58.4	215 35.4	208 53.6	1 25.4	267 40.0	-19 56.8
4	238 42.9	3 .3	245 40.3	238 52.8	1 27.9	297 41.2	-19 56.0
6	268 43.3	3 2.3	275 45.2	268 52.1	1 30.4	327 42.4	-19 55.2
8	298 43.7	3 4.2	305 50.1	298 51.3	1 32.9	357 43.5	-19 54.4
10	328 44.1	3 6.2	335 55.1	328 50.5	1 35.4	27 44.7	-19 53.6
12	358 44.5	3 8.1	6 .0	358 49.8	1 37.9	57 45.9	-19 52.8
14	28 44.8	3 10.1	36 4.9	28 49.0	1 40.5	87 47.1	-19 51.9
16	58 45.2	3 12.0	66 9.8	58 48.3	1 43.0	117 48.2	-19 51.1
18	88 45.6	3 14.0	96 14.8	88 47.5	1 45.5	147 49.4	-19 50.3
20	118 46.0	3 15.9	126 19.7	118 46.8	1 48.0	177 50.6	-19 49.5
22	148 46.4	3 17.9	156 24.6	148 46.0	1 50.5	207 51.8	-19 48.7
Δ	2	10		-4	13	6	4

φ	SUNCE		TRAJANJE SUMRAKA		MESEC			
	IZLAZ	ZALAZ	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 37	18 34	0 42	2 34	22 47	4.5	6 2	.0
55	5 42	18 29	0 37	2 9	22 18	3.8	6 22	.5
50	5 45	18 26	0 33	1 53	21 57	3.5	6 38	.8
45	5 48	18 23	0 30	1 41	21 40	3.2	6 50	1.0
40	5 51	18 20	0 27	1 32	21 27	3.0	7 1	1.2
35	5 53	18 18	0 25	1 26	21 16	2.9	7 10	1.4
30	5 54	18 16	0 24	1 21	21 6	2.8	7 18	1.5
20	5 57	18 13	0 22	1 14	20 49	2.5	7 31	1.7
10	5 60	18 11	0 21	1 10	20 34	2.4	7 43	1.9
0	6 2	18 8	0 21	1 9	20 20	2.2	7 55	2.1
10	6 4	18 6	0 21	1 10	20 7	2.0	8 6	2.3
20	6 6	18 4	0 22	1 13	19 52	1.8	8 18	2.5
30	6 8	18 1	0 24	1 19	19 36	1.6	8 32	2.7
35	6 10	17 60	0 25	1 24	19 27	1.5	8 41	2.8
40	6 11	17 58	0 27	1 30	19 16	1.4	8 50	3.0
45	6 13	17 57	0 29	1 38	19 3	1.2	9 1	3.2
50	6 14	17 55	0 32	1 48	18 48	.9	9 15	3.4
55	6 17	17 52	0 36	2 2	18 29	.6	9 32	3.8
60	6 20	17 49	0 41	2 21	18 4	.1	9 55	4.3

UT	MESEC				JUPITER		SATURN	
	S <sub>♃</sub>	Δ	δ <sub>♃</sub>	Δ	S <sub>♃</sub>	δ <sub>♃</sub>	S <sub>♄</sub>	δ <sub>♄</sub>
h	° / ' / "	' / "	° / ' / "	' / "	° / ' / "	' / "	° / ' / "	' / "
0	335 .3	124 -13	25.0 -142		351 14.8	-4 22.4	73 23.7	22 1.0
2	4 3.0	122 -13	53.3 -140		21 20.3	-4 22.1	103 28.6	22 1.0
4	33 5.5	120 -14	21.4 -139		51 25.8	-4 21.9	133 33.5	22 1.0
6	62 7.5	119 -14	49.2 -138		81 31.4	-4 21.6	163 38.3	22 1.0
8	91 9.3	117 -15	16.8 -137		111 36.9	-4 21.4	193 43.2	22 1.0
10	120 10.6	115 -15	44.1 -135		141 42.4	-4 21.1	223 48.1	22 1.0
12	149 11.6	113 -16	11.2 -134		171 47.9	-4 20.9	253 52.9	22 1.0
14	178 12.3	111 -16	38.0 -132		201 53.4	-4 20.7	283 57.8	22 1.0
16	207 12.5	109 -17	4.4 -131		231 58.9	-4 20.4	314 2.7	22 1.0
18	236 12.4	107 -17	30.6 -129		262 4.4	-4 20.2	344 7.5	22 1.0
20	265 11.9	105 -17	56.4 -128		292 9.9	-4 19.9	14 12.4	22 1.0
22	294 11.0	104 -18	21.9 -126		322 15.5	-4 19.7	44 17.2	22 1.0
Δ					28	1	24	0

SUNCE				MESEC			
UT	e = T <sub>p</sub> - UT	Δ/24	r	Prolaz	Δ/24	π <sub>☉</sub>	r
h	min s	s / ' / "	' / "	h min	min	' / "	' / "
00	- 5 11.1	.8	16.1	T <sub>m</sub>	1 43	2.1	57.3 15.6
12	- 5 2.0	T <sub>m☉</sub> 12 h 5.0 min		Starost 17.6 d	Faza ☉		

PLANETE									
Pl.	T <sub>m</sub>	π	360-α	Vel.	Pl.	T <sub>m</sub>	π	360-α	Vel.
☉	h min	' / "	°	°	☿	h min	' / "	°	°
♂	12 5	.1	353	-3.8	♃	0 35	.0	166	-2.3
♄	8 9	.1	52	1.0	♄	19 3	.0	248	.0

UT	SUNCE		PROLEĆ. TAČKA S <sub>γ</sub>	VENERA		MARS	
	S <sub>☉</sub>	δ <sub>☉</sub>		S <sub>♀</sub>	δ <sub>♀</sub>	S <sub>♂</sub>	δ <sub>♂</sub>
h	° / ' / "	° / ' / "	° / ' / "	° / ' / "	° / ' / "	° / ' / "	° / ' / "
0	178 46.7	3 19.8	186 29.6	178 45.3	1 53.0	237 52.9	-19 47.9
2	208 47.1	3 21.8	216 34.5	208 44.5	1 55.6	267 54.1	-19 47.0
4	238 47.5	3 23.7	246 39.4	238 43.8	1 58.1	297 55.3	-19 46.2
6	268 47.9	3 25.7	276 44.3	268 43.0	2 .6	327 56.5	-19 45.4
8	298 48.2	3 27.6	306 49.3	298 42.3	2 3.1	357 57.7	-19 44.6
10	328 48.6	3 29.6	336 54.2	328 41.5	2 5.6	27 58.9	-19 43.8
12	358 49.0	3 31.5	6 59.1	358 40.7	2 8.1	58 .0	-19 42.9
14	28 49.4	3 33.5	37 4.1	28 40.0	2 10.6	88 1.2	-19 42.1
16	58 49.8	3 35.4	67 9.0	58 39.2	2 13.1	118 2.4	-19 41.3
18	88 50.1	3 37.4	97 13.9	88 38.5	2 15.7	148 3.6	-19 40.5
20	118 50.5	3 39.3	127 18.8	118 37.7	2 18.2	178 4.8	-19 39.6
22	148 50.9	3 41.2	157 23.8	148 37.0	2 20.7	208 6.0	-19 38.8
Δ	2	10		-4	13	6	4

φ	SUNCE		TRAJANJE SUMRAKA		MESEC			
	IZLAZ	ZALAZ	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 37	0 43	2 36	. . . .	.0	6 2	.1
55	5 39	18 31	0 37	2 10	23 51	3.8	6 34	.7
50	5 43	18 27	0 33	1 53	23 21	3.4	6 57	1.1
45	5 46	18 24	0 30	1 41	22 58	3.2	7 15	1.3
40	5 49	18 21	0 27	1 32	22 40	3.1	7 30	1.5
35	5 51	18 19	0 25	1 26	22 25	2.9	7 42	1.6
30	5 53	18 17	0 24	1 21	22 12	2.8	7 54	1.8
20	5 56	18 13	0 22	1 14	21 50	2.7	8 13	2.0
10	5 59	18 11	0 21	1 10	21 31	2.5	8 29	2.1
0	6 1	18 8	0 21	1 9	21 13	2.4	8 45	2.3
10	6 4	18 5	0 21	1 10	20 55	2.2	9 1	2.4
20	6 6	18 3	0 22	1 13	20 37	2.1	9 18	2.6
30	6 9	18 0	0 24	1 19	20 15	1.9	9 37	2.8
35	6 10	17 59	0 25	1 24	20 3	1.8	9 49	2.9
40	6 12	17 57	0 27	1 30	19 48	1.7	10 2	3.1
45	6 14	17 55	0 29	1 38	19 31	1.5	10 17	3.2
50	6 16	17 53	0 32	1 48	19 11	1.3	10 37	3.5
55	6 19	17 50	0 36	2 1	18 44	1.0	11 2	3.8
60	6 22	17 46	0 41	2 21	18 6	.3	11 38	4.5

UT	MESEC				JUPITER		SATURN	
	S <sub>♃</sub>	Δ	δ <sub>♃</sub>	Δ	S <sub>♃</sub>	δ <sub>♃</sub>	S <sub>♄</sub>	δ <sub>♄</sub>
h	° / ' / "	' / "	° / ' / "	' / "	° / ' / "	' / "	° / ' / "	' / "
0	323 9.7	101 -18	47.1 -124		352 21.0	-4 19.4	74 22.1	22 1.0
2	352 8.0	99 -19	11.8 -122		22 26.5	-4 19.2	104 27.0	22 1.0
4	21 5.9	97 -19	36.3 -120		52 32.0	-4 18.9	134 31.8	22 1.0
6	50 3.3	95 -20	.3 -118		82 37.5	-4 18.7	164 36.7	22 .9
8	79 .4	93 -20	23.9 -116		112 43.0	-4 18.4	194 41.5	22 .9
10	107 57.0	91 -20	47.1 -114		142 48.6	-4 18.2	224 46.4	22 .9
12	136 53.3	89 -21	9.9 -112		172 54.1	-4 17.9	254 51.2	22 .9
14	165 49.1	87 -21	32.2 -109		202 59.6	-4 17.7	284 56.1	22 .9
16	194 44.4	85 -21	54.1 -107		233 5.1	-4 17.4	315 .9	22 .9
18	223 39.4	83 -22	15.5 -105		263 10.6	-4 17.2	345 5.8	22 .9
20	252 33.9	80 -22	36.5 -102		293 16.1	-4 16.9	15 10.7	22 .9
22	281 28.0	78 -22	56.9 -100		323 21.7	-4 16.7	45 15.5	22 .9
Δ					28	1	24	0

SUNCE				MESEC			
UT	e = T <sub>p</sub> - UT	Δ/24	r	Prolaz	Δ/24	π <sub>☉</sub>	r
h	min s	s / ' / "	' / "	h min	min	' / "	' / "
00	- 4 52.9	.8	16.0	T <sub>m</sub>	2 33	2.2	57.8 15.7
12	- 4 43.8	T <sub>m☉</sub> 12 h 4.7 min		Starost 18.6 d	Faza ☉		

PLANETE									
Pl.	T <sub>m</sub>	π	360-α	Vel.	Pl.	T <sub>m</sub>	π	360-α	Vel.
☉	h min	' / "	°	°	☿	h min	' / "	°	°
♂	12 5	.1	352	-3.8	♃	0 31	.0	166	-2.3
♄									



UT	SUNCE		PROLEĆ. TAČKA S <sub>γ</sub>	VENERA		MARS	
	S <sub>☉</sub>	δ <sub>☉</sub>		S <sub>♀</sub>	δ <sub>♀</sub>	S <sub>♂</sub>	δ <sub>♂</sub>
h	° / ' / "	° / ' / "	° / ' / "	° / ' / "	° / ' / "	° / ' / "	° / ' / "
0	178 51.3	3 43.2	187 28.7	178 36.2	2 23.2	238 7.1	-19 38.0
2	208 51.6	3 45.1	217 33.6	208 35.4	2 25.7	268 8.3	-19 37.1
4	238 52.0	3 47.1	247 38.6	238 34.7	2 28.2	298 9.5	-19 36.3
6	268 52.4	3 49.0	277 43.5	268 33.9	2 30.7	328 10.7	-19 35.5
8	298 52.8	3 51.0	307 48.4	298 33.2	2 33.2	358 11.9	-19 34.6
10	328 53.2	3 52.9	337 53.3	328 32.4	2 35.7	28 13.1	-19 33.8
12	358 53.5	3 54.8	7 58.3	358 31.7	2 38.2	58 14.3	-19 32.9
14	28 53.9	3 56.8	38 3.2	28 30.9	2 40.8	88 15.5	-19 32.1
16	58 54.3	3 58.7	68 8.1	58 30.1	2 43.3	118 16.6	-19 31.3
18	88 54.7	4 .7	98 13.1	88 29.4	2 45.8	148 17.8	-19 30.4
20	118 55.0	4 2.6	128 18.0	118 28.6	2 48.3	178 19.0	-19 29.6
22	148 55.4	4 4.5	158 22.9	148 27.9	2 50.8	208 20.2	-19 28.7
Δ	2	10		-4	13	6	4

φ	SUNCE		TRAJANJE SUMRAKA		MESEC			
	IZLAZ	ZALAZ	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 31	18 39	0 43	2 37	0 36	4.6	6 6	.4
55	5 37	18 33	0 37	2 11	...	.0	6 52	1.2
50	5 41	18 29	0 33	1 54	...	.0	7 23	1.5
45	5 44	18 25	0 30	1 41	...	.0	7 47	1.7
40	5 47	18 22	0 27	1 33	23 53	2.9	8 6	1.9
35	5 50	18 20	0 25	1 26	23 35	2.8	8 22	2.0
30	5 52	18 18	0 24	1 21	23 20	2.8	8 36	2.1
20	5 55	18 14	0 22	1 14	22 53	2.7	8 60	2.2
10	5 58	18 11	0 21	1 10	22 31	2.6	9 20	2.4
0	6 1	18 8	0 21	1 9	22 10	2.5	9 40	2.5
10	6 4	18 5	0 21	1 10	21 49	2.5	9 59	2.6
20	6 7	18 2	0 22	1 13	21 27	2.4	10 20	2.7
30	6 9	17 59	0 24	1 19	21 1	2.3	10 44	2.8
35	6 11	17 57	0 25	1 24	20 46	2.2	10 59	2.9
40	6 13	17 55	0 27	1 30	20 29	2.1	11 15	3.0
45	6 15	17 53	0 29	1 38	20 8	2.0	11 35	3.1
50	6 18	17 50	0 32	1 48	19 42	1.9	12 0	3.3
55	6 21	17 47	0 36	2 1	19 7	1.6	12 34	3.6
60	6 24	17 43	0 41	2 20	18 13	.9	13 26	4.4

UT	MESEC				JUPITER		SATURN	
	S <sub>♃</sub>	Δ	δ <sub>♃</sub>	Δ	S <sub>♃</sub>	δ <sub>♃</sub>	S <sub>♄</sub>	δ <sub>♄</sub>
h	° / ' / "	° / ' / "	° / ' / "	° / ' / "	° / ' / "	° / ' / "	° / ' / "	° / ' / "
0	310 21.7	76 -23	16.8	-97	353 27.2	-4 16.4	75 20.4	22 .9
2	339 14.9	74 -23	36.2	-94	23 32.7	-4 16.2	105 25.2	22 .9
4	8 7.7	72 -23	55.1	-92	53 38.2	-4 15.9	135 30.1	22 .9
6	37 .1	70 -24	13.5	-89	83 43.7	-4 15.7	165 34.9	22 .9
8	65 52.1	68 -24	31.2	-86	113 49.2	-4 15.4	195 39.7	22 .9
10	94 43.7	66 -24	48.5	-83	143 54.8	-4 15.2	225 44.6	22 .9
12	123 34.9	64 -25	5.1	-80	174 .3	-4 14.9	255 49.4	22 .9
14	152 25.7	62 -25	21.1	-77	204 5.8	-4 14.7	285 54.3	22 .9
16	181 16.1	60 -25	36.5	-74	234 11.3	-4 14.4	315 59.1	22 .9
18	210 6.1	58 -25	51.3	-71	264 16.8	-4 14.2	346 4.0	22 .9
20	238 55.7	56 -26	5.5	-68	294 22.4	-4 13.9	16 8.8	22 .9
22	267 45.0	55 -26	19.0	-64	324 27.9	-4 13.7	46 13.7	22 .9
Δ					28	1	24	0

SUNCE				MESEC			
UT	e = T <sub>p</sub> - UT	Δ/24	r	Prolaz	Δ/24	π <sub>☾</sub>	r
h	min s	s	'	h min	min	'	'
00	- 4 34.7	.8	16.0	T <sub>m</sub>	3 26	2.4	58.2
12	- 4 25.7	T <sub>m☉</sub>	12 h 4.4 min	Starost	19.6 d	Faza	☉

PLANETE									
Pl.	T <sub>m</sub>	π	360-α	Vel.	Pl.	T <sub>m</sub>	π	360-α	Vel.
	h min	'	°			h min	'	°	
♀	12 6	.1	351	-3.8	♃	0 26	.0	166	-2.3
♂	8 7	.1	51	.9	♄	18 56	.0	248	.0

UT	SUNCE		PROLEĆ. TAČKA S <sub>γ</sub>	VENERA		MARS	
	S <sub>☉</sub>	δ <sub>☉</sub>		S <sub>♀</sub>	δ <sub>♀</sub>	S <sub>♂</sub>	δ <sub>♂</sub>
h	° / ' / "	° / ' / "	° / ' / "	° / ' / "	° / ' / "	° / ' / "	° / ' / "
0	178 55.8	4 6.5	188 27.8	178 27.1	2 53.3	238 21.4	-19 27.9
2	208 56.2	4 8.4	218 32.8	208 26.4	2 55.8	268 22.6	-19 27.0
4	238 56.5	4 10.3	248 37.7	238 25.6	2 58.3	298 23.8	-19 26.2
6	268 56.9	4 12.3	278 42.6	268 24.8	3 .8	328 25.0	-19 25.3
8	298 57.3	4 14.2	308 47.6	298 24.1	3 3.3	358 26.2	-19 24.5
10	328 57.7	4 16.1	338 52.5	328 23.3	3 5.8	28 27.4	-19 23.6
12	358 58.0	4 18.1	8 57.4	358 22.6	3 8.3	58 28.6	-19 22.8
14	28 58.4	4 20.0	39 2.3	28 21.8	3 10.8	88 29.8	-19 21.9
16	58 58.8	4 21.9	69 7.3	58 21.0	3 13.3	118 31.0	-19 21.1
18	88 59.2	4 23.9	99 12.2	88 20.3	3 15.8	148 32.2	-19 20.2
20	118 59.5	4 25.8	129 17.1	118 19.5	3 18.4	178 33.4	-19 19.3
22	148 59.9	4 27.7	159 22.0	148 18.7	3 20.9	208 34.5	-19 18.5
Δ	2	10		-4	13	6	4

φ	SUNCE		TRAJANJE SUMRAKA		MESEC			
	IZLAZ	ZALAZ	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 28	18 41	0 43	2 39	2 26	4.0	6 16	1.4
55	5 34	18 35	0 37	2 11	1 22	3.3	7 21	2.0
50	5 39	18 30	0 33	1 54	0 43	3.1	7 60	2.2
45	5 43	18 26	0 30	1 42	0 15	3.0	8 29	2.3
40	5 46	18 23	0 27	1 33	...	.0	8 51	2.4
35	5 48	18 21	0 25	1 26	...	.0	9 10	2.4
30	5 51	18 18	0 24	1 21	...	.0	9 26	2.4
20	5 55	18 14	0 22	1 14	23 58	2.6	9 53	2.5
10	5 58	18 11	0 21	1 10	23 33	2.6	10 17	2.5
0	6 1	18 7	0 21	1 9	23 11	2.6	10 39	2.6
10	6 4	18 4	0 21	1 10	22 48	2.6	11 1	2.6
20	6 7	18 1	0 22	1 13	22 24	2.6	11 24	2.6
30	6 10	17 58	0 24	1 19	21 56	2.6	11 52	2.7
35	6 12	17 56	0 25	1 24	21 39	2.6	12 8	2.7
40	6 14	17 54	0 27	1 30	21 20	2.6	12 27	2.7
45	6 16	17 51	0 29	1 38	20 57	2.6	12 50	2.8
50	6 19	17 48	0 32	1 48	20 27	2.6	13 19	2.8
55	6 22	17 45	0 36	2 1	19 45	2.5	14 0	2.9
60	6 27	17 40	0 41	2 20	18 34	2.4	15 11	3.1

UT	MESEC				JUPITER		SATURN	
	S <sub>♃</sub>	Δ	δ <sub>♃</sub>	Δ	S <sub>♃</sub>	δ <sub>♃</sub>	S <sub>♄</sub>	δ <sub>♄</sub>
h	° / ' / "	° / ' / "	° / ' / "	° / ' / "	° / ' / "	° / ' / "	° / ' / "	° / ' / "
0	296 33.9	53 -26	31.9	-61	354 33.4	-4 13.4	76 18.5	22 .9
2	325 22.5	51 -26	44.1	-58	24 38.9	-4 13.2	106 23.3	22 .9
4	354 10.7	50 -26	55.7	-54	54 44.4	-4 13.0	136 28.2	22 .8
6	22 58.6	48 -27	6.5	-51	84 50.0	-4 12.7	166 33.0	22 .8
8	51 46.2	47 -27	16.7	-47	114 55.5	-4 12.5	196 37.8	22 .8
10	80 33.6	45 -27	26.2	-44	145 1.0	-4 12.2	226 42.7	22 .8
12	109 20.6	44 -27	34.9	-40	175 6.5	-4 12.0	256 47.5	22 .8
14	138 7.4	43 -27	42.9	-37	205 12.0	-4 11.7	286 52.4	22 .8
16	166 53.9	41 -27	50.2	-33	235 17.6	-4 11.5	316 57.2	22 .8
18	195 40.2	40 -27	56.8	-29	265 23.1	-4 11.2	347 2.0	22 .8
20	224 26.3	39 -28	2.6	-25	295 28.6	-4 11.0	17 6.8	22 .8
22	253 12.2	39 -28	7.7	-22	325 34.1	-4 10.7	47 11.7	22 .8
Δ					28	1	24	0

SUNCE				MESEC			
UT	e = T <sub>p</sub> - UT	Δ/24	r	Prolaz	Δ/24	π <sub>☾</sub>	r
h	min s	s	'	h min	min	'	'
00	- 4 16.7	.7	16.0	T <sub>m</sub>	4 24	2.6	58.6
12	- 4 7.7	T <sub>m☉</sub>	12 h 4.1 min	Starost	20.6 d	Faza	☉

PLANETE									
Pl.	T <sub>m</sub>	π	360-α	Vel.	Pl.	T <sub>m</sub>	π	360-α	Vel.
	h min	'	°			h min	'	°	
♀	12 6	.1	350	-3.8	♃	0 22	.0	166	-2.3
♂	8 6	.1	50	.9	♄	18 52	.0	248	.0

UT	SUNCE		PROLEĆ. TAČKA S <sub>γ</sub>	VENERA		MARS									
	S <sub>☉</sub>	δ <sub>☉</sub>		S <sub>♀</sub>	δ <sub>♀</sub>	S <sub>♂</sub>	δ <sub>♂</sub>								
h	°	'	°	'	°	'	°	'							
0	179	.3	4	29.7	189	27.0	178	18.0	3	23.4	238	35.7	-19	17.6	
2	209	.6	4	31.6	219	31.9	208	17.2	3	25.9	268	36.9	-19	16.8	
4	239	1.0	4	33.5	249	36.8	238	16.5	3	28.4	298	38.1	-19	15.9	
6	269	1.4	4	35.5	279	41.8	268	15.7	3	30.9	328	39.3	-19	15.0	
8	299	1.8	4	37.4	309	46.7	298	14.9	3	33.4	358	40.5	-19	14.2	
10	329	2.1	4	39.3	339	51.6	328	14.2	3	35.9	28	41.7	-19	13.3	
12	359	2.5	4	41.2	9	56.5	358	13.4	3	38.4	58	42.9	-19	12.4	
14	29	2.9	4	43.2	40	1.5	28	12.6	3	40.9	88	44.1	-19	11.6	
16	59	3.3	4	45.1	70	6.4	58	11.9	3	43.4	118	45.3	-19	10.7	
18	89	3.6	4	47.0	100	11.3	88	11.1	3	45.9	148	46.6	-19	9.8	
20	119	4.0	4	48.9	130	16.3	118	10.3	3	48.4	178	47.8	-19	8.9	
22	149	4.4	4	50.9	160	21.2	148	9.6	3	50.9	208	49.0	-19	8.1	
Δ		2		10				-4		12		6			4

φ	SUNCE		TRAJANJE SUMRAKA		MESEC			
	IZLAZ	ZALAZ	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 44	0 43	2 40	4 2	2.1	6 49	3.4
55	5 32	18 37	0 37	2 12	2 41	2.4	8 9	3.0
50	5 37	18 32	0 33	1 54	1 58	2.5	8 53	2.9
45	5 41	18 28	0 30	1 42	1 27	2.5	9 24	2.9
40	5 44	18 24	0 27	1 33	1 3	2.5	9 48	2.8
35	5 47	18 21	0 26	1 26	0 43	2.6	10 8	2.8
30	5 49	18 19	0 24	1 21	0 26	2.6	10 25	2.7
20	5 54	18 14	0 22	1 14	...	...	10 53	2.7
10	5 57	18 11	0 21	1 10	...	...	11 18	2.6
0	6 1	18 7	0 21	1 9	...	...	11 41	2.6
10	6 4	18 4	0 21	1 10	23 51	2.6	12 3	2.6
20	6 7	18 0	0 22	1 13	23 27	2.7	12 28	2.5
30	6 11	17 57	0 24	1 19	22 58	2.8	12 56	2.4
35	6 13	17 54	0 25	1 24	22 42	2.9	13 13	2.4
40	6 15	17 52	0 27	1 30	22 22	3.0	13 33	2.3
45	6 18	17 49	0 29	1 37	21 59	3.1	13 56	2.3
50	6 21	17 46	0 32	1 48	21 28	3.2	14 27	2.1
55	6 24	17 42	0 36	2 1	20 46	3.4	15 10	1.9
60	6 29	17 37	0 41	2 20	19 31	4.1	16 25	1.3

UT	MESEC				JUPITER		SATURN								
	S <sub>♃</sub>	Δ	δ <sub>♃</sub>	Δ	S <sub>♃</sub>	δ <sub>♃</sub>	S <sub>♄</sub>	δ <sub>♄</sub>							
h	°	'	°	'	°	'	°	'							
0	281	57.9	38	-28	12.0	-18	355	39.6	-4	10.5	77	16.5	22	.8	
2	310	43.4	37	-28	15.6	-14	25	45.2	-4	10.2	107	21.3	22	.8	
4	339	28.8	36	-28	18.4	-10	55	50.7	-4	10.0	137	26.2	22	.8	
6	8	14.1	36	-28	20.4	-6	85	56.2	-4	9.7	167	31.0	22	.8	
8	36	59.3	36	-28	21.7	-2	116	1.7	-4	9.5	197	35.8	22	.8	
10	65	44.4	35	-28	22.2	1	146	7.2	-4	9.2	227	40.7	22	.8	
12	94	29.5	35	-28	21.9	5	176	12.8	-4	9.0	257	45.5	22	.7	
14	123	14.5	35	-28	20.9	9	206	18.3	-4	8.7	287	50.3	22	.7	
16	151	59.5	35	-28	19.0	13	236	23.8	-4	8.5	317	55.1	22	.7	
18	180	44.4	35	-28	16.4	17	266	29.3	-4	8.2	347	60.0	22	.7	
20	209	29.4	35	-28	13.0	21	296	34.8	-4	8.0	18	4.8	22	.7	
22	238	14.5	36	-28	8.8	25	326	40.4	-4	7.7	48	9.6	22	.7	
Δ								28		1		24			0

SUNCE				MESEC				
UT	e = T <sub>p</sub> - UT	Δ/24	r	Prolaz	Δ/24	π <sub>☉</sub>	r	
h	min	s	'	h min	min	'	'	
00	- 3 58.7	.7	16.0	T <sub>m</sub>	5 26	2.6	58.9	16.1
12	- 3 49.8	T <sub>m☉</sub>	12 h 3.8 min	Starost	21.6 d	Faza	☉	

PLANETE									
Pl.	T <sub>m</sub>	π	360-α	Vel.	Pl.	T <sub>m</sub>	π	360-α	Vel.
☉	h min	'	°		☿	h min	'	°	
♃	12 7	.1	349	-3.8	♄	0 17	.0	166	-2.3
♅	8 5	.1	49	.9	♁	18 48	.0	248	.0

UT	SUNCE		PROLEĆ. TAČKA S <sub>γ</sub>	VENERA		MARS									
	S <sub>☉</sub>	δ <sub>☉</sub>		S <sub>♀</sub>	δ <sub>♀</sub>	S <sub>♂</sub>	δ <sub>♂</sub>								
h	°	'	°	'	°	'	°	'							
0	179	4.7	4	52.8	190	26.1	178	8.8	3	53.3	238	50.2	-19	7.2	
2	209	5.1	4	54.7	220	31.0	208	8.0	3	55.8	268	51.4	-19	6.3	
4	239	5.5	4	56.6	250	36.0	238	7.3	3	58.3	298	52.6	-19	5.4	
6	269	5.8	4	58.6	280	40.9	268	6.5	4	.8	328	53.8	-19	4.6	
8	299	6.2	5	.5	310	45.8	298	5.7	4	3.3	358	55.0	-19	3.7	
10	329	6.6	5	2.4	340	50.8	328	5.0	4	5.8	28	56.2	-19	2.8	
12	359	6.9	5	4.3	10	55.7	358	4.2	4	8.3	58	57.4	-19	1.9	
14	29	7.3	5	6.2	41	.6	28	3.4	4	10.8	88	58.6	-19	1.0	
16	59	7.7	5	8.2	71	5.5	58	2.7	4	13.3	118	59.8	-19	.2	
18	89	8.1	5	10.1	101	10.5	88	1.9	4	15.8	149	1.0	-18	59.3	
20	119	8.4	5	12.0	131	15.4	118	1.1	4	18.3	179	2.2	-18	58.4	
22	149	8.8	5	13.9	161	20.3	148	.3	4	20.8	209	3.5	-18	57.5	
Δ		2		10				-4		12		6			4

φ	SUNCE		TRAJANJE SUMRAKA		MESEC			
	IZLAZ	ZALAZ	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 46	0 43	2 42	4 52	.7	8 10	4.6
55	5 29	18 39	0 37	2 13	3 39	1.5	9 21	3.8
50	5 35	18 33	0 33	1 55	2 57	1.8	10 3	3.4
45	5 39	18 29	0 30	1 42	2 27	2.0	10 32	3.2
40	5 42	18 25	0 27	1 33	2 4	2.1	10 55	3.1
35	5 46	18 22	0 26	1 26	1 45	2.2	11 14	3.0
30	5 48	18 19	0 24	1 21	1 28	2.3	11 30	2.9
20	5 53	18 15	0 22	1 14	0 60	2.4	11 58	2.8
10	5 57	18 11	0 21	1 10	0 36	2.5	12 21	2.6
0	6 0	18 7	0 21	1 9	0 13	2.6	12 43	2.5
10	6 4	18 3	0 21	1 10	...	...	13 5	2.4
20	6 7	17 59	0 22	1 13	...	...	13 28	2.3
30	6 11	17 55	0 24	1 19	...	...	13 55	2.1
35	6 14	17 53	0 25	1 24	23 51	3.0	14 10	2.0
40	6 16	17 50	0 27	1 30	23 34	3.2	14 29	1.9
45	6 19	17 47	0 29	1 37	23 12	3.3	14 51	1.7
50	6 22	17 44	0 32	1 47	22 45	3.6	15 18	1.5
55	6 26	17 40	0 36	2 1	22 8	3.9	15 56	1.2
60	6 32	17 34	0 41	2 20	21 9	4.7	16 56	.4

UT	MESEC				JUPITER		SATURN								
	S <sub>♃</sub>	Δ	δ <sub>♃</sub>	Δ	S <sub>♃</sub>	δ <sub>♃</sub>	S <sub>♄</sub>	δ <sub>♄</sub>							
h	°	'	°	'	°	'	°	'							
0	266	59.6	36	-28	3.9	29	356	45.9	-4	7.5	78	14.4	22	.7	
2	295	44.8	36	-27	58.2	32	26	51.4	-4	7.2	108	19.2	22	.7	
4	324	30.1	37	-27	51.7	36	56	56.9	-4	7.0	138	24.1	22	.7	
6	353	15.5	38	-27	44.4	40	87	2.5	-4	6.7	168	28.9	22	.7	
8	22	1.0	38	-27	36.4	44	117	8.0	-4	6.5	198	33.7	22	.7	
10	50	46.7	39	-27	27.7	48	147	13.5	-4	6.2	228	38.5	22	.7	
12	79	32.6	40	-27	18.1	51	177	19.0	-4	6.0	258	43.3	22	.6	
14	108	18.6	41	-27	7.9	55	207	24.5	-4	5.7	288	48.1	22	.6	
16	137	4.9	42	-26	56.9	59	237	30.1	-4	5.5	318	53.0	22	.6	
18	165	51.3	44	-26	45.1	62	267	35.6	-4	5.2	348	57.8	22	.6	
20	194	38.0	45	-26	32.7	66	297	41.1	-4	5.0	19	2.6	22	.6	
22	223	25.0	46	-26	19.5	69	327	46.6	-4	4.7	49	7.4	22	.6	
Δ								28		1		24			0

SUNCE				MESEC				
UT	e = T <sub>p</sub> - UT	Δ/24	r	Prolaz	Δ/24	π <sub>☉</sub>	r	
h	min	s	'	h min	min	'	'	
00	- 3 40.9	.7	16.0	T <sub>m</sub>	6 28	2.5	59.2	16.1
12	- 3 32.0	T <sub>m☉</sub>	12 h 3.5 min	Starost	22.6 d	Faza	☉	

PLANETE									
Pl.	T <sub>m</sub>	π	360-α	Vel.	Pl.	T <sub>m</sub>	π	360-α	Vel.
☉	h min	'	°		☿				

UT	SUNCE		PROLEĆ. TAČKA S <sub>γ</sub>	VENERA		MARS	
	S <sub>☉</sub>	δ <sub>☉</sub>		S <sub>♀</sub>	δ <sub>♀</sub>	S <sub>♂</sub>	δ <sub>♂</sub>
h	° / ' / "	° / ' / "	° / ' / "	° / ' / "	° / ' / "	° / ' / "	° / ' / "
0	179 9.2	5 15.8	191 25.3	177 59.6	4 23.3	239 4.7	-18 56.6
2	209 9.5	5 17.7	221 30.2	207 58.8	4 25.8	269 5.9	-18 55.7
4	239 9.9	5 19.7	251 35.1	237 58.0	4 28.2	299 7.1	-18 54.8
6	269 10.3	5 21.6	281 40.0	267 57.2	4 30.7	329 8.3	-18 53.9
8	299 10.6	5 23.5	311 45.0	297 56.5	4 33.2	359 9.5	-18 53.0
10	329 11.0	5 25.4	341 49.9	327 55.7	4 35.7	29 10.7	-18 52.1
12	359 11.4	5 27.3	11 54.8	357 54.9	4 38.2	59 11.9	-18 51.2
14	29 11.7	5 29.2	41 59.8	27 54.1	4 40.7	89 13.2	-18 50.3
16	59 12.1	5 31.1	72 4.7	57 53.4	4 43.2	119 14.4	-18 49.4
18	89 12.4	5 33.1	102 9.6	87 52.6	4 45.6	149 15.6	-18 48.5
20	119 12.8	5 35.0	132 14.5	117 51.8	4 48.1	179 16.8	-18 47.6
22	149 13.2	5 36.9	162 19.5	147 51.0	4 50.6	209 18.0	-18 46.7
Δ	2	10		-4	12	6	4

φ	SUNCE		TRAJANJE SUMRAKA		MESEC			
	IZLAZ	ZALAZ	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 19	18 49	0 43	2 43	5 9	.2	10 1	4.8
55	5 27	18 41	0 37	2 14	4 16	.9	10 52	4.0
50	5 32	18 35	0 33	1 55	3 41	1.3	11 25	3.7
45	5 37	18 30	0 30	1 43	3 15	1.5	11 50	3.4
40	5 41	18 26	0 27	1 34	2 55	1.7	12 10	3.2
35	5 44	18 23	0 26	1 27	2 37	1.8	12 26	3.1
30	5 47	18 20	0 24	1 21	2 23	2.0	12 40	2.9
20	5 52	18 15	0 22	1 14	1 57	2.1	13 4	2.7
10	5 56	18 10	0 21	1 10	1 35	2.3	13 24	2.5
0	5 60	18 7	0 21	1 9	1 15	2.4	13 43	2.4
10	6 4	18 3	0 21	1 10	0 54	2.6	14 2	2.2
20	6 8	17 59	0 22	1 13	0 32	2.7	14 22	2.0
30	6 12	17 54	0 24	1 19	0 7	2.9	14 45	1.8
35	6 14	17 52	0 25	1 24	...	.0	14 59	1.7
40	6 17	17 49	0 27	1 30	...	.0	15 14	1.5
45	6 20	17 46	0 29	1 37	...	.0	15 32	1.3
50	6 24	17 42	0 32	1 47	...	.0	15 55	1.1
55	6 28	17 37	0 36	2 1	23 43	4.0	16 24	.7
60	6 34	17 31	0 41	2 19	23 2	4.6	17 7	.2
S								

UT	MESEC				JUPITER		SATURN	
	S <sub>♃</sub>	Δ	δ <sub>♃</sub>	Δ	S <sub>♃</sub>	δ <sub>♃</sub>	S <sub>♄</sub>	δ <sub>♄</sub>
h	° / ' / "	° / ' / "	° / ' / "	° / ' / "	° / ' / "	° / ' / "	° / ' / "	° / ' / "
0	252 12.2	47 -26	5.6	73	357 52.2	-4 4.5	79 12.2	22 .6
2	280 59.7	49 -25	51.0	76	27 57.7	-4 4.2	109 17.0	22 .6
4	309 47.5	50 -25	35.8	80	58 3.2	-4 4.0	139 21.8	22 .6
6	338 35.6	52 -25	19.8	83	88 8.7	-4 3.7	169 26.6	22 .6
8	7 24.0	54 -25	3.2	86	118 14.3	-4 3.5	199 31.4	22 .6
10	36 12.7	55 -24	45.9	90	148 19.8	-4 3.2	229 36.3	22 .5
12	65 1.7	57 -24	28.0	93	178 25.3	-4 3.0	259 41.1	22 .5
14	93 51.1	59 -24	9.4	96	208 30.8	-4 2.7	289 45.9	22 .5
16	122 40.8	60 -23	50.2	99	238 36.4	-4 2.5	319 50.7	22 .5
18	151 30.9	62 -23	30.4	102	268 41.9	-4 2.2	349 55.2	22 .5
20	180 21.3	64 -23	10.0	105	298 47.4	-4 2.0	20 .3	22 .5
22	209 12.1	66 -22	49.1	108	328 52.9	-4 1.7	50 5.1	22 .5
Δ					28	1	24	0

SUNCE				MESEC					
UT	e = T <sub>p</sub> - UT	Δ/24	r	Prolaz	Δ/24	π <sub>☾</sub>	r		
h	min s	s	'	h min	min	'	'		
00	- 3 23.2	.7	16.0	T <sub>m</sub>	7 29	2.4	59.4	16.2	
12	- 3 14.4	T <sub>m☉</sub>	12 h 3,2 min	Starost	23.6 d	Faza	☉		
PLANETE									
Pl.	T <sub>m</sub>	π	360-α	Vel.	Pl.	T <sub>m</sub>	π	360-α	Vel.
♀	h min	'	°	°	♀	h min	'	°	°
♂	12 8	.1	347	-3.8	♃	0 8	.0	166	-2.3
♄	8 3	.1	48	.9	♄	18 40	.0	248	.0

UT	SUNCE		PROLEĆ. TAČKA S <sub>γ</sub>	VENERA		MARS	
	S <sub>☉</sub>	δ <sub>☉</sub>		S <sub>♀</sub>	δ <sub>♀</sub>	S <sub>♂</sub>	δ <sub>♂</sub>
h	° / ' / "	° / ' / "	° / ' / "	° / ' / "	° / ' / "	° / ' / "	° / ' / "
0	179 13.5	5 38.8	192 24.4	177 50.3	4 53.1	239 19.2	-18 45.8
2	209 13.9	5 40.7	222 29.3	207 49.5	4 55.6	269 20.5	-18 44.9
4	239 14.3	5 42.6	252 34.3	237 48.7	4 58.1	299 21.7	-18 44.0
6	269 14.6	5 44.5	282 39.2	267 47.9	5 .5	329 22.9	-18 43.1
8	299 15.0	5 46.4	312 44.1	297 47.1	5 3.0	359 24.1	-18 42.2
10	329 15.4	5 48.3	342 49.0	327 46.4	5 5.5	29 25.3	-18 41.3
12	359 15.7	5 50.2	12 54.0	357 45.6	5 8.0	59 26.6	-18 40.4
14	29 16.1	5 52.1	42 58.9	27 44.8	5 10.4	89 27.8	-18 39.5
16	59 16.4	5 54.0	73 3.8	57 44.0	5 12.9	119 29.0	-18 38.6
18	89 16.8	5 55.9	103 8.7	87 43.2	5 15.4	149 30.2	-18 37.6
20	119 17.2	5 57.8	133 13.7	117 42.4	5 17.9	179 31.5	-18 36.7
22	149 17.5	5 59.7	163 18.6	147 41.6	5 20.3	209 32.7	-18 35.8
Δ	2	10		-4	12	6	5

φ	SUNCE		TRAJANJE SUMRAKA		MESEC			
	IZLAZ	ZALAZ	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 16	18 51	0 44	2 45	5 14	.1	11 55	4.6
55	5 24	18 43	0 37	2 15	4 38	.6	12 29	4.0
50	5 30	18 37	0 33	1 56	4 12	.9	12 53	3.6
45	5 35	18 32	0 30	1 43	3 52	1.2	13 12	3.4
40	5 39	18 27	0 27	1 34	3 35	1.4	13 27	3.2
35	5 43	18 24	0 26	1 27	3 22	1.5	13 39	3.0
30	5 46	18 21	0 24	1 21	3 9	1.7	13 50	2.9
20	5 51	18 15	0 22	1 14	2 49	1.9	14 9	2.6
10	5 56	18 10	0 21	1 10	2 31	2.1	14 25	2.4
0	5 60	18 6	0 21	1 9	2 14	2.3	14 40	2.2
10	6 4	18 2	0 21	1 10	1 56	2.5	14 55	2.0
20	6 8	17 58	0 22	1 13	1 38	2.7	15 11	1.8
30	6 12	17 53	0 24	1 19	1 17	2.9	15 29	1.6
35	6 15	17 50	0 25	1 24	1 5	3.0	15 39	1.4
40	6 18	17 47	0 27	1 30	0 50	3.2	15 51	1.3
45	6 21	17 44	0 29	1 37	0 33	3.4	16 4	1.1
50	6 25	17 40	0 32	1 47	0 12	3.7	16 21	.8
55	6 30	17 35	0 36	2 1	...	.0	16 42	.5
60	6 36	17 28	0 42	2 19	...	.0	17 11	.0
S								

UT	MESEC				JUPITER		SATURN	
	S <sub>♃</sub>	Δ	δ <sub>♃</sub>	Δ	S <sub>♃</sub>	δ <sub>♃</sub>	S <sub>♄</sub>	δ <sub>♄</sub>
h	° / ' / "	° / ' / "	° / ' / "	° / ' / "	° / ' / "	° / ' / "	° / ' / "	° / ' / "
0	238 3.2	68 -22	27.5	111	358 58.4	-4 1.5	80 9.9	22 .5
2	266 54.8	69 -22	5.4	113	29 4.0	-4 1.2	110 14.7	22 .5
4	295 46.6	71 -21	42.7	116	59 9.5	-4 1.0	140 19.5	22 .4
6	324 38.9	73 -21	19.5	119	89 15.0	-4 .7	170 24.3	22 .4
8	353 31.5	75 -20	55.8	121	119 20.5	-4 .5	200 29.1	22 .4
10	22 24.5	77 -20	31.5	124	149 26.1	-4 .2	230 33.9	22 .4
12	51 17.9	79 -20	6.8	126	179 31.6	-3 60.0	260 38.7	22 .4
14	80 11.6	81 -19	41.6	128	209 37.1	-3 59.7	290 43.5	22 .4
16	109 5.7	82 -19	15.9	131	239 42.6	-3 59.5	320 48.3	22 .4
18	138 .2	84 -18	49.7	133	269 48.2	-3 59.3	350 53.1	22 .4
20	166 55.0	86 -18	23.1	135	299 53.7	-3 59.0	20 57.9	22 .4
22	195 50.2	88 -17	56.1	137	329 59.2	-3 58.8	51 2.6	22 .3
Δ					28	1	24	0

SUNCE				MESEC					
UT	e = T <sub>p</sub> - UT	Δ/24	r	Prolaz	Δ/24	π <sub>☾</sub>	r		
h	min s	s	'	h min	min	'	'		
00	- 3 5.7	.7	16.0	T <sub>m</sub>	8 27	2.3	59.5	16.2	
12	- 2 57.0	T <sub>m☉</sub>	12 h 3.0 min	Starost	24.6 d	Faza	☉		
PLANETE									
Pl.	T <sub>m</sub>	π	360-α	Vel.	Pl.	T <sub>m</sub>	π	360-α	Vel.
♀	h min	'	°	°	♀	h min	'	°	°
♂	12 9	.1	345	-3.8	♃	0 4	.0	167	-2.3
♄	8 2	.1	47	.9	♄	18 36	.0	248	.0

UT	SUNCE		PROLEĆ. TAČKA S <sub>γ</sub>	VENERA		MARS	
	S <sub>☉</sub>	δ <sub>☉</sub>		S <sub>♀</sub>	δ <sub>♀</sub>	S <sub>♂</sub>	δ <sub>♂</sub>
h	° / ' / "	° / ' / "	° / ' / "	° / ' / "	° / ' / "	° / ' / "	° / ' / "
0	179 17.9	6 1.6	193 23.5	177 40.9	5 22.8	239 33.9	-18 34.9
2	209 18.2	6 3.5	223 28.5	207 40.1	5 25.3	269 35.1	-18 34.0
4	239 18.6	6 5.4	253 33.4	237 39.3	5 27.8	299 36.4	-18 33.1
6	269 19.0	6 7.3	283 38.3	267 38.5	5 30.2	329 37.6	-18 32.1
8	299 19.3	6 9.2	313 43.2	297 37.7	5 32.7	359 38.8	-18 31.2
10	329 19.7	6 11.1	343 48.2	327 36.9	5 35.2	29 40.0	-18 30.3
12	359 20.0	6 13.0	13 53.1	357 36.1	5 37.6	59 41.3	-18 29.4
14	29 20.4	6 14.9	43 58.0	27 35.3	5 40.1	89 42.5	-18 28.4
16	59 20.7	6 16.8	74 3.0	57 34.6	5 42.6	119 43.7	-18 27.5
18	89 21.1	6 18.7	104 7.9	87 33.8	5 45.0	149 45.0	-18 26.6
20	119 21.5	6 20.6	134 12.8	117 33.0	5 47.5	179 46.2	-18 25.7
22	149 21.8	6 22.5	164 17.7	147 32.2	5 50.0	209 47.4	-18 24.7
Δ	2	9		-4	12	6	5

φ	SUNCE		TRAJANJE SUMRAKA		MESEC			
	IZLAZ	ZALAZ	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 54	0 44	2 47	5 15	.0	13 45	4.3
55	5 22	18 45	0 38	2 16	4 52	.4	14 5	3.9
50	5 28	18 38	0 33	1 57	4 34	.7	14 21	3.5
45	5 33	18 33	0 30	1 43	4 20	1.0	14 33	3.3
40	5 38	18 28	0 28	1 34	4 8	1.2	14 43	3.1
35	5 41	18 24	0 26	1 27	3 58	1.3	14 51	2.9
30	5 45	18 21	0 24	1 22	3 50	1.5	14 59	2.8
20	5 50	18 15	0 22	1 14	3 34	1.7	15 12	2.5
10	5 55	18 10	0 21	1 10	3 21	1.9	15 23	2.3
0	5 59	18 6	0 21	1 9	3 8	2.1	15 33	2.1
10	6 4	18 2	0 21	1 10	2 56	2.3	15 43	1.9
20	6 8	17 57	0 22	1 13	2 42	2.6	15 54	1.6
30	6 13	17 52	0 24	1 19	2 27	2.8	16 6	1.4
35	6 16	17 49	0 25	1 24	2 17	3.0	16 13	1.3
40	6 19	17 46	0 27	1 30	2 7	3.1	16 21	1.1
45	6 23	17 42	0 29	1 37	1 55	3.3	16 30	.9
50	6 27	17 38	0 32	1 47	1 40	3.6	16 41	.7
55	6 32	17 32	0 36	2 1	1 21	3.9	16 54	.4
60	6 39	17 25	0 42	2 19	0 55	4.4	17 12	.0
S								

UT	MESEC				JUPITER		SATURN	
	S <sub>♃</sub>	Δ	δ <sub>♃</sub>	Δ	S <sub>♃</sub>	δ <sub>♃</sub>	S <sub>♄</sub>	δ <sub>♄</sub>
h	° / ' / "	° / ' / "	° / ' / "	° / ' / "	° / ' / "	° / ' / "	° / ' / "	° / ' / "
0	224 45.8	90 -17	28.7	139	0 4.7	-3 58.5	81 7.4	22 .3
2	253 41.7	91 -17	.9	141	30 10.2	-3 58.3	111 12.2	22 .3
4	282 38.0	93 -16	32.7	143	60 15.8	-3 58.0	141 17.0	22 .3
6	311 34.6	95 -16	4.1	145	90 21.3	-3 57.8	171 21.8	22 .3
8	340 31.5	96 -15	35.2	146	120 26.8	-3 57.5	201 26.6	22 .3
10	9 28.8	98 -15	5.9	148	150 32.3	-3 57.3	231 31.4	22 .3
12	38 26.4	100 -14	36.4	150	180 37.9	-3 57.0	261 36.2	22 .3
14	67 24.3	101 -14	6.4	151	210 43.4	-3 56.8	291 41.0	22 .2
16	96 22.6	103 -13	36.2	152	240 48.9	-3 56.5	321 45.7	22 .2
18	125 21.1	104 -13	5.8	154	270 54.4	-3 56.3	351 50.5	22 .2
20	154 19.9	106 -12	35.0	155	300 60.0	-3 56.0	21 55.3	22 .2
22	183 19.1	107 -12	4.0	156	331 5.5	-3 55.8	52 .1	22 .2
Δ					28	1	24	0

SUNCE				MESEC					
UT	e = T <sub>p</sub> - UT	Δ/24	r	Prolaz	Δ/24	π <sub>♃</sub>	r		
h	min s	s	'	h min	min	'	'		
00	- 2 48.3	.7	16.0	T <sub>m</sub>	9 21	2.1	59.5	16.2	
12	- 2 39.7	T <sub>m☉</sub>	12 h 2.7 min	Starost	25.6 d	Faza	●		
PLANETE									
Pl.	T <sub>m</sub>	π	360-α	Vel.	Pl.	T <sub>m</sub>	π	360-α	Vel.
♀	h min	'	°		♃	h min	'	°	
♂	12 10	.1	344	-3.8	♄	23 55	.0	167	-2.3
	8 1	.1	46	.9	♅	18 33	.0	248	.0

UT	SUNCE		PROLEĆ. TAČKA S <sub>γ</sub>	VENERA		MARS	
	S <sub>☉</sub>	δ <sub>☉</sub>		S <sub>♀</sub>	δ <sub>♀</sub>	S <sub>♂</sub>	δ <sub>♂</sub>
h	° / ' / "	° / ' / "	° / ' / "	° / ' / "	° / ' / "	° / ' / "	° / ' / "
0	179 22.2	6 24.4	194 22.7	177 31.4	5 52.4	239 48.6	-18 23.8
2	209 22.5	6 26.3	224 27.6	207 30.6	5 54.9	269 49.9	-18 22.9
4	239 22.9	6 28.2	254 32.5	237 29.8	5 57.3	299 51.1	-18 21.9
6	269 23.2	6 30.1	284 37.5	267 29.0	5 59.8	329 52.3	-18 21.0
8	299 23.6	6 31.9	314 42.4	297 28.2	6 2.3	359 53.6	-18 20.1
10	329 23.9	6 33.8	344 47.3	327 27.4	6 4.7	29 54.8	-18 19.1
12	359 24.3	6 35.7	14 52.2	357 26.6	6 7.2	59 56.1	-18 18.2
14	29 24.6	6 37.6	44 57.2	27 25.8	6 9.6	89 57.3	-18 17.3
16	59 25.0	6 39.5	75 2.1	57 25.0	6 12.1	119 58.5	-18 16.3
18	89 25.4	6 41.4	105 7.0	87 24.2	6 14.5	149 59.8	-18 15.4
20	119 25.7	6 43.3	135 12.0	117 23.4	6 17.0	180 1.0	-18 14.4
22	149 26.1	6 45.1	165 16.9	147 22.6	6 19.5	210 2.2	-18 13.5
Δ	2	9		-4	12	6	5

φ	SUNCE		TRAJANJE SUMRAKA		MESEC			
	IZLAZ	ZALAZ	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 56	0 44	2 49	5 15	.0	15 28	4.1
55	5 19	18 47	0 38	2 17	5 2	.3	15 38	3.7
50	5 26	18 40	0 33	1 57	4 52	.6	15 46	3.4
45	5 32	18 34	0 30	1 44	4 43	.8	15 52	3.2
40	5 36	18 29	0 28	1 34	4 36	1.0	15 57	3.0
35	5 40	18 25	0 26	1 27	4 30	1.2	16 1	2.8
30	5 43	18 22	0 24	1 22	4 25	1.3	16 5	2.7
20	5 49	18 16	0 22	1 14	4 15	1.6	16 12	2.4
10	5 54	18 10	0 21	1 11	4 7	1.8	16 17	2.2
0	5 59	18 6	0 21	1 9	3 59	2.0	16 23	2.0
10	6 4	18 1	0 21	1 10	3 52	2.2	16 28	1.8
20	6 8	17 56	0 22	1 13	3 43	2.5	16 33	1.6
30	6 14	17 51	0 24	1 19	3 34	2.7	16 39	1.3
35	6 17	17 48	0 25	1 24	3 28	2.9	16 43	1.2
40	6 20	17 44	0 27	1 30	3 22	3.0	16 47	1.0
45	6 24	17 40	0 29	1 37	3 15	3.2	16 51	.8
50	6 28	17 35	0 32	1 47	3 6	3.5	16 57	.6
55	6 34	17 30	0 36	2 1	2 55	3.8	17 3	.3
60	6 41	17 22	0 42	2 19	2 41	4.2	17 12	.0
S								

UT	MESEC				JUPITER		SATURN	
	S <sub>♃</sub>	Δ	δ <sub>♃</sub>	Δ	S <sub>♃</sub>	δ <sub>♃</sub>	S <sub>♄</sub>	δ <sub>♄</sub>
h	° / ' / "	° / ' / "	° / ' / "	° / ' / "	° / ' / "	° / ' / "	° / ' / "	° / ' / "
0	212 18.5	108 -11	32.7	157	1 11.0	-3 55.5	82 4.9	22 .2
2	241 18.1	110 -11	1.2	159	31 16.5	-3 55.3	112 9.7	22 .2
4	270 18.1	111 -10	29.5	160	61 22.0	-3 55.0	142 14.4	22 .1
6	299 18.3	112 -9	57.6	160	91 27.6	-3 54.8	172 19.2	22 .1
8	328 18.7	113 -9	25.5	161	121 33.1	-3 54.5	202 24.0	22 .1
10	357 19.4	115 -8	53.2	162	151 38.6	-3 54.3	232 28.8	22 .1
12	26 20.4	116 -8	20.8	163	181 44.1	-3 54.0	262 33.6	22 .1
14	55 21.5	117 -7	48.2	164	211 49.7	-3 53.8	292 38.3	22 .1
16	84 22.8	118 -7	15.5	164	241 55.2	-3 53.5	322 43.1	22 .1
18	113 24.4	119 -6	42.6	165	272 .7	-3 53.3	352 47.9	22 .0
20	142 26.1	120 -6	9.7	165	302 6.2	-3 53.1	22 52.7	22 .0
22	171 28.1	121 -5	36.6	166	332 11.8	-3 52.8	52 57.4	22 .0
Δ					28	1	24	0

SUNCE				MESEC					
UT	e = T <sub>p</sub> - UT	Δ/24	r	Prolaz	Δ/24	π <sub>♃</sub>	r		
h	min s	s	'	h min	min	'	'		
00	- 2 31.2	.7	16.0	T <sub>m</sub>	10 11	2.0	59.3	16.2	
12	- 2 22.7	T <sub>m☉</sub>	12 h 2.4 min	Starost	26.6 d	Faza	●		
PLANETE									
Pl.	T <sub>m</sub>	π	360-α	Vel.	Pl.	T <sub>m</sub>	π	360-α	Vel.
♀	h min	'	°		♃	h min	'	°	
♂	12 10	.1	343	-3.8	♄	23 51	.0	167	-2.3
	8 0	.1	45	.9	♅	18 29	.0	248	.0

UT	SUNCE		PROLEĆ. TAČKA S <sub>γ</sub>	VENERA		MARS	
	S <sub>☉</sub>	δ <sub>☉</sub>		S <sub>♀</sub>	δ <sub>♀</sub>	S <sub>♂</sub>	δ <sub>♂</sub>
h	° / ' / "	° / ' / "	° / ' / "	° / ' / "	° / ' / "	° / ' / "	° / ' / "
0	179 26.4	6 47.0	195 21.8	177 21.8	6 21.9	240 3.5	-18 12.6
2	209 26.8	6 48.9	225 26.7	207 21.0	6 24.4	270 4.7	-18 11.6
4	239 27.1	6 50.8	255 31.7	237 20.2	6 26.8	300 6.0	-18 10.7
6	269 27.5	6 52.7	285 36.6	267 19.4	6 29.3	330 7.2	-18 9.7
8	299 27.8	6 54.5	315 41.5	297 18.6	6 31.7	0 8.4	-18 8.8
10	329 28.2	6 56.4	345 46.4	327 17.8	6 34.1	30 9.7	-18 7.8
12	359 28.5	6 58.3	15 51.4	357 17.0	6 36.6	60 10.9	-18 6.9
14	29 28.9	7 2.2	45 56.3	27 16.2	6 39.0	90 12.2	-18 5.9
16	59 29.2	7 2.1	76 1.2	57 15.4	6 41.5	120 13.4	-18 5.0
18	89 29.5	7 3.9	106 6.2	87 14.5	6 43.9	150 14.7	-18 4.0
20	119 29.9	7 5.8	136 11.1	117 13.7	6 46.4	180 15.9	-18 3.1
22	149 30.2	7 7.7	166 16.0	147 12.9	6 48.8	210 17.2	-18 2.1
Δ	2	9		-4	12	6	5

φ	SUNCE		TRAJANJE SUMRAKA		MESEC			
	IZLAZ	ZALAZ	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 7	18 59	0 44	2 52	5 15	.0	17 7	4.0
55	5 17	18 49	0 38	2 18	5 10	.3	17 8	3.7
50	5 24	18 41	0 33	1 58	5 6	.6	17 8	3.4
45	5 30	18 35	0 30	1 44	5 3	.8	17 9	3.1
40	5 35	18 30	0 28	1 35	5 1	1.0	17 9	2.9
35	5 39	18 26	0 26	1 27	4 59	1.1	17 9	2.8
30	5 42	18 22	0 24	1 22	4 57	1.3	17 9	2.6
20	5 49	18 16	0 22	1 15	4 53	1.5	17 10	2.4
10	5 54	18 10	0 21	1 11	4 51	1.7	17 10	2.2
0	5 59	18 5	0 21	1 9	4 48	2.0	17 10	1.9
10	6 4	18 0	0 21	1 10	4 45	2.2	17 10	1.7
20	6 9	17 55	0 22	1 13	4 42	2.4	17 11	1.5
30	6 14	17 50	0 24	1 19	4 39	2.6	17 11	1.3
35	6 17	17 46	0 25	1 24	4 37	2.8	17 11	1.1
40	6 21	17 43	0 27	1 30	4 35	3.0	17 11	1.0
45	6 25	17 38	0 29	1 37	4 32	3.2	17 11	.8
50	6 30	17 33	0 32	1 47	4 30	3.4	17 11	.6
55	6 36	17 27	0 36	2 0	4 26	3.7	17 11	.3
60	6 44	17 19	0 42	2 19	4 21	4.1	17 11	.0

UT	MESEC				JUPITER		SATURN		
	S <sub>♃</sub>	Δ	δ <sub>♃</sub>	Δ	S <sub>♃</sub>	δ <sub>♃</sub>	S <sub>♄</sub>	δ <sub>♄</sub>	
h	° / ' / "	° / ' / "	° / ' / "	° / ' / "	° / ' / "	° / ' / "	° / ' / "	° / ' / "	
0	200 30.2	121 - 5	3.5	166	2 17.3	- 3	52.6	83 2.2	22 .0
2	229 32.5	122 - 4	30.3	166	32 22.8	- 3	52.3	113 7.0	21 60.0
4	258 34.9	123 - 3	57.0	167	62 28.3	- 3	52.1	143 11.8	21 60.0
6	287 37.5	124 - 3	23.7	167	92 33.8	- 3	51.8	173 16.5	21 60.0
8	316 40.2	124 - 2	50.4	167	122 39.4	- 3	51.6	203 21.3	21 59.9
10	345 43.0	125 - 2	17.0	167	152 44.9	- 3	51.3	233 26.1	21 59.9
12	14 45.9	125 - 1	43.7	167	182 50.4	- 3	51.1	263 30.8	21 59.9
14	43 49.0	126 - 1	10.3	167	212 55.9	- 3	50.8	293 35.6	21 59.9
16	72 52.1	126 - 0	37.0	167	243 1.4	- 3	50.6	323 40.4	21 59.9
18	101 55.4	127 - 0	3.7	166	273 7.0	- 3	50.3	353 45.1	21 59.9
20	130 58.7	127 - 0	29.6	166	303 12.5	- 3	50.1	23 49.9	21 59.8
22	160 2.1	127 1	2.8	166	333 18.0	- 3	49.8	53 54.7	21 59.8
Δ					28	1		24	0

SUNCE				MESEC				
UT	e = T <sub>p</sub> - UT	Δ/24	r	Prolaz	Δ/24	π <sub>♃</sub>	r	
h	min s	s	'	h min	min	'	'	
00	- 2 14.2	.7	16.0	T <sub>m</sub>	10 59	2.0	59.1	16.1
12	- 2 5.8	T <sub>m☉</sub>	12 h 2.1 min	Starost	27.6 d	Faza	●	

PLANETE									
Pl.	T <sub>m</sub>	π	360-α	Vel.	Pl.	T <sub>m</sub>	π	360-α	Vel.
h	min	'	°	'	h	min	'	°	'
♀	12 11	.1	342	-3.8	♃	23 46	.0	167	-2.3
♂	7 59	.1	45	.9	♄	18 25	.0	248	.0

UT	SUNCE		PROLEĆ. TAČKA S <sub>γ</sub>	VENERA		MARS	
	S <sub>☉</sub>	δ <sub>☉</sub>		S <sub>♀</sub>	δ <sub>♀</sub>	S <sub>♂</sub>	δ <sub>♂</sub>
h	° / ' / "	° / ' / "	° / ' / "	° / ' / "	° / ' / "	° / ' / "	° / ' / "
0	179 30.6	7 9.6	196 20.9	177 12.1	6 51.2	240 18.4	-18 1.1
2	209 30.9	7 11.4	226 25.9	207 11.3	6 53.7	270 19.6	-18 .2
4	239 31.3	7 13.3	256 30.8	237 10.5	6 56.1	300 20.9	-17 59.2
6	269 31.6	7 15.2	286 35.7	267 9.7	6 58.6	330 22.1	-17 58.3
8	299 32.0	7 17.0	316 40.7	297 8.9	7 1.0	0 23.4	-17 57.3
10	329 32.3	7 18.9	346 45.6	327 8.0	7 3.4	30 24.6	-17 56.3
12	359 32.7	7 20.8	16 50.5	357 7.2	7 5.9	60 25.9	-17 55.4
14	29 33.0	7 22.6	46 55.4	27 6.4	7 8.3	90 27.1	-17 54.4
16	59 33.3	7 24.5	77 .4	57 5.6	7 10.7	120 28.4	-17 53.4
18	89 33.7	7 26.4	107 5.3	87 4.8	7 13.2	150 29.6	-17 52.5
20	119 34.0	7 28.2	137 10.2	117 3.9	7 15.6	180 30.9	-17 51.5
22	149 34.4	7 30.1	167 15.2	147 3.1	7 18.0	210 32.2	-17 50.5
Δ	2	9		-4	12	6	5

φ	SUNCE		TRAJANJE SUMRAKA		MESEC			
	IZLAZ	ZALAZ	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 4	19 1	0 45	2 54	5 14	.0	18 44	4.1
55	5 14	18 51	0 38	2 19	5 17	.3	18 36	3.6
50	5 22	18 43	0 33	1 58	5 20	.6	18 29	3.3
45	5 28	18 37	0 30	1 45	5 22	.8	18 24	3.1
40	5 33	18 31	0 28	1 35	5 24	1.0	18 19	2.9
35	5 37	18 27	0 26	1 28	5 26	1.1	18 16	2.8
30	5 41	18 23	0 24	1 22	5 27	1.3	18 12	2.6
20	5 48	18 16	0 22	1 15	5 30	1.5	18 7	2.4
10	5 53	18 10	0 21	1 11	5 32	1.7	18 2	2.2
0	5 59	18 5	0 21	1 9	5 35	1.9	17 57	2.0
10	6 4	17 60	0 21	1 10	5 37	2.1	17 52	1.8
20	6 9	17 54	0 22	1 13	5 40	2.4	17 47	1.5
30	6 15	17 48	0 24	1 19	5 42	2.6	17 41	1.3
35	6 18	17 45	0 25	1 24	5 44	2.8	17 38	1.2
40	6 22	17 41	0 27	1 30	5 46	2.9	17 34	1.0
45	6 26	17 37	0 29	1 37	5 48	3.1	17 30	.8
50	6 32	17 31	0 32	1 47	5 51	3.4	17 25	.6
55	6 38	17 25	0 36	2 0	5 54	3.7	17 19	.3
60	6 46	17 16	0 42	2 19	5 59	4.0	17 10	.0

UT	MESEC				JUPITER		SATURN		
	S <sub>♃</sub>	Δ	δ <sub>♃</sub>	Δ	S <sub>♃</sub>	δ <sub>♃</sub>	S <sub>♄</sub>	δ <sub>♄</sub>	
h	° / ' / "	° / ' / "	° / ' / "	° / ' / "	° / ' / "	° / ' / "	° / ' / "	° / ' / "	
0	189 5.6	128 1	36.0	165	3 23.5	- 3	49.6	83 59.4	21 59.8
2	218 9.1	128 2	9.1	165	33 29.0	- 3	49.4	114 4.2	21 59.8
4	247 12.6	128 2	42.1	164	63 34.6	- 3	49.1	144 9.0	21 59.8
6	276 16.2	128 3	15.0	164	93 40.1	- 3	48.9	174 13.7	21 59.8
8	305 19.8	128 3	47.8	163	123 45.6	- 3	48.6	204 18.5	21 59.7
10	334 23.4	128 4	20.4	163	153 51.1	- 3	48.4	234 23.2	21 59.7
12	3 27.0	128 4	52.9	162	183 56.6	- 3	48.1	264 28.0	21 59.7
14	32 30.7	128 5	25.3	161	214 2.2	- 3	47.9	294 32.8	21 59.7
16	61 34.3	128 5	57.6	160	244 7.7	- 3	47.6	324 37.5	21 59.7
18	90 37.9	128 6	29.6	159	274 13.2	- 3	47.4	354 42.3	21 59.7
20	119 41.4	128 7	1.5	159	304 18.7	- 3	47.1	24 47.0	21 59.6
22	148 45.0	127 7	33.2	158	334 24.2	- 3	46.9	54 51.8	21 59.6
Δ					28	1		24	0

SUNCE				MESEC				
UT	e = T <sub>p</sub> - UT	Δ/24	r	Prolaz	Δ/24	π <sub>♃</sub>	r	
h	min s	s	'	h min	min	'	'	
00	- 1 57.5	.7	16.0	T <sub>m</sub>	11 46	1.9	58.6	16.0
12	- 1 49.2	T <sub>m☉</sub>	12 h 1.8 min	Starost	28.6 d	Faza	●	

PLANETE									
Pl.	T <sub>m</sub>	π	360-α	Vel.	Pl.	T <sub>m</sub>	π	360-α	Vel.
h	min	'	°	'	h	min	'	°	'
♀	12 12	.1	341	-3.8	♃	23 42	.0	167	-2.3
♂	7 58	.1	44	.9	♄	18 21	.0	248	.0

UT	SUNCE		PROLEĆ. TAČKA S <sub>γ</sub>	VENERA		MARS	
	S <sub>☉</sub>	δ <sub>☉</sub>		S <sub>♀</sub>	δ <sub>♀</sub>	S <sub>♂</sub>	δ <sub>♂</sub>
h	° / ' / "	° / ' / "	° / ' / "	° / ' / "	° / ' / "	° / ' / "	° / ' / "
0	179 34.7	7 32.0	197 20.1	177 2.3	7 20.4	240 33.4	-17 49.6
2	209 35.1	7 33.8	227 25.0	207 1.5	7 22.9	270 34.7	-17 48.6
4	239 35.4	7 35.7	257 29.9	237 .6	7 25.3	300 35.9	-17 47.6
6	269 35.7	7 37.5	287 34.9	266 59.8	7 27.7	330 37.2	-17 46.7
8	299 36.1	7 39.4	317 39.8	296 59.0	7 30.1	0 38.4	-17 45.7
10	329 36.4	7 41.3	347 44.7	326 58.2	7 32.6	30 39.7	-17 44.7
12	359 36.7	7 43.1	17 49.7	356 57.3	7 35.0	60 40.9	-17 43.7
14	29 37.1	7 45.0	47 54.6	26 56.5	7 37.4	90 42.2	-17 42.7
16	59 37.4	7 46.8	77 59.5	56 55.7	7 39.8	120 43.5	-17 41.8
18	89 37.8	7 48.7	108 4.4	86 54.9	7 42.2	150 44.7	-17 40.8
20	119 38.1	7 50.5	138 9.4	116 54.0	7 44.6	180 46.0	-17 39.8
22	149 38.4	7 52.4	168 14.3	146 53.2	7 47.1	210 47.2	-17 38.8
Δ	2	9		-4	12	6	5

φ	SUNCE		TRAJANJE SUMRAKA		MESEC			
	IZLAZ	ZALAZ	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 1	19 4	0 45	2 57	5 13	.0	20 21	4.1
55	5 12	18 53	0 38	2 20	5 25	.4	20 3	3.7
50	5 20	18 44	0 34	1 59	5 34	.7	19 49	3.3
45	5 26	18 38	0 30	1 45	5 42	.9	19 39	3.1
40	5 31	18 32	0 28	1 35	5 48	1.1	19 30	2.9
35	5 36	18 28	0 26	1 28	5 53	1.2	19 22	2.8
30	5 40	18 24	0 24	1 22	5 58	1.3	19 15	2.6
20	5 47	18 17	0 22	1 15	6 7	1.6	19 3	2.4
10	5 53	18 10	0 21	1 11	6 14	1.8	18 53	2.2
0	5 58	18 5	0 21	1 9	6 21	2.0	18 44	2.0
10	6 4	17 59	0 21	1 10	6 29	2.2	18 34	1.8
20	6 9	17 54	0 22	1 13	6 36	2.4	18 24	1.6
30	6 15	17 47	0 24	1 19	6 45	2.6	18 13	1.4
35	6 19	17 44	0 25	1 24	6 50	2.8	18 6	1.3
40	6 23	17 39	0 27	1 30	6 56	2.9	17 59	1.1
45	6 28	17 35	0 29	1 37	7 3	3.1	17 50	.9
50	6 33	17 29	0 32	1 47	7 12	3.3	17 40	.7
55	6 40	17 22	0 36	2 0	7 22	3.7	17 27	.4
60	6 48	17 14	0 42	2 19	7 36	4.1	17 10	.0
S								

UT	MESEC				JUPITER		SATURN	
	S <sub>♃</sub>	Δ	δ <sub>♃</sub>	Δ	S <sub>♃</sub>	δ <sub>♃</sub>	S <sub>♄</sub>	δ <sub>♄</sub>
h	° / ' / "	° / ' / "	° / ' / "	° / ' / "	° / ' / "	° / ' / "	° / ' / "	° / ' / "
0	177 48.5	127 8	4 7	156	4 29.8	-3 46.7	84 56.5	21 59.6
2	206 51.9	127 8	36.0	155	34 35.3	-3 46.4	115 1.3	21 59.6
4	235 55.3	127 9	7.1	154	64 40.8	-3 46.2	145 6.0	21 59.6
6	264 58.6	126 9	37.9	153	94 46.3	-3 45.9	175 10.8	21 59.5
8	294 1.9	126 10	8.6	152	124 51.8	-3 45.7	205 15.5	21 59.5
10	323 5.0	125 10	38.9	151	154 57.4	-3 45.4	235 20.3	21 59.5
12	352 8.1	125 11	9.0	149	185 2.9	-3 45.2	265 25.0	21 59.5
14	21 11.1	124 11	38.8	148	215 8.4	-3 44.9	295 29.8	21 59.5
16	50 14.0	124 12	8.4	146	245 13.9	-3 44.7	325 34.5	21 59.5
18	79 16.8	123 12	37.7	145	275 19.4	-3 44.5	355 39.3	21 59.4
20	108 19.4	123 13	6.6	143	305 24.9	-3 44.2	25 44.0	21 59.4
22	137 22.0	122 13	35.3	142	335 30.5	-3 44.0	55 48.8	21 59.4
Δ					28	1	24	0

SUNCE				MESEC			
UT	e = T <sub>p</sub> - UT	Δ/24	r	Prolaz	Δ/24	π <sub>♃</sub>	r
h	min s	s	'	h min	min	'	'
00	- 1 41.0	.7	16.0	T <sub>m</sub>	12 32	2.0	58.1 15.8
12	- 1 32.8	T <sub>m☉</sub>	12 h 1.5 min	Starost	.1 d	Faza	●

PLANETE									
Pl.	T <sub>m</sub>	π	360-α	Vel.	Pl.	T <sub>m</sub>	π	360-α	Vel.
♀	h min	'	°		♃	h min	'	°	
♂	12 12	.1	340	-3.8	♄	23 38	.0	167	-2.3
♂	7 57	.1	43	.8	♂	18 17	.0	248	.0

UT	SUNCE		PROLEĆ. TAČKA S <sub>γ</sub>	VENERA		MARS	
	S <sub>☉</sub>	δ <sub>☉</sub>		S <sub>♀</sub>	δ <sub>♀</sub>	S <sub>♂</sub>	δ <sub>♂</sub>
h	° / ' / "	° / ' / "	° / ' / "	° / ' / "	° / ' / "	° / ' / "	° / ' / "
0	179 38.8	7 54.2	198 19.2	176 52.4	7 49.5	240 48.5	-17 37.8
2	209 39.1	7 56.1	228 24.2	206 51.5	7 51.9	270 49.8	-17 36.9
4	239 39.4	7 57.9	258 29.1	236 50.7	7 54.3	300 51.0	-17 35.9
6	269 39.8	7 59.8	288 34.0	266 49.9	7 56.7	330 52.3	-17 34.9
8	299 40.1	8 1.6	318 38.9	296 49.0	7 59.1	0 53.6	-17 33.9
10	329 40.4	8 3.5	348 43.9	326 48.2	8 1.5	30 54.8	-17 32.9
12	359 40.8	8 5.3	18 48.8	356 47.3	8 3.9	60 56.1	-17 31.9
14	29 41.1	8 7.2	48 53.7	26 46.5	8 6.3	90 57.3	-17 30.9
16	59 41.4	8 9.0	78 58.7	56 45.7	8 8.7	120 58.6	-17 29.9
18	89 41.8	8 10.9	109 3.6	86 44.8	8 11.1	150 59.9	-17 29.0
20	119 42.1	8 12.7	139 8.5	116 44.0	8 13.5	181 1.2	-17 28.0
22	149 42.4	8 14.5	169 13.4	146 43.1	8 15.9	211 2.4	-17 27.0
Δ	2	9		-4	12	6	5

φ	SUNCE		TRAJANJE SUMRAKA		MESEC			
	IZLAZ	ZALAZ	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 58	19 6	0 45	2 60	5 13	.0	22 0	4.2
55	5 9	18 55	0 38	2 21	5 34	.5	21 31	3.6
50	5 18	18 46	0 34	1 60	5 50	.8	21 10	3.3
45	5 24	18 39	0 30	1 46	6 3	1.0	20 53	3.0
40	5 30	18 33	0 28	1 35	6 13	1.2	20 39	2.9
35	5 35	18 28	0 26	1 28	6 23	1.3	20 28	2.7
30	5 39	18 24	0 24	1 22	6 31	1.5	20 18	2.6
20	5 46	18 17	0 22	1 15	6 45	1.7	20 1	2.4
10	5 52	18 10	0 21	1 11	6 57	1.9	19 46	2.2
0	5 58	18 5	0 21	1 9	7 9	2.0	19 32	2.1
10	6 4	17 59	0 21	1 10	7 20	2.2	19 18	1.9
20	6 9	17 53	0 22	1 13	7 33	2.4	19 3	1.7
30	6 16	17 46	0 24	1 20	7 48	2.6	18 46	1.5
35	6 20	17 42	0 25	1 24	7 56	2.7	18 37	1.4
40	6 24	17 38	0 27	1 30	8 6	2.9	18 26	1.3
45	6 29	17 33	0 29	1 37	8 18	3.1	18 13	1.1
50	6 35	17 27	0 32	1 47	8 32	3.3	17 57	.9
55	6 42	17 20	0 36	2 0	8 50	3.6	17 37	.6
60	6 51	17 11	0 42	2 19	9 14	4.2	17 10	.1
S								

UT	MESEC				JUPITER		SATURN	
	S <sub>♃</sub>	Δ	δ <sub>♃</sub>	Δ	S <sub>♃</sub>	δ <sub>♃</sub>	S <sub>♄</sub>	δ <sub>♄</sub>
h	° / ' / "	° / ' / "	° / ' / "	° / ' / "	° / ' / "	° / ' / "	° / ' / "	° / ' / "
0	166 24.4	122 14	3.6	140	5 36.0	-3 43.7	85 53.5	21 59.4
2	195 26.7	121 14	31.6	138	35 41.5	-3 43.5	115 58.3	21 59.4
4	224 28.9	120 14	59.3	137	65 47.0	-3 43.2	146 3.0	21 59.3
6	253 30.9	119 15	26.6	135	95 52.5	-3 43.0	176 7.7	21 59.3
8	282 32.8	119 15	53.6	133	125 58.0	-3 42.8	206 12.5	21 59.3
10	311 34.5	118 16	20.2	131	156 3.6	-3 42.5	236 17.2	21 59.3
12	340 36.1	117 16	46.5	129	186 9.1	-3 42.3	266 22.0	21 59.3
14	9 37.5	116 17	12.4	127	216 14.6	-3 42.0	296 26.7	21 59.2
16	38 38.8	116 17	37.8	125	246 20.1	-3 41.8	326 31.4	21 59.2
18	67 39.9	115 18	2.9	123	276 25.6	-3 41.5	356 36.2	21 59.2
20	96 40.9	114 18	27.6	121	306 31.1	-3 41.3	26 40.9	21 59.2
22	125 41.7	113 18	51.9	119	336 36.6	-3 41.1	56 45.7	21 59.2
Δ					28	1	24	0

SUNCE				MESEC			
UT	e = T <sub>p</sub> - UT	Δ/24	r	Prolaz	Δ/24	π <sub>♃</sub>	r
h	min s	s	'	h min	min	'	'
00	- 1 24.7	.7	16.0	T <sub>m</sub>	13 20	2.1	57.4 15.6
12	- 1 16.7	T <sub>m☉</sub>	12 h 1.3 min	Starost	1.1 d	Faza	●

PLANETE									
Pl.	T <sub>m</sub>	π	360-α	Vel.	Pl.	T <sub>m</sub>	π	360-α	Vel.
♀	h min	'	°		♃	h min	'	°	
♂	12 13	.1	339	-3.8	♄	23 33	.0	167	-2.3
♂	7 56	.1	42	.8	♂	18 14	.0	248	.0

UT	SUNCE		PROLEĆ. TAČKA S <sub>γ</sub>	VENERA		MARS	
	S <sub>☉</sub>	δ <sub>☉</sub>		S <sub>♀</sub>	δ <sub>♀</sub>	S <sub>♂</sub>	δ <sub>♂</sub>
h	° / ' / "	° / ' / "	° / ' / "	° / ' / "	° / ' / "	° / ' / "	° / ' / "
0	179 42.8	8 16.4	199 18.4	176 42.3	8 18.3	241 3.7	-17 26.0
2	209 43.1	8 18.2	229 23.3	206 41.4	8 20.7	271 5.0	-17 25.0
4	239 43.4	8 20.1	259 28.2	236 40.6	8 23.1	301 6.2	-17 24.0
6	269 43.8	8 21.9	289 33.2	266 39.7	8 25.5	331 7.5	-17 23.0
8	299 44.1	8 23.7	319 38.1	296 38.9	8 27.9	1 8.8	-17 22.0
10	329 44.4	8 25.6	349 43.0	326 38.0	8 30.3	31 10.0	-17 21.0
12	359 44.7	8 27.4	19 47.9	356 37.2	8 32.7	61 11.3	-17 20.0
14	29 45.1	8 29.2	49 52.9	26 36.3	8 35.1	91 12.6	-17 19.0
16	59 45.4	8 31.1	79 57.8	56 35.5	8 37.4	121 13.9	-17 18.0
18	89 45.7	8 32.9	110 2.7	86 34.6	8 39.8	151 15.1	-17 17.0
20	119 46.0	8 34.7	140 7.6	116 33.8	8 42.2	181 16.4	-17 16.0
22	149 46.4	8 36.6	170 12.6	146 32.9	8 44.6	211 17.7	-17 15.0
Δ	2	9		-4	12	6	5

φ	SUNCE		TRAJANJE SUMRAKA		MESEC			
	IZLAZ	ZALAZ	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 55	19 8	0 45	3 3	5 14	.1	23 41	4.1
55	5 7	18 57	0 39	2 22	5 46	.7	22 58	3.4
50	5 15	18 48	0 34	2 0	6 9	1.0	22 28	3.1
45	5 22	18 40	0 30	1 46	6 27	1.2	22 6	2.9
40	5 28	18 34	0 28	1 36	6 42	1.4	21 48	2.8
35	5 33	18 29	0 26	1 28	6 55	1.5	21 33	2.6
30	5 38	18 25	0 24	1 23	7 6	1.6	21 20	2.6
20	5 45	18 17	0 22	1 15	7 25	1.8	20 58	2.4
10	5 52	18 10	0 21	1 11	7 42	2.0	20 39	2.3
0	5 58	18 4	0 21	1 9	7 58	2.1	20 22	2.1
10	6 4	17 58	0 21	1 10	8 13	2.3	20 4	2.0
20	6 10	17 52	0 22	1 13	8 31	2.4	19 45	1.9
30	6 17	17 45	0 24	1 20	8 50	2.6	19 24	1.7
35	6 21	17 41	0 25	1 24	9 2	2.7	19 11	1.6
40	6 25	17 36	0 27	1 30	9 16	2.8	18 56	1.5
45	6 30	17 31	0 30	1 37	9 32	3.0	18 39	1.4
50	6 36	17 25	0 33	1 47	9 51	3.2	18 18	1.2
55	6 44	17 17	0 37	2 0	10 17	3.5	17 51	.8
60	6 53	17 8	0 42	2 19	10 54	4.2	17 12	.2
S								

UT	MESEC				JUPITER		SATURN	
	S <sub>♃</sub>	Δ	δ <sub>♃</sub>	Δ	S <sub>♃</sub>	δ <sub>♃</sub>	S <sub>♄</sub>	δ <sub>♄</sub>
h	° / ' / "	° / ' / "	° / ' / "	° / ' / "	° / ' / "	° / ' / "	° / ' / "	° / ' / "
0	154 42.3	112	19 15.7	117	6 42.2	-3 40.8	86 50.4	21 59.1
2	183 42.8	111	19 39.2	115	36 47.7	-3 40.6	116 55.1	21 59.1
4	212 43.0	111	20 2.2	113	66 53.2	-3 40.3	146 59.9	21 59.1
6	241 43.2	110	20 24.7	111	96 58.7	-3 40.1	177 4.6	21 59.1
8	270 43.1	109	20 46.8	108	127 4.2	-3 39.9	207 9.3	21 59.1
10	299 42.9	108	21 8.4	106	157 9.7	-3 39.6	237 14.1	21 59.0
12	328 42.5	107	21 29.6	104	187 15.2	-3 39.4	267 18.8	21 59.0
14	357 41.9	106	21 50.3	101	217 20.7	-3 39.1	297 23.5	21 59.0
16	26 41.1	105	22 10.6	99	247 26.3	-3 38.9	327 28.3	21 59.0
18	55 40.2	105	22 30.3	96	277 31.8	-3 38.6	357 33.0	21 58.9
20	84 39.1	104	22 49.6	94	307 37.3	-3 38.4	27 37.7	21 58.9
22	113 37.9	103	23 8.3	91	337 42.8	-3 38.2	57 42.4	21 58.9
Δ					28	1	24	0

SUNCE				MESEC					
UT	e = T <sub>p</sub> - UT	Δ/24	r	Prolaz	Δ/24	π <sub>♃</sub>	r		
h	min s	s	'	h min	min	'	'		
00	- 1 8.8	.7	16.0	T <sub>m</sub>	14 10	2.1	56.7 15.5		
12	- 1 .9	T <sub>m☉</sub>	12 h 1.0 min	Starost	2.1 d	Faza ●			
PLANETE									
Pl.	T <sub>m</sub>	π	360-α	Vel.	Pl.	T <sub>m</sub>	π	360-α	Vel.
♀	h min	'	°		♃	h min	'	°	
♁	12 14	.1	337	-3.8	♃	23 29	.0	167	-2.3
♂	7 55	.1	42	.8	♄	18 10	.0	248	.0

UT	SUNCE		PROLEĆ. TAČKA S <sub>γ</sub>	VENERA		MARS	
	S <sub>☉</sub>	δ <sub>☉</sub>		S <sub>♀</sub>	δ <sub>♀</sub>	S <sub>♂</sub>	δ <sub>♂</sub>
h	° / ' / "	° / ' / "	° / ' / "	° / ' / "	° / ' / "	° / ' / "	° / ' / "
0	179 46.7	8 38.4	200 17.5	176 32.1	8 47.0	241 19.0	-17 14.0
2	209 47.0	8 40.2	230 22.4	206 31.2	8 49.4	271 20.2	-17 12.9
4	239 47.3	8 42.0	260 27.4	236 30.3	8 51.7	301 21.5	-17 11.9
6	269 47.7	8 43.9	290 32.3	266 29.5	8 54.1	331 22.8	-17 10.9
8	299 48.0	8 45.7	320 37.2	296 28.6	8 56.5	1 24.1	-17 9.9
10	329 48.3	8 47.5	350 42.1	326 27.8	8 58.9	31 25.4	-17 8.9
12	359 48.6	8 49.3	20 47.1	356 26.9	9 1.2	61 26.6	-17 7.9
14	29 48.9	8 51.2	50 52.0	26 26.0	9 3.6	91 27.9	-17 6.9
16	59 49.3	8 53.0	80 56.9	56 25.2	9 6.0	121 29.2	-17 5.9
18	89 49.6	8 54.8	111 1.9	86 24.3	9 8.3	151 30.5	-17 4.8
20	119 49.9	8 56.6	141 6.8	116 23.4	9 10.7	181 31.8	-17 3.8
22	149 50.2	8 58.4	171 11.7	146 22.6	9 13.1	211 33.0	-17 2.8
Δ	2	9		-4	12	6	5

φ	SUNCE		TRAJANJE SUMRAKA		MESEC			
	IZLAZ	ZALAZ	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 11	0 46	3 6	5 18	.4	...	.0
55	5 4	18 59	0 39	2 24	6 3	1.0	...	.0
50	5 13	18 49	0 34	2 1	6 33	1.3	23 43	2.8
45	5 21	18 42	0 30	1 46	6 57	1.5	23 16	2.6
40	5 27	18 35	0 28	1 36	7 15	1.7	22 54	2.5
35	5 32	18 30	0 26	1 29	7 31	1.8	22 37	2.5
30	5 37	18 25	0 24	1 23	7 45	1.8	22 22	2.4
20	5 44	18 17	0 22	1 15	8 9	2.0	21 56	2.3
10	5 51	18 10	0 21	1 11	8 29	2.1	21 34	2.3
0	5 57	18 4	0 21	1 10	8 48	2.2	21 13	2.2
10	6 4	17 58	0 21	1 10	9 8	2.3	20 53	2.1
20	6 10	17 51	0 22	1 13	9 28	2.4	20 31	2.0
30	6 17	17 44	0 24	1 20	9 52	2.5	20 5	1.9
35	6 21	17 40	0 25	1 24	10 7	2.6	19 50	1.9
40	6 26	17 35	0 27	1 30	10 23	2.7	19 33	1.8
45	6 31	17 29	0 30	1 38	10 43	2.8	19 12	1.7
50	6 38	17 23	0 33	1 47	11 8	2.9	18 46	1.6
55	6 46	17 15	0 37	2 1	11 42	3.2	18 11	1.3
60	6 56	17 5	0 42	2 19	12 35	4.0	17 17	.6
S								

UT	MESEC				JUPITER		SATURN	
	S <sub>♃</sub>	Δ	δ <sub>♃</sub>	Δ	S <sub>♃</sub>	δ <sub>♃</sub>	S <sub>♄</sub>	δ <sub>♄</sub>
h	° / ' / "	° / ' / "	° / ' / "	° / ' / "	° / ' / "	° / ' / "	° / ' / "	° / ' / "
0	142 36.5	102	23 26.6	89	7 48.3	-3 37.9	87 47.2	21 58.9
2	171 34.9	101	23 44.4	86	37 53.8	-3 37.7	117 51.9	21 58.9
4	200 33.2	101	24 1.6	84	67 59.3	-3 37.4	147 56.6	21 58.8
6	229 31.3	100	24 18.3	81	98 4.8	-3 37.2	178 1.3	21 58.8
8	258 29.2	99	24 34.6	78	128 10.3	-3 37.0	208 6.1	21 58.8
10	287 27.1	98	24 50.2	76	158 15.8	-3 36.7	238 10.8	21 58.8
12	316 24.7	98	25 5.4	73	188 21.4	-3 36.5	268 15.5	21 58.7
14	345 22.3	97	25 20.0	70	218 26.9	-3 36.3	298 20.2	21 58.7
16	14 19.7	96	25 34.1	68	248 32.4	-3 36.0	328 24.9	21 58.7
18	43 17.0	96	25 47.6	65	278 37.9	-3 35.8	358 29.7	21 58.7
20	72 14.2	95	26 .6	62	308 43.4	-3 35.5	28 34.4	21 58.7
22	101 11.2	95	26 13.0	59	338 48.9	-3 35.3	58 39.1	21 58.6
Δ					28	1	24	0

SUNCE				MESEC					
UT	e = T <sub>p</sub> - UT	Δ/24	r	Prolaz	Δ/24	π <sub>♃</sub>	r		
h	min s	s	'	h min	min	'	'		
00	- 0 53.1	.6	16.0	T <sub>m</sub>	15 1	2.2	56.0 15.3		
12	- 0 45.4	T <sub>m☉</sub>	12 h .8 min	Starost	3.1 d	Faza ●			
PLANETE									
Pl.	T <sub>m</sub>	π	360-α	Vel.	Pl.	T <sub>m</sub>	π	360-α	Vel.
♀	h min	'	°		♃	h min	'	°	
♁	12 14	.1	336	-3.8	♃	23 24	.0	168	-2.3
♂	7 54	.1	41	.8	♄	18 6	.0	247	.0

UT	SUNCE		PROLEĆ. TAČKA S <sub>γ</sub>	VENERA		MARS	
	S <sub>☉</sub>	δ <sub>☉</sub>		S <sub>♀</sub>	δ <sub>♀</sub>	S <sub>♂</sub>	δ <sub>♂</sub>
h	° / ' / "	° / ' / "	° / ' / "	° / ' / "	° / ' / "	° / ' / "	° / ' / "
0	179 50.5	9 2	201 16.6	176 21.7	9 15.4	241 34.3	-17 1.8
2	209 50.8	9 2.1	231 21.6	206 20.8	9 17.8	271 35.6	-17 5.8
4	239 51.2	9 3.9	261 26.5	236 19.9	9 20.2	301 36.9	-16 59.7
6	269 51.5	9 5.7	291 31.4	266 19.1	9 22.5	331 38.2	-16 58.7
8	299 51.8	9 7.5	321 36.4	296 18.2	9 24.9	1 39.5	-16 57.7
10	329 52.1	9 9.3	351 41.3	326 17.3	9 27.2	31 40.8	-16 56.7
12	359 52.4	9 11.1	21 46.2	356 16.4	9 29.6	61 42.0	-16 55.7
14	29 52.7	9 12.9	51 51.1	26 15.6	9 31.9	91 43.3	-16 54.6
16	59 53.1	9 14.7	81 56.1	56 14.7	9 34.3	121 44.6	-16 53.6
18	89 53.4	9 16.5	112 1.0	86 13.8	9 36.6	151 45.9	-16 52.6
20	119 53.7	9 18.3	142 5.9	116 12.9	9 39.0	181 47.2	-16 51.5
22	149 54.0	9 20.2	172 10.9	146 12.0	9 41.3	211 48.5	-16 50.5
Δ	2	9		-4	12	6	5

φ	SUNCE		TRAJANJE SUMRAKA		MESEC			
	IZLAZ	ZALAZ	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 13	0 46	3 10	5 27	1.0	1 20	3.5
55	5 2	19 1	0 39	2 25	6 28	1.6	0 20	3.0
50	5 11	18 51	0 34	2 2	7 5	1.8	...	.0
45	5 19	18 43	0 31	1 47	7 33	1.9	...	.0
40	5 25	18 36	0 28	1 36	7 55	1.9	23 56	2.2
35	5 31	18 31	0 26	1 29	8 13	2.0	23 36	2.2
30	5 35	18 26	0 24	1 23	8 29	2.0	23 20	2.2
20	5 44	18 18	0 22	1 15	8 56	2.1	22 52	2.2
10	5 51	18 10	0 21	1 11	9 19	2.2	22 28	2.2
0	5 57	18 4	0 21	1 10	9 40	2.2	22 6	2.2
10	6 4	17 57	0 21	1 10	10 2	2.2	21 43	2.2
20	6 10	17 50	0 22	1 14	10 25	2.3	21 20	2.2
30	6 18	17 43	0 24	1 20	10 52	2.3	20 52	2.1
35	6 22	17 38	0 26	1 24	11 9	2.4	20 35	2.1
40	6 27	17 33	0 27	1 30	11 27	2.4	20 16	2.1
45	6 33	17 28	0 30	1 38	11 50	2.5	19 53	2.1
50	6 39	17 21	0 33	1 47	12 19	2.5	19 23	2.0
55	6 47	17 13	0 37	2 1	12 60	2.6	18 42	1.9
60	6 58	17 2	0 42	2 19	14 10	3.0	17 31	1.6
S								

UT	MESEC				JUPITER		SATURN	
	S <sub>♃</sub>	Δ	δ <sub>♃</sub>	Δ	S <sub>♃</sub>	δ <sub>♃</sub>	S <sub>♄</sub>	δ <sub>♄</sub>
h	° / ' / "	° / ' / "	° / ' / "	° / ' / "	° / ' / "	° / ' / "	° / ' / "	° / ' / "
0	130 8.2	94 26 24.8	57	8 54.4	-3 35.1	88 43.8	21 58.6	
2	159 5.0	94 26 36.2	54	38 59.9	-3 34.8	118 48.5	21 58.6	
4	188 1.8	93 26 46.9	51	69 5.4	-3 34.6	148 53.2	21 58.6	
6	216 58.5	93 26 57.1	48	99 10.9	-3 34.3	178 58.0	21 58.5	
8	245 55.1	93 27 6.7	45	129 16.4	-3 34.1	209 2.7	21 58.5	
10	274 51.6	92 27 15.8	42	159 21.9	-3 33.9	239 7.4	21 58.5	
12	303 48.1	92 27 24.2	40	189 27.4	-3 33.6	269 12.1	21 58.5	
14	332 44.5	92 27 32.2	37	219 32.9	-3 33.4	299 16.8	21 58.4	
16	1 40.9	92 27 39.5	34	249 38.5	-3 33.2	329 21.5	21 58.4	
18	30 37.3	92 27 46.3	31	279 44.0	-3 32.9	359 26.2	21 58.4	
20	59 33.6	92 27 52.4	28	309 49.5	-3 32.7	29 30.9	21 58.4	
22	88 29.9	92 27 58.1	25	339 55.0	-3 32.5	59 35.7	21 58.3	
Δ				28	1	24	0	

SUNCE				MESEC					
UT	e = T <sub>p</sub> - UT	Δ/24	r	Prolaz	Δ/24	π <sub>♃</sub>	r		
h	min s	s / ' / "		h min	min / ' / "				
00	- 0 37.7	.6	16.0	T <sub>m</sub>	15 53	2.2	55.4 15.1		
12	- 0 30.1	T <sub>m☉</sub>	12 h .5 min	Starost	4.1 d	Faza	☉		
PLANETE									
Pl.	T <sub>m</sub>	π	360-α	Vel.	Pl.	T <sub>m</sub>	π	360-α	Vel.
♀	h min / ' / "	°	°	°	♃	h min / ' / "	°	°	°
♂	12 15 .1	335	-3.8	♃	23 20 .0	168	-2.3		
	7 53 .1	40	.8	♄	18 2 .0	247	.0		

UT	SUNCE		PROLEĆ. TAČKA S <sub>γ</sub>	VENERA		MARS	
	S <sub>☉</sub>	δ <sub>☉</sub>		S <sub>♀</sub>	δ <sub>♀</sub>	S <sub>♂</sub>	δ <sub>♂</sub>
h	° / ' / "	° / ' / "	° / ' / "	° / ' / "	° / ' / "	° / ' / "	° / ' / "
0	179 54.3	9 22.0	202 15.8	176 11.1	9 43.7	241 49.8	-16 49.5
2	209 54.6	9 23.8	232 20.7	206 10.3	9 46.0	271 51.1	-16 48.4
4	239 54.9	9 25.6	262 25.6	236 9.4	9 48.4	301 52.4	-16 47.4
6	269 55.2	9 27.4	292 30.6	266 8.5	9 50.7	331 53.7	-16 46.4
8	299 55.5	9 29.2	322 35.5	296 7.6	9 53.1	1 55.0	-16 45.3
10	329 55.9	9 31.0	352 40.4	326 6.7	9 55.4	31 56.3	-16 44.3
12	359 56.2	9 32.7	22 45.4	356 5.8	9 57.7	61 57.5	-16 43.3
14	29 56.5	9 34.5	52 50.3	26 4.9	10 .1	91 58.8	-16 42.2
16	59 56.8	9 36.3	82 55.2	56 4.0	10 2.4	122 .1	-16 41.2
18	89 57.1	9 38.1	113 .1	86 3.1	10 4.7	152 1.4	-16 40.2
20	119 57.4	9 39.9	143 5.1	116 2.2	10 7.1	182 2.7	-16 39.1
22	149 57.7	9 41.7	173 10.0	146 1.3	10 9.4	212 4.0	-16 38.1
Δ	2	9		-4	12	6	5

φ	SUNCE		TRAJANJE SUMRAKA		MESEC			
	IZLAZ	ZALAZ	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 46	19 16	0 46	3 14	5 51	2.3	2 46	2.3
55	4 59	19 2	0 39	2 27	7 6	2.3	1 31	2.3
50	5 9	18 52	0 34	2 3	7 48	2.3	0 49	2.3
45	5 17	18 44	0 31	1 47	8 18	2.2	0 19	2.3
40	5 24	18 37	0 28	1 37	8 42	2.2	...	.0
35	5 29	18 32	0 26	1 29	9 1	2.2	...	.0
30	5 34	18 27	0 25	1 23	9 18	2.2	...	.0
20	5 43	18 18	0 22	1 15	9 46	2.2	23 45	2.1
10	5 50	18 10	0 21	1 11	10 10	2.2	23 21	2.1
0	5 57	18 4	0 21	1 10	10 33	2.2	22 58	2.1
10	6 4	17 57	0 21	1 10	10 56	2.2	22 36	2.2
20	6 11	17 50	0 22	1 14	11 20	2.1	22 11	2.2
30	6 18	17 42	0 24	1 20	11 48	2.1	21 43	2.3
35	6 23	17 37	0 26	1 24	12 5	2.1	21 26	2.3
40	6 28	17 32	0 27	1 30	12 25	2.1	21 7	2.4
45	6 34	17 26	0 30	1 38	12 49	2.0	20 43	2.4
50	6 41	17 19	0 33	1 47	13 20	2.0	20 12	2.5
55	6 49	17 10	0 37	2 1	14 3	1.9	19 28	2.6
60	7 0	16 59	0 42	2 19	15 23	1.5	18 9	3.0
S								

UT	MESEC				JUPITER		SATURN	
	S <sub>♃</sub>	Δ	δ <sub>♃</sub>	Δ	S <sub>♃</sub>	δ <sub>♃</sub>	S <sub>♄</sub>	δ <sub>♄</sub>
h	° / ' / "	° / ' / "	° / ' / "	° / ' / "	° / ' / "	° / ' / "	° / ' / "	° / ' / "
0	117 26.2	92 28 3.1	22	10 .5	-3 32.2	89 40.4	21 58.3	
2	146 22.5	92 28 7.6	19	40 6.0	-3 32.0	119 45.1	21 58.3	
4	175 18.9	92 28 11.4	17	70 11.5	-3 31.7	149 49.8	21 58.3	
6	204 15.2	92 28 14.8	14	100 17.0	-3 31.5	179 54.5	21 58.2	
8	233 11.6	92 28 17.5	11	130 22.5	-3 31.3	209 59.2	21 58.2	
10	262 8.0	92 28 19.7	8	160 28.0	-3 31.0	240 3.9	21 58.2	
12	291 4.5	93 28 21.2	5	190 33.5	-3 30.8	270 8.6	21 58.2	
14	320 1.0	93 28 22.3	2	220 39.0	-3 30.6	300 13.3	21 58.1	
16	348 57.6	93 28 22.7	-1	250 44.5	-3 30.3	330 18.0	21 58.1	
18	17 54.3	94 28 22.6	-3	280 50.0	-3 30.1	0 22.7	21 58.1	
20	46 51.1	94 28 21.9	-6	310 55.5	-3 29.9	30 27.4	21 58.1	
22	75 48.0	95 28 20.7	-9	341 1.0	-3 29.6	60 32.1	21 58.0	
Δ				28	1	24	0	

SUNCE				MESEC					
UT	e = T <sub>p</sub> - UT	Δ/24	r	Prolaz	Δ/24	π <sub>♃</sub>	r		
h	min s	s / ' / "		h min	min / ' / "				
00	- 0 22.6	.6	16.0	T <sub>m</sub>	16 46	2.2	54.9 15.0		
12	- 0 15.2	T <sub>m☉</sub>	12 h .3 min	Starost	5.1 d	Faza	☉		
PLANETE									
Pl.	T <sub>m</sub>	π	360-α	Vel.	Pl.	T <sub>m</sub>	π	360-α	Vel.
♀	h min / ' / "	°	°	°	♃	h min / ' / "	°	°	°
♂	12 16 .1	334	-3.8	♃	23 16 .0	168	-2.3		
	7 52 .1	40	.8	♄	17 58 .0	247	.1		



UT	SUNCE		PROLEĆ. TAČKA S <sub>γ</sub>	VENERA		MARS	
	S <sub>☉</sub>	δ <sub>☉</sub>		S <sub>♀</sub>	δ <sub>♀</sub>	S <sub>♂</sub>	δ <sub>♂</sub>
h	° / ' / "	° / ' / "	° / ' / "	° / ' / "	° / ' / "	° / ' / "	° / ' / "
0	179 58.0	9 43.5	203 14.9	176 .4	10 11.7	242 5.3	-16 37.0
2	209 58.3	9 45.3	233 19.8	205 59.5	10 14.0	272 6.6	-16 36.0
4	239 58.6	9 47.1	263 24.8	235 58.6	10 16.4	302 7.9	-16 34.9
6	269 58.9	9 48.9	293 29.7	265 57.7	10 18.7	332 9.2	-16 33.9
8	299 59.2	9 50.7	323 34.6	295 56.8	10 21.0	2 10.5	-16 32.9
10	329 59.5	9 52.4	353 39.6	325 55.9	10 23.3	32 11.8	-16 31.8
12	359 59.8	9 54.2	23 44.5	355 55.0	10 25.6	62 13.1	-16 30.8
14	30 .1	9 56.0	53 49.4	25 54.1	10 27.9	92 14.4	-16 29.7
16	60 .4	9 57.8	83 54.3	55 53.2	10 30.3	122 15.7	-16 28.7
18	90 .7	9 59.6	113 59.3	85 52.3	10 32.6	152 17.1	-16 27.6
20	120 1.0	10 1.3	144 4.2	115 51.4	10 34.9	182 18.4	-16 26.6
22	150 1.3	10 3.1	174 9.1	145 50.5	10 37.2	212 19.7	-16 25.5
Δ	2	9		-5	12	7	5

φ	SUNCE		TRAJANJE SUMRAKA		MESEC			
	IZLAZ	ZALAZ	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 43	19 18	0 47	3 19	6 46	3.4	3 40	1.0
55	4 57	19 4	0 39	2 28	8 0	2.9	2 26	1.6
50	5 7	18 54	0 34	2 3	8 42	2.6	1 43	1.7
45	5 15	18 45	0 31	1 48	9 12	2.5	1 13	1.8
40	5 22	18 38	0 28	1 37	9 35	2.4	0 50	1.9
35	5 28	18 32	0 26	1 29	9 55	2.4	0 30	2.0
30	5 33	18 27	0 25	1 23	10 11	2.3	0 13	2.0
20	5 42	18 18	0 22	1 16	10 39	2.2	...	.0
10	5 50	18 11	0 21	1 11	11 3	2.2	...	.0
0	5 57	18 3	0 21	1 10	11 25	2.1	23 50	2.1
10	6 4	17 56	0 21	1 11	11 48	2.0	23 28	2.2
20	6 11	17 49	0 22	1 14	12 11	2.0	23 5	2.2
30	6 19	17 41	0 24	1 20	12 39	1.9	22 38	2.4
35	6 24	17 36	0 26	1 24	12 56	1.8	22 22	2.4
40	6 29	17 30	0 27	1 30	13 15	1.7	22 3	2.5
45	6 35	17 24	0 30	1 38	13 38	1.6	21 40	2.6
50	6 42	17 17	0 33	1 48	14 7	1.5	21 11	2.8
55	6 51	17 8	0 37	2 1	14 48	1.2	20 31	3.1
60	7 3	16 56	0 43	2 19	15 59	.6	19 20	3.7
S								

UT	MESEC				JUPITER		SATURN	
	S <sub>♃</sub>	Δ	δ <sub>♃</sub>	Δ	S <sub>♃</sub>	δ <sub>♃</sub>	S <sub>♄</sub>	δ <sub>♄</sub>
h	° / ' / "	° / ' / "	° / ' / "	° / ' / "	° / ' / "	° / ' / "	° / ' / "	° / ' / "
0	104 44.9	95 28	18.9	-12	11 6.5	-3 29.4	90 36.8	21 58.0
2	133 42.0	96 28	16.5	-15	41 12.0	-3 29.2	120 41.5	21 58.0
4	162 39.2	97 28	13.6	-17	71 17.5	-3 28.9	150 46.2	21 58.0
6	191 36.6	97 28	10.1	-20	101 23.0	-3 28.7	180 50.9	21 57.9
8	220 34.1	98 28	6.1	-23	131 28.5	-3 28.5	210 55.6	21 57.9
10	249 31.7	99 28	1.5	-26	161 34.0	-3 28.2	241 .3	21 57.9
12	278 29.5	100 27	56.4	-28	191 39.5	-3 28.0	271 5.0	21 57.8
14	307 27.4	101 27	50.8	-31	221 45.0	-3 27.8	301 9.7	21 57.8
16	336 25.5	101 27	44.6	-34	251 50.5	-3 27.5	331 14.4	21 57.8
18	5 23.8	102 27	37.9	-36	281 56.0	-3 27.3	1 19.1	21 57.8
20	34 22.3	103 27	30.7	-39	312 1.5	-3 27.1	31 23.7	21 57.7
22	63 20.9	104 27	22.9	-41	342 6.9	-3 26.8	61 28.4	21 57.7
Δ					27	1	23	0

SUNCE				MESEC					
UT	e = T <sub>p</sub> - UT	Δ/24	r	Prolaz	Δ/24	π <sub>♃</sub>	r		
h	min s	s	'	h min	min	'	'		
00	- 0 7.8	.6	16.0	T <sub>m</sub>	17 38	2.1	54.5 14.9		
12	- 0 .6	T <sub>m☉</sub>	12 h .0 min	Starost	6.1 d	Faza	☉		
PLANETE									
Pl.	T <sub>m</sub>	π	360-α	Vel.	Pl.	T <sub>m</sub>	π	360-α	Vel.
♀	h min	'	°		♃	h min	'	°	
♂	12 16	.1	333	-3.8	♄	23 11	.0	168	-2.3
	7 51	.1	39	.8	♅	17 55	.0	247	.1

UT	SUNCE		PROLEĆ. TAČKA S <sub>γ</sub>	VENERA		MARS	
	S <sub>☉</sub>	δ <sub>☉</sub>		S <sub>♀</sub>	δ <sub>♀</sub>	S <sub>♂</sub>	δ <sub>♂</sub>
h	° / ' / "	° / ' / "	° / ' / "	° / ' / "	° / ' / "	° / ' / "	° / ' / "
0	180 1.6	10 4.9	204 14.1	175 49.5	10 39.5	242 21.0	-16 24.4
2	210 1.9	10 6.7	234 19.0	205 48.6	10 41.8	272 22.3	-16 23.4
4	240 2.2	10 8.4	264 23.9	235 47.7	10 44.1	302 23.6	-16 22.3
6	270 2.5	10 10.2	294 28.8	265 46.8	10 46.4	332 24.9	-16 21.3
8	300 2.8	10 12.0	324 33.8	295 45.9	10 48.7	2 26.2	-16 20.2
10	330 3.1	10 13.8	354 38.7	325 45.0	10 51.0	32 27.5	-16 19.2
12	0 3.4	10 15.5	24 43.6	355 44.0	10 53.3	62 28.8	-16 18.1
14	30 3.7	10 17.3	54 48.6	25 43.1	10 55.6	92 30.1	-16 17.0
16	60 4.0	10 19.1	84 53.5	55 42.2	10 57.9	122 31.4	-16 16.0
18	90 4.2	10 20.8	114 58.4	85 41.3	11 .2	152 32.8	-16 14.9
20	120 4.5	10 22.6	145 3.3	115 40.3	11 2.5	182 34.1	-16 13.9
22	150 4.8	10 24.4	175 8.3	145 39.4	11 4.7	212 35.4	-16 12.8
Δ	1	9		-5	11	7	5

φ	SUNCE		TRAJANJE SUMRAKA		MESEC			
	IZLAZ	ZALAZ	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 21	0 47	3 24	8 8	3.8	4 4	.4
55	4 54	19 6	0 39	2 30	9 9	3.2	3 3	1.0
50	5 5	18 55	0 34	2 4	9 46	2.9	2 25	1.3
45	5 14	18 47	0 31	1 48	10 13	2.7	1 57	1.5
40	5 21	18 39	0 28	1 38	10 34	2.6	1 35	1.6
35	5 27	18 33	0 26	1 30	10 52	2.5	1 17	1.7
30	5 32	18 28	0 25	1 24	11 7	2.4	1 1	1.7
20	5 41	18 19	0 23	1 16	11 33	2.2	0 35	1.9
10	5 49	18 11	0 21	1 11	11 55	2.1	0 11	2.0
0	5 56	18 3	0 21	1 10	12 16	2.0	...	.0
10	6 4	17 56	0 21	1 11	12 36	1.9	...	.0
20	6 11	17 48	0 22	1 14	12 58	1.8	23 59	2.2
30	6 20	17 39	0 24	1 20	13 24	1.6	23 35	2.4
35	6 25	17 35	0 26	1 24	13 39	1.5	23 20	2.5
40	6 30	17 29	0 27	1 30	13 56	1.4	23 4	2.6
45	6 36	17 23	0 30	1 38	14 17	1.3	22 44	2.8
50	6 44	17 15	0 33	1 48	14 43	1.1	22 18	3.0
55	6 53	17 5	0 37	2 1	15 18	.8	21 44	3.3
60	7 5	16 53	0 43	2 19	16 12	.2	20 50	3.9
S								

UT	MESEC				JUPITER		SATURN	
	S <sub>♃</sub>	Δ	δ <sub>♃</sub>	Δ	S <sub>♃</sub>	δ <sub>♃</sub>	S <sub>♄</sub>	δ <sub>♄</sub>
h	° / ' / "	° / ' / "	° / ' / "	° / ' / "	° / ' / "	° / ' / "	° / ' / "	° / ' / "
0	92 19.8	105 27	14.7	-44	12 12.4	-3 26.6	91 33.1	21 57.7
2	121 18.8	106 27	5.9	-46	42 17.9	-3 26.4	121 37.8	21 57.7
4	150 18.1	107 26	56.6	-49	72 23.4	-3 26.1	151 42.5	21 57.6
6	179 17.5	108 26	46.8	-51	102 28.9	-3 25.9	181 47.2	21 57.6
8	208 17.2	109 26	36.5	-54	132 34.4	-3 25.7	211 51.9	21 57.6
10	237 17.1	111 26	25.7	-56	162 39.9	-3 25.5	241 56.6	21 57.5
12	266 17.2	112 26	14.5	-59	192 45.4	-3 25.2	272 1.2	21 57.5
14	295 17.5	113 26	2.7	-61	222 50.9	-3 25.0	302 5.9	21 57.5
16	324 18.1	114 25	50.5	-63	252 56.4	-3 24.8	332 10.6	21 57.5
18	353 18.9	115 25	37.8	-66	283 1.9	-3 24.5	2 15.3	21 57.4
20	22 19.9	116 25	24.7	-68	313 7.4	-3 24.3	32 20.0	21 57.4
22	51 21.2	117 25	11.1	-70	343 12.9	-3 24.1	62 24.7	21 57.4
Δ					27	1	23	0

SUNCE				MESEC					
UT	e = T <sub>p</sub> - UT	Δ/24	r	Prolaz	Δ/24	π <sub>♃</sub>	r		
h	min s	s	'	h min	min	'	'		
00	0 6.6	.6	16.0	T <sub>m</sub>	18 28	2.0	54.3 14.8		
12	0 13.6	T <sub>m☉</sub>	11 h 59.8 min	Starost	7.1 d	Faza	☉		
PLANETE									
Pl.	T <sub>m</sub>	π	360-α	Vel.	Pl.	T <sub>m</sub>	π	360-α	Vel.
♀	h min	'	°		♃	h min	'	°	
♂	12 17	.1	332	-3.8	♄	23 7	.0	168	-2.3
	7 50	.1	38	.8	♅	17 51	.0	247	.1

UT	SUNCE				PROLEĆ. TAČKA S <sub>γ</sub>	VENERA				MARS				
	S <sub>☉</sub>		δ <sub>☉</sub>			S <sub>♀</sub>		δ <sub>♀</sub>		S <sub>♂</sub>		δ <sub>♂</sub>		
h	°	'	°	'	°	'	°	'	°	'	°	'		
0	180	5.1	10	26.1	205	13.2	175	38.5	11	7.0	242	36.7	-16	11.7
2	210	5.4	10	27.9	235	18.1	205	37.5	11	9.3	272	38.0	-16	10.7
4	240	5.7	10	29.6	265	23.1	235	36.6	11	11.6	302	39.3	-16	9.6
6	270	6.0	10	31.4	295	28.0	265	35.7	11	13.9	332	40.6	-16	8.5
8	300	6.3	10	33.1	325	32.9	295	34.7	11	16.1	2	42.0	-16	7.5
10	330	6.6	10	34.9	355	37.8	325	33.8	11	18.4	32	43.3	-16	6.4
12	0	6.8	10	36.7	25	42.8	355	32.9	11	20.7	62	44.6	-16	5.3
14	30	7.1	10	38.4	55	47.7	25	31.9	11	23.0	92	45.9	-16	4.2
16	60	7.4	10	40.2	85	52.6	55	31.0	11	25.2	122	47.2	-16	3.2
18	90	7.7	10	41.9	115	57.6	85	30.0	11	27.5	152	48.6	-16	2.1
20	120	8.0	10	43.7	146	2.5	115	29.1	11	29.8	182	49.9	-16	1.0
22	150	8.3	10	45.4	176	7.4	145	28.1	11	32.0	212	51.2	-15	60.0
Δ		1		9				-5		11		7		5

φ	SUNCE		TRAJANJE SUMRAKA		MESEC			
	IZLAZ	ZALAZ	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 23	0 47	3 30	9 40	3.8	4 13	.1
55	4 52	19 8	0 40	2 31	10 25	3.3	3 27	.7
50	5 3	18 57	0 35	2 5	10 55	3.0	2 56	1.0
45	5 12	18 48	0 31	1 49	11 18	2.8	2 32	1.2
40	5 19	18 40	0 28	1 38	11 36	2.6	2 13	1.3
35	5 26	18 34	0 26	1 30	11 51	2.5	1 57	1.4
30	5 31	18 28	0 25	1 24	12 4	2.4	1 43	1.5
20	5 40	18 19	0 23	1 16	12 27	2.2	1 19	1.7
10	5 49	18 11	0 21	1 12	12 46	2.0	0 59	1.8
0	5 56	18 3	0 21	1 10	13 4	1.9	0 39	2.0
10	6 4	17 55	0 21	1 11	13 22	1.8	0 20	2.1
20	6 11	17 47	0 22	1 14	13 41	1.6	...	.0
30	6 20	17 38	0 24	1 20	14 3	1.4	...	.0
35	6 25	17 33	0 26	1 24	14 16	1.3	...	.0
40	6 31	17 28	0 27	1 30	14 30	1.2	...	.0
45	6 38	17 21	0 30	1 38	14 48	1.0	23 50	2.8
50	6 45	17 13	0 33	1 48	15 9	.8	23 29	3.0
55	6 55	17 3	0 37	2 1	15 37	.5	23 2	3.3
60	7 8	16 50	0 43	2 19	16 17	.1	22 24	3.8
S								

UT	MESEC				JUPITER				SATURN							
	S <sub>♃</sub>		Δ		δ <sub>♃</sub>		Δ		S <sub>♃</sub>		δ <sub>♃</sub>		S <sub>♄</sub>		δ <sub>♄</sub>	
h	°	'	°	'	°	'	°	'	°	'	°	'	°	'	°	'
0	80	22.7	119	24	57.0	-73	13	18.3	-3	23.9	92	29.3	21	57.3		
2	109	24.4	120	24	42.5	-75	43	23.8	-3	23.6	122	34.0	21	57.3		
4	138	26.3	121	24	27.5	-77	73	29.3	-3	23.4	152	38.7	21	57.3		
6	167	28.5	122	24	12.1	-79	103	34.8	-3	23.2	182	43.4	21	57.3		
8	196	31.0	123	23	56.3	-81	133	40.3	-3	22.9	212	48.1	21	57.2		
10	225	33.6	125	23	40.0	-83	163	45.8	-3	22.7	242	52.7	21	57.2		
12	254	36.5	126	23	23.4	-85	193	51.3	-3	22.5	272	57.4	21	57.2		
14	283	39.7	127	23	6.3	-87	223	56.8	-3	22.3	303	2.1	21	57.1		
16	312	43.1	128	22	48.8	-89	254	2.2	-3	22.0	333	6.8	21	57.1		
18	341	46.7	129	22	30.9	-91	284	7.7	-3	21.8	3	11.4	21	57.1		
20	10	50.5	130	22	12.6	-93	314	13.2	-3	21.6	33	16.1	21	57.0		
22	39	54.6	131	21	53.9	-95	344	18.7	-3	21.4	63	20.8	21	57.0		
Δ								27		1		23		0		

SUNCE				MESEC					
UT	e = T <sub>p</sub> - UT	Δ/24	r	Prolaz	Δ/24	π <sub>☾</sub>	r		
h	min	s	s	h min	min	'	'		
00	0 20.7	.6	16.0	T <sub>m</sub>	19 15	1.9	54.2	14.8	
12	0 27.5	T <sub>m☉</sub>	11 h 59.5 min	Starost	8.1 d	Faza	☉		
PLANETE									
Pl.	T <sub>m</sub>	π	360-α	Vel.	Pl.	T <sub>m</sub>	π	360-α	Vel.
♀	h min	'	°		♃	h min	'	°	
♁	12 18	.1	330	-3.8	♄	23 3	.0	168	-2.3
♂	7 49	.1	37	.8	♅	17 47	.0	247	.1

UT	SUNCE				PROLEĆ. TAČKA S <sub>γ</sub>	VENERA				MARS				
	S <sub>☉</sub>		δ <sub>☉</sub>			S <sub>♀</sub>		δ <sub>♀</sub>		S <sub>♂</sub>		δ <sub>♂</sub>		
h	°	'	°	'	°	'	°	'	°	'	°	'		
0	180	8.5	10	47.2	206	12.3	175	27.2	11	34.3	242	52.5	-15	58.9
2	210	8.8	10	48.9	236	17.3	205	26.3	11	36.6	272	53.8	-15	57.8
4	240	9.1	10	50.6	266	22.2	235	25.3	11	38.8	302	55.2	-15	56.7
6	270	9.4	10	52.4	296	27.1	265	24.3	11	41.1	332	56.5	-15	55.6
8	300	9.7	10	54.1	326	32.1	295	23.4	11	43.3	2	57.8	-15	54.6
10	330	9.9	10	55.9	356	37.0	325	22.4	11	45.6	32	59.1	-15	53.5
12	0	10.2	10	57.6	26	41.9	355	21.5	11	47.8	63	.5	-15	52.4
14	30	10.5	10	59.4	56	46.8	25	20.5	11	50.1	93	1.8	-15	51.3
16	60	10.8	11	1.1	86	51.8	55	19.6	11	52.3	123	3.1	-15	50.2
18	90	11.1	11	2.8	116	56.7	85	18.6	11	54.6	153	4.4	-15	49.2
20	120	11.3	11	4.6	147	1.6	115	17.7	11	56.8	183	5.8	-15	48.1
22	150	11.6	11	6.3	177	6.5	145	16.7	11	59.1	213	7.1	-15	47.0
Δ		1		9				-5		11		7		5

φ	SUNCE		TRAJANJE SUMRAKA		MESEC			
	IZLAZ	ZALAZ	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 26	0 48	3 38	11 12	3.7	4 17	.0
55	4 50	19 10	0 40	2 33	11 44	3.3	3 43	.5
50	5 1	18 59	0 35	2 6	12 7	3.0	3 19	.7
45	5 10	18 49	0 31	1 50	12 25	2.8	2 60	.9
40	5 18	18 42	0 28	1 38	12 39	2.6	2 44	1.1
35	5 24	18 35	0 26	1 30	12 51	2.5	2 31	1.2
30	5 30	18 29	0 25	1 24	13 2	2.4	2 20	1.4
20	5 40	18 19	0 23	1 16	13 20	2.2	1 60	1.5
10	5 48	18 11	0 21	1 12	13 35	2.0	1 43	1.7
0	5 56	18 3	0 21	1 10	13 50	1.8	1 26	1.9
10	6 4	17 55	0 21	1 11	14 4	1.7	1 10	2.0
20	6 12	17 47	0 22	1 14	14 20	1.5	0 52	2.2
30	6 21	17 37	0 24	1 20	14 37	1.3	0 32	2.4
35	6 26	17 32	0 26	1 25	14 48	1.2	0 20	2.5
40	6 32	17 26	0 28	1 30	14 59	1.0	0 6	2.6
45	6 39	17 19	0 30	1 38	15 13	.9	...	.0
50	6 47	17 11	0 33	1 48	15 29	.7	...	.0
55	6 57	17 1	0 37	2 1	15 50	.4	...	.0
60	7 10	16 48	0 43	2 19	16 19	.0	23 55	3.7
S								

UT	MESEC				JUPITER				SATURN							
	S <sub>♃</sub>		Δ		δ <sub>♃</sub>		Δ		S <sub>♃</sub>		δ <sub>♃</sub>		S <sub>♄</sub>		δ <sub>♄</sub>	
h	°	'	°	'	°	'	°	'	°	'	°	'	°	'	°	'
0	68	58.9	133	21	34.9	-97	14	24.2	-3	21.1	93	25.5	21	57.0		
2	98	3.4	134	21	15.4	-99	44	29.7	-3	20.9	123	30.1	21	57.0		
4	127	8.1	135	20	55.6	-101	74	35.1	-3	20.7	153	34.8	21	56.9		
6	156	13.1	136	20	35.4	-103	104	40.6	-3	20.4	183	39.5	21	56.9		
8	185	18.3	137	20	14.9	-104	134	46.1	-3	20.2	213	44.1	21	56.9		
10	214	23.7	138	19	54.0	-106	164	51.6	-3	20.0	243	48.8	21	56.8		
12	243	29.2	139	19	32.7	-108	194	57.1	-3	19.8	273	53.5	21	56.8		
14	272	35.0	140	19	11.1	-110	225	2.6	-3	19.6	303	58.1	21	56.8		
16	301	41.0	141	18	49.2	-111	255	8.0	-3	19.3	334	2.8	21	56.7		
18	330	47.2	142	18	26.9	-113	285	13.5	-3	19.1	4	7.5	21	56.7		
20	359	53.6	143	18	4.4	-115	315	19.0	-3	18.9	34	12.1	21	56.7		
22	29	.1	144	17	41.4	-116	345	24.5	-3	18.7	64	16.8	21	56.6		
Δ								27		1		23		0		

SUNCE				MESEC			
UT	e = T <sub>p</sub> - UT	Δ/24	r	Prolaz	Δ/24	π <sub>☾</sub>	r
h	min	s	s				

UT	SUNCE				PROLEĆ. TAČKA S <sub>γ</sub>	VENERA				MARS				
	S <sub>☉</sub>		δ <sub>☉</sub>			S <sub>♀</sub>		δ <sub>♀</sub>		S <sub>♂</sub>		δ <sub>♂</sub>		
h	°	'	°	'	°	'	°	'	°	'	°	'		
0	180	11.9	11	8.0	207	11.5	175	15.7	12	1.3	243	8.4	-15	45.9
2	210	12.2	11	9.8	237	16.4	205	14.8	12	3.5	273	9.8	-15	44.8
4	240	12.4	11	11.5	267	21.3	235	13.8	12	5.8	303	11.1	-15	43.7
6	270	12.7	11	13.2	297	26.3	265	12.8	12	8.0	333	12.4	-15	42.6
8	300	13.0	11	14.9	327	31.2	295	11.9	12	10.2	3	13.8	-15	41.5
10	330	13.2	11	16.7	357	36.1	325	10.9	12	12.5	33	15.1	-15	40.4
12	0	13.5	11	18.4	27	41.0	355	9.9	12	14.7	63	16.4	-15	39.4
14	30	13.8	11	20.1	57	46.0	25	8.9	12	16.9	93	17.7	-15	38.3
16	60	14.1	11	21.8	87	50.9	55	8.0	12	19.1	123	19.1	-15	37.2
18	90	14.3	11	23.5	117	55.8	85	7.0	12	21.4	153	20.4	-15	36.1
20	120	14.6	11	25.3	148	8	115	6.0	12	23.6	183	21.8	-15	35.0
22	150	14.9	11	27.0	178	5.7	145	5.0	12	25.8	213	23.1	-15	33.9
Δ		1		9				-5		11		7		5

UT	MESEC				JUPITER				SATURN										
	S <sub>♃</sub>		Δ		δ <sub>♃</sub>		Δ		S <sub>♃</sub>		δ <sub>♃</sub>		S <sub>♄</sub>		δ <sub>♄</sub>				
h	°	'	°	'	°	'	°	'	°	'	°	'	°	'	°	'			
0	58	6.9	145	17	18.2	-118	15	29.9	-3	18.4	94	21.5	21	56.6	124	26.1	21	56.6	
2	87	13.8	145	16	54.7	-119	45	35.4	-3	18.2	124	26.1	21	56.6	154	30.8	21	56.5	
4	116	20.8	146	16	30.9	-121	75	40.9	-3	18.0	184	35.5	21	56.5	214	40.1	21	56.5	
6	145	28.1	147	16	6.7	-122	105	46.4	-3	17.8	214	40.1	21	56.5	244	44.8	21	56.4	
8	174	35.5	148	15	42.3	-124	135	51.9	-3	17.5	274	49.4	21	56.4	304	54.1	21	56.4	
10	203	43.0	148	15	17.6	-125	165	57.3	-3	17.3	334	58.8	21	56.4	366	63.1	21	56.3	
12	232	50.7	149	14	52.6	-126	196	2.8	-3	17.1	366	63.1	21	56.3	396	71.4	21	56.3	
14	261	58.5	150	14	27.4	-128	226	8.3	-3	16.9	396	71.4	21	56.3	426	79.7	21	56.3	
16	291	6.5	150	14	1.9	-129	256	13.8	-3	16.7	426	79.7	21	56.3	456	88.0	21	56.3	
18	320	14.5	151	13	36.1	-130	286	19.2	-3	16.4	456	88.0	21	56.3	486	96.3	21	56.3	
20	349	22.7	152	13	10.0	-131	316	24.7	-3	16.2	486	96.3	21	56.3	516	104.6	21	56.3	
22	18	31.0	152	12	43.7	-133	346	30.2	-3	16.0	516	104.6	21	56.3	546	112.9	21	56.3	
Δ								27		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	4 32	19 28	0 48	3 47	12 42	3.7	4 18	.0
55	4 47	19 12	0 40	2 35	13 3	3.3	3 54	.3
50	4 59	19 0	0 35	2 7	13 19	3.0	3 37	.6
45	5 9	18 51	0 31	1 50	13 32	2.8	3 23	.8
40	5 16	18 43	0 28	1 39	13 42	2.6	3 11	1.0
35	5 23	18 36	0 26	1 30	13 51	2.5	3 1	1.1
30	5 29	18 30	0 25	1 24	13 58	2.3	2 52	1.2
20	5 39	18 20	0 23	1 16	14 11	2.1	2 37	1.4
10	5 48	18 11	0 21	1 12	14 23	1.9	2 24	1.6
0	5 56	18 2	0 21	1 10	14 33	1.8	2 11	1.8
10	6 4	17 54	0 21	1 11	14 44	1.6	1 58	2.0
20	6 12	17 46	0 22	1 14	14 55	1.4	1 45	2.1
30	6 22	17 36	0 24	1 20	15 8	1.2	1 29	2.4
35	6 27	17 31	0 26	1 25	15 16	1.1	1 20	2.5
40	6 33	17 25	0 28	1 30	15 24	.9	1 9	2.6
45	6 40	17 17	0 30	1 38	15 34	.8	0 57	2.8
50	6 48	17 9	0 33	1 48	15 45	.6	0 42	3.0
55	6 59	16 58	0 37	2 1	15 60	.3	0 23	3.3
60	7 12	16 45	0 43	2 20	16 19	.0	...	.0

SUNCE				MESEC			
UT	e = T <sub>p</sub> - UT	Δ/24	r	Prolaz	Δ/24	π <sub>♃</sub>	r
h	min	s	'	h min	min	'	'
00	0 47.7	.5	16.0	T <sub>m</sub> 20 44	1.7	54.6	14.9
12	0 54.2	T <sub>m☉</sub> 11 h 59.1 min	Starost 10.1 d	Faza ☉			

PLANETE									
Pl.	T <sub>m</sub>	π	360-α	Vel.	Pl.	T <sub>m</sub>	π	360-α	Vel.
♀	h min	'	°	°	♃	h min	'	°	°
♀	12 19	.1	328	-3.8	♃	22 54	.0	168	-2.3
♂	7 47	.1	36	.7	♄	17 40	.0	247	.1

UT	SUNCE				PROLEĆ. TAČKA S <sub>γ</sub>	VENERA				MARS				
	S <sub>☉</sub>		δ <sub>☉</sub>			S <sub>♀</sub>		δ <sub>♀</sub>		S <sub>♂</sub>		δ <sub>♂</sub>		
h	°	'	°	'	°	'	°	'	°	'	°	'		
0	180	15.1	11	28.7	208	10.6	175	4.0	12	28.0	243	24.4	-15	32.8
2	210	15.4	11	30.4	238	15.5	205	3.1	12	30.2	273	25.8	-15	31.7
4	240	15.6	11	32.1	268	20.5	235	2.1	12	32.4	303	27.1	-15	30.6
6	270	15.9	11	33.8	298	25.4	265	1.1	12	34.6	333	28.4	-15	29.5
8	300	16.2	11	35.6	328	30.3	295	.1	12	36.8	3	29.8	-15	28.4
10	330	16.4	11	37.3	358	35.3	324	59.1	12	39.0	33	31.1	-15	27.3
12	0	16.7	11	39.0	28	40.2	354	58.1	12	41.2	63	32.5	-15	26.2
14	30	17.0	11	40.7	58	45.1	24	57.1	12	43.4	93	33.8	-15	25.1
16	60	17.2	11	42.4	88	50.0	54	56.1	12	45.6	123	35.1	-15	24.0
18	90	17.5	11	44.1	118	55.0	84	55.1	12	47.8	153	36.5	-15	22.9
20	120	17.7	11	45.8	148	59.9	114	54.1	12	50.0	183	37.8	-15	21.8
22	150	18.0	11	47.5	179	4.8	144	53.1	12	52.2	213	39.2	-15	20.7
Δ		1		9				-5		11		7		6

UT	MESEC				JUPITER				SATURN										
	S <sub>♃</sub>		Δ		δ <sub>♃</sub>		Δ		S <sub>♃</sub>		δ <sub>♃</sub>		S <sub>♄</sub>		δ <sub>♄</sub>				
h	°	'	°	'	°	'	°	'	°	'	°	'	°	'	°	'			
0	47	39.4	153	12	17.2	-134	16	35.6	-3	15.8	95	17.4	21	56.2	125	22.0	21	56.2	
2	76	47.9	153	11	50.4	-135	46	41.1	-3	15.6	125	22.0	21	56.2	155	26.7	21	56.2	
4	105	56.5	153	11	23.4	-136	76	46.6	-3	15.3	155	26.7	21	56.2	185	31.3	21	56.1	
6	135	5.2	154	10	56.2	-137	106	52.1	-3	15.1	185	31.3	21	56.1	215	36.0	21	56.1	
8	164	13.9	154	10	28.8	-138	136	57.5	-3	14.9	215	36.0	21	56.1	245	40.6	21	56.1	
10	193	22.8	154	10	1.1	-139	167	3.0	-3	14.7	245	40.6	21	56.1	275	45.3	21	56.0	
12	222	31.6	155	9	33.2	-140	197	8.5	-3	14.5	275	45.3	21	56.0	305	49.9	21	56.0	
14	251	40.5	155	9	5.2	-141	227	13.9	-3	14.2	305	49.9	21	56.0	335	54.6	21	55.9	
16	280	49.5	155	8	36.9	-142	257	19.4	-3	14.0	335	54.6	21	55.9	365	59.2	21	55.9	
18	309	58.5	155	8	8.4	-143	287	24.9	-3	13.8	365	59.2	21	55.9	395	63.8	21	55.9	
20	339	7.5	155	7	39.8	-144	317	30.3	-3	13.6	395	63.8	21	55.9	425	68.4	21	55.9	
22	18	16.5	155	7	11.0	-145	347	35.8	-3	13.4	425	68.4	21	55.9	455	73.0	21	55.8	
Δ								27		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	4 29	19 31	0 48	4 2	14 10	3.6	4 17	.0
55	4 45	19 14	0 40	2 37	14 22	3.3	4 3	.3
50	4 57	19 2	0 35	2 8	14 31	3.0	3 51	.5
45	5 7	18 52	0 31	1 51	14 39	2.8	3 42	.7
40	5 15	18 44	0 28	1 39	14 45	2.6	3 34	.9
35	5 22	18 37	0 26	1 31	14 50	2.5	3 28	1.0
30	5 28	18 30	0 25	1 24	14 55	2.4	3 22	1.2
20	5 38	18 20	0 23	1 16	15 3	2.1	3 12	1.4
10	5 47	18 11	0 22	1 12	15 9	1.9	3 2	1.6
0	5 56	18 2	0 21	1 10	15 16	1.8	2 54	1.8
10	6 4	17 54	0 21	1 11	15 22	1.6	2 45	1.9
20	6 12	17 45	0 22	1 14				

UT	SUNCE		PROLEĆ. TAČKA S <sub>γ</sub>	VENERA		MARS									
	S <sub>☉</sub>	δ <sub>☉</sub>		S <sub>♀</sub>	δ <sub>♀</sub>	S <sub>♂</sub>	δ <sub>♂</sub>								
h	°	'	°	'	°	'	°	'							
0	180	18.3	11	49.2	209	9.8	174	52.1	12	54.4	243	40.5	-15	19.5	
2	210	18.5	11	50.9	239	14.7	204	51.1	12	56.6	273	41.9	-15	18.4	
4	240	18.8	11	52.6	269	19.6	234	50.1	12	58.8	303	43.2	-15	17.3	
6	270	19.0	11	54.3	299	24.5	264	49.1	13	1.0	333	44.5	-15	16.2	
8	300	19.3	11	56.0	329	29.5	294	48.1	13	3.1	3	45.9	-15	15.1	
10	330	19.5	11	57.7	359	34.4	324	47.1	13	5.3	33	47.2	-15	14.0	
12	0	19.8	11	59.4	29	39.3	354	46.1	13	7.5	63	48.6	-15	12.9	
14	30	20.0	12	1.1	59	44.3	24	45.1	13	9.7	93	49.9	-15	11.8	
16	60	20.3	12	2.7	89	49.2	54	44.1	13	11.8	123	51.3	-15	10.7	
18	90	20.5	12	4.4	119	54.1	84	43.1	13	14.0	153	52.6	-15	9.5	
20	120	20.8	12	6.1	149	59.0	114	42.0	13	16.2	183	54.0	-15	8.4	
22	150	21.0	12	7.8	180	4.0	144	41.0	13	18.3	213	55.3	-15	7.3	
Δ		1		8				-5		11		7			6

φ	SUNCE		TRAJANJE SUMRAKA		MESEC			
	IZLAZ	ZALAZ	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 26	19 33	0 49	:	15 38	3.7	4 17	.0
55	4 43	19 16	0 41	2 39	15 41	3.4	4 10	.3
50	4 55	19 3	0 35	2 9	15 44	3.1	4 4	.5
45	5 5	18 53	0 31	1 51	15 46	2.9	3 60	.7
40	5 13	18 45	0 29	1 39	15 48	2.7	3 56	.9
35	5 21	18 37	0 26	1 31	15 50	2.5	3 53	1.0
30	5 27	18 31	0 25	1 25	15 51	2.4	3 50	1.1
20	5 38	18 20	0 23	1 16	15 54	2.2	3 45	1.4
10	5 47	18 11	0 22	1 12	15 56	2.0	3 40	1.6
0	5 55	18 2	0 21	1 10	15 58	1.8	3 36	1.8
10	6 4	17 53	0 21	1 11	16 60	1.6	3 32	1.9
20	6 13	17 44	0 22	1 14	16 2	1.4	3 27	2.1
30	6 23	17 34	0 24	1 20	16 4	1.2	3 22	2.4
35	6 29	17 28	0 26	1 25	16 6	1.0	3 19	2.5
40	6 35	17 22	0 28	1 31	16 7	.9	3 15	2.7
45	6 43	17 14	0 30	1 38	16 9	.7	3 11	2.8
50	6 52	17 5	0 33	1 48	16 11	.5	3 7	3.1
55	7 3	16 54	0 37	2 2	16 14	.3	3 1	3.3
60	7 17	16 39	0 44	2 20	16 17	.0	2 53	3.7
S								

UT	MESEC				JUPITER		SATURN								
	S <sub>♃</sub>	Δ	δ <sub>♃</sub>	Δ	S <sub>♃</sub>	δ <sub>♃</sub>	S <sub>♄</sub>	δ <sub>♄</sub>							
h	°	'	°	'	°	'	°	'							
0	37	25.6	155	6	42.0	-146	17	41.3	-3	13.2	96	13.2	21	55.8	
2	66	34.6	155	6	12.9	-146	47	46.7	-3	12.9	126	17.8	21	55.8	
4	95	43.7	155	5	43.6	-147	77	52.2	-3	12.7	156	22.5	21	55.7	
6	124	52.7	155	5	14.1	-148	107	57.7	-3	12.5	186	27.1	21	55.7	
8	154	1.7	155	4	44.6	-149	138	3.1	-3	12.3	216	31.8	21	55.7	
10	183	10.7	155	4	14.8	-149	168	8.6	-3	12.1	246	36.4	21	55.6	
12	212	19.6	154	3	45.0	-150	198	14.0	-3	11.9	276	41.0	21	55.6	
14	241	28.5	154	3	15.0	-150	228	19.5	-3	11.6	306	45.7	21	55.6	
16	270	37.3	154	2	44.9	-151	258	25.0	-3	11.4	336	50.3	21	55.5	
18	299	46.0	153	2	14.7	-151	288	30.4	-3	11.2	6	55.0	21	55.5	
20	328	54.7	153	3	15.0	-152	318	35.9	-3	11.0	36	59.6	21	55.5	
22	358	3.2	152	1	14.1	-152	348	41.3	-3	10.8	67	4.2	21	55.4	
Δ								27		1		23			0

SUNCE				MESEC					
UT	e = T <sub>p</sub> - UT	Δ/24	r	Prolaz	Δ/24	π <sub>♃</sub>	r		
h	min	s	s	h min	min	'	'		
00	1 13.2	.5	15.9	T <sub>m</sub>	22 8	1.8	55.6	15.2	
12	1 19.3	T <sub>m☉</sub>	11 h 58.7 min	Starost	12.1 d	Faza	☉		
PLANETE									
Pl.	T <sub>m</sub>	π	360-α	Vel.	Pl.	T <sub>m</sub>	π	360-α	Vel.
♀	h min	'	°	°	♃	h min	'	°	°
♂	12 21	.1	326	-3.8	♄	22 45	.0	169	-2.3
	7 45	.1	35	.7	♅	17 32	.0	247	.1

UT	SUNCE		PROLEĆ. TAČKA S <sub>γ</sub>	VENERA		MARS									
	S <sub>☉</sub>	δ <sub>☉</sub>		S <sub>♀</sub>	δ <sub>♀</sub>	S <sub>♂</sub>	δ <sub>♂</sub>								
h	°	'	°	'	°	'	°	'							
0	180	21.3	12	9.5	210	8.9	174	40.0	13	20.5	243	56.7	-15	6.2	
2	210	21.5	12	11.2	240	13.8	204	39.0	13	22.7	273	58.0	-15	5.1	
4	240	21.8	12	12.8	270	18.7	234	38.0	13	24.8	303	59.4	-15	4.0	
6	270	22.0	12	14.5	300	23.7	264	36.9	13	27.0	334	.7	-15	2.8	
8	300	22.3	12	16.2	330	28.6	294	35.9	13	29.1	4	2.1	-15	1.7	
10	330	22.5	12	17.9	0	33.5	324	34.9	13	31.3	34	3.5	-15	.6	
12	0	22.8	12	19.6	30	38.5	354	33.8	13	33.4	64	4.8	-14	59.5	
14	30	23.0	12	21.2	60	43.4	24	32.8	13	35.6	94	6.2	-14	58.3	
16	60	23.2	12	22.9	90	48.3	54	31.8	13	37.7	124	7.5	-14	57.2	
18	90	23.5	12	24.6	120	53.2	84	30.7	13	39.9	154	8.9	-14	56.1	
20	120	23.7	12	26.2	150	58.2	114	29.7	13	42.0	184	10.2	-14	55.0	
22	150	24.0	12	27.9	181	3.1	144	28.7	13	44.1	214	11.6	-14	53.8	
Δ		1		8				-5		11		7			6

φ	SUNCE		TRAJANJE SUMRAKA		MESEC			
	IZLAZ	ZALAZ	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 36	0 49	:	17 7	3.9	4 16	.0
55	4 40	19 18	0 41	2 41	17 2	3.5	4 16	.3
50	4 53	19 5	0 35	2 10	16 59	3.2	4 16	.5
45	5 4	18 54	0 31	1 52	16 56	3.0	4 17	.7
40	5 12	18 46	0 29	1 40	16 53	2.8	4 17	.9
35	5 19	18 38	0 27	1 31	16 51	2.6	4 17	1.1
30	5 26	18 32	0 25	1 25	16 49	2.5	4 17	1.2
20	5 37	18 20	0 23	1 17	16 46	2.3	4 18	1.4
10	5 46	18 11	0 22	1 12	16 43	2.1	4 18	1.6
0	5 55	18 2	0 21	1 10	16 41	1.9	4 18	1.8
10	6 4	17 53	0 21	1 11	16 38	1.7	4 18	2.0
20	6 13	17 44	0 22	1 14	16 35	1.5	4 19	2.2
30	6 23	17 33	0 24	1 20	16 32	1.2	4 19	2.5
35	6 29	17 27	0 26	1 25	16 31	1.1	4 19	2.6
40	6 36	17 20	0 28	1 31	16 29	.9	4 19	2.7
45	6 44	17 13	0 30	1 38	16 26	.8	4 20	2.9
50	6 53	17 3	0 33	1 48	16 24	.6	4 20	3.1
55	7 5	16 52	0 38	2 2	16 20	.3	4 20	3.4
60	7 20	16 36	0 44	2 20	16 16	.0	4 21	3.8
S								

UT	MESEC				JUPITER		SATURN								
	S <sub>♃</sub>	Δ	δ <sub>♃</sub>	Δ	S <sub>♃</sub>	δ <sub>♃</sub>	S <sub>♄</sub>	δ <sub>♄</sub>							
h	°	'	°	'	°	'	°	'							
0	27	11.7	152	0	43.6	-153	18	46.8	-3	10.6	97	8.9	21	55.4	
2	56	20.1	151	0	13.1	-153	48	52.3	-3	10.4	127	13.5	21	55.4	
4	85	28.4	151	-0	17.5	-153	78	57.7	-3	10.1	157	18.2	21	55.3	
6	114	36.5	150	-0	48.2	-154	109	3.2	-3	9.9	187	22.8	21	55.3	
8	143	44.5	149	-1	18.9	-154	139	8.6	-3	9.7	217	27.4	21	55.2	
10	172	52.4	149	-1	49.7	-154	169	14.1	-3	9.5	247	32.1	21	55.2	
12	202	.1	148	-2	20.5	-154	199	19.5	-3	9.3	277	36.7	21	55.2	
14	231	7.6	147	-2	51.3	-154	229	25.0	-3	9.1	307	41.3	21	55.1	
16	260	15.0	146	-3	22.1	-154	259	30.5	-3	8.9	337	46.0	21	55.1	
18	289	22.2	145	-3	52.9	-154	289	35.9	-3	8.7	7	50.6	21	55.1	
20	318	29.2	144	-4	23.8	-154	319	41.4	-3	8.5	37	55.2	21	55.0	
22	347	36.0	143	-4	54.6	-154	349	46.8	-3	8.2	67	59.9	21	55.0	
Δ								27		1		23			0

SUNCE				MESEC				
UT	e = T <sub>p</sub> - UT	Δ/24	r	Prolaz	Δ/24	π <sub>♃</sub>	r	
h	min	s	s	h min	min	'	'	
00	1 25.3	.5	15.9	T <sub>m</sub>	22 51	1.9	56.3	15.3
12	1 31.2	T <sub>m☉</sub>	11 h 58.5 min	Starost	13.1 d	Faza	☉	
PLANETE								

UT	SUNCE		PROLEĆ. TAČKA S <sub>γ</sub>	VENERA		MARS	
	S <sub>☉</sub>	δ <sub>☉</sub>		S <sub>♀</sub>	δ <sub>♀</sub>	S <sub>♂</sub>	δ <sub>♂</sub>
h	° / ' / "	° / ' / "	° / ' / "	° / ' / "	° / ' / "	° / ' / "	° / ' / "
0	180 24.2	12 29.6	211 8.0	174 27.6	13 46.3	244 12.9	-14 52.7
2	210 24.4	12 31.2	241 13.0	204 26.6	13 48.4	274 14.3	-14 51.6
4	240 24.7	12 32.9	271 17.9	234 25.5	13 50.5	304 15.7	-14 50.5
6	270 24.9	12 34.6	301 22.8	264 24.5	13 52.7	334 17.0	-14 49.3
8	300 25.2	12 36.2	331 27.7	294 23.5	13 54.8	4 18.4	-14 48.2
10	330 25.4	12 37.9	1 32.7	324 22.4	13 56.9	34 19.8	-14 47.1
12	0 25.6	12 39.5	31 37.6	354 21.4	13 59.0	64 21.1	-14 45.9
14	30 25.9	12 41.2	61 42.5	24 20.3	14 1.1	94 22.5	-14 44.8
16	60 26.1	12 42.9	91 47.5	54 19.3	14 3.3	124 23.8	-14 43.7
18	90 26.3	12 44.5	121 52.4	84 18.2	14 5.4	154 25.2	-14 42.5
20	120 26.6	12 46.2	151 57.3	114 17.1	14 7.5	184 26.6	-14 41.4
22	150 26.8	12 47.8	182 2.2	144 16.1	14 9.6	214 27.9	-14 40.2
Δ	1	8		-5	11	7	6

φ	SUNCE		TRAJANJE SUMRAKA		MESEC			
	IZLAZ	ZALAZ	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 20	19 38	0 50	:	18 40	4.1	4 15	.0
55	4 38	19 20	0 41	2 43	18 26	3.7	4 23	.3
50	4 51	19 6	0 35	2 11	18 16	3.4	4 29	.6
45	5 2	18 56	0 32	1 52	18 8	3.1	4 34	.8
40	5 11	18 47	0 29	1 40	18 1	2.9	4 39	1.0
35	5 18	18 39	0 27	1 32	17 55	2.8	4 42	1.1
30	5 25	18 32	0 25	1 25	17 49	2.6	4 46	1.3
20	5 36	18 21	0 23	1 17	17 40	2.4	4 52	1.5
10	5 46	18 11	0 22	1 12	17 33	2.2	4 57	1.7
0	5 55	18 2	0 21	1 10	17 25	2.0	5 2	1.9
10	6 4	17 53	0 21	1 11	17 18	1.8	5 7	2.1
20	6 13	17 43	0 23	1 14	17 11	1.6	5 12	2.3
30	6 24	17 32	0 24	1 20	17 2	1.4	5 18	2.6
35	6 30	17 26	0 26	1 25	16 57	1.2	5 21	2.7
40	6 37	17 19	0 28	1 31	16 51	1.1	5 25	2.9
45	6 45	17 11	0 30	1 39	16 45	.9	5 30	3.1
50	6 55	17 1	0 33	1 49	16 37	.7	5 36	3.3
55	7 6	16 49	0 38	2 2	16 28	.4	5 42	3.6
60	7 22	16 34	0 44	2 21	16 16	.0	5 52	4.0
S								

UT	MESEC				JUPITER		SATURN		
	S <sub>♃</sub>	Δ	δ <sub>♃</sub>	Δ	S <sub>♃</sub>	δ <sub>♃</sub>	S <sub>♄</sub>	δ <sub>♄</sub>	
h	° / ' / "	° / ' / "	° / ' / "	° / ' / "	° / ' / "	° / ' / "	° / ' / "	° / ' / "	
0	16 42.6	142 - 5	25.4	-154	19 52.3	- 3	8.0	98 4.5	21 55.0
2	45 48.9	141 - 5	56.2	-154	49 57.7	- 3	7.8	128 9.1	21 54.9
4	74 55.1	140 - 6	26.9	-153	80 3.2	- 3	7.6	158 13.7	21 54.9
6	104 1.0	138 - 6	57.6	-153	110 8.6	- 3	7.4	188 18.4	21 54.8
8	133 6.6	137 - 7	28.2	-153	140 14.1	- 3	7.2	218 23.0	21 54.8
10	162 12.0	136 - 7	58.8	-152	170 19.5	- 3	7.0	248 27.6	21 54.8
12	191 17.1	134 - 8	29.3	-152	200 25.0	- 3	6.8	278 32.2	21 54.7
14	220 22.0	133 - 8	59.6	-151	230 30.4	- 3	6.6	308 36.9	21 54.7
16	249 26.6	131 - 9	29.9	-151	260 35.9	- 3	6.4	338 41.5	21 54.6
18	278 30.8	130 -10	.1	-150	290 41.3	- 3	6.2	8 46.1	21 54.6
20	307 34.8	128 -10	30.1	-149	320 46.7	- 3	5.9	38 50.7	21 54.6
22	336 38.5	127 -11	.0	-149	350 52.2	- 3	5.7	68 55.4	21 54.5
Δ					27	1		23	0

SUNCE				MESEC			
UT	e = T <sub>p</sub> - UT	Δ/24	r	Prolaz	Δ/24	π <sub>♃</sub>	r
h	min s	s	'	h min	min	'	'
00	1 37.0	.5	15.9	T <sub>m</sub> 23 36	2.0	56.9	15.5
12	1 42.6	T <sub>m☉</sub> 11 h 58.3 min	Starost 14.1 d	Faza ☉			

PLANETE									
Pl.	T <sub>m</sub>	π	360-α	Vel.	Pl.	T <sub>m</sub>	π	360-α	Vel.
♀	h min	'	°		♃	h min	'	°	
♂	12 23	.1	323	-3.8	♄	22 36	.0	169	-2.3
♂	7 43	.1	33	.7	♄	17 25	.0	247	.1

UT	SUNCE		PROLEĆ. TAČKA S <sub>γ</sub>	VENERA		MARS	
	S <sub>☉</sub>	δ <sub>☉</sub>		S <sub>♀</sub>	δ <sub>♀</sub>	S <sub>♂</sub>	δ <sub>♂</sub>
h	° / ' / "	° / ' / "	° / ' / "	° / ' / "	° / ' / "	° / ' / "	° / ' / "
0	180 27.0	12 49.5	212 7.2	174 15.0	14 11.7	244 29.3	-14 39.1
2	210 27.2	12 51.1	242 12.1	204 14.0	14 13.8	274 30.7	-14 38.0
4	240 27.5	12 52.8	272 17.0	234 12.9	14 15.9	304 32.0	-14 36.8
6	270 27.7	12 54.4	302 22.0	264 11.8	14 18.0	334 33.4	-14 35.7
8	300 27.9	12 56.0	332 26.9	294 10.8	14 20.1	4 34.8	-14 34.6
10	330 28.1	12 57.7	2 31.8	324 9.7	14 22.2	34 36.1	-14 33.4
12	0 28.4	12 59.3	32 36.7	354 8.6	14 24.3	64 37.5	-14 32.3
14	30 28.6	13 1.0	62 41.7	24 7.6	14 26.4	94 38.9	-14 31.1
16	60 28.8	13 2.6	92 46.6	54 6.5	14 28.5	124 40.2	-14 30.0
18	90 29.0	13 4.2	122 51.5	84 5.4	14 30.5	154 41.6	-14 28.8
20	120 29.3	13 5.9	152 56.5	114 4.3	14 32.6	184 43.0	-14 27.7
22	150 29.5	13 7.5	183 1.4	144 3.3	14 34.7	214 44.4	-14 26.5
Δ	1	8		-5	10	7	6

φ	SUNCE		TRAJANJE SUMRAKA		MESEC			
	IZLAZ	ZALAZ	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 17	19 41	0 50	:	20 20	4.5	4 14	.0
55	4 36	19 22	0 41	2 46	19 55	3.9	4 31	.4
50	4 49	19 8	0 36	2 12	19 37	3.5	4 43	.7
45	5 0	18 57	0 32	1 53	19 23	3.3	4 54	1.0
40	5 9	18 48	0 29	1 41	19 11	3.1	5 2	1.2
35	5 17	18 40	0 27	1 32	19 1	2.9	5 10	1.3
30	5 24	18 33	0 25	1 25	18 53	2.8	5 17	1.5
20	5 35	18 21	0 23	1 17	18 38	2.6	5 28	1.7
10	5 45	18 11	0 22	1 12	18 25	2.4	5 38	1.9
0	5 55	18 1	0 21	1 11	18 13	2.2	5 48	2.1
10	6 4	17 52	0 22	1 11	18 1	2.0	5 57	2.3
20	6 14	17 42	0 23	1 14	17 49	1.8	6 8	2.5
30	6 25	17 31	0 24	1 20	17 35	1.6	6 19	2.7
35	6 31	17 25	0 26	1 25	17 26	1.4	6 26	2.8
40	6 38	17 18	0 28	1 31	17 17	1.3	6 34	3.0
45	6 46	17 9	0 30	1 39	17 6	1.1	6 43	3.2
50	6 56	16 59	0 33	1 49	16 53	.9	6 55	3.5
55	7 8	16 47	0 38	2 2	16 37	.5	7 9	3.8
60	7 24	16 31	0 44	2 21	16 16	.1	7 27	4.3
S								

UT	MESEC				JUPITER		SATURN		
	S <sub>♃</sub>	Δ	δ <sub>♃</sub>	Δ	S <sub>♃</sub>	δ <sub>♃</sub>	S <sub>♄</sub>	δ <sub>♄</sub>	
h	° / ' / "	° / ' / "	° / ' / "	° / ' / "	° / ' / "	° / ' / "	° / ' / "	° / ' / "	
0	5 41.8	125 -11	29.7	-148	20 57.6	- 3	5.5	98 60.0	21 54.5
2	34 44.8	123 -11	59.3	-147	51 3.1	- 3	5.3	129 4.6	21 54.5
4	63 47.4	122 -12	28.7	-146	81 8.5	- 3	5.1	159 9.2	21 54.4
6	92 49.8	120 -12	58.0	-145	111 14.0	- 3	4.9	189 13.8	21 54.4
8	121 51.7	118 -13	27.0	-144	141 19.4	- 3	4.7	219 18.5	21 54.3
10	150 53.3	116 -13	55.8	-143	171 24.8	- 3	4.5	249 23.1	21 54.3
12	179 54.5	114 -14	24.4	-142	201 30.3	- 3	4.3	279 27.7	21 54.3
14	208 55.3	112 -14	52.7	-140	231 35.7	- 3	4.1	309 32.3	21 54.2
16	237 55.8	110 -15	20.8	-139	261 41.2	- 3	3.9	339 36.9	21 54.2
18	266 55.8	108 -15	48.6	-138	291 46.6	- 3	3.7	9 41.5	21 54.1
20	295 55.5	106 -16	16.2	-136	321 52.0	- 3	3.5	39 46.2	21 54.1
22	324 54.7	104 -16	43.5	-135	351 57.5	- 3	3.3	69 50.8	21 54.1
Δ					27	1		23	0

SUNCE				MESEC			
UT	e = T <sub>p</sub> - UT	Δ/24	r	Prolaz	Δ/24	π <sub>♃</sub>	r
h	min s	s	'	h min	min	'	'
00	1 48.2	.4	15.9	T <sub>m</sub> ...	1.0	57.6	15.7
12	1 53.6	T <sub>m☉</sub> 11 h 58.1 min	Starost 15.1 d	Faza ☉			

PLANETE									
Pl.	T <sub>m</sub>	π	360-α	Vel.	Pl.	T <sub>m</sub>	π	360-α	Vel.
♀	h min	'	°		♃	h min	'	°	
♂	7 42	.1	32	.7	♄	17 21	.0	247	.1

UT	SUNCE		PROLEĆ. TAČKA S <sub>γ</sub>	VENERA		MARS	
	S <sub>☉</sub>	δ <sub>☉</sub>		S <sub>♀</sub>	δ <sub>♀</sub>	S <sub>♂</sub>	δ <sub>♂</sub>
h	° / ' / "	° / ' / "	° / ' / "	° / ' / "	° / ' / "	° / ' / "	° / ' / "
0	180 29.7	13 9.1	213 6.3	174 2.2	14 36.8	244 45.7	-14 25.4
2	210 29.9	13 10.8	243 11.2	204 1.1	14 38.9	274 47.1	-14 24.2
4	240 30.1	13 12.4	273 16.2	234 .0	14 40.9	304 48.5	-14 23.1
6	270 30.4	13 14.0	303 21.1	263 58.9	14 43.0	334 49.9	-14 21.9
8	300 30.6	13 15.6	333 26.0	293 57.8	14 45.1	4 51.2	-14 20.8
10	330 30.8	13 17.3	3 31.0	323 56.8	14 47.1	34 52.6	-14 19.6
12	0 31.0	13 18.9	33 35.9	353 55.7	14 49.2	64 54.0	-14 18.5
14	30 31.2	13 20.5	63 40.8	23 54.6	14 51.2	94 55.4	-14 17.3
16	60 31.4	13 22.1	93 45.7	53 53.5	14 53.3	124 56.7	-14 16.2
18	90 31.6	13 23.8	123 50.7	83 52.4	14 55.4	154 58.1	-14 15.0
20	120 31.8	13 25.4	153 55.6	113 51.3	14 57.4	184 59.5	-14 13.9
22	150 32.1	13 27.0	184 .5	143 50.2	14 59.5	215 .9	-14 12.7
Δ	1	8		-5	10	7	6

φ	SUNCE		TRAJANJE SUMRAKA		MESEC			
	IZLAZ	ZALAZ	GRAĐ.	ASTR.	IZLAZ	Δ/24	ZALAZ	Δ/24
N	h min	h min	h min	h min	h min	min	h min	min
60	4 14	19 43	0 51	:	22 7	4.7	4 14	.1
55	4 33	19 24	0 42	2 48	21 29	3.9	4 41	.6
50	4 47	19 9	0 36	2 13	21 2	3.6	5 1	1.0
45	4 59	18 58	0 32	1 54	20 42	3.3	5 17	1.2
40	5 8	18 49	0 29	1 41	20 25	3.1	5 30	1.4
35	5 16	18 41	0 27	1 32	20 12	3.0	5 42	1.6
30	5 23	18 34	0 25	1 26	19 60	2.9	5 51	1.7
20	5 35	18 21	0 23	1 17	19 39	2.7	6 9	1.9
10	5 45	18 11	0 22	1 12	19 22	2.5	6 23	2.1
0	5 55	18 1	0 21	1 11	19 5	2.4	6 38	2.3
10	6 4	17 52	0 22	1 11	18 49	2.2	6 52	2.4
20	6 14	17 42	0 23	1 14	18 32	2.1	7 7	2.6
30	6 25	17 30	0 25	1 21	18 12	1.9	7 24	2.8
35	6 32	17 24	0 26	1 25	18 1	1.7	7 35	3.0
40	6 39	17 16	0 28	1 31	17 48	1.6	7 46	3.1
45	6 47	17 8	0 30	1 39	17 33	1.4	8 0	3.3
50	6 58	16 58	0 34	1 49	17 14	1.2	8 18	3.6
55	7 10	16 45	0 38	2 2	16 50	.8	8 40	3.9
60	7 27	16 28	0 44	2 21	16 17	.2	9 10	4.6
S								

UT	MESEC				JUPITER		SATURN	
	S <sub>♃</sub>	Δ	δ <sub>♃</sub>	Δ	S <sub>♃</sub>	δ <sub>♃</sub>	S <sub>♄</sub>	δ <sub>♄</sub>
h	° / ' / "	° / ' / "	° / ' / "	° / ' / "	° / ' / "	° / ' / "	° / ' / "	° / ' / "
0	353 53.5	102 -17	10.4 -133		22 2.9	-3 3.1	99 55.4	21 54.0
2	22 51.9	100 -17	37.0 -132		52 8.3	-3 2.9	129 60.0	21 54.0
4	51 49.9	98 -18	3.3 -130		82 13.8	-3 2.7	160 4.6	21 53.9
6	80 47.4	96 -18	29.3 -128		112 19.2	-3 2.5	190 9.2	21 53.9
8	109 44.5	93 -18	54.9 -126		142 24.6	-3 2.3	220 13.8	21 53.9
10	138 41.2	91 -19	20.1 -124		172 30.1	-3 2.1	250 18.4	21 53.8
12	167 37.4	89 -19	44.9 -122		202 35.5	-3 1.9	280 23.0	21 53.8
14	196 33.2	87 -20	9.3 -120		232 40.9	-3 1.7	310 27.7	21 53.7
16	225 28.5	84 -20	33.3 -118		262 46.4	-3 1.5	340 32.3	21 53.7
18	254 23.4	82 -20	56.9 -116		292 51.8	-3 1.3	10 36.9	21 53.7
20	283 17.8	80 -21	20.0 -113		322 57.2	-3 1.1	40 41.5	21 53.6
22	312 11.8	78 -21	42.6 -111		353 2.7	-3 .9	70 46.1	21 53.6
Δ					27	1	23	0

SUNCE				MESEC					
UT	e = T <sub>p</sub> - UT	Δ/24	r	Prolaz	Δ/24	π <sub>♃</sub>	r		
h	min s	s	'	h min	min	'	'		
00	1 59.0	.4	15.9	T <sub>m</sub>	0 25	2.3	58.2	15.9	
12	2 4.1	T <sub>m☉</sub>	11 h 57.9 min	Starost	16.1 d	Faza	☉		
PLANETE									
Pl.	T <sub>m</sub>	π	360-α	Vel.	Pl.	T <sub>m</sub>	π	360-α	Vel.
♀	h min	'	°	°	♃	h min	'	°	°
♂	12 24	.1	321	-3.8	♃	22 28	.0	169	-2.3
	7 41	.1	32	.7	♄	17 18	.0	247	.1

UT	SUNCE		PROLEĆ. TAČKA S <sub>γ</sub>	VENERA		MARS	
	S <sub>☉</sub>	δ <sub>☉</sub>		S <sub>♀</sub>	δ <sub>♀</sub>	S <sub>♂</sub>	δ <sub>♂</sub>
h	° / ' / "	° / ' / "	° / ' / "	° / ' / "	° / ' / "	° / ' / "	° / ' / "
0	180 32.3	13 28.6	214 5.4	173 49.1	15 1.5	245 2.3	-14 11.6
2	210 32.5	13 30.2	244 10.4	203 48.0	15 3.5	275 3.6	-14 10.4
4	240 32.7	13 31.8	274 15.3	233 46.9	15 5.6	305 5.0	-14 9.3
6	270 32.9	13 33.4	304 20.2	263 45.8	15 7.6	335 6.4	-14 8.1
8	300 33.1	13 35.0	334 25.2	293 44.7	15 9.7	5 7.8	-14 6.9
10	330 33.3	13 36.6	4 30.1	323 43.5	15 11.7	35 9.2	-14 5.8
12	0 33.5	13 38.2	34 35.0	353 42.4	15 13.7	65 10.6	-14 4.6
14	30 33.7	13 39.8	64 39.9	23 41.3	15 15.7	95 11.9	-14 3.5
16	60 33.9	13 41.4	94 44.9	53 40.2	15 17.8	125 13.3	-14 2.3
18	90 34.1	13 43.0	124 49.8	83 39.1	15 19.8	155 14.7	-14 1.1
20	120 34.3	13 44.6	154 54.7	113 38.0	15 21.8	185 16.1	-13 60.0
22	150 34.5	13 46.2	184 59.7	143 36.8	15 23.8	215 17.5	-13 58.8
Δ	1	8		-6	10	7	6

φ	SUNCE		TRAJANJE SUMRAKA		MESEC			
	IZLAZ	ZALAZ	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 12	19 46	0 51	:	22 7	.0	4 17	.3
55	4 31	19 26	0 42	2 51	23 4	3.6	4 57	1.0
50	4 46	19 11	0 36	2 14	22 28	3.3	5 25	1.4
45	4 57	18 59	0 32	1 54	22 2	3.2	5 47	1.6
40	5 7	18 50	0 29	1 42	21 41	3.0	6 4	1.8
35	5 15	18 41	0 27	1 32	21 24	2.9	6 19	1.9
30	5 22	18 34	0 25	1 26	21 9	2.9	6 32	2.0
20	5 34	18 22	0 23	1 17	20 44	2.7	6 54	2.2
10	5 45	18 11	0 22	1 13	20 22	2.6	7 14	2.3
0	5 54	18 1	0 21	1 11	20 2	2.5	7 32	2.5
10	6 4	17 51	0 22	1 11	19 42	2.4	7 50	2.6
20	6 14	17 41	0 23	1 15	19 21	2.3	8 10	2.7
30	6 26	17 29	0 25	1 21	18 57	2.2	8 33	2.9
35	6 32	17 23	0 26	1 25	18 43	2.1	8 46	3.0
40	6 40	17 15	0 28	1 31	18 26	2.0	9 1	3.1
45	6 49	17 6	0 30	1 39	18 7	1.9	9 20	3.3
50	6 59	16 56	0 34	1 49	17 43	1.7	9 43	3.5
55	7 12	16 43	0 38	2 3	17 10	1.4	10 14	3.8
60	7 29	16 25	0 44	2 22	16 23	.6	10 60	4.6
S								

UT	MESEC				JUPITER		SATURN	
	S <sub>♃</sub>	Δ	δ <sub>♃</sub>	Δ	S <sub>♃</sub>	δ <sub>♃</sub>	S <sub>♄</sub>	δ <sub>♄</sub>
h	° / ' / "	° / ' / "	° / ' / "	° / ' / "	° / ' / "	° / ' / "	° / ' / "	° / ' / "
0	341 5.3	75 -22	4.8 -108		23 8.1	-3 .7	100 50.7	21 53.5
2	9 58.3	73 -22	26.4 -106		53 13.5	-3 .5	130 55.3	21 53.5
4	38 50.9	71 -22	47.6 -103		83 18.9	-3 .3	160 59.9	21 53.4
6	67 43.1	69 -23	8.2 -100		113 24.4	-3 .1	191 4.5	21 53.4
8	96 34.8	66 -23	28.3 -98		143 29.8	-2 59.9	221 9.1	21 53.4
10	125 26.1	64 -23	47.8 -95		173 35.2	-2 59.7	251 13.7	21 53.3
12	154 16.9	62 -24	6.8 -92		203 40.6	-2 59.5	281 18.3	21 53.3
14	183 7.3	60 -24	25.2 -89		233 46.1	-2 59.3	311 22.9	21 53.2
16	211 57.3	58 -24	43.0 -86		263 51.5	-2 59.1	341 27.5	21 53.2
18	240 46.9	56 -25	.1 -83		293 56.9	-2 58.9	11 32.1	21 53.2
20	269 36.0	54 -25	16.7 -80		324 2.3	-2 58.7	41 36.7	21 53.1
22	298 24.8	52 -25	32.6 -76		354 7.7	-2 58.5	71 41.3	21 53.1
Δ					27	1	23	0

SUNCE				MESEC					
UT	e = T <sub>p</sub> - UT	Δ/24	r	Prolaz	Δ/24	π <sub>♃</sub>	r		
h	min s	s	'	h min	min	'	'		
00	2 9.2	.4	15.9	T <sub>m</sub>	1 19	2.4	58.7	16.0	
12	2 14.1	T <sub>m☉</sub>	11 h 57.8 min	Starost	17.1 d	Faza	☉		
PLANETE									
Pl.	T <sub>m</sub>	π	360-α	Vel.	Pl.	T <sub>m</sub>	π	360-α	Vel.
♀	h min	'	°	°	♃	h min	'	°	°
♂	12 25	.1	320	-3.8	♃	22 23	.0	169	-2.3
	7 39	.1	31	.7	♄	17 14	.0	247	.1

UT	SUNCE		PROLEĆ. TAČKA S <sub>γ</sub>	VENERA		MARS								
	S <sub>☉</sub>	δ <sub>☉</sub>		S <sub>♀</sub>	δ <sub>♀</sub>	S <sub>♂</sub>	δ <sub>♂</sub>							
h	°	'	°	'	°	'	°	'						
0	180	34.7	13	47.8	215	4.6	173	35.7	15	25.8	245	18.9	-13	57.6
2	210	34.9	13	49.4	245	9.5	203	34.6	15	27.9	275	20.3	-13	56.5
4	240	35.1	13	51.0	275	14.4	233	33.5	15	29.9	305	21.6	-13	55.3
6	270	35.3	13	52.6	305	19.4	263	32.3	15	31.9	335	23.0	-13	54.1
8	300	35.5	13	54.2	335	24.3	293	31.2	15	33.9	5	24.4	-13	53.0
10	330	35.7	13	55.8	5	29.2	323	30.1	15	35.9	35	25.8	-13	51.8
12	0	35.9	13	57.4	35	34.2	353	28.9	15	37.9	65	27.2	-13	50.6
14	30	36.1	13	59.0	65	39.1	23	27.8	15	39.9	95	28.6	-13	49.4
16	60	36.3	14	5	95	44.0	53	26.7	15	41.9	125	30.0	-13	48.3
18	90	36.5	14	2.1	125	48.9	83	25.5	15	43.9	155	31.4	-13	47.1
20	120	36.6	14	3.7	155	53.9	113	24.4	15	45.8	185	32.8	-13	45.9
22	150	36.8	14	5.3	185	58.8	143	23.3	15	47.8	215	34.2	-13	44.8
Δ		1		8				-6		10		7		6

φ	SUNCE		TRAJANJE SUMRAKA		MESEC			
	IZLAZ	ZALAZ	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 9	19 48	0 52	:::	0 2	4.4	4 24	1.0
55	4 29	19 28	0 42	2 54	..	.0	5 22	1.7
50	4 44	19 13	0 36	2 15	23 48	2.7	5 59	2.0
45	4 55	19 1	0 32	1 55	23 17	2.7	6 26	2.2
40	5 5	18 51	0 29	1 42	22 54	2.7	6 47	2.3
35	5 14	18 42	0 27	1 33	22 34	2.7	7 5	2.3
30	5 21	18 35	0 25	1 26	22 18	2.7	7 21	2.4
20	5 33	18 22	0 23	1 17	21 50	2.7	7 47	2.5
10	5 44	18 11	0 22	1 13	21 26	2.7	8 10	2.5
0	5 54	18 1	0 21	1 11	21 3	2.6	8 31	2.6
10	6 4	17 51	0 22	1 11	20 41	2.6	8 52	2.7
20	6 15	17 40	0 23	1 15	20 17	2.6	9 15	2.7
30	6 26	17 28	0 25	1 21	19 50	2.6	9 42	2.8
35	6 33	17 22	0 26	1 25	19 34	2.5	9 58	2.8
40	6 41	17 14	0 28	1 31	19 15	2.5	10 16	2.9
45	6 50	17 5	0 30	1 39	18 52	2.5	10 38	3.0
50	7 1	16 54	0 34	1 49	18 23	2.4	11 6	3.1
55	7 14	16 40	0 38	2 3	17 43	2.3	11 45	3.2
60	7 32	16 23	0 45	2 22	16 38	1.8	12 50	3.7
S								

UT	MESEC				JUPITER		SATURN							
	S <sub>♃</sub>	Δ	δ <sub>♃</sub>	Δ	S <sub>♃</sub>	δ <sub>♃</sub>	S <sub>♄</sub>	δ <sub>♄</sub>						
h	°	'	°	'	°	'	°	'						
0	327	13.2	50	-25	47.9	-73	24	13.2	-2	58.3	101	45.9	21	53.0
2	356	1.2	48	-26	2.5	-70	54	18.6	-2	58.1	131	50.5	21	53.0
4	24	48.8	46	-26	16.4	-66	84	24.0	-2	57.9	161	55.1	21	52.9
6	53	36.1	45	-26	29.7	-63	114	29.4	-2	57.7	191	59.7	21	52.9
8	82	23.0	43	-26	42.2	-59	144	34.8	-2	57.5	222	4.3	21	52.9
10	111	9.6	41	-26	54.1	-56	174	40.3	-2	57.3	252	8.9	21	52.8
12	139	55.9	40	-27	5.2	-52	204	45.7	-2	57.1	282	13.5	21	52.8
14	168	41.9	39	-27	15.6	-48	234	51.1	-2	57.0	312	18.0	21	52.7
16	197	27.6	37	-27	25.3	-45	264	56.5	-2	56.8	342	22.6	21	52.7
18	226	13.1	36	-27	34.2	-41	295	1.9	-2	56.6	12	27.2	21	52.6
20	254	58.3	35	-27	42.4	-37	325	7.3	-2	56.4	42	31.8	21	52.6
22	283	43.3	34	-27	49.8	-33	355	12.7	-2	56.2	72	36.4	21	52.6
Δ								27		1		23		0

SUNCE				MESEC					
UT	e = T <sub>p</sub> - UT	Δ/24	r	Prolaz	Δ/24	π <sub>♃</sub>	r		
h	min	s	s	h min	min	'	'		
00	2 19.0	.4	15.9	T <sub>m</sub>	2 17	2.5	59.1	16.1	
12	2 23.6	T <sub>m☉</sub>	11 h 57.6 min	Starost	18.1 d	Faza	☉		
PLANETE									
Pl.	T <sub>m</sub>	π	360-α	Vel.	Pl.	T <sub>m</sub>	π	360-α	Vel.
♀	h min	'	°	°	♃	h min	'	°	°
♂	12 26	.1	319	-3.8	♄	22 19	.0	169	-2.3
	7 38	.1	30	.7	♅	17 10	.0	247	.1

UT	SUNCE		PROLEĆ. TAČKA S <sub>γ</sub>	VENERA		MARS								
	S <sub>☉</sub>	δ <sub>☉</sub>		S <sub>♀</sub>	δ <sub>♀</sub>	S <sub>♂</sub>	δ <sub>♂</sub>							
h	°	'	°	'	°	'	°	'						
0	180	37.0	14	6.8	216	3.7	173	22.1	15	49.8	245	35.6	-13	43.6
2	210	37.2	14	8.4	246	8.7	203	21.0	15	51.8	275	37.0	-13	42.4
4	240	37.4	14	10.0	276	13.6	233	19.8	15	53.8	305	38.3	-13	41.2
6	270	37.6	14	11.6	306	18.5	263	18.7	15	55.7	335	39.7	-13	40.1
8	300	37.8	14	13.1	336	23.4	293	17.5	15	57.7	5	41.1	-13	38.9
10	330	37.9	14	14.7	6	28.4	323	16.4	15	59.7	35	42.5	-13	37.7
12	0	38.1	14	16.3	36	33.3	353	15.2	16	1.6	65	43.9	-13	36.5
14	30	38.3	14	17.8	66	38.2	23	14.0	16	3.6	95	45.3	-13	35.3
16	60	38.5	14	19.4	96	43.2	53	12.9	16	5.6	125	46.7	-13	34.2
18	90	38.7	14	21.0	126	48.1	83	11.7	16	7.5	155	48.1	-13	33.0
20	120	38.8	14	22.5	156	53.0	113	10.6	16	9.5	185	49.5	-13	31.8
22	150	39.0	14	24.1	186	57.9	143	9.4	16	11.4	215	50.9	-13	30.6
Δ		1		8				-6		10		7		6

φ	SUNCE		TRAJANJE SUMRAKA		MESEC			
	IZLAZ	ZALAZ	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	19 51	0 52	:::	1 47	2.8	4 47	2.8
55	4 26	19 30	0 42	2 57	0 31	2.8	6 4	2.8
50	4 42	19 14	0 36	2 17	..	.0	6 47	2.7
45	4 54	19 2	0 32	1 56	..	.0	7 17	2.7
40	5 4	18 52	0 29	1 42	23 59	2.3	7 41	2.7
35	5 12	18 43	0 27	1 33	23 39	2.3	8 1	2.7
30	5 20	18 35	0 25	1 26	23 22	2.4	8 18	2.7
20	5 33	18 22	0 23	1 17	22 54	2.5	8 46	2.7
10	5 44	18 11	0 22	1 13	22 29	2.5	9 11	2.7
0	5 54	18 1	0 21	1 11	22 7	2.6	9 34	2.6
10	6 4	17 51	0 22	1 12	21 44	2.7	9 56	2.6
20	6 15	17 40	0 23	1 15	21 20	2.7	10 21	2.6
30	6 27	17 27	0 25	1 21	20 51	2.8	10 49	2.6
35	6 34	17 20	0 26	1 26	20 34	2.9	11 6	2.5
40	6 42	17 12	0 28	1 31	20 15	2.9	11 25	2.5
45	6 51	17 3	0 31	1 39	19 51	3.0	11 49	2.5
50	7 2	16 52	0 34	1 49	19 20	3.1	12 20	2.4
55	7 16	16 38	0 38	2 3	18 38	3.2	13 3	2.3
60	7 34	16 20	0 45	2 22	17 21	3.7	14 19	1.8
S								

UT	MESEC				JUPITER		SATURN							
	S <sub>♃</sub>	Δ	δ <sub>♃</sub>	Δ	S <sub>♃</sub>	δ <sub>♃</sub>	S <sub>♄</sub>	δ <sub>♄</sub>						
h	°	'	°	'	°	'	°	'						
0	312	28.1	33	-27	56.5	-29	25	18.2	-2	56.0	102	41.0	21	52.5
2	341	12.8	32	-28	2.3	-26	55	23.6	-2	55.8	132	45.6	21	52.5
4	9	57.2	32	-28	7.4	-22	85	29.0	-2	55.6	162	50.2	21	52.4
6	38	41.6	31	-28	11.7	-18	115	34.4	-2	55.4	192	54.8	21	52.4
8	67	25.8	31	-28	15.3	-14	145	39.8	-2	55.2	222	59.3	21	52.3
10	96	9.9	30	-28	18.0	-10	175	45.2	-2	55.0	253	3.9	21	52.3
12	124	53.9	30	-28	19.9	-6	205	50.6	-2	54.9	283	8.5	21	52.2
14	153	37.9	30	-28	21.1	-2	235	56.0	-2	54.7	313	13.1	21	52.2
16	182	21.8	30	-28	21.4	2	266	1.4	-2	54.5	343	17.7	21	52.2
18	211	5.8	30	-28	21.0	6	296	6.8	-2	54.3	13	22.3	21	52.1
20	239	49.7	30	-28	19.7	10	326	12.2	-2	54.1	43	26.8	21	52.1
22	268	33.7	30	-28	17.7	14	356	17.6	-2	53.9	73	31.4	21	52.0
Δ								27		1		23		0

SUNCE				MESEC				
UT	e = T <sub>p</sub> - UT	Δ/24	r	Prolaz	Δ/24	π <sub>♃</sub>	r	
h	min	s	s	h min	min	'	'	
00	2 28.3	.4	15.9	T <sub>m</sub>	3 18	2.7	59.3	16.2
12	2 32.6	T <sub>m☉</sub>	11 h 57.5 min	Starost	19.1 d	Faza	☉	

UT	SUNCE		PROLEĆ. TAČKA S <sub>γ</sub>	VENERA		MARS	
	S <sub>☉</sub>	δ <sub>☉</sub>		S <sub>♀</sub>	δ <sub>♀</sub>	S <sub>♂</sub>	δ <sub>♂</sub>
h	° / ' / "	° / ' / "	° / ' / "	° / ' / "	° / ' / "	° / ' / "	° / ' / "
0	180 39.2	14 25.6	217 2.9	173 8.2	16 13.4	245 52.3	-13 29.4
2	210 39.4	14 27.2	247 7.8	203 7.1	16 15.3	275 53.7	-13 28.2
4	240 39.5	14 28.7	277 12.7	233 5.9	16 17.3	305 55.1	-13 27.1
6	270 39.7	14 30.3	307 17.7	263 4.7	16 19.2	335 56.5	-13 25.9
8	300 39.9	14 31.8	337 22.6	293 3.5	16 21.1	5 58.0	-13 24.7
10	330 40.1	14 33.4	7 27.5	323 2.4	16 23.1	35 59.4	-13 23.5
12	0 40.2	14 34.9	37 32.4	353 1.2	16 25.0	66 .8	-13 22.3
14	30 40.4	14 36.5	67 37.4	22 60.0	16 26.9	96 2.2	-13 21.1
16	60 40.6	14 38.0	97 42.3	52 58.8	16 28.9	126 3.6	-13 19.9
18	90 40.7	14 39.6	127 47.2	82 57.6	16 30.8	156 5.0	-13 18.7
20	120 40.9	14 41.1	157 52.1	112 56.4	16 32.7	186 6.4	-13 17.6
22	150 41.1	14 42.6	187 57.1	142 55.3	16 34.6	216 7.8	-13 16.4
Δ	1	8		-6	10	7	6

φ	SUNCE		TRAJANJE SUMRAKA		MESEC			
	IZLAZ	ZALAZ	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 3	19 53	0 53	:::	2 54	1.0	5 53	4.4
55	4 24	19 32	0 43	3 1	1 37	1.8	7 10	3.6
50	4 40	19 16	0 36	2 18	0 54	2.0	7 53	3.3
45	4 52	19 3	0 32	1 56	0 23	2.2	8 23	3.2
40	5 3	18 53	0 29	1 43	...	.0	8 47	3.0
35	5 11	18 44	0 27	1 33	...	.0	9 6	3.0
30	5 19	18 36	0 25	1 27	...	.0	9 23	2.9
20	5 32	18 23	0 23	1 18	23 53	2.2	9 51	2.8
10	5 43	18 11	0 22	1 13	23 31	2.4	10 15	2.7
0	5 54	18 1	0 21	1 11	23 9	2.5	10 37	2.6
10	6 4	17 50	0 22	1 12	22 48	2.6	10 59	2.5
20	6 15	17 39	0 23	1 15	22 25	2.7	11 23	2.3
30	6 28	17 27	0 25	1 21	21 59	2.9	11 50	2.2
35	6 35	17 19	0 26	1 26	21 43	3.0	12 7	2.1
40	6 43	17 11	0 28	1 32	21 24	3.1	12 25	2.0
45	6 52	17 2	0 31	1 39	21 2	3.3	12 48	1.9
50	7 4	16 50	0 34	1 50	20 34	3.5	13 17	1.7
55	7 18	16 36	0 39	2 3	19 55	3.8	13 57	1.4
60	7 36	16 17	0 45	2 23	18 50	4.6	15 2	.6
S								

UT	MESEC				JUPITER		SATURN	
	S <sub>♃</sub>	Δ	δ <sub>♃</sub>	Δ	S <sub>♃</sub>	δ <sub>♃</sub>	S <sub>♄</sub>	δ <sub>♄</sub>
h	° / ' / "	° / ' / "	° / ' / "	° / ' / "	° / ' / "	° / ' / "	° / ' / "	° / ' / "
0	297 17.8	31 -28	14.8	18	26 23.0	-2 53.7	103 36.0	21 52.0
2	326 1.9	31 -28	11.2	22	56 28.4	-2 53.5	133 40.6	21 51.9
4	354 46.2	32 -28	6.8	26	86 33.8	-2 53.4	163 45.2	21 51.9
6	23 30.5	33 -28	1.6	30	116 39.2	-2 53.2	193 49.8	21 51.8
8	52 15.1	33 -27	55.6	34	146 44.6	-2 53.0	223 54.3	21 51.8
10	80 59.7	34 -27	48.8	38	176 50.0	-2 52.8	253 58.9	21 51.7
12	109 44.6	35 -27	41.3	41	206 55.4	-2 52.6	284 3.5	21 51.7
14	138 29.7	36 -27	33.0	45	237 .8	-2 52.4	314 8.1	21 51.7
16	167 14.9	38 -27	23.9	49	267 6.2	-2 52.3	344 12.6	21 51.6
18	196 .5	39 -27	14.1	53	297 11.6	-2 52.1	14 17.2	21 51.6
20	224 46.2	40 -27	3.6	56	327 17.0	-2 51.9	44 21.8	21 51.5
22	253 32.3	42 -26	52.3	60	357 22.4	-2 51.7	74 26.4	21 51.5
Δ					27	1	23	0

SUNCE				MESEC					
UT	e = T <sub>p</sub> - UT	Δ/24	r	Prolaz	Δ/24	π <sub>☉</sub>	r		
h	min s	s	'	h min	min	'	'		
00	2 37.0	.3	15.9	T <sub>m</sub>	4 22	2.6	59.4	16.2	
12	2 41.1	T <sub>m☉</sub>	11 h 57.3 min	Starost	20.1 d	Faza	☉		
PLANETE									
Pl.	T <sub>m</sub>	π	360-α	Vel.	Pl.	T <sub>m</sub>	π	360-α	Vel.
♀	h min	'	°		♃	h min	'	°	
♁	12 28	.1	316	-3.8	♃	22 10	.0	169	-2.3
♂	7 36	.1	29	.6	♄	17 3	.0	247	.1

UT	SUNCE		PROLEĆ. TAČKA S <sub>γ</sub>	VENERA		MARS	
	S <sub>☉</sub>	δ <sub>☉</sub>		S <sub>♀</sub>	δ <sub>♀</sub>	S <sub>♂</sub>	δ <sub>♂</sub>
h	° / ' / "	° / ' / "	° / ' / "	° / ' / "	° / ' / "	° / ' / "	° / ' / "
0	180 41.2	14 44.2	218 2.0	172 54.1	16 36.5	246 9.2	-13 15.2
2	210 41.4	14 45.7	248 6.9	202 52.9	16 38.4	276 10.6	-13 14.0
4	240 41.6	14 47.2	278 11.9	232 51.7	16 40.3	306 12.0	-13 12.8
6	270 41.7	14 48.8	308 16.8	262 50.5	16 42.2	336 13.4	-13 11.6
8	300 41.9	14 50.3	338 21.7	292 49.3	16 44.2	6 14.8	-13 10.4
10	330 42.1	14 51.8	8 26.6	322 48.1	16 46.0	36 16.3	-13 9.2
12	0 42.2	14 53.4	38 31.6	352 46.9	16 47.9	66 17.7	-13 8.0
14	30 42.4	14 54.9	68 36.5	22 45.7	16 49.8	96 19.1	-13 6.8
16	60 42.5	14 56.4	98 41.4	52 44.5	16 51.7	126 20.5	-13 5.6
18	90 42.7	14 57.9	128 46.4	82 43.3	16 53.6	156 21.9	-13 4.4
20	120 42.8	14 59.5	158 51.3	112 42.1	16 55.5	186 23.3	-13 3.2
22	150 43.0	15 1.0	188 56.2	142 40.9	16 57.4	216 24.7	-13 2.0
Δ	1	8		-6	9	7	6

φ	SUNCE		TRAJANJE SUMRAKA		MESEC			
	IZLAZ	ZALAZ	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	19 56	0 53	:::	3 18	.3	7 40	4.8
55	4 22	19 34	0 43	3 5	2 19	1.1	8 37	4.0
50	4 38	19 17	0 37	2 19	1 42	1.4	9 13	3.6
45	4 51	19 4	0 32	1 57	1 15	1.6	9 39	3.4
40	5 1	18 54	0 29	1 43	0 53	1.8	9 60	3.2
35	5 10	18 45	0 27	1 34	0 35	1.9	10 17	3.0
30	5 18	18 37	0 25	1 27	0 20	2.0	10 32	2.9
20	5 31	18 23	0 23	1 18	...	.0	10 57	2.7
10	5 43	18 11	0 22	1 13	...	.0	11 18	2.5
0	5 54	18 1	0 21	1 11	...	.0	11 38	2.4
10	6 4	17 50	0 22	1 12	23 51	2.5	11 58	2.2
20	6 16	17 39	0 23	1 15	23 31	2.7	12 19	2.1
30	6 28	17 26	0 25	1 21	23 8	2.9	12 44	1.9
35	6 36	17 18	0 26	1 26	22 55	3.0	12 58	1.8
40	6 44	17 10	0 28	1 32	22 40	3.2	13 14	1.6
45	6 54	17 0	0 31	1 40	22 21	3.4	13 34	1.4
50	7 5	16 49	0 34	1 50	21 58	3.6	13 58	1.2
55	7 20	16 34	0 39	2 4	21 27	4.0	14 30	.8
60	7 39	16 15	0 45	2 23	20 41	4.6	15 17	.2
S								

UT	MESEC				JUPITER		SATURN	
	S <sub>♃</sub>	Δ	δ <sub>♃</sub>	Δ	S <sub>♃</sub>	δ <sub>♃</sub>	S <sub>♄</sub>	δ <sub>♄</sub>
h	° / ' / "	° / ' / "	° / ' / "	° / ' / "	° / ' / "	° / ' / "	° / ' / "	° / ' / "
0	282 18.6	43 -26	40.3	64	27 27.8	-2 51.5	104 30.9	21 51.4
2	311 5.3	45 -26	27.5	67	57 33.2	-2 51.3	134 35.5	21 51.4
4	339 52.2	46 -26	14.1	71	87 38.6	-2 51.2	164 40.1	21 51.3
6	8 39.5	48 -26	.0	74	117 44.0	-2 51.0	194 44.6	21 51.3
8	37 27.2	50 -25	45.2	77	147 49.4	-2 50.8	224 49.2	21 51.2
10	66 15.1	52 -25	29.7	81	177 54.7	-2 50.6	254 53.8	21 51.2
12	95 3.5	54 -25	13.6	84	208 .1	-2 50.4	284 58.4	21 51.1
14	123 52.2	55 -24	56.8	87	238 5.5	-2 50.3	315 2.9	21 51.1
16	152 41.3	57 -24	39.3	90	268 10.9	-2 50.1	345 7.5	21 51.0
18	181 30.8	59 -24	21.3	93	298 16.3	-2 49.9	15 12.1	21 51.0
20	210 20.7	61 -24	2.6	96	328 21.7	-2 49.7	45 16.6	21 50.9
22	239 10.9	63 -23	43.4	99	358 27.1	-2 49.5	75 21.2	21 50.9
Δ					27	1	23	0

SUNCE				MESEC					
UT	e = T <sub>p</sub> - UT	Δ/24	r	Prolaz	Δ/24	π <sub>☉</sub>	r		
h	min s	s	'	h min	min	'	'		
00	2 45.2	.3	15.9	T <sub>m</sub>	5 24	2.4	59.4	16.2	
12	2 49.0	T <sub>m☉</sub>	11 h 57.2 min	Starost	21.1 d	Faza	☉		
PLANETE									
Pl.	T <sub>m</sub>	π	360-α	Vel.	Pl.	T <sub>m</sub>	π	360-α	Vel.
♀	h min	'	°		♃	h min	'	°	
♁	12 29	.1	315	-3.8	♃	22 6	.0	169	-2.2
♂	7 35	.1	28	.6	♄	16 59	.0	246	.1



1. MAJ

2005.

NEDELJA

UT	SUNCE				PROLEĆ. TAČKA S <sub>γ</sub>	VENERA				MARS				
	S <sub>☉</sub>		δ <sub>☉</sub>			S <sub>♀</sub>		δ <sub>♀</sub>		S <sub>♂</sub>		δ <sub>♂</sub>		
h	°	'	°	'	°	'	°	'	°	'	°	'		
0	180	43.2	15	2.5	219	1.1	172	39.6	16	59.3	246	26.2	-13	.8
2	210	43.3	15	4.0	249	6.1	202	38.4	17	1.1	276	27.6	-12	59.6
4	240	43.5	15	5.5	279	11.0	232	37.2	17	3.0	306	29.0	-12	58.4
6	270	43.6	15	7.0	309	15.9	262	36.0	17	4.9	336	30.4	-12	57.2
8	300	43.8	15	8.5	339	20.9	292	34.8	17	6.7	6	31.8	-12	56.0
10	330	43.9	15	10.0	9	25.8	322	33.5	17	8.6	36	33.2	-12	54.8
12	0	44.1	15	11.5	39	30.7	352	32.3	17	10.5	66	34.7	-12	53.6
14	30	44.2	15	13.1	69	35.6	22	31.1	17	12.3	96	36.1	-12	52.4
16	60	44.4	15	14.6	99	40.6	52	29.9	17	14.2	126	37.5	-12	51.2
18	90	44.5	15	16.1	129	45.5	82	28.6	17	16.0	156	38.9	-12	50.0
20	120	44.6	15	17.6	159	50.4	112	27.4	17	17.9	186	40.3	-12	48.8
22	150	44.8	15	19.1	189	55.4	142	26.2	17	19.7	216	41.8	-12	47.6
Δ		1		8				-6		9		7		6

φ	SUNCE		TRAJANJE SUMRAKA		MESEC			
	IZLAZ	ZALAZ	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 58	19 58	0 54	:::	3 25	.1	9 34	4.6
55	4 20	19 36	0 43	3 9	2 45	.7	10 12	4.0
50	4 36	19 19	0 37	2 21	2 16	1.0	10 39	3.6
45	4 49	19 6	0 32	1 58	1 54	1.3	10 59	3.3
40	5 0	18 55	0 29	1 44	1 37	1.4	11 16	3.1
35	5 9	18 45	0 27	1 34	1 22	1.6	11 30	3.0
30	5 17	18 37	0 25	1 27	1 9	1.7	11 42	2.8
20	5 31	18 24	0 23	1 18	0 46	1.9	12 2	2.6
10	5 43	18 12	0 22	1 13	0 27	2.1	12 19	2.4
0	5 54	18 0	0 21	1 11	0 9	2.3	12 36	2.2
10	6 5	17 50	0 22	1 12	...	.0	12 52	2.0
20	6 16	17 38	0 23	1 15	...	.0	13 9	1.8
30	6 29	17 25	0 25	1 21	...	.0	13 29	1.6
35	6 36	17 17	0 26	1 26	...	.0	13 40	1.5
40	6 45	17 9	0 28	1 32	23 56	3.1	13 53	1.3
45	6 55	16 59	0 31	1 40	23 42	3.3	14 8	1.1
50	7 7	16 47	0 34	1 50	23 25	3.5	14 27	.9
55	7 21	16 32	0 39	2 4	23 3	3.9	14 50	.6
60	7 41	16 12	0 46	2 23	22 32	4.4	15 22	.1
S								

UT	MESEC				JUPITER				SATURN							
	S <sub>♃</sub>		Δ		δ <sub>♃</sub>		Δ		S <sub>♃</sub>		δ <sub>♃</sub>		S <sub>♄</sub>		δ <sub>♄</sub>	
h	°	'	°	'	°	'	°	'	°	'	°	'	°	'	°	'
0	268	1.6	65	-23	23.5	102	28	32.4	-2	49.4	105	25.8	21	50.9		
2	296	52.7	67	-23	3.1	105	58	37.8	-2	49.2	135	30.3	21	50.8		
4	325	44.2	70	-22	42.1	108	88	43.2	-2	49.0	165	34.9	21	50.8		
6	354	36.1	72	-22	20.6	110	118	48.6	-2	48.8	195	39.4	21	50.7		
8	23	28.4	74	-21	58.5	113	148	54.0	-2	48.7	225	44.0	21	50.7		
10	52	21.1	76	-21	36.0	115	178	59.3	-2	48.5	255	48.6	21	50.6		
12	81	14.3	78	-21	12.9	118	209	4.7	-2	48.3	285	53.1	21	50.6		
14	110	7.8	80	-20	49.3	120	239	10.1	-2	48.1	315	57.7	21	50.5		
16	139	1.8	82	-20	25.3	123	269	15.5	-2	47.9	346	2.3	21	50.5		
18	167	56.2	84	-20	.8	125	299	20.9	-2	47.8	16	6.8	21	50.4		
20	196	51.0	86	-19	35.8	127	329	26.2	-2	47.6	46	11.4	21	50.4		
22	225	46.2	88	-19	10.4	129	359	31.6	-2	47.4	76	15.9	21	50.3		
Δ								27		1				23		0

SUNCE				MESEC					
UT	e = T <sub>p</sub> - UT	Δ/24	r	Prolaz	Δ/24	π <sub>☾</sub>	r		
h	min	s	s	h min	min	'	'		
00	2 52.8	.3	15.9	T <sub>m</sub>	6 22	2.3	59.3	16.2	
12	2 56.4	T <sub>m☉</sub>	11 h 57.1 min	Starost	22.1 d	Faza	☉		
PLANETE									
Pl.	T <sub>m</sub>	π	360-α	Vel.	Pl.	T <sub>m</sub>	π	360-α	Vel.
♀	h min	'	°	°	♃	h min	'	°	°
♁	12 30	.1	314	-3.8	♃	22 2	.0	170	-2.2
♂	7 34	.1	27	.6	♄	16 56	.0	246	.1

2. MAJ

PONEDELJAK

UT	SUNCE				PROLEĆ. TAČKA S <sub>γ</sub>	VENERA				MARS				
	S <sub>☉</sub>		δ <sub>☉</sub>			S <sub>♀</sub>		δ <sub>♀</sub>		S <sub>♂</sub>		δ <sub>♂</sub>		
h	°	'	°	'	°	'	°	'	°	'	°	'		
0	180	44.9	15	20.5	220	.3	172	24.9	17	21.6	246	43.2	-12	46.4
2	210	45.1	15	22.0	250	5.2	202	23.7	17	23.4	276	44.6	-12	45.2
4	240	45.2	15	23.5	280	10.1	232	22.5	17	25.2	306	46.0	-12	44.0
6	270	45.4	15	25.0	310	15.1	262	21.2	17	27.1	336	47.5	-12	42.7
8	300	45.5	15	26.5	340	20.0	292	20.0	17	28.9	6	48.9	-12	41.5
10	330	45.6	15	28.0	10	24.9	322	18.7	17	30.7	36	50.3	-12	40.3
12	0	45.8	15	29.5	40	29.9	352	17.5	17	32.5	66	51.7	-12	39.1
14	30	45.9	15	31.0	70	34.8	22	16.2	17	34.4	96	53.2	-12	37.9
16	60	46.0	15	32.4	100	39.7	52	15.0	17	36.2	126	54.6	-12	36.7
18	90	46.2	15	33.9	130	44.6	82	13.7	17	38.0	156	56.0	-12	35.5
20	120	46.3	15	35.4	160	49.6	112	12.5	17	39.8	186	57.5	-12	34.3
22	150	46.4	15	36.9	190	54.5	142	11.2	17	41.6	216	58.9	-12	33.0
Δ		1		7				-6		9		7		6

φ	SUNCE		TRAJANJE SUMRAKA		MESEC			
	IZLAZ	ZALAZ	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 55	20 0	0 54	:::	3 28	.0	11 23	4.3
55	4 18	19 37	0 43	3 13	3 0	.5	11 48	3.8
50	4 35	19 20	0 37	2 22	2 40	.8	12 6	3.5
45	4 48	19 7	0 33	1 59	2 24	1.0	12 20	3.2
40	4 59	18 56	0 29	1 44	2 11	1.2	12 31	3.0
35	5 8	18 46	0 27	1 34	1 60	1.4	12 41	2.9
30	5 16	18 38	0 25	1 27	1 50	1.5	12 50	2.7
20	5 30	18 24	0 23	1 18	1 33	1.7	13 4	2.5
10	5 42	18 12	0 22	1 13	1 18	1.9	13 17	2.3
0	5 54	18 0	0 21	1 11	1 4	2.1	13 29	2.1
10	6 5	17 49	0 22	1 12	0 50	2.3	13 41	1.9
20	6 16	17 37	0 23	1 15	0 35	2.5	13 53	1.6
30	6 30	17 24	0 25	1 21	0 18	2.8	14 7	1.4
35	6 37	17 16	0 26	1 26	0 7	2.9	14 15	1.3
40	6 46	17 8	0 28	1 32	...	.0	14 24	1.1
45	6 56	16 57	0 31	1 40	...	.0	14 35	.9
50	7 8	16 45	0 34	1 50	...	.0	14 48	.7
55	7 23	16 30	0 39	2 4	...	.0	15 3	.4
60	7 43	16 10	0 46	2 24	...	.0	15 24	.0
S								

UT	MESEC				JUPITER				SATURN							
	S <sub>♃</sub>		Δ		δ <sub>♃</sub>		Δ		S <sub>♃</sub>		δ <sub>♃</sub>		S <sub>♄</sub>		δ <sub>♄</sub>	
h	°	'	°	'	°	'	°	'	°	'	°	'	°	'	°	'
0	254	41.8	90	-18	44.6	131	29	37.0	-2	47.3	106	20.5	21	50.3		
2	283	37.7	92	-18	18.4	133	59	42.4	-2	47.1	136	25.0	21	50.2		
4	312	34.1	94	-17	51.7	135	89	47.7	-2	46.9	166	29.6	21	50.2		
6	341	30.9	96	-17	24.7	137	119	53.1	-2	46.7	196	34.2	21	50.1		
8	10	28.0	98	-16	57.4	139	149	58.5	-2	46.6	226	38.7	21	50.1		
10	39	25.5	99	-16	29.6	140	180	3.8	-2	46.4	256	43.3	21	50.0		
12	68	23.4	101	-16	1.6	142	210	9.2	-2	46.2	286	47.8	21	50.0		
14	97	21.6	103	-15	33.2	144	240	14.6	-2	46.0	316	52.4	21	49.9		
16	126	20.2	105	-15	4.5	145	270	19.9	-2	45.9	346	56.9	21	49.9		
18	155	19.1	106	-14	35.5	146	300	25.3	-2	45.7	17	1.5	21	49.8		
20	184	18.4	108	-14	6.2	148	330	30.7	-2	45.5	47	6.0	21	49.8		
22	213	18.0	110	-13	36.6	149	0	36.0	-2	45.4	77	10.6	21	49.7		
Δ								27		1				23		0

SUNCE				MESEC			
UT	e = T <sub>p</sub> - UT	Δ/24	r	Prolaz	Δ/24	π <sub>☾</sub>	r
h							

UT	SUNCE				PROLEĆ. TAČKA S <sub>γ</sub>	VENERA				MARS				
	S <sub>☉</sub>		δ <sub>☉</sub>			S <sub>♀</sub>		δ <sub>♀</sub>		S <sub>♂</sub>		δ <sub>♂</sub>		
h	°	'	°	'	°	'	°	'	°	'	°	'		
0	180	46.6	15	38.4	220	59.4	172	9.9	17	43.4	247	.3	-12	31.8
2	210	46.7	15	39.8	251	4.3	202	8.7	17	45.2	277	1.8	-12	30.6
4	240	46.8	15	41.3	281	9.3	232	7.4	17	47.0	307	3.2	-12	29.4
6	270	46.9	15	42.8	311	14.2	262	6.2	17	48.8	337	4.6	-12	28.2
8	300	47.1	15	44.2	341	19.1	292	4.9	17	50.6	7	6.1	-12	27.0
10	330	47.2	15	45.7	11	24.1	322	3.6	17	52.4	37	7.5	-12	25.7
12	0	47.3	15	47.2	41	29.0	352	2.4	17	54.2	67	8.9	-12	24.5
14	30	47.4	15	48.6	71	33.9	22	1.1	17	55.9	97	10.4	-12	23.3
16	60	47.6	15	50.1	101	38.8	51	59.8	17	57.7	127	11.8	-12	22.1
18	90	47.7	15	51.5	131	43.8	81	58.5	17	59.5	157	13.2	-12	20.9
20	120	47.8	15	53.0	161	48.7	111	57.2	18	1.3	187	14.7	-12	19.6
22	150	47.9	15	54.5	191	53.6	141	56.0	18	3.0	217	16.1	-12	18.4
Δ		1		7				-6		9		7		6

φ	SUNCE		TRAJANJE SUMRAKA		MESEC			
	IZLAZ	ZALAZ	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 3	0 55	:	3 28	.0	13 6	4.1
55	4 16	19 39	0 44	3 19	3 11	.3	13 19	3.7
50	4 33	19 22	0 37	2 23	2 59	.6	13 30	3.4
45	4 46	19 8	0 33	1 59	2 48	.9	13 38	3.1
40	4 58	18 57	0 30	1 45	2 40	1.0	13 44	2.9
35	5 7	18 47	0 27	1 35	2 32	1.2	13 50	2.8
30	5 15	18 39	0 26	1 28	2 26	1.3	13 55	2.6
20	5 30	18 24	0 23	1 18	2 15	1.6	14 4	2.4
10	5 42	18 12	0 22	1 13	2 5	1.8	14 11	2.2
0	5 53	18 0	0 21	1 11	1 55	2.0	14 18	2.0
10	6 5	17 49	0 22	1 12	1 46	2.2	14 25	1.8
20	6 17	17 37	0 23	1 15	1 36	2.4	14 33	1.5
30	6 30	17 23	0 25	1 21	1 24	2.7	14 41	1.3
35	6 38	17 15	0 26	1 26	1 18	2.8	14 45	1.2
40	6 47	17 6	0 28	1 32	1 10	3.0	14 51	1.0
45	6 57	16 56	0 31	1 40	1 1	3.2	14 57	.8
50	7 10	16 43	0 34	1 50	0 50	3.4	15 4	.6
55	7 25	16 28	0 39	2 5	0 37	3.7	15 13	.3
60	7 46	16 7	0 46	2 24	0 19	4.1	15 24	.0
S								

UT	MESEC				JUPITER				SATURN							
	S <sub>♃</sub>		Δ		δ <sub>♃</sub>		Δ		S <sub>♃</sub>		δ <sub>♃</sub>		S <sub>♄</sub>		δ <sub>♄</sub>	
h	°	'	°	'	°	'	°	'	°	'	°	'	°	'	°	'
0	242	17.9	111	-13	6.8	150	30	41.4	-2	45.2	107	15.1	21	49.7		
2	271	18.1	113	-12	36.7	152	60	46.8	-2	45.0	137	19.7	21	49.6		
4	300	18.6	114	-12	6.4	153	90	52.1	-2	44.9	167	24.2	21	49.6		
6	329	19.4	115	-11	35.9	154	120	57.5	-2	44.7	197	28.8	21	49.5		
8	358	20.5	117	-11	5.1	155	151	2.8	-2	44.5	227	33.3	21	49.5		
10	27	21.9	118	-10	34.2	156	181	8.2	-2	44.4	257	37.9	21	49.4		
12	56	23.5	119	-10	3.0	157	211	13.6	-2	44.2	287	42.4	21	49.4		
14	85	25.4	121	-9	31.7	157	241	18.9	-2	44.0	317	47.0	21	49.3		
16	114	27.5	122	-9	.2	158	271	24.3	-2	43.9	347	51.5	21	49.3		
18	143	29.8	123	-8	28.6	159	301	29.6	-2	43.7	17	56.1	21	49.2		
20	172	32.4	124	-7	56.8	159	331	35.0	-2	43.5	48	.6	21	49.2		
22	201	35.2	125	-7	25.0	160	1	40.3	-2	43.4	78	5.1	21	49.1		
Δ								27		1				23		0

SUNCE				MESEC					
UT	e = T <sub>p</sub> - UT	Δ/24	r	Prolaz	Δ/24	π <sub>☾</sub>	r		
h	min	s	s	h min	min	'	'		
00	3 12.4	.2	15.9	T <sub>m</sub>	8 7	2.0	58.9 16.0		
12	3 15.1	T <sub>m☉</sub>	11 h 56.8 min	Starost	24.1 d	Faza	☉		
PLANETE									
Pl.	T <sub>m</sub>	π	360-α	Vel.	Pl.	T <sub>m</sub>	π	360-α	Vel.
♀	h min	'	°		♃	h min	'	°	
♂	12 32	.1	311	-3.8	♄	21 53	.0	170	-2.2
	7 32	.1	26	.6	♅	16 48	.0	246	.1

UT	SUNCE				PROLEĆ. TAČKA S <sub>γ</sub>	VENERA				MARS				
	S <sub>☉</sub>		δ <sub>☉</sub>			S <sub>♀</sub>		δ <sub>♀</sub>		S <sub>♂</sub>		δ <sub>♂</sub>		
h	°	'	°	'	°	'	°	'	°	'	°	'		
0	180	48.1	15	55.9	221	58.6	171	54.7	18	4.8	247	17.5	-12	17.2
2	210	48.2	15	57.4	252	3.5	201	53.4	18	6.6	277	19.0	-12	16.0
4	240	48.3	15	58.8	282	8.4	231	52.1	18	8.3	307	20.4	-12	14.8
6	270	48.4	16	.3	312	13.3	261	50.8	18	10.1	337	21.9	-12	13.5
8	300	48.5	16	1.7	342	18.3	291	49.5	18	11.8	7	23.3	-12	12.3
10	330	48.6	16	3.1	12	23.2	321	48.2	18	13.6	37	24.7	-12	11.1
12	0	48.7	16	4.6	42	28.1	351	46.9	18	15.3	67	26.2	-12	9.9
14	30	48.9	16	6.0	72	33.1	21	45.6	18	17.1	97	27.6	-12	8.6
16	60	49.0	16	7.5	102	38.0	51	44.3	18	18.8	127	29.1	-12	7.4
18	90	49.1	16	8.9	132	42.9	81	43.0	18	20.5	157	30.5	-12	6.2
20	120	49.2	16	10.3	162	47.8	111	41.7	18	22.3	187	32.0	-12	4.9
22	150	49.3	16	11.8	192	52.8	141	40.4	18	24.0	217	33.4	-12	3.7
Δ		1		7				-6		9		7		6

φ	SUNCE		TRAJANJE SUMRAKA		MESEC			
	IZLAZ	ZALAZ	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 50	20 5	0 56	:	3 27	.0	14 44	4.0
55	4 14	19 41	0 44	3 25	3 20	.3	14 48	3.6
50	4 31	19 23	0 37	2 25	3 14	.6	14 51	3.3
45	4 45	19 9	0 33	2 0	3 9	.8	14 53	3.1
40	4 56	18 58	0 30	1 45	3 5	1.0	14 55	2.9
35	5 6	18 48	0 27	1 35	3 1	1.1	14 57	2.7
30	5 15	18 39	0 26	1 28	2 58	1.3	14 58	2.6
20	5 29	18 25	0 23	1 19	2 52	1.5	15 1	2.3
10	5 42	18 12	0 22	1 14	2 48	1.7	15 3	2.1
0	5 53	18 0	0 22	1 12	2 43	1.9	15 5	1.9
10	6 5	17 49	0 22	1 12	2 39	2.1	15 7	1.7
20	6 17	17 36	0 23	1 15	2 34	2.3	15 9	1.5
30	6 31	17 22	0 25	1 22	2 28	2.6	15 12	1.2
35	6 39	17 14	0 26	1 26	2 25	2.7	15 13	1.1
40	6 48	17 5	0 28	1 32	2 22	2.9	15 15	1.0
45	6 58	16 55	0 31	1 40	2 18	3.1	15 16	.8
50	7 11	16 42	0 34	1 51	2 13	3.3	15 18	.6
55	7 27	16 26	0 39	2 5	2 6	3.6	15 21	.3
60	7 48	16 4	0 46	2 25	1 58	4.0	15 24	.0
S								

UT	MESEC				JUPITER				SATURN							
	S <sub>♃</sub>		Δ		δ <sub>♃</sub>		Δ		S <sub>♃</sub>		δ <sub>♃</sub>		S <sub>♄</sub>		δ <sub>♄</sub>	
h	°	'	°	'	°	'	°	'	°	'	°	'	°	'	°	'
0	230	38.2	126	-6	53.0	161	31	45.7	-2	43.2	108	9.7	21	49.1		
2	259	41.3	127	-6	20.8	161	61	51.0	-2	43.0	138	14.2	21	49.0		
4	288	44.7	128	-5	48.6	161	91	56.4	-2	42.9	168	18.8	21	48.9		
6	317	48.2	128	-5	16.3	162	122	1.7	-2	42.7	198	23.3	21	48.9		
8	346	51.9	129	-4	44.0	162	152	7.1	-2	42.5	228	27.8	21	48.8		
10	15	55.8	130	-4	11.6	162	182	12.4	-2	42.4	258	32.4	21	48.8		
12	44	59.8	131	-3	39.1	163	212	17.8	-2	42.2	288	36.9	21	48.7		
14	74	3.9	131	-3	6.6	163	242	23.1	-2	42.1	318	41.5	21	48.7		
16	103	8.1	132	-2	34.1	163	272	28.5	-2	41.9	348	46.0	21	48.6		
18	132	12.4	132	-2	1.5	163	302	33.8	-2	41.7	18	50.5	21	48.6		
20	161	16.9	133	-1	29.0	163	332	39.2	-2	41.6	48	55.1	21	48.5		
22	190	21.4	133	-0	56.4	163	2	44.5	-2	41.4	78	59.6	21	48.5		
Δ								27		1				23		0

SUNCE				MESEC			
UT	e = T <sub>p</sub> - UT	Δ/24	r	Prolaz	Δ/24	π <sub>☾</sub>	r
h	min						

UT	SUNCE		PROLEĆ. TAČKA S <sub>γ</sub>	VENERA		MARS									
	S <sub>☉</sub>	δ <sub>☉</sub>		S <sub>♀</sub>	δ <sub>♀</sub>	S <sub>♂</sub>	δ <sub>♂</sub>								
h	°	'	°	'	'	°	'								
0	180	49.4	16	13.2	222	57.7	171	39.1	18	25.7	247	34.8	-12	2.5	
2	210	49.5	16	14.6	253	2.6	201	37.8	18	27.4	277	36.3	-12	1.3	
4	240	49.6	16	16.0	283	7.6	231	36.5	18	29.2	307	37.7	-12	.0	
6	270	49.7	16	17.5	313	12.5	261	35.2	18	30.9	337	39.2	-11	58.8	
8	300	49.8	16	18.9	343	17.4	291	33.9	18	32.6	7	40.6	-11	57.6	
10	330	49.9	16	20.3	13	22.3	321	32.6	18	34.3	37	42.1	-11	56.3	
12	0	50.0	16	21.7	43	27.3	351	31.3	18	36.0	67	43.5	-11	55.1	
14	30	50.1	16	23.2	73	32.2	21	29.9	18	37.7	97	45.0	-11	53.9	
16	60	50.2	16	24.6	103	37.1	51	28.6	18	39.4	127	46.4	-11	52.6	
18	90	50.3	16	26.0	133	42.1	81	27.3	18	41.1	157	47.9	-11	51.4	
20	120	50.4	16	27.4	163	47.0	111	26.0	18	42.8	187	49.3	-11	50.2	
22	150	50.5	16	28.8	193	51.9	141	24.6	18	44.5	217	50.8	-11	48.9	
Δ		1		7				-7		9		7			6

φ	SUNCE		TRAJANJE SUMRAKA		MESEC			
	IZLAZ	ZALAZ	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 8	0 56	:	3 27	.0	16 19	4.0
55	4 11	19 43	0 44	3 33	3 27	.3	16 14	3.6
50	4 29	19 25	0 38	2 26	3 27	.6	16 10	3.3
45	4 44	19 10	0 33	2 1	3 27	.8	16 7	3.1
40	4 55	18 59	0 30	1 46	3 28	1.0	16 4	2.9
35	5 5	18 49	0 27	1 36	3 28	1.1	16 2	2.7
30	5 14	18 40	0 26	1 28	3 28	1.2	16 0	2.6
20	5 29	18 25	0 23	1 19	3 28	1.5	15 57	2.3
10	5 41	18 12	0 22	1 14	3 29	1.7	15 54	2.1
0	5 53	18 0	0 22	1 12	3 29	1.9	15 51	1.9
10	6 5	17 48	0 22	1 12	3 30	2.1	15 48	1.7
20	6 17	17 36	0 23	1 15	3 30	2.3	15 45	1.5
30	6 31	17 22	0 25	1 22	3 31	2.6	15 42	1.3
35	6 40	17 13	0 26	1 26	3 31	2.7	15 40	1.1
40	6 49	17 4	0 28	1 32	3 31	2.9	15 37	1.0
45	6 60	16 53	0 31	1 40	3 32	3.1	15 35	.8
50	7 13	16 40	0 35	1 51	3 33	3.3	15 32	.6
55	7 29	16 24	0 39	2 5	3 33	3.6	15 28	.3
60	7 51	16 2	0 47	2 25	3 34	3.9	15 23	.0

UT	MESEC				JUPITER		SATURN								
	S <sub>♃</sub>	Δ	δ <sub>♃</sub>	Δ	S <sub>♃</sub>	δ <sub>♃</sub>	S <sub>♄</sub>	δ <sub>♄</sub>							
h	°	'	°	'	°	'	°	'							
0	219	26.0	133	-0	23.9	163	32	49.9	-2	41.3	109	4.1	21	48.4	
2	248	30.7	134	0	8.6	162	62	55.2	-2	41.1	139	8.7	21	48.4	
4	277	35.5	134	0	41.1	162	93	.5	-2	40.9	169	13.2	21	48.3	
6	306	40.3	134	1	13.5	162	123	5.9	-2	40.8	199	17.7	21	48.3	
8	335	45.1	134	1	45.9	161	153	11.2	-2	40.6	229	22.3	21	48.2	
10	4	50.0	134	2	18.1	161	183	16.6	-2	40.5	259	26.8	21	48.2	
12	33	54.8	134	2	50.4	161	213	21.9	-2	40.3	289	31.3	21	48.1	
14	62	59.7	135	3	22.5	160	243	27.2	-2	40.2	319	35.9	21	48.0	
16	92	4.6	134	3	54.5	160	273	32.6	-2	40.0	349	40.4	21	48.0	
18	121	9.5	134	4	26.4	159	303	37.9	-2	39.8	19	44.9	21	47.9	
20	150	14.4	134	4	58.2	158	333	43.2	-2	39.7	49	49.5	21	47.9	
22	179	19.3	134	5	29.9	158	3	48.6	-2	39.5	79	54.0	21	47.8	
Δ								27		1			23		0

SUNCE				MESEC				
UT	e = T <sub>p</sub> - UT	Δ/24	r	Prolaz	Δ/24	π <sub>♃</sub>	r	
h	min	s	s	h min	min	'	'	
00	3 17.8	.2	15.9	T <sub>m</sub>	9 40	1.9	58.2	15.8
12	3 20.2	T <sub>m☉</sub>	11 h 56.7 min	Starost	26.1 d	Faza	●	

PLANETE									
Pl.	T <sub>m</sub>	π	360-α	Vel.	Pl.	T <sub>m</sub>	π	360-α	Vel.
♀	h min	'	°		♃	h min	'	°	
♂	12 34	.1	309	-3.8	♄	21 45	.0	170	-2.2
♂	7 29	.1	25	.6	♄	16 41	.0	246	.1

UT	SUNCE		PROLEĆ. TAČKA S <sub>γ</sub>	VENERA		MARS									
	S <sub>☉</sub>	δ <sub>☉</sub>		S <sub>♀</sub>	δ <sub>♀</sub>	S <sub>♂</sub>	δ <sub>♂</sub>								
h	°	'	°	'	'	°	'								
0	180	50.6	16	30.2	223	56.8	171	23.3	18	46.2	247	52.2	-11	47.7	
2	210	50.7	16	31.6	254	1.8	201	22.0	18	47.8	277	53.7	-11	46.4	
4	240	50.8	16	33.0	284	6.7	231	20.6	18	49.5	307	55.1	-11	45.2	
6	270	50.9	16	34.4	314	11.6	261	19.3	18	51.2	337	56.6	-11	44.0	
8	300	51.0	16	35.8	344	16.6	291	18.0	18	52.9	7	58.1	-11	42.7	
10	330	51.1	16	37.2	14	21.5	321	16.6	18	54.5	37	59.5	-11	41.5	
12	0	51.2	16	38.6	44	26.4	351	15.3	18	56.2	68	1.0	-11	40.2	
14	30	51.2	16	40.0	74	31.3	21	13.9	18	57.8	98	2.4	-11	39.0	
16	60	51.3	16	41.4	104	36.3	51	12.6	18	59.5	128	3.9	-11	37.8	
18	90	51.4	16	42.8	134	41.2	81	11.2	19	1.2	158	5.3	-11	36.5	
20	120	51.5	16	44.2	164	46.1	111	9.9	19	2.8	188	6.8	-11	35.3	
22	150	51.6	16	45.6	194	51.0	141	8.5	19	4.4	218	8.3	-11	34.0	
Δ		0		7				-7		8		7			6

φ	SUNCE		TRAJANJE SUMRAKA		MESEC			
	IZLAZ	ZALAZ	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 45	20 10	0 57	:	3 26	.0	17 54	4.0
55	4 9	19 45	0 45	3 45	3 34	.3	17 39	3.6
50	4 28	19 26	0 38	2 28	3 41	.6	17 29	3.3
45	4 42	19 12	0 33	2 2	3 46	.8	17 20	3.1
40	4 54	18 60	0 30	1 46	3 51	1.0	17 13	2.9
35	5 4	18 49	0 27	1 36	3 54	1.2	17 7	2.7
30	5 13	18 41	0 26	1 28	3 58	1.3	17 2	2.6
20	5 28	18 25	0 23	1 19	4 4	1.5	16 52	2.3
10	5 41	18 12	0 22	1 14	4 10	1.7	16 44	2.1
0	5 53	18 0	0 22	1 12	4 15	1.9	16 37	2.0
10	6 5	17 48	0 22	1 12	4 20	2.1	16 29	1.8
20	6 18	17 35	0 23	1 15	4 26	2.3	16 21	1.6
30	6 32	17 21	0 25	1 22	4 32	2.6	16 12	1.3
35	6 40	17 12	0 27	1 26	4 36	2.7	16 7	1.2
40	6 50	17 3	0 29	1 33	4 40	2.9	16 1	1.1
45	7 1	16 52	0 31	1 41	4 45	3.1	15 54	.9
50	7 14	16 39	0 35	1 51	4 51	3.3	15 46	.7
55	7 31	16 22	0 40	2 5	4 59	3.6	15 36	.4
60	7 53	15 60	0 47	2 26	5 9	4.0	15 23	.0

UT	MESEC				JUPITER		SATURN								
	S <sub>♃</sub>	Δ	δ <sub>♃</sub>	Δ	S <sub>♃</sub>	δ <sub>♃</sub>	S <sub>♄</sub>	δ <sub>♄</sub>							
h	°	'	°	'	°	'	°	'							
0	208	24.1	134	6	1.4	157	33	53.9	-2	39.4	109	58.5	21	47.8	
2	237	28.9	134	6	32.8	156	63	59.2	-2	39.2	140	3.0	21	47.7	
4	266	33.6	133	7	4.0	155	94	4.6	-2	39.1	170	7.6	21	47.7	
6	295	38.3	133	7	35.1	154	124	9.9	-2	38.9	200	12.1	21	47.6	
8	324	42.9	133	8	6.0	153	154	15.2	-2	38.8	230	16.6	21	47.6	
10	353	47.4	132	8	36.6	152	184	20.5	-2	38.6	260	21.1	21	47.5	
12	22	51.8	132	9	7.1	151	214	25.9	-2	38.5	290	25.7	21	47.4	
14	51	56.2	131	9	37.4	150	244	31.2	-2	38.3	320	30.2	21	47.4	
16	81	.4	131	10	7.5	149	274	36.5	-2	38.2	350	34.7	21	47.3	
18	110	4.5	130	10	37.3	148	304	41.8	-2	38.0	20	39.2	21	47.3	
20	139	8.6	130	11	6.9	147	334	47.2	-2	37.9	50	43.8	21	47.2	
22	168	12.5	129	11	36.3	146	4	52.5	-2	37.7	80	48.3	21	47.2	
Δ								27		1			23		0

SUNCE				MESEC				
UT	e = T <sub>p</sub> - UT	Δ/24	r	Prolaz	Δ/24	π <sub>♃</sub>	r	
h	min	s	s	h min	min	'	'	
00	3 22.6	.2	15.9	T <sub>m</sub>	10 26	1.9	57.7	15.7
12	3 24.7	T <sub>m☉</sub>	11 h 56.6 min	Starost	27.1 d	Faza	●	

PLANETE							
Pl.	T <sub>m</sub>	π	360-α	Vel.	Pl.	T <sub>m</sub>	π

UT	SUNCE		PROLEĆ. TAČKA S <sub>γ</sub>	VENERA		MARS								
	S <sub>☉</sub>	δ <sub>☉</sub>		S <sub>♀</sub>	δ <sub>♀</sub>	S <sub>♂</sub>	δ <sub>♂</sub>							
h	°	'	°	'	°	'	°	'						
0	180	51.7	16	47.0	224	56.0	171	7.2	19	6.1	248	9.7	-11	32.8
2	210	51.8	16	48.3	255	.9	201	5.8	19	7.7	278	11.2	-11	31.6
4	240	51.8	16	49.7	285	5.8	231	4.5	19	9.4	308	12.6	-11	30.3
6	270	51.9	16	51.1	315	10.8	261	3.1	19	11.0	338	14.1	-11	29.1
8	300	52.0	16	52.5	345	15.7	291	1.8	19	12.6	8	15.6	-11	27.8
10	330	52.1	16	53.9	15	20.6	321	.4	19	14.3	38	17.0	-11	26.6
12	0	52.1	16	55.2	45	25.5	350	59.0	19	15.9	68	18.5	-11	25.3
14	30	52.2	16	56.6	75	30.5	20	57.7	19	17.5	98	20.0	-11	24.1
16	60	52.3	16	58.0	105	35.4	50	56.3	19	19.1	128	21.4	-11	22.8
18	90	52.4	16	59.3	135	40.3	80	54.9	19	20.7	158	22.9	-11	21.6
20	120	52.4	17	.7	165	45.3	110	53.6	19	22.3	188	24.4	-11	20.3
22	150	52.5	17	2.1	195	50.2	140	52.2	19	23.9	218	25.8	-11	19.1
Δ	0	7					-7	8			7	6		

φ	SUNCE		TRAJANJE SUMRAKA		MESEC			
	IZLAZ	ZALAZ	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 42	20 13	0 58	:	3 25	.0	19 30	4.1
55	4 7	19 47	0 45	:	3 42	.4	19 6	3.6
50	4 26	19 28	0 38	2 30	3 55	.7	18 48	3.3
45	4 41	19 13	0 33	2 3	4 6	.9	18 34	3.1
40	4 53	19 1	0 30	1 47	4 15	1.1	18 22	2.9
35	5 3	18 50	0 28	1 36	4 22	1.3	18 12	2.7
30	5 12	18 41	0 26	1 29	4 29	1.4	18 3	2.6
20	5 27	18 26	0 23	1 19	4 41	1.6	17 48	2.4
10	5 41	18 12	0 22	1 14	4 51	1.8	17 35	2.2
0	5 53	17 60	0 22	1 12	5 1	2.0	17 23	2.0
10	6 5	17 48	0 22	1 12	5 11	2.2	17 11	1.9
20	6 18	17 35	0 23	1 16	5 21	2.4	16 59	1.7
30	6 33	17 20	0 25	1 22	5 34	2.6	16 44	1.5
35	6 41	17 11	0 27	1 27	5 41	2.7	16 36	1.3
40	6 51	17 2	0 29	1 33	5 49	2.9	16 26	1.2
45	7 2	16 51	0 31	1 41	5 59	3.1	16 15	1.0
50	7 15	16 37	0 35	1 51	6 10	3.3	16 1	.8
55	7 33	16 20	0 40	2 6	6 25	3.6	15 45	.5
60	7 55	15 57	0 47	2 26	6 45	4.1	15 22	.0
S								

UT	MESEC				JUPITER		SATURN							
	S <sub>♃</sub>	Δ	δ <sub>♃</sub>	Δ	S <sub>♃</sub>	δ <sub>♃</sub>	S <sub>♄</sub>	δ <sub>♄</sub>						
h	°	'	°	'	°	'	°	'						
0	197	16.2	128	12	5.4	144	34	57.8	-2	37.6	110	52.8	21	47.1
2	226	19.9	128	12	34.2	143	65	3.1	-2	37.4	140	57.3	21	47.1
4	255	23.4	127	13	2.8	141	95	8.5	-2	37.3	171	1.8	21	47.0
6	284	26.8	126	13	31.0	140	125	13.8	-2	37.1	201	6.4	21	46.9
8	313	30.0	125	13	59.0	138	155	19.1	-2	37.0	231	10.9	21	46.9
10	342	33.0	124	14	26.7	137	185	24.4	-2	36.8	261	15.4	21	46.8
12	11	35.9	124	14	54.1	135	215	29.7	-2	36.7	291	19.9	21	46.8
14	40	38.6	123	15	21.1	134	245	35.0	-2	36.5	321	24.4	21	46.7
16	69	41.1	122	15	47.8	132	275	40.3	-2	36.4	351	28.9	21	46.7
18	98	43.5	121	16	14.2	130	305	45.7	-2	36.2	21	33.5	21	46.6
20	127	45.7	120	16	40.2	128	335	51.0	-2	36.1	51	38.0	21	46.5
22	156	47.7	119	17	5.9	127	5	56.3	-2	35.9	81	42.5	21	46.5
Δ							27	1			23	0		

SUNCE				MESEC					
UT	e = T <sub>p</sub> - UT	Δ/24	r	Prolaz	Δ/24	π <sub>♃</sub>	r		
h	min	s	s	h min	min	'	'		
00	3 26.9	.2	15.9	T <sub>m</sub>	11 12	2.0	57.2	15.6	
12	3 28.7	T <sub>m☉</sub>	11 h 56.5 min	Starost	28.1 d	Faza	●		
PLANETE									
Pl.	T <sub>m</sub>	π	360-α	Vel.	Pl.	T <sub>m</sub>	π	360-α	Vel.
♀	h min	'	°	°	♃	h min	'	°	°
♁	12 36	.1	306	-3.8	♃	21 36	.0	170	-2.2
♂	7 27	.1	23	.6	♄	16 34	.0	246	.1

UT	SUNCE		PROLEĆ. TAČKA S <sub>γ</sub>	VENERA		MARS								
	S <sub>☉</sub>	δ <sub>☉</sub>		S <sub>♀</sub>	δ <sub>♀</sub>	S <sub>♂</sub>	δ <sub>♂</sub>							
h	°	'	°	'	°	'	°	'						
0	180	52.6	17	3.4	225	55.1	170	50.8	19	25.5	248	27.3	-11	17.8
2	210	52.7	17	4.8	256	.0	200	49.4	19	27.1	278	28.8	-11	16.6
4	240	52.7	17	6.1	286	5.0	230	48.0	19	28.7	308	30.2	-11	15.3
6	270	52.8	17	7.5	316	9.9	260	46.7	19	30.3	338	31.7	-11	14.1
8	300	52.9	17	8.8	346	14.8	290	45.3	19	31.9	8	33.2	-11	12.8
10	330	52.9	17	10.2	16	19.8	320	43.9	19	33.5	38	34.6	-11	11.6
12	0	53.0	17	11.5	46	24.7	350	42.5	19	35.0	68	36.1	-11	10.3
14	30	53.1	17	12.9	76	29.6	20	41.1	19	36.6	98	37.6	-11	9.1
16	60	53.1	17	14.2	106	34.5	50	39.7	19	38.2	128	39.1	-11	7.8
18	90	53.2	17	15.6	136	39.5	80	38.3	19	39.8	158	40.5	-11	6.6
20	120	53.2	17	16.9	166	44.4	110	36.9	19	41.3	188	42.0	-11	5.3
22	150	53.3	17	18.3	196	49.3	140	35.5	19	42.9	218	43.5	-11	4.1
Δ	0	7					-7	8			7	6		

φ	SUNCE		TRAJANJE SUMRAKA		MESEC			
	IZLAZ	ZALAZ	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 39	20 15	0 58	:	3 26	.1	21 9	4.2
55	4 5	19 49	0 45	:	3 53	.6	20 33	3.5
50	4 25	19 29	0 38	2 31	4 13	.9	20 7	3.2
45	4 40	19 14	0 33	2 3	4 28	1.1	19 47	3.0
40	4 52	19 2	0 30	1 47	4 41	1.3	19 31	2.8
35	5 2	18 51	0 28	1 37	4 53	1.4	19 17	2.7
30	5 11	18 42	0 26	1 29	5 2	1.6	19 6	2.6
20	5 27	18 26	0 23	1 19	5 19	1.7	18 46	2.4
10	5 40	18 13	0 22	1 14	5 34	1.9	18 28	2.3
0	5 53	17 60	0 22	1 12	5 49	2.1	18 12	2.1
10	6 5	17 47	0 22	1 13	6 3	2.2	17 56	2.0
20	6 19	17 34	0 23	1 16	6 18	2.4	17 39	1.8
30	6 33	17 19	0 25	1 22	6 36	2.6	17 19	1.7
35	6 42	17 11	0 27	1 27	6 46	2.7	17 8	1.5
40	6 52	17 1	0 29	1 33	6 58	2.9	16 55	1.4
45	7 3	16 49	0 31	1 41	7 12	3.0	16 39	1.3
50	7 17	16 35	0 35	1 52	7 29	3.3	16 21	1.0
55	7 34	16 18	0 40	2 6	7 52	3.6	15 57	.7
60	7 58	15 55	0 47	2 27	8 23	4.2	15 23	.1
S								

UT	MESEC				JUPITER		SATURN							
	S <sub>♃</sub>	Δ	δ <sub>♃</sub>	Δ	S <sub>♃</sub>	δ <sub>♃</sub>	S <sub>♄</sub>	δ <sub>♄</sub>						
h	°	'	°	'	°	'	°	'						
0	185	49.5	118	17	31.2	125	36	1.6	-2	35.8	111	47.0	21	46.4
2	214	51.1	117	17	56.2	123	66	6.9	-2	35.7	141	51.5	21	46.4
4	243	52.5	116	18	20.7	121	96	12.2	-2	35.5	171	56.0	21	46.3
6	272	53.8	115	18	44.9	119	126	17.5	-2	35.4	202	.5	21	46.3
8	301	54.8	114	19	8.6	117	156	22.8	-2	35.2	232	5.0	21	46.2
10	330	55.6	113	19	32.0	115	186	28.1	-2	35.1	262	9.6	21	46.1
12	359	56.2	112	19	54.9	113	216	33.4	-2	34.9	292	14.1	21	46.1
14	28	56.6	111	20	17.4	110	246	38.7	-2	34.8	322	18.6	21	46.0
16	57	56.9	110	20	39.5	108	276	44.0	-2	34.7	352	23.1	21	46.0
18	86	56.9	109	21	1.1	106	306	49.3	-2	34.5	22	27.6	21	45.9
20	115	56.7	108	21	22.3	104	336	54.6	-2	34.4	52	32.1	21	45.9
22	144	56.3	107	21	43.1	101	6	59.9	-2	34.2	82	36.6	21	45.8
Δ							27	1			23	0		

SUNCE				MESEC				
UT	e = T <sub>p</sub> - UT	Δ/24	r	Prolaz	Δ/24	π <sub>♃</sub>	r	
h	min	s	s	h min	min	'	'	
00	3 30.5	.1	15.9	T <sub>m</sub>	12 0	2.1	56.7	15.4
12	3 32.1	T <sub>m☉</sub>	11 h 56.5 min	Starost	29.1 d	Faza	●	

UT	SUNCE		PROLEĆ. TAČKA S <sub>γ</sub>	VENERA		MARS	
	S <sub>☉</sub>	δ <sub>☉</sub>		S <sub>♀</sub>	δ <sub>♀</sub>	S <sub>♂</sub>	δ <sub>♂</sub>
h	° / ' / "	° / ' / "	° / ' / "	° / ' / "	° / ' / "	° / ' / "	° / ' / "
0	180 53.4	17 19.6	226 54.3	170 34.1	19 44.4	248 44.9	-11 2.8
2	210 53.4	17 20.9	256 59.2	200 32.7	19 46.0	278 46.4	-11 1.5
4	240 53.5	17 22.3	287 4.1	230 31.3	19 47.5	308 47.9	-11 1.3
6	270 53.5	17 23.6	317 9.0	260 29.9	19 49.1	338 49.4	-10 59.0
8	300 53.6	17 24.9	347 14.0	290 28.5	19 50.6	8 50.9	-10 57.8
10	330 53.6	17 26.3	17 18.9	320 27.1	19 52.2	38 52.3	-10 56.5
12	0 53.7	17 27.6	47 23.8	350 25.7	19 53.7	68 53.8	-10 55.3
14	30 53.8	17 28.9	77 28.8	20 24.3	19 55.2	98 55.3	-10 54.0
16	60 53.8	17 30.2	107 33.7	50 22.9	19 56.8	128 56.8	-10 52.7
18	90 53.9	17 31.5	137 38.6	80 21.4	19 58.3	158 58.3	-10 51.5
20	120 53.9	17 32.9	167 43.5	110 20.0	19 59.8	188 59.7	-10 50.2
22	150 53.9	17 34.2	197 48.5	140 18.6	20 1.3	219 1.2	-10 49.0
Δ	0	7		-7	8	7	6

ϕ	SUNCE		TRAJANJE SUMRAKA		MESEC			
	IZLAZ	ZALAZ	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 18	0 59	:	3 28	.3	22 49	3.9
55	4 3	19 51	0 46	:	4 7	.9	21 57	3.2
50	4 23	19 31	0 38	2 33	4 34	1.2	21 23	2.9
45	4 38	19 15	0 34	2 4	4 55	1.4	20 58	2.8
40	4 51	19 3	0 30	1 48	5 13	1.5	20 38	2.7
35	5 1	18 52	0 28	1 37	5 27	1.7	20 22	2.6
30	5 11	18 43	0 26	1 29	5 40	1.8	20 7	2.5
20	5 27	18 27	0 23	1 19	6 1	1.9	19 43	2.4
10	5 40	18 13	0 22	1 14	6 20	2.0	19 22	2.3
0	5 53	17 60	0 22	1 12	6 38	2.2	19 3	2.2
10	6 6	17 47	0 22	1 13	6 56	2.3	18 44	2.1
20	6 19	17 34	0 23	1 16	7 16	2.4	18 23	2.0
30	6 34	17 19	0 25	1 22	7 38	2.5	17 59	1.9
35	6 43	17 10	0 27	1 27	7 51	2.6	17 45	1.8
40	6 53	16 60	0 29	1 33	8 6	2.8	17 29	1.7
45	7 4	16 48	0 31	1 41	8 25	2.9	17 10	1.6
50	7 18	16 34	0 35	1 52	8 48	3.1	16 46	1.4
55	7 36	16 16	0 40	2 6	9 18	3.4	16 14	1.1
60	7 60	15 52	0 48	2 27	10 4	4.1	15 27	.4
S								

UT	MESEC				JUPITER		SATURN	
	S <sub>♃</sub>	Δ	δ <sub>♃</sub>	Δ	S <sub>♃</sub>	δ <sub>♃</sub>	S <sub>♄</sub>	δ <sub>♄</sub>
h	° / ' / "	° / ' / "	° / ' / "	° / ' / "	° / ' / "	° / ' / "	° / ' / "	° / ' / "
0	173 55.7	106 22 3.3	99	37 5.2	-2 34.1	112 41.1	21 45.7	
2	202 54.9	105 22 23.1	97	67 10.5	-2 34.0	142 45.6	21 45.7	
4	231 53.9	104 22 42.5	94	97 15.8	-2 33.8	172 50.1	21 45.6	
6	260 52.7	103 23 1.3	92	127 21.1	-2 33.7	202 54.6	21 45.6	
8	289 51.3	102 23 19.6	89	157 26.4	-2 33.5	232 59.1	21 45.5	
10	318 49.8	101 23 37.5	87	187 31.7	-2 33.4	263 3.6	21 45.4	
12	347 48.0	100 23 54.8	84	217 37.0	-2 33.3	293 8.1	21 45.4	
14	16 46.1	99 24 11.7	82	247 42.3	-2 33.1	323 12.6	21 45.3	
16	45 43.9	99 24 28.0	79	277 47.6	-2 33.0	353 17.1	21 45.3	
18	74 41.6	98 24 43.8	76	307 52.9	-2 32.9	23 21.6	21 45.2	
20	103 39.2	97 24 59.1	74	337 58.1	-2 32.7	53 26.1	21 45.1	
22	132 36.6	96 25 13.8	71	8 3.4	-2 32.6	83 30.6	21 45.1	
Δ				26	1	23	0	

SUNCE				MESEC					
UT	e = T <sub>p</sub> - UT	Δ/24	r	Prolaz	Δ/24	π <sub>☾</sub>	r		
h	min s	s	'	h min	min	'	'		
00	3 33.6	.1	15.9	T <sub>m</sub>	12 51	2.2	56.1 15.3		
12	3 34.9	T <sub>m☉</sub>	11 h 56.4 min	Starost	.6 d	Faza	●		
PLANETE									
Pl.	T <sub>m</sub>	π	360-α	Vel.	Pl.	T <sub>m</sub>	π	360-α	Vel.
♀	h min	'	°		♃	h min	'	°	
♁	12 38	.1	304	-3.8	♃	21 28	.0	170	-2.2
♂	7 25	.1	22	.5	♄	16 27	.0	246	.2

UT	SUNCE		PROLEĆ. TAČKA S <sub>γ</sub>	VENERA		MARS	
	S <sub>☉</sub>	δ <sub>☉</sub>		S <sub>♀</sub>	δ <sub>♀</sub>	S <sub>♂</sub>	δ <sub>♂</sub>
h	° / ' / "	° / ' / "	° / ' / "	° / ' / "	° / ' / "	° / ' / "	° / ' / "
0	180 54.0	17 35.5	227 53.4	170 17.2	20 2.8	249 2.7	-10 47.7
2	210 54.0	17 36.8	257 58.3	200 15.8	20 4.3	279 4.2	-10 46.4
4	240 54.1	17 38.1	288 3.2	230 14.3	20 5.8	309 5.7	-10 45.2
6	270 54.1	17 39.4	318 8.2	260 12.9	20 7.3	339 7.1	-10 43.9
8	300 54.2	17 40.7	348 13.1	290 11.5	20 8.8	9 8.6	-10 42.7
10	330 54.2	17 42.0	18 18.0	320 10.0	20 10.3	39 10.1	-10 41.4
12	0 54.3	17 43.3	48 23.0	350 8.6	20 11.8	69 11.6	-10 40.1
14	30 54.3	17 44.6	78 27.9	20 7.2	20 13.3	99 13.1	-10 38.9
16	60 54.3	17 45.9	108 32.8	50 5.7	20 14.8	129 14.6	-10 37.6
18	90 54.4	17 47.2	138 37.7	80 4.3	20 16.3	159 16.1	-10 36.3
20	120 54.4	17 48.5	168 42.7	110 2.9	20 17.7	189 17.6	-10 35.1
22	150 54.5	17 49.8	198 47.6	140 1.4	20 19.2	219 19.0	-10 33.8
Δ	0	6		-7	7	7	6

ϕ	SUNCE		TRAJANJE SUMRAKA		MESEC			
	IZLAZ	ZALAZ	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 34	20 20	0 60	:	3 35	.7	...	.0
55	4 1	19 53	0 46	:	4 28	1.3	23 14	2.6
50	4 21	19 32	0 39	2 35	5 3	1.6	22 34	2.5
45	4 37	19 17	0 34	2 5	5 29	1.7	22 5	2.4
40	4 50	19 4	0 30	1 48	5 50	1.8	21 42	2.4
35	5 1	18 53	0 28	1 37	6 7	1.9	21 24	2.4
30	5 10	18 43	0 26	1 29	6 22	2.0	21 8	2.3
20	5 26	18 27	0 23	1 20	6 47	2.1	20 40	2.3
10	5 40	18 13	0 23	1 14	7 9	2.1	20 17	2.3
0	5 53	17 60	0 22	1 12	7 30	2.2	19 55	2.2
10	6 6	17 47	0 22	1 13	7 51	2.3	19 34	2.2
20	6 19	17 33	0 23	1 16	8 13	2.3	19 11	2.1
30	6 35	17 18	0 25	1 22	8 39	2.4	18 44	2.1
35	6 44	17 9	0 27	1 27	8 55	2.5	18 28	2.0
40	6 54	16 59	0 29	1 33	9 12	2.5	18 9	2.0
45	7 5	16 47	0 31	1 41	9 34	2.6	17 47	1.9
50	7 20	16 32	0 35	1 52	10 2	2.7	17 19	1.8
55	7 38	16 14	0 40	2 7	10 40	2.9	16 40	1.7
60	8 2	15 50	0 48	2 28	11 42	3.5	15 37	1.1
S								

UT	MESEC				JUPITER		SATURN	
	S <sub>♃</sub>	Δ	δ <sub>♃</sub>	Δ	S <sub>♃</sub>	δ <sub>♃</sub>	S <sub>♄</sub>	δ <sub>♄</sub>
h	° / ' / "	° / ' / "	° / ' / "	° / ' / "	° / ' / "	° / ' / "	° / ' / "	° / ' / "
0	161 33.8	95 25 28.0	68	38 8.7	-2 32.5	113 35.1	21 45.0	
2	190 30.9	95 25 41.7	66	68 14.0	-2 32.3	143 39.6	21 45.0	
4	219 27.8	94 25 54.8	63	98 19.3	-2 32.2	173 44.1	21 44.9	
6	248 24.6	93 26 7.3	60	128 24.6	-2 32.1	203 48.6	21 44.8	
8	277 21.3	93 26 19.3	57	158 29.9	-2 31.9	233 53.1	21 44.8	
10	306 17.8	92 26 30.8	54	188 35.1	-2 31.8	263 57.6	21 44.7	
12	335 14.3	92 26 41.6	52	218 40.4	-2 31.7	294 2.1	21 44.7	
14	4 10.6	91 26 52.0	49	248 45.7	-2 31.5	324 6.6	21 44.6	
16	33 6.8	91 27 1.7	46	278 51.0	-2 31.4	354 11.1	21 44.5	
18	62 3.0	90 27 10.9	43	308 56.2	-2 31.3	24 15.6	21 44.5	
20	90 59.1	90 27 19.5	40	339 1.5	-2 31.2	54 20.1	21 44.4	
22	119 55.1	90 27 27.5	37	9 6.8	-2 31.0	84 24.6	21 44.4	
Δ				26	1	22	0	

SUNCE				MESEC					
UT	e = T <sub>p</sub> - UT	Δ/24	r	Prolaz	Δ/24	π <sub>☾</sub>	r		
h	min s	s	'	h min	min	'	'		
00	3 36.2	.1	15.9	T <sub>m</sub>	13 43	2.2	55.6 15.1		
12	3 37.1	T <sub>m☉</sub>	11 h 56.4 min	Starost	1.6 d	Faza	●		
PLANETE									
Pl.	T <sub>m</sub>	π	360-α	Vel.	Pl.	T <sub>m</sub>	π	360-α	Vel.
♀	h min	'	°		♃	h min	'	°	
♁	12 39	.1	302	-3.8	♃	21 24	.0	170	-2.2
♂	7 23	.1	21	.5	♄	16 23	.0	246	.2

UT	SUNCE		PROLEĆ. TAČKA S <sub>γ</sub>	VENERA		MARS		
	S <sub>☉</sub>	δ <sub>☉</sub>		S <sub>♀</sub>	δ <sub>♀</sub>	S <sub>♂</sub>	δ <sub>♂</sub>	
h	°	'	°	'	°	'	°	'
0	180 54.5	17 51.1	228 52.5	169 60.0	20 20.7	249 20.5	-10 32.5	
2	210 54.5	17 52.4	258 57.5	199 58.5	20 22.1	279 22.0	-10 31.3	
4	240 54.6	17 53.7	289 2.4	229 57.1	20 23.6	309 23.5	-10 30.0	
6	270 54.6	17 54.9	319 7.3	259 55.6	20 25.0	339 25.0	-10 28.7	
8	300 54.6	17 56.2	349 12.2	289 54.2	20 26.5	9 26.5	-10 27.5	
10	330 54.6	17 57.5	19 17.2	319 52.7	20 27.9	39 28.0	-10 26.2	
12	0 54.7	17 58.8	49 22.1	349 51.3	20 29.4	69 29.5	-10 24.9	
14	30 54.7	18 .0	79 27.0	19 49.8	20 30.8	99 31.0	-10 23.6	
16	60 54.7	18 1.3	109 32.0	49 48.3	20 32.3	129 32.5	-10 22.4	
18	90 54.8	18 2.6	139 36.9	79 46.9	20 33.7	159 34.0	-10 21.1	
20	120 54.8	18 3.9	169 41.8	109 45.4	20 35.1	189 35.5	-10 19.8	
22	150 54.8	18 5.1	199 46.7	139 43.9	20 36.5	219 37.0	-10 18.6	
Δ	0	6		-7	7	7	6	

φ	SUNCE		TRAJANJE SUMRAKA		MESEC			
	IZLAZ	ZALAZ	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 32	20 23	1 1	:::	3 52	1.7	0 23	2.9
55	3 60	19 54	0 47	:::	5 1	2.0	...	.0
50	4 20	19 34	0 39	2 37	5 41	2.1	23 34	2.0
45	4 36	19 18	0 34	2 6	6 11	2.1	23 3	2.0
40	4 49	19 5	0 30	1 49	6 34	2.1	22 40	2.1
35	4 60	18 54	0 28	1 38	6 53	2.2	22 20	2.1
30	5 9	18 44	0 26	1 30	7 9	2.2	22 4	2.1
20	5 26	18 27	0 24	1 20	7 37	2.2	21 35	2.1
10	5 40	18 13	0 22	1 14	8 1	2.2	21 11	2.2
0	5 53	17 60	0 22	1 12	8 23	2.2	20 49	2.2
10	6 6	17 47	0 22	1 13	8 45	2.2	20 26	2.2
20	6 20	17 33	0 23	1 16	9 9	2.2	20 2	2.2
30	6 35	17 17	0 25	1 22	9 37	2.2	19 33	2.2
35	6 44	17 8	0 27	1 27	9 54	2.2	19 17	2.3
40	6 55	16 58	0 29	1 33	10 13	2.2	18 57	2.3
45	7 7	16 46	0 32	1 42	10 37	2.2	18 33	2.3
50	7 21	16 31	0 35	1 52	11 7	2.2	18 3	2.3
55	7 40	16 12	0 40	2 7	11 50	2.2	17 20	2.3
60	8 4	15 48	0 48	2 28	13 7	2.1	16 3	2.4
S								

UT	MESEC				JUPITER		SATURN	
	S <sub>♃</sub>	Δ	δ <sub>♃</sub>	Δ	S <sub>♃</sub>	δ <sub>♃</sub>	S <sub>♄</sub>	δ <sub>♄</sub>
h	°	'	°	'	°	'	°	'
0	148 51.1	90 27 34.9	34	39 12.1	- 2 30.9	114 29.1	21 44.3	
2	177 47.0	89 27 41.8	31	69 17.3	- 2 30.8	144 33.6	21 44.2	
4	206 42.9	89 27 48.1	29	99 22.6	- 2 30.6	174 38.1	21 44.2	
6	235 38.8	89 27 53.8	26	129 27.9	- 2 30.5	204 42.6	21 44.1	
8	264 34.6	89 27 58.9	23	159 33.2	- 2 30.4	234 47.1	21 44.0	
10	293 30.5	89 28 3.4	20	189 38.4	- 2 30.3	264 51.5	21 44.0	
12	322 26.4	89 28 7.4	17	219 43.7	- 2 30.1	294 56.0	21 43.9	
14	351 22.2	90 28 10.8	14	249 49.0	- 2 30.0	325 .5	21 43.9	
16	20 18.2	90 28 13.5	11	279 54.2	- 2 29.9	355 5.0	21 43.8	
18	49 14.1	90 28 15.7	8	309 59.5	- 2 29.8	25 9.5	21 43.7	
20	78 10.1	90 28 17.4	5	340 4.8	- 2 29.6	55 14.0	21 43.7	
22	107 6.2	91 28 18.4	2	10 10.0	- 2 29.5	85 18.5	21 43.6	
Δ				26	1	22	0	

SUNCE				MESEC					
UT	e = T <sub>p</sub> - UT	Δ/24	r	Prolaz	Δ/24	π <sub>☾</sub>	r		
h	min	s	s	h min	min	'	'		
00	3 38.1	.1	15.9	T <sub>m</sub>	14 36	2.2	55.1 15.0		
12	3 38.8	T <sub>m☉</sub>	11 h 56.4 min	Starost	2.6 d	Faza ●			
PLANETE									
Pl.	T <sub>m</sub>	π	360-α	Vel.	Pl.	T <sub>m</sub>	π	360-α	Vel.
♀	h min	'	°		♃	h min	'	°	
♂	12 41	.1	301	-3.8	♄	21 19	.0	170	-2.2
	7 22	.1	20	.5	♅	16 20	.0	246	.2

UT	SUNCE		PROLEĆ. TAČKA S <sub>γ</sub>	VENERA		MARS		
	S <sub>☉</sub>	δ <sub>☉</sub>		S <sub>♀</sub>	δ <sub>♀</sub>	S <sub>♂</sub>	δ <sub>♂</sub>	
h	°	'	°	'	°	'	°	'
0	180 54.8	18 6.4	229 51.7	169 42.5	20 38.0	249 38.5	-10 17.3	
2	210 54.9	18 7.6	259 56.6	199 41.0	20 39.4	279 40.0	-10 16.0	
4	240 54.9	18 8.9	290 1.5	229 39.5	20 40.8	309 41.5	-10 14.7	
6	270 54.9	18 10.2	320 6.5	259 38.1	20 42.2	339 43.0	-10 13.5	
8	300 54.9	18 11.4	350 11.4	289 36.6	20 43.6	9 44.5	-10 12.2	
10	330 54.9	18 12.7	20 16.3	319 35.1	20 45.0	39 46.0	-10 10.9	
12	0 55.0	18 13.9	50 21.2	349 33.6	20 46.4	69 47.5	-10 9.6	
14	30 55.0	18 15.2	80 26.2	19 32.2	20 47.8	99 49.0	-10 8.4	
16	60 55.0	18 16.4	110 31.1	49 30.7	20 49.2	129 50.5	-10 7.1	
18	90 55.0	18 17.7	140 36.0	79 29.2	20 50.6	159 52.0	-10 5.8	
20	120 55.0	18 18.9	170 41.0	109 27.7	20 51.9	189 53.5	-10 4.5	
22	150 55.0	18 20.1	200 45.9	139 26.2	20 53.3	219 55.0	-10 3.3	
Δ	0	6		-7	7	8	6	

φ	SUNCE		TRAJANJE SUMRAKA		MESEC			
	IZLAZ	ZALAZ	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 29	20 25	1 2	:::	4 33	3.1	1 32	1.5
55	3 58	19 56	0 47	:::	5 49	2.7	0 16	1.8
50	4 18	19 35	0 39	2 39	6 31	2.5	...	.0
45	4 34	19 19	0 34	2 7	7 1	2.4	23 52	1.6
40	4 48	19 6	0 30	1 49	7 25	2.4	23 29	1.7
35	4 59	18 54	0 28	1 38	7 44	2.3	23 10	1.8
30	5 9	18 45	0 26	1 30	8 1	2.3	22 54	1.8
20	5 25	18 28	0 24	1 20	8 29	2.2	22 27	1.9
10	5 40	18 13	0 22	1 15	8 53	2.2	22 3	2.0
0	5 53	17 60	0 22	1 12	9 16	2.1	21 41	2.1
10	6 6	17 47	0 22	1 13	9 38	2.1	21 19	2.2
20	6 20	17 32	0 23	1 16	10 3	2.0	20 55	2.3
30	6 36	17 16	0 25	1 22	10 31	2.0	20 27	2.4
35	6 45	17 7	0 27	1 27	10 47	1.9	20 11	2.4
40	6 56	16 57	0 29	1 34	11 7	1.9	19 52	2.5
45	7 8	16 44	0 32	1 42	11 30	1.8	19 28	2.6
50	7 23	16 30	0 35	1 53	12 1	1.7	18 58	2.7
55	7 41	16 11	0 41	2 8	12 43	1.5	18 16	2.9
60	8 7	15 45	0 49	2 29	13 58	.9	17 1	3.5
S								

UT	MESEC				JUPITER		SATURN	
	S <sub>♃</sub>	Δ	δ <sub>♃</sub>	Δ	S <sub>♃</sub>	δ <sub>♃</sub>	S <sub>♄</sub>	δ <sub>♄</sub>
h	°	'	°	'	°	'	°	'
0	136 2.3	91 28 18.9	0	40 15.3	- 2 29.4	115 23.0	21 43.6	
2	164 58.6	92 28 18.8	-3	70 20.5	- 2 29.3	145 27.4	21 43.5	
4	193 54.9	92 28 18.1	-6	100 25.8	- 2 29.1	175 31.9	21 43.4	
6	222 51.3	93 28 16.9	-9	130 31.1	- 2 29.0	205 36.4	21 43.4	
8	251 47.9	93 28 15.1	-12	160 36.3	- 2 28.9	235 40.9	21 43.3	
10	280 44.5	94 28 12.7	-15	190 41.6	- 2 28.8	265 45.4	21 43.2	
12	309 41.3	95 28 9.7	-17	220 46.8	- 2 28.7	295 49.9	21 43.2	
14	338 38.3	95 28 6.2	-20	250 52.1	- 2 28.5	325 54.3	21 43.1	
16	7 35.4	96 28 2.2	-23	280 57.3	- 2 28.4	355 58.8	21 43.0	
18	36 32.6	97 27 57.6	-26	311 2.6	- 2 28.3	26 3.3	21 43.0	
20	65 30.1	98 27 52.4	-28	341 7.8	- 2 28.2	56 7.8	21 42.9	
22	94 27.7	99 27 46.7	-31	11 13.1	- 2 28.1	86 12.3	21 42.9	
Δ				26	1	22	0	

SUNCE				MESEC					
UT	e = T <sub>p</sub> - UT	Δ/24	r	Prolaz	Δ/24	π <sub>☾</sub>	r		
h	min	s	s	h min	min	'	'		
00	3 39.5	.0	15.9	T <sub>m</sub>	15 29	2.1	54.7 14.9		
12	3 39.9	T <sub>m☉</sub>	11 h 56.3 min	Starost	3.6 d	Faza ●			
PLANETE									
Pl.	T <sub>m</sub>	π	360-α	Vel.	Pl.	T <sub>m</sub>	π	360-α	Vel.
♀	h min	'	°		♃	h min	'	°	
♂	12 42	.1	300	-3.8	♄	21 15	.0	170	-2.2
	7 21	.1	20	.5	♅	16 16	.0	246	.2

UT	SUNCE		PROLEĆ. TAČKA S <sub>γ</sub>	VENERA		MARS								
	S <sub>☉</sub>	δ <sub>☉</sub>		S <sub>♀</sub>	δ <sub>♀</sub>	S <sub>♂</sub>	δ <sub>♂</sub>							
h	°	'	°	'	°	'	°	'						
0	180	55.0	18	21.4	230	50.8	169	24.7	20	54.7	249	56.5	-10	2.0
2	210	55.1	18	22.6	260	55.7	199	23.2	20	56.1	279	58.0	-10	.7
4	240	55.1	18	23.8	291	.7	229	21.7	20	57.4	309	59.5	-9	59.4
6	270	55.1	18	25.1	321	5.6	259	20.2	20	58.8	340	1.0	-9	58.2
8	300	55.1	18	26.3	351	10.5	289	18.7	21	.1	10	2.5	-9	56.9
10	330	55.1	18	27.5	21	15.5	319	17.2	21	1.5	40	4.0	-9	55.6
12	0	55.1	18	28.7	51	20.4	349	15.7	21	2.8	70	5.5	-9	54.3
14	30	55.1	18	30.0	81	25.3	19	14.2	21	4.2	100	7.0	-9	53.0
16	60	55.1	18	31.2	111	30.2	49	12.7	21	5.5	130	8.5	-9	51.8
18	90	55.1	18	32.4	141	35.2	79	11.2	21	6.9	160	10.0	-9	50.5
20	120	55.1	18	33.6	171	40.1	109	9.7	21	8.2	190	11.6	-9	49.2
22	150	55.1	18	34.8	201	45.0	139	8.2	21	9.5	220	13.1	-9	47.9
Δ	0	6						-8	7		8			6

φ	SUNCE		TRAJANJE SUMRAKA		MESEC			
	IZLAZ	ZALAZ	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 27	20 27	1 2	:::	5 46	3.7	2 8	.6
55	3 56	19 58	0 47	:::	6 52	3.1	1 1	1.2
50	4 17	19 37	0 39	2 41	7 32	2.8	0 21	1.5
45	4 33	19 20	0 34	2 8	7 60	2.7	...	.0
40	4 47	19 7	0 31	1 50	8 22	2.5	...	.0
35	4 58	18 55	0 28	1 38	8 41	2.4	23 53	1.5
30	5 8	18 45	0 26	1 30	9 56	2.4	23 39	1.6
20	5 25	18 28	0 24	1 20	9 23	2.3	23 14	1.8
10	5 39	18 13	0 22	1 15	9 46	2.1	22 52	1.9
0	5 53	17 60	0 22	1 13	10 8	2.1	22 32	2.0
10	6 6	17 46	0 22	1 13	10 29	2.0	22 11	2.1
20	6 20	17 32	0 23	1 16	10 52	1.9	21 49	2.2
30	6 37	17 16	0 25	1 23	11 18	1.7	21 24	2.4
35	6 46	17 6	0 27	1 27	11 34	1.6	21 9	2.5
40	6 57	16 56	0 29	1 34	11 52	1.5	20 51	2.6
45	7 9	16 43	0 32	1 42	12 14	1.4	20 30	2.7
50	7 24	16 28	0 35	1 53	12 41	1.2	20 3	2.9
55	7 43	16 9	0 41	2 8	13 19	1.0	19 26	3.2
60	8 9	15 43	0 49	2 30	14 19	.3	18 26	3.9
S								

UT	MESEC				JUPITER		SATURN							
	S <sub>♃</sub>	Δ	δ <sub>♃</sub>	Δ	S <sub>♃</sub>	δ <sub>♃</sub>	S <sub>♄</sub>	δ <sub>♄</sub>						
h	°	'	°	'	°	'	°	'						
0	123	25.4	100	27	40.5	-34	41	18.3	-2	28.0	116	16.7	21	42.8
2	152	23.4	101	27	33.8	-36	71	23.6	-2	27.8	146	21.2	21	42.7
4	181	21.6	102	27	26.5	-39	101	28.8	-2	27.7	176	25.7	21	42.7
6	210	20.0	103	27	18.7	-42	131	34.1	-2	27.6	206	30.2	21	42.6
8	239	18.6	104	27	10.3	-44	161	39.3	-2	27.5	236	34.6	21	42.5
10	268	17.4	105	27	1.5	-47	191	44.6	-2	27.4	266	39.1	21	42.5
12	297	16.5	106	26	52.2	-49	221	49.8	-2	27.3	296	43.6	21	42.4
14	326	15.8	108	26	42.3	-52	251	55.1	-2	27.1	326	48.1	21	42.3
16	355	15.3	109	26	32.0	-54	282	.3	-2	27.0	356	52.5	21	42.3
18	24	15.0	110	26	21.1	-57	312	5.5	-2	26.9	26	57.0	21	42.2
20	53	15.0	111	26	9.8	-59	342	10.8	-2	26.8	57	1.5	21	42.2
22	82	15.3	112	25	58.0	-61	12	16.0	-2	26.7	87	6.0	21	42.1
Δ							26	1			22			0

SUNCE				MESEC					
UT	e = T <sub>p</sub> - UT	Δ/24	r	Prolaz	Δ/24	π <sub>♃</sub>	r		
h	min	s	s	h min	min	'	'		
00	3 40.3	.0	15.9	T <sub>m</sub>	16 20	2.0	54.4	14.8	
12	3 40.5	T <sub>m☉</sub>	11 h 56.3 min	Starost	4.6 d	Faza	☉		
PLANETE									
Pl.	T <sub>m</sub>	π	360-α	Vel.	Pl.	T <sub>m</sub>	π	360-α	Vel.
♀	h min	'	°	°	♃	h min	'	°	°
♂	12 43	.1	299	-3.8	♄	21 11	.0	170	-2.2
	7 20	.1	19	.5	♅	16 12	.0	245	.2

UT	SUNCE		PROLEĆ. TAČKA S <sub>γ</sub>	VENERA		MARS								
	S <sub>☉</sub>	δ <sub>☉</sub>		S <sub>♀</sub>	δ <sub>♀</sub>	S <sub>♂</sub>	δ <sub>♂</sub>							
h	°	'	°	'	°	'	°	'						
0	180	55.1	18	36.1	231	49.9	169	6.7	21	10.8	250	14.6	-9	46.6
2	210	55.1	18	37.3	261	54.9	199	5.2	21	12.2	280	16.1	-9	45.3
4	240	55.1	18	38.5	291	59.8	229	3.7	21	13.5	310	17.6	-9	44.1
6	270	55.1	18	39.7	322	4.7	259	2.2	21	14.8	340	19.1	-9	42.8
8	300	55.1	18	40.9	352	9.7	289	.6	21	16.1	10	20.6	-9	41.5
10	330	55.1	18	42.1	22	14.6	318	59.1	21	17.4	40	22.1	-9	40.2
12	0	55.1	18	43.3	52	19.5	348	57.6	21	18.7	70	23.7	-9	38.9
14	30	55.1	18	44.5	82	24.4	18	56.1	21	20.0	100	25.2	-9	37.6
16	60	55.1	18	45.7	112	29.4	48	54.6	21	21.3	130	26.7	-9	36.4
18	90	55.1	18	46.9	142	34.3	78	53.0	21	22.6	160	28.2	-9	35.1
20	120	55.1	18	48.0	172	39.2	108	51.5	21	23.8	190	29.7	-9	33.8
22	150	55.1	18	49.2	202	44.2	138	50.0	21	25.1	220	31.2	-9	32.5
Δ	0	6						-8	6		8			6

φ	SUNCE		TRAJANJE SUMRAKA		MESEC			
	IZLAZ	ZALAZ	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 25	20 30	1 3	:::	7 16	3.8	2 22	.2
55	3 54	19 60	0 48	:::	8 6	3.3	1 30	.8
50	4 15	19 38	0 39	2 43	8 39	3.0	0 56	1.1
45	4 32	19 21	0 34	2 9	9 4	2.7	0 31	1.3
40	4 46	19 7	0 31	1 50	9 23	2.6	0 10	1.4
35	4 57	18 56	0 28	1 39	9 39	2.5	...	.0
30	5 7	18 46	0 26	1 31	9 53	2.4	...	.0
20	5 24	18 29	0 24	1 20	10 17	2.2	23 56	1.6
10	5 39	18 14	0 22	1 15	10 38	2.1	23 37	1.7
0	5 53	17 60	0 22	1 13	10 57	1.9	23 20	1.9
10	6 6	17 46	0 22	1 13	11 16	1.8	23 2	2.0
20	6 21	17 32	0 23	1 16	11 36	1.7	22 43	2.2
30	6 37	17 15	0 25	1 23	11 60	1.5	22 21	2.4
35	6 47	17 6	0 27	1 28	12 13	1.4	22 8	2.5
40	6 57	16 55	0 29	1 34	12 29	1.3	21 53	2.6
45	7 10	16 42	0 32	1 42	12 48	1.1	21 35	2.8
50	7 25	16 27	0 36	1 53	13 11	.9	21 13	3.0
55	7 45	16 7	0 41	2 8	13 42	.6	20 43	3.3
60	8 11	15 41	0 49	2 30	14 27	.1	19 59	3.8
S								

UT	MESEC				JUPITER		SATURN							
	S <sub>♃</sub>	Δ	δ <sub>♃</sub>	Δ	S <sub>♃</sub>	δ <sub>♃</sub>	S <sub>♄</sub>	δ <sub>♄</sub>						
h	°	'	°	'	°	'	°	'						
0	111	15.8	114	25	45.8	-64	42	21.3	-2	26.6	117	10.4	21	42.0
2	140	16.5	115	25	33.0	-66	72	26.5	-2	26.5	147	14.9	21	42.0
4	169	17.5	116	25	19.8	-68	102	31.7	-2	26.4	177	19.4	21	41.9
6	198	18.8	118	25	6.2	-70	132	37.0	-2	26.3	207	23.9	21	41.8
8	227	20.3	119	24	52.1	-73	162	42.2	-2	26.1	237	28.3	21	41.8
10	256	22.1	120	24	37.6	-75	192	47.4	-2	26.0	267	32.8	21	41.7
12	285	24.1	121	24	22.6	-77	222	52.7	-2	25.9	297	37.3	21	41.6
14	314	26.4	123	24	7.2	-79	252	57.9	-2	25.8	327	41.7	21	41.6
16	343	28.9	124	23	51.4	-81	283	3.1	-2	25.7	357	46.2	21	41.5
18	12	31.8	125	23	35.1	-83	313	8.3	-2	25.6	27	50.7	21	41.4
20	41	34.8	127	23	18.5	-85	343	13.6	-2	25.5	57	55.1	21	41.4
22	70	38.2	128	23	1.4	-87	13	18.8	-2	25.4	87	59.6	21	41.3
Δ							26	1			22			0

SUNCE				MESEC				
UT	e = T <sub>p</sub> - UT	Δ/24	r	Prolaz	Δ/24	π <sub>♃</sub>	r	
h	min	s	s	h min	min	'	'	
00	3 40.6	.0	15.9	T <sub>m</sub>	17 8	1.9	54.2	14.8
12	3 40.5	T <sub>m☉</sub>	11 h 56.3 min	Starost	5.6 d	Faza	☉	
PLANETE								
Pl.	T							

UT	SUNCE		PROLEĆ. TAČKA S <sub>γ</sub>	VENERA		MARS											
	S <sub>☉</sub>	δ <sub>☉</sub>		S <sub>♀</sub>	δ <sub>♀</sub>	S <sub>♂</sub>	δ <sub>♂</sub>										
h	°	'	°	'	°	'	°	'									
0	180	55.0	18	50.4	232	49.1	168	48.4	21	26.4	250	32.8	-9	31.2			
2	210	55.0	18	51.6	262	54.0	198	46.9	21	27.7	280	34.3	-9	29.9			
4	240	55.0	18	52.8	292	58.9	228	45.4	21	28.9	310	35.8	-9	28.6			
6	270	55.0	18	54.0	323	3.9	258	43.8	21	30.2	340	37.3	-9	27.4			
8	300	55.0	18	55.1	353	8.8	288	42.3	21	31.5	10	38.8	-9	26.1			
10	330	55.0	18	56.3	23	13.7	318	40.8	21	32.7	40	40.4	-9	24.8			
12	0	55.0	18	57.5	53	18.7	348	39.2	21	34.0	70	41.9	-9	23.5			
14	30	54.9	18	58.6	83	23.6	18	37.7	21	35.2	100	43.4	-9	22.2			
16	60	54.9	18	59.8	113	28.5	48	36.1	21	36.5	130	44.9	-9	20.9			
18	90	54.9	19	1.0	143	33.4	78	34.6	21	37.7	160	46.5	-9	19.6			
20	120	54.9	19	2.1	173	38.4	108	33.0	21	38.9	190	48.0	-9	18.3			
22	150	54.9	19	3.3	203	43.3	138	31.5	21	40.2	220	49.5	-9	17.0			
Δ		0		6				-8		6				8			6

φ	SUNCE		TRAJANJE SUMRAKA		MESEC			
	IZLAZ	ZALAZ	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 32	1 4	:::	8 48	3.7	2 27	.1
55	3 52	20 2	0 48	:::	9 24	3.3	1 49	.5
50	4 14	19 39	0 40	2 45	9 50	3.0	1 22	.8
45	4 31	19 22	0 34	2 9	10 10	2.8	1 1	1.0
40	4 45	19 8	0 31	1 51	10 25	2.6	0 44	1.2
35	4 56	18 57	0 28	1 39	10 39	2.5	0 30	1.3
30	5 7	18 46	0 26	1 31	10 50	2.3	0 17	1.4
20	5 24	18 29	0 24	1 20	11 10	2.2	...	.0
10	5 39	18 14	0 22	1 15	11 27	2.0	...	.0
0	5 53	17 60	0 22	1 13	11 43	1.8	...	.0
10	6 7	17 46	0 22	1 13	11 59	1.7	23 51	2.0
20	6 21	17 31	0 23	1 16	12 16	1.5	23 35	2.1
30	6 38	17 15	0 25	1 23	12 36	1.3	23 18	2.3
35	6 47	17 5	0 27	1 28	12 47	1.2	23 7	2.5
40	6 58	16 54	0 29	1 34	12 60	1.1	22 56	2.6
45	7 11	16 41	0 32	1 42	13 15	.9	22 41	2.8
50	7 27	16 25	0 36	1 53	13 33	.7	22 24	3.0
55	7 47	16 6	0 41	2 9	13 57	.4	22 2	3.3
60	8 13	15 39	0 50	2 31	14 30	.0	21 31	3.7
S								

UT	MESEC				JUPITER		SATURN										
	S <sub>♃</sub>	Δ	δ <sub>♃</sub>	Δ	S <sub>♃</sub>	δ <sub>♃</sub>	S <sub>♄</sub>	δ <sub>♄</sub>									
h	°	'	°	'	°	'	°	'									
0	99	41.8	129	22	44.0	-89	43	24.0	-2	25.3	118	4.1	21	41.2			
2	128	45.6	131	22	26.1	-91	73	29.2	-2	25.2	148	8.5	21	41.2			
4	157	49.7	132	22	7.9	-93	103	34.5	-2	25.1	178	13.0	21	41.1			
6	186	54.1	133	21	49.3	-95	133	39.7	-2	25.0	208	17.5	21	41.0			
8	215	58.7	134	21	30.3	-97	163	44.9	-2	24.9	238	21.9	21	41.0			
10	245	3.5	135	21	11.0	-98	193	50.1	-2	24.8	268	26.4	21	40.9			
12	274	8.6	137	20	51.3	-100	223	55.3	-2	24.7	298	30.9	21	40.8			
14	303	13.9	138	20	31.2	-102	254	.6	-2	24.6	328	35.3	21	40.8			
16	332	19.5	139	20	10.8	-104	284	5.8	-2	24.4	358	39.8	21	40.7			
18	1	25.3	140	19	50.1	-105	314	11.0	-2	24.3	28	44.2	21	40.6			
20	30	31.3	141	19	29.0	-107	344	16.2	-2	24.2	58	48.7	21	40.6			
22	59	37.5	142	19	7.6	-109	14	21.4	-2	24.1	88	53.2	21	40.5			
Δ								26		1				22			0

SUNCE				MESEC					
UT	e = T <sub>p</sub> - UT	Δ/24	r	Prolaz	Δ/24	π <sub>♃</sub>	r		
h	min	s	s	h min	min	'	'		
00	3 40.3	.0	15.8	T <sub>m</sub>	17 54	1.8	54.2	14.8	
12	3 39.9	T <sub>m☉</sub>	11 h 56.3 min	Starost	6.6 d	Faza	☉		
PLANETE									
Pl.	T <sub>m</sub>	π	360-α	Vel.	Pl.	T <sub>m</sub>	π	360-α	Vel.
♀	h min	'	°	°	♃	h min	'	°	°
♂	12 45	.1	296	-3.8	♄	21 3	.0	171	-2.2
	7 17	.1	18	.5	♅	16 5	.0	245	.2

UT	SUNCE		PROLEĆ. TAČKA S <sub>γ</sub>	VENERA		MARS											
	S <sub>☉</sub>	δ <sub>☉</sub>		S <sub>♀</sub>	δ <sub>♀</sub>	S <sub>♂</sub>	δ <sub>♂</sub>										
h	°	'	°	'	°	'	°	'									
0	180	54.8	19	4.5	233	48.2	168	29.9	21	41.4	250	51.0	-9	15.7			
2	210	54.8	19	5.6	263	53.2	198	28.4	21	42.6	280	52.6	-9	14.5			
4	240	54.8	19	6.8	293	58.1	228	26.8	21	43.8	310	54.1	-9	13.2			
6	270	54.8	19	7.9	324	3.0	258	25.3	21	45.0	340	55.6	-9	11.9			
8	300	54.7	19	9.1	354	7.9	288	23.7	21	46.2	10	57.2	-9	10.6			
10	330	54.7	19	10.2	24	12.9	318	22.1	21	47.4	40	58.7	-9	9.3			
12	0	54.7	19	11.4	54	17.8	348	20.6	21	48.6	71	.2	-9	8.0			
14	30	54.7	19	12.5	84	22.7	18	19.0	21	49.8	101	1.7	-9	6.7			
16	60	54.6	19	13.6	114	27.7	48	17.4	21	51.0	131	3.3	-9	5.4			
18	90	54.6	19	14.8	144	32.6	78	15.9	21	52.2	161	4.8	-9	4.1			
20	120	54.6	19	15.9	174	37.5	108	14.3	21	53.4	191	6.3	-9	2.8			
22	150	54.5	19	17.0	204	42.4	138	12.7	21	54.6	221	7.9	-9	1.5			
Δ		0		6				-8		6				8			6

φ	SUNCE		TRAJANJE SUMRAKA		MESEC			
	IZLAZ	ZALAZ	GRAĐ.	ASTR.	IZLAZ	Δ/24	ZALAZ	Δ/24
N	h min	h min	h min	h min	h min	min	h min	min
60	3 20	20 34	1 5	:::	10 18	3.6	2 29	.0
55	3 51	20 3	0 48	:::	10 43	3.2	2 2	.4
50	4 13	19 41	0 40	2 47	11 2	3.0	1 41	.7
45	4 30	19 24	0 34	2 10	11 16	2.8	1 25	.9
40	4 44	19 9	0 31	1 51	11 28	2.6	1 12	1.0
35	4 56	18 57	0 28	1 39	11 38	2.4	1 1	1.1
30	5 6	18 47	0 26	1 31	11 47	2.3	0 51	1.3
20	5 24	18 29	0 24	1 21	12 2	2.1	0 34	1.5
10	5 39	18 14	0 22	1 15	12 15	1.9	0 19	1.6
0	5 53	17 60	0 22	1 13	12 27	1.8	0 5	1.8
10	6 7	17 46	0 22	1 13	12 40	1.6	...	.0
20	6 22	17 31	0 23	1 17	12 53	1.4	...	.0
30	6 38	17 14	0 25	1 23	13 7	1.2	...	.0
35	6 48	17 4	0 27	1 28	13 16	1.1	...	.0
40	6 59	16 53	0 29	1 34	13 26	1.0	23 58	2.6
45	7 12	16 40	0 32	1 42	13 37	.8	23 48	2.8
50	7 28	16 24	0 36	1 54	13 51	.6	23 36	3.0
55	7 48	16 4	0 41	2 9	14 8	.3	23 20	3.2
60	8 16	15 36	0 50	2 31	14 30	.0	22 59	3.6
S								

UT	MESEC				JUPITER		SATURN										
	S <sub>♃</sub>	Δ	δ <sub>♃</sub>	Δ	S <sub>♃</sub>	δ <sub>♃</sub>	S <sub>♄</sub>	δ <sub>♄</sub>									
h	°	'	°	'	°	'	°	'									
0	88	43.9	143	18	45.9	-110	44	26.6	-2	24.0	118	57.6	21	40.4			
2	117	50.6	144	18	23.8	-112	74	31.8	-2	23.9	149	2.1	21	40.4			
4	146	57.5	145	18	1.5	-113	104	37.0	-2	23.8	179	6.5	21	40.3			
6	176	4.5	146	17	38.8	-115	134	42.3	-2	23.7	209	11.0	21	40.2			
8	205	11.8	147	17	15.8	-116	164	47.5	-2	23.6	239	15.5	21	40.2			
10	234	19.2	148	16	52.5	-118	194	52.7	-2	23.5	269	19.9	21	40.1			
12	263	26.9	149	16	29.0	-119	224	57.9	-2	23.5	299	24.4	21	40.0			
14	292	34.7	150	16	5.2	-121	255	3.1	-2	23.4	329	28.8	21	40.0			
16	321	42.6	151	15	41.0	-122	285	8.3	-2	23.3	359	33.3	21	39.9			
18	350	50.8	151	15	16.7	-123	315	13.5	-2	23.2	29	37.7	21	39.8			
20	19	59.0	152	14	52.0	-125	345	18.7	-2	23.1	59	42.2	21	39.7			
22	49	7.5	153	14	27.1	-126	15	23.9	-2	23.0	89	46.6	21	39.7			
Δ								26		0				22			0

SUNCE				MESEC				
UT	e = T <sub>p</sub> - UT	Δ/24	r	Prolaz	Δ/24	π <sub>♃</sub>	r	
h	min	s	s	h min	min	'	'	
00	3 39.5	-.1	15.8	T <sub>m</sub>	18 38	1.8	54.4	14.8
12	3 38.8	T <sub>m☉</sub>	11 h 56.4 min	Starost	7.6 d	Faza	☉	



UT	SUNCE		PROLEĆ. TAČKA S <sub>γ</sub>	VENERA		MARS	
	S <sub>☉</sub>	δ <sub>☉</sub>		S <sub>♀</sub>	δ <sub>♀</sub>	S <sub>♂</sub>	δ <sub>♂</sub>
h	° / ' / "	° / ' / "	° / ' / "	° / ' / "	° / ' / "	° / ' / "	° / ' / "
0	180 54.5	19 18.2	234 47.4	168 11.2	21 55.7	251 9.4	- 9 .2
2	210 54.5	19 19.3	264 52.3	198 9.6	21 56.9	281 10.9	- 8 58.9
4	240 54.4	19 20.4	294 57.2	228 8.0	21 58.1	311 12.5	- 8 57.6
6	270 54.4	19 21.6	325 2.1	258 6.4	21 59.2	341 14.0	- 8 56.3
8	300 54.3	19 22.7	355 7.1	288 4.9	22 .4	11 15.5	- 8 55.0
10	330 54.3	19 23.8	25 12.0	318 3.3	22 1.6	41 17.1	- 8 53.7
12	0 54.3	19 24.9	55 16.9	348 1.7	22 2.7	71 18.6	- 8 52.4
14	30 54.2	19 26.0	85 21.9	18 .1	22 3.8	101 20.1	- 8 51.1
16	60 54.2	19 27.1	115 26.8	47 58.5	22 5.0	131 21.7	- 8 49.9
18	90 54.1	19 28.3	145 31.7	77 56.9	22 6.1	161 23.2	- 8 48.6
20	120 54.1	19 29.4	175 36.6	107 55.4	22 7.2	191 24.8	- 8 47.3
22	150 54.1	19 30.5	205 41.6	137 53.8	22 8.4	221 26.3	- 8 46.0
Δ	0	6		-8	6	8	6

φ	SUNCE		TRAJANJE SUMRAKA		MESEC			
	IZLAZ	ZALAZ	GRAĐ.	ASTR.	IZLAZ	Δ/24	ZALAZ	Δ/24
N	h min	h min	h min	h min	h min	min	h min	min
60	3 18	20 37	1 6	:::	11 45	3.6	2 29	.0
55	3 49	20 5	0 49	:::	12 1	3.2	2 11	.3
50	4 11	19 42	0 40	2 49	12 13	3.0	1 57	.6
45	4 29	19 25	0 35	2 11	12 22	2.8	1 46	.7
40	4 43	19 10	0 31	1 52	12 30	2.6	1 36	.9
35	4 55	18 58	0 28	1 40	12 37	2.4	1 28	1.0
30	5 5	18 48	0 26	1 31	12 43	2.3	1 21	1.2
20	5 23	18 30	0 24	1 21	12 53	2.1	1 9	1.4
10	5 39	18 14	0 22	1 15	13 1	1.9	0 58	1.6
0	5 53	17 60	0 22	1 13	13 10	1.7	0 48	1.7
10	6 7	17 46	0 22	1 13	13 18	1.5	0 38	1.9
20	6 22	17 31	0 23	1 17	13 27	1.4	0 27	2.1
30	6 39	17 13	0 25	1 23	13 36	1.1	0 14	2.3
35	6 49	17 4	0 27	1 28	13 42	1.0	0 6	2.4
40	7 0	16 52	0 29	1 34	13 49	.9	...	.0
45	7 13	16 39	0 32	1 43	13 56	.7	...	.0
50	7 29	16 23	0 36	1 54	14 5	.5	...	.0
55	7 50	16 2	0 42	2 9	14 16	.3	...	.0
60	8 18	15 34	0 50	2 32	14 30	.0	...	.0

UT	MESEC				JUPITER		SATURN	
	S <sub>♃</sub>	Δ	δ <sub>♃</sub>	Δ	S <sub>♃</sub>	δ <sub>♃</sub>	S <sub>♄</sub>	δ <sub>♄</sub>
h	° / ' / "	° / ' / "	° / ' / "	° / ' / "	° / ' / "	° / ' / "	° / ' / "	° / ' / "
0	78 16.0	154 14	1.9	-127	45 29.1	- 2 22.9	119 51.1	21 39.6
2	107 24.8	154 13	36.5	-128	75 34.3	- 2 22.8	149 55.5	21 39.5
4	136 33.6	155 13	10.8	-129	105 39.5	- 2 22.7	179 60.0	21 39.5
6	165 42.5	155 12	44.9	-131	135 44.7	- 2 22.6	210 4.4	21 39.4
8	194 51.6	156 12	18.8	-132	165 49.9	- 2 22.5	240 8.9	21 39.3
10	224 .8	156 11	52.5	-133	195 55.1	- 2 22.4	270 13.4	21 39.3
12	253 10.0	157 11	25.9	-134	226 .3	- 2 22.3	300 17.8	21 39.2
14	282 19.4	157 10	59.1	-135	256 5.4	- 2 22.2	330 22.3	21 39.1
16	311 28.8	158 10	32.1	-136	286 10.6	- 2 22.1	0 26.7	21 39.1
18	340 38.3	158 10	4.8	-137	316 15.8	- 2 22.0	30 31.1	21 39.0
20	9 47.9	158 9	37.4	-138	346 21.0	- 2 22.0	60 35.6	21 38.9
22	38 57.5	158 9	9.8	-139	16 26.2	- 2 21.9	90 40.0	21 38.8
Δ					26	0	22	0

SUNCE				MESEC			
UT	e = T <sub>p</sub> - UT	Δ/24	r	Prolaz	Δ/24	π <sub>☉</sub>	r
h	min s	s / ' / "		h min	min	' / "	
00	3 38.1	-.1	15.8	T <sub>m</sub>	19 20	1.7	54.7 14.9
12	3 37.2	T <sub>m☉</sub>	11 h 56.4 min	Starost	8.6 d	Faza ☉	

PLANETE									
Pl.	T <sub>m</sub>	π	360-α	Vel.	Pl.	T <sub>m</sub>	π	360-α	Vel.
h	min / ' / "	°	°	°	h min / ' / "	°	°	°	°
♀	12 48	.1	293	-3.8	♃	20 54	.0	171	-2.2
♂	7 15	.1	16	.5	♄	15 58	.0	245	.2

UT	SUNCE		PROLEĆ. TAČKA S <sub>γ</sub>	VENERA		MARS	
	S <sub>☉</sub>	δ <sub>☉</sub>		S <sub>♀</sub>	δ <sub>♀</sub>	S <sub>♂</sub>	δ <sub>♂</sub>
h	° / ' / "	° / ' / "	° / ' / "	° / ' / "	° / ' / "	° / ' / "	° / ' / "
0	180 54.0	19 31.6	235 46.5	167 52.2	22 9.5	251 27.8	- 8 44.7
2	210 54.0	19 32.7	265 51.4	197 50.6	22 10.6	281 29.4	- 8 43.4
4	240 53.9	19 33.8	295 56.4	227 49.0	22 11.7	311 30.9	- 8 42.1
6	270 53.9	19 34.9	326 1.3	257 47.4	22 12.8	341 32.5	- 8 40.8
8	300 53.8	19 36.0	356 6.2	287 45.8	22 13.9	11 34.0	- 8 39.5
10	330 53.8	19 37.0	26 11.1	317 44.2	22 15.0	41 35.5	- 8 38.2
12	0 53.7	19 38.1	56 16.1	347 42.6	22 16.1	71 37.1	- 8 36.9
14	30 53.7	19 39.2	86 21.0	17 41.0	22 17.2	101 38.6	- 8 35.6
16	60 53.6	19 40.3	116 25.9	47 39.4	22 18.3	131 40.2	- 8 34.3
18	90 53.6	19 41.4	146 30.9	77 37.8	22 19.4	161 41.7	- 8 32.9
20	120 53.5	19 42.5	176 35.8	107 36.2	22 20.5	191 43.3	- 8 31.6
22	150 53.5	19 43.5	206 40.7	137 34.6	22 21.6	221 44.8	- 8 30.3
Δ	0	5		-8	5	8	7

φ	SUNCE		TRAJANJE SUMRAKA		MESEC			
	IZLAZ	ZALAZ	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 39	1 7	:::	13 11	3.6	2 29	.0
55	3 47	20 7	0 49	:::	13 19	3.3	2 18	.3
50	4 10	19 44	0 40	2 52	13 24	3.0	2 10	.5
45	4 28	19 26	0 35	2 12	13 29	2.8	2 4	.7
40	4 42	19 11	0 31	1 52	13 32	2.6	1 58	.9
35	4 54	18 59	0 28	1 40	13 35	2.5	1 54	1.0
30	5 5	18 48	0 26	1 32	13 38	2.4	1 49	1.1
20	5 23	18 30	0 24	1 21	13 43	2.1	1 42	1.4
10	5 38	18 15	0 22	1 15	13 47	1.9	1 36	1.5
0	5 53	17 60	0 22	1 13	13 51	1.7	1 30	1.7
10	6 7	17 46	0 22	1 14	13 55	1.6	1 23	1.9
20	6 22	17 30	0 23	1 17	13 59	1.4	1 17	2.1
30	6 40	17 13	0 26	1 23	14 4	1.1	1 9	2.3
35	6 50	17 3	0 27	1 28	14 7	1.0	1 5	2.5
40	7 1	16 51	0 29	1 34	14 10	.9	1 0	2.6
45	7 14	16 38	0 32	1 43	14 13	.7	0 54	2.8
50	7 31	16 22	0 36	1 54	14 17	.5	0 47	3.0
55	7 52	16 1	0 42	2 10	14 23	.3	0 39	3.2
60	8 20	15 32	0 50	2 32	14 29	.0	0 27	3.6

UT	MESEC				JUPITER		SATURN	
	S <sub>♃</sub>	Δ	δ <sub>♃</sub>	Δ	S <sub>♃</sub>	δ <sub>♃</sub>	S <sub>♄</sub>	δ <sub>♄</sub>
h	° / ' / "	° / ' / "	° / ' / "	° / ' / "	° / ' / "	° / ' / "	° / ' / "	° / ' / "
0	68 7.2	158 8	42.0	-140	46 31.4	- 2 21.8	120 44.5	21 38.8
2	97 16.9	159 8	14.0	-141	76 36.6	- 2 21.7	150 48.9	21 38.7
4	126 26.6	159 7	45.9	-142	106 41.8	- 2 21.6	180 53.4	21 38.6
6	155 36.3	159 7	17.5	-142	136 46.9	- 2 21.5	210 57.8	21 38.6
8	184 46.1	159 6	49.1	-143	166 52.1	- 2 21.4	241 2.3	21 38.5
10	213 55.8	159 6	20.4	-144	196 57.3	- 2 21.3	271 6.7	21 38.4
12	243 5.6	159 5	51.6	-145	227 2.5	- 2 21.3	301 11.2	21 38.4
14	272 15.3	159 5	22.6	-146	257 7.7	- 2 21.2	331 15.6	21 38.3
16	301 25.0	158 4	53.5	-146	287 12.8	- 2 21.1	1 20.1	21 38.2
18	330 34.7	158 4	24.3	-147	317 18.0	- 2 21.0	31 24.5	21 38.1
20	359 44.3	158 3	54.9	-147	347 23.2	- 2 20.9	61 28.9	21 38.1
22	28 53.9	158 3	25.4	-148	17 28.4	- 2 20.8	91 33.4	21 38.0
Δ					26	0	22	0

SUNCE				MESEC			
UT	e = T <sub>p</sub> - UT	Δ/24	r	Prolaz	Δ/24	π <sub>☉</sub>	r
h	min s	s / ' / "		h min	min	' / "	
00	3 36.2	-.1	15.8	T <sub>m</sub>	20 1	1.8	55.2 15.0
12	3 35.0	T <sub>m☉</sub>	11 h 56.4 min	Starost	9.6 d	Faza ☉	

PLANETE									
Pl.	T <sub>m</sub>	π	360-α	Vel.	Pl.	T <sub>m</sub>	π	360-α	Vel.
h	min / ' / "	°	°	°	h min / ' / "	°	°	°	°
♀	12 49	.1	292	-3.8	♃	20 50	.0	171	-2.2
♂	7 14	.1	16	.5	♄	15 55	.0	245	.2

UT	SUNCE		PROLEĆ. TAČKA S <sub>γ</sub>	VENERA		MARS	
	S <sub>☉</sub>	δ <sub>☉</sub>		S <sub>♀</sub>	δ <sub>♀</sub>	S <sub>♂</sub>	δ <sub>♂</sub>
h	° / ' / "	° / ' / "	° / ' / "	° / ' / "	° / ' / "	° / ' / "	° / ' / "
0	180 53.4	19 44.6	236 45.6	167 33.0	22 22.6	251 46.4	- 8 29.0
2	210 53.3	19 45.7	266 50.6	197 31.3	22 23.7	281 47.9	- 8 27.7
4	240 53.3	19 46.8	296 55.5	227 29.7	22 24.8	311 49.5	- 8 26.4
6	270 53.2	19 47.8	327 .4	257 28.1	22 25.8	341 51.0	- 8 25.1
8	300 53.2	19 48.9	357 5.4	287 26.5	22 26.9	11 52.6	- 8 23.8
10	330 53.1	19 50.0	27 10.3	317 24.9	22 27.9	41 54.1	- 8 22.5
12	0 53.0	19 51.0	57 15.2	347 23.3	22 29.0	71 55.7	- 8 21.2
14	30 53.0	19 52.1	87 20.1	17 21.6	22 30.0	101 57.2	- 8 19.9
16	60 52.9	19 53.1	117 25.1	47 20.0	22 31.0	131 58.8	- 8 18.6
18	90 52.9	19 54.2	147 30.0	77 18.4	22 32.1	162 .3	- 8 17.3
20	120 52.8	19 55.2	177 34.9	107 16.8	22 33.1	192 1.9	- 8 16.0
22	150 52.7	19 56.3	207 39.9	137 15.1	22 34.1	222 3.4	- 8 14.7
Δ	0	5		-8	5	8	7

φ	SUNCE		TRAJANJE SUMRAKA		MESEC			
	IZLAZ	ZALAZ	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 41	1 8	: : :	14 38	3.8	2 28	.0
55	3 46	20 8	0 50	: : :	14 37	3.4	2 25	.3
50	4 9	19 45	0 40	2 54	14 37	3.1	2 23	.5
45	4 27	19 27	0 35	2 13	14 36	2.9	2 21	.7
40	4 41	19 12	0 31	1 53	14 35	2.7	2 19	.9
35	4 54	18 60	0 28	1 40	14 35	2.6	2 18	1.0
30	5 4	18 49	0 26	1 32	14 35	2.4	2 17	1.2
20	5 23	18 31	0 24	1 21	14 34	2.2	2 15	1.4
10	5 38	18 15	0 22	1 15	14 33	2.0	2 13	1.6
0	5 53	18 0	0 22	1 13	14 33	1.8	2 11	1.8
10	6 7	17 45	0 22	1 14	14 32	1.6	2 9	2.0
20	6 23	17 30	0 23	1 17	14 32	1.4	2 7	2.2
30	6 40	17 12	0 26	1 23	14 31	1.2	2 5	2.4
35	6 50	17 2	0 27	1 28	14 31	1.1	2 4	2.5
40	7 2	16 51	0 29	1 35	14 31	.9	2 3	2.7
45	7 16	16 37	0 32	1 43	14 30	.7	2 1	2.9
50	7 32	16 20	0 36	1 54	14 30	.5	1 59	3.1
55	7 53	15 59	0 42	2 10	14 29	.3	1 57	3.3
60	8 22	15 30	0 51	2 33	14 28	.0	1 54	3.7

UT	MESEC				JUPITER		SATURN	
	S <sub>♃</sub>	Δ	δ <sub>♃</sub>	Δ	S <sub>♃</sub>	δ <sub>♃</sub>	S <sub>♄</sub>	δ <sub>♄</sub>
h	° / ' / "	° / ' / "	° / ' / "	° / ' / "	° / ' / "	° / ' / "	° / ' / "	° / ' / "
0	58 3.4	157	2 55.8	-149	47 33.5	- 2 20.7	121 37.8	21 37.9
2	87 12.8	157	2 26.1	-149	77 38.7	- 2 20.7	151 42.3	21 37.9
4	116 22.2	156	1 56.3	-150	107 43.9	- 2 20.6	181 46.7	21 37.8
6	145 31.4	156	1 26.3	-150	137 49.0	- 2 20.5	211 51.1	21 37.7
8	174 40.6	155	0 56.3	-150	167 54.2	- 2 20.4	241 55.6	21 37.6
10	203 49.6	155	0 26.2	-151	197 59.4	- 2 20.3	272 .0	21 37.6
12	232 58.5	154	0 4.0	-151	228 4.5	- 2 20.3	302 4.5	21 37.5
14	262 7.3	153	0 34.2	-152	258 9.7	- 2 20.2	332 8.9	21 37.4
16	291 15.9	152	- 1 4.5	-152	288 14.9	- 2 20.1	2 13.3	21 37.4
18	320 24.4	152	- 1 34.9	-152	318 20.0	- 2 20.0	32 17.8	21 37.3
20	349 32.7	151	- 2 5.3	-152	348 25.2	- 2 19.9	62 22.2	21 37.2
22	18 40.8	150	- 2 35.7	-152	18 30.4	- 2 19.9	92 26.6	21 37.1
Δ					26	0	22	0

SUNCE				MESEC				
UT	e = T <sub>p</sub> - UT	Δ/24	r	Prolaz	Δ/24	π <sub>♃</sub>	r	
h	min s	s / ' / "	h min	h min	min / ' / "	h min	min	
00	3 33.8	-.1	15.8	T <sub>m</sub>	20 43	1.8	55.8	15.2
12	3 32.3	T <sub>m☉</sub>	11 h 56.5 min	Starost	10.6 d	Faza	☉	

PLANETE									
Pl.	T <sub>m</sub>	π	360-α	Vel.	Pl.	T <sub>m</sub>	π	360-α	Vel.
h min / ' / "	h min / ' / "	° / ' / "	° / ' / "	° / ' / "	h min / ' / "	h min / ' / "	° / ' / "	° / ' / "	° / ' / "
♀	12 50	.1	291	-3.8	♃	20 46	.0	171	-2.1
♂	7 13	.1	15	.4	♄	15 51	.0	245	.2

UT	SUNCE		PROLEĆ. TAČKA S <sub>γ</sub>	VENERA		MARS	
	S <sub>☉</sub>	δ <sub>☉</sub>		S <sub>♀</sub>	δ <sub>♀</sub>	S <sub>♂</sub>	δ <sub>♂</sub>
h	° / ' / "	° / ' / "	° / ' / "	° / ' / "	° / ' / "	° / ' / "	° / ' / "
0	180 52.7	19 57.3	237 44.8	167 13.5	22 35.1	252 5.0	- 8 13.4
2	210 52.6	19 58.4	267 49.7	197 11.9	22 36.1	282 6.5	- 8 12.1
4	240 52.5	19 59.4	297 54.6	227 10.3	22 37.1	312 8.1	- 8 10.8
6	270 52.5	20 .5	327 59.6	257 8.6	22 38.2	342 9.6	- 8 9.5
8	300 52.4	20 1.5	358 4.5	287 7.0	22 39.2	12 11.2	- 8 8.2
10	330 52.3	20 2.5	28 9.4	317 5.4	22 40.1	42 12.7	- 8 6.8
12	0 52.2	20 3.6	58 14.4	347 3.7	22 41.1	72 14.3	- 8 5.5
14	30 52.2	20 4.6	88 19.3	17 2.1	22 42.1	102 15.9	- 8 4.2
16	60 52.1	20 5.6	118 24.2	47 .4	22 43.1	132 17.4	- 8 2.9
18	90 52.0	20 6.7	148 29.1	76 58.8	22 44.1	162 19.0	- 8 1.6
20	120 51.9	20 7.7	178 34.1	106 57.2	22 45.1	192 20.5	- 8 .3
22	150 51.9	20 8.7	208 39.0	136 55.5	22 46.0	222 22.1	- 7 59.0
Δ	0	5		-8	5	8	7

φ	SUNCE		TRAJANJE SUMRAKA		MESEC			
	IZLAZ	ZALAZ	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	20 44	1 9	: : :	16 9	4.0	2 27	.0
55	3 44	20 10	0 50	: : :	15 59	3.6	2 31	.3
50	4 8	19 46	0 41	2 57	15 52	3.3	2 35	.6
45	4 26	19 28	0 35	2 14	15 46	3.1	2 38	.8
40	4 41	19 13	0 31	1 54	15 41	2.9	2 40	.9
35	4 53	19 0	0 28	1 41	15 37	2.7	2 42	1.1
30	5 4	18 50	0 26	1 32	15 33	2.6	2 44	1.2
20	5 22	18 31	0 24	1 21	15 27	2.3	2 48	1.5
10	5 38	18 15	0 23	1 16	15 21	2.1	2 51	1.7
0	5 53	18 0	0 22	1 13	15 16	1.9	2 53	1.9
10	6 8	17 45	0 22	1 14	15 11	1.7	2 56	2.0
20	6 23	17 30	0 23	1 17	15 6	1.5	2 59	2.3
30	6 41	17 12	0 26	1 23	14 60	1.3	3 3	2.5
35	6 51	17 2	0 27	1 28	14 56	1.2	3 5	2.6
40	7 3	16 50	0 29	1 35	14 52	1.0	3 7	2.8
45	7 17	16 36	0 32	1 43	14 48	.8	3 9	3.0
50	7 33	16 19	0 36	1 55	14 43	.6	3 13	3.2
55	7 55	15 58	0 42	2 10	14 36	.3	3 17	3.5
60	8 24	15 28	0 51	2 34	14 28	.0	3 22	3.9

UT	MESEC				JUPITER		SATURN	
	S <sub>♃</sub>	Δ	δ <sub>♃</sub>	Δ	S <sub>♃</sub>	δ <sub>♃</sub>	S <sub>♄</sub>	δ <sub>♄</sub>
h	° / ' / "	° / ' / "	° / ' / "	° / ' / "	° / ' / "	° / ' / "	° / ' / "	° / ' / "
0	47 48.7	149 - 3	6.2	-153	48 35.5	- 2 19.8	122 31.1	21 37.1
2	76 56.5	148 - 3	36.7	-153	78 40.7	- 2 19.7	152 35.5	21 37.0
4	106 4.0	147 - 4	7.3	-153	108 45.8	- 2 19.6	182 39.9	21 36.9
6	135 11.4	145 - 4	37.8	-153	138 51.0	- 2 19.6	212 44.4	21 36.8
8	164 18.4	144 - 5	8.3	-153	168 56.1	- 2 19.5	242 48.8	21 36.8
10	193 25.3	143 - 5	38.8	-152	199 1.3	- 2 19.4	272 53.2	21 36.7
12	222 31.9	142 - 6	9.3	-152	229 6.5	- 2 19.3	302 57.7	21 36.6
14	251 38.3	140 - 6	39.8	-152	259 11.6	- 2 19.3	333 2.1	21 36.6
16	280 44.3	139 - 7	10.2	-152	289 16.8	- 2 19.2	3 6.5	21 36.5
18	309 50.1	138 - 7	40.6	-152	319 21.9	- 2 19.1	33 11.0	21 36.4
20	338 55.6	136 - 8	10.9	-151	349 27.1	- 2 19.0	63 15.4	21 36.3
22	8 .8	134 - 8	41.2	-151	19 32.2	- 2 19.0	93 19.8	21 36.3
Δ					26	0	22	0

SUNCE				MESEC				
UT	e = T <sub>p</sub> - UT	Δ/24	r	Prolaz	Δ/24	π <sub>♃</sub>	r	
h	min s	s / ' / "	h min	h min	min / ' / "	h min	min	
00	3 30.8	-.1	15.8	T <sub>m</sub>	21 27	2.0	56.6	15.4
12	3 29.1	T <sub>m☉</sub>	11 h 56.5 min	Starost	11.6 d	Faza	☉	

PLANETE									
Pl.	T <sub>m</sub>	π	360-α	Vel.	Pl.	T <sub>m</sub>	π	360-α	Vel.
h min / ' / "	h min / ' / "	° / ' / "	° / ' / "	° / ' / "	h min / ' / "	h min / ' / "	° / ' / "	° / ' / "	° / ' / "
♀	12 52	.1	289	-3.8	♃	20 42	.0	171	-2.1
♂	7 11	.1	14	.4	♄	15 48	.0	245	.2

UT	SUNCE				PROLEĆ. TAČKA		VENERA		MARS					
	S <sub>☉</sub>		δ <sub>☉</sub>		S <sub>♈</sub>		S <sub>♀</sub>	δ <sub>♀</sub>	S <sub>♂</sub>	δ <sub>♂</sub>				
h	°	'	°	'	°	'	°	'	°	'	°	'		
0	180	51.8	20	9.7	238	43.9	166	53.9	22	47.0	252	23.7	-7	57.7
2	210	51.7	20	10.7	268	48.8	196	52.2	22	47.9	282	25.2	-7	56.4
4	240	51.6	20	11.7	298	53.8	226	50.6	22	48.9	312	26.8	-7	55.1
6	270	51.5	20	12.8	328	58.7	256	48.9	22	49.8	342	28.3	-7	53.8
8	300	51.5	20	13.8	359	3.6	286	47.3	22	50.8	12	29.9	-7	52.4
10	330	51.4	20	14.8	29	8.6	316	45.6	22	51.7	42	31.5	-7	51.1
12	0	51.3	20	15.8	59	13.5	346	44.0	22	52.7	72	33.0	-7	49.8
14	30	51.2	20	16.8	89	18.4	16	42.3	22	53.6	102	34.6	-7	48.5
16	60	51.1	20	17.8	119	23.3	46	40.7	22	54.5	132	36.2	-7	47.2
18	90	51.0	20	18.8	149	28.3	76	39.0	22	55.5	162	37.7	-7	45.9
20	120	51.0	20	19.8	179	33.2	106	37.3	22	56.4	192	39.3	-7	44.6
22	150	50.9	20	20.8	209	38.1	136	35.7	22	57.3	222	40.8	-7	43.3
Δ	0		5				-8		5		8			7

UT	MESEC				JUPITER		SATURN							
	S <sub>♄</sub>	Δ	δ <sub>♄</sub>	Δ	S <sub>♃</sub>	δ <sub>♃</sub>	S <sub>♄</sub>	δ <sub>♄</sub>						
h	°	'	°	'	°	'	°	'						
0	37	5.7	133	-9	11.3	-150	49	37.4	-2	18.9	123	24.3	21	36.2
2	66	10.3	131	-9	41.4	-150	79	42.5	-2	18.8	153	28.7	21	36.1
4	95	14.5	129	-10	11.4	-149	109	47.6	-2	18.8	183	33.1	21	36.0
6	124	18.4	128	-10	41.3	-149	139	52.8	-2	18.7	213	37.5	21	36.0
8	153	21.9	126	-11	11.0	-148	169	57.9	-2	18.6	243	42.0	21	35.9
10	182	25.1	124	-11	40.6	-147	200	3.1	-2	18.5	273	46.4	21	35.8
12	211	27.9	122	-12	10.1	-146	230	8.2	-2	18.5	303	50.8	21	35.7
14	240	30.3	120	-12	39.3	-146	260	13.3	-2	18.4	333	55.3	21	35.7
16	269	32.3	118	-13	8.5	-145	290	18.5	-2	18.3	3	59.7	21	35.6
18	298	34.0	116	-13	37.4	-144	320	23.6	-2	18.3	34	4.1	21	35.5
20	327	35.2	114	-14	6.1	-143	350	28.8	-2	18.2	64	8.5	21	35.4
22	356	35.9	112	-14	34.6	-141	20	33.9	-2	18.1	94	13.0	21	35.4
Δ							26		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	3 9	20 46	1 10	:	:	17 45	4.3	2 26	.0
55	3 42	20 12	0 50	:	:	17 25	3.8	2 39	.4
50	4 6	19 48	0 41	2	60	17 11	3.5	2 48	.7
45	4 25	19 29	0 35	2	15	16 59	3.2	2 56	.9
40	4 40	19 14	0 31	1	54	16 50	3.0	3 3	1.1
35	4 52	19 1	0 29	1	41	16 42	2.9	3 9	1.2
30	5 3	18 50	0 27	1	32	16 35	2.7	3 14	1.4
20	5 22	18 31	0 24	1	21	16 23	2.5	3 23	1.6
10	5 38	18 15	0 23	1	16	16 12	2.3	3 30	1.8
0	5 53	18 0	0 22	1	13	16 2	2.1	3 38	2.0
10	6 8	17 45	0 22	1	14	15 53	1.9	3 45	2.2
20	6 24	17 29	0 23	1	17	15 42	1.7	3 53	2.4
30	6 41	17 11	0 26	1	24	15 31	1.5	4 2	2.6
35	6 52	17 1	0 27	1	28	15 24	1.3	4 8	2.8
40	7 4	16 49	0 29	1	35	15 17	1.2	4 14	3.0
45	7 18	16 35	0 32	1	43	15 8	1.0	4 21	3.1
50	7 35	16 18	0 36	1	55	14 57	.8	4 29	3.4
55	7 56	15 56	0 42	2	11	14 44	.5	4 40	3.7
60	8 26	15 26	0 51	2	34	14 27	.0	4 54	4.2
S									

SUNCE				MESEC					
UT	e = T <sub>p</sub> - UT	Δ/24	r	Prolaz	Δ/24	π <sub>☾</sub>	r		
h	min	s	'	h min	min	'	'		
00	3 27.3	-.2	15.8	T <sub>m</sub>	22 14	2.2	57.4	15.6	
12	3 25.3	T <sub>m☉</sub>	11 h 56.6 min	Starost	12.6 d	Faza	☉		
PLANETE									
Pl.	T <sub>m</sub>	π	360-α	Vel.	Pl.	T <sub>m</sub>	π	360-α	Vel.
♀	h min	'	°		♂	h min	'	°	
♂	12 53	.1	288	-3.8	♃	20 38	.0	171	-2.1
♂	7 10	.1	14	.4	♄	15 44	.0	245	.2

UT	SUNCE				PROLEĆ. TAČKA		VENERA		MARS					
	S <sub>☉</sub>		δ <sub>☉</sub>		S <sub>♈</sub>		S <sub>♀</sub>	δ <sub>♀</sub>	S <sub>♂</sub>	δ <sub>♂</sub>				
h	°	'	°	'	°	'	°	'	°	'	°	'		
0	180	50.8	20	21.8	239	43.1	166	34.0	22	58.2	252	42.4	-7	41.9
2	210	50.7	20	22.7	269	48.0	196	32.4	22	59.1	282	44.0	-7	40.6
4	240	50.6	20	23.7	299	52.9	226	30.7	22	60.0	312	45.5	-7	39.3
6	270	50.5	20	24.7	329	57.8	256	29.0	23	.9	342	47.1	-7	38.0
8	300	50.4	20	25.7	0	2.8	286	27.4	23	1.8	12	48.7	-7	36.7
10	330	50.3	20	26.7	30	7.7	316	25.7	23	2.7	42	50.3	-7	35.4
12	0	50.2	20	27.6	60	12.6	346	24.0	23	3.6	72	51.8	-7	34.1
14	30	50.1	20	28.6	90	17.6	16	22.4	23	4.4	102	53.4	-7	32.7
16	60	50.0	20	29.6	120	22.5	46	20.7	23	5.3	132	55.0	-7	31.4
18	90	49.9	20	30.5	150	27.4	76	19.0	23	6.2	162	56.5	-7	30.1
20	120	49.8	20	31.5	180	32.3	106	17.3	23	7.0	192	58.1	-7	28.8
22	150	49.7	20	32.5	210	37.3	136	15.7	23	7.9	222	59.7	-7	27.5
Δ	0		5				-8		4		8			7

UT	MESEC				JUPITER		SATURN							
	S <sub>♄</sub>	Δ	δ <sub>♄</sub>	Δ	S <sub>♃</sub>	δ <sub>♃</sub>	S <sub>♄</sub>	δ <sub>♄</sub>						
h	°	'	°	'	°	'	°	'						
0	25	36.3	110	-15	2.9	-140	50	39.0	-2	18.1	124	17.4	21	35.3
2	54	36.2	107	-15	31.0	-139	80	44.2	-2	18.0	154	21.8	21	35.2
4	83	35.6	105	-15	58.8	-138	110	49.3	-2	17.9	184	26.2	21	35.1
6	112	34.6	103	-16	26.3	-136	140	54.4	-2	17.9	214	30.6	21	35.1
8	141	33.2	100	-16	53.6	-135	170	59.5	-2	17.8	244	35.1	21	35.0
10	170	31.3	98	-17	20.5	-133	201	4.7	-2	17.8	274	39.5	21	34.9
12	199	28.9	96	-17	47.1	-132	231	9.8	-2	17.7	304	43.9	21	34.8
14	228	26.0	93	-18	13.4	-130	261	14.9	-2	17.6	334	48.3	21	34.8
16	257	22.6	91	-18	39.4	-128	291	20.0	-2	17.6	4	52.8	21	34.7
18	286	18.7	88	-19	5.0	-126	321	25.2	-2	17.5	34	57.2	21	34.6
20	315	14.3	86	-19	30.2	-124	351	30.3	-2	17.4	65	1.6	21	34.5
22	344	9.5	83	-19	55.1	-122	21	35.4	-2	17.4	95	6.0	21	34.5
Δ							26		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	3 7	20 48	1 12	:	:	19 29	4.7	2 26	.1
55	3 41	20 13	0 51	:	:	18 58	4.0	2 48	.6
50	4 5	19 49	0 41	3	3	18 35	3.6	3 4	.9
45	4 24	19 30	0 35	2	16	18 17	3.4	3 18	1.1
40	4 39	19 15	0 31	1	55	18 3	3.2	3 29	1.3
35	4 52	19 2	0 29	1	41	17 51	3.0	3 38	1.5
30	5 3	18 51	0 27	1	33	17 41	2.9	3 47	1.6
20	5 22	18 32	0 24	1	22	17 23	2.7	4 1	1.8
10	5 38	18 15	0 23	1	16	17 7	2.5	4 14	2.0
0	5 53	18 0	0 22	1	14	16 53	2.3	4 26	2.2
10	6 8	17 45	0 22	1	14	16 39	2.2	4 38	2.4
20	6 24	17 29	0 23	1	17	16 24	2.0	4 51	2.6
30	6 42	17 11	0 26	1	24	16 6	1.8	5 6	2.8
35	6 53	17 0	0 27	1	29	15 56	1.6	5 15	3.0
40	7 5	16 48	0 30	1	35	15 45	1.5	5 25	3.1
45	7 19	16 34	0 32	1	44	15 32	1.3	5 36	3.3
50	7 36	16 17	0 37	1	55	15 16	1.0	5 51	3.6
55	7 58	15 55	0 42	2	11	14 56	.7	6 9	3.9
60	8 28	15 25	0 52	2	35	14 28	.2	6 34	4.5
S									

SUNCE				MESEC			
UT	e = T <sub>p</sub> - UT	Δ/24	r	Prolaz	Δ/24	π <sub>☾</sub>	r</

UT	SUNCE		PROLEĆ. TAČKA S <sub>γ</sub>	VENERA		MARS									
	S <sub>☉</sub>	δ <sub>☉</sub>		S <sub>♀</sub>	δ <sub>♀</sub>	S <sub>♂</sub>	δ <sub>♂</sub>								
h	°	'	°	'	°	'	°	'							
0	180	49.6	20	33.4	240	42.2	166	14.0	23	8.7	253	1.3	-7	26.2	
2	210	49.5	20	34.4	270	47.1	196	12.3	23	9.6	283	2.8	-7	24.9	
4	240	49.4	20	35.3	300	52.1	226	10.6	23	10.4	313	4.4	-7	23.5	
6	270	49.3	20	36.3	330	57.0	256	8.9	23	11.3	343	6.0	-7	22.2	
8	300	49.2	20	37.3	1	1.9	286	7.3	23	12.1	13	7.6	-7	20.9	
10	330	49.1	20	38.2	31	6.8	316	5.6	23	12.9	43	9.1	-7	19.6	
12	0	49.0	20	39.1	61	11.8	346	3.9	23	13.8	73	10.7	-7	18.3	
14	30	48.9	20	40.1	91	16.7	16	2.2	23	14.6	103	12.3	-7	17.0	
16	60	48.8	20	41.0	121	21.6	46	.5	23	15.4	133	13.9	-7	15.6	
18	90	48.7	20	42.0	151	26.6	75	58.8	23	16.2	163	15.4	-7	14.3	
20	120	48.6	20	42.9	181	31.5	105	57.1	23	17.0	193	17.0	-7	13.0	
22	150	48.5	20	43.8	211	36.4	135	55.4	23	17.8	223	18.6	-7	11.7	
Δ		-1		5				-8		4		8			7

φ	SUNCE		TRAJANJE SUMRAKA		MESEC			
	IZLAZ	ZALAZ	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	20 50	1 13	:::	21 22	4.8	2 27	.2
55	3 40	20 15	0 51	:::	20 34	3.9	3 1	.9
50	4 4	19 50	0 41	3 6	20 2	3.6	3 25	1.2
45	4 23	19 31	0 35	2 17	19 39	3.3	3 45	1.5
40	4 38	19 16	0 31	1 55	19 20	3.2	4 0	1.7
35	4 51	19 3	0 29	1 42	19 4	3.1	4 13	1.8
30	5 2	18 51	0 27	1 33	18 50	3.0	4 25	1.9
20	5 21	18 32	0 24	1 22	18 27	2.8	4 45	2.1
10	5 38	18 16	0 23	1 16	18 7	2.7	5 2	2.3
0	5 53	18 0	0 22	1 14	17 49	2.5	5 19	2.4
10	6 8	17 45	0 22	1 14	17 30	2.4	5 35	2.6
20	6 24	17 29	0 24	1 17	17 11	2.3	5 53	2.7
30	6 43	17 11	0 26	1 24	16 48	2.1	6 13	2.9
35	6 53	16 60	0 27	1 29	16 35	2.0	6 26	3.1
40	7 5	16 48	0 30	1 35	16 20	1.9	6 39	3.2
45	7 20	16 33	0 33	1 44	16 3	1.7	6 56	3.4
50	7 37	16 16	0 37	1 55	15 41	1.5	7 16	3.6
55	7 59	15 54	0 43	2 12	15 13	1.2	7 43	4.0
60	8 30	15 23	0 52	2 35	14 32	.4	8 22	4.7
S								

UT	MESEC				JUPITER		SATURN								
	S <sub>♃</sub>	Δ	δ <sub>♃</sub>	Δ	S <sub>♃</sub>	δ <sub>♃</sub>	S <sub>♄</sub>	δ <sub>♄</sub>							
h	°	'	°	'	°	'	°	'							
0	13	4.1	81	-20	19.5	-120	51	40.5	-2	17.3	125	10.4	21	34.4	
2	41	58.2	78	-20	43.5	-118	81	45.6	-2	17.3	155	14.8	21	34.3	
4	70	51.8	75	-21	7.0	-116	111	50.8	-2	17.2	185	19.3	21	34.2	
6	99	44.9	73	-21	30.1	-113	141	55.9	-2	17.2	215	23.7	21	34.1	
8	128	37.4	70	-21	52.8	-111	172	1.0	-2	17.1	245	28.1	21	34.1	
10	157	29.5	68	-22	14.9	-108	202	6.1	-2	17.0	275	32.5	21	34.0	
12	186	21.0	65	-22	36.5	-106	232	11.2	-2	17.0	305	36.9	21	33.9	
14	215	12.1	63	-22	57.6	-103	262	16.3	-2	16.9	335	41.3	21	33.8	
16	244	2.6	60	-23	18.2	-100	292	21.4	-2	16.9	5	45.8	21	33.8	
18	272	52.6	58	-23	38.2	-97	322	26.6	-2	16.8	35	50.2	21	33.7	
20	301	42.1	55	-23	57.6	-94	352	31.7	-2	16.8	65	54.6	21	33.6	
22	330	31.2	53	-24	16.5	-91	22	36.8	-2	16.7	95	59.0	21	33.5	
Δ								26		0		22			0

SUNCE				MESEC					
UT	e = T <sub>p</sub> - UT	Δ/24	r	Prolaz	Δ/24	π <sub>♃</sub>	r		
h	min	s	s	h min	min	'	'		
00	3 18.7	-.2	15.8	T <sub>m</sub>	1.0	58.9	16.1		
12	3 16.2	T <sub>m☉</sub>	11 h 56.7 min	Starost	14.6 d	Faza	☉		
PLANETE									
Pl.	T <sub>m</sub>	π	360-α	Vel.	Pl.	T <sub>m</sub>	π	360-α	Vel.
♀	h min	'	°	°	♃	h min	'	°	°
♂	12 56	.1	286	-3.8	♄	20 30	.0	171	-2.1
	7 8	.1	12	.4	♅	15 37	.0	244	.2

UT	SUNCE		PROLEĆ. TAČKA S <sub>γ</sub>	VENERA		MARS									
	S <sub>☉</sub>	δ <sub>☉</sub>		S <sub>♀</sub>	δ <sub>♀</sub>	S <sub>♂</sub>	δ <sub>♂</sub>								
h	°	'	°	'	°	'	°	'							
0	180	48.4	20	44.8	241	41.3	165	53.8	23	18.6	253	20.2	-7	10.4	
2	210	48.3	20	45.7	271	46.3	195	52.1	23	19.4	283	21.8	-7	9.0	
4	240	48.2	20	46.6	301	51.2	225	50.4	23	20.2	313	23.3	-7	7.7	
6	270	48.0	20	47.5	331	56.1	255	48.7	23	21.0	343	24.9	-7	6.4	
8	300	47.9	20	48.5	2	1.0	285	47.0	23	21.8	13	26.5	-7	5.1	
10	330	47.8	20	49.4	32	6.0	315	45.3	23	22.6	43	28.1	-7	3.8	
12	0	47.7	20	50.3	62	10.9	345	43.6	23	23.3	73	29.7	-7	2.4	
14	30	47.6	20	51.2	92	15.8	15	41.9	23	24.1	103	31.2	-7	1.1	
16	60	47.5	20	52.1	122	20.8	45	40.2	23	24.9	133	32.8	-6	59.8	
18	90	47.3	20	53.0	152	25.7	75	38.5	23	25.6	163	34.4	-6	58.5	
20	120	47.2	20	53.9	182	30.6	105	36.8	23	26.4	193	36.0	-6	57.2	
22	150	47.1	20	54.8	212	35.5	135	35.1	23	27.1	223	37.6	-6	55.8	
Δ		-1		5				-8		4		8			7

φ	SUNCE		TRAJANJE SUMRAKA		MESEC			
	IZLAZ	ZALAZ	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 3	20 52	1 14	:::	23 16	3.7	2 32	.6
55	3 38	20 17	0 51	:::	22 8	3.2	3 22	1.5
50	4 3	19 51	0 41	3 9	21 28	3.1	3 55	1.8
45	4 22	19 32	0 36	2 18	20 59	3.0	4 20	2.0
40	4 38	19 17	0 32	1 56	20 36	3.0	4 40	2.1
35	4 51	19 3	0 29	1 42	20 17	2.9	4 56	2.2
30	5 2	18 52	0 27	1 33	20 1	2.9	5 11	2.3
20	5 21	18 33	0 24	1 22	19 34	2.8	5 36	2.4
10	5 38	18 16	0 23	1 16	19 11	2.7	5 57	2.5
0	5 53	18 0	0 22	1 14	18 50	2.7	6 17	2.6
10	6 9	17 45	0 22	1 14	18 28	2.6	6 37	2.7
20	6 25	17 29	0 24	1 17	18 5	2.6	6 59	2.8
30	6 43	17 10	0 26	1 24	17 39	2.5	7 24	2.9
35	6 54	16 59	0 27	1 29	17 24	2.4	7 39	3.0
40	7 6	16 47	0 30	1 35	17 6	2.4	7 56	3.1
45	7 21	16 33	0 33	1 44	16 44	2.3	8 17	3.2
50	7 38	16 15	0 37	1 56	16 17	2.2	8 43	3.4
55	8 1	15 52	0 43	2 12	15 40	1.9	9 19	3.6
60	8 32	15 21	0 52	2 36	14 43	1.3	10 15	4.3
S								

UT	MESEC				JUPITER		SATURN								
	S <sub>♃</sub>	Δ	δ <sub>♃</sub>	Δ	S <sub>♃</sub>	δ <sub>♃</sub>	S <sub>♄</sub>	δ <sub>♄</sub>							
h	°	'	°	'	°	'	°	'							
0	359	19.7	50	-24	34.7	-88	52	41.9	-2	16.6	126	3.4	21	33.5	
2	28	7.8	48	-24	52.4	-85	82	47.0	-2	16.6	156	7.8	21	33.4	
4	56	55.4	46	-25	9.3	-82	112	52.1	-2	16.5	186	12.2	21	33.3	
6	85	42.5	43	-25	25.7	-78	142	57.2	-2	16.5	216	16.6	21	33.2	
8	114	29.2	41	-25	41.3	-75	173	2.3	-2	16.4	246	21.1	21	33.1	
10	143	15.5	39	-25	56.3	-71	203	7.4	-2	16.4	276	25.5	21	33.1	
12	172	1.3	37	-26	10.6	-68	233	12.5	-2	16.3	306	29.9	21	33.0	
14	200	46.8	35	-26	24.2	-64	263	17.6	-2	16.3	336	34.3	21	32.9	
16	229	31.8	33	-26	37.0	-61	293	22.7	-2	16.2	6	38.7	21	32.8	
18	258	16.5	32	-26	49.2	-57	323	27.8	-2	16.2	36	43.1	21	32.7	
20	287	.8	30	-27	.5	-53	353	32.9	-2	16.1	66	47.5	21	32.7	
22	315	44.8	28	-27	11.2	-49	23	38.0	-2	16.1	96	51.9	21	32.6	
Δ								25		0		22			0

SUNCE				MESEC				
UT	e = T <sub>p</sub> - UT	Δ/24	r	Prolaz	Δ/24	π <sub>♃</sub>	r	
h	min	s	s	h min	min	'	'	
00	3 13.7	-.2	15.8	T <sub>m</sub>	0 3	2.6	59.5	16.2
12	3 10.9	T <sub>m☉</sub>	11 h 56.8 min	Starost	15.6 d	Faza	☉	
PLANETE								
Pl.	T <sub>m</sub>							

UT	SUNCE		PROLEĆ. TAČKA S <sub>γ</sub>	VENERA		MARS	
	S <sub>☉</sub>	δ <sub>☉</sub>		S <sub>♀</sub>	δ <sub>♀</sub>	S <sub>♂</sub>	δ <sub>♂</sub>
h	° / ' / "	° / ' / "	° / ' / "	° / ' / "	° / ' / "	° / ' / "	° / ' / "
0	180 47.0	20 55.7	242 40.5	165 33.4	23 27.9	253 39.2	- 6 54.5
2	210 46.9	20 56.6	272 45.4	195 31.7	23 28.6	283 40.8	- 6 53.2
4	240 46.7	20 57.5	302 50.3	225 30.0	23 29.3	313 42.3	- 6 51.9
6	270 46.6	20 58.4	332 55.3	255 28.2	23 30.1	343 43.9	- 6 50.6
8	300 46.5	20 59.3	3	285 26.5	23 30.8	13 45.5	- 6 49.2
10	330 46.4	21 . 2	33 5.1	315 24.8	23 31.5	43 47.1	- 6 47.9
12	0 46.2	21 1.1	63 10.0	345 23.1	23 32.2	73 48.7	- 6 46.6
14	30 46.1	21 2.0	93 15.0	15 21.4	23 32.9	103 50.3	- 6 45.3
16	60 46.0	21 2.9	123 19.9	45 19.7	23 33.6	133 51.9	- 6 43.9
18	90 45.9	21 3.7	153 24.8	75 18.0	23 34.3	163 53.5	- 6 42.6
20	120 45.7	21 4.6	183 29.8	105 16.3	23 35.0	193 55.1	- 6 41.3
22	150 45.6	21 5.5	213 34.7	135 14.5	23 35.7	223 56.6	- 6 40.0
Δ	-1	4		-9	4	8	7

φ	SUNCE		TRAJANJE SUMRAKA		MESEC			
	IZLAZ	ZALAZ	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 1	20 54	1 15	:	:	:	2 47	2.0
55	3 37	20 18	0 52	:	:	23 25	2.2	3 57
50	4 2	19 53	0 42	:	3 13	22 42	2.3	4 38
45	4 21	19 33	0 36	:	2 18	22 11	2.4	5 7
40	4 37	19 17	0 32	:	1 56	21 47	2.5	5 30
35	4 50	19 4	0 29	:	1 42	21 27	2.6	5 50
30	5 2	18 53	0 27	:	1 33	21 10	2.6	6 6
20	5 21	18 33	0 24	:	1 22	20 42	2.6	6 34
10	5 38	18 16	0 23	:	1 16	20 17	2.7	6 58
0	5 53	18 1	0 22	:	1 14	19 54	2.7	7 20
10	6 9	17 45	0 22	:	1 14	19 32	2.7	7 43
20	6 25	17 29	0 24	:	1 17	19 7	2.8	8 7
30	6 44	17 10	0 26	:	1 24	18 39	2.8	8 34
35	6 55	16 59	0 27	:	1 29	18 22	2.8	8 51
40	7 7	16 46	0 30	:	1 36	18 3	2.9	9 10
45	7 22	16 32	0 33	:	1 44	17 39	2.9	9 34
50	7 40	16 14	0 37	:	1 56	17 9	2.9	10 4
55	8 2	15 51	0 43	:	2 12	16 27	3.0	10 46
60	8 34	15 19	0 53	:	2 37	15 13	3.1	11 59
S								

UT	MESEC				JUPITER		SATURN	
	S <sub>♃</sub>	Δ	δ <sub>♃</sub>	Δ	S <sub>♃</sub>	δ <sub>♃</sub>	S <sub>♄</sub>	δ <sub>♄</sub>
h	° / ' / "	° / ' / "	° / ' / "	° / ' / "	° / ' / "	° / ' / "	° / ' / "	° / ' / "
0	344 28.4	27 -27	21.0	-45	53 43.1	- 2 16.0	126 56.3	21 32.5
2	13 11.8	25 -27	30.1	-41	83 48.2	- 2 16.0	157 .7	21 32.4
4	41 54.8	24 -27	38.3	-37	113 53.2	- 2 15.9	187 5.1	21 32.4
6	70 37.7	23 -27	45.8	-33	143 58.3	- 2 15.9	217 9.5	21 32.3
8	99 20.3	22 -27	52.5	-29	174 3.4	- 2 15.9	247 13.9	21 32.2
10	128 2.6	21 -27	58.3	-25	204 8.5	- 2 15.8	277 18.4	21 32.1
12	156 44.9	20 -28	3.4	-21	234 13.6	- 2 15.8	307 22.8	21 32.0
14	185 26.9	20 -28	7.6	-17	264 18.7	- 2 15.7	337 27.2	21 32.0
16	214 8.8	19 -28	10.9	-13	294 23.8	- 2 15.7	7 31.6	21 31.9
18	242 50.6	19 -28	13.5	-9	324 28.8	- 2 15.6	37 36.0	21 31.8
20	271 32.3	18 -28	15.2	-4	354 33.9	- 2 15.6	67 40.4	21 31.7
22	300 14.0	18 -28	16.0	0	24 39.0	- 2 15.5	97 44.8	21 31.6
Δ					25	0	22	0

SUNCE				MESEC					
UT	e = T <sub>p</sub> - UT	Δ/24	r	Prolaz	Δ/24	π <sub>☾</sub>	r		
h	min s	s	'	h min	min	'	'		
00	3 8.1	-.3	15.8	T <sub>m</sub>	1 5	2.7	60.0	16.3	
12	3 5.1	T <sub>m☉</sub>	11 h 56.9 min	Starost	16.6 d	Faza	☉		
PLANETE									
Pl.	T <sub>m</sub>	π	360-α	Vel.	Pl.	T <sub>m</sub>	π	360-α	Vel.
♀	h min	'	°	°	♃	h min	'	°	°
♁	12 59	.1	283	-3.8	♃	20 22	.0	171	-2.1
♂	7 5	.1	11	.4	♄	15 30	.0	244	.2

UT	SUNCE		PROLEĆ. TAČKA S <sub>γ</sub>	VENERA		MARS	
	S <sub>☉</sub>	δ <sub>☉</sub>		S <sub>♀</sub>	δ <sub>♀</sub>	S <sub>♂</sub>	δ <sub>♂</sub>
h	° / ' / "	° / ' / "	° / ' / "	° / ' / "	° / ' / "	° / ' / "	° / ' / "
0	180 45.5	21 6.4	243 39.6	165 12.8	23 36.4	253 58.2	- 6 38.7
2	210 45.3	21 7.2	273 44.5	195 11.1	23 37.1	283 59.8	- 6 37.3
4	240 45.2	21 8.1	303 49.5	225 9.4	23 37.8	314 1.4	- 6 36.0
6	270 45.1	21 9.0	333 54.4	255 7.7	23 38.4	344 3.0	- 6 34.7
8	300 44.9	21 9.8	3 59.3	285 5.9	23 39.1	14 4.6	- 6 33.4
10	330 44.8	21 10.7	34 4.3	315 4.2	23 39.8	44 6.2	- 6 32.0
12	0 44.7	21 11.5	64 9.2	345 2.5	23 40.4	74 7.8	- 6 30.7
14	30 44.5	21 12.4	94 14.1	15 .8	23 41.1	104 9.4	- 6 29.4
16	60 44.4	21 13.2	124 19.0	44 59.0	23 41.7	134 11.0	- 6 28.1
18	90 44.2	21 14.1	154 24.0	74 57.3	23 42.4	164 12.6	- 6 26.7
20	120 44.1	21 14.9	184 28.9	104 55.6	23 43.0	194 14.2	- 6 25.4
22	150 44.0	21 15.8	214 33.8	134 53.9	23 43.6	224 15.8	- 6 24.1
Δ	-1	4		-9	3	8	7

φ	SUNCE		TRAJANJE SUMRAKA		MESEC			
	IZLAZ	ZALAZ	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	20 56	1 17	:	:	0 45	1.6	3 36
55	3 35	20 20	0 52	:	:	:	.0	4 55
50	4 1	19 54	0 42	:	3 17	23 38	1.6	5 39
45	4 20	19 34	0 36	:	2 19	23 10	1.9	6 10
40	4 36	19 18	0 32	:	1 57	22 47	2.0	6 34
35	4 50	19 5	0 29	:	1 43	22 28	2.1	6 53
30	5 1	18 53	0 27	:	1 33	22 12	2.2	7 10
20	5 21	18 33	0 24	:	1 22	21 45	2.4	7 39
10	5 38	18 16	0 23	:	1 16	21 21	2.5	8 3
0	5 53	18 1	0 22	:	1 14	20 60	2.6	8 26
10	6 9	17 45	0 22	:	1 14	20 38	2.7	8 48
20	6 26	17 28	0 24	:	1 17	20 14	2.8	9 12
30	6 44	17 9	0 26	:	1 24	19 47	3.0	9 40
35	6 55	16 58	0 28	:	1 29	19 30	3.1	9 57
40	7 8	16 46	0 30	:	1 36	19 11	3.2	10 16
45	7 23	16 31	0 33	:	1 44	18 48	3.3	10 40
50	7 41	16 13	0 37	:	1 56	18 19	3.5	11 9
55	8 4	15 50	0 43	:	2 13	17 38	3.8	11 51
60	8 36	15 18	0 53	:	2 37	16 28	4.6	13 1
S								

UT	MESEC				JUPITER		SATURN	
	S <sub>♃</sub>	Δ	δ <sub>♃</sub>	Δ	S <sub>♃</sub>	δ <sub>♃</sub>	S <sub>♄</sub>	δ <sub>♄</sub>
h	° / ' / "	° / ' / "	° / ' / "	° / ' / "	° / ' / "	° / ' / "	° / ' / "	° / ' / "
0	328 55.6	18 -28	16.1	4	54 44.1	- 2 15.5	127 49.2	21 31.6
2	357 37.3	18 -28	15.2	8	84 49.2	- 2 15.5	157 53.6	21 31.5
4	26 18.9	19 -28	13.6	13	114 54.2	- 2 15.4	187 58.0	21 31.4
6	55 .6	19 -28	11.1	17	144 59.3	- 2 15.4	218 2.4	21 31.3
8	83 42.4	19 -28	7.7	21	175 4.4	- 2 15.3	248 6.8	21 31.2
10	112 24.3	20 -28	3.5	25	205 9.5	- 2 15.3	278 11.2	21 31.2
12	141 6.4	21 -27	58.5	29	235 14.5	- 2 15.3	308 15.6	21 31.1
14	169 48.5	22 -27	52.7	33	265 19.6	- 2 15.2	338 20.0	21 31.0
16	198 30.9	23 -27	46.0	37	295 24.7	- 2 15.2	8 24.4	21 30.9
18	227 13.4	24 -27	38.5	41	325 29.8	- 2 15.2	38 28.8	21 30.8
20	255 56.2	25 -27	30.2	45	355 34.8	- 2 15.1	68 33.2	21 30.8
22	284 39.2	26 -27	21.1	49	25 39.9	- 2 15.1	98 37.6	21 30.7
Δ					25	0	22	0

SUNCE				MESEC					
UT	e = T <sub>p</sub> - UT	Δ/24	r	Prolaz	Δ/24	π <sub>☾</sub>	r		
h	min s	s	'	h min	min	'	'		
00	3 2.0	-.3	15.8	T <sub>m</sub>	2 10	2.7	60.2	16.4	
12	2 58.7	T <sub>m☉</sub>	11 h 57.0 min	Starost	17.6 d	Faza	☉		
PLANETE									
Pl.	T <sub>m</sub>	π	360-α	Vel.	Pl.	T <sub>m</sub>	π	360-α	Vel.
♀	h min	'	°	°	♃	h min	'	°	°
♁	12 60	.1	282	-3.8	♃	20 18	.0	171	-2.1
♂	7 4	.1	10	.4	♄	15 26	.0	244	.2

UT	SUNCE				PROLEĆ. TAČKA S <sub>γ</sub>	VENERA			MARS							
	S <sub>☉</sub>	δ <sub>☉</sub>				S <sub>♀</sub>	δ <sub>♀</sub>			S <sub>♂</sub>	δ <sub>♂</sub>					
h	°	'	°	'	°	'	°	'	°	'	°	'				
0	180	43.8	21	16.6	244	38.8	164	52.1	23	44.3	254	17.4	- 6	22.8		
2	210	43.7	21	17.5	274	43.7	194	50.4	23	44.9	284	19.0	- 6	21.4		
4	240	43.5	21	18.3	304	48.6	224	48.7	23	45.5	314	20.6	- 6	20.1		
6	270	43.4	21	19.1	334	53.5	254	46.9	23	46.1	344	22.2	- 6	18.8		
8	300	43.2	21	20.0	4	58.5	284	45.2	23	46.7	14	23.8	- 6	17.5		
10	330	43.1	21	20.8	35	3.4	314	43.5	23	47.3	44	25.4	- 6	16.1		
12	0	43.0	21	21.6	65	8.3	344	41.7	23	47.9	74	27.0	- 6	14.8		
14	30	42.8	21	22.4	95	13.3	14	40.0	23	48.5	104	28.6	- 6	13.5		
16	60	42.7	21	23.2	125	18.2	44	38.2	23	49.1	134	30.2	- 6	12.2		
18	90	42.5	21	24.1	155	23.1	74	36.5	23	49.7	164	31.8	- 6	10.8		
20	120	42.4	21	24.9	185	28.0	104	34.8	23	50.3	194	33.4	- 6	9.5		
22	150	42.2	21	25.7	215	33.0	134	33.0	23	50.9	224	35.0	- 6	8.2		
Δ		-1		4				-9		3				8		7

φ	SUNCE		TRAJANJE SUMRAKA		MESEC			
	IZLAZ	ZALAZ	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	20 58	1 18	:	1 23	.5	5 15	4.9
55	3 34	20 21	0 53	:	0 18	1.3	6 18	4.0
50	3 60	19 55	0 42	:	...	.0	6 57	3.6
45	4 20	19 35	0 36	:	2 20	1.4	7 25	3.4
40	4 36	19 19	0 32	:	1 57	1.6	7 47	3.2
35	4 49	19 5	0 29	:	1 43	1.7	8 5	3.1
30	5 1	18 54	0 27	:	1 34	2.3	8 20	3.0
20	5 21	18 34	0 24	:	1 22	2.2	8 46	2.8
10	5 38	18 17	0 23	:	1 16	2.2	9 9	2.7
0	5 54	18 1	0 22	:	1 14	2.2	9 30	2.5
10	6 9	17 45	0 23	:	1 14	2.1	9 51	2.4
20	6 26	17 28	0 24	:	1 18	2.2	10 13	2.2
30	6 45	17 9	0 26	:	1 24	2.2	10 38	2.0
35	6 56	16 58	0 28	:	1 29	2.2	10 53	1.9
40	7 9	16 45	0 30	:	1 36	2.2	11 10	1.8
45	7 24	16 30	0 33	:	1 45	2.2	11 31	1.6
50	7 42	16 12	0 37	:	1 56	2.2	11 57	1.4
55	8 5	15 49	0 43	:	2 13	2.2	12 32	1.0
60	8 38	15 16	0 53	:	2 38	2.2	13 24	.3

UT	MESEC				JUPITER			SATURN								
	S <sub>♃</sub>	Δ	δ <sub>♃</sub>	Δ	S <sub>♃</sub>	δ <sub>♃</sub>			S <sub>♄</sub>	δ <sub>♄</sub>						
h	°	'	°	'	°	'	°	'	°	'	°	'				
0	313	22.5	28	-27	11.3	53	55	45.0	- 2	15.0	128	42.0	21	30.6		
2	342	6.1	29	-27	.6	57	85	50.0	- 2	15.0	158	46.4	21	30.5		
4	10	49.9	31	-26	49.2	61	115	55.1	- 2	15.0	188	50.8	21	30.4		
6	39	34.2	33	-26	37.0	65	146	.1	- 2	14.9	218	55.2	21	30.3		
8	68	18.7	35	-26	24.0	68	176	5.2	- 2	14.9	248	59.5	21	30.3		
10	97	3.6	36	-26	10.4	72	206	10.3	- 2	14.9	279	3.9	21	30.2		
12	125	48.9	38	-25	56.0	76	236	15.3	- 2	14.8	309	8.3	21	30.1		
14	154	34.5	40	-25	40.8	79	266	20.4	- 2	14.8	339	12.7	21	30.0		
16	183	20.6	42	-25	25.0	82	296	25.4	- 2	14.8	9	17.1	21	29.9		
18	212	7.1	45	-25	8.5	86	326	30.5	- 2	14.7	39	21.5	21	29.9		
20	240	54.0	47	-24	51.3	89	356	35.5	- 2	14.7	69	25.9	21	29.8		
22	269	41.3	49	-24	33.5	92	26	40.6	- 2	14.7	99	30.3	21	29.7		
Δ								25		0				22		0

SUNCE				MESEC				
UT	e = T <sub>p</sub> - UT	Δ/24	r	Prolaz	Δ/24	π <sub>♃</sub>	r	
h	min	s	s	h min	min	'	'	
00	2 55.5	-.3	15.8	T <sub>m</sub>	3 15	2.5	60.2	16.4
12	2 51.9	T <sub>m☉</sub>	11 h 57.1 min	Starost	18.6 d	Faza	☉	

PLANETE									
Pl.	T <sub>m</sub>	π	360-α	Vel.	Pl.	T <sub>m</sub>	π	360-α	Vel.
♀	h min	'	°		♃	h min	'	°	
♂	13 1	.1	280	-3.8	♄	20 14	.0	171	-2.1
♂	7 2	.1	10	.4	♄	15 23	.0	244	.2

UT	SUNCE				PROLEĆ. TAČKA S <sub>γ</sub>	VENERA			MARS							
	S <sub>☉</sub>	δ <sub>☉</sub>				S <sub>♀</sub>	δ <sub>♀</sub>			S <sub>♂</sub>	δ <sub>♂</sub>					
h	°	'	°	'	°	'	°	'	°	'	°	'				
0	180	42.1	21	26.5	245	37.9	164	31.3	23	51.4	254	36.6	- 6	6.8		
2	210	41.9	21	27.3	275	42.8	194	29.6	23	52.0	284	38.2	- 6	5.5		
4	240	41.8	21	28.1	305	47.7	224	27.8	23	52.6	314	39.8	- 6	4.2		
6	270	41.6	21	28.9	335	52.7	254	26.1	23	53.1	344	41.4	- 6	2.9		
8	300	41.4	21	29.7	5	57.6	284	24.3	23	53.7	14	43.0	- 6	1.5		
10	330	41.3	21	30.5	36	2.5	314	22.6	23	54.2	44	44.6	- 6	.2		
12	0	41.1	21	31.3	66	7.5	344	20.8	23	54.8	74	46.3	- 5	58.9		
14	30	41.0	21	32.1	96	12.4	14	19.1	23	55.3	104	47.9	- 5	57.6		
16	60	40.8	21	32.9	126	17.3	44	17.3	23	55.8	134	49.5	- 5	56.2		
18	90	40.7	21	33.7	156	22.2	74	15.6	23	56.4	164	51.1	- 5	54.9		
20	120	40.5	21	34.5	186	27.2	104	13.8	23	56.9	194	52.7	- 5	53.6		
22	150	40.3	21	35.2	216	32.1	134	12.1	23	57.4	224	54.3	- 5	52.2		
Δ		-1		4				-9		3				8		7

φ	SUNCE		TRAJANJE SUMRAKA		MESEC			
	IZLAZ	ZALAZ	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 0	1 19	:	1 35	.2	7 11	4.7
55	3 33	20 23	0 53	:	0 49	.8	7 55	4.1
50	3 59	19 56	0 42	:	0 18	1.1	8 24	3.7
45	4 19	19 36	0 36	:	2 21	.0	8 46	3.4
40	4 35	19 20	0 32	:	1 57	.0	9 4	3.2
35	4 49	19 6	0 29	:	1 43	.0	9 19	3.1
30	5 0	18 54	0 27	:	1 34	1.6	9 32	2.9
20	5 20	18 34	0 24	:	1 22	1.8	9 54	2.7
10	5 38	18 17	0 23	:	1 16	2.0	10 13	2.5
0	5 54	18 1	0 22	:	1 14	2.2	10 30	2.3
10	6 10	17 45	0 23	:	1 14	2.4	10 47	2.1
20	6 26	17 28	0 24	:	1 18	2.6	11 6	1.9
30	6 46	17 9	0 26	:	1 24	2.8	11 27	1.7
35	6 57	16 58	0 28	:	1 29	3.0	11 39	1.6
40	7 9	16 45	0 30	:	1 36	3.2	11 53	1.4
45	7 25	16 30	0 33	:	1 45	3.4	12 10	1.2
50	7 43	16 11	0 37	:	1 57	3.6	12 30	1.0
55	8 7	15 47	0 43	:	2 13	4.0	12 56	.6
60	8 40	15 14	0 54	:	2 38	4.5	13 32	.1

UT	MESEC				JUPITER			SATURN								
	S <sub>♃</sub>	Δ	δ <sub>♃</sub>	Δ	S <sub>♃</sub>	δ <sub>♃</sub>			S <sub>♄</sub>	δ <sub>♄</sub>						
h	°	'	°	'	°	'	°	'	°	'	°	'				
0	298	29.1	51	-24	15.0	95	56	45.7	- 2	14.7	129	34.7	21	29.6		
2	327	17.4	53	-23	55.9	99	86	50.7	- 2	14.6	159	39.1	21	29.5		
4	356	6.1	56	-23	36.2	102	116	55.8	- 2	14.6	189	43.5	21	29.4		
6	24	55.2	58	-23	15.9	104	147	.8	- 2	14.6	219	47.9	21	29.4		
8	53	44.8	60	-22	55.0	107	177	5.9	- 2	14.5	249	52.2	21	29.3		
10	82	34.9	63	-22	33.6	110	207	10.9	- 2	14.5	279	56.6	21	29.2		
12	111	25.5	65	-22	11.6	113	237	15.9	- 2	14.5	310	1.0	21	29.1		
14	140	16.5	68	-21	49.0	115	267	21.0	- 2	14.5	340	5.4	21	29.0		
16	169	8.0	70	-21	25.9	118	297	26.0	- 2	14.4	10	9.8	21	28.9		
18	198	.0	72	-21	2.4	120	327	31.1	- 2	14.4	40	14.2	21	28.9		
20	226	52.5	75	-20	38.3	123	357	36.1	- 2	14.4	70	18.6	21	28.8		
22	255	45.4	77	-20	13.8	125	27	41.2	- 2	14.4	100	23.0	21	28.7		
Δ								25		0				22		0

SUNCE				MESEC				
UT	e = T <sub>p</sub> - UT	Δ/24	r	Prolaz	Δ/24	π <sub>♃</sub>	r	
h	min	s	s	h min	min	'	'	
00	2 48.4	-.3	15.8	T <sub>m</sub>	4 16	2.4	60.0	16.3
12	2 44.6	T <sub>m☉</sub>	11 h 57.3 min	Starost	19.6 d	Faza	☉	

PLANETE							
Pl.	T <sub>m</sub>	π	360-				

UT	SUNCE				PROLEĆ. TAČKA S <sub>γ</sub>	VENERA				MARS					
	S <sub>☉</sub>		δ <sub>☉</sub>			S <sub>♀</sub>		δ <sub>♀</sub>		S <sub>♂</sub>		δ <sub>♂</sub>			
h	°	'	°	'	°	'	°	'	°	'	°	'			
0	180	40.2	21	36.0	246	37.0	164	10.3	23	57.9	254	55.9	-5	50.9	
2	210	40.0	21	36.8	276	42.0	194	8.6	23	58.4	284	57.5	-5	49.6	
4	240	39.9	21	37.6	306	46.9	224	6.8	23	58.9	314	59.1	-5	48.3	
6	270	39.7	21	38.3	336	51.8	254	5.1	23	59.4	345	59.7	-5	46.9	
8	300	39.5	21	39.1	6	56.7	284	3.3	23	59.9	15	2.4	-5	45.6	
10	330	39.4	21	39.9	37	1.7	314	1.6	24	4	45	4.0	-5	44.3	
12	0	39.2	21	40.6	67	6.6	343	59.8	24	9	75	5.6	-5	42.9	
14	30	39.0	21	41.4	97	11.5	13	58.1	24	1.4	105	7.2	-5	41.6	
16	60	38.9	21	42.2	127	16.5	43	56.3	24	1.8	135	8.8	-5	40.3	
18	90	38.7	21	42.9	157	21.4	73	54.6	24	2.3	165	10.4	-5	39.0	
20	120	38.5	21	43.7	187	26.3	103	52.8	24	2.8	195	12.1	-5	37.6	
22	150	38.3	21	44.4	217	31.2	133	51.0	24	3.2	225	13.7	-5	36.3	
Δ		-1		4				-9		2			8		7

φ	SUNCE		TRAJANJE SUMRAKA		MESEC			
	IZLAZ	ZALAZ	GRAĐ.	ASTR.	IZLAZ	Δ/24	ZALAZ	Δ/24
N	h min	h min	h min	h min	h min	min	h min	min
60	2 54	21 2	1 21	:::	1 39	.0	9 4	4.4
55	3 32	20 24	0 53	:::	1 8	.5	9 32	3.9
50	3 58	19 57	0 42	3 33	0 45	.8	9 53	3.6
45	4 18	19 37	0 36	2 22	0 28	1.1	10 9	3.3
40	4 35	19 21	0 32	1 58	0 13	1.3	10 22	3.1
35	4 48	19 7	0 29	1 44	0 1	1.4	10 32	2.9
30	5 0	18 55	0 27	1 34	...	.0	10 42	2.8
20	5 20	18 35	0 24	1 23	...	.0	10 58	2.5
10	5 38	18 17	0 23	1 17	...	.0	11 12	2.3
0	5 54	18 1	0 22	1 14	23 53	2.0	11 26	2.1
10	6 10	17 45	0 23	1 15	23 42	2.2	11 39	1.9
20	6 27	17 28	0 24	1 18	23 31	2.5	11 52	1.7
30	6 46	17 9	0 26	1 24	23 17	2.7	12 8	1.5
35	6 57	16 57	0 28	1 29	23 10	2.9	12 17	1.3
40	7 10	16 44	0 30	1 36	23 1	3.0	12 27	1.2
45	7 25	16 29	0 33	1 45	22 50	3.2	12 39	1.0
50	7 44	16 10	0 37	1 57	22 38	3.5	12 53	.7
55	8 8	15 46	0 44	2 14	22 22	3.8	13 11	.4
60	8 41	15 13	0 54	2 39	22 0	4.2	13 35	.0
S								

UT	MESEC				JUPITER				SATURN						
	S <sub>♃</sub>		Δ		δ <sub>♃</sub>		Δ		S <sub>♃</sub>		δ <sub>♃</sub>				
h	°	'	°	'	°	'	°	'	°	'	°	'			
0	284	38.8	79	-19	48.8	127	57	46.2	-2	14.3	130	27.4	21	28.6	
2	313	32.7	82	-19	23.4	129	87	51.2	-2	14.3	160	31.7	21	28.5	
4	342	27.0	84	-18	57.6	131	117	56.3	-2	14.3	190	36.1	21	28.4	
6	11	21.8	86	-18	31.3	133	148	1.3	-2	14.3	220	40.5	21	28.4	
8	40	17.1	88	-18	4.7	135	178	6.3	-2	14.2	250	44.9	21	28.3	
10	69	12.8	91	-17	37.6	137	208	11.4	-2	14.2	280	49.3	21	28.2	
12	98	8.9	93	-17	10.2	139	238	16.4	-2	14.2	310	53.7	21	28.1	
14	127	5.5	95	-16	42.5	140	268	21.4	-2	14.2	340	58.0	21	28.0	
16	156	2.5	97	-16	14.4	142	298	26.5	-2	14.2	11	2.4	21	27.9	
18	184	59.9	99	-15	46.0	143	328	31.5	-2	14.1	41	6.8	21	27.9	
20	213	57.7	101	-15	17.3	145	358	36.5	-2	14.1	71	11.2	21	27.8	
22	242	55.9	103	-14	48.3	146	28	41.5	-2	14.1	101	15.6	21	27.7	
Δ								25		0			22		0

SUNCE				MESEC				
UT	e = T <sub>p</sub> - UT	Δ/24	r	Prolaz	Δ/24	π <sub>☉</sub>	r	
h	min	s	'	h min	min	'	'	
00	2 40.9	-.3	15.8	T <sub>m</sub>	5 13	2.2	59.6	16.2
12	2 36.9			T <sub>m☉</sub>	11 h 57.4 min	Starost 20.6 d	Faza ☉	

PLANETE									
Pl.	T <sub>m</sub>	π	360-α	Vel.	Pl.	T <sub>m</sub>	π	360-α	Vel.
♀	h min	'	°	°	♃	h min	'	°	°
♀	13 4	.1	278	-3.8	♃	20 6	.0	171	-2.1
♂	6 60	.1	8	.3	♃	15 16	.0	244	.2

UT	SUNCE				PROLEĆ. TAČKA S <sub>γ</sub>	VENERA				MARS					
	S <sub>☉</sub>		δ <sub>☉</sub>			S <sub>♀</sub>		δ <sub>♀</sub>		S <sub>♂</sub>		δ <sub>♂</sub>			
h	°	'	°	'	°	'	°	'	°	'	°	'			
0	180	38.2	21	45.2	247	36.2	163	49.3	24	3.7	255	15.3	-5	35.0	
2	210	38.0	21	45.9	277	41.1	193	47.5	24	4.1	285	16.9	-5	33.6	
4	240	37.8	21	46.7	307	46.0	223	45.8	24	4.6	315	18.5	-5	32.3	
6	270	37.7	21	47.4	337	51.0	253	44.0	24	5.0	345	20.1	-5	31.0	
8	300	37.5	21	48.1	7	55.9	283	42.2	24	5.5	15	21.8	-5	29.7	
10	330	37.3	21	48.9	38	8	313	40.5	24	5.9	45	23.4	-5	28.3	
12	0	37.1	21	49.6	68	5.7	343	38.7	24	6.3	75	25.0	-5	27.0	
14	30	37.0	21	50.3	98	10.7	13	36.9	24	6.7	105	26.6	-5	25.7	
16	60	36.8	21	51.1	128	15.6	43	35.2	24	7.2	135	28.2	-5	24.3	
18	90	36.6	21	51.8	158	20.5	73	33.4	24	7.6	165	29.9	-5	23.0	
20	120	36.4	21	52.5	188	25.5	103	31.6	24	8.0	195	31.5	-5	21.7	
22	150	36.2	21	53.2	218	30.4	133	29.9	24	8.4	225	33.1	-5	20.3	
Δ		-1		4				-9		2			8		7

φ	SUNCE		TRAJANJE SUMRAKA		MESEC			
	IZLAZ	ZALAZ	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 52	21 4	1 22	:::	1 39	.0	10 49	4.1
55	3 31	20 25	0 54	:::	1 20	.4	11 6	3.7
50	3 57	19 58	0 43	3 42	1 5	.7	11 18	3.4
45	4 18	19 38	0 36	2 23	0 54	.9	11 28	3.2
40	4 34	19 21	0 32	1 58	0 44	1.1	11 36	3.0
35	4 48	19 7	0 29	1 44	0 35	1.2	11 43	2.8
30	4 60	18 55	0 27	1 34	0 28	1.4	11 49	2.6
20	5 20	18 35	0 24	1 23	0 15	1.6	11 59	2.4
10	5 38	18 17	0 23	1 17	0 3	1.8	12 8	2.2
0	5 54	18 1	0 22	1 14	...	.0	12 16	2.0
10	6 10	17 45	0 23	1 15	...	.0	12 25	1.8
20	6 27	17 28	0 24	1 18	...	.0	12 33	1.6
30	6 47	17 8	0 26	1 24	...	.0	12 43	1.3
35	6 58	16 57	0 28	1 30	...	.0	12 49	1.2
40	7 11	16 44	0 30	1 36	...	.0	12 55	1.0
45	7 26	16 28	0 33	1 45	...	.0	13 3	.8
50	7 45	16 10	0 37	1 57	...	.0	13 11	.6
55	8 9	15 45	0 44	2 14	23 52	3.6	13 22	.3
60	8 43	15 11	0 54	2 39	23 41	4.0	13 36	.0
S								

UT	MESEC				JUPITER				SATURN						
	S <sub>♃</sub>		Δ		δ <sub>♃</sub>		Δ		S <sub>♃</sub>		δ <sub>♃</sub>				
h	°	'	°	'	°	'	°	'	°	'	°	'			
0	271	54.5	105	-14	19.1	148	58	46.6	-2	14.1	131	20.0	21	27.6	
2	300	53.5	107	-13	49.6	149	88	51.6	-2	14.1	161	24.3	21	27.5	
4	329	52.9	109	-13	19.8	150	118	56.6	-2	14.0	191	28.7	21	27.4	
6	358	52.7	110	-12	49.8	151	149	1.6	-2	14.0	221	33.1	21	27.3	
8	27	52.7	112	-12	19.5	152	179	6.7	-2	14.0	251	37.5	21	27.3	
10	56	53.2	114	-11	49.1	153	209	11.7	-2	14.0	281	41.9	21	27.2	
12	85	54.0	115	-11	18.5	154	239	16.7	-2	14.0	311	46.2	21	27.1	
14	114	55.1	117	-10	47.6	155	269	21.7	-2	14.0	341	50.6	21	27.0	
16	143	56.5	119	-10	16.7	156	299	26.7	-2	13.9	11	55.0	21	26.9	
18	172	58.2	120	-9	45.5	156	329	31.7	-2	13.9	41	59.4	21	26.8	
20	202	.2	121	-9	14.2	157	359	36.7	-2	13.9	72	3.7	21	26.7	
22	231	2.5	123	-8	42.8	158	29	41.8	-2	13.9	102	8.1	21	26.7	
Δ								25		0			22		0

SUNCE				MESEC				
UT	e = T <sub>p</sub> - UT	Δ/24	r	Prolaz	Δ/24	π <sub>☉</sub>	r	
h	min	s	'	h min	min	'	'	
00	2 32.9	-.4	15.8	T <sub>m</sub>	6 5	2.0	59.1	16.1
12	2 28.7							

UT	SUNCE		PROLEĆ. TAČKA S <sub>γ</sub>	VENERA		MARS	
	S <sub>☉</sub>	δ <sub>☉</sub>		S <sub>♀</sub>	δ <sub>♀</sub>	S <sub>♂</sub>	δ <sub>♂</sub>
h	° / ' / "	° / ' / "	° / ' / "	° / ' / "	° / ' / "	° / ' / "	° / ' / "
0	180 36.1	21 53.9	248 35.3	163 28.1	24 8.8	255 34.7	- 5 19.0
2	210 35.9	21 54.7	278 40.2	193 26.3	24 9.2	285 36.4	- 5 17.7
4	240 35.7	21 55.4	308 45.2	223 24.6	24 9.5	315 38.0	- 5 16.4
6	270 35.5	21 56.1	338 50.1	253 22.8	24 9.9	345 39.6	- 5 15.0
8	300 35.3	21 56.8	8 55.0	283 21.0	24 10.3	15 41.2	- 5 13.7
10	330 35.2	21 57.5	38 59.9	313 19.3	24 10.7	45 42.9	- 5 12.4
12	0 35.0	21 58.2	69 4.9	343 17.5	24 11.0	75 44.5	- 5 11.0
14	30 34.8	21 58.9	99 9.8	13 15.7	24 11.4	105 46.1	- 5 9.7
16	60 34.6	21 59.6	129 14.7	43 14.0	24 11.8	135 47.8	- 5 8.4
18	90 34.4	22 .3	159 19.7	73 12.2	24 12.1	165 49.4	- 5 7.0
20	120 34.2	22 1.0	189 24.6	103 10.4	24 12.5	195 51.0	- 5 5.7
22	150 34.0	22 1.6	219 29.5	133 8.6	24 12.8	225 52.6	- 5 4.4
Δ	-1	3		-9	2	8	7

φ	SUNCE		TRAJANJE SUMRAKA		MESEC			
	IZLAZ	ZALAZ	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 6	1 23	:::	1 39	.0	12 28	3.9
55	3 30	20 27	0 54	:::	1 29	.3	12 35	3.6
50	3 57	19 59	0 43	:::	1 21	.6	12 40	3.3
45	4 17	19 39	0 36	2 24	1 15	.8	12 44	3.1
40	4 34	19 22	0 32	1 59	1 9	1.0	12 47	2.9
35	4 48	19 8	0 29	1 44	1 5	1.1	12 50	2.7
30	4 60	18 56	0 27	1 35	1 1	1.3	12 52	2.6
20	5 20	18 35	0 24	1 23	0 54	1.5	12 57	2.3
10	5 38	18 18	0 23	1 17	0 47	1.7	13 0	2.1
0	5 54	18 1	0 22	1 14	0 42	1.9	13 4	1.9
10	6 10	17 45	0 23	1 15	0 36	2.1	13 7	1.7
20	6 27	17 28	0 24	1 18	0 29	2.3	13 11	1.5
30	6 47	17 8	0 26	1 25	0 22	2.6	13 15	1.2
35	6 59	16 57	0 28	1 30	0 18	2.7	13 17	1.1
40	7 12	16 43	0 30	1 36	0 13	2.9	13 20	.9
45	7 27	16 28	0 33	1 45	0 8	3.1	13 23	.8
50	7 46	16 9	0 37	1 57	0 2	3.3	13 26	.6
55	8 11	15 44	0 44	2 14	...	.0	13 30	.3
60	8 45	15 10	0 54	2 40	...	.0	13 36	.0

UT	MESEC				JUPITER		SATURN	
	S <sub>♃</sub>	Δ	δ <sub>♃</sub>	Δ	S <sub>♃</sub>	δ <sub>♃</sub>	S <sub>♄</sub>	δ <sub>♄</sub>
h	° / ' / "	° / ' / "	° / ' / "	° / ' / "	° / ' / "	° / ' / "	° / ' / "	° / ' / "
0	260 5.0	124 - 8	11.2	158	59 46.8	- 2 13.9	132 12.5	21 26.6
2	289 7.8	125 - 7	39.6	159	89 51.8	- 2 13.9	162 16.9	21 26.5
4	318 10.9	126 - 7	7.8	159	119 56.8	- 2 13.9	192 21.2	21 26.4
6	347 14.2	128 - 6	35.9	160	150 1.8	- 2 13.9	222 25.6	21 26.3
8	16 17.7	129 - 6	4.0	160	180 6.8	- 2 13.9	252 30.0	21 26.2
10	45 21.5	130 - 5	32.0	160	210 11.8	- 2 13.8	282 34.4	21 26.1
12	74 25.4	131 - 5	.0	160	240 16.8	- 2 13.8	312 38.7	21 26.1
14	103 29.5	132 - 4	27.9	161	270 21.8	- 2 13.8	342 43.1	21 26.0
16	132 33.8	132 - 3	55.7	161	300 26.8	- 2 13.8	12 47.5	21 25.9
18	161 38.3	133 - 3	23.6	161	330 31.8	- 2 13.8	42 51.9	21 25.8
20	190 42.9	134 - 2	51.4	161	0 36.8	- 2 13.8	72 56.2	21 25.7
22	219 47.7	135 - 2	19.2	161	30 41.8	- 2 13.8	103 .6	21 25.6
Δ					25	0	22	0

SUNCE				MESEC				
UT	e = T <sub>p</sub> - UT	Δ/24	r	Prolaz	Δ/24	π <sub>☉</sub>	r	
h	min s	s / ' / "	h min	h min	min	' / "	' / "	
00	2 24.5	-.4	15.8	T <sub>m</sub>	6 53	1.9	58.6	16.0
12	2 20.0	T <sub>m☉</sub>	11 h 57.7 min	Starost	22.6 d	Faza	☉	

PLANETE									
Pl.	T <sub>m</sub>	π	360-α	Vel.	Pl.	T <sub>m</sub>	π	360-α	Vel.
h	h min	' / "	°	°	h	h min	' / "	°	°
♀	13 7	.1	275	-3.8	♃	19 58	.0	171	-2.1
♂	6 57	.1	7	.3	♄	15 9	.0	244	.2

1. JUN

SREDA

UT	SUNCE		PROLEĆ. TAČKA S <sub>γ</sub>	VENERA		MARS	
	S <sub>☉</sub>	δ <sub>☉</sub>		S <sub>♀</sub>	δ <sub>♀</sub>	S <sub>♂</sub>	δ <sub>♂</sub>
h	° / ' / "	° / ' / "	° / ' / "	° / ' / "	° / ' / "	° / ' / "	° / ' / "
0	180 33.9	22 2.3	249 34.4	163 6.9	24 13.1	255 54.3	- 5 3.0
2	210 33.7	22 3.0	279 39.4	193 5.1	24 13.5	285 55.9	- 5 1.7
4	240 33.5	22 3.7	309 44.3	223 3.3	24 13.8	315 57.5	- 5 .4
6	270 33.3	22 4.4	339 49.2	253 1.6	24 14.1	345 59.2	- 4 59.1
8	300 33.1	22 5.0	9 54.2	282 59.8	24 14.4	16 .8	- 4 57.7
10	330 32.9	22 5.7	39 59.1	312 58.0	24 14.7	46 2.4	- 4 56.4
12	0 32.7	22 6.4	70 4.0	342 56.2	24 15.1	76 4.1	- 4 55.1
14	30 32.5	22 7.0	100 8.9	12 54.5	24 15.4	106 5.7	- 4 53.7
16	60 32.3	22 7.7	130 13.9	42 52.7	24 15.7	136 7.3	- 4 52.4
18	90 32.1	22 8.4	160 18.8	72 50.9	24 15.9	166 9.0	- 4 51.1
20	120 31.9	22 9.0	190 23.7	102 49.1	24 16.2	196 10.6	- 4 49.7
22	150 31.7	22 9.7	220 28.7	132 47.3	24 16.5	226 12.2	- 4 48.4
Δ	-1	3		-9	2	8	7

φ	SUNCE		TRAJANJE SUMRAKA		MESEC			
	IZLAZ	ZALAZ	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 8	1 25	:::	1 39	.0	14 2	3.9
55	3 29	20 28	0 54	:::	1 37	.3	14 0	3.5
50	3 56	20 0	0 43	:::	1 35	.6	13 58	3.2
45	4 17	19 40	0 36	2 25	1 34	.8	13 57	3.0
40	4 33	19 23	0 32	1 59	1 33	.9	13 56	2.8
35	4 47	19 9	0 29	1 44	1 32	1.1	13 55	2.7
30	4 59	18 57	0 27	1 35	1 31	1.2	13 54	2.5
20	5 20	18 36	0 24	1 23	1 30	1.5	13 52	2.3
10	5 38	18 18	0 23	1 17	1 29	1.7	13 51	2.1
0	5 54	18 1	0 22	1 14	1 28	1.9	13 49	1.9
10	6 11	17 45	0 23	1 15	1 27	2.1	13 48	1.7
20	6 28	17 28	0 24	1 18	1 26	2.3	13 46	1.5
30	6 48	17 8	0 26	1 25	1 25	2.5	13 45	1.2
35	6 59	16 56	0 28	1 30	1 24	2.7	13 44	1.1
40	7 12	16 43	0 30	1 36	1 23	2.8	13 42	.9
45	7 28	16 27	0 33	1 45	1 22	3.0	13 41	.8
50	7 47	16 8	0 38	1 57	1 21	3.2	13 40	.6
55	8 12	15 43	0 44	2 15	1 20	3.5	13 38	.3
60	8 47	15 9	0 55	2 41	1 19	3.9	13 35	.0

UT	MESEC				JUPITER		SATURN	
	S <sub>♃</sub>	Δ	δ <sub>♃</sub>	Δ	S <sub>♃</sub>	δ <sub>♃</sub>	S <sub>♄</sub>	δ <sub>♄</sub>
h	° / ' / "	° / ' / "	° / ' / "	° / ' / "	° / ' / "	° / ' / "	° / ' / "	° / ' / "
0	248 52.6	135 - 1	47.1	161	60 46.8	- 2 13.8	133 5.0	21 25.5
2	277 57.7	136 - 1	14.9	161	90 51.8	- 2 13.8	163 9.4	21 25.5
4	307 2.8	136 - 0	42.8	160	120 56.8	- 2 13.8	193 13.7	21 25.4
6	336 8.1	137 - 0	10.7	160	151 1.8	- 2 13.8	223 18.1	21 25.3
8	5 13.4	137 0	21.3	160	181 6.8	- 2 13.8	253 22.5	21 25.2
10	34 18.9	138 0	53.3	160	211 11.8	- 2 13.8	283 26.8	21 25.1
12	63 24.4	138 1	25.2	159	241 16.8	- 2 13.8	313 31.2	21 25.0
14	92 29.9	138 1	57.1	159	271 21.8	- 2 13.8	343 35.6	21 24.9
16	121 35.6	138 2	28.9	158	301 26.7	- 2 13.8	13 39.9	21 24.8
18	150 41.2	138 3	.6	158	331 31.7	- 2 13.8	43 44.3	21 24.8
20	179 46.9	138 3	32.1	157	1 36.7	- 2 13.8	73 48.7	21 24.7
22	208 52.6	139 4	3.6	157	31 41.7	- 2 13.8	103 53.0	21 24.6
Δ					25	0	22	0

SUNCE				MESEC				
UT	e = T <sub>p</sub> - UT	Δ/24	r	Prolaz	Δ/24	π <sub>☉</sub>	r	
h	min s	s / ' / "	h min	h min	min	' / "	' / "	
00	2 15.6	-.4	15.8	T <sub>m</sub>	7 38	1.9	58.1	15.8
12	2 10.9	T <sub>m☉</sub>	11 h 57.8 min	Starost	23.6 d	Faza	☉	

PLANETE									
Pl.	T <sub>m</sub>	π	360-α	Vel.	Pl.	T <sub>m</sub>	π	360-α	Vel.
h	h min	' / "	°	°	h	h min	' / "	°	°
♀	13 8	.1	274	-3.8	♃	19 54	.0	171	-2.1
♂	6 56	.1	6	.3	♄	15 5	.0	244	.2



UT	SUNCE		PROLEĆ. TAČKA S <sub>γ</sub>	VENERA		MARS	
	S <sub>☉</sub>	δ <sub>☉</sub>		S <sub>♀</sub>	δ <sub>♀</sub>	S <sub>♂</sub>	δ <sub>♂</sub>
h	° / ' / "	° / ' / "	° / ' / "	° / ' / "	° / ' / "	° / ' / "	° / ' / "
0	180 31.5	22 10.3	250 33.6	162 45.6	24 16.8	256 13.9	- 4 47.1
2	210 31.3	22 11.0	280 38.5	192 43.8	24 17.1	286 15.5	- 4 45.7
4	240 31.1	22 11.6	310 43.4	222 42.0	24 17.3	316 17.2	- 4 44.4
6	270 30.9	22 12.3	340 48.4	252 40.2	24 17.6	346 18.8	- 4 43.1
8	300 30.7	22 12.9	10 53.3	282 38.5	24 17.9	16 20.4	- 4 41.7
10	330 30.5	22 13.6	40 58.2	312 36.7	24 18.1	46 22.1	- 4 40.4
12	0 30.3	22 14.2	71 3.2	342 34.9	24 18.4	76 23.7	- 4 39.1
14	30 30.1	22 14.8	101 8.1	12 33.1	24 18.6	106 25.4	- 4 37.8
16	60 29.9	22 15.5	131 13.0	42 31.3	24 18.8	136 27.0	- 4 36.4
18	90 29.7	22 16.1	161 17.9	72 29.6	24 19.1	166 28.6	- 4 35.1
20	120 29.5	22 16.7	191 22.9	102 27.8	24 19.3	196 30.3	- 4 33.8
22	150 29.3	22 17.3	221 27.8	132 26.0	24 19.5	226 31.9	- 4 32.4
Δ	-1	3		-9	1	8	7

φ	SUNCE		TRAJANJE SUMRAKA		MESEC			
	IZLAZ	ZALAZ	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 9	1 26	:::	1 38	.0	15 36	3.9
55	3 28	20 29	0 55	:::	1 44	.3	15 24	3.5
50	3 55	20 1	0 43	:::	1 48	.6	15 16	3.2
45	4 16	19 40	0 37	2 25	1 52	.8	15 9	3.0
40	4 33	19 23	0 32	1 60	1 55	1.0	15 3	2.8
35	4 47	19 9	0 29	1 45	1 58	1.1	14 58	2.7
30	4 59	18 57	0 27	1 35	2 1	1.3	14 54	2.5
20	5 20	18 36	0 24	1 23	2 5	1.5	14 47	2.3
10	5 38	18 18	0 23	1 17	2 9	1.7	14 40	2.1
0	5 54	18 2	0 22	1 14	2 13	1.9	14 34	1.9
10	6 11	17 45	0 23	1 15	2 16	2.1	14 28	1.7
20	6 28	17 28	0 24	1 18	2 21	2.3	14 21	1.5
30	6 48	17 8	0 26	1 25	2 25	2.5	14 14	1.3
35	6 60	16 56	0 28	1 30	2 28	2.7	14 10	1.2
40	7 13	16 43	0 30	1 37	2 31	2.8	14 5	1.0
45	7 29	16 27	0 33	1 45	2 35	3.0	13 60	.8
50	7 48	16 8	0 38	1 58	2 39	3.2	13 53	.6
55	8 13	15 43	0 44	2 15	2 45	3.5	13 45	.3
60	8 48	15 7	0 55	2 41	2 52	3.9	13 35	.0

UT	MESEC				JUPITER		SATURN	
	S <sub>♃</sub>	Δ	δ <sub>♃</sub>	Δ	S <sub>♃</sub>	δ <sub>♃</sub>	S <sub>♄</sub>	δ <sub>♄</sub>
h	° / ' / "	° / ' / "	° / ' / "	° / ' / "	° / ' / "	° / ' / "	° / ' / "	° / ' / "
0	237 58.3	139	4 35.0	156	61 46.7	- 2 13.8	133 57.4	21 24.5
2	267 4.0	138	5 6.2	155	91 51.7	- 2 13.8	164 1.8	21 24.4
4	296 9.7	138	5 37.3	155	121 56.6	- 2 13.8	194 6.1	21 24.3
6	325 15.4	138	6 8.2	154	152 1.6	- 2 13.8	224 10.5	21 24.2
8	354 21.0	138	6 39.0	153	182 6.6	- 2 13.8	254 14.9	21 24.1
10	23 26.6	138	7 9.6	152	212 11.6	- 2 13.8	284 19.2	21 24.0
12	52 32.2	138	7 40.1	151	242 16.6	- 2 13.8	314 23.6	21 24.0
14	81 37.7	137	8 10.4	150	272 21.5	- 2 13.8	344 28.0	21 23.9
16	110 43.1	137	8 40.4	149	302 26.5	- 2 13.8	14 32.3	21 23.8
18	139 48.5	136	9 10.3	148	332 31.5	- 2 13.8	44 36.7	21 23.7
20	168 53.8	136	9 40.0	147	2 36.5	- 2 13.8	74 41.1	21 23.6
22	197 59.0	135	10 9.5	146	32 41.4	- 2 13.8	104 45.4	21 23.5
Δ					25	0	22	0

SUNCE				MESEC				
UT	e = T <sub>p</sub> - UT	Δ/24	r	Prolaz	Δ/24	π <sub>♃</sub>	r	
h	min s	s / ' / "		h min	min	' / "	' / "	
00	2 6.3	-.4	15.8	T <sub>m</sub>	8 23	1.9	57.5	15.7
12	2 1.4	T <sub>m☉</sub>	11 h 58.0 min	Starost	24.6 d	Faza	☉	

PLANETE									
Pl.	T <sub>m</sub>	π	360-α	Vel.	Pl.	T <sub>m</sub>	π	360-α	Vel.
♀	h min	'	°		♃	h min	'	°	
♂	13 10	.1	272	-3.8	♄	19 50	.0	171	-2.1
♂	6 55	.1	6	.3	♂	15 2	.0	243	.2

UT	SUNCE		PROLEĆ. TAČKA S <sub>γ</sub>	VENERA		MARS	
	S <sub>☉</sub>	δ <sub>☉</sub>		S <sub>♀</sub>	δ <sub>♀</sub>	S <sub>♂</sub>	δ <sub>♂</sub>
h	° / ' / "	° / ' / "	° / ' / "	° / ' / "	° / ' / "	° / ' / "	° / ' / "
0	180 29.1	22 17.9	251 32.7	162 24.2	24 19.7	256 33.6	- 4 31.1
2	210 28.9	22 18.6	281 37.7	192 22.4	24 20.0	286 35.2	- 4 29.8
4	240 28.7	22 19.2	311 42.6	222 20.6	24 20.2	316 36.9	- 4 28.4
6	270 28.5	22 19.8	341 47.5	252 18.9	24 20.4	346 38.5	- 4 27.1
8	300 28.3	22 20.4	11 52.4	282 17.1	24 20.6	16 40.2	- 4 25.8
10	330 28.1	22 21.0	41 57.4	312 15.3	24 20.8	46 41.8	- 4 24.4
12	0 27.9	22 21.6	72 2.3	342 13.5	24 20.9	76 43.4	- 4 23.1
14	30 27.6	22 22.2	102 7.2	12 11.7	24 21.1	106 45.1	- 4 21.8
16	60 27.4	22 22.8	132 12.2	42 9.9	24 21.3	136 46.7	- 4 20.5
18	90 27.2	22 23.4	162 17.1	72 8.2	24 21.5	166 48.4	- 4 19.1
20	120 27.0	22 24.0	192 22.0	102 6.4	24 21.6	196 50.0	- 4 17.8
22	150 26.8	22 24.6	222 26.9	132 4.6	24 21.8	226 51.7	- 4 16.5
Δ	-1	3		-9	1	8	7

φ	SUNCE		TRAJANJE SUMRAKA		MESEC			
	IZLAZ	ZALAZ	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 11	1 28	:::	1 37	.0	17 10	4.0
55	3 27	20 30	0 55	:::	1 51	.4	16 49	3.5
50	3 54	20 2	0 43	:::	2 2	.7	16 33	3.2
45	4 16	19 41	0 37	2 26	2 11	.9	16 21	3.0
40	4 32	19 24	0 32	1 60	2 18	1.1	16 11	2.8
35	4 47	19 10	0 29	1 45	2 25	1.2	16 2	2.7
30	4 59	18 58	0 27	1 35	2 31	1.3	15 55	2.5
20	5 20	18 37	0 24	1 23	2 41	1.6	15 42	2.3
10	5 38	18 19	0 23	1 17	2 49	1.7	15 30	2.1
0	5 54	18 2	0 22	1 15	2 58	1.9	15 20	2.0
10	6 11	17 45	0 23	1 15	3 6	2.1	15 9	1.8
20	6 29	17 28	0 24	1 18	3 15	2.3	14 58	1.6
30	6 49	17 7	0 26	1 25	3 26	2.5	14 45	1.4
35	7 0	16 56	0 28	1 30	3 32	2.7	14 38	1.3
40	7 14	16 42	0 30	1 37	3 39	2.8	14 29	1.1
45	7 30	16 26	0 33	1 46	3 47	3.0	14 20	1.0
50	7 49	16 7	0 38	1 58	3 57	3.2	14 8	.7
55	8 14	15 42	0 44	2 15	4 9	3.5	13 53	.4
60	8 50	15 6	0 55	2 42	4 26	4.0	13 34	.0

UT	MESEC				JUPITER		SATURN	
	S <sub>♃</sub>	Δ	δ <sub>♃</sub>	Δ	S <sub>♃</sub>	δ <sub>♃</sub>	S <sub>♄</sub>	δ <sub>♄</sub>
h	° / ' / "	° / ' / "	° / ' / "	° / ' / "	° / ' / "	° / ' / "	° / ' / "	° / ' / "
0	227 4.1	135	10 38.7	145	62 46.4	- 2 13.8	134 49.8	21 23.4
2	256 9.0	134	11 7.8	144	92 51.4	- 2 13.8	164 54.1	21 23.3
4	285 13.9	134	11 36.5	143	122 56.3	- 2 13.8	194 58.5	21 23.2
6	314 18.7	133	12 5.1	141	153 1.3	- 2 13.8	225 2.9	21 23.1
8	343 23.3	132	12 33.3	140	183 6.3	- 2 13.8	255 7.2	21 23.1
10	12 27.7	132	13 1.3	139	213 11.2	- 2 13.8	285 11.6	21 23.0
12	41 32.1	131	13 29.1	137	243 16.2	- 2 13.8	315 15.9	21 22.9
14	70 36.3	130	13 56.5	136	273 21.1	- 2 13.8	345 20.3	21 22.8
16	99 40.3	129	14 23.7	134	303 26.1	- 2 13.9	15 24.7	21 22.7
18	128 44.2	128	14 50.5	133	333 31.1	- 2 13.9	45 29.0	21 22.6
20	157 47.9	128	15 17.1	131	3 36.0	- 2 13.9	75 33.4	21 22.5
22	186 51.4	127	15 43.3	130	33 41.0	- 2 13.9	105 37.7	21 22.4
Δ					25	0	22	0

SUNCE				MESEC				
UT	e = T <sub>p</sub> - UT	Δ/24	r	Prolaz	Δ/24	π <sub>♃</sub>	r	
h	min s	s / ' / "		h min	min	' / "	' / "	
00	1 56.6	-.4	15.8	T <sub>m</sub>	9 9	1.9	57.0	15.5
12	1 51.6	T <sub>m☉</sub>	11 h 58.1 min	Starost	25.6 d	Faza	☉	

PLANETE									
Pl.	T <sub>m</sub>	π	360-α	Vel.	Pl.	T <sub>m</sub>	π	360-α	Vel.
♀	h min	'	°		♃	h min	'	°	
♂	13 11	.1	271	-3.8	♄	19 46	.0	171	-2.1
♂	6 53	.1	5	.3	♂	14 59	.0	243	.2

UT	SUNCE		PROLEĆ. TAČKA S <sub>γ</sub>	VENERA		MARS								
	S <sub>☉</sub>	δ <sub>☉</sub>		S <sub>♀</sub>	δ <sub>♀</sub>	S <sub>♂</sub>	δ <sub>♂</sub>							
h	°	'	°	'	°	'	°	'						
0	180	26.6	22	25.2	252	31.9	162	2.8	24	22.0	256	53.3	-4	15.1
2	210	26.4	22	25.8	282	36.8	192	1.0	24	22.1	286	55.0	-4	13.8
4	240	26.2	22	26.3	312	41.7	221	59.2	24	22.3	316	56.6	-4	12.5
6	270	25.9	22	26.9	342	46.6	251	57.5	24	22.4	346	58.3	-4	11.1
8	300	25.7	22	27.5	12	51.6	281	55.7	24	22.6	16	60.0	-4	9.8
10	330	25.5	22	28.1	42	56.5	311	53.9	24	22.7	47	1.6	-4	8.5
12	0	25.3	22	28.6	73	1.4	341	52.1	24	22.8	77	3.3	-4	7.1
14	30	25.1	22	29.2	103	6.4	11	50.3	24	22.9	107	4.9	-4	5.8
16	60	24.9	22	29.8	133	11.3	41	48.5	24	23.1	137	6.6	-4	4.5
18	90	24.6	22	30.3	163	16.2	71	46.7	24	23.2	167	8.2	-4	3.1
20	120	24.4	22	30.9	193	21.1	101	45.0	24	23.3	197	9.9	-4	1.8
22	150	24.2	22	31.5	223	26.1	131	43.2	24	23.4	227	11.5	-4	.5
Δ		-1		3				-9		1		8		7

φ	SUNCE		TRAJANJE SUMRAKA		MESEC			
	IZLAZ	ZALAZ	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 45	21 13	1 29	: : :	1 38	.1	18 46	4.1
55	3 26	20 31	0 55	: : :	2 1	.5	18 14	3.5
50	3 54	20 3	0 43	: : :	2 18	.8	17 51	3.2
45	4 15	19 42	0 37	2 27	2 32	1.0	17 33	3.0
40	4 32	19 25	0 32	2 0	2 44	1.2	17 19	2.8
35	4 46	19 10	0 29	1 45	2 54	1.4	17 6	2.7
30	4 59	18 58	0 27	1 35	3 3	1.5	16 56	2.6
20	5 20	18 37	0 24	1 23	3 18	1.7	16 37	2.4
10	5 38	18 19	0 23	1 17	3 31	1.8	16 22	2.2
0	5 55	18 2	0 22	1 15	3 44	2.0	16 7	2.1
10	6 11	17 45	0 23	1 15	3 57	2.2	15 52	1.9
20	6 29	17 28	0 24	1 18	4 10	2.3	15 36	1.8
30	6 49	17 7	0 26	1 25	4 26	2.6	15 19	1.6
35	7 1	16 55	0 28	1 30	4 36	2.7	15 8	1.4
40	7 14	16 42	0 30	1 37	4 46	2.8	14 56	1.3
45	7 30	16 26	0 33	1 46	4 59	3.0	14 42	1.2
50	7 50	16 6	0 38	1 58	5 14	3.2	14 26	.9
55	8 15	15 41	0 44	2 15	5 34	3.6	14 4	.6
60	8 51	15 5	0 56	2 42	6 1	4.1	13 35	.1

UT	MESEC				JUPITER		SATURN							
	S <sub>♃</sub>	Δ	δ <sub>♃</sub>	Δ	S <sub>♃</sub>	δ <sub>♃</sub>	S <sub>♄</sub>	δ <sub>♄</sub>						
h	°	'	°	'	°	'	°	'						
0	215	54.7	126	16	9.3	128	63	45.9	-2	13.9	135	42.1	21	22.3
2	244	57.9	125	16	34.8	126	93	50.9	-2	13.9	165	46.5	21	22.2
4	274	.9	124	17	.1	125	123	55.8	-2	13.9	195	50.8	21	22.2
6	303	3.6	123	17	25.0	123	154	.8	-2	13.9	225	55.2	21	22.1
8	332	6.2	122	17	49.5	121	184	5.7	-2	13.9	255	59.5	21	22.0
10	1	8.6	121	18	13.7	119	214	10.7	-2	14.0	286	3.9	21	21.9
12	30	10.8	120	18	37.5	117	244	15.6	-2	14.0	316	8.2	21	21.8
14	59	12.7	119	19	.9	115	274	20.6	-2	14.0	346	12.6	21	21.7
16	88	14.5	118	19	24.0	113	304	25.5	-2	14.0	16	16.9	21	21.6
18	117	16.1	117	19	46.6	111	334	30.5	-2	14.0	46	21.3	21	21.5
20	146	17.4	116	20	8.8	109	4	35.4	-2	14.0	76	25.7	21	21.4
22	175	18.5	115	20	30.7	107	34	40.4	-2	14.1	106	30.0	21	21.3
Δ								25		0		22		0

SUNCE				MESEC				
UT	e = T <sub>p</sub> - UT	Δ/24	r	Prolaz	Δ/24	π <sub>♃</sub>	r	
h	min	s	s	'	h min	min	'	
00	1 46.5	-.4	15.8	T <sub>m</sub>	9 55	2.0	56.4	15.4
12	1 41.3	T <sub>m☉</sub>	11 h 58.3 min	Starost	26.6 d	Faza	●	

PLANETE									
Pl.	T <sub>m</sub>	π	360-α	Vel.	Pl.	T <sub>m</sub>	π	360-α	Vel.
h min	'	°	°	°	h min	'	°	°	°
♀	13 13	.1	270	-3.8	♃	19 42	.0	171	-2.0
♂	6 52	.1	4	.3	♄	14 55	.0	243	.3

UT	SUNCE		PROLEĆ. TAČKA S <sub>γ</sub>	VENERA		MARS								
	S <sub>☉</sub>	δ <sub>☉</sub>		S <sub>♀</sub>	δ <sub>♀</sub>	S <sub>♂</sub>	δ <sub>♂</sub>							
h	°	'	°	'	°	'	°	'						
0	180	24.0	22	32.0	253	31.0	161	41.4	24	23.5	257	13.2	-3	59.2
2	210	23.8	22	32.6	283	35.9	191	39.6	24	23.6	287	14.9	-3	57.8
4	240	23.5	22	33.1	313	40.9	221	37.8	24	23.7	317	16.5	-3	56.5
6	270	23.3	22	33.7	343	45.8	251	36.0	24	23.7	347	18.2	-3	55.2
8	300	23.1	22	34.2	13	50.7	281	34.2	24	23.8	17	19.8	-3	53.8
10	330	22.9	22	34.7	43	55.6	311	32.5	24	23.9	47	21.5	-3	52.5
12	0	22.6	22	35.3	74	.6	341	30.7	24	24.0	77	23.2	-3	51.2
14	30	22.4	22	35.8	104	5.5	11	28.9	24	24.0	107	24.8	-3	49.8
16	60	22.2	22	36.3	134	10.4	41	27.1	24	24.1	137	26.5	-3	48.5
18	90	22.0	22	36.9	164	15.4	71	25.3	24	24.1	167	28.1	-3	47.2
20	120	21.7	22	37.4	194	20.3	101	23.5	24	24.2	197	29.8	-3	45.9
22	150	21.5	22	37.9	224	25.2	131	21.7	24	24.2	227	31.5	-3	44.5
Δ		-1		3				-9		0		8		7

φ	SUNCE		TRAJANJE SUMRAKA		MESEC			
	IZLAZ	ZALAZ	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 14	1 31	: : :	1 40	.2	20 25	4.0
55	3 25	20 33	0 56	: : :	2 13	.8	19 39	3.3
50	3 53	20 4	0 44	: : :	2 38	1.1	19 8	3.0
45	4 15	19 43	0 37	2 28	2 57	1.3	18 44	2.8
40	4 32	19 25	0 32	2 1	3 13	1.4	18 26	2.7
35	4 46	19 11	0 29	1 45	3 26	1.6	18 10	2.6
30	4 59	18 59	0 27	1 35	3 38	1.7	17 57	2.5
20	5 20	18 37	0 24	1 23	3 58	1.8	17 34	2.4
10	5 38	18 19	0 23	1 17	4 16	2.0	17 14	2.3
0	5 55	18 2	0 22	1 15	4 32	2.1	16 56	2.1
10	6 12	17 45	0 23	1 15	4 49	2.2	16 38	2.0
20	6 29	17 28	0 24	1 18	5 7	2.4	16 18	1.9
30	6 50	17 7	0 26	1 25	5 28	2.5	15 56	1.8
35	7 2	16 55	0 28	1 30	5 40	2.6	15 43	1.7
40	7 15	16 42	0 30	1 37	5 54	2.8	15 28	1.6
45	7 31	16 26	0 33	1 46	6 11	2.9	15 10	1.4
50	7 51	16 6	0 38	1 58	6 32	3.1	14 48	1.2
55	8 16	15 40	0 45	2 16	6 59	3.4	14 19	.9
60	8 53	15 4	0 56	2 42	7 39	4.1	13 38	.3

UT	MESEC				JUPITER		SATURN							
	S <sub>♃</sub>	Δ	δ <sub>♃</sub>	Δ	S <sub>♃</sub>	δ <sub>♃</sub>	S <sub>♄</sub>	δ <sub>♄</sub>						
h	°	'	°	'	°	'	°	'						
0	204	19.4	113	20	52.1	105	64	45.3	-2	14.1	136	34.4	21	21.2
2	233	20.1	112	21	13.0	103	94	50.3	-2	14.1	166	38.7	21	21.1
4	262	20.6	111	21	33.6	100	124	55.2	-2	14.1	196	43.1	21	21.1
6	291	20.8	110	21	53.7	98	155	.1	-2	14.1	226	47.4	21	21.0
8	320	20.9	109	22	13.3	96	185	5.1	-2	14.2	256	51.8	21	20.9
10	349	20.7	108	22	32.5	94	215	10.0	-2	14.2	286	56.1	21	20.8
12	18	20.3	107	22	51.2	91	245	14.9	-2	14.2	317	.5	21	20.7
14	47	19.7	106	23	9.5	89	275	19.9	-2	14.2	347	4.8	21	20.6
16	76	18.9	105	23	27.2	86	305	24.8	-2	14.2	17	9.2	21	20.5
18	105	17.9	104	23	44.5	84	335	29.7	-2	14.3	47	13.5	21	20.4
20	134	16.7	103	24	1.3	82	5	34.7	-2	14.3	77	17.9	21	20.3
22	163	15.2	102	24	17.6	79	35	39.6	-2	14.3	107	22.2	21	20.2
Δ								25		0		22		0

SUNCE				MESEC				
UT	e = T <sub>p</sub> - UT	Δ/24	r	Prolaz	Δ/24	π <sub>♃</sub>	r	
h	min	s	s	'	h min	min	'	
00	1 36.1	-.4	15.8	T <sub>m</sub>	10 44	2.1	56.0	15.2
12	1 30.7	T <sub>m☉</sub>	11 h 58.5 min	Starost	27.6 d	Faza	●	

PLANETE								
Pl.	T <sub>m</sub>	π	360-α	Vel.	Pl.	T <sub>m</sub>	π	360-α

UT	SUNCE		PROLEĆ. TAČKA S <sub>γ</sub>	VENERA		MARS	
	S <sub>☉</sub>	δ <sub>☉</sub>		S <sub>♀</sub>	δ <sub>♀</sub>	S <sub>♂</sub>	δ <sub>♂</sub>
h	° / ' / "	° / ' / "	° / ' / "	° / ' / "	° / ' / "	° / ' / "	° / ' / "
0	180 21.3	22 38.5	254 30.1	161 20.0	24 24.3	257 33.1	- 3 43.2
2	210 21.1	22 39.0	284 35.1	191 18.2	24 24.3	287 34.8	- 3 41.9
4	240 20.8	22 39.5	314 40.0	221 16.4	24 24.3	317 36.5	- 3 40.5
6	270 20.6	22 40.0	344 44.9	251 14.6	24 24.4	347 38.1	- 3 39.2
8	300 20.4	22 40.5	14 49.9	281 12.8	24 24.4	17 39.8	- 3 37.9
10	330 20.1	22 41.0	44 54.8	311 11.0	24 24.4	47 41.5	- 3 36.6
12	0 19.9	22 41.5	74 59.7	341 9.3	24 24.4	77 43.1	- 3 35.2
14	30 19.7	22 42.0	105 4.6	11 7.5	24 24.4	107 44.8	- 3 33.9
16	60 19.4	22 42.5	135 9.6	41 5.7	24 24.4	137 46.5	- 3 32.6
18	90 19.2	22 43.0	165 14.5	71 3.9	24 24.4	167 48.1	- 3 31.2
20	120 19.0	22 43.5	195 19.4	101 2.1	24 24.4	197 49.8	- 3 29.9
22	150 18.7	22 44.0	225 24.4	131 .3	24 24.4	227 51.5	- 3 28.6
Δ	-1	3		-9	0	8	7

φ	SUNCE		TRAJANJE SUMRAKA		MESEC			
	IZLAZ	ZALAZ	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 16	1 32	: : :	1 44	.5	22 0	3.3
55	3 24	20 34	0 56	: : :	2 32	1.2	20 58	2.8
50	3 53	20 5	0 44	: : :	3 4	1.4	20 20	2.7
45	4 14	19 43	0 37	2 28	3 28	1.6	19 52	2.6
40	4 32	19 26	0 32	2 1	3 47	1.7	19 31	2.5
35	4 46	19 12	0 29	1 46	4 4	1.8	19 13	2.4
30	4 59	18 59	0 27	1 36	4 18	1.9	18 57	2.4
20	5 20	18 38	0 24	1 23	4 42	2.0	18 31	2.3
10	5 38	18 19	0 23	1 17	5 3	2.1	18 9	2.3
0	5 55	18 2	0 22	1 15	5 23	2.2	17 48	2.2
10	6 12	17 45	0 23	1 15	5 42	2.3	17 27	2.1
20	6 30	17 28	0 24	1 18	6 4	2.4	17 4	2.1
30	6 50	17 7	0 26	1 25	6 29	2.5	16 38	2.0
35	7 2	16 55	0 28	1 30	6 43	2.5	16 23	1.9
40	7 16	16 41	0 30	1 37	7 0	2.6	16 6	1.9
45	7 32	16 25	0 33	1 46	7 21	2.7	15 44	1.8
50	7 52	16 5	0 38	1 58	7 47	2.9	15 18	1.7
55	8 17	15 40	0 45	2 16	8 22	3.1	14 42	1.4
60	8 54	15 3	0 56	2 43	9 18	3.8	13 45	.8
S								

UT	MESEC				JUPITER		SATURN	
	S <sub>♃</sub>	Δ	δ <sub>♃</sub>	Δ	S <sub>♃</sub>	δ <sub>♃</sub>	S <sub>♄</sub>	δ <sub>♄</sub>
h	° / ' / "	° / ' / "	° / ' / "	° / ' / "	° / ' / "	° / ' / "	° / ' / "	° / ' / "
0	192 13.6	101	24 33.4	76	65 44.5	- 2 14.3	137 26.6	21 20.1
2	221 11.8	100	24 48.7	74	95 49.5	- 2 14.4	167 30.9	21 20.0
4	250 9.8	99	25 3.5	71	125 54.4	- 2 14.4	197 35.3	21 19.9
6	279 7.7	98	25 17.7	69	155 59.3	- 2 14.4	227 39.6	21 19.8
8	308 5.3	97	25 31.5	66	186 4.2	- 2 14.4	257 44.0	21 19.8
10	337 2.8	97	25 44.7	63	216 9.1	- 2 14.5	287 48.3	21 19.7
12	6 .2	96	25 57.3	61	246 14.1	- 2 14.5	317 52.7	21 19.6
14	34 57.4	95	26 9.4	58	276 19.0	- 2 14.5	347 57.0	21 19.5
16	63 54.4	95	26 21.0	55	306 23.9	- 2 14.5	18 1.3	21 19.4
18	92 51.3	94	26 32.0	52	336 28.8	- 2 14.6	48 5.7	21 19.3
20	121 48.1	93	26 42.5	50	6 33.7	- 2 14.6	78 10.0	21 19.2
22	150 44.7	93	26 52.4	47	36 38.7	- 2 14.6	108 14.4	21 19.1
Δ					25	0	22	0

SUNCE				MESEC					
UT	e = T <sub>p</sub> - UT	Δ/24	r	Prolaz	Δ/24	π <sub>♃</sub>	r		
h	min s	s / ' / "	h min	h min	min	' / "	' / "		
00	1 25.3	- .5	15.8	T <sub>m</sub>	11 35	2.2	55.5 15.1		
12	1 19.7	T <sub>m☉</sub>	11 h 58.7 min	Starost	28.6 d	Faza ●			
PLANETE									
Pl.	T <sub>m</sub>	π	360-α	Vel.	Pl.	T <sub>m</sub>	π	360-α	Vel.
♀	h min	' / "	°	°	♃	h min	' / "	°	°
♂	13 15	.1	267	-3.8	♃	19 34	.0	171	-2.0
	6 49	.1	3	.2	♄	14 48	.0	243	.3

UT	SUNCE		PROLEĆ. TAČKA S <sub>γ</sub>	VENERA		MARS	
	S <sub>☉</sub>	δ <sub>☉</sub>		S <sub>♀</sub>	δ <sub>♀</sub>	S <sub>♂</sub>	δ <sub>♂</sub>
h	° / ' / "	° / ' / "	° / ' / "	° / ' / "	° / ' / "	° / ' / "	° / ' / "
0	180 18.5	22 44.5	255 29.3	160 58.6	24 24.3	257 53.1	- 3 27.2
2	210 18.3	22 45.0	285 34.2	190 56.8	24 24.3	287 54.8	- 3 25.9
4	240 18.0	22 45.5	315 39.1	220 55.0	24 24.3	317 56.5	- 3 24.6
6	270 17.8	22 45.9	345 44.1	250 53.2	24 24.3	347 58.2	- 3 23.3
8	300 17.6	22 46.4	15 49.0	280 51.4	24 24.2	17 59.8	- 3 21.9
10	330 17.3	22 46.9	45 53.9	310 49.6	24 24.2	48 1.5	- 3 20.6
12	0 17.1	22 47.4	75 58.8	340 47.9	24 24.1	78 3.2	- 3 19.3
14	30 16.9	22 47.8	106 3.8	10 46.1	24 24.1	108 4.9	- 3 18.0
16	60 16.6	22 48.3	136 8.7	40 44.3	24 24.0	138 6.5	- 3 16.6
18	90 16.4	22 48.8	166 13.6	70 42.5	24 23.9	168 8.2	- 3 15.3
20	120 16.1	22 49.2	196 18.6	100 40.7	24 23.9	198 9.9	- 3 14.0
22	150 15.9	22 49.7	226 23.5	130 38.9	24 23.8	228 11.6	- 3 12.6
Δ	-1	2		-9	0	8	7

φ	SUNCE		TRAJANJE SUMRAKA		MESEC			
	IZLAZ	ZALAZ	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 17	1 34	: : :	1 57	1.3	23 20	2.0
55	3 24	20 35	0 56	: : :	2 59	1.7	22 6	2.1
50	3 52	20 6	0 44	: : :	3 38	1.9	21 24	2.2
45	4 14	19 44	0 37	2 29	4 6	2.0	20 54	2.2
40	4 31	19 27	0 33	2 1	4 29	2.0	20 31	2.2
35	4 46	19 12	0 29	1 46	4 47	2.1	20 11	2.2
30	4 58	18 59	0 27	1 36	5 3	2.1	19 55	2.2
20	5 20	18 38	0 24	1 24	5 30	2.1	19 27	2.2
10	5 38	18 20	0 23	1 17	5 53	2.2	19 3	2.2
0	5 55	18 3	0 22	1 15	6 15	2.2	18 41	2.2
10	6 12	17 46	0 23	1 15	6 37	2.2	18 18	2.2
20	6 30	17 28	0 24	1 18	7 0	2.3	17 54	2.2
30	6 51	17 7	0 26	1 25	7 28	2.3	17 26	2.2
35	7 3	16 55	0 28	1 30	7 44	2.3	17 10	2.2
40	7 16	16 41	0 30	1 37	8 3	2.3	16 51	2.2
45	7 33	16 25	0 34	1 46	8 26	2.4	16 27	2.2
50	7 52	16 5	0 38	1 58	8 55	2.4	15 58	2.1
55	8 18	15 39	0 45	2 16	9 37	2.5	15 16	2.1
60	8 55	15 2	0 56	2 43	10 48	2.7	14 4	1.9
S								

UT	MESEC				JUPITER		SATURN	
	S <sub>♃</sub>	Δ	δ <sub>♃</sub>	Δ	S <sub>♃</sub>	δ <sub>♃</sub>	S <sub>♄</sub>	δ <sub>♄</sub>
h	° / ' / "	° / ' / "	° / ' / "	° / ' / "	° / ' / "	° / ' / "	° / ' / "	° / ' / "
0	179 41.3	92	27 1.8	44	66 43.6	- 2 14.7	138 18.7	21 19.0
2	208 37.7	92	27 10.5	41	96 48.5	- 2 14.7	168 23.1	21 18.9
4	237 34.1	91	27 18.8	38	126 53.4	- 2 14.7	198 27.4	21 18.8
6	266 30.4	91	27 26.4	35	156 58.3	- 2 14.7	228 31.8	21 18.7
8	295 26.6	91	27 33.5	33	187 3.2	- 2 14.8	258 36.1	21 18.6
10	324 22.7	90	27 40.0	30	217 8.1	- 2 14.8	288 40.4	21 18.5
12	353 18.8	90	27 45.9	27	247 13.0	- 2 14.8	318 44.8	21 18.4
14	22 14.9	90	27 51.3	24	277 17.9	- 2 14.9	348 49.1	21 18.3
16	51 10.9	90	27 56.0	21	307 22.8	- 2 14.9	18 53.5	21 18.2
18	80 6.9	90	28 .2	18	337 27.7	- 2 14.9	48 57.8	21 18.2
20	109 2.9	90	28 3.8	15	7 32.6	- 2 15.0	79 2.2	21 18.1
22	137 59.0	90	28 6.9	12	37 37.5	- 2 15.0	109 6.5	21 18.0
Δ					25	0	22	0

SUNCE				MESEC					
UT	e = T <sub>p</sub> - UT	Δ/24	r	Prolaz	Δ/24	π <sub>♃</sub>	r		
h	min s	s / ' / "	h min	h min	min	' / "	' / "		
00	1 14.2	- .5	15.8	T <sub>m</sub>	12 28	2.2	55.1 15.0		
12	1 8.5	T <sub>m☉</sub>	11 h 58.9 min	Starost	.1 d	Faza ●			
PLANETE									
Pl.	T <sub>m</sub>	π	360-α	Vel.	Pl.	T <sub>m</sub>	π	360-α	Vel.
♀	h min	' / "	°	°	♃	h min	' / "	°	°
♂	13 17	.1	265	-3.8	♃	19 30	.0	171	-2.0
	6 48	.1	2	.2	♄	14 45	.0	243	.3

UT	SUNCE		PROLEĆ. TAČKA S <sub>γ</sub>	VENERA		MARS	
	S <sub>☉</sub>	δ <sub>☉</sub>		S <sub>♀</sub>	δ <sub>♀</sub>	S <sub>♂</sub>	δ <sub>♂</sub>
h	° / ' / "	° / ' / "	° / ' / "	° / ' / "	° / ' / "	° / ' / "	° / ' / "
0	180 15.7	22 50.1	256 28.4	160 37.2	24 23.7	258 13.2	- 3 11.3
2	210 15.4	22 50.6	286 33.3	190 35.4	24 23.6	288 14.9	- 3 10.0
4	240 15.2	22 51.0	316 38.3	220 33.6	24 23.5	318 16.6	- 3 8.7
6	270 14.9	22 51.5	346 43.2	250 31.8	24 23.4	348 18.3	- 3 7.3
8	300 14.7	22 51.9	16 48.1	280 30.0	24 23.3	18 20.0	- 3 6.0
10	330 14.5	22 52.4	46 53.1	310 28.3	24 23.2	48 21.6	- 3 4.7
12	0 14.2	22 52.8	76 58.0	340 26.5	24 23.1	78 23.3	- 3 3.4
14	30 14.0	22 53.2	107 2.9	10 24.7	24 23.0	108 25.0	- 3 2.0
16	60 13.7	22 53.7	137 7.8	40 22.9	24 22.9	138 26.7	- 3 0.7
18	90 13.5	22 54.1	167 12.8	70 21.2	24 22.7	168 28.4	- 2 59.4
20	120 13.2	22 54.5	197 17.7	100 19.4	24 22.6	198 30.0	- 2 58.0
22	150 13.0	22 55.0	227 22.6	130 17.6	24 22.5	228 31.7	- 2 56.7
Δ	-1	2		-9	-1	8	7

φ	SUNCE		TRAJANJE SUMRAKA		MESEC			
	IZLAZ	ZALAZ	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	:::	2 27	2.6	..	.0
55	3 23	20 36	0 57	:::	3 41	2.4	22 57	1.4
50	3 52	20 7	0 44	:::	4 24	2.4	22 16	1.6
45	4 14	19 45	0 37	2 30	4 54	2.3	21 46	1.8
40	4 31	19 27	0 33	2 2	5 17	2.3	21 23	1.8
35	4 46	19 13	0 30	1 46	5 37	2.3	21 4	1.9
30	4 58	18 60	0 27	1 36	5 53	2.3	20 47	1.9
20	5 20	18 38	0 24	1 24	6 21	2.2	20 20	2.0
10	5 38	18 20	0 23	1 17	6 45	2.2	19 56	2.1
0	5 55	18 3	0 22	1 15	7 8	2.2	19 33	2.1
10	6 12	17 46	0 23	1 15	7 30	2.1	19 11	2.2
20	6 30	17 28	0 24	1 18	7 55	2.1	18 47	2.3
30	6 51	17 7	0 26	1 25	8 23	2.1	18 19	2.3
35	7 3	16 55	0 28	1 30	8 40	2.0	18 2	2.4
40	7 17	16 41	0 30	1 37	8 59	2.0	17 43	2.4
45	7 33	16 25	0 34	1 46	9 23	2.0	17 19	2.5
50	7 53	16 5	0 38	1 59	9 53	1.9	16 49	2.6
55	8 19	15 39	0 45	2 16	10 36	1.7	16 6	2.7
60	8 56	15 1	0 56	2 44	11 53	1.3	14 49	3.2
S								

UT	MESEC				JUPITER		SATURN	
	S <sub>♃</sub>	Δ	δ <sub>♃</sub>	Δ	S <sub>♃</sub>	δ <sub>♃</sub>	S <sub>♄</sub>	δ <sub>♄</sub>
h	° / ' / "	° / ' / "	° / ' / "	° / ' / "	° / ' / "	° / ' / "	° / ' / "	° / ' / "
0	166 55.0	90 28 9.3	9	67 42.4	- 2 15.0	139 10.8	21 17.9	
2	195 51.1	91 28 11.2	7	97 47.3	- 2 15.1	169 15.2	21 17.8	
4	224 47.2	91 28 12.5	4	127 52.2	- 2 15.1	199 19.5	21 17.7	
6	253 43.3	91 28 13.3	1	157 57.1	- 2 15.2	229 23.9	21 17.6	
8	282 39.6	92 28 13.4	-2	188 2.0	- 2 15.2	259 28.2	21 17.5	
10	311 35.9	92 28 13.0	-5	218 6.9	- 2 15.2	289 32.5	21 17.4	
12	340 32.3	92 28 12.0	-8	248 11.8	- 2 15.3	319 36.9	21 17.3	
14	9 28.7	93 28 10.4	-11	278 16.7	- 2 15.3	349 41.2	21 17.2	
16	38 25.3	94 28 8.3	-13	308 21.6	- 2 15.4	19 45.5	21 17.1	
18	67 22.0	94 28 5.6	-16	338 26.5	- 2 15.4	49 49.9	21 17.0	
20	96 18.9	95 28 2.4	-19	8 31.4	- 2 15.4	79 54.2	21 16.9	
22	125 15.9	96 27 58.6	-22	38 36.3	- 2 15.5	109 58.6	21 16.8	
Δ				24	0	22	0	

SUNCE				MESEC					
UT	e = T <sub>p</sub> - UT	Δ/24	r	Prolaz	Δ/24	π <sub>☾</sub>	r		
h	min s	s / ' / "	h min	h min	min	' / "	' / "		
00	1 2.8	- .5	15.8	T <sub>m</sub>	13 21	2.2	54.7 14.9		
12	0 57.0	T <sub>m☉</sub>	11 h 59.1 min	Starost	1.1 d	Faza	●		
PLANETE									
Pl.	T <sub>m</sub>	π	360-α	Vel.	Pl.	T <sub>m</sub>	π	360-α	Vel.
♀	h min	' / "	°	°	♃	h min	' / "	°	°
♁	13 18	.1	264	-3.8	♃	19 26	.0	171	-2.0
♂	6 47	.1	2	.2	♄	14 41	.0	243	.3

UT	SUNCE		PROLEĆ. TAČKA S <sub>γ</sub>	VENERA		MARS	
	S <sub>☉</sub>	δ <sub>☉</sub>		S <sub>♀</sub>	δ <sub>♀</sub>	S <sub>♂</sub>	δ <sub>♂</sub>
h	° / ' / "	° / ' / "	° / ' / "	° / ' / "	° / ' / "	° / ' / "	° / ' / "
0	180 12.7	22 55.4	257 27.6	160 15.8	24 22.3	258 33.4	- 2 55.4
2	210 12.5	22 55.8	287 32.5	190 14.0	24 22.2	288 35.1	- 2 54.1
4	240 12.3	22 56.2	317 37.4	220 12.3	24 22.0	318 36.8	- 2 52.7
6	270 12.0	22 56.6	347 42.3	250 10.5	24 21.9	348 38.5	- 2 51.4
8	300 11.8	22 57.0	17 47.3	280 8.7	24 21.7	18 40.2	- 2 50.1
10	330 11.5	22 57.4	47 52.2	310 6.9	24 21.6	48 41.9	- 2 48.8
12	0 11.3	22 57.9	77 57.1	340 5.2	24 21.4	78 43.5	- 2 47.4
14	30 11.0	22 58.3	108 2.1	10 3.4	24 21.2	108 45.2	- 2 46.1
16	60 10.8	22 58.7	138 7.0	40 1.6	24 21.0	138 46.9	- 2 44.8
18	90 10.5	22 59.1	168 11.9	69 59.9	24 20.8	168 48.6	- 2 43.5
20	120 10.3	22 59.4	198 16.8	99 58.1	24 20.7	198 50.3	- 2 42.1
22	150 10.0	22 59.8	228 21.8	129 56.3	24 20.5	228 52.0	- 2 40.8
Δ	-1	2		-9	-1	8	7

φ	SUNCE		TRAJANJE SUMRAKA		MESEC			
	IZLAZ	ZALAZ	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 20	1 37	:::	3 30	3.6	0 7	.8
55	3 22	20 37	0 57	:::	4 40	3.0	23 31	.9
50	3 51	20 7	0 44	:::	5 20	2.7	22 55	1.2
45	4 13	19 45	0 37	2 30	5 50	2.6	22 28	1.4
40	4 31	19 28	0 33	2 2	6 13	2.5	22 7	1.5
35	4 46	19 13	0 30	1 46	6 31	2.4	21 49	1.6
30	4 58	19 0	0 27	1 36	6 48	2.4	21 34	1.7
20	5 20	18 39	0 24	1 24	7 15	2.3	21 8	1.8
10	5 38	18 20	0 23	1 17	7 38	2.2	20 46	1.9
0	5 56	18 3	0 22	1 15	8 0	2.1	20 25	2.0
10	6 13	17 46	0 23	1 15	8 22	2.0	20 4	2.1
20	6 31	17 28	0 24	1 18	8 45	1.9	19 41	2.2
30	6 52	17 7	0 26	1 25	9 13	1.8	19 15	2.4
35	7 4	16 55	0 28	1 30	9 29	1.7	18 59	2.5
40	7 17	16 41	0 30	1 37	9 47	1.7	18 41	2.6
45	7 34	16 25	0 34	1 46	10 10	1.6	18 19	2.7
50	7 54	16 4	0 38	1 59	10 38	1.4	17 51	2.8
55	8 20	15 38	0 45	2 17	11 18	1.1	17 12	3.1
60	8 58	15 1	0 57	2 44	12 23	.5	16 7	3.8
S								

UT	MESEC				JUPITER		SATURN	
	S <sub>♃</sub>	Δ	δ <sub>♃</sub>	Δ	S <sub>♃</sub>	δ <sub>♃</sub>	S <sub>♄</sub>	δ <sub>♄</sub>
h	° / ' / "	° / ' / "	° / ' / "	° / ' / "	° / ' / "	° / ' / "	° / ' / "	° / ' / "
0	154 13.0	96 27 54.2	-24	68 41.2	- 2 15.5	140 2.9	21 16.7	
2	183 10.3	97 27 49.3	-27	98 46.0	- 2 15.6	170 7.2	21 16.6	
4	212 7.7	98 27 43.9	-30	128 50.9	- 2 15.6	200 11.6	21 16.5	
6	241 5.4	99 27 37.9	-33	158 55.8	- 2 15.6	230 15.9	21 16.4	
8	270 3.2	100 27 31.4	-35	189 .7	- 2 15.7	260 20.2	21 16.3	
10	299 1.2	101 27 24.3	-38	219 5.6	- 2 15.7	290 24.6	21 16.2	
12	327 59.4	102 27 16.7	-40	249 10.4	- 2 15.8	320 28.9	21 16.1	
14	356 57.9	103 27 8.6	-43	279 15.3	- 2 15.8	350 33.2	21 16.0	
16	25 56.5	104 27 .0	-46	309 20.2	- 2 15.9	20 37.6	21 15.9	
18	54 55.4	105 26 50.9	-48	339 25.1	- 2 15.9	50 41.9	21 15.8	
20	83 54.5	107 26 41.2	-51	9 30.0	- 2 16.0	80 46.2	21 15.7	
22	112 53.8	108 26 31.1	-53	39 34.8	- 2 16.0	110 50.6	21 15.6	
Δ				24	0	22	0	

SUNCE				MESEC					
UT	e = T <sub>p</sub> - UT	Δ/24	r	Prolaz	Δ/24	π <sub>☾</sub>	r		
h	min s	s / ' / "	h min	h min	min	' / "	' / "		
00	0 51.2	- .5	15.8	T <sub>m</sub>	14 13	2.0	54.4 14.8		
12	0 45.2	T <sub>m☉</sub>	11 h 59.2 min	Starost	2.1 d	Faza	●		
PLANETE									
Pl.	T <sub>m</sub>	π	360-α	Vel.	Pl.	T <sub>m</sub>	π	360-α	Vel.
♀	h min	' / "	°	°	♃	h min	' / "	°	°
♁	13 20	.1	263	-3.8	♃	19 22	.0	171	-2.0
♂	6 45	.1	1	.2	♄	14 38	.0	243	.3

UT	SUNCE				PROLEĆ. TAČKA S <sub>γ</sub>	VENERA				MARS					
	S <sub>☉</sub>		δ <sub>☉</sub>			S <sub>♀</sub>		δ <sub>♀</sub>		S <sub>♂</sub>		δ <sub>♂</sub>			
h	°	'	°	'	°	'	°	'	°	'	°	'			
0	180	9.8	23	.2	258	26.7	159	54.5	24	20.3	258	53.7	-2	39.5	
2	210	9.5	23	.6	288	31.6	189	52.8	24	20.0	288	55.4	-2	38.2	
4	240	9.3	23	1.0	318	36.6	219	51.0	24	19.8	318	57.1	-2	36.8	
6	270	9.0	23	1.4	348	41.5	249	49.2	24	19.6	348	58.8	-2	35.5	
8	300	8.8	23	1.7	18	46.4	279	47.5	24	19.4	19	.5	-2	34.2	
10	330	8.5	23	2.1	48	51.3	309	45.7	24	19.2	49	2.1	-2	32.9	
12	0	8.3	23	2.5	78	56.3	339	43.9	24	18.9	79	3.8	-2	31.6	
14	30	8.0	23	2.9	109	1.2	9	42.2	24	18.7	109	5.5	-2	30.2	
16	60	7.8	23	3.2	139	6.1	39	40.4	24	18.5	139	7.2	-2	28.9	
18	90	7.5	23	3.6	169	11.1	69	38.6	24	18.2	169	8.9	-2	27.6	
20	120	7.3	23	3.9	199	16.0	99	36.9	24	18.0	199	10.6	-2	26.3	
22	150	7.0	23	4.3	229	20.9	129	35.1	24	17.7	229	12.3	-2	24.9	
Δ		-1		2				-9		-1			8		7

φ	SUNCE		TRAJANJE SUMRAKA		MESEC			
	IZLAZ	ZALAZ	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 21	1 38	: : :	4 56	3.8	0 28	.3
55	3 22	20 37	0 57	: : :	5 51	3.2	23 53	.6
50	3 51	20 8	0 44	: : :	6 26	2.9	23 24	.9
45	4 13	19 46	0 37	2 31	6 52	2.7	23 1	1.1
40	4 31	19 28	0 33	2 2	7 12	2.6	22 43	1.2
35	4 46	19 14	0 30	1 46	7 29	2.5	22 28	1.4
30	4 58	19 1	0 27	1 36	7 44	2.4	22 15	1.5
20	5 20	18 39	0 24	1 24	8 9	2.2	21 52	1.6
10	5 39	18 20	0 23	1 17	8 31	2.1	21 32	1.8
0	5 56	18 3	0 22	1 15	8 50	2.0	21 14	1.9
10	6 13	17 46	0 23	1 15	9 10	1.9	20 55	2.1
20	6 31	17 28	0 24	1 18	9 32	1.7	20 35	2.2
30	6 52	17 7	0 26	1 25	9 56	1.6	20 12	2.4
35	7 4	16 55	0 28	1 30	10 11	1.5	19 58	2.5
40	7 18	16 41	0 30	1 37	10 27	1.4	19 42	2.6
45	7 34	16 24	0 34	1 46	10 47	1.2	19 23	2.7
50	7 55	16 4	0 38	1 59	11 12	1.0	18 59	3.0
55	8 21	15 38	0 45	2 17	11 45	.7	18 27	3.3
60	8 59	15 0	0 57	2 44	12 35	.2	17 38	3.8

UT	MESEC				JUPITER				SATURN							
	S <sub>♃</sub>		Δ		δ <sub>♃</sub>		Δ		S <sub>♃</sub>		δ <sub>♃</sub>		S <sub>♄</sub>		δ <sub>♄</sub>	
h	°	'	°	'	°	'	°	'	°	'	°	'	°	'	°	'
0	141	53.4	109	26	20.5	-56	69	39.7	-2	16.1	140	54.9	21	15.6		
2	170	53.2	110	26	9.4	-58	99	44.6	-2	16.1	170	59.2	21	15.5		
4	199	53.3	112	25	57.8	-60	129	49.4	-2	16.1	201	3.6	21	15.4		
6	228	53.6	113	25	45.7	-63	159	54.3	-2	16.2	231	7.9	21	15.3		
8	257	54.2	114	25	33.2	-65	189	59.2	-2	16.2	261	12.2	21	15.2		
10	286	55.1	116	25	20.2	-67	220	4.0	-2	16.3	291	16.6	21	15.1		
12	315	56.2	117	25	6.7	-69	250	8.9	-2	16.3	321	20.9	21	15.0		
14	344	57.6	118	24	52.9	-72	280	13.8	-2	16.4	351	25.2	21	14.9		
16	13	59.2	120	24	38.5	-74	310	18.6	-2	16.5	21	29.6	21	14.8		
18	43	1.1	121	24	23.7	-76	340	23.5	-2	16.5	51	33.9	21	14.7		
20	72	3.3	122	24	8.5	-78	10	28.4	-2	16.6	81	38.2	21	14.6		
22	101	5.8	124	23	52.9	-80	40	33.2	-2	16.6	111	42.5	21	14.5		
Δ								24		0			22		0	

SUNCE				MESEC				
UT	e = T <sub>p</sub> - UT	Δ/24	r	Prolaz	Δ/24	π <sub>☾</sub>	r	
h	min	s	s	h min	min	'	'	
00	0 39.3	- .5	15.8	T <sub>m</sub>	15 2	2.0	54.2	14.8
12	0 33.2			T <sub>m☉</sub>	11 h 59.4 min	Starost	3.1 d	Faza ●

PLANETE									
Pl.	T <sub>m</sub>	π	360-α	Vel.	Pl.	T <sub>m</sub>	π	360-α	Vel.
h	min	'	°	°	h	min	'	°	°
♀	13 21	.1	261	-3.8	♃	19 18	.0	171	-2.0
♂	6 44	.1	0	.2	♄	14 34	.0	242	.3

UT	SUNCE				PROLEĆ. TAČKA S <sub>γ</sub>	VENERA				MARS					
	S <sub>☉</sub>		δ <sub>☉</sub>			S <sub>♀</sub>		δ <sub>♀</sub>		S <sub>♂</sub>		δ <sub>♂</sub>			
h	°	'	°	'	°	'	°	'	°	'	°	'			
0	180	6.7	23	4.7	259	25.8	159	33.3	24	17.5	259	14.0	-2	23.6	
2	210	6.5	23	5.0	289	30.8	189	31.6	24	17.2	289	15.7	-2	22.3	
4	240	6.2	23	5.4	319	35.7	219	29.8	24	16.9	319	17.4	-2	21.0	
6	270	6.0	23	5.7	349	40.6	249	28.0	24	16.6	349	19.1	-2	19.7	
8	300	5.7	23	6.0	19	45.5	279	26.3	24	16.4	19	20.8	-2	18.3	
10	330	5.5	23	6.4	49	50.5	309	24.5	24	16.1	49	22.5	-2	17.0	
12	0	5.2	23	6.7	79	55.4	339	22.8	24	15.8	79	24.2	-2	15.7	
14	30	5.0	23	7.1	110	.3	9	21.0	24	15.5	109	25.9	-2	14.4	
16	60	4.7	23	7.4	140	5.3	39	19.2	24	15.2	139	27.6	-2	13.0	
18	90	4.4	23	7.7	170	10.2	69	17.5	24	14.9	169	29.3	-2	11.7	
20	120	4.2	23	8.0	200	15.1	99	15.7	24	14.6	199	31.0	-2	10.4	
22	150	3.9	23	8.4	230	20.0	129	14.0	24	14.3	229	32.7	-2	9.1	
Δ		-1		2				-9		-1			9		7

φ	SUNCE		TRAJANJE SUMRAKA		MESEC			
	IZLAZ	ZALAZ	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	: : :	6 27	3.8	0 36	.1
55	3 21	20 38	0 57	: : :	7 8	3.3	. . .	.0
50	3 51	20 9	0 44	: : :	7 36	3.0	23 45	.7
45	4 13	19 47	0 37	2 31	7 57	2.8	23 28	.9
40	4 31	19 29	0 33	2 2	8 14	2.6	23 13	1.1
35	4 45	19 14	0 30	1 46	8 29	2.5	23 1	1.2
30	4 58	19 1	0 27	1 36	8 41	2.3	22 50	1.3
20	5 20	18 39	0 25	1 24	9 2	2.2	22 31	1.5
10	5 39	18 21	0 23	1 18	9 21	2.0	22 15	1.7
0	5 56	18 3	0 22	1 15	9 38	1.9	21 60	1.8
10	6 13	17 46	0 23	1 15	9 55	1.7	21 44	2.0
20	6 31	17 28	0 24	1 19	10 13	1.6	21 28	2.1
30	6 52	17 7	0 26	1 25	10 34	1.4	21 9	2.3
35	7 4	16 55	0 28	1 31	10 46	1.3	20 57	2.4
40	7 18	16 41	0 30	1 37	11 0	1.1	20 44	2.6
45	7 35	16 24	0 34	1 47	11 16	1.0	20 29	2.7
50	7 55	16 4	0 38	1 59	11 37	.8	20 10	3.0
55	8 22	15 37	0 45	2 17	12 3	.5	19 45	3.3
60	8 60	14 59	0 57	2 45	12 39	.1	19 10	3.7

UT	MESEC				JUPITER				SATURN							
	S <sub>♃</sub>		Δ		δ <sub>♃</sub>		Δ		S <sub>♃</sub>		δ <sub>♃</sub>		S <sub>♄</sub>		δ <sub>♄</sub>	
h	°	'	°	'	°	'	°	'	°	'	°	'	°	'	°	'
0	130	8.5	125	23	36.9	-82	70	38.1	-2	16.7	141	46.9	21	14.4		
2	159	11.6	126	23	20.5	-84	100	42.9	-2	16.7	171	51.2	21	14.3		
4	188	14.9	128	23	3.6	-86	130	47.8	-2	16.8	201	55.5	21	14.2		
6	217	18.4	129	22	46.4	-88	160	52.7	-2	16.8	231	59.9	21	14.1		
8	246	22.3	131	22	28.7	-90	190	57.5	-2	16.9	262	4.2	21	14.0		
10	275	26.4	132	22	10.7	-92	221	2.4	-2	16.9	292	8.5	21	13.9		
12	304	30.7	133	21	52.4	-94	251	7.2	-2	17.0	322	12.8	21	13.8		
14	333	35.4	135	21	33.6	-96	281	12.1	-2	17.0	352	17.2	21	13.7		
16	2	40.3	136	21	14.5	-97	311	16.9	-2	17.1	22	21.5	21	13.6		
18	31	45.5	137	20	55.1	-99	341	21.8	-2	17.2	52	25.8	21	13.5		
20	60	50.9	138	20	35.3	-101	11	26.6	-2	17.2	82	30.1	21	13.4		
22	89	56.6	140	20	15.1	-102	41	31.5	-2	17.3	112	34.5	21	13.3		
Δ								24		0			22		0	

SUNCE				MESEC				
UT	e = T <sub>p</sub> - UT	Δ/24	r	Prolaz	Δ/24	π <sub>☾</sub>	r	
h	min	s	s	h min	min	'	'	
00	0 27.2	- .5	15.8	T <sub>m</sub>	15 49	1.8	54.1	14.7

UT	SUNCE				PROLEĆ. TAČKA S <sub>γ</sub>	VENERA				MARS					
	S <sub>☉</sub>		δ <sub>☉</sub>			S <sub>♀</sub>		δ <sub>♀</sub>		S <sub>♂</sub>		δ <sub>♂</sub>			
h	°	'	°	'	°	'	°	'	°	'	°	'			
0	180	3.7	23	8.7	260	25.0	159	12.2	24	13.9	259	34.5	-2	7.8	
2	210	3.4	23	9.0	290	29.9	189	10.5	24	13.6	289	36.2	-2	6.4	
4	240	3.2	23	9.3	320	34.8	219	8.7	24	13.3	319	37.9	-2	5.1	
6	270	2.9	23	9.6	350	39.8	249	6.9	24	12.9	349	39.6	-2	3.8	
8	300	2.6	23	9.9	20	44.7	279	5.2	24	12.6	19	41.3	-2	2.5	
10	330	2.4	23	10.2	50	49.6	309	3.4	24	12.3	49	43.0	-2	1.2	
12	0	2.1	23	10.5	80	54.5	339	1.7	24	11.9	79	44.7	-1	59.9	
14	30	1.9	23	10.8	110	59.5	8	59.9	24	11.6	109	46.4	-1	58.5	
16	60	1.6	23	11.1	141	4.4	38	58.2	24	11.2	139	48.1	-1	57.2	
18	90	1.3	23	11.4	171	9.3	68	56.4	24	10.8	169	49.8	-1	55.9	
20	120	1.1	23	11.7	201	14.3	98	54.7	24	10.5	199	51.5	-1	54.6	
22	150	.8	23	12.0	231	19.2	128	52.9	24	10.1	229	53.2	-1	53.3	
Δ		-1		2				-9		-2			9		7

φ	SUNCE		TRAJANJE SUMRAKA		MESEC			
	IZLAZ	ZALAZ	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 23	1 41	:::	7 57	3.6	0 39	.0
55	3 21	20 39	0 57	:::	8 26	3.2	0 8	.4
50	3 51	20 9	0 44	:::	8 47	2.9	...	.0
45	4 13	19 47	0 37	2 32	9 3	2.7	23 49	.8
40	4 31	19 29	0 33	2 3	9 17	2.6	23 38	.9
35	4 45	19 14	0 30	1 47	9 28	2.4	23 29	1.1
30	4 58	19 2	0 27	1 36	9 38	2.3	23 21	1.2
20	5 20	18 40	0 25	1 24	9 54	2.1	23 7	1.4
10	5 39	18 21	0 23	1 18	10 9	1.9	22 55	1.6
0	5 56	18 4	0 22	1 15	10 23	1.8	22 43	1.7
10	6 13	17 46	0 23	1 15	10 36	1.6	22 32	1.9
20	6 32	17 28	0 24	1 19	10 51	1.4	22 19	2.1
30	6 53	17 7	0 26	1 25	11 7	1.2	22 5	2.3
35	7 5	16 55	0 28	1 31	11 17	1.1	21 56	2.4
40	7 19	16 41	0 30	1 37	11 27	1.0	21 46	2.6
45	7 36	16 24	0 34	1 47	11 40	.8	21 35	2.7
50	7 56	16 4	0 38	1 59	11 55	.6	21 21	2.9
55	8 23	15 37	0 45	2 17	12 15	.4	21 3	3.2
60	9 1	14 59	0 57	2 45	12 41	.0	20 39	3.6
S								

UT	MESEC				JUPITER		SATURN								
	S <sub>♃</sub>	Δ	δ <sub>♃</sub>	Δ	S <sub>♃</sub>	δ <sub>♃</sub>	S <sub>♄</sub>	δ <sub>♄</sub>							
h	°	'	°	'	°	'	°	'							
0	119	2.5	141	19	54.6	-104	71	36.3	-2	17.3	142	38.8	21	13.2	
2	148	8.6	142	19	33.8	-106	101	41.1	-2	17.4	172	43.1	21	13.1	
4	177	15.1	143	19	12.7	-107	131	46.0	-2	17.5	202	47.4	21	13.0	
6	206	21.7	144	18	51.3	-109	161	50.8	-2	17.5	232	51.8	21	12.9	
8	235	28.6	146	18	29.5	-110	191	55.7	-2	17.6	262	56.1	21	12.8	
10	264	35.7	147	18	7.5	-112	222	.5	-2	17.6	293	.4	21	12.7	
12	293	43.0	148	17	45.1	-113	252	5.3	-2	17.7	323	4.7	21	12.6	
14	322	50.6	149	17	22.5	-115	282	10.2	-2	17.8	353	9.1	21	12.5	
16	351	58.4	150	16	59.6	-116	312	15.0	-2	17.8	23	13.4	21	12.4	
18	21	6.3	151	16	36.4	-117	342	19.9	-2	17.9	53	17.7	21	12.3	
20	50	14.5	152	16	12.9	-119	12	24.7	-2	18.0	83	22.0	21	12.2	
22	79	22.9	153	15	49.2	-120	42	29.5	-2	18.0	113	26.3	21	12.1	
Δ								24		0			22		-1

SUNCE				MESEC					
UT	e = T <sub>p</sub> - UT	Δ/24	r	Prolaz	Δ/24	π <sub>♃</sub>	r		
h	min	s	s	h min	min	'	'		
00	0 14.9	-.5	15.8	T <sub>m</sub>	16 33	1.8	54.1	14.7	
12	0 8.6	T <sub>m☉</sub>	11 h 59.9 min	Starost	5.1 d	Faza	☉		
PLANETE									
Pl.	T <sub>m</sub>	π	360-α	Vel.	Pl.	T <sub>m</sub>	π	360-α	Vel.
♀	h min	'	°	°	♃	h min	'	°	°
♂	13 24	.1	259	-3.8	♄	19 10	.0	171	-2.0
♂	6 41	.1	359	.2	♄	14 27	.0	242	.3

UT	SUNCE				PROLEĆ. TAČKA S <sub>γ</sub>	VENERA				MARS					
	S <sub>☉</sub>		δ <sub>☉</sub>			S <sub>♀</sub>		δ <sub>♀</sub>		S <sub>♂</sub>		δ <sub>♂</sub>			
h	°	'	°	'	°	'	°	'	°	'	°	'			
0	180	.6	23	12.3	261	24.1	158	51.2	24	9.7	259	55.0	-1	51.9	
2	210	.3	23	12.6	291	29.0	188	49.5	24	9.3	289	56.7	-1	50.6	
4	240	.0	23	12.9	321	34.0	218	47.7	24	8.9	319	58.4	-1	49.3	
6	269	59.8	23	13.1	351	38.9	248	46.0	24	8.5	350	.1	-1	48.0	
8	299	59.5	23	13.4	21	43.8	278	44.2	24	8.1	20	1.8	-1	46.7	
10	329	59.2	23	13.7	51	48.8	308	42.5	24	7.7	50	3.5	-1	45.4	
12	359	59.0	23	14.0	81	53.7	338	40.7	24	7.3	80	5.2	-1	44.0	
14	29	58.7	23	14.2	111	58.6	8	39.0	24	6.9	110	7.0	-1	42.7	
16	59	58.5	23	14.5	142	3.5	38	37.3	24	6.5	140	8.7	-1	41.4	
18	89	58.2	23	14.7	172	8.5	68	35.5	24	6.1	170	10.4	-1	40.1	
20	119	57.9	23	15.0	202	13.4	98	33.8	24	5.6	200	12.1	-1	38.8	
22	149	57.7	23	15.3	232	18.3	128	32.0	24	5.2	230	13.8	-1	37.5	
Δ		-1		1				-9		-2			9		7

φ	SUNCE		TRAJANJE SUMRAKA		MESEC			
	IZLAZ	ZALAZ	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 42	:::	9 25	3.5	0 40	.0
55	3 21	20 40	0 58	:::	9 44	3.2	0 18	.3
50	3 50	20 10	0 44	:::	9 58	2.9	0 2	.6
45	4 13	19 48	0 37	2 32	10 9	2.7	...	.0
40	4 31	19 30	0 33	2 3	10 18	2.5	...	.0
35	4 45	19 15	0 30	1 47	10 26	2.4	23 55	1.0
30	4 58	19 2	0 27	1 36	10 33	2.3	23 50	1.1
20	5 20	18 40	0 25	1 24	10 45	2.1	23 41	1.3
10	5 39	18 21	0 23	1 18	10 55	1.9	23 33	1.5
0	5 56	18 4	0 23	1 15	11 5	1.7	23 25	1.7
10	6 14	17 46	0 23	1 15	11 15	1.5	23 17	1.9
20	6 32	17 28	0 24	1 19	11 25	1.4	23 9	2.1
30	6 53	17 7	0 26	1 25	11 37	1.1	22 59	2.3
35	7 5	16 55	0 28	1 31	11 43	1.0	22 54	2.4
40	7 19	16 41	0 31	1 37	11 51	.9	22 48	2.5
45	7 36	16 24	0 34	1 47	11 60	.7	22 40	2.7
50	7 57	16 3	0 38	1 59	12 10	.5	22 31	2.9
55	8 23	15 37	0 45	2 17	12 24	.3	22 20	3.2
60	9 2	14 58	0 57	2 45	12 41	.0	22 5	3.5
S								

UT	MESEC				JUPITER		SATURN								
	S <sub>♃</sub>	Δ	δ <sub>♃</sub>	Δ	S <sub>♃</sub>	δ <sub>♃</sub>	S <sub>♄</sub>	δ <sub>♄</sub>							
h	°	'	°	'	°	'	°	'							
0	108	31.4	154	15	25.2	-121	72	34.3	-2	18.1	143	30.7	21	12.0	
2	137	40.1	154	15	.9	-122	102	39.2	-2	18.2	173	35.0	21	11.9	
4	166	49.0	155	14	36.4	-124	132	44.0	-2	18.2	203	39.3	21	11.8	
6	195	58.1	156	14	11.7	-125	162	48.8	-2	18.3	233	43.6	21	11.7	
8	225	7.3	157	13	46.7	-126	192	53.7	-2	18.4	263	47.9	21	11.6	
10	254	16.7	158	13	21.5	-127	222	58.5	-2	18.4	293	52.3	21	11.5	
12	283	26.2	158	12	56.1	-128	253	3.3	-2	18.5	323	56.6	21	11.4	
14	312	35.9	159	12	30.4	-129	283	8.1	-2	18.6	354	.9	21	11.3	
16	341	45.6	160	12	4.6	-130	313	13.0	-2	18.6	24	5.2	21	11.2	
18	10	55.5	160	11	38.5	-131	343	17.8	-2	18.7	54	9.5	21	11.1	
20	40	5.5	161	11	12.3	-132	13	22.6	-2	18.8	84	13.9	21	11.0	
22	69	15.7	161	10	45.8	-133	43	27.4	-2	18.8	114	18.2	21	10.9	
Δ								24		0			22		-1

SUNCE				MESEC				
UT	e = T <sub>p</sub> - UT	Δ/24	r	Prolaz	Δ/24	π <sub>♃</sub>	r	
h	min	s	s	h min	min	'	'	
00	0 2.4	-.5	15.8	T <sub>m</sub>	17 15	1.7	54.3	14.8
12	-0 3.9	T <sub>m☉</sub>	12 h .1 min					

UT	SUNCE		PROLEĆ. TAČKA S <sub>γ</sub>	VENERA		MARS	
	S <sub>☉</sub>	δ <sub>☉</sub>		S <sub>♀</sub>	δ <sub>♀</sub>	S <sub>♂</sub>	δ <sub>♂</sub>
h	° / ' / "	° / ' / "	° / ' / "	° / ' / "	° / ' / "	° / ' / "	° / ' / "
0	179 57.4	23 15.5	262 23.3	158 30.3	24 4.8	260 15.5	- 1 36.2
2	209 57.1	23 15.8	292 28.2	188 28.6	24 4.3	290 17.3	- 1 34.8
4	239 56.9	23 16.0	322 33.1	218 26.8	24 3.9	320 19.0	- 1 33.5
6	269 56.6	23 16.2	352 38.0	248 25.1	24 3.4	350 20.7	- 1 32.2
8	299 56.3	23 16.5	22 43.0	278 23.4	24 3.0	20 22.4	- 1 30.9
10	329 56.1	23 16.7	52 47.9	308 21.6	24 2.5	50 24.2	- 1 29.6
12	359 55.8	23 17.0	82 52.8	338 19.9	24 2.0	80 25.9	- 1 28.3
14	29 55.5	23 17.2	112 57.7	8 18.2	24 1.6	110 27.6	- 1 27.0
16	59 55.3	23 17.4	143 2.7	38 16.5	24 1.1	140 29.3	- 1 25.6
18	89 55.0	23 17.6	173 7.6	68 14.7	24 .6	170 31.0	- 1 24.3
20	119 54.8	23 17.9	203 12.5	98 13.0	24 .1	200 32.8	- 1 23.0
22	149 54.5	23 18.1	233 17.5	128 11.3	23 59.6	230 34.5	- 1 21.7
Δ	-1	1		-9	-2	9	7

UT	MESEC				JUPITER		SATURN	
	S <sub>♃</sub>	Δ	δ <sub>♃</sub>	Δ	S <sub>♃</sub>	δ <sub>♃</sub>	S <sub>♄</sub>	δ <sub>♄</sub>
h	° / ' / "	° / ' / "	° / ' / "	° / ' / "	° / ' / "	° / ' / "	° / ' / "	° / ' / "
0	98 25.9	162	10 19.1	-134	73 32.2	- 2 18.9	144 22.5	21 10.8
2	127 36.2	162	9 52.3	-135	103 37.1	- 2 19.0	174 26.8	21 10.7
4	156 46.6	162	9 25.3	-136	133 41.9	- 2 19.1	204 31.1	21 10.6
6	185 57.0	163	8 58.0	-137	163 46.7	- 2 19.1	234 35.5	21 10.5
8	215 7.5	163	8 30.7	-138	193 51.5	- 2 19.2	264 39.8	21 10.4
10	244 18.1	163	8 3.1	-138	223 56.3	- 2 19.3	294 44.1	21 10.3
12	273 28.7	163	7 35.4	-139	254 1.1	- 2 19.3	324 48.4	21 10.2
14	302 39.3	163	7 7.6	-140	284 5.9	- 2 19.4	354 52.7	21 10.0
16	331 50.0	163	6 39.6	-141	314 10.7	- 2 19.5	24 57.0	21 9.9
18	1 .7	163	6 11.4	-141	344 15.5	- 2 19.6	55 1.3	21 9.8
20	30 11.4	163	5 43.2	-142	14 20.4	- 2 19.6	85 5.7	21 9.7
22	59 22.1	163	5 14.7	-143	44 25.2	- 2 19.7	115 10.0	21 9.6
Δ					24	0	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	2 36	21 25	1 43	:::	10 50	3.5	0 40	.0
55	3 21	20 40	0 58	:::	10 60	3.2	0 26	.3
50	3 50	20 10	0 44	:::	11 8	2.9	0 16	.5
45	4 13	19 48	0 37	2 32	11 14	2.7	0 8	.7
40	4 31	19 30	0 33	2 3	11 19	2.6	0 1	.9
35	4 45	19 15	0 30	1 47	11 24	2.4	...	.0
30	4 58	19 2	0 27	1 36	11 28	2.3	...	.0
20	5 20	18 40	0 25	1 24	11 35	2.1	...	.0
10	5 39	18 21	0 23	1 18	11 41	1.9	...	.0
0	5 57	18 4	0 23	1 15	11 46	1.7	...	.0
10	6 14	17 47	0 23	1 15	11 52	1.5	...	.0
20	6 32	17 28	0 24	1 19	11 58	1.3	23 58	2.1
30	6 53	17 7	0 26	1 25	12 4	1.1	23 54	2.3
35	7 6	16 55	0 28	1 31	12 8	1.0	23 52	2.4
40	7 20	16 41	0 31	1 38	12 12	.9	23 49	2.6
45	7 36	16 24	0 34	1 47	12 17	.7	23 45	2.8
50	7 57	16 3	0 38	1 59	12 23	.5	23 41	3.0
55	8 24	15 36	0 45	2 17	12 31	.3	23 36	3.2
60	9 2	14 58	0 57	2 46	12 40	.0	23 30	3.5

SUNCE				MESEC				
UT	e = T <sub>p</sub> - UT	Δ/24	r	Prolaz	Δ/24	π <sub>☾</sub>	r	
h	min s	s / ' / "	h min	h min	min / ' / "	h min	min	
00	- 0 10.2	-.5	15.8	T <sub>m</sub>	17 56	1.7	54.6	14.9
12	- 0 16.6	T <sub>m☉</sub>	12 h .3 min	Starost	7.1 d	Faza	☾	

PLANETE									
Pl.	T <sub>m</sub>	π	360-α	Vel.	Pl.	T <sub>m</sub>	π	360-α	Vel.
h	h min	' / "	°	°	h min	' / "	°	°	°
♀	13 27	.1	256	-3.8	♃	19 3	.0	171	-2.0
♂	6 39	.1	358	.2	♄	14 20	.0	242	.3

UT	SUNCE		PROLEĆ. TAČKA S <sub>γ</sub>	VENERA		MARS	
	S <sub>☉</sub>	δ <sub>☉</sub>		S <sub>♀</sub>	δ <sub>♀</sub>	S <sub>♂</sub>	δ <sub>♂</sub>
h	° / ' / "	° / ' / "	° / ' / "	° / ' / "	° / ' / "	° / ' / "	° / ' / "
0	179 54.2	23 18.3	263 22.4	158 9.6	23 59.1	260 36.2	- 1 20.4
2	209 54.0	23 18.5	293 27.3	188 7.8	23 58.6	290 37.9	- 1 19.1
4	239 53.7	23 18.7	323 32.2	218 6.1	23 58.1	320 39.7	- 1 17.8
6	269 53.4	23 18.9	353 37.2	248 4.4	23 57.6	350 41.4	- 1 16.5
8	299 53.2	23 19.1	23 42.1	278 2.7	23 57.1	20 43.1	- 1 15.1
10	329 52.9	23 19.3	53 47.0	308 .9	23 56.6	50 44.9	- 1 13.8
12	359 52.6	23 19.5	83 52.0	337 59.2	23 56.0	80 46.6	- 1 12.5
14	29 52.4	23 19.7	113 56.9	7 57.5	23 55.5	110 48.3	- 1 11.2
16	59 52.1	23 19.9	144 1.8	37 55.8	23 55.0	140 50.0	- 1 9.9
18	89 51.8	23 20.1	174 6.7	67 54.1	23 54.4	170 51.8	- 1 8.6
20	119 51.6	23 20.3	204 11.7	97 52.4	23 53.9	200 53.5	- 1 7.3
22	149 51.3	23 20.5	234 16.6	127 50.7	23 53.3	230 55.2	- 1 6.0
Δ	-1	1		-9	-3	9	7

UT	MESEC				JUPITER		SATURN	
	S <sub>♃</sub>	Δ	δ <sub>♃</sub>	Δ	S <sub>♃</sub>	δ <sub>♃</sub>	S <sub>♄</sub>	δ <sub>♄</sub>
h	° / ' / "	° / ' / "	° / ' / "	° / ' / "	° / ' / "	° / ' / "	° / ' / "	° / ' / "
0	88 32.8	163	4 46.2	-143	74 30.0	- 2 19.8	145 14.3	21 9.5
2	117 43.4	163	4 17.5	-144	104 34.8	- 2 19.9	175 18.6	21 9.4
4	146 54.0	163	3 48.7	-144	134 39.6	- 2 19.9	205 22.9	21 9.3
6	176 4.6	163	3 19.9	-145	164 44.4	- 2 20.0	235 27.2	21 9.2
8	205 15.2	162	2 50.9	-145	194 49.2	- 2 20.1	265 31.5	21 9.1
10	234 25.7	162	2 21.8	-146	224 54.0	- 2 20.2	295 35.9	21 9.0
12	263 36.1	162	1 52.6	-146	254 58.8	- 2 20.3	325 40.2	21 8.9
14	292 46.4	161	1 23.3	-147	285 3.6	- 2 20.3	355 44.5	21 8.8
16	321 56.6	161	0 53.9	-147	315 8.4	- 2 20.4	25 48.8	21 8.7
18	351 6.8	160	0 24.5	-148	345 13.2	- 2 20.5	55 53.1	21 8.6
20	20 16.8	160	- 0 5.0	-148	15 17.9	- 2 20.6	85 57.4	21 8.5
22	49 26.7	159	- 0 34.6	-148	45 22.7	- 2 20.7	116 1.7	21 8.4
Δ					24	0	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	2 36	21 25	1 44	:::	12 14	3.6	0 39	.0
55	3 20	20 41	0 58	:::	12 16	3.3	0 33	.3
50	3 50	20 11	0 45	:::	12 18	3.0	0 29	.5
45	4 13	19 49	0 37	2 33	12 20	2.8	0 25	.7
40	4 31	19 31	0 33	2 3	12 21	2.6	0 22	.8
35	4 46	19 16	0 30	1 47	12 22	2.5	0 19	1.0
30	4 58	19 3	0 27	1 36	12 23	2.3	0 17	1.1
20	5 20	18 41	0 25	1 24	12 24	2.1	0 13	1.3
10	5 39	18 22	0 23	1 18	12 25	1.9	0 9	1.5
0	5 57	18 4	0 23	1 15	12 27	1.7	0 6	1.7
10	6 14	17 47	0 23	1 15	12 28	1.5	0 2	1.9
20	6 33	17 28	0 24	1 19	12 29	1.4	...	.0
30	6 54	17 7	0 26	1 25	12 31	1.1	...	.0
35	7 6	16 55	0 28	1 31	12 32	1.0	...	.0
40	7 20	16 41	0 31	1 38	12 33	.9	...	.0
45	7 37	16 24	0 34	1 47	12 34	.7	...	.0
50	7 58	16 3	0 38	1 59	12 35	.5	...	.0
55	8 25	15 36	0 45	2 17	12 37	.3	...	.0
60	9 3	14 58	0 58	2 46	12 39	.0	...	.0

SUNCE				MESEC				
UT	e = T <sub>p</sub> - UT	Δ/24	r	Prolaz	Δ/24	π <sub>☾</sub>	r	
h	min s	s / ' / "	h min	h min	min / ' / "	h min	min	
00	- 0 22.9	-.5	15.8	T <sub>m</sub>	18 37	1.7	55.1	15.0
12	- 0 29.4	T <sub>m☉</sub>	12 h .5 min	Starost	8.1 d	Faza	☾	

PLANETE									
Pl.	T <sub>m</sub>	π	360-α	Vel.	Pl.	T <sub>m</sub>	π	360-α	Vel.
h	h min	' / "	°	°	h min	' / "	°	°	°
♀	13 28	.1	255	-3.8	♃	18 59	.0	171	-2.0
♂	6 37	.1	357	.1	♄	14 17	.0	242	.3

UT	SUNCE		PROLEĆ. TAČKA S <sub>γ</sub>	VENERA		MARS		
	S <sub>☉</sub>	δ <sub>☉</sub>		S <sub>♀</sub>	δ <sub>♀</sub>	S <sub>♂</sub>	δ <sub>♂</sub>	
h	°	'	°	'	°	'	°	'
0	179 51.0	23 20.7	264 21.5	157 48.9	23 52.8	260 57.0	- 1 4.7	
2	209 50.7	23 20.9	294 26.5	187 47.2	23 52.2	290 58.7	- 1 3.4	
4	239 50.5	23 21.0	324 31.4	217 45.5	23 51.7	321 2.4	- 1 2.1	
6	269 50.2	23 21.2	354 36.3	247 43.8	23 51.1	351 2.2	- 1 1.7	
8	299 49.9	23 21.4	24 41.2	277 42.1	23 50.5	21 3.9	- 0 59.4	
10	329 49.7	23 21.6	54 46.2	307 40.4	23 49.9	51 5.6	- 0 58.1	
12	359 49.4	23 21.7	84 51.1	337 38.7	23 49.4	81 7.4	- 0 56.8	
14	29 49.1	23 21.9	114 56.0	7 37.0	23 48.8	111 9.1	- 0 55.5	
16	59 48.9	23 22.1	145 1.0	37 35.3	23 48.2	141 10.9	- 0 54.2	
18	89 48.6	23 22.2	175 5.9	67 33.6	23 47.6	171 12.6	- 0 52.9	
20	119 48.3	23 22.4	205 10.8	97 31.9	23 47.0	201 14.3	- 0 51.6	
22	149 48.1	23 22.5	235 15.7	127 30.2	23 46.4	231 16.1	- 0 50.3	
Δ	-1	1		-9	-3	9	7	

φ	SUNCE		TRAJANJE SUMRAKA		MESEC			
	IZLAZ	ZALAZ	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	:::	13 41	3.8	0 38	.0
55	3 20	20 41	0 58	:::	13 35	3.4	0 39	.3
50	3 50	20 11	0 45	:::	13 30	3.1	0 40	.5
45	4 13	19 49	0 37	2 33	13 27	2.9	0 41	.7
40	4 31	19 31	0 33	2 3	13 24	2.7	0 42	.9
35	4 46	19 16	0 30	1 47	13 21	2.6	0 43	1.0
30	4 59	19 3	0 27	1 37	13 19	2.5	0 43	1.2
20	5 21	18 41	0 25	1 24	13 15	2.2	0 45	1.4
10	5 39	18 22	0 23	1 18	13 11	2.0	0 46	1.6
0	5 57	18 4	0 23	1 15	13 8	1.8	0 46	1.8
10	6 14	17 47	0 23	1 15	13 5	1.6	0 47	2.0
20	6 33	17 28	0 24	1 19	13 2	1.4	0 48	2.2
30	6 54	17 7	0 26	1 25	12 58	1.2	0 49	2.4
35	7 6	16 55	0 28	1 31	12 56	1.1	0 50	2.5
40	7 21	16 41	0 31	1 38	12 54	.9	0 51	2.7
45	7 37	16 24	0 34	1 47	12 51	.8	0 52	2.8
50	7 58	16 3	0 38	1 59	12 48	.6	0 53	3.1
55	8 25	15 36	0 45	2 18	12 44	.3	0 54	3.3
60	9 4	14 58	0 58	2 46	12 39	.0	0 56	3.7
S								

UT	MESEC				JUPITER		SATURN	
	S <sub>♃</sub>	Δ	δ <sub>♃</sub>	Δ	S <sub>♃</sub>	δ <sub>♃</sub>	S <sub>♄</sub>	δ <sub>♄</sub>
h	°	'	°	'	°	'	°	'
0	78 36.5	158 - 1	4.2	-148	75 27.5	- 2 20.8	146 6.0	21 8.3
2	107 46.1	157 - 1	33.9	-149	105 32.3	- 2 20.8	176 10.4	21 8.2
4	136 55.6	157 - 2	3.6	-149	135 37.1	- 2 20.9	206 14.7	21 8.1
6	166 4.9	156 - 2	33.3	-149	165 41.9	- 2 21.0	236 19.0	21 8.0
8	195 14.0	155 - 3	3.1	-149	195 46.7	- 2 21.1	266 23.3	21 7.9
10	224 23.0	154 - 3	32.9	-149	225 51.5	- 2 21.2	296 27.6	21 7.8
12	253 31.7	153 - 4	2.7	-149	255 56.2	- 2 21.3	326 31.9	21 7.7
14	282 40.3	152 - 4	32.6	-149	286 1.0	- 2 21.3	356 36.2	21 7.6
16	311 48.6	151 - 5	2.4	-149	316 5.8	- 2 21.4	26 40.5	21 7.5
18	340 56.7	149 - 5	32.2	-149	346 10.6	- 2 21.5	56 44.8	21 7.4
20	10 4.6	148 - 6	2.0	-149	16 15.4	- 2 21.6	86 49.1	21 7.2
22	39 12.2	147 - 6	31.8	-149	46 20.2	- 2 21.7	116 53.5	21 7.1
Δ					24	0	22	-1

SUNCE				MESEC					
UT	e = T <sub>p</sub> - UT	Δ/24	r	Prolaz	Δ/24	π <sub>☉</sub>	r		
h	min	s	s	h min	min	'	'		
00	- 0 35.8	-.5	15.8	T <sub>m</sub>	19 18	1.9	55.8	15.2	
12	- 0 42.2	T <sub>m☉</sub>	12 h .7 min	Starost	9.1 d	Faza	☉		
PLANETE									
Pl.	T <sub>m</sub>	π	360-α	Vel.	Pl.	T <sub>m</sub>	π	360-α	Vel.
♀	h min	'	°		♃	h min	'	°	
♁	13 30	.1	253	-3.8	♃	18 55	.0	171	-2.0
♂	6 36	.1	357	.1	♄	14 14	.0	242	.3

UT	SUNCE		PROLEĆ. TAČKA S <sub>γ</sub>	VENERA		MARS		
	S <sub>☉</sub>	δ <sub>☉</sub>		S <sub>♀</sub>	δ <sub>♀</sub>	S <sub>♂</sub>	δ <sub>♂</sub>	
h	°	'	°	'	°	'	°	'
0	179 47.8	23 22.7	265 20.7	157 28.5	23 45.7	261 17.8	- 0 49.0	
2	209 47.5	23 22.8	295 25.6	187 26.8	23 45.1	291 19.6	- 0 47.7	
4	239 47.3	23 23.0	325 30.5	217 25.1	23 44.5	321 21.3	- 0 46.4	
6	269 47.0	23 23.1	355 35.5	247 23.4	23 43.9	351 23.0	- 0 45.1	
8	299 46.7	23 23.2	25 40.4	277 21.7	23 43.2	21 24.8	- 0 43.8	
10	329 46.4	23 23.4	55 45.3	307 20.0	23 42.6	51 26.5	- 0 42.5	
12	359 46.2	23 23.5	85 50.2	337 18.4	23 42.0	81 28.3	- 0 41.2	
14	29 45.9	23 23.6	115 55.2	7 16.7	23 41.3	111 30.0	- 0 39.8	
16	59 45.6	23 23.7	146 .1	37 15.0	23 40.7	141 31.7	- 0 38.5	
18	89 45.4	23 23.9	176 5.0	67 13.3	23 40.0	171 33.5	- 0 37.2	
20	119 45.1	23 24.0	206 10.0	97 11.6	23 39.4	201 35.2	- 0 35.9	
22	149 44.8	23 24.1	236 14.9	127 9.9	23 38.7	231 37.0	- 0 34.6	
Δ	-1	1		-8	-3	9	7	

φ	SUNCE		TRAJANJE SUMRAKA		MESEC			
	IZLAZ	ZALAZ	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	:::	15 12	4.1	0 37	.0
55	3 20	20 42	0 58	:::	14 57	3.7	0 46	.3
50	3 50	20 12	0 45	:::	14 46	3.3	0 53	.6
45	4 13	19 49	0 37	2 33	14 37	3.1	0 59	.8
40	4 31	19 31	0 33	2 3	14 29	2.9	1 3	1.0
35	4 46	19 16	0 30	1 47	14 23	2.8	1 8	1.1
30	4 59	19 3	0 27	1 37	14 18	2.6	1 11	1.3
20	5 21	18 41	0 25	1 24	14 8	2.4	1 18	1.5
10	5 40	18 22	0 23	1 18	13 60	2.2	1 23	1.7
0	5 57	18 5	0 23	1 15	13 52	2.0	1 29	1.9
10	6 15	17 47	0 23	1 15	13 44	1.8	1 34	2.1
20	6 33	17 29	0 24	1 19	13 36	1.6	1 40	2.3
30	6 54	17 7	0 26	1 26	13 27	1.4	1 47	2.5
35	7 7	16 55	0 28	1 31	13 22	1.2	1 51	2.7
40	7 21	16 41	0 31	1 38	13 16	1.1	1 55	2.8
45	7 38	16 24	0 34	1 47	13 9	.9	2 0	3.0
50	7 58	16 3	0 38	1 60	13 1	.7	2 6	3.2
55	8 26	15 36	0 46	2 18	12 51	.4	2 14	3.5
60	9 4	14 58	0 58	2 46	12 38	.0	2 24	3.9
S								

UT	MESEC				JUPITER		SATURN	
	S <sub>♃</sub>	Δ	δ <sub>♃</sub>	Δ	S <sub>♃</sub>	δ <sub>♃</sub>	S <sub>♄</sub>	δ <sub>♄</sub>
h	°	'	°	'	°	'	°	'
0	68 19.5	145 - 7	1.6	-149	76 24.9	- 2 21.8	146 57.8	21 7.0
2	97 26.6	144 - 7	31.3	-148	106 29.7	- 2 21.9	177 2.1	21 6.9
4	126 33.4	142 - 8	.9	-148	136 34.5	- 2 22.0	207 6.4	21 6.8
6	155 39.9	141 - 8	30.5	-148	166 39.3	- 2 22.0	237 10.7	21 6.7
8	184 46.0	139 - 9	.1	-147	196 44.0	- 2 22.1	267 15.0	21 6.6
10	213 51.9	138 - 9	29.5	-147	226 48.8	- 2 22.2	297 19.3	21 6.5
12	242 57.4	136 - 9	58.9	-146	256 53.6	- 2 22.3	327 23.6	21 6.4
14	272 2.6	134 -10	28.2	-146	286 58.3	- 2 22.4	357 27.9	21 6.3
16	301 7.4	132 -10	57.3	-145	317 3.1	- 2 22.5	27 32.2	21 6.2
18	330 11.9	130 -11	26.4	-145	347 7.9	- 2 22.6	57 36.5	21 6.1
20	359 16.0	129 -11	55.3	-144	17 12.6	- 2 22.7	87 40.8	21 6.0
22	28 19.7	127 -12	24.1	-143	47 17.4	- 2 22.8	117 45.1	21 5.9
Δ					24	0	22	-1

SUNCE				MESEC					
UT	e = T <sub>p</sub> - UT	Δ/24	r	Prolaz	Δ/24	π <sub>☉</sub>	r		
h	min	s	s	h min	min	'	'		
00	- 0 48.7	-.5	15.8	T <sub>m</sub>	20 3	2.0	56.6	15.4	
12	- 0 55.1	T <sub>m☉</sub>	12 h .9 min	Starost	10.1 d	Faza	☉		
PLANETE									
Pl.	T <sub>m</sub>	π	360-α	Vel.	Pl.	T <sub>m</sub>	π	360-α	Vel.
♀	h min	'	°		♃	h min	'	°	
♁	13 31	.1	252	-3.8	♃	18 51	.0	171	-2.0
♂	6 34	.1	356	.1	♄	14 10	.0	242	.3



UT	SUNCE				PROLEĆ. TAČKA S <sub>γ</sub>	VENERA			MARS					
	S <sub>☉</sub>		δ <sub>☉</sub>			S <sub>♀</sub>	δ <sub>♀</sub>		S <sub>♂</sub>	δ <sub>♂</sub>				
h	°	'	°	'	°	'	°	'	°	'	°	'		
0	179	44.6	23	24.2	266	19.8	157	8.3	23	38.0	261	38.7 - 0 33.3		
2	209	44.3	23	24.3	296	24.7	187	6.6	23	37.3	291	40.5 - 0 32.0		
4	239	44.0	23	24.4	326	29.7	217	4.9	23	36.7	321	42.2 - 0 30.7		
6	269	43.7	23	24.5	356	34.6	247	3.2	23	36.0	351	44.0 - 0 29.4		
8	299	43.5	23	24.7	26	39.5	277	1.5	23	35.3	21	45.7 - 0 28.1		
10	329	43.2	23	24.8	56	44.4	306	59.9	23	34.6	51	47.5 - 0 26.8		
12	359	42.9	23	24.8	86	49.4	336	58.2	23	33.9	81	49.2 - 0 25.5		
14	29	42.7	23	24.9	116	54.3	6	56.5	23	33.2	111	51.0 - 0 24.2		
16	59	42.4	23	25.0	146	59.2	36	54.8	23	32.5	141	52.7 - 0 22.9		
18	89	42.1	23	25.1	177	4.2	66	53.2	23	31.8	171	54.5 - 0 21.6		
20	119	41.9	23	25.2	207	9.1	96	51.5	23	31.0	201	56.2 - 0 20.3		
22	149	41.6	23	25.3	237	14.0	126	49.8	23	30.3	231	58.0 - 0 19.0		
Δ		-1		0				-8		-4		9		7

φ	SUNCE		TRAJANJE SUMRAKA		MESEC			
	IZLAZ	ZALAZ	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 35	21 27	1 46	:::	16 50	4.5	0 37	.0
55	3 20	20 42	0 58	:::	16 25	3.9	0 54	.5
50	3 50	20 12	0 45	:::	16 6	3.5	1 7	.8
45	4 13	19 50	0 37	2 33	15 51	3.3	1 18	1.0
40	4 31	19 32	0 33	2 3	15 39	3.1	1 27	1.2
35	4 46	19 16	0 30	1 47	15 29	2.9	1 35	1.3
30	4 59	19 3	0 27	1 37	15 20	2.8	1 42	1.5
20	5 21	18 41	0 25	1 24	15 5	2.6	1 54	1.7
10	5 40	18 22	0 23	1 18	14 52	2.4	2 4	1.9
0	5 57	18 5	0 23	1 15	14 40	2.2	2 14	2.1
10	6 15	17 47	0 23	1 15	14 27	2.0	2 24	2.3
20	6 33	17 29	0 24	1 19	14 15	1.8	2 35	2.5
30	6 55	17 8	0 26	1 26	13 60	1.6	2 47	2.7
35	7 7	16 55	0 28	1 31	13 51	1.5	2 54	2.8
40	7 21	16 41	0 31	1 38	13 42	1.3	3 3	3.0
45	7 38	16 24	0 34	1 47	13 31	1.1	3 12	3.2
50	7 59	16 3	0 39	1 60	13 17	.9	3 24	3.4
55	8 26	15 36	0 46	2 18	13 1	.6	3 39	3.8
60	9 5	14 57	0 58	2 46	12 39	.1	3 58	4.3

UT	MESEC				JUPITER		SATURN						
	S <sub>♃</sub>	Δ	δ <sub>♃</sub>	Δ	S <sub>♃</sub>	δ <sub>♃</sub>	S <sub>♄</sub>	δ <sub>♄</sub>					
h	°	'	°	'	°	'	°	'					
0	57	23.0	124	-12	52.7	-142	77	22.2 - 2 22.9					
2	86	25.9	122	-13	21.2	-141	107	26.9 - 2 23.0					
4	115	28.4	120	-13	49.5	-141	137	31.7 - 2 23.1					
6	144	30.4	118	-14	17.6	-140	167	36.5 - 2 23.1					
8	173	32.0	116	-14	45.5	-139	197	41.2 - 2 23.2					
10	202	33.2	113	-15	13.2	-137	227	46.0 - 2 23.3					
12	231	33.9	111	-15	40.7	-136	257	50.7 - 2 23.4					
14	260	34.1	109	-16	7.9	-135	287	55.5 - 2 23.5					
16	289	33.8	106	-16	34.9	-134	318	.2 - 2 23.6					
18	318	33.1	104	-17	1.6	-132	348	5.0 - 2 23.7					
20	347	31.8	101	-17	28.1	-131	378	9.8 - 2 23.8					
22	16	30.1	99	-17	54.2	-129	48	14.5 - 2 23.9					
Δ							24		0		22		-1

SUNCE				MESEC					
UT	e = T <sub>p</sub> - UT	Δ/24	r	Prolaz	Δ/24	π <sub>☉</sub>	r		
h	min	s	s	h min	min	'	'		
00	- 1	1.6	- .5	15.8	T <sub>m</sub>	20 52	2.2	57.5	15.7
12	- 1	8.1	T <sub>m☉</sub>	12 h 1.1 min	Starost	11.1 d	Faza	☉	

PLANETE									
Pl.	T <sub>m</sub>	π	360-α	Vel.	Pl.	T <sub>m</sub>	π	360-α	Vel.
h min	'	°	°	°	h min	'	°	°	°
♀	13 32	.1	251	-3.8	♃	18 48	.0	171	-2.0
♂	6 33	.1	355	.1	♄	14 7	.0	241	.3

UT	SUNCE				PROLEĆ. TAČKA S <sub>γ</sub>	VENERA			MARS					
	S <sub>☉</sub>		δ <sub>☉</sub>			S <sub>♀</sub>	δ <sub>♀</sub>		S <sub>♂</sub>	δ <sub>♂</sub>				
h	°	'	°	'	°	'	°	'	°	'	°	'		
0	179	41.3	23	25.4	267	18.9	156	48.2	23	29.6	261	59.7 - 0 17.7		
2	209	41.0	23	25.4	297	23.9	186	46.5	23	28.9	292	1.5 - 0 16.4		
4	239	40.8	23	25.5	327	28.8	216	44.9	23	28.1	322	3.2 - 0 15.1		
6	269	40.5	23	25.6	357	33.7	246	43.2	23	27.4	352	5.0 - 0 13.8		
8	299	40.2	23	25.7	27	38.7	276	41.5	23	26.6	22	6.7 - 0 12.5		
10	329	40.0	23	25.7	57	43.6	306	39.9	23	25.9	52	8.5 - 0 11.2		
12	359	39.7	23	25.8	87	48.5	336	38.2	23	25.1	82	10.3 - 0 9.9		
14	29	39.4	23	25.8	117	53.4	6	36.6	23	24.4	112	12.0 - 0 8.6		
16	59	39.1	23	25.9	147	58.4	36	34.9	23	23.6	142	13.8 - 0 7.4		
18	89	38.9	23	26.0	178	3.3	66	33.3	23	22.8	172	15.5 - 0 6.1		
20	119	38.6	23	26.0	208	8.2	96	31.6	23	22.1	202	17.3 - 0 4.8		
22	149	38.3	23	26.1	238	13.2	126	30.0	23	21.3	232	19.0 - 0 3.5		
Δ		-1		0				-8		-4		9		6

φ	SUNCE		TRAJANJE SUMRAKA		MESEC			
	IZLAZ	ZALAZ	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 35	21 27	1 47	:::	18 38	4.8	0 37	.1
55	3 20	20 43	0 58	:::	17 59	4.0	1 5	.7
50	3 50	20 12	0 45	:::	17 31	3.6	1 26	1.0
45	4 13	19 50	0 37	2 33	17 10	3.4	1 42	1.3
40	4 31	19 32	0 33	2 3	16 54	3.2	1 55	1.5
35	4 46	19 17	0 30	1 47	16 40	3.1	2 7	1.6
30	4 59	19 4	0 27	1 37	16 27	2.9	2 17	1.7
20	5 21	18 42	0 25	1 24	16 7	2.8	2 34	2.0
10	5 40	18 23	0 23	1 18	15 49	2.6	2 50	2.1
0	5 58	18 5	0 23	1 15	15 32	2.4	3 4	2.3
10	6 15	17 48	0 23	1 15	15 16	2.3	3 18	2.5
20	6 34	17 29	0 24	1 19	14 58	2.1	3 34	2.7
30	6 55	17 8	0 26	1 26	14 38	1.9	3 52	2.9
35	7 7	16 55	0 28	1 31	14 27	1.8	4 2	3.0
40	7 22	16 41	0 31	1 38	14 13	1.7	4 14	3.2
45	7 38	16 24	0 34	1 47	13 58	1.5	4 29	3.3
50	7 59	16 4	0 39	1 60	13 39	1.3	4 46	3.6
55	8 26	15 36	0 46	2 18	13 14	.9	5 9	4.0
60	9 5	14 58	0 58	2 46	12 41	.3	5 41	4.6

UT	MESEC				JUPITER		SATURN						
	S <sub>♃</sub>	Δ	δ <sub>♃</sub>	Δ	S <sub>♃</sub>	δ <sub>♃</sub>	S <sub>♄</sub>	δ <sub>♄</sub>					
h	°	'	°	'	°	'	°	'					
0	45	27.8	96	-18	20.1	-128	78	19.3 - 2 24.0					
2	74	25.1	93	-18	45.6	-126	108	24.0 - 2 24.1					
4	103	21.7	91	-19	10.7	-124	138	28.8 - 2 24.2					
6	132	17.9	88	-19	35.6	-122	168	33.5 - 2 24.3					
8	161	13.5	85	-20	.0	-120	198	38.3 - 2 24.4					
10	190	8.6	83	-20	24.0	-118	228	43.0 - 2 24.5					
12	219	3.1	80	-20	47.7	-116	258	47.7 - 2 24.6					
14	247	57.1	77	-21	10.9	-114	288	52.5 - 2 24.7					
16	276	50.5	74	-21	33.7	-112	318	57.2 - 2 24.8					
18	305	43.3	71	-21	56.0	-109	349	2.0 - 2 24.9					
20	334	35.6	69	-22	17.9	-107	19	6.7 - 2 25.0					
22	3	27.3	66	-22	39.3	-104	49	11.4 - 2 25.1					
Δ							24		-1		22		-1

SUNCE				MESEC					
UT	e = T <sub>p</sub> - UT	Δ/24	r	Prolaz	Δ/24	π <sub>☉</sub>	r		
h	min	s	s	h min	min	'	'		
00	- 1	14.6	- .5	15.8	T <sub>m</sub>	21 46	2.5	58.4	15.9
12	- 1	21.1	T <sub>m☉</sub>	12 h 1.4 min	Starost	12.1 d	Faza	☉	

PLANETE									
Pl.	T <sub>m</sub>	π	360-α	Vel.	Pl.	T <sub>m</sub>	π	360-α	Vel.
h min	'	°	°	°	h min	'	°	°	°
♀	13 34	.1	249	-3.8	♃	18 44	.0	171	-1.9
♂	6 32	.1	355	.1	♄	14 3	.0	241	.3

UT	SUNCE		PROLEĆ. TAČKA S <sub>γ</sub>	VENERA		MARS	
	S <sub>☉</sub>	δ <sub>☉</sub>		S <sub>♀</sub>	δ <sub>♀</sub>	S <sub>♂</sub>	δ <sub>♂</sub>
h	° / ' / "	° / ' / "	° / ' / "	° / ' / "	° / ' / "	° / ' / "	° / ' / "
0	179 38.1	23 26.1	268 18.1	156 28.3	23 20.5	262 20.8	- 0 2.2
2	209 37.8	23 26.1	298 23.0	186 26.7	23 19.7	292 22.6	- 0 . 9
4	239 37.5	23 26.2	328 27.9	216 25.0	23 18.9	322 24.3	0 . 4
6	269 37.3	23 26.2	358 32.9	246 23.4	23 18.1	352 26.1	0 1.7
8	299 37.0	23 26.3	28 37.8	276 21.7	23 17.3	22 27.8	0 3.0
10	329 36.7	23 26.3	58 42.7	306 20.1	23 16.5	52 29.6	0 4.3
12	359 36.4	23 26.3	88 47.7	336 18.5	23 15.7	82 31.4	0 5.6
14	29 36.2	23 26.3	118 52.6	6 16.8	23 14.9	112 33.1	0 6.9
16	59 35.9	23 26.4	148 57.5	36 15.2	23 14.1	142 34.9	0 8.2
18	89 35.6	23 26.4	179 2.4	66 13.6	23 13.2	172 36.7	0 9.5
20	119 35.4	23 26.4	209 7.4	96 11.9	23 12.4	202 38.4	0 10.8
22	149 35.1	23 26.4	239 12.3	126 10.3	23 11.6	232 40.2	0 12.1
Δ	-1	0		-8	-4	9	6

UT	MESEC				JUPITER		SATURN	
	S <sub>♃</sub>	Δ	δ <sub>♃</sub>	Δ	S <sub>♃</sub>	δ <sub>♃</sub>	S <sub>♄</sub>	δ <sub>♄</sub>
h	° / ' / "	° / ' / "	° / ' / "	° / ' / "	° / ' / "	° / ' / "	° / ' / "	° / ' / "
0	32 18.5	63 -23	.1 -102	79 16.2	- 2 25.3	149 32.7	21 3.2	
2	61 9.1	60 -23	20.5 -99	109 20.9	- 2 25.4	179 37.0	21 3.1	
4	89 59.1	57 -23	40.3 -96	139 25.7	- 2 25.5	209 41.3	21 3.0	
6	118 48.6	55 -23	59.5 -93	169 30.4	- 2 25.6	239 45.6	21 2.9	
8	147 37.5	52 -24	18.2 -90	199 35.1	- 2 25.7	269 49.9	21 2.8	
10	176 25.9	49 -24	36.2 -87	229 39.9	- 2 25.8	299 54.2	21 2.7	
12	205 13.7	47 -24	53.7 -84	259 44.6	- 2 25.9	329 58.5	21 2.6	
14	234 1.1	44 -25	10.5 -81	289 49.3	- 2 26.0	0 2.8	21 2.4	
16	262 47.9	41 -25	26.7 -78	319 54.1	- 2 26.1	30 7.1	21 2.3	
18	291 34.1	39 -25	42.2 -74	349 58.8	- 2 26.2	60 11.4	21 2.2	
20	320 19.9	36 -25	57.1 -71	20 3.5	- 2 26.3	90 15.7	21 2.1	
22	349 5.2	34 -26	11.2 -67	50 8.2	- 2 26.4	120 20.0	21 2.0	
Δ				24	-1	21	-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	2 36	21 28	1 47	:::	20 33	4.4	0 41	.4
55	3 20	20 43	0 58	:::	19 35	3.7	1 22	1.1
50	3 50	20 13	0 45	:::	18 58	3.4	1 50	1.5
45	4 13	19 50	0 37	2 33	18 32	3.2	2 13	1.7
40	4 31	19 32	0 33	2 3	18 10	3.1	2 30	1.9
35	4 46	19 17	0 30	1 47	17 53	3.0	2 46	2.0
30	4 59	19 4	0 27	1 37	17 38	3.0	2 59	2.1
20	5 21	18 42	0 25	1 24	17 13	2.9	3 21	2.3
10	5 40	18 23	0 23	1 18	16 51	2.8	3 41	2.4
0	5 58	18 5	0 23	1 15	16 31	2.7	3 59	2.6
10	6 15	17 48	0 23	1 15	16 11	2.6	4 18	2.7
20	6 34	17 29	0 24	1 19	15 49	2.5	4 38	2.8
30	6 55	17 8	0 26	1 26	15 25	2.3	5 1	3.0
35	7 8	16 56	0 28	1 31	15 10	2.3	5 14	3.1
40	7 22	16 41	0 31	1 38	14 54	2.2	5 30	3.2
45	7 39	16 25	0 34	1 47	14 34	2.0	5 49	3.3
50	7 59	16 4	0 39	1 60	14 9	1.8	6 12	3.5
55	8 27	15 37	0 46	2 18	13 36	1.5	6 44	3.9
60	9 5	14 58	0 58	2 46	12 48	.8	7 31	4.6

SUNCE				MESEC			
UT	e = T <sub>p</sub> - UT	Δ/24	r	Prolaz	Δ/24	π <sub>♃</sub>	r
h	min s	s / ' / "	h min	h min	min / ' / "	h min	min / ' / "
00	- 1 27.6	-.5 15.8	T <sub>m</sub>	22 46	2.7	59.3	16.2
12	- 1 34.1	T <sub>m☉</sub> 12 h 1.6 min	Starost 13.1 d	Faza ☉			

PLANETE									
Pl.	T <sub>m</sub>	π	360-α	Vel.	Pl.	T <sub>m</sub>	π	360-α	Vel.
	h min / ' / "	°	°	°		h min / ' / "	°	°	°
♀	13 35	.1	248	-3.8	♃	18 40	.0	171	-1.9
♂	6 30	.1	354	.1	♄	13 60	.0	241	.3

UT	SUNCE		PROLEĆ. TAČKA S <sub>γ</sub>	VENERA		MARS	
	S <sub>☉</sub>	δ <sub>☉</sub>		S <sub>♀</sub>	δ <sub>♀</sub>	S <sub>♂</sub>	δ <sub>♂</sub>
h	° / ' / "	° / ' / "	° / ' / "	° / ' / "	° / ' / "	° / ' / "	° / ' / "
0	179 34.8	23 26.4	269 17.2	156 8.7	23 10.7	262 42.0	0 13.3
2	209 34.5	23 26.4	299 22.2	186 7.0	23 9.9	292 43.7	0 14.6
4	239 34.3	23 26.4	329 27.1	216 5.4	23 9.0	322 45.5	0 15.9
6	269 34.0	23 26.4	359 32.0	246 3.8	23 8.2	352 47.3	0 17.2
8	299 33.7	23 26.4	29 36.9	276 2.2	23 7.3	22 49.0	0 18.5
10	329 33.5	23 26.4	59 41.9	306 .5	23 6.5	52 50.8	0 19.8
12	359 33.2	23 26.4	89 46.8	335 58.9	23 5.6	82 52.6	0 21.1
14	29 32.9	23 26.4	119 51.7	5 57.3	23 4.7	112 54.3	0 22.4
16	59 32.7	23 26.4	149 56.6	35 55.7	23 3.8	142 56.1	0 23.7
18	89 32.4	23 26.4	180 1.6	65 54.1	23 3.0	172 57.9	0 25.0
20	119 32.1	23 26.4	210 6.5	95 52.5	23 2.1	202 59.7	0 26.2
22	149 31.8	23 26.4	240 11.4	125 50.9	23 1.2	233 1.4	0 27.5
Δ	-1	0		-8	-4	9	6

UT	MESEC				JUPITER		SATURN	
	S <sub>♃</sub>	Δ	δ <sub>♃</sub>	Δ	S <sub>♃</sub>	δ <sub>♃</sub>	S <sub>♄</sub>	δ <sub>♄</sub>
h	° / ' / "	° / ' / "	° / ' / "	° / ' / "	° / ' / "	° / ' / "	° / ' / "	° / ' / "
0	17 50.0	32 -26	24.7 -64	80 13.0	- 2 26.5	150 24.3	21 1.9	
2	46 34.4	30 -26	37.4 -60	110 17.7	- 2 26.7	180 28.5	21 1.8	
4	75 18.3	27 -26	49.4 -56	140 22.4	- 2 26.8	210 32.8	21 1.7	
6	104 1.8	25 -27	.6 -52	170 27.1	- 2 26.9	240 37.1	21 1.6	
8	132 44.8	23 -27	11.1 -48	200 31.8	- 2 27.0	270 41.4	21 1.5	
10	161 27.5	22 -27	20.8 -44	230 36.6	- 2 27.1	300 45.7	21 1.4	
12	190 9.9	20 -27	29.7 -40	260 41.3	- 2 27.2	330 50.0	21 1.2	
14	218 51.8	18 -27	37.7 -36	290 46.0	- 2 27.3	0 54.3	21 1.1	
16	247 33.5	17 -27	45.0 -32	320 50.7	- 2 27.4	30 58.6	21 1.0	
18	276 14.9	15 -27	51.5 -28	350 55.4	- 2 27.6	61 2.9	21 .9	
20	304 56.0	14 -27	57.1 -24	21 .1	- 2 27.7	91 7.2	21 .8	
22	333 36.8	13 -28	1.8 -20	51 4.9	- 2 27.8	121 11.5	21 .7	
Δ				24	-1	21	-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	2 36	21 28	1 47	:::	22 19	2.5	0 50	1.2
55	3 20	20 43	0 58	:::	21 3	2.7	1 49	2.0
50	3 51	20 13	0 45	:::	20 20	2.8	2 26	2.2
45	4 13	19 50	0 37	2 33	19 49	2.8	2 54	2.3
40	4 31	19 32	0 33	2 3	19 25	2.8	3 16	2.4
35	4 46	19 17	0 30	1 47	19 6	2.8	3 34	2.5
30	4 59	19 4	0 27	1 37	18 49	2.8	3 50	2.5
20	5 21	18 42	0 25	1 24	18 21	2.8	4 16	2.6
10	5 40	18 23	0 23	1 18	17 57	2.8	4 39	2.7
0	5 58	18 5	0 23	1 15	17 35	2.8	5 1	2.7
10	6 16	17 48	0 23	1 15	17 12	2.8	5 22	2.8
20	6 34	17 29	0 24	1 19	16 48	2.8	5 45	2.8
30	6 55	17 8	0 26	1 26	16 21	2.7	6 12	2.9
35	7 8	16 56	0 28	1 31	16 4	2.7	6 28	2.9
40	7 22	16 42	0 31	1 38	15 45	2.7	6 46	3.0
45	7 39	16 25	0 34	1 47	15 23	2.7	7 9	3.0
50	7 60	16 4	0 39	1 60	14 53	2.6	7 37	3.1
55	8 27	15 37	0 46	2 18	14 13	2.5	8 17	3.2
60	9 6	14 58	0 58	2 46	13 7	2.2	9 23	3.6

SUNCE				MESEC			
UT	e = T <sub>p</sub> - UT	Δ/24	r	Prolaz	Δ/24	π <sub>♃</sub>	r
h	min s	s / ' / "	h min	h min	min / ' / "	h min	min / ' / "
00	- 1 40.6	-.5 15.8	T <sub>m</sub>	23 50	2.8	60.1	16.4
12	- 1 47.0	T <sub>m☉</sub> 12 h 1.8 min	Starost 14.1 d	Faza ☉			

PLANETE									
Pl.	T <sub>m</sub>	π	360-α	Vel.	Pl.	T <sub>m</sub>	π	360-α	Vel.
	h min / ' / "	°	°	°		h min / ' / "	°	°	°
♀	13 36	.1	247	-3.8	♃	18 36	.0	171	-1.9
♂	6 29	.1	353	.1	♄	13 56	.0	241	.3

UT	SUNCE		PROLEĆ. TAČKA S <sub>γ</sub>	VENERA		MARS	
	S <sub>☉</sub>	δ <sub>☉</sub>		S <sub>♀</sub>	δ <sub>♀</sub>	S <sub>♂</sub>	δ <sub>♂</sub>
h	° / ' / "	° / ' / "	° / ' / "	° / ' / "	° / ' / "	° / ' / "	° / ' / "
0	179 31.6	23 26.3	270 16.4	155 49.2	23 .3	263 3.2	0 28.8
2	209 31.3	23 26.3	300 21.3	185 47.6	22 59.4	293 5.0	0 30.1
4	239 31.0	23 26.3	330 26.2	215 46.0	22 58.5	323 6.8	0 31.4
6	269 30.8	23 26.2	0 31.1	245 44.4	22 57.6	353 8.5	0 32.7
8	299 30.5	23 26.2	30 36.1	275 42.8	22 56.7	23 10.3	0 34.0
10	329 30.2	23 26.2	60 41.0	305 41.2	22 55.7	53 12.1	0 35.2
12	359 30.0	23 26.1	90 45.9	335 39.6	22 54.8	83 13.9	0 36.5
14	29 29.7	23 26.1	120 50.9	5 38.0	22 53.9	113 15.6	0 37.8
16	59 29.4	23 26.0	150 55.8	35 36.4	22 53.0	143 17.4	0 39.1
18	89 29.2	23 26.0	181 .7	65 34.8	22 52.0	173 19.2	0 40.4
20	119 28.9	23 25.9	211 5.6	95 33.2	22 51.1	203 21.0	0 41.7
22	149 28.6	23 25.9	241 10.6	125 31.6	22 50.1	233 22.7	0 42.9
Δ	-1	0		-8	-5	9	6

UT	MESEC				JUPITER		SATURN	
	S <sub>♃</sub>	Δ	δ <sub>♃</sub>	Δ	S <sub>♃</sub>	δ <sub>♃</sub>	S <sub>♄</sub>	δ <sub>♄</sub>
h	° / ' / "	° / ' / "	° / ' / "	° / ' / "	° / ' / "	° / ' / "	° / ' / "	° / ' / "
0	2 17.4	12 -28	5.7	-15	81 9.6	-2 27.9	151 15.8	21 .6
2	30 57.9	11 -28	8.8	-11	111 14.3	-2 28.0	181 20.1	21 .5
4	59 38.1	11 -28	11.0	-7	141 19.0	-2 28.1	211 24.4	21 .4
6	88 18.2	10 -28	12.3	-2	171 23.7	-2 28.3	241 28.7	21 .3
8	116 58.3	10 -28	12.8	2	201 28.4	-2 28.4	271 33.0	21 .1
10	145 38.2	9 -28	12.3	6	231 33.1	-2 28.5	301 37.3	21 .0
12	174 18.1	9 -28	11.0	11	261 37.8	-2 28.6	331 41.5	20 59.9
14	202 58.0	9 -28	8.9	15	291 42.5	-2 28.7	1 45.8	20 59.8
16	231 37.9	10 -28	5.8	20	321 47.2	-2 28.8	31 50.1	20 59.7
18	260 17.8	10 -28	1.9	24	351 51.9	-2 29.0	61 54.4	20 59.6
20	288 57.8	10 -27	57.0	28	21 56.6	-2 29.1	91 58.7	20 59.5
22	317 37.9	11 -27	51.3	33	52 1.3	-2 29.2	122 3.0	20 59.4
Δ					24	-1	21	-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	2 36	21 28	1 46	:::	23 20	.8	1 19	3.4
55	3 21	20 43	0 58	:::	22 8	1.7	2 36	3.1
50	3 51	20 13	0 45	:::	21 26	2.0	3 19	3.0
45	4 13	19 51	0 37	2 33	20 56	2.2	3 50	3.0
40	4 31	19 32	0 33	2 3	20 32	2.3	4 14	3.0
35	4 47	19 17	0 30	1 47	20 13	2.4	4 34	2.9
30	4 60	19 4	0 27	1 37	19 56	2.5	4 51	2.9
20	5 22	18 42	0 25	1 24	19 28	2.6	5 19	2.9
10	5 41	18 23	0 23	1 18	19 4	2.7	5 44	2.8
0	5 58	18 6	0 23	1 15	18 41	2.7	6 6	2.8
10	6 16	17 48	0 23	1 15	18 19	2.8	6 29	2.7
20	6 34	17 30	0 24	1 19	17 55	2.9	6 53	2.7
30	6 56	17 8	0 26	1 26	17 27	3.0	7 22	2.6
35	7 8	16 56	0 28	1 31	17 10	3.1	7 38	2.6
40	7 22	16 42	0 31	1 38	16 51	3.2	7 58	2.5
45	7 39	16 25	0 34	1 47	16 27	3.2	8 22	2.5
50	7 60	16 4	0 39	1 60	15 57	3.4	8 52	2.4
55	8 27	15 37	0 46	2 18	15 15	3.6	9 34	2.2
60	9 6	14 58	0 58	2 46	14 0	4.2	10 48	1.6
S								

SUNCE				MESEC			
UT	e = T <sub>p</sub> - UT	Δ/24	r	Prolaz	Δ/24	π <sub>☾</sub>	r
h	min s	s / ' / "	h min	h min	min	' / "	' / "
00	- 1 53.5	-.5	15.8	T <sub>m</sub>	1.0	60.6	16.5
12	- 1 60.0	T <sub>m☉</sub> 12 h 2.0 min	Starost 15.1 d	Faza ☉			

PLANETE									
Pl.	T <sub>m</sub>	π	360-α	Vel.	Pl.	T <sub>m</sub>	π	360-α	Vel.
h	h min	' / "	°	°	h min	' / "	°	°	°
♀	13 37	.1	246	-3.8	♃	18 32	.0	171	-1.9
♂	6 27	.1	353	.1	♄	13 53	.0	241	.3

UT	SUNCE		PROLEĆ. TAČKA S <sub>γ</sub>	VENERA		MARS	
	S <sub>☉</sub>	δ <sub>☉</sub>		S <sub>♀</sub>	δ <sub>♀</sub>	S <sub>♂</sub>	δ <sub>♂</sub>
h	° / ' / "	° / ' / "	° / ' / "	° / ' / "	° / ' / "	° / ' / "	° / ' / "
0	179 28.4	23 25.8	271 15.5	155 30.1	22 49.2	263 24.5	0 44.2
2	209 28.1	23 25.8	301 20.4	185 28.5	22 48.2	293 26.3	0 45.5
4	239 27.8	23 25.7	331 25.4	215 26.9	22 47.3	323 28.1	0 46.8
6	269 27.5	23 25.6	1 30.3	245 25.3	22 46.3	353 29.9	0 48.1
8	299 27.3	23 25.6	31 35.2	275 23.7	22 45.3	23 31.7	0 49.4
10	329 27.0	23 25.5	61 40.1	305 22.1	22 44.4	53 33.4	0 50.6
12	359 26.7	23 25.4	91 45.1	335 20.6	22 43.4	83 35.2	0 51.9
14	29 26.5	23 25.3	121 50.0	5 19.0	22 42.4	113 37.0	0 53.2
16	59 26.2	23 25.3	151 54.9	35 17.4	22 41.4	143 38.8	0 54.5
18	89 25.9	23 25.2	181 59.9	65 15.8	22 40.4	173 40.6	0 55.8
20	119 25.7	23 25.1	212 4.8	95 14.3	22 39.4	203 42.4	0 57.0
22	149 25.4	23 25.0	242 9.7	125 12.7	22 38.4	233 44.1	0 58.3
Δ	-1	0		-8	-5	9	6

UT	MESEC				JUPITER		SATURN	
	S <sub>♃</sub>	Δ	δ <sub>♃</sub>	Δ	S <sub>♃</sub>	δ <sub>♃</sub>	S <sub>♄</sub>	δ <sub>♄</sub>
h	° / ' / "	° / ' / "	° / ' / "	° / ' / "	° / ' / "	° / ' / "	° / ' / "	° / ' / "
0	346 18.1	12 -27	44.8	37	82 6.0	-2 29.3	152 7.3	20 59.3
2	14 58.4	13 -27	37.4	41	112 10.7	-2 29.4	182 11.6	20 59.1
4	43 39.0	14 -27	29.1	46	142 15.4	-2 29.6	212 15.9	20 59.0
6	72 19.7	15 -27	20.0	50	172 20.1	-2 29.7	242 20.2	20 58.9
8	101 .7	16 -27	10.0	54	202 24.8	-2 29.8	272 24.5	20 58.8
10	129 42.0	18 -26	59.2	58	232 29.5	-2 29.9	302 28.7	20 58.7
12	158 23.5	19 -26	47.6	62	262 34.2	-2 30.1	332 33.0	20 58.6
14	187 5.3	21 -26	35.2	66	292 38.9	-2 30.2	2 37.3	20 58.5
16	215 47.4	22 -26	21.9	70	322 43.6	-2 30.3	32 41.6	20 58.4
18	244 29.9	24 -26	7.9	74	352 48.3	-2 30.4	62 45.9	20 58.3
20	273 12.7	26 -25	53.1	78	22 53.0	-2 30.6	92 50.2	20 58.1
22	301 56.0	28 -25	37.6	82	52 57.7	-2 30.7	122 54.5	20 58.0
Δ					23	-1	21	-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	2 36	21 28	1 46	:::	23 40	.3	2 39	4.9
55	3 21	20 43	0 58	:::	22 48	1.0	3 51	4.0
50	3 51	20 13	0 45	:::	22 13	1.4	4 32	3.6
45	4 14	19 51	0 37	2 33	21 48	1.6	5 2	3.4
40	4 32	19 33	0 33	2 3	21 27	1.8	5 25	3.3
35	4 47	19 18	0 30	1 47	21 10	1.9	5 44	3.2
30	4 60	19 5	0 27	1 37	20 55	2.1	6 0	3.1
20	5 22	18 42	0 25	1 24	20 30	2.3	6 28	2.9
10	5 41	18 23	0 23	1 18	20 8	2.4	6 51	2.8
0	5 59	18 6	0 23	1 15	19 47	2.6	7 13	2.7
10	6 16	17 48	0 23	1 15	19 27	2.7	7 35	2.6
20	6 35	17 30	0 24	1 19	19 5	2.9	7 58	2.4
30	6 56	17 9	0 26	1 26	18 39	3.1	8 25	2.3
35	7 8	16 56	0 28	1 31	18 24	3.2	8 41	2.2
40	7 22	16 42	0 31	1 38	18 6	3.3	8 59	2.0
45	7 39	16 25	0 34	1 47	17 45	3.5	9 21	1.9
50	7 60	16 4	0 39	1 60	17 18	3.8	9 49	1.7
55	8 27	15 37	0 46	2 18	16 41	4.1	10 27	1.3
60	9 6	14 58	0 58	2 46	15 42	4.9	11 27	.6
S								

SUNCE				MESEC				
UT	e = T <sub>p</sub> - UT	Δ/24	r	Prolaz	Δ/24	π <sub>☾</sub>	r	
h	min s	s / ' / "	h min	h min	min	' / "	' / "	
00	- 2 6.4	-.5	15.8	T <sub>m</sub>	0 57	2.8	60.9	16.6
12	- 2 12.8	T <sub>m☉</sub> 12 h 2.2 min	Starost 16.1 d	Faza ☉				

PLANETE									
Pl.	T <sub>m</sub>	π	360-α	Vel.	Pl.	T <sub>m</sub>	π	360-α	Vel.
h	h min	' / "	°	°	h min	' / "	°	°	°
♀	13 39	.1	244	-3.8	♃	18 29	.0	171	-1.9
♂	6 26	.1	352	.0	♄	13 50	.0	241	.3

UT	SUNCE		PROLEĆ. TAČKA S <sub>γ</sub>	VENERA		MARS	
	S <sub>☉</sub>	δ <sub>☉</sub>		S <sub>♀</sub>	δ <sub>♀</sub>	S <sub>♂</sub>	δ <sub>♂</sub>
h	° / ' / "	° / ' / "	° / ' / "	° / ' / "	° / ' / "	° / ' / "	° / ' / "
0	179 25.1	23 24.9	272 14.6	155 11.1	22 37.4	263 45.9	0 59.6
2	209 24.9	23 24.8	302 19.6	185 9.6	22 36.4	293 47.7	1 9
4	239 24.6	23 24.7	332 24.5	215 8.0	22 35.4	323 49.5	1 2.1
6	269 24.3	23 24.6	2 29.4	245 6.4	22 34.4	353 51.3	1 3.4
8	299 24.1	23 24.5	32 34.4	275 4.9	22 33.4	23 53.1	1 4.7
10	329 23.8	23 24.4	62 39.3	305 3.3	22 32.3	53 54.9	1 6.0
12	359 23.5	23 24.3	92 44.2	335 1.7	22 31.3	83 56.7	1 7.2
14	29 23.3	23 24.2	122 49.1	5 .2	22 30.3	113 58.5	1 8.5
16	59 23.0	23 24.1	152 54.1	34 58.6	22 29.2	144 .2	1 9.8
18	89 22.8	23 24.0	182 59.0	64 57.1	22 28.2	174 2.0	1 11.1
20	119 22.5	23 23.8	213 3.9	94 55.5	22 27.2	204 3.8	1 12.3
22	149 22.2	23 23.7	243 8.9	124 54.0	22 26.1	234 5.6	1 13.6
Δ	-1	-1		-8	-5	9	6

φ	SUNCE		TRAJANJE SUMRAKA		MESEC			
	IZLAZ	ZALAZ	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	:::	23 46	.1	4 36	5.0
55	3 21	20 43	0 58	:::	23 11	.6	5 27	4.2
50	3 51	20 13	0 45	:::	22 46	1.0	5 60	3.8
45	4 14	19 51	0 37	2 33	22 26	1.2	6 24	3.6
40	4 32	19 33	0 33	2 3	22 10	1.4	6 44	3.4
35	4 47	19 18	0 30	1 47	21 57	1.6	7 0	3.2
30	5 0	19 5	0 27	1 37	21 45	1.7	7 14	3.1
20	5 22	18 43	0 25	1 24	21 24	2.0	7 38	2.8
10	5 41	18 24	0 23	1 18	21 6	2.2	7 58	2.7
0	5 59	18 6	0 23	1 15	20 49	2.4	8 17	2.5
10	6 16	17 49	0 23	1 15	20 32	2.5	8 36	2.3
20	6 35	17 30	0 24	1 19	20 14	2.8	8 56	2.1
30	6 56	17 9	0 26	1 26	19 53	3.0	9 19	1.9
35	7 8	16 57	0 28	1 31	19 41	3.1	9 33	1.8
40	7 23	16 42	0 31	1 38	19 26	3.3	9 48	1.6
45	7 39	16 26	0 34	1 47	19 9	3.5	10 6	1.4
50	8 0	16 5	0 39	1 60	18 48	3.8	10 29	1.2
55	8 27	15 38	0 46	2 18	18 20	4.2	10 58	.8
60	9 6	14 59	0 58	2 46	17 40	4.8	11 40	.2
S								

UT	MESEC				JUPITER		SATURN	
	S <sub>♃</sub>	Δ	δ <sub>♃</sub>	Δ	S <sub>♃</sub>	δ <sub>♃</sub>	S <sub>♄</sub>	δ <sub>♄</sub>
h	° / ' / "	° / ' / "	° / ' / "	° / ' / "	° / ' / "	° / ' / "	° / ' / "	° / ' / "
0	330 39.6	30 -25	21.3	85	83 2.3	- 2 30.8	152 58.8	20 57.9
2	359 23.6	32 -25	4.2	89	113 7.0	- 2 30.9	183 3.1	20 57.8
4	28 8.1	35 -24	46.5	92	143 11.7	- 2 31.1	213 7.3	20 57.7
6	56 53.0	37 -24	28.0	96	173 16.4	- 2 31.2	243 11.6	20 57.6
8	85 38.4	39 -24	8.8	99	203 21.1	- 2 31.3	273 15.9	20 57.5
10	114 24.2	42 -23	49.0	102	233 25.8	- 2 31.4	303 20.2	20 57.4
12	143 10.5	44 -23	28.6	105	263 30.4	- 2 31.6	333 24.5	20 57.2
14	171 57.3	46 -23	7.5	109	293 35.1	- 2 31.7	3 28.8	20 57.1
16	200 44.6	49 -22	45.7	112	323 39.8	- 2 31.8	33 33.1	20 57.0
18	229 32.3	51 -22	23.4	115	353 44.5	- 2 32.0	63 37.4	20 56.9
20	258 20.6	54 -22	.5	117	23 49.2	- 2 32.1	93 41.6	20 56.8
22	287 9.4	56 -21	37.0	120	53 53.8	- 2 32.2	123 45.9	20 56.7
Δ					23	-1	21	-1

SUNCE				MESEC			
UT	e = T <sub>p</sub> - UT	Δ/24	r	Prolaz	Δ/24	π <sub>♃</sub>	r
h	min s	s	'	h min	min	'	'
00	- 2 19.3	-.5	15.8	T <sub>m</sub>	2 3	2.5	60.9 16.6
12	- 2 25.6	T <sub>m☉</sub>	12 h 2.4 min	Starost	17.1 d	Faza	☉

PLANETE									
Pl.	T <sub>m</sub>	π	360-α	Vel.	Pl.	T <sub>m</sub>	π	360-α	Vel.
h	min	'	°		h min	'	°		
♀	13 40	.1	243	-3.8	♃	18 25	.0	171	-1.9
♂	6 25	.1	352	.0	♄	13 46	.0	241	.3

UT	SUNCE		PROLEĆ. TAČKA S <sub>γ</sub>	VENERA		MARS	
	S <sub>☉</sub>	δ <sub>☉</sub>		S <sub>♀</sub>	δ <sub>♀</sub>	S <sub>♂</sub>	δ <sub>♂</sub>
h	° / ' / "	° / ' / "	° / ' / "	° / ' / "	° / ' / "	° / ' / "	° / ' / "
0	179 22.0	23 23.6	273 13.8	154 52.4	22 25.0	264 7.4	1 14.9
2	209 21.7	23 23.5	303 18.7	184 50.9	22 24.0	294 9.2	1 16.2
4	239 21.4	23 23.3	333 23.6	214 49.3	22 22.9	324 11.0	1 17.4
6	269 21.2	23 23.2	3 28.6	244 47.8	22 21.8	354 12.8	1 18.7
8	299 20.9	23 23.1	33 33.5	274 46.3	22 20.8	24 14.6	1 20.0
10	329 20.6	23 22.9	63 38.4	304 44.7	22 19.7	54 16.4	1 21.3
12	359 20.4	23 22.8	93 43.3	334 43.2	22 18.6	84 18.2	1 22.5
14	29 20.1	23 22.6	123 48.3	4 41.7	22 17.5	114 20.0	1 23.8
16	59 19.8	23 22.5	153 53.2	34 40.1	22 16.4	144 21.8	1 25.1
18	89 19.6	23 22.3	183 58.1	64 38.6	22 15.3	174 23.6	1 26.3
20	119 19.3	23 22.2	214 3.1	94 37.1	22 14.2	204 25.4	1 27.6
22	149 19.1	23 22.0	244 8.0	124 35.5	22 13.1	234 27.2	1 28.9
Δ	-1	-1		-8	-5	9	6

φ	SUNCE		TRAJANJE SUMRAKA		MESEC			
	IZLAZ	ZALAZ	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	:::	23 48	.0	6 35	4.6
55	3 22	20 43	0 58	:::	23 26	.4	7 8	4.1
50	3 52	20 13	0 45	:::	23 9	.7	7 32	3.7
45	4 14	19 51	0 37	2 33	22 56	1.0	7 50	3.5
40	4 32	19 33	0 33	2 3	22 44	1.2	8 5	3.3
35	4 47	19 18	0 30	1 47	22 35	1.3	8 17	3.1
30	5 0	19 5	0 27	1 37	22 26	1.5	8 28	2.9
20	5 22	18 43	0 25	1 24	22 11	1.7	8 46	2.7
10	5 41	18 24	0 23	1 18	21 58	1.9	9 2	2.5
0	5 59	18 6	0 23	1 15	21 46	2.2	9 17	2.3
10	6 16	17 49	0 23	1 15	21 34	2.4	9 31	2.1
20	6 35	17 30	0 24	1 19	21 20	2.6	9 47	1.8
30	6 56	17 9	0 26	1 25	21 5	2.8	10 5	1.6
35	7 8	16 57	0 28	1 31	20 56	3.0	10 15	1.5
40	7 23	16 43	0 31	1 38	20 46	3.2	10 26	1.3
45	7 39	16 26	0 34	1 47	20 34	3.4	10 40	1.1
50	8 0	16 5	0 38	1 59	20 19	3.6	10 56	.8
55	8 27	15 38	0 46	2 18	20 0	4.0	11 17	.5
60	9 6	14 59	0 58	2 46	19 35	4.4	11 45	.1
S								

UT	MESEC				JUPITER		SATURN	
	S <sub>♃</sub>	Δ	δ <sub>♃</sub>	Δ	S <sub>♃</sub>	δ <sub>♃</sub>	S <sub>♄</sub>	δ <sub>♄</sub>
h	° / ' / "	° / ' / "	° / ' / "	° / ' / "	° / ' / "	° / ' / "	° / ' / "	° / ' / "
0	315 58.6	59 -21	13.0	123	83 58.5	- 2 32.4	153 50.2	20 56.6
2	344 48.4	61 -20	48.5	125	114 3.2	- 2 32.5	183 54.5	20 56.5
4	13 38.7	64 -20	23.4	128	144 7.8	- 2 32.6	213 58.8	20 56.3
6	42 29.5	67 -19	57.8	130	174 12.5	- 2 32.8	244 3.1	20 56.2
8	71 20.8	69 -19	31.8	132	204 17.2	- 2 32.9	274 7.4	20 56.1
10	100 12.6	72 -19	5.3	135	234 21.9	- 2 33.0	304 11.6	20 56.0
12	129 5.0	74 -18	38.4	137	264 26.5	- 2 33.2	334 15.9	20 55.9
14	157 57.8	77 -18	11.1	139	294 31.2	- 2 33.3	4 20.2	20 55.8
16	186 51.1	79 -17	43.3	141	324 35.9	- 2 33.4	34 24.5	20 55.7
18	215 44.9	81 -17	15.2	142	354 40.5	- 2 33.6	64 28.8	20 55.6
20	244 39.1	84 -16	46.7	144	24 45.2	- 2 33.7	94 33.1	20 55.4
22	273 33.9	86 -16	17.8	146	54 49.8	- 2 33.8	124 37.3	20 55.3
Δ					23	-1	21	-1

SUNCE				MESEC			
UT	e = T <sub>p</sub> - UT	Δ/24	r	Prolaz	Δ/24	π <sub>♃</sub>	r
h	min s	s	'	h min	min	'	'
00	- 2 32.0	-.5	15.8	T <sub>m</sub>	3 3	2.3	60.6 16.5
12	- 2 38.3	T <sub>m☉</sub>	12 h 2.6 min	Starost	18.1 d	Faza	☉

PLANETE									
Pl.	T <sub>m</sub>	π	360-α	Vel.	Pl.	T <sub>m</sub>	π	360-α	Vel.
h	min	'	°		h min	'	°		
♀	13 41	.1	242	-3.8	♃	18 21	.0	171	-1.9
♂	6 23	.1	351	.0	♄	13 43	.0	241	.3

UT	SUNCE				PROLEĆ. TAČKA S <sub>γ</sub>	VENERA				MARS					
	S <sub>☉</sub>		δ <sub>☉</sub>			S <sub>♀</sub>		δ <sub>♀</sub>		S <sub>♂</sub>		δ <sub>♂</sub>			
h	°	'	°	'	°	'	°	'	°	'	°	'			
0	179	18.8	23	21.9	274	12.9	154	34.0	22	12.0	264	29.0	1	30.1	
2	209	18.5	23	21.7	304	17.8	184	32.5	22	10.9	294	30.8	1	31.4	
4	239	18.3	23	21.5	334	22.8	214	31.0	22	9.8	324	32.6	1	32.7	
6	269	18.0	23	21.4	4	27.7	244	29.5	22	8.7	354	34.4	1	33.9	
8	299	17.8	23	21.2	34	32.6	274	27.9	22	7.5	24	36.2	1	35.2	
10	329	17.5	23	21.0	64	37.6	304	26.4	22	6.4	54	38.0	1	36.5	
12	359	17.2	23	20.8	94	42.5	334	24.9	22	5.3	84	39.8	1	37.7	
14	29	17.0	23	20.6	124	47.4	4	23.4	22	4.1	114	41.6	1	39.0	
16	59	16.7	23	20.5	154	52.3	34	21.9	22	3.0	144	43.4	1	40.3	
18	89	16.4	23	20.3	184	57.3	64	20.4	22	1.8	174	45.2	1	41.5	
20	119	16.2	23	20.1	215	2.2	94	18.9	22	.7	204	47.0	1	42.8	
22	149	15.9	23	19.9	245	7.1	124	17.4	21	59.5	234	48.9	1	44.1	
Δ		-1		-1				-8		-6			9		6

φ	SUNCE		TRAJANJE SUMRAKA		MESEC			
	IZLAZ	ZALAZ	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	:::	23 49	.0	8 27	4.3
55	3 22	20 43	0 58	:::	23 36	.3	8 47	3.9
50	3 52	20 13	0 45	:::	23 27	.6	9 1	3.5
45	4 15	19 51	0 37	2 33	23 19	.8	9 13	3.3
40	4 33	19 33	0 33	2 3	23 12	1.0	9 23	3.1
35	4 48	19 18	0 30	1 47	23 7	1.2	9 31	2.9
30	5 1	19 5	0 27	1 36	23 2	1.3	9 38	2.8
20	5 23	18 43	0 25	1 24	22 53	1.6	9 50	2.5
10	5 42	18 24	0 23	1 18	22 45	1.8	10 1	2.3
0	5 59	18 7	0 23	1 15	22 38	2.0	10 11	2.1
10	6 17	17 49	0 23	1 15	22 30	2.2	10 21	1.9
20	6 35	17 31	0 24	1 19	22 22	2.4	10 31	1.6
30	6 56	17 10	0 26	1 25	22 13	2.7	10 43	1.4
35	7 9	16 57	0 28	1 31	22 8	2.8	10 50	1.3
40	7 23	16 43	0 31	1 38	22 2	3.0	10 57	1.1
45	7 39	16 26	0 34	1 47	21 55	3.2	11 6	.9
50	8 0	16 6	0 38	1 59	21 46	3.4	11 17	.7
55	8 27	15 39	0 45	2 18	21 36	3.7	11 30	.4
60	9 6	15 0	0 58	2 46	21 21	4.2	11 47	.0
S								

UT	MESEC				JUPITER				SATURN							
	S <sub>♃</sub>		Δ		δ <sub>♃</sub>		Δ		S <sub>♃</sub>		δ <sub>♃</sub>		S <sub>♄</sub>		δ <sub>♄</sub>	
h	°	'	°	'	°	'	°	'	°	'	°	'	°	'	°	'
0	302	29.1	88	-15	48.7	147	84	54.5	-2	34.0	154	41.6	20	55.2		
2	331	24.8	91	-15	19.2	149	114	59.2	-2	34.1	184	45.9	20	55.1		
4	0	20.9	93	-14	49.4	150	145	3.8	-2	34.2	214	50.2	20	55.0		
6	29	17.5	95	-14	19.3	152	175	8.5	-2	34.4	244	54.5	20	54.9		
8	58	14.5	97	-13	48.9	153	205	13.1	-2	34.5	274	58.8	20	54.8		
10	87	11.9	99	-13	18.3	154	235	17.8	-2	34.7	305	3.0	20	54.6		
12	116	9.7	101	-12	47.5	155	265	22.5	-2	34.8	335	7.3	20	54.5		
14	145	8.0	103	-12	16.4	156	295	27.1	-2	34.9	5	11.6	20	54.4		
16	174	6.6	105	-11	45.2	157	325	31.8	-2	35.1	35	15.9	20	54.3		
18	203	5.7	107	-11	13.7	158	355	36.4	-2	35.2	65	20.2	20	54.2		
20	232	5.1	109	-10	42.1	159	25	41.1	-2	35.4	95	24.5	20	54.1		
22	261	4.9	111	-10	10.3	160	55	45.7	-2	35.5	125	28.7	20	54.0		
Δ								23		-1			21			-1

SUNCE				MESEC				
UT	e = T <sub>p</sub> - UT	Δ/24	r	Prolaz	Δ/24	π <sub>☾</sub>	r	
h	min	s	'	h min	min	'	'	
00	- 2 44.6	-.5	15.8	T <sub>m</sub>	3 59	2.1	60.1	16.4
12	- 2 50.9	T <sub>m☉</sub>	12 h 2.9 min	Starost	19.1 d	Faza	☉	

PLANETE									
Pl.	T <sub>m</sub>	π	360-α	Vel.	Pl.	T <sub>m</sub>	π	360-α	Vel.
♀	h min	'	°		♃	h min	'	°	
♀	13 42	.1	240	-3.8	♃	18 18	.0	171	-1.9
♂	6 22	.1	350	.0	♄	13 39	.0	240	.3

UT	SUNCE				PROLEĆ. TAČKA S <sub>γ</sub>	VENERA				MARS					
	S <sub>☉</sub>		δ <sub>☉</sub>			S <sub>♀</sub>		δ <sub>♀</sub>		S <sub>♂</sub>		δ <sub>♂</sub>			
h	°	'	°	'	°	'	°	'	°	'	°	'			
0	179	15.7	23	19.7	275	12.1	154	15.9	21	58.4	264	50.7	1	45.3	
2	209	15.4	23	19.5	305	17.0	184	14.4	21	57.2	294	52.5	1	46.6	
4	239	15.2	23	19.3	335	21.9	214	12.9	21	56.0	324	54.3	1	47.8	
6	269	14.9	23	19.1	5	26.8	244	11.4	21	54.8	354	56.1	1	49.1	
8	299	14.6	23	18.9	35	31.8	274	9.9	21	53.7	24	57.9	1	50.4	
10	329	14.4	23	18.7	65	36.7	304	8.4	21	52.5	54	59.7	1	51.6	
12	359	14.1	23	18.5	95	41.6	334	6.9	21	51.3	85	1.5	1	52.9	
14	29	13.9	23	18.3	125	46.6	4	5.4	21	50.1	115	3.3	1	54.1	
16	59	13.6	23	18.0	155	51.5	34	3.9	21	48.9	145	5.1	1	55.4	
18	89	13.3	23	17.8	185	56.4	64	2.4	21	47.7	175	7.0	1	56.7	
20	119	13.1	23	17.6	216	1.3	94	1.0	21	46.5	205	8.8	1	57.9	
22	149	12.8	23	17.4	246	6.3	123	59.5	21	45.3	235	10.6	1	59.2	
Δ		-1		-1				-7		-6			9		6

φ	SUNCE		TRAJANJE SUMRAKA		MESEC			
	IZLAZ	ZALAZ	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	:::	23 48	.0	10 10	4.1
55	3 23	20 43	0 58	:::	23 44	.3	10 19	3.7
50	3 53	20 13	0 44	:::	23 41	.6	10 26	3.4
45	4 15	19 51	0 37	2 32	23 39	.8	10 32	3.1
40	4 33	19 33	0 33	2 3	23 37	1.0	10 37	2.9
35	4 48	19 18	0 30	1 47	23 35	1.1	10 41	2.8
30	5 1	19 5	0 27	1 36	23 33	1.3	10 44	2.6
20	5 23	18 43	0 25	1 24	23 30	1.5	10 50	2.4
10	5 42	18 24	0 23	1 18	23 28	1.7	10 56	2.2
0	5 59	18 7	0 23	1 15	23 26	1.9	11 1	1.9
10	6 17	17 49	0 23	1 15	23 23	2.1	11 5	1.7
20	6 35	17 31	0 24	1 19	23 21	2.3	11 11	1.5
30	6 56	17 10	0 26	1 25	23 18	2.6	11 16	1.3
35	7 9	16 58	0 28	1 31	23 16	2.7	11 20	1.1
40	7 23	16 43	0 31	1 38	23 14	2.9	11 23	1.0
45	7 39	16 27	0 34	1 47	23 12	3.1	11 28	.8
50	8 0	16 6	0 38	1 59	23 9	3.3	11 33	.6
55	8 27	15 39	0 45	2 17	23 6	3.6	11 39	.3
60	9 6	15 1	0 57	2 46	23 1	4.0	11 47	.0
S								

UT	MESEC				JUPITER				SATURN							
	S <sub>♃</sub>		Δ		δ <sub>♃</sub>		Δ		S <sub>♃</sub>		δ <sub>♃</sub>		S <sub>♄</sub>		δ <sub>♄</sub>	
h	°	'	°	'	°	'	°	'	°	'	°	'	°	'	°	'
0	290	5.0	112	- 9	38.3	160	85	50.4	-2	35.6	155	33.0	20	53.8		
2	319	5.4	114	- 9	6.3	161	115	55.0	-2	35.8	185	37.3	20	53.7		
4	348	6.2	116	- 8	34.1	161	145	59.7	-2	35.9	215	41.6	20	53.6		
6	17	7.4	117	- 8	1.8	162	176	4.3	-2	36.1	245	45.9	20	53.5		
8	46	8.8	119	- 7	29.4	162	206	8.9	-2	36.2	275	50.1	20	53.4		
10	75	10.5	120	- 6	56.9	163	236	13.6	-2	36.4	305	54.4	20	53.3		
12	104	12.5	121	- 6	24.4	163	266	18.2	-2	36.5	335	58.7	20	53.1		
14	133	14.8	123	- 5	51.8	163	296	22.9	-2	36.7	6	3.0	20	53.0		
16	162	17.3	124	- 5	19.1	163	326	27.5	-2	36.8	36	7.3	20	52.9		
18	191	20.1	125	- 4	46.4	163	356	32.2	-2	36.9	66	11.5	20	52.8		
20	220	23.1	126	- 4	13.8	164	26	36.8	-2	37.1	96	15.8	20	52.7		
22	249	26.3	127	- 3	41.0	164	56	41.4	-2	37.2	126	20.1	20	52.6		
Δ								23		-1			21			-1

SUNCE				MESEC			
UT	e = T <sub>p</sub> - UT	Δ/24	r	Prolaz	Δ/24		

UT	SUNCE				PROLEĆ. TAČKA S <sub>γ</sub>	VENERA			MARS						
	S <sub>☉</sub>		δ <sub>☉</sub>			S <sub>♀</sub>	δ <sub>♀</sub>		S <sub>♂</sub>	δ <sub>♂</sub>					
h	°	'	°	'	°	'	°	'	°	'	°	'			
0	179	12.6	23	17.1	276	11.2	153	58.0	21	44.1	265	12.4	2	.4	
2	209	12.3	23	16.9	306	16.1	183	56.5	21	42.9	295	14.2	2	1.7	
4	239	12.1	23	16.7	336	21.1	213	55.1	21	41.6	325	16.0	2	2.9	
6	269	11.8	23	16.4	6	26.0	243	53.6	21	40.4	355	17.9	2	4.2	
8	299	11.6	23	16.2	36	30.9	273	52.1	21	39.2	25	19.7	2	5.5	
10	329	11.3	23	16.0	66	35.8	303	50.6	21	37.9	55	21.5	2	6.7	
12	359	11.0	23	15.7	96	40.8	333	49.2	21	36.7	85	23.3	2	8.0	
14	29	10.8	23	15.5	126	45.7	3	47.7	21	35.5	115	25.1	2	9.2	
16	59	10.5	23	15.2	156	50.6	33	46.3	21	34.2	145	27.0	2	10.5	
18	89	10.3	23	15.0	186	55.6	63	44.8	21	33.0	175	28.8	2	11.7	
20	119	10.0	23	14.7	217	.5	93	43.3	21	31.7	205	30.6	2	13.0	
22	149	9.8	23	14.4	247	5.4	123	41.9	21	30.5	235	32.4	2	14.2	
Δ		-1		-1				-7		-6		9			6

φ	SUNCE		TRAJANJE SUMRAKA		MESEC			
	IZLAZ	ZALAZ	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	:::	23 48	.0	11 47	3.9
55	3 23	20 43	0 58	:::	23 52	.3	11 47	3.6
50	3 53	20 13	0 44	:::	23 55	.6	11 47	3.3
45	4 16	19 51	0 37	2 32	23 58	.8	11 47	3.0
40	4 33	19 33	0 33	2 3	23 60	1.0	11 47	2.9
35	4 48	19 18	0 30	1 47	...	.0	11 47	2.7
30	5 1	19 5	0 27	1 36	...	.0	11 47	2.6
20	5 23	18 43	0 25	1 24	...	.0	11 47	2.3
10	5 42	18 24	0 23	1 18	...	.0	11 47	2.1
0	5 60	18 7	0 23	1 15	...	.0	11 47	1.9
10	6 17	17 50	0 23	1 15	...	.0	11 47	1.7
20	6 35	17 31	0 24	1 19	...	.0	11 47	1.5
30	6 56	17 10	0 26	1 25	...	.0	11 47	1.2
35	7 9	16 58	0 28	1 31	...	.0	11 47	1.1
40	7 23	16 44	0 31	1 38	...	.0	11 47	1.0
45	7 39	16 27	0 34	1 47	...	.0	11 47	.8
50	8 0	16 7	0 38	1 59	...	.0	11 47	.6
55	8 27	15 40	0 45	2 17	...	.0	11 47	.3
60	9 5	15 1	0 57	2 45	...	.0	11 46	.0

UT	MESEC				JUPITER		SATURN								
	S <sub>♃</sub>	Δ	δ <sub>♃</sub>	Δ	S <sub>♃</sub>	δ <sub>♃</sub>	S <sub>♄</sub>	δ <sub>♄</sub>							
h	°	'	°	'	°	'	°	'							
0	278	29.8	128	-3	8.3	163	86	46.1	-2	37.4	156	24.4	20	52.5	
2	307	33.4	129	-2	35.7	163	116	50.7	-2	37.5	186	28.7	20	52.3	
4	336	37.3	130	-2	3.0	163	146	55.3	-2	37.7	216	32.9	20	52.2	
6	5	41.3	131	-1	30.3	163	176	60.0	-2	37.8	246	37.2	20	52.1	
8	34	45.5	132	-0	57.8	163	207	4.6	-2	38.0	276	41.5	20	52.0	
10	63	49.8	132	-0	25.2	162	237	9.2	-2	38.1	306	45.8	20	51.9	
12	92	54.3	133	0	7.3	162	267	13.9	-2	38.3	336	50.0	20	51.8	
14	121	58.9	134	0	39.6	162	297	18.5	-2	38.4	6	54.3	20	51.6	
16	151	3.6	134	1	12.0	161	327	23.1	-2	38.6	36	58.6	20	51.5	
18	180	8.5	135	1	44.2	161	357	27.7	-2	38.7	67	2.9	20	51.4	
20	209	13.4	135	2	16.3	160	209	32.4	-2	38.9	97	7.2	20	51.3	
22	238	18.4	136	2	48.3	159	57	37.0	-2	39.0	127	11.4	20	51.2	
Δ								23		-1		21			-1

SUNCE				MESEC					
UT	e = T <sub>p</sub> - UT	Δ/24	r	Prolaz	Δ/24	π <sub>☾</sub>	r		
h	min	s	s	h min	min	'	'		
00	-3	9.5	-5	15.8	T <sub>m</sub>	5 37	1.9	58.7	16.0
12	-3	15.6	T <sub>m☉</sub>	12 h 3.3 min	Starost	21.1 d	Faza	☉	

PLANETE									
Pl.	T <sub>m</sub>	π	360-α	Vel.	Pl.	T <sub>m</sub>	π	360-α	Vel.
h	min	'	°	°	h	min	'	°	°
♀	13 45	.1	238	-3.8	♃	18 10	.0	171	-1.9
♂	6 19	.1	349	.0	♄	13 32	.0	240	.3

UT	SUNCE				PROLEĆ. TAČKA S <sub>γ</sub>	VENERA			MARS						
	S <sub>☉</sub>		δ <sub>☉</sub>			S <sub>♀</sub>	δ <sub>♀</sub>		S <sub>♂</sub>	δ <sub>♂</sub>					
h	°	'	°	'	°	'	°	'	°	'	°	'			
0	179	9.5	23	14.2	277	10.3	153	40.4	21	29.2	265	34.3	2	15.5	
2	209	9.3	23	13.9	307	15.3	183	39.0	21	27.9	295	36.1	2	16.7	
4	239	9.0	23	13.6	337	20.2	213	37.5	21	26.6	325	37.9	2	18.0	
6	269	8.8	23	13.4	7	25.1	243	36.1	21	25.4	355	39.7	2	19.2	
8	299	8.5	23	13.1	37	30.0	273	34.6	21	24.1	25	41.6	2	20.5	
10	329	8.3	23	12.8	67	35.0	303	33.2	21	22.8	55	43.4	2	21.7	
12	359	8.0	23	12.5	97	39.9	333	31.7	21	21.5	85	45.2	2	23.0	
14	29	7.8	23	12.3	127	44.8	3	30.3	21	20.2	115	47.0	2	24.2	
16	59	7.5	23	12.0	157	49.8	33	28.9	21	18.9	145	48.9	2	25.5	
18	89	7.3	23	11.7	187	54.7	63	27.4	21	17.6	175	50.7	2	26.7	
20	119	7.0	23	11.4	217	59.6	93	26.0	21	16.3	205	52.5	2	28.0	
22	149	6.8	23	11.1	248	4.5	123	24.6	21	15.0	235	54.4	2	29.2	
Δ		-1		-1				-7		-6		9			6

φ	SUNCE		TRAJANJE SUMRAKA		MESEC			
	IZLAZ	ZALAZ	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 40	:::	23 47	.0	13 21	3.9
55	3 24	20 43	0 57	:::	23 59	.4	13 13	3.5
50	3 54	20 13	0 44	:::	...	.0	13 6	3.2
45	4 16	19 51	0 37	2 31	...	.0	13 0	3.0
40	4 34	19 33	0 33	2 2	...	.0	12 56	2.8
35	4 49	19 18	0 30	1 47	0 2	1.1	12 52	2.7
30	5 2	19 5	0 27	1 36	0 3	1.2	12 49	2.5
20	5 24	18 43	0 25	1 24	0 6	1.5	12 43	2.3
10	5 42	18 25	0 23	1 18	0 9	1.7	12 38	2.1
0	5 60	18 7	0 22	1 15	0 11	1.9	12 33	1.9
10	6 17	17 50	0 23	1 15	0 14	2.1	12 28	1.7
20	6 35	17 32	0 24	1 19	0 17	2.3	12 23	1.5
30	6 56	17 11	0 26	1 25	0 20	2.5	12 17	1.3
35	7 9	16 58	0 28	1 31	0 21	2.7	12 14	1.1
40	7 23	16 44	0 31	1 37	0 24	2.8	12 10	1.0
45	7 39	16 28	0 34	1 47	0 26	3.0	12 6	.8
50	7 60	16 7	0 38	1 59	0 29	3.2	12 0	.6
55	8 27	15 40	0 45	2 17	0 33	3.5	11 54	.3
60	9 5	15 2	0 57	2 45	0 38	3.9	11 46	.0

UT	MESEC				JUPITER		SATURN								
	S <sub>♃</sub>	Δ	δ <sub>♃</sub>	Δ	S <sub>♃</sub>	δ <sub>♃</sub>	S <sub>♄</sub>	δ <sub>♄</sub>							
h	°	'	°	'	°	'	°	'							
0	267	23.5	136	3	20.2	159	87	41.6	-2	39.2	157	15.7	20	51.1	
2	296	28.7	136	3	52.0	158	117	46.2	-2	39.3	187	20.0	20	50.9	
4	325	33.9	136	4	23.6	157	147	50.9	-2	39.5	217	24.3	20	50.8	
6	354	39.2	137	4	55.0	157	177	55.5	-2	39.6	247	28.5	20	50.7	
8	23	44.5	137	5	26.4	156	208	.1	-2	39.8	277	32.8	20	50.6	
10	52	49.8	137	5	57.5	155	238	4.7	-2	40.0	307	37.1	20	50.5	
12	81	55.2	137	6	28.5	154	268	9.3	-2	40.1	337	41.4	20	50.4	
14	111	.5	137	6	59.3	153	298	14.0	-2	40.3	7	45.6	20	50.2	
16	140	5.8	137	7	29.9	152	328	18.6	-2	40.4	37	49.9	20	50.1	
18	169	11.2	136	8	.3	151	358	23.2	-2	40.6	67	54.2	20	50.0	
20	198	16.4	136	8	30.5	150	28	27.8	-2	40.7	97	58.5	20	49.9	
22	227	21.7	136	9	.5	149	58	32.4	-2	40.9	128	2.7	20	49.8	
Δ								23		-1		21			-1

SUNCE				MESEC					
UT	e = T <sub>p</sub> - UT	Δ/24	r	Prolaz	Δ/24	π <sub>☾</sub>	r		
h	min	s	s	h min	min	'	'		
00	-3	21.7	-5	15.8	T <sub>m</sub>	6 22	1.9	58.0	15.8
12	-3	27.7	T <sub>m☉</sub>	12 h 3.5 min	Starost	22.1 d	Faza	☉	

PLANETE									
Pl.	T <sub>m</sub>	π	360-α	Vel.	Pl.	T <sub>m</sub>	π	360-α	Vel.
h</									

UT	SUNCE				PROLEĆ. TAČKA		VENERA				MARS				
	$S_{\odot}$		$\delta_{\odot}$		$S_{\Upsilon}$		$S_{\zeta}$		$\delta_{\zeta}$		$S_{\sigma}$		$\delta_{\sigma}$		
h	°	'	°	'	°	'	°	'	°	'	°	'	°	'	
0	179	6.5	23	10.8	278	9.5	153	23.1	21	13.7	265	56.2	2	30.4	
2	209	6.3	23	10.5	308	14.4	183	21.7	21	12.4	295	58.0	2	31.7	
4	239	6.0	23	10.2	338	19.3	213	20.3	21	11.1	325	59.9	2	32.9	
6	269	5.8	23	9.9	8	24.3	243	18.9	21	9.7	356	1.7	2	34.2	
8	299	5.5	23	9.6	38	29.2	273	17.4	21	8.4	26	3.5	2	35.4	
10	329	5.3	23	9.3	68	34.1	303	16.0	21	7.1	56	5.4	2	36.7	
12	359	5.0	23	9.0	98	39.0	333	14.6	21	5.7	86	7.2	2	37.9	
14	29	4.8	23	8.6	128	44.0	3	13.2	21	4.4	116	9.0	2	39.1	
16	59	4.6	23	8.3	158	48.9	33	11.8	21	3.0	146	10.9	2	40.4	
18	89	4.3	23	8.0	188	53.8	63	10.4	21	1.7	176	12.7	2	41.6	
20	119	4.1	23	7.7	218	58.8	93	9.0	21	3.7	206	14.5	2	42.9	
22	149	3.8	23	7.4	249	3.7	123	7.6	20	59.0	236	16.4	2	44.1	
$\Delta$		-1		-2				-7		-7		9			6

$\varphi$	SUNCE		TRAJANJE SUMRAKA		MESEC			
	IZLAZ	ZALAZ	GRAĐ.	ASTR.	IZLAZ	$\Delta/24$	ZALAZ	$\Delta/24$
N	h min	h min	h min	h min	h min	min	h min	min
60	2 41	21 26	1 39	:::	23 47	.1	14 55	4.0
55	3 25	20 42	0 57	:::	..	.0	14 37	3.5
50	3 54	20 13	0 44	:::	0 9	.6	14 23	3.2
45	4 17	19 51	0 37	2 31	0 17	.8	14 13	3.0
40	4 34	19 33	0 33	2 2	0 23	1.0	14 4	2.8
35	4 49	19 18	0 30	1 46	0 29	1.2	13 56	2.7
30	5 2	19 5	0 27	1 36	0 33	1.3	13 49	2.5
20	5 24	18 43	0 25	1 24	0 42	1.5	13 38	2.3
10	5 43	18 25	0 23	1 17	0 49	1.7	13 28	2.1
0	5 60	18 7	0 22	1 15	0 56	1.9	13 18	1.9
10	6 17	17 50	0 23	1 15	1 4	2.1	13 9	1.8
20	6 36	17 32	0 24	1 19	1 11	2.3	12 59	1.6
30	6 57	17 11	0 26	1 25	1 20	2.5	12 47	1.4
35	7 9	16 59	0 28	1 31	1 25	2.7	12 41	1.2
40	7 23	16 45	0 30	1 37	1 31	2.8	12 34	1.1
45	7 39	16 28	0 34	1 47	1 38	3.0	12 25	.9
50	7 60	16 8	0 38	1 59	1 47	3.2	12 15	.7
55	8 26	15 41	0 45	2 17	1 57	3.5	12 2	.4
60	9 4	15 3	0 57	2 45	2 11	3.9	11 46	.0
S								

UT	MESEC				JUPITER		SATURN							
	$S_{\zeta}$	$\Delta$	$\delta_{\zeta}$	$\Delta$	$S_{\mu}$	$\delta_{\mu}$	$S_{\eta}$	$\delta_{\eta}$						
h	°	'	°	'	°	'	°	'						
0	256	26.9	136	9 30.3	148	88	37.0	- 2 41.0	158	7.0	20	49.7		
2	285	32.1	135	9 59.8	147	118	41.6	- 2 41.2	188	11.3	20	49.5		
4	314	37.2	135	10 29.1	145	148	46.2	- 2 41.4	218	15.6	20	49.4		
6	343	42.2	135	10 58.2	144	178	50.9	- 2 41.5	248	19.8	20	49.3		
8	12	47.1	134	11 27.0	143	208	55.5	- 2 41.7	278	24.1	20	49.2		
10	41	52.0	134	11 55.6	141	239	.1	- 2 41.8	308	28.4	20	49.1		
12	70	56.8	133	12 23.8	140	269	4.7	- 2 42.0	338	32.7	20	49.0		
14	100	1.4	133	12 51.9	139	299	9.3	- 2 42.2	8	36.9	20	48.8		
16	129	6.0	132	13 19.6	137	329	13.9	- 2 42.3	38	41.2	20	48.7		
18	158	10.4	132	13 47.0	136	359	18.5	- 2 42.5	68	45.5	20	48.6		
20	187	14.7	131	14 14.2	134	299	23.1	- 2 42.6	98	49.8	20	48.5		
22	216	18.9	130	14 41.0	133	59	27.7	- 2 42.8	128	54.0	20	48.4		
$\Delta$						23		-1		21				-1

SUNCE				MESEC					
UT	$e = T_p - UT$	$\Delta/24$	r	Prolaz	$\Delta/24$	$\pi_{\zeta}$	r		
h	min	s	s	'	h min	min	'		
00	- 3 33.7	- .5	15.8	$T_m$	7 7	1.9	57.2	15.6	
12	- 3 39.6	$T_{m\odot}$	12 h 3,7 min	Starost	23.1 d	Faza	☉		
PLANETE									
Pl.	$T_m$	$\pi$	$360-\alpha$	Vel.	Pl.	$T_m$	$\pi$	$360-\alpha$	Vel.
	h min	'	°	°		h min	'	°	°
♀	13 47	.1	235	-3.8	♃	18 3	.0	170	-1.9
♂	6 16	.1	348	.0	♄	13 26	.0	240	.3

1. JUL

PETAK

UT	SUNCE				PROLEĆ. TAČKA		VENERA				MARS				
	$S_{\odot}$		$\delta_{\odot}$		$S_{\Upsilon}$		$S_{\zeta}$		$\delta_{\zeta}$		$S_{\sigma}$		$\delta_{\sigma}$		
h	°	'	°	'	°	'	°	'	°	'	°	'	°	'	
0	179	3.6	23	7.0	279	8.6	153	6.2	20	57.6	266	18.2	2	45.3	
2	209	3.3	23	6.7	309	13.5	183	4.8	20	56.3	296	20.1	2	46.6	
4	239	3.1	23	6.4	339	18.5	213	3.4	20	54.9	326	21.9	2	47.8	
6	269	2.9	23	6.0	9	23.4	243	2.0	20	53.5	356	23.8	2	49.1	
8	299	2.6	23	5.7	39	28.3	273	.6	20	52.1	26	25.6	2	50.3	
10	329	2.4	23	5.3	69	33.3	302	59.2	20	50.7	56	27.4	2	51.5	
12	359	2.1	23	5.0	99	38.2	332	57.8	20	49.4	86	29.3	2	52.8	
14	29	1.9	23	4.6	129	43.1	2	56.4	20	48.0	116	31.1	2	54.0	
16	59	1.6	23	4.3	159	48.0	32	55.0	20	46.6	146	33.0	2	55.2	
18	89	1.4	23	3.9	189	53.0	62	53.6	20	45.2	176	34.8	2	56.5	
20	119	1.2	23	3.6	219	57.9	92	52.2	20	43.8	206	36.7	2	57.7	
22	149	.9	23	3.2	250	2.8	122	50.8	20	42.4	236	38.5	2	58.9	
$\Delta$		-1		-2				-7		-7		9			6

$\varphi$	SUNCE		TRAJANJE SUMRAKA		MESEC			
	IZLAZ	ZALAZ	GRAĐ.	ASTR.	IZLAZ	$\Delta/24$	ZALAZ	$\Delta/24$
N	h min	h min	h min	h min	h min	min	h min	min
60	2 42	21 25	1 38	:::	23 49	.2	16 30	4.0
55	3 26	20 42	0 57	:::	0 9	.5	16 2	3.5
50	3 55	20 12	0 44	:::	0 25	.8	15 41	3.2
45	4 17	19 50	0 37	2 30	0 37	1.0	15 24	3.0
40	4 35	19 33	0 33	2 2	0 48	1.2	15 11	2.8
35	4 50	19 18	0 30	1 46	0 57	1.3	14 60	2.6
30	5 2	19 5	0 27	1 36	1 5	1.4	14 50	2.5
20	5 24	18 43	0 24	1 24	1 18	1.6	14 33	2.3
10	5 43	18 25	0 23	1 17	1 31	1.8	14 18	2.2
0	6 0	18 8	0 22	1 15	1 42	2.0	14 5	2.0
10	6 17	17 50	0 23	1 15	1 54	2.1	13 51	1.9
20	6 36	17 32	0 24	1 19	2 6	2.3	13 36	1.7
30	6 57	17 11	0 26	1 25	2 21	2.5	13 20	1.5
35	7 9	16 59	0 28	1 30	2 29	2.7	13 10	1.4
40	7 23	16 45	0 30	1 37	2 39	2.8	12 60	1.2
45	7 39	16 29	0 34	1 46	2 50	3.0	12 47	1.1
50	7 60	16 8	0 38	1 59	3 4	3.2	12 31	.9
55	8 26	15 42	0 45	2 17	3 22	3.5	12 12	.6
60	9 4	15 4	0 57	2 45	3 46	4.0	11 46	.1
S								

UT	MESEC				JUPITER		SATURN							
	$S_{\zeta}$	$\Delta$	$\delta_{\zeta}$	$\Delta$	$S_{\mu}$	$\delta_{\mu}$	$S_{\eta}$	$\delta_{\eta}$						
h	°	'	°	'	°	'	°	'						
0	245	22.9	129	15 7.5	131	89	32.3	- 2 43.0	158	58.3	20	48.2		
2	274	26.8	129	15 33.7	129	119	36.9	- 2 43.1	189	2.6	20	48.1		
4	303	30.6	128	15 59.6	128	149	41.5	- 2 43.3	219	6.8	20	48.0		
6	332	34.2	127	16 25.1	126	179	46.1	- 2 43.5	249	11.1	20	47.9		
8	1	37.6	126	16 50.3	124	209	50.7	- 2 43.6	279	15.4	20	47.8		
10	30	40.9	125	17 15.2	122	239	55.3	- 2 43.8	309	19.7	20	47.7		
12	59	43.9	125	17 39.7	121	269	59.9	- 2 43.9	339	23.9	20	47.5		
14	88	46.8	124	18 3.8	119	300	4.5	- 2 44.1	9	28.2	20	47.4		
16	117	49.6	123	18 27.5	117	330	9.0	- 2 44.3	39	32.5	20	47.3		
18	146	52.1	122	18 50.9	115	0	13.6	- 2 44.4	69	36.7	20	47.2		
20	175	54.5	121	19 13.9	113	30	18.2	- 2 44.6	99	41.0	20	47.1		
22	204	56.6	120	19 36.5	111	60	22.8	- 2 44.8	129	45.3	20	46.9		
$\Delta$						23		-1		21				-1

SUNCE				MESEC				
UT	$e = T_p - UT$	$\Delta/24$	r	Prolaz	$\Delta/24$	$\pi_{\zeta}$	r	
h	min	s	s	'	h min	min	'	
00	- 3 45.5	- .5	15.8	$T_m$	7 53	2.0	56.5	15.4
12	- 3 51.3	$T_{m\odot}$	12 h 3,9 min	Starost	24.1 d	Faza	☉	

UT	SUNCE				PROLEĆ. TAČKA		VENERA				MARS				
	$S_{\odot}$		$\delta_{\odot}$		$S_{\Upsilon}$		$S_{\zeta}$		$\delta_{\zeta}$		$S_{\sigma}$		$\delta_{\sigma}$		
h	°	'	°	'	°	'	°	'	°	'	°	'	°	'	
0	179	.7	23	2.8	280	7.8	152	49.5	20	41.0	266	40.4	3	.2	
2	209	.4	23	2.5	310	12.7	182	48.1	20	39.5	296	42.2	3	1.4	
4	239	.2	23	2.1	340	17.6	212	46.7	20	38.1	326	44.1	3	2.6	
6	269	.0	23	1.7	10	22.5	242	45.3	20	36.7	356	45.9	3	3.9	
8	298	59.7	23	1.4	40	27.5	272	44.0	20	35.3	26	47.8	3	5.1	
10	328	59.5	23	1.0	70	32.4	302	42.6	20	33.8	56	49.6	3	6.3	
12	358	59.3	23	.6	100	37.3	332	41.2	20	32.4	86	51.5	3	7.5	
14	28	59.0	23	.2	130	42.2	2	39.9	20	31.0	116	53.3	3	8.8	
16	58	58.8	22	59.8	160	47.2	32	38.5	20	29.5	146	55.2	3	10.0	
18	88	58.6	22	59.4	190	52.1	62	37.2	20	28.1	176	57.0	3	11.2	
20	118	58.3	22	59.0	220	57.0	92	35.8	20	26.6	206	58.9	3	12.5	
22	148	58.1	22	58.6	251	2.0	122	34.5	20	25.2	237	.7	3	13.7	
$\Delta$		-1		-2				-7		-7		9			6

UT	MESEC				JUPITER				SATURN						
	$S_{\zeta}$		$\Delta$	$\delta_{\zeta}$	$\Delta$	$S_{\eta}$		$\delta_{\eta}$		$S_{\theta}$		$\delta_{\theta}$			
h	°	'	°	'	°	'	°	'	°	'	°	'	°	'	
0	233	58.6	119	19	58.7	109	90	27.4	-2	44.9	159	49.6	20	46.8	
2	263	.4	118	20	20.5	107	120	32.0	-2	45.1	189	53.8	20	46.7	
4	292	1.9	117	20	41.9	105	150	36.6	-2	45.3	219	58.1	20	46.6	
6	321	3.3	116	21	2.9	103	180	41.2	-2	45.5	250	2.4	20	46.5	
8	350	4.5	115	21	23.4	101	210	45.7	-2	45.6	280	6.6	20	46.3	
10	19	5.4	114	21	43.5	98	240	50.3	-2	45.8	310	10.9	20	46.2	
12	48	6.2	113	22	3.2	96	270	54.9	-2	46.0	340	15.2	20	46.1	
14	77	6.7	112	22	22.4	94	300	59.5	-2	46.1	10	19.5	20	46.0	
16	106	7.1	111	22	41.2	92	331	4.1	-2	46.3	40	23.7	20	45.9	
18	135	7.2	110	22	59.5	89	1	8.6	-2	46.5	70	28.0	20	45.7	
20	164	7.2	109	23	17.3	87	31	13.2	-2	46.6	100	32.3	20	45.6	
22	193	6.9	108	23	34.7	84	61	17.8	-2	46.8	130	36.5	20	45.5	
$\Delta$								23		-1		21			-1

$\varphi$	SUNCE		TRAJANJE SUMRAKA		MESEC			
	IZLAZ	ZALAZ	GRAĐ.	ASTR.	IZLAZ	$\Delta/24$	ZALAZ	$\Delta/24$
N	h min	h min	h min	h min	h min	min	h min	min
60	2 43	21 24	1 36	:::	23 52	.4	18 7	4.0
55	3 26	20 41	0 57	:::	0 21	.7	17 26	3.4
50	3 56	20 12	0 44	:::	0 43	1.0	16 57	3.1
45	4 18	19 50	0 37	2 30	1 1	1.2	16 35	2.9
40	4 35	19 33	0 33	2 2	1 15	1.3	16 18	2.7
35	4 50	19 18	0 30	1 46	1 28	1.5	16 3	2.6
30	5 3	19 5	0 27	1 36	1 39	1.6	15 50	2.5
20	5 24	18 44	0 24	1 24	1 57	1.8	15 29	2.4
10	5 43	18 25	0 23	1 17	2 14	1.9	15 10	2.2
0	6 0	18 8	0 22	1 15	2 29	2.1	14 53	2.1
10	6 18	17 51	0 23	1 15	2 45	2.2	14 36	2.0
20	6 36	17 32	0 24	1 18	3 2	2.3	14 17	1.8
30	6 57	17 12	0 26	1 25	3 21	2.5	13 56	1.7
35	7 9	16 60	0 28	1 30	3 33	2.6	13 44	1.6
40	7 23	16 46	0 30	1 37	3 46	2.8	13 29	1.5
45	7 39	16 29	0 34	1 46	4 2	2.9	13 13	1.3
50	7 59	16 9	0 38	1 59	4 21	3.1	12 52	1.1
55	8 26	15 43	0 45	2 17	4 46	3.5	12 25	.8
60	9 3	15 5	0 57	2 44	5 22	4.1	11 48	.2
S								

SUNCE				MESEC					
UT	$e = T_p - UT$	$\Delta/24$	r	Prolaz	$\Delta/24$	$\pi_{\zeta}$	r		
h	min	s	s	h min	min	'	'		
00	- 3 57.1	-.5	15.8	$T_m$	8 41	2.1	55.9 15.2		
12	- 4 2.7	$T_{m\odot}$	12 h 4.0 min	Starost	25.1 d	Faza	☉		
PLANETE									
Pl.	$T_m$	$\pi$	$360-\alpha$	Vel.	Pl.	$T_m$	$\pi$	$360-\alpha$	Vel.
	h min	'	°			h min	'	°	
♀	13 49	.1	233	-3.8	♃	17 55	.0	170	-1.9
♂	6 13	.1	347	-.1	♄	13 19	.0	240	.3

UT	SUNCE				PROLEĆ. TAČKA		VENERA				MARS				
	$S_{\odot}$		$\delta_{\odot}$		$S_{\Upsilon}$		$S_{\zeta}$		$\delta_{\zeta}$		$S_{\sigma}$		$\delta_{\sigma}$		
h	°	'	°	'	°	'	°	'	°	'	°	'	°	'	
0	178	57.9	22	58.2	281	6.9	152	33.1	20	23.7	267	2.6	3	14.9	
2	208	57.6	22	57.8	311	11.8	182	31.8	20	22.3	297	4.5	3	16.1	
4	238	57.4	22	57.4	341	16.7	212	30.4	20	20.8	327	6.3	3	17.4	
6	268	57.2	22	57.0	11	21.7	242	29.1	20	19.3	357	8.2	3	18.6	
8	298	56.9	22	56.6	41	26.6	272	27.7	20	17.9	27	10.0	3	19.8	
10	328	56.7	22	56.2	71	31.5	302	26.4	20	16.4	57	11.9	3	21.0	
12	358	56.5	22	55.8	101	36.5	332	25.0	20	14.9	87	13.8	3	22.2	
14	28	56.2	22	55.4	131	41.4	2	23.7	20	13.4	117	15.6	3	23.5	
16	58	56.0	22	55.0	161	46.3	32	22.4	20	11.9	147	17.5	3	24.7	
18	88	55.8	22	54.5	191	51.2	62	21.0	20	10.4	177	19.3	3	25.9	
20	118	55.6	22	54.1	221	56.2	92	19.7	20	8.9	207	21.2	3	27.1	
22	148	55.3	22	53.7	252	1.1	122	18.4	20	7.4	237	23.1	3	28.3	
$\Delta$		-1		-2				-7		-7		9			6

UT	MESEC				JUPITER				SATURN						
	$S_{\zeta}$		$\Delta$	$\delta_{\zeta}$	$\Delta$	$S_{\eta}$		$\delta_{\eta}$		$S_{\theta}$		$\delta_{\theta}$			
h	°	'	°	'	°	'	°	'	°	'	°	'	°	'	
0	222	6.5	107	23	51.6	82	91	22.4	-2	47.0	160	40.8	20	45.4	
2	251	5.8	106	24	8.0	80	121	26.9	-2	47.2	190	45.1	20	45.3	
4	280	5.0	105	24	23.9	77	151	31.5	-2	47.3	220	49.3	20	45.1	
6	309	3.9	104	24	39.3	75	181	36.1	-2	47.5	250	53.6	20	45.0	
8	338	2.7	103	24	54.2	72	211	40.7	-2	47.7	280	57.9	20	44.9	
10	7	1.3	102	25	8.6	70	241	45.2	-2	47.9	311	2.1	20	44.8	
12	35	59.8	101	25	22.5	67	271	49.8	-2	48.0	341	6.4	20	44.7	
14	64	58.0	100	25	35.9	64	301	54.4	-2	48.2	1	10.7	20	44.5	
16	93	56.1	100	25	48.8	62	331	58.9	-2	48.4	41	14.9	20	44.4	
18	122	54.0	99	26	1.1	59	2	3.5	-2	48.6	71	19.2	20	44.3	
20	151	51.8	98	26	12.9	56	32	8.1	-2	48.7	101	23.5	20	44.2	
22	180	49.4	97	26	24.2	54	62	12.6	-2	48.9	131	27.8	20	44.1	
$\Delta$								23		-1		21			-1

$\varphi$	SUNCE		TRAJANJE SUMRAKA		MESEC			
	IZLAZ	ZALAZ	GRAĐ.	ASTR.	IZLAZ	$\Delta/24$	ZALAZ	$\Delta/24$
N	h min	h min	h min	h min	h min	min	h min	min
60	2 44	21 23	1 35	:::	..	.0	19 44	3.6
55	3 27	20 41	0 56	:::	0 37	1.0	18 46	3.0
50	3 56	20 12	0 44	:::	1 7	1.3	18 10	2.8
45	4 18	19 50	0 37	2 29	1 29	1.5	17 44	2.6
40	4 36	19 32	0 33	2 1	1 48	1.6	17 23	2.5
35	4 51	19 18	0 30	1 46	2 3	1.7	17 6	2.5
30	5 3	19 5	0 27	1 36	2 17	1.8	16 51	2.4
20	5 25	18 44	0 24	1 24	2 40	1.9	16 25	2.3
10	5 43	18 25	0 23	1 17	2 60	2.0	16 3	2.2
0	6 1	18 8	0 22	1 15	3 19	2.1	15 43	2.2
10	6 18	17 51	0 23	1 15	3 38	2.2	15 23	2.1
20	6 36	17 33	0 24	1 18	3 58	2.3	15 1	2.0
30	6 56	17 12	0 26	1 25	4 22	2.5	14 36	1.9
35	7 9	17 0	0 28	1 30	4 36	2.5	14 22	1.8
40	7 22	16 46	0 30	1 37	4 52	2.6	14 5	1.8
45	7 39	16 30	0 34	1 46	5 12	2.8	13 44	1.7
50	7 59	16 10	0 38	1 59	5 36	2.9	13 19	1.5
55	8 25	15 44	0 45	2 16	6 9	3.2	12 45	1.2
60	9 2	15 6	0 57	2 44	6 60	3.9	11 53	.6
S								

SUNCE				MESEC			
UT	$e = T_p - UT$	$\Delta/24$	r	Prolaz	$\Delta/24$	$\pi_{\zeta}$	r</



UT	SUNCE		PROLEĆ. TAČKA S <sub>γ</sub>	VENERA		MARS	
	S <sub>☉</sub>	δ <sub>☉</sub>		S <sub>♀</sub>	δ <sub>♀</sub>	S <sub>♂</sub>	δ <sub>♂</sub>
h	° / ' / "	° / ' / "	° / ' / "	° / ' / "	° / ' / "	° / ' / "	° / ' / "
0	178 55.1	22 53.3	282 6.0	152 17.0	20 5.9	267 24.9	3 29.6
2	208 54.9	22 52.8	312 11.0	182 15.7	20 4.4	297 26.8	3 30.8
4	238 54.7	22 52.4	342 15.9	212 14.4	20 2.9	327 28.7	3 32.0
6	268 54.4	22 51.9	12 20.8	242 13.1	20 1.4	357 30.5	3 33.2
8	298 54.2	22 51.5	42 25.7	272 11.8	19 59.9	27 32.4	3 34.4
10	328 54.0	22 51.1	72 30.7	302 10.4	19 58.4	57 34.3	3 35.6
12	358 53.8	22 50.6	102 35.6	332 9.1	19 56.8	87 36.2	3 36.9
14	28 53.5	22 50.2	132 40.5	2 7.8	19 55.3	117 38.0	3 38.1
16	58 53.3	22 49.7	162 45.5	32 6.5	19 53.8	147 39.9	3 39.3
18	88 53.1	22 49.3	192 50.4	62 5.2	19 52.2	177 41.8	3 40.5
20	118 52.9	22 48.8	222 55.3	92 3.9	19 50.7	207 43.6	3 41.7
22	148 52.6	22 48.3	253 .2	122 2.6	19 49.1	237 45.5	3 42.9
Δ	-1	-2		-7	-8	9	6

φ	SUNCE		TRAJANJE SUMRAKA		MESEC			
	IZLAZ	ZALAZ	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 22	1 33	:::	0 3	1.0	21 9	2.4
55	3 28	20 40	0 56	:::	1 1	1.5	19 58	2.3
50	3 57	20 11	0 44	:::	1 38	1.7	19 16	2.3
45	4 19	19 50	0 37	2 29	2 5	1.8	18 47	2.3
40	4 36	19 32	0 33	2 1	2 26	1.9	18 24	2.3
35	4 51	19 18	0 29	1 46	2 44	2.0	18 5	2.3
30	5 4	19 5	0 27	1 36	2 60	2.0	17 49	2.2
20	5 25	18 44	0 24	1 23	3 26	2.1	17 21	2.2
10	5 44	18 25	0 23	1 17	3 49	2.1	16 57	2.2
0	6 1	18 8	0 22	1 15	4 10	2.2	16 35	2.2
10	6 18	17 51	0 23	1 15	4 31	2.2	16 13	2.2
20	6 36	17 33	0 24	1 18	4 54	2.3	15 50	2.2
30	6 56	17 12	0 26	1 25	5 21	2.3	15 22	2.1
35	7 8	17 1	0 28	1 30	5 37	2.4	15 6	2.1
40	7 22	16 47	0 30	1 37	5 55	2.4	14 47	2.1
45	7 39	16 30	0 34	1 46	6 18	2.5	14 24	2.0
50	7 59	16 10	0 38	1 59	6 46	2.5	13 55	2.0
55	8 25	15 44	0 45	2 16	7 26	2.7	13 15	1.9
60	9 2	15 7	0 56	2 44	8 33	3.1	12 7	1.5
S								

UT	MESEC				JUPITER		SATURN	
	S <sub>♃</sub>	Δ	δ <sub>♃</sub>	Δ	S <sub>♃</sub>	δ <sub>♃</sub>	S <sub>♄</sub>	δ <sub>♄</sub>
h	° / ' / "	° / ' / "	° / ' / "	° / ' / "	° / ' / "	° / ' / "	° / ' / "	° / ' / "
0	209 46.9	97 26 34.9	51	92 17.2	- 2 49.1	161 32.0	20 43.9	
2	238 44.3	96 26 45.1	48	122 21.8	- 2 49.3	191 36.3	20 43.8	
4	267 41.5	96 26 54.7	45	152 26.3	- 2 49.4	221 40.6	20 43.7	
6	296 38.6	95 27 3.8	43	182 30.9	- 2 49.6	251 44.8	20 43.6	
8	325 35.6	95 27 12.3	40	212 35.4	- 2 49.8	281 49.1	20 43.4	
10	354 32.5	94 27 20.3	37	242 40.0	- 2 50.0	311 53.4	20 43.3	
12	23 29.3	94 27 27.7	34	272 44.6	- 2 50.2	341 57.6	20 43.2	
14	52 26.1	93 27 34.6	31	302 49.1	- 2 50.3	12 1.9	20 43.1	
16	81 22.7	93 27 40.8	29	332 53.7	- 2 50.5	42 6.2	20 43.0	
18	110 19.4	93 27 46.6	26	2 58.2	- 2 50.7	72 10.4	20 42.8	
20	139 15.9	93 27 51.7	23	33 2.8	- 2 50.9	102 14.7	20 42.7	
22	168 12.4	92 27 56.3	20	63 7.3	- 2 51.1	132 19.0	20 42.6	
Δ				23	-1	21	-1	

SUNCE				MESEC					
UT	e = T <sub>p</sub> - UT	Δ/24	r	Prolaz	Δ/24	π <sub>☾</sub>	r		
h	min s	s / ' / "	h min	h min	min / ' / "	h min	h min		
00	- 4 19.4	-.4	15.8	T <sub>m</sub>	10 23	2.2	55.0	15.0	
12	- 4 24.8	T <sub>m☉</sub>	12 h 4.4 min	Starost	27.1 d	Faza	●		
PLANETE									
Pl.	T <sub>m</sub>	π	360-α	Vel.	Pl.	T <sub>m</sub>	π	360-α	Vel.
♀	h min	'	°	°	♃	h min	'	°	°
♁	13 51	.1	230	-3.8	♃	17 48	.0	170	-1.9
♂	6 10	.1	345	-.1	♄	13 12	.0	239	.3

UT	SUNCE		PROLEĆ. TAČKA S <sub>γ</sub>	VENERA		MARS	
	S <sub>☉</sub>	δ <sub>☉</sub>		S <sub>♀</sub>	δ <sub>♀</sub>	S <sub>♂</sub>	δ <sub>♂</sub>
h	° / ' / "	° / ' / "	° / ' / "	° / ' / "	° / ' / "	° / ' / "	° / ' / "
0	178 52.4	22 47.9	283 5.2	152 1.3	19 47.6	267 47.4	3 44.1
2	208 52.2	22 47.4	313 10.1	182 .0	19 46.0	297 49.3	3 45.3
4	238 52.0	22 46.9	343 15.0	211 58.7	19 44.5	327 51.1	3 46.5
6	268 51.8	22 46.5	13 20.0	241 57.4	19 42.9	357 53.0	3 47.8
8	298 51.5	22 46.0	43 24.9	271 56.1	19 41.4	27 54.9	3 49.0
10	328 51.3	22 45.5	73 29.8	301 54.8	19 39.8	57 56.8	3 50.2
12	358 51.1	22 45.0	103 34.7	331 53.6	19 38.2	87 58.7	3 51.4
14	28 50.9	22 44.5	133 39.7	1 52.3	19 36.6	118 .5	3 52.6
16	58 50.7	22 44.1	163 44.6	31 51.0	19 35.1	148 2.4	3 53.8
18	88 50.5	22 43.6	193 49.5	61 49.7	19 33.5	178 4.3	3 55.0
20	118 50.3	22 43.1	223 54.5	91 48.4	19 31.9	208 6.2	3 56.2
22	148 50.0	22 42.6	253 59.4	121 47.2	19 30.3	238 8.1	3 57.4
Δ	-1	-2		-6	-8	9	6

φ	SUNCE		TRAJANJE SUMRAKA		MESEC			
	IZLAZ	ZALAZ	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 47	21 21	1 32	:::	0 26	2.2	22 7	1.1
55	3 29	20 39	0 56	:::	1 38	2.2	20 54	1.6
50	3 58	20 11	0 44	:::	2 19	2.2	20 12	1.8
45	4 20	19 49	0 37	2 28	2 49	2.2	19 42	1.9
40	4 37	19 32	0 32	2 1	3 12	2.2	19 18	1.9
35	4 52	19 17	0 29	1 46	3 32	2.2	18 59	2.0
30	5 4	19 5	0 27	1 35	3 48	2.2	18 42	2.0
20	5 25	18 44	0 24	1 23	4 16	2.2	18 14	2.1
10	5 44	18 25	0 23	1 17	4 40	2.2	17 50	2.1
0	6 1	18 8	0 22	1 15	5 3	2.2	17 28	2.2
10	6 18	17 51	0 23	1 15	5 25	2.2	17 5	2.2
20	6 36	17 33	0 24	1 18	5 49	2.2	16 41	2.2
30	6 56	17 13	0 26	1 25	6 17	2.1	16 13	2.3
35	7 8	17 1	0 28	1 30	6 34	2.1	15 56	2.3
40	7 22	16 47	0 30	1 37	6 53	2.1	15 37	2.3
45	7 38	16 31	0 34	1 46	7 17	2.1	15 13	2.4
50	7 58	16 11	0 38	1 58	7 47	2.0	14 43	2.4
55	8 24	15 45	0 45	2 16	8 30	2.0	13 60	2.5
60	9 1	15 9	0 56	2 43	9 47	1.7	12 43	2.9
S								

UT	MESEC				JUPITER		SATURN	
	S <sub>♃</sub>	Δ	δ <sub>♃</sub>	Δ	S <sub>♃</sub>	δ <sub>♃</sub>	S <sub>♄</sub>	δ <sub>♄</sub>
h	° / ' / "	° / ' / "	° / ' / "	° / ' / "	° / ' / "	° / ' / "	° / ' / "	° / ' / "
0	197 8.9	92 28 .3	17	93 11.9	- 2 51.3	162 23.2	20 42.5	
2	226 5.4	92 28 3.8	14	123 16.4	- 2 51.4	192 27.5	20 42.4	
4	255 1.9	92 28 6.7	12	153 21.0	- 2 51.6	222 31.8	20 42.2	
6	283 58.4	92 28 9.0	9	183 25.5	- 2 51.8	252 36.0	20 42.1	
8	312 54.8	93 28 10.7	6	213 30.1	- 2 52.0	282 40.3	20 42.0	
10	341 51.4	93 28 11.9	3	243 34.6	- 2 52.2	312 44.5	20 41.9	
12	10 47.9	93 28 12.5	0	273 39.2	- 2 52.4	342 48.8	20 41.7	
14	39 44.5	93 28 12.5	-3	303 43.7	- 2 52.5	12 53.1	20 41.6	
16	68 41.2	94 28 12.0	-5	333 48.3	- 2 52.7	42 57.3	20 41.5	
18	97 37.9	94 28 10.9	-8	3 52.8	- 2 52.9	73 1.6	20 41.4	
20	126 34.7	95 28 9.2	-11	33 57.3	- 2 53.1	103 5.9	20 41.3	
22	155 31.6	95 28 7.0	-14	64 1.9	- 2 53.3	133 10.1	20 41.1	
Δ				23	-1	21	-1	

SUNCE				MESEC					
UT	e = T <sub>p</sub> - UT	Δ/24	r	Prolaz	Δ/24	π <sub>☾</sub>	r		
h	min s	s / ' / "	h min	h min	min / ' / "	h min	h min		
00	- 4 30.1	-.4	15.8	T <sub>m</sub>	11 15	2.2	54.6	14.9	
12	- 4 35.3	T <sub>m☉</sub>	12 h 4.6 min	Starost	28.1 d	Faza	●		
PLANETE									
Pl.	T <sub>m</sub>	π	360-α	Vel.	Pl.	T <sub>m</sub>	π	360-α	Vel.
♀	h min	'	°	°	♃	h min	'	°	°
♁	13 53	.1	229	-3.8	♃	17 45	.0	170	-1.8
♂	6 8	.1	345	-.1	♄	13 9	.0	239	.3

UT	SUNCE		PROLEĆ. TAČKA S <sub>γ</sub>	VENERA		MARS	
	S <sub>☉</sub>	δ <sub>☉</sub>		S <sub>♀</sub>	δ <sub>♀</sub>	S <sub>♂</sub>	δ <sub>♂</sub>
h	° / ' / "	° / ' / "	° / ' / "	° / ' / "	° / ' / "	° / ' / "	° / ' / "
0	178 49.8	22 42.1	284 4.3	151 45.9	19 28.7	268 10.0	3 58.6
2	208 49.6	22 41.6	314 9.2	181 44.6	19 27.1	298 11.8	3 59.8
4	238 49.4	22 41.1	344 14.2	211 43.4	19 25.5	328 13.7	4 1.0
6	268 49.2	22 40.6	14 19.1	241 42.1	19 23.9	358 15.6	4 2.2
8	298 49.0	22 40.1	44 24.0	271 40.8	19 22.3	28 17.5	4 3.4
10	328 48.8	22 39.6	74 28.9	301 39.6	19 20.7	58 19.4	4 4.6
12	358 48.6	22 39.0	104 33.9	331 38.3	19 19.1	88 21.3	4 5.8
14	28 48.4	22 38.5	134 38.8	1 37.1	19 17.4	118 23.2	4 7.0
16	58 48.1	22 38.0	164 43.7	31 35.8	19 15.8	148 25.1	4 8.2
18	88 47.9	22 37.5	194 48.7	61 34.5	19 14.2	178 26.9	4 9.4
20	118 47.7	22 37.0	224 53.6	91 33.3	19 12.6	208 28.8	4 10.6
22	148 47.5	22 36.4	254 58.5	121 32.0	19 10.9	238 30.7	4 11.8
Δ	-1	-3		-6	-8	9	6

φ	SUNCE		TRAJANJE SUMRAKA		MESEC			
	IZLAZ	ZALAZ	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 20	1 30	: : :	1 18	3.4	22 33	.4
55	3 30	20 39	0 56	: : :	2 31	2.8	21 32	1.0
50	3 59	20 10	0 43	: : :	3 13	2.6	20 54	1.3
45	4 20	19 49	0 37	2 27	3 42	2.5	20 27	1.5
40	4 38	19 32	0 32	2 1	4 6	2.4	20 5	1.6
35	4 52	19 17	0 29	1 45	4 25	2.4	19 47	1.7
30	5 5	19 5	0 27	1 35	5 41	2.3	19 31	1.8
20	5 26	18 44	0 24	1 23	6 41	2.3	19 4	1.9
10	5 44	18 25	0 23	1 17	5 33	2.2	18 41	2.0
0	6 1	18 8	0 22	1 15	5 55	2.1	18 20	2.1
10	6 18	17 52	0 23	1 15	6 17	2.1	17 58	2.2
20	6 36	17 34	0 24	1 18	6 41	2.0	17 35	2.3
30	6 56	17 13	0 26	1 25	7 9	1.9	17 8	2.4
35	7 8	17 2	0 28	1 30	7 25	1.8	16 52	2.4
40	7 22	16 48	0 30	1 37	7 44	1.8	16 33	2.5
45	7 38	16 32	0 33	1 46	8 7	1.7	16 10	2.6
50	7 58	16 12	0 38	1 58	8 36	1.5	15 41	2.8
55	8 23	15 46	0 45	2 16	9 17	1.3	15 1	3.0
60	8 60	15 10	0 56	2 43	10 27	.7	13 52	3.7
S								

UT	MESEC				JUPITER		SATURN	
	S <sub>♃</sub>	Δ	δ <sub>♃</sub>	Δ	S <sub>♃</sub>	δ <sub>♃</sub>	S <sub>♄</sub>	δ <sub>♄</sub>
h	° / ' / "	° / ' / "	° / ' / "	° / ' / "	° / ' / "	° / ' / "	° / ' / "	° / ' / "
0	184 28.7	96 28	4.2	-17	94 6.4	-2 53.5	163 14.4	20 41.0
2	213 25.8	96 28	.9	-19	124 11.0	-2 53.7	193 18.7	20 40.9
4	242 23.0	97 27	57.0	-22	154 15.5	-2 53.8	223 22.9	20 40.8
6	271 20.4	98 27	52.5	-25	184 20.0	-2 54.0	253 27.2	20 40.6
8	300 18.0	98 27	47.6	-28	214 24.6	-2 54.2	283 31.5	20 40.5
10	329 15.6	99 27	42.0	-30	244 29.1	-2 54.4	313 35.7	20 40.4
12	358 13.5	100 27	36.0	-33	274 33.6	-2 54.6	343 40.0	20 40.3
14	27 11.5	101 27	29.4	-36	304 38.2	-2 54.8	13 44.3	20 40.2
16	56 9.7	102 27	22.2	-38	334 42.7	-2 55.0	43 48.5	20 40.0
18	85 8.1	103 27	14.6	-41	4 47.2	-2 55.2	73 52.8	20 39.9
20	114 6.7	104 27	6.4	-43	34 51.8	-2 55.4	103 57.0	20 39.8
22	143 5.5	105 26	57.7	-46	64 56.3	-2 55.6	134 1.3	20 39.7
Δ					23	-1	21	-1

SUNCE				MESEC					
UT	e = T <sub>p</sub> - UT	Δ/24	r	Prolaz	Δ/24	π <sub>☾</sub>	r		
h	min s	s	'	h min	min	'	'		
00	- 4 40.5	-.4	15.8	T <sub>m</sub>	12 7	2.1	54.3 14.8		
12	- 4 45.5	T <sub>m☉</sub>	12 h 4.8 min	Starost	29.1 d	Faza	●		
PLANETE									
Pl.	T <sub>m</sub>	π	360-α	Vel.	Pl.	T <sub>m</sub>	π	360-α	Vel.
♀	h min	'	°		♃	h min	'	°	
♁	13 54	.1	228	-3.8	♃	17 41	.0	170	-1.8
♂	6 7	.2	344	-.1	♄	13 5	.0	239	.3

UT	SUNCE		PROLEĆ. TAČKA S <sub>γ</sub>	VENERA		MARS	
	S <sub>☉</sub>	δ <sub>☉</sub>		S <sub>♀</sub>	δ <sub>♀</sub>	S <sub>♂</sub>	δ <sub>♂</sub>
h	° / ' / "	° / ' / "	° / ' / "	° / ' / "	° / ' / "	° / ' / "	° / ' / "
0	178 47.3	22 35.9	285 3.4	151 30.8	19 9.3	268 32.6	4 13.0
2	208 47.1	22 35.4	315 8.4	181 29.6	19 7.7	298 34.5	4 14.2
4	238 46.9	22 34.8	345 13.3	211 28.3	19 6.0	328 36.4	4 15.4
6	268 46.7	22 34.3	15 18.2	241 27.1	19 4.4	358 38.3	4 16.6
8	298 46.5	22 33.8	45 23.2	271 25.8	19 2.7	28 40.2	4 17.8
10	328 46.3	22 33.2	75 28.1	301 24.6	19 1.1	58 42.1	4 19.0
12	358 46.1	22 32.7	105 33.0	331 23.4	18 59.4	88 44.0	4 20.1
14	28 45.9	22 32.1	135 37.9	1 22.2	18 57.7	118 45.9	4 21.3
16	58 45.7	22 31.6	165 42.9	31 20.9	18 56.1	148 47.8	4 22.5
18	88 45.5	22 31.0	195 47.8	61 19.7	18 54.4	178 49.7	4 23.7
20	118 45.3	22 30.5	225 52.7	91 18.5	18 52.7	208 51.6	4 24.9
22	148 45.1	22 29.9	255 57.7	121 17.3	18 51.1	238 53.5	4 26.1
Δ	-1	-3		-6	-8	9	6

φ	SUNCE		TRAJANJE SUMRAKA		MESEC			
	IZLAZ	ZALAZ	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 19	1 29	: : :	2 38	3.8	22 44	.2
55	3 31	20 38	0 55	: : :	3 38	3.2	21 57	.7
50	3 60	20 10	0 43	: : :	4 16	2.9	21 26	1.0
45	4 21	19 49	0 37	2 27	4 43	2.7	21 2	1.2
40	4 38	19 31	0 32	2 0	5 4	2.6	20 43	1.3
35	4 53	19 17	0 29	1 45	5 22	2.5	20 27	1.4
30	5 5	19 5	0 27	1 35	5 37	2.4	20 13	1.5
20	5 26	18 44	0 24	1 23	6 3	2.2	19 50	1.7
10	5 44	18 25	0 23	1 17	6 25	2.1	19 29	1.8
0	6 1	18 9	0 22	1 15	6 46	2.0	19 9	2.0
10	6 18	17 52	0 23	1 15	7 6	1.9	18 50	2.1
20	6 36	17 34	0 24	1 18	7 28	1.8	18 29	2.2
30	6 56	17 14	0 26	1 25	7 54	1.6	18 5	2.4
35	7 8	17 2	0 28	1 30	8 9	1.6	17 50	2.5
40	7 22	16 49	0 30	1 37	8 26	1.5	17 34	2.6
45	7 38	16 33	0 33	1 46	8 47	1.3	17 13	2.7
50	7 57	16 13	0 38	1 58	9 13	1.1	16 48	2.9
55	8 23	15 47	0 45	2 16	9 48	.8	16 14	3.2
60	8 59	15 11	0 56	2 42	10 43	.3	15 20	3.8
S								

UT	MESEC				JUPITER		SATURN	
	S <sub>♃</sub>	Δ	δ <sub>♃</sub>	Δ	S <sub>♃</sub>	δ <sub>♃</sub>	S <sub>♄</sub>	δ <sub>♄</sub>
h	° / ' / "	° / ' / "	° / ' / "	° / ' / "	° / ' / "	° / ' / "	° / ' / "	° / ' / "
0	172 4.5	106 26	48.5	-48	95 .8	-2 55.7	164 5.6	20 39.5
2	201 3.7	107 26	38.8	-51	125 5.3	-2 55.9	194 9.8	20 39.4
4	230 3.1	108 26	28.6	-53	155 9.9	-2 56.1	224 14.1	20 39.3
6	259 2.8	110 26	17.9	-56	185 14.4	-2 56.3	254 18.4	20 39.2
8	288 2.7	111 26	6.8	-58	215 18.9	-2 56.5	284 22.6	20 39.0
10	317 2.9	112 25	55.1	-61	245 23.4	-2 56.7	314 26.9	20 38.9
12	346 3.3	113 25	43.0	-63	275 28.0	-2 56.9	344 31.1	20 38.8
14	15 3.9	115 25	30.4	-65	305 32.5	-2 57.1	14 35.4	20 38.7
16	44 4.8	116 25	17.3	-68	335 37.0	-2 57.3	44 39.7	20 38.5
18	73 6.0	117 25	3.8	-70	5 41.5	-2 57.5	74 43.9	20 38.4
20	102 7.4	118 24	49.8	-72	35 46.0	-2 57.7	104 48.2	20 38.3
22	131 9.1	120 24	35.4	-74	65 50.6	-2 57.9	134 52.5	20 38.2
Δ					23	-1	21	-1

SUNCE				MESEC					
UT	e = T <sub>p</sub> - UT	Δ/24	r	Prolaz	Δ/24	π <sub>☾</sub>	r		
h	min s	s	'	h min	min	'	'		
00	- 4 50.5	-.4	15.8	T <sub>m</sub>	12 58	2.0	54.1 14.7		
12	- 4 55.4	T <sub>m☉</sub>	12 h 4.9 min	Starost	.5 d	Faza	●		
PLANETE									
Pl.	T <sub>m</sub>	π	360-α	Vel.	Pl.	T <sub>m</sub>	π	360-α	Vel.
♀	h min	'	°		♃	h min	'	°	
♁	13 55	.1	226	-3.8	♃	17 37	.0	170	-1.8
♂	6 5	.2	343	-.1	♄	13 2	.0	239	.3

UT	SUNCE		PROLEĆ. TAČKA S <sub>γ</sub>	VENERA		MARS		
	S <sub>☉</sub>	δ <sub>☉</sub>		S <sub>♀</sub>	δ <sub>♀</sub>	S <sub>♂</sub>	δ <sub>♂</sub>	
h	°	'	°	'	°	'	°	'
0	178 44.9	22 29.3	286 2.6	151 16.0	18 49.4	268 55.4	4 27.3	
2	208 44.7	22 28.8	316 7.5	181 14.8	18 47.7	298 57.3	4 28.5	
4	238 44.5	22 28.2	346 12.4	211 13.6	18 46.0	328 59.2	4 29.7	
6	268 44.3	22 27.6	16 17.4	241 12.4	18 44.3	359 1.1	4 30.8	
8	298 44.1	22 27.1	46 22.3	271 11.2	18 42.6	29 3.0	4 32.0	
10	328 43.9	22 26.5	76 27.2	301 10.0	18 40.9	59 4.9	4 33.2	
12	358 43.7	22 25.9	106 32.2	331 8.8	18 39.2	89 6.9	4 34.4	
14	28 43.5	22 25.3	136 37.1	1 7.6	18 37.5	119 8.8	4 35.6	
16	58 43.4	22 24.7	166 42.0	31 6.4	18 35.8	149 10.7	4 36.8	
18	88 43.2	22 24.1	196 46.9	61 5.2	18 34.1	179 12.6	4 37.9	
20	118 43.0	22 23.6	226 51.9	91 4.0	18 32.4	209 14.5	4 39.1	
22	148 42.8	22 23.0	256 56.8	121 2.8	18 30.7	239 16.4	4 40.3	
Δ	-1	-3		-6	-9	10	6	

φ	SUNCE		TRAJANJE SUMRAKA		MESEC			
	IZLAZ	ZALAZ	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 18	1 27	:::	4 9	3.8	22 48	.1
55	3 32	20 37	0 55	:::	4 54	3.3	22 14	.5
50	4 0	20 9	0 43	:::	5 25	3.0	21 50	.7
45	4 22	19 48	0 37	2 26	5 47	2.8	21 31	1.0
40	4 39	19 31	0 32	1 60	6 6	2.6	21 15	1.1
35	4 53	19 17	0 29	1 45	6 21	2.5	21 2	1.2
30	5 5	19 4	0 27	1 35	6 34	2.4	20 50	1.3
20	5 27	18 44	0 24	1 23	6 57	2.2	20 30	1.5
10	5 45	18 25	0 23	1 17	7 16	2.0	20 13	1.7
0	6 1	18 9	0 22	1 15	7 34	1.9	19 56	1.8
10	6 18	17 52	0 23	1 15	7 52	1.8	19 40	2.0
20	6 36	17 34	0 24	1 18	8 11	1.6	19 22	2.2
30	6 56	17 14	0 26	1 25	8 33	1.4	19 2	2.3
35	7 8	17 3	0 28	1 30	8 46	1.3	18 50	2.5
40	7 21	16 49	0 30	1 37	9 1	1.2	18 36	2.6
45	7 37	16 33	0 33	1 46	9 19	1.1	18 19	2.8
50	7 57	16 14	0 38	1 58	9 40	.8	17 58	3.0
55	8 22	15 48	0 44	2 15	10 9	.6	17 31	3.3
60	8 58	15 13	0 55	2 42	10 49	.1	16 52	3.8
S								

UT	MESEC				JUPITER		SATURN	
	S <sub>♃</sub>	Δ	δ <sub>♃</sub>	Δ	S <sub>♃</sub>	δ <sub>♃</sub>	S <sub>♄</sub>	δ <sub>♄</sub>
h	°	'	°	'	°	'	°	'
0	160 11.1	121 24	20.6	-76	95 55.1	-2 58.1	164 56.7	20 38.1
2	189 13.3	123 24	5.3	-78	125 59.6	-2 58.3	195 1.0	20 37.9
4	218 15.8	124 23	49.6	-81	156 4.1	-2 58.5	225 5.2	20 37.8
6	247 18.6	125 23	33.5	-83	186 8.6	-2 58.7	255 9.5	20 37.7
8	276 21.7	127 23	17.0	-85	216 13.1	-2 58.9	285 13.8	20 37.6
10	305 25.0	128 23	.1	-87	246 17.7	-2 59.1	315 18.0	20 37.4
12	334 28.6	129 22	42.8	-88	276 22.2	-2 59.3	345 22.3	20 37.3
14	3 32.5	131 22	25.1	-90	306 26.7	-2 59.5	15 26.5	20 37.2
16	32 36.6	132 22	7.0	-92	336 31.2	-2 59.7	45 30.8	20 37.1
18	61 41.0	133 21	48.6	-94	6 35.7	-2 59.9	75 35.1	20 36.9
20	90 45.7	135 21	29.8	-96	36 40.2	-3 .1	105 39.3	20 36.8
22	119 50.7	136 21	10.6	-98	66 44.7	-3 .3	135 43.6	20 36.7
Δ					23	-1	21	-1

SUNCE				MESEC					
UT	e = T <sub>p</sub> - UT	Δ/24	r	Prolaz	Δ/24	π <sub>♃</sub>	r		
h	min	s	s	h min	min	'	'		
00	- 5 .2	.4	15.8	T <sub>m</sub>	13 45	1.9	54.0 14.7		
12	- 5 4.8			T <sub>m☉</sub> 12 h 5.1 min	Starost 1.5 d	Faza ●			
PLANETE									
Pl.	T <sub>m</sub>	π	360-α	Vel.	Pl.	T <sub>m</sub>	π	360-α	Vel.
♀	h min	'	°		♃	h min	'	°	
♁	13 55	.1	225	-3.8	♃	17 34	.0	170	-1.8
♂	6 4	.2	343	-.1	♄	12 58	.0	239	.3

UT	SUNCE		PROLEĆ. TAČKA S <sub>γ</sub>	VENERA		MARS		
	S <sub>☉</sub>	δ <sub>☉</sub>		S <sub>♀</sub>	δ <sub>♀</sub>	S <sub>♂</sub>	δ <sub>♂</sub>	
h	°	'	°	'	°	'	°	'
0	178 42.6	22 22.4	287 1.7	151 1.6	18 28.9	269 18.3	4 41.5	
2	208 42.4	22 21.8	317 6.7	181 .4	18 27.2	299 20.2	4 42.7	
4	238 42.2	22 21.2	347 11.6	210 59.2	18 25.5	329 22.2	4 43.8	
6	268 42.0	22 20.6	17 16.5	240 58.1	18 23.8	359 24.1	4 45.0	
8	298 41.8	22 20.0	47 21.4	270 56.9	18 22.0	29 26.0	4 46.2	
10	328 41.7	22 19.4	77 26.4	300 55.7	18 20.3	59 27.9	4 47.4	
12	358 41.5	22 18.7	107 31.3	330 54.5	18 18.5	89 29.8	4 48.5	
14	28 41.3	22 18.1	137 36.2	0 53.3	18 16.8	119 31.7	4 49.7	
16	58 41.1	22 17.5	167 41.1	30 52.2	18 15.0	149 33.7	4 50.9	
18	88 40.9	22 16.9	197 46.1	60 51.0	18 13.3	179 35.6	4 52.1	
20	118 40.7	22 16.3	227 51.0	90 49.8	18 11.5	209 37.5	4 53.2	
22	148 40.6	22 15.6	257 55.9	120 48.7	18 9.8	239 39.4	4 54.4	
Δ	-1	-3		-6	-9	10	6	

φ	SUNCE		TRAJANJE SUMRAKA		MESEC			
	IZLAZ	ZALAZ	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 16	1 26	:::	5 41	3.7	22 49	.0
55	3 33	20 36	0 55	:::	6 13	3.2	22 25	.4
50	4 1	20 9	0 43	:::	6 36	2.9	22 8	.6
45	4 22	19 48	0 36	2 25	6 53	2.7	21 53	.8
40	4 39	19 31	0 32	1 59	7 8	2.6	21 42	1.0
35	4 54	19 17	0 29	1 45	7 20	2.4	21 31	1.1
30	5 6	19 4	0 27	1 35	7 31	2.3	21 23	1.2
20	5 27	18 43	0 24	1 23	7 49	2.1	21 7	1.4
10	5 45	18 26	0 23	1 17	8 5	1.9	20 54	1.6
0	6 2	18 9	0 22	1 14	8 20	1.8	20 41	1.7
10	6 18	17 52	0 23	1 15	8 34	1.6	20 28	1.9
20	6 36	17 35	0 24	1 18	8 50	1.5	20 14	2.1
30	6 56	17 15	0 26	1 25	9 8	1.3	19 58	2.3
35	7 8	17 3	0 28	1 30	9 18	1.2	19 49	2.4
40	7 21	16 50	0 30	1 37	9 30	1.0	19 38	2.6
45	7 37	16 34	0 33	1 46	9 44	.9	19 25	2.7
50	7 56	16 15	0 38	1 58	10 1	.7	19 10	2.9
55	8 21	15 50	0 44	2 15	10 22	.4	18 50	3.2
60	8 57	15 14	0 55	2 41	10 51	.0	18 22	3.6
S								

UT	MESEC				JUPITER		SATURN	
	S <sub>♃</sub>	Δ	δ <sub>♃</sub>	Δ	S <sub>♃</sub>	δ <sub>♃</sub>	S <sub>♄</sub>	δ <sub>♄</sub>
h	°	'	°	'	°	'	°	'
0	148 55.9	137 20	51.1	-99	96 49.2	-3 .5	165 47.9	20 36.6
2	178 1.4	139 20	31.2	-101	126 53.7	-3 .7	195 52.1	20 36.4
4	207 7.1	140 20	11.0	-103	156 58.2	-3 .9	225 56.4	20 36.3
6	236 13.1	141 19	50.5	-104	187 2.7	-3 1.1	256 .6	20 36.2
8	265 19.4	143 19	29.6	-106	217 7.2	-3 1.3	286 4.9	20 36.1
10	294 25.9	144 19	8.5	-107	247 11.7	-3 1.5	316 9.2	20 35.9
12	323 32.6	145 18	47.0	-109	277 16.2	-3 1.7	346 13.4	20 35.8
14	352 39.6	146 18	25.2	-110	307 20.7	-3 1.9	16 17.7	20 35.7
16	21 46.8	147 18	3.1	-112	337 25.2	-3 2.1	46 21.9	20 35.6
18	50 54.3	148 17	40.8	-113	7 29.7	-3 2.3	76 26.2	20 35.4
20	80 2.0	150 17	18.1	-115	37 34.2	-3 2.5	106 30.5	20 35.3
22	109 9.9	151 16	55.2	-116	67 38.7	-3 2.7	136 34.7	20 35.2
Δ					22	-1	21	-1

SUNCE				MESEC					
UT	e = T <sub>p</sub> - UT	Δ/24	r	Prolaz	Δ/24	π <sub>♃</sub>	r		
h	min	s	s	h min	min	'	'		
00	- 5 9.4	.4	15.8	T <sub>m</sub>	14 30	1.8	54.0 14.7		
12	- 5 13.9			T <sub>m☉</sub> 12 h 5.2 min	Starost 2.5 d	Faza ●			
PLANETE									
Pl.	T <sub>m</sub>	π	360-α	Vel.	Pl.	T <sub>m</sub>	π	360-α	Vel.
♀	h min	'	°		♃	h min	'	°	
♁	13 56	.1	224	-3.8	♃	17 30	.0	170	-1.8
♂	6 2	.2	342	-.2	♄	12 55	.0	239	.3

UT	SUNCE		PROLEĆ. TAČKA S <sub>γ</sub>	VENERA		MARS	
	S <sub>☉</sub>	δ <sub>☉</sub>		S <sub>♀</sub>	δ <sub>♀</sub>	S <sub>♂</sub>	δ <sub>♂</sub>
h	° / ' / "	° / ' / "	° / ' / "	° / ' / "	° / ' / "	° / ' / "	° / ' / "
0	178 40.4	22 15.0	288 .9	150 47.5	18 8.0	269 41.4	4 55.6
2	208 40.2	22 14.4	318 5.8	180 46.4	18 6.3	299 43.3	4 56.7
4	238 40.0	22 13.8	348 10.7	210 45.2	18 4.5	329 45.2	4 57.9
6	268 39.9	22 13.1	18 15.6	240 44.0	18 2.7	359 47.1	4 59.1
8	298 39.7	22 12.5	48 20.6	270 42.9	18 .9	29 49.1	5 .3
10	328 39.5	22 11.8	78 25.5	300 41.7	17 59.2	59 51.0	5 1.4
12	358 39.3	22 11.2	108 30.4	330 40.6	17 57.4	89 52.9	5 2.6
14	28 39.2	22 10.6	138 35.4	0 39.4	17 55.6	119 54.8	5 3.8
16	58 39.0	22 9.9	168 40.3	30 38.3	17 53.8	149 56.8	5 4.9
18	88 38.8	22 9.3	198 45.2	60 37.2	17 52.0	179 58.7	5 6.1
20	118 38.6	22 8.6	228 50.1	90 36.0	17 50.2	210 .6	5 7.2
22	148 38.5	22 7.9	258 55.1	120 34.9	17 48.4	240 2.6	5 8.4
Δ	-1	-3		-6	-9	10	6

φ	SUNCE		TRAJANJE SUMRAKA		MESEC			
	IZLAZ	ZALAZ	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 15	1 24	:::	7 8	3.5	22 49	.0
55	3 35	20 35	0 54	:::	7 30	3.2	22 34	.3
50	4 2	20 8	0 43	:::	7 46	2.9	22 22	.5
45	4 23	19 47	0 36	2 24	7 59	2.7	22 13	.7
40	4 40	19 30	0 32	1 59	8 10	2.5	22 5	.9
35	4 54	19 16	0 29	1 44	8 19	2.4	21 58	1.0
30	5 6	19 4	0 27	1 35	8 26	2.3	21 52	1.1
20	5 27	18 43	0 24	1 23	8 40	2.1	21 41	1.3
10	5 45	18 26	0 23	1 17	8 52	1.9	21 31	1.5
0	6 2	18 9	0 22	1 14	9 3	1.7	21 23	1.7
10	6 18	17 53	0 23	1 15	9 14	1.5	21 14	1.9
20	6 36	17 35	0 24	1 18	9 25	1.4	21 4	2.0
30	6 56	17 15	0 26	1 25	9 38	1.2	20 53	2.3
35	7 7	17 4	0 28	1 30	9 46	1.0	20 46	2.4
40	7 21	16 50	0 30	1 37	9 55	.9	20 39	2.5
45	7 36	16 35	0 33	1 45	10 5	.7	20 30	2.7
50	7 55	16 16	0 38	1 58	10 17	.6	20 20	2.9
55	8 20	15 51	0 44	2 15	10 32	.3	20 7	3.1
60	8 55	15 16	0 55	2 41	10 52	.0	19 49	3.5

UT	MESEC				JUPITER		SATURN	
	S <sub>♃</sub>	Δ	δ <sub>♃</sub>	Δ	S <sub>♃</sub>	δ <sub>♃</sub>	S <sub>♄</sub>	δ <sub>♄</sub>
h	° / ' / "	° / ' / "	° / ' / "	° / ' / "	° / ' / "	° / ' / "	° / ' / "	° / ' / "
0	138 18.1	152	16 32.0	-117	97 43.2	-3 2.9	166 39.0	20 35.1
2	167 26.4	153	16 8.6	-119	127 47.7	-3 3.1	196 43.2	20 34.9
4	196 35.0	154	15 44.9	-120	157 52.2	-3 3.3	226 47.5	20 34.8
6	225 43.7	155	15 20.9	-121	187 56.7	-3 3.5	256 51.8	20 34.7
8	254 52.7	156	14 56.7	-122	218 1.2	-3 3.7	286 56.0	20 34.6
10	284 1.8	157	14 32.2	-123	248 5.7	-3 4.0	317 .3	20 34.4
12	313 11.2	158	14 7.6	-124	278 10.1	-3 4.2	347 4.5	20 34.3
14	342 20.7	158	13 42.7	-126	308 14.6	-3 4.4	17 8.8	20 34.2
16	11 30.3	159	13 17.6	-127	338 19.1	-3 4.6	47 13.0	20 34.1
18	40 40.2	160	12 52.2	-128	8 23.6	-3 4.8	77 17.3	20 33.9
20	69 50.2	161	12 26.7	-129	38 28.1	-3 5.0	107 21.6	20 33.8
22	99 .3	161	12 1.0	-130	68 32.6	-3 5.2	137 25.8	20 33.7
Δ					22	-1	21	-1

SUNCE				MESEC				
UT	e = T <sub>p</sub> - UT	Δ/24	r	Prolaz	Δ/24	π <sub>♃</sub>	r	
h	min s	s / ' / "	h min	h min	min / ' / "	h min	h min	
00	- 5 18.3	-.3	15.8	T <sub>m</sub>	15 13	1.7	54.0	14.7
12	- 5 22.5	T <sub>m☉</sub>	12 h 5.4 min	Starost	3.5 d	Faza	☉	

PLANETE									
Pl.	T <sub>m</sub>	π	360-α	Vel.	Pl.	T <sub>m</sub>	π	360-α	Vel.
♃	h min / ' / "	°	°	°	♄	h min / ' / "	°	°	°
♃	13 57	.1	223	-3.8	♄	17 27	.0	170	-1.8
♅	6 1	.2	342	-.2	♅	12 52	.0	239	.3

UT	SUNCE		PROLEĆ. TAČKA S <sub>γ</sub>	VENERA		MARS	
	S <sub>☉</sub>	δ <sub>☉</sub>		S <sub>♀</sub>	δ <sub>♀</sub>	S <sub>♂</sub>	δ <sub>♂</sub>
h	° / ' / "	° / ' / "	° / ' / "	° / ' / "	° / ' / "	° / ' / "	° / ' / "
0	178 38.3	22 7.3	289 .0	150 33.7	17 46.6	270 4.5	5 9.6
2	208 38.1	22 6.6	319 4.9	180 32.6	17 44.8	300 6.4	5 10.7
4	238 38.0	22 6.0	349 9.9	210 31.5	17 43.0	330 8.4	5 11.9
6	268 37.8	22 5.3	19 14.8	240 30.4	17 41.2	0 10.3	5 13.1
8	298 37.6	22 4.6	49 19.7	270 29.2	17 39.4	30 12.2	5 14.2
10	328 37.5	22 4.0	79 24.6	300 28.1	17 37.6	60 14.2	5 15.4
12	358 37.3	22 3.3	109 29.6	330 27.0	17 35.7	90 16.1	5 16.5
14	28 37.1	22 2.6	139 34.5	0 25.9	17 33.9	120 18.1	5 17.7
16	58 37.0	22 1.9	169 39.4	30 24.8	17 32.1	150 20.0	5 18.8
18	88 36.8	22 1.2	199 44.4	60 23.6	17 30.3	180 21.9	5 20.0
20	118 36.6	22 .6	229 49.3	90 22.5	17 28.4	210 23.9	5 21.2
22	148 36.5	21 59.9	259 54.2	120 21.4	17 26.6	240 25.8	5 22.3
Δ	-1	-3		-6	-9	10	6

φ	SUNCE		TRAJANJE SUMRAKA		MESEC			
	IZLAZ	ZALAZ	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	:::	8 33	3.5	22 49	.0
55	3 36	20 34	0 54	:::	8 46	3.1	22 41	.3
50	4 3	20 7	0 43	:::	8 56	2.9	22 35	.5
45	4 24	19 47	0 36	2 23	9 4	2.7	22 30	.7
40	4 41	19 30	0 32	1 59	9 10	2.5	22 25	.8
35	4 55	19 16	0 29	1 44	9 16	2.4	22 22	1.0
30	5 7	19 4	0 27	1 34	9 21	2.2	22 19	1.1
20	5 28	18 43	0 24	1 23	9 29	2.0	22 13	1.3
10	5 45	18 26	0 23	1 17	9 37	1.8	22 8	1.5
0	6 2	18 9	0 22	1 14	9 44	1.7	22 3	1.7
10	6 18	17 53	0 23	1 15	9 51	1.5	21 58	1.8
20	6 36	17 36	0 24	1 18	9 58	1.3	21 53	2.0
30	6 55	17 16	0 26	1 25	10 6	1.1	21 47	2.3
35	7 7	17 4	0 28	1 30	10 11	1.0	21 43	2.4
40	7 20	16 51	0 30	1 36	10 16	.8	21 39	2.5
45	7 36	16 36	0 33	1 45	10 23	.7	21 35	2.7
50	7 55	16 17	0 38	1 57	10 30	.5	21 29	2.9
55	8 19	15 52	0 44	2 14	10 39	.3	21 22	3.1
60	8 54	15 17	0 55	2 40	10 51	.0	21 13	3.5

UT	MESEC				JUPITER		SATURN	
	S <sub>♃</sub>	Δ	δ <sub>♃</sub>	Δ	S <sub>♃</sub>	δ <sub>♃</sub>	S <sub>♄</sub>	δ <sub>♄</sub>
h	° / ' / "	° / ' / "	° / ' / "	° / ' / "	° / ' / "	° / ' / "	° / ' / "	° / ' / "
0	128 10.6	162	11 35.0	-131	98 37.0	-3 5.4	167 30.1	20 33.5
2	157 21.0	163	11 8.9	-132	128 41.5	-3 5.6	197 34.3	20 33.4
4	186 31.5	163	10 42.6	-132	158 46.0	-3 5.8	227 38.6	20 33.3
6	215 42.2	164	10 16.1	-133	188 50.5	-3 6.0	257 42.9	20 33.2
8	244 52.9	164	9 49.5	-134	218 55.0	-3 6.3	287 47.1	20 33.0
10	274 3.8	165	9 22.6	-135	248 59.4	-3 6.5	317 51.4	20 32.9
12	303 14.8	165	8 55.7	-136	279 3.9	-3 6.7	347 55.6	20 32.8
14	332 25.8	166	8 28.5	-136	309 8.4	-3 6.9	17 59.9	20 32.7
16	1 36.9	166	8 1.2	-137	339 12.9	-3 7.1	48 4.2	20 32.5
18	30 48.1	166	7 33.8	-138	9 17.4	-3 7.3	78 8.4	20 32.4
20	59 59.4	167	7 6.2	-138	39 21.8	-3 7.5	108 12.7	20 32.3
22	89 10.7	167	6 38.5	-139	69 26.3	-3 7.8	138 16.9	20 32.2
Δ					22	-1	21	-1

SUNCE				MESEC				
UT	e = T <sub>p</sub> - UT	Δ/24	r	Prolaz	Δ/24	π <sub>♃</sub>	r	
h	min s	s / ' / "	h min	h min	min / ' / "	h min	h min	
00	- 5 26.7	-.3	15.8	T <sub>m</sub>	15 53	1.7	54.3	14.8
12	- 5 30.6	T <sub>m☉</sub>	12 h 5.5 min	Starost	4.5 d	Faza	☉	

PLANETE									
Pl.	T <sub>m</sub>	π	360-α	Vel.	Pl.	T <sub>m</sub>	π	360-α	Vel.
♃	h min / ' / "	°	°	°	♄	h min / ' / "	°	°	°
♃	13 58	.1	222	-3.8	♄	17 23	.0	170	-1.8
♅	5 59	.2	341	-.2	♅	12 48	.0	238	.3

UT	SUNCE		PROLEĆ. TAČKA S <sub>γ</sub>	VENERA		MARS	
	S <sub>☉</sub>	δ <sub>☉</sub>		S <sub>♀</sub>	δ <sub>♀</sub>	S <sub>♂</sub>	δ <sub>♂</sub>
h	° / ' / "	° / ' / "	° / ' / "	° / ' / "	° / ' / "	° / ' / "	° / ' / "
0	178 36.3	21 59.2	289 59.1	150 20.3	17 24.7	270 27.8	5 23.5
2	208 36.2	21 58.5	320 4.1	180 19.2	17 22.9	300 29.7	5 24.6
4	238 36.0	21 57.8	350 9.0	210 18.1	17 21.1	330 31.7	5 25.8
6	268 35.8	21 57.1	20 13.9	240 17.0	17 19.2	0 33.6	5 26.9
8	298 35.7	21 56.4	50 18.9	270 15.9	17 17.4	30 35.6	5 28.1
10	328 35.5	21 55.7	80 23.8	300 14.8	17 15.5	60 37.5	5 29.2
12	358 35.4	21 55.0	110 28.7	330 13.7	17 13.6	90 39.5	5 30.4
14	28 35.2	21 54.3	140 33.6	0 12.6	17 11.8	120 41.4	5 31.5
16	58 35.1	21 53.6	170 38.6	30 11.5	17 9.9	150 43.4	5 32.7
18	88 34.9	21 52.8	200 43.5	60 10.5	17 8.0	180 45.3	5 33.8
20	118 34.8	21 52.1	230 48.4	90 9.4	17 6.2	210 47.3	5 35.0
22	148 34.6	21 51.4	260 53.4	120 8.3	17 4.3	240 49.2	5 36.1
Δ	-1	-4		-5	-9	10	6

φ	SUNCE		TRAJANJE SUMRAKA		MESEC			
	IZLAZ	ZALAZ	GRAĐ.	ASTR.	IZLAZ	Δ/24	ZALAZ	Δ/24
N	h min	h min	h min	h min	h min	min	h min	min
60	2 58	21 12	1 21	:::	9 57	3.5	22 48	.0
55	3 37	20 33	0 54	:::	10 2	3.2	22 47	.3
50	4 4	20 6	0 42	3 38	10 5	2.9	22 46	.5
45	4 25	19 46	0 36	2 23	10 8	2.7	22 46	.7
40	4 42	19 29	0 32	1 58	10 11	2.5	22 45	.8
35	4 55	19 16	0 29	1 44	10 13	2.4	22 45	1.0
30	5 7	19 4	0 27	1 34	10 15	2.3	22 45	1.1
20	5 28	18 43	0 24	1 24	10 18	2.0	22 44	1.3
10	5 46	18 26	0 23	1 17	10 21	1.9	22 44	1.5
0	6 2	18 9	0 22	1 14	10 24	1.7	22 43	1.7
10	6 18	17 53	0 23	1 15	10 26	1.5	22 42	1.9
20	6 35	17 36	0 24	1 18	10 29	1.3	22 42	2.1
30	6 55	17 16	0 26	1 25	10 33	1.1	22 41	2.3
35	7 7	17 5	0 28	1 30	10 35	1.0	22 41	2.4
40	7 20	16 52	0 30	1 36	10 37	.8	22 40	2.6
45	7 35	16 36	0 33	1 45	10 39	.7	22 39	2.7
50	7 54	16 18	0 37	1 57	10 42	.5	22 39	2.9
55	8 19	15 53	0 44	2 14	10 46	.3	22 38	3.2
60	8 53	15 19	0 54	2 40	10 50	.0	22 36	3.5
S								

UT	MESEC				JUPITER		SATURN	
	S <sub>♃</sub>	Δ	δ <sub>♃</sub>	Δ	S <sub>♃</sub>	δ <sub>♃</sub>	S <sub>♄</sub>	δ <sub>♄</sub>
h	° / ' / "	° / ' / "	° / ' / "	° / ' / "	° / ' / "	° / ' / "	° / ' / "	° / ' / "
0	118 22.0	167	6 10.7	-140	99 30.8	-3 8.0	168 21.2	20 32.0
2	147 33.4	167	5 42.8	-140	129 35.2	-3 8.2	198 25.4	20 31.9
4	176 44.8	167	5 14.7	-141	159 39.7	-3 8.4	228 29.7	20 31.8
6	205 56.2	167	4 46.5	-141	189 44.2	-3 8.6	258 34.0	20 31.6
8	235 7.6	167	4 18.3	-142	219 48.6	-3 8.8	288 38.2	20 31.5
10	264 19.1	167	3 49.9	-142	249 53.1	-3 9.0	318 42.5	20 31.4
12	293 30.5	167	3 21.4	-143	279 57.6	-3 9.3	348 46.7	20 31.3
14	322 41.9	167	2 52.8	-143	310 2.0	-3 9.5	18 51.0	20 31.1
16	351 53.2	167	2 24.2	-144	340 6.5	-3 9.7	48 55.2	20 31.0
18	21 4.6	166	1 55.5	-144	10 11.0	-3 9.9	78 59.5	20 30.9
20	50 15.8	166	1 26.7	-144	40 15.4	-3 10.1	109 3.8	20 30.8
22	79 27.0	166	0 57.8	-145	70 19.9	-3 10.4	139 8.0	20 30.6
Δ					22	-1	21	-1

SUNCE				MESEC					
UT	e = T <sub>p</sub> - UT	Δ/24	r	Prolaz	Δ/24	π <sub>♃</sub>	r		
h	min s	s / ' / "		h min	min	' / "	' / "		
00	- 5 34.6	-.3	15.8	T <sub>m</sub>	16 33	1.7	54.6	14.9	
12	- 5 38.3	T <sub>m☉</sub>	12 h 5.6 min	Starost	5.5 d	Faza	☉		
PLANETE									
Pl.	T <sub>m</sub>	π	360-α	Vel.	Pl.	T <sub>m</sub>	π	360-α	Vel.
♀	h min	' / "	°		♃	h min	' / "	°	
♂	13 59	.1	220	-3.8	♄	17 19	.0	170	-1.8
	5 58	.2	340	-.2	♅	12 45	.0	238	.3

UT	SUNCE		PROLEĆ. TAČKA S <sub>γ</sub>	VENERA		MARS	
	S <sub>☉</sub>	δ <sub>☉</sub>		S <sub>♀</sub>	δ <sub>♀</sub>	S <sub>♂</sub>	δ <sub>♂</sub>
h	° / ' / "	° / ' / "	° / ' / "	° / ' / "	° / ' / "	° / ' / "	° / ' / "
0	178 34.4	21 50.7	290 58.3	150 7.2	17 2.4	270 51.2	5 37.3
2	208 34.3	21 50.0	321 3.2	180 6.1	17 .5	300 53.1	5 38.4
4	238 34.2	21 49.2	351 8.1	210 5.1	16 58.6	330 55.1	5 39.5
6	268 34.0	21 48.5	21 13.1	240 4.0	16 56.8	0 57.0	5 40.7
8	298 33.9	21 47.8	51 18.0	270 2.9	16 54.9	30 59.0	5 41.8
10	328 33.7	21 47.0	81 22.9	300 1.8	16 53.0	61 1.0	5 43.0
12	358 33.6	21 46.3	111 27.8	330 .8	16 51.1	91 2.9	5 44.1
14	28 33.4	21 45.6	141 32.8	359 59.7	16 49.2	121 4.9	5 45.2
16	58 33.3	21 44.8	171 37.7	29 58.7	16 47.3	151 6.8	5 46.4
18	88 33.1	21 44.1	201 42.6	59 57.6	16 45.4	181 8.8	5 47.5
20	118 33.0	21 43.3	231 47.6	89 56.5	16 43.5	211 10.8	5 48.7
22	148 32.9	21 42.6	261 52.5	119 55.5	16 41.6	241 12.7	5 49.8
Δ	-1	-4		-5	-9	10	6

φ	SUNCE		TRAJANJE SUMRAKA		MESEC			
	IZLAZ	ZALAZ	GRAĐ.	ASTR.	IZLAZ	Δ/24	ZALAZ	Δ/24
N	h min	h min	h min	h min	h min	min	h min	min
60	2 60	21 10	1 20	:::	11 21	3.6	22 47	.0
55	3 38	20 32	0 53	:::	11 18	3.3	22 53	.3
50	4 5	20 6	0 42	3 31	11 15	3.0	22 58	.5
45	4 26	19 45	0 36	2 22	11 13	2.8	23 2	.7
40	4 42	19 29	0 32	1 58	11 12	2.6	23 6	.9
35	4 56	19 15	0 29	1 44	11 11	2.5	23 9	1.1
30	5 8	19 3	0 27	1 34	11 9	2.3	23 11	1.2
20	5 28	18 43	0 24	1 23	11 7	2.1	23 16	1.4
10	5 46	18 26	0 23	1 17	11 6	1.9	23 20	1.6
0	6 2	18 9	0 22	1 14	11 4	1.7	23 24	1.8
10	6 18	17 53	0 23	1 15	11 2	1.6	23 27	2.0
20	6 35	17 36	0 24	1 18	11 1	1.4	23 32	2.2
30	6 55	17 17	0 26	1 24	10 59	1.1	23 36	2.4
35	7 6	17 5	0 28	1 30	10 58	1.0	23 39	2.5
40	7 19	16 53	0 30	1 36	10 57	.9	23 42	2.7
45	7 35	16 37	0 33	1 45	10 55	.7	23 45	2.9
50	7 53	16 19	0 37	1 57	10 54	.5	23 49	3.1
55	8 17	15 54	0 44	2 14	10 52	.3	23 54	3.3
60	8 51	15 21	0 54	2 39	10 49	.0	...	.0
S								

UT	MESEC				JUPITER		SATURN	
	S <sub>♃</sub>	Δ	δ <sub>♃</sub>	Δ	S <sub>♃</sub>	δ <sub>♃</sub>	S <sub>♄</sub>	δ <sub>♄</sub>
h	° / ' / "	° / ' / "	° / ' / "	° / ' / "	° / ' / "	° / ' / "	° / ' / "	° / ' / "
0	108 38.2	165	0 28.9	-145	100 24.4	-3 10.6	169 12.3	20 30.5
2	137 49.3	165	0 .1	-145	130 28.8	-3 10.8	199 16.5	20 30.4
4	167 .2	164	0 29.1	-145	160 33.3	-3 11.0	229 20.8	20 30.2
6	196 11.1	164	0 58.1	-145	190 37.7	-3 11.2	259 25.0	20 30.1
8	225 21.9	163	-1 27.2	-146	220 42.2	-3 11.5	289 29.3	20 30.0
10	254 32.6	163	-1 56.4	-146	250 46.6	-3 11.7	319 33.6	20 29.9
12	283 43.1	162	-2 25.5	-146	280 51.1	-3 11.9	349 37.8	20 29.7
14	312 53.5	161	-2 54.7	-146	310 55.6	-3 12.1	19 42.1	20 29.6
16	342 3.7	160	-3 23.9	-146	341 .0	-3 12.3	49 46.3	20 29.5
18	11 13.8	160	-3 53.0	-146	11 4.5	-3 12.6	79 50.6	20 29.3
20	40 23.7	159	-4 22.2	-146	41 8.9	-3 12.8	109 54.8	20 29.2
22	69 33.4	158	-4 51.4	-146	71 13.4	-3 13.0	139 59.1	20 29.1
Δ					22	-1	21	-1

SUNCE				MESEC					
UT	e = T <sub>p</sub> - UT	Δ/24	r	Prolaz	Δ/24	π <sub>♃</sub>	r		
h	min s	s / ' / "		h min	min	' / "	' / "		
00	- 5 42.0	-.3	15.8	T <sub>m</sub>	17 14	1.7	55.1	15.0	
12	- 5 45.5	T <sub>m☉</sub>	12 h 5.8 min	Starost	6.5 d	Faza	☉		
PLANETE									
Pl.	T <sub>m</sub>	π	360-α	Vel.	Pl.	T <sub>m</sub>	π	360-α	Vel.
♀	h min	' / "	°		♃	h min	' / "	°	
♂	14 0	.1	219	-3.8	♄	17 16	.0	169	-1.8
	5 56	.2	340	-.2	♅	12 41	.0	238	.4

UT	SUNCE		PROLEĆ. TAČKA S <sub>γ</sub>	VENERA		MARS	
	S <sub>☉</sub>	δ <sub>☉</sub>		S <sub>♀</sub>	δ <sub>♀</sub>	S <sub>♂</sub>	δ <sub>♂</sub>
h	° / ' / "	° / ' / "	° / ' / "	° / ' / "	° / ' / "	° / ' / "	° / ' / "
0	178 32.7	21 41.8	291 57.4	149 54.4	16 39.6	271 14.7	5 50.9
2	208 32.6	21 41.1	322 2.3	179 53.4	16 37.7	301 16.7	5 52.1
4	238 32.4	21 40.3	352 7.3	209 52.3	16 35.8	331 18.6	5 53.2
6	268 32.3	21 39.6	22 12.2	239 51.3	16 33.9	1 20.6	5 54.3
8	298 32.2	21 38.8	52 17.1	269 50.2	16 31.9	31 22.6	5 55.5
10	328 32.0	21 38.0	82 22.1	299 49.2	16 30.0	61 24.5	5 56.6
12	358 31.9	21 37.3	112 27.0	329 48.2	16 28.1	91 26.5	5 57.7
14	28 31.8	21 36.5	142 31.9	359 47.1	16 26.1	121 28.5	5 58.9
16	58 31.6	21 35.7	172 36.8	29 46.1	16 24.2	151 30.5	5 60.0
18	88 31.5	21 34.9	202 41.8	59 45.1	16 22.3	181 32.4	6 1.1
20	118 31.4	21 34.2	232 46.7	89 44.0	16 20.3	211 34.4	6 2.3
22	148 31.2	21 33.4	262 51.6	119 43.0	16 18.4	241 36.4	6 3.4
Δ	-1	-4		-5	-10	10	6

φ	SUNCE		TRAJANJE SUMRAKA		MESEC			
	IZLAZ	ZALAZ	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	21 9	1 19	:	12 47	3.9	22 46	.0
55	3 40	20 31	0 53	:	12 36	3.5	23 0	.4
50	4 6	20 5	0 42	3 25	12 27	3.2	23 11	.7
45	4 27	19 45	0 36	2 21	12 21	2.9	23 20	.9
40	4 43	19 28	0 32	1 57	12 15	2.8	23 28	1.1
35	4 57	19 15	0 29	1 43	12 10	2.6	23 34	1.2
30	5 9	19 3	0 27	1 34	12 6	2.5	23 40	1.3
20	5 29	18 43	0 24	1 22	11 58	2.2	23 50	1.6
10	5 46	18 26	0 23	1 16	11 52	2.0	23 58	1.7
0	6 2	18 9	0 22	1 14	11 46	1.9	...	.0
10	6 18	17 54	0 23	1 14	11 40	1.7	...	.0
20	6 35	17 37	0 24	1 18	11 33	1.5	...	.0
30	6 55	17 17	0 26	1 24	11 26	1.3	...	.0
35	7 6	17 6	0 28	1 29	11 22	1.1	...	.0
40	7 19	16 53	0 30	1 36	11 18	1.0	...	.0
45	7 34	16 38	0 33	1 45	11 12	.8	...	.0
50	7 52	16 20	0 37	1 57	11 6	.6	...	.0
55	8 16	15 56	0 44	2 14	10 58	.3	...	.0
60	8 50	15 22	0 54	2 39	10 48	.0	0 2	3.7

UT	MESEC				JUPITER		SATURN		
	S <sub>♃</sub>	Δ	δ <sub>♃</sub>	Δ	S <sub>♃</sub>	δ <sub>♃</sub>	S <sub>♄</sub>	δ <sub>♄</sub>	
h	° / ' / "	° / ' / "	° / ' / "	° / ' / "	° / ' / "	° / ' / "	° / ' / "	° / ' / "	
0	98 42.9	157 - 5	20.6	-146	101 17.8	- 3	13.2	170 3.4	20 29.0
2	127 52.3	156 - 5	49.7	-146	131 22.3	- 3	13.5	200 7.6	20 28.8
4	157 1.4	154 - 6	18.8	-145	161 26.7	- 3	13.7	230 11.9	20 28.7
6	186 10.3	153 - 6	47.9	-145	191 31.2	- 3	13.9	260 16.1	20 28.6
8	215 18.9	152 - 7	16.9	-145	221 35.6	- 3	14.1	290 20.4	20 28.5
10	244 27.3	151 - 7	45.9	-145	251 40.1	- 3	14.4	320 24.6	20 28.3
12	273 35.5	149 - 8	14.8	-144	281 44.5	- 3	14.6	350 28.9	20 28.2
14	302 43.4	148 - 8	43.6	-144	311 48.9	- 3	14.8	20 33.1	20 28.1
16	331 51.0	147 - 9	12.4	-143	341 53.4	- 3	15.0	50 37.4	20 27.9
18	0 58.3	145 - 9	41.1	-143	11 57.8	- 3	15.3	80 41.7	20 27.8
20	30 5.3	143 -10	9.7	-142	42 2.3	- 3	15.5	110 45.9	20 27.7
22	59 12.0	142 -10	38.2	-142	72 6.7	- 3	15.7	140 50.2	20 27.5
Δ					22	-1	21	-1	

SUNCE				MESEC			
UT	e = T <sub>p</sub> - UT	Δ/24	r	Prolaz	Δ/24	π <sub>☉</sub>	r
h	min s	s	'	h min	min	'	'
00	- 5 49.0	-.3	15.8	T <sub>m</sub>	17 56	1.9	55.7 15.2
12	- 5 52.2	T <sub>m☉</sub>	12 h 5.9 min	Starost	7.5 d	Faza	☉

PLANETE									
Pl.	T <sub>m</sub>	π	360-α	Vel.	Pl.	T <sub>m</sub>	π	360-α	Vel.
☉	h min	'	°		♃	h min	'	°	
♃	14 1	.1	218	-3.8	♄	17 12	.0	169	-1.8
♄	5 55	.2	339	-.2	♅	12 38	.0	238	.4

UT	SUNCE		PROLEĆ. TAČKA S <sub>γ</sub>	VENERA		MARS	
	S <sub>☉</sub>	δ <sub>☉</sub>		S <sub>♀</sub>	δ <sub>♀</sub>	S <sub>♂</sub>	δ <sub>♂</sub>
h	° / ' / "	° / ' / "	° / ' / "	° / ' / "	° / ' / "	° / ' / "	° / ' / "
0	178 31.1	21 32.6	292 56.6	149 42.0	16 16.4	271 38.4	6 4.5
2	208 31.0	21 31.8	323 1.5	179 41.0	16 14.5	301 40.3	6 5.6
4	238 30.8	21 31.0	353 6.4	209 39.9	16 12.5	331 42.3	6 6.8
6	268 30.7	21 30.2	23 11.3	239 38.9	16 10.6	1 44.3	6 7.9
8	298 30.6	21 29.4	53 16.3	269 37.9	16 8.6	31 46.3	6 9.0
10	328 30.5	21 28.6	83 21.2	299 36.9	16 6.6	61 48.3	6 10.1
12	358 30.3	21 27.8	113 26.1	329 35.9	16 4.7	91 50.2	6 11.3
14	28 30.2	21 27.0	143 31.1	359 34.9	16 2.7	121 52.2	6 12.4
16	58 30.1	21 26.2	173 36.0	29 33.9	16 .7	151 54.2	6 13.5
18	88 30.0	21 25.4	203 40.9	59 32.9	15 58.7	181 56.2	6 14.6
20	118 29.9	21 24.6	233 45.8	89 31.9	15 56.8	211 58.2	6 15.7
22	148 29.7	21 23.8	263 50.8	119 30.9	15 54.8	242 .2	6 16.9
Δ	-1	-4		-5	-10	10	6

φ	SUNCE		TRAJANJE SUMRAKA		MESEC			
	IZLAZ	ZALAZ	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 4	21 7	1 17	:	14 20	4.2	22 46	.1
55	3 41	20 30	0 52	:	13 59	3.7	23 9	.5
50	4 7	20 4	0 42	3 20	13 43	3.4	23 27	.9
45	4 28	19 44	0 36	2 20	13 31	3.1	23 41	1.1
40	4 44	19 28	0 32	1 57	13 21	2.9	23 53	1.3
35	4 57	19 14	0 29	1 43	13 12	2.8	...	.0
30	5 9	19 3	0 27	1 34	13 5	2.6	...	.0
20	5 29	18 43	0 24	1 22	12 52	2.4	...	.0
10	5 46	18 26	0 23	1 16	12 41	2.2	...	.0
0	6 2	18 10	0 22	1 14	12 30	2.0	0 6	1.9
10	6 18	17 54	0 23	1 14	12 20	1.9	0 15	2.1
20	6 35	17 37	0 24	1 18	12 9	1.7	0 24	2.3
30	6 54	17 18	0 26	1 24	11 56	1.4	0 34	2.5
35	7 5	17 7	0 28	1 29	11 49	1.3	0 40	2.7
40	7 18	16 54	0 30	1 36	11 41	1.2	0 46	2.8
45	7 33	16 39	0 33	1 45	11 32	1.0	0 54	3.0
50	7 52	16 21	0 37	1 57	11 20	.8	1 4	3.3
55	8 15	15 57	0 43	2 13	11 7	.5	1 16	3.6
60	8 48	15 24	0 54	2 38	10 48	.0	1 31	4.0

UT	MESEC				JUPITER		SATURN		
	S <sub>♃</sub>	Δ	δ <sub>♃</sub>	Δ	S <sub>♃</sub>	δ <sub>♃</sub>	S <sub>♄</sub>	δ <sub>♄</sub>	
h	° / ' / "	° / ' / "	° / ' / "	° / ' / "	° / ' / "	° / ' / "	° / ' / "	° / ' / "	
0	88 18.3	140 -11	6.6	-141	102 11.1	- 3	15.9	170 54.4	20 27.4
2	117 24.4	138 -11	34.8	-141	132 15.6	- 3	16.2	200 58.7	20 27.3
4	146 30.0	137 -12	3.0	-140	162 20.0	- 3	16.4	231 2.9	20 27.2
6	175 35.4	135 -12	31.0	-139	192 24.5	- 3	16.6	261 7.2	20 27.0
8	204 40.3	133 -12	58.8	-138	222 28.9	- 3	16.9	291 11.4	20 26.9
10	233 44.9	131 -13	26.5	-138	252 33.3	- 3	17.1	321 15.7	20 26.8
12	262 49.1	129 -13	54.0	-137	282 37.8	- 3	17.3	351 20.0	20 26.6
14	291 52.9	127 -14	21.4	-136	312 42.2	- 3	17.5	21 24.2	20 26.5
16	320 56.2	125 -14	48.5	-135	342 46.6	- 3	17.8	51 28.5	20 26.4
18	349 59.2	123 -15	15.5	-134	12 51.1	- 3	18.0	81 32.7	20 26.3
20	19 1.7	120 -15	42.2	-133	42 55.5	- 3	18.2	111 37.0	20 26.1
22	48 3.8	118 -16	8.7	-131	72 59.9	- 3	18.5	141 41.2	20 26.0
Δ					22	-1	21	-1	

SUNCE				MESEC			
UT	e = T <sub>p</sub> - UT	Δ/24	r	Prolaz	Δ/24	π <sub>☉</sub>	r
h	min s	s	'	h min	min	'	'
00	- 5 55.4	-.2	15.8	T <sub>m</sub>	18 41	2.1	56.5 15.4
12	- 5 58.4	T <sub>m☉</sub>	12 h 6.0 min	Starost	8.5 d	Faza	☉

PLANETE									
Pl.	T <sub>m</sub>	π	360-α	Vel.	Pl.	T <sub>m</sub>	π	360-α	Vel.
☉	h min	'	°		♃	h min	'	°	
♃	14 2	.1	217	-3.8	♄	17 9	.0	169	-1.8
♄	5 53	.2	339	-.2	♅	12 35	.0	238	.4

UT	SUNCE				PROLEĆ. TAČKA S <sub>γ</sub>	VENERA				MARS				
	S <sub>☉</sub>		δ <sub>☉</sub>			S <sub>♀</sub>		δ <sub>♀</sub>		S <sub>♂</sub>		δ <sub>♂</sub>		
h	°	'	°	'	°	'	°	'	°	'	°	'		
0	178	29.6	21	23.0	293	55.7	149	29.9	15	52.8	272	2.2	6	18.0
2	208	29.5	21	22.2	324	.6	179	28.9	15	50.8	302	4.1	6	19.1
4	238	29.4	21	21.4	354	5.6	209	27.9	15	48.8	332	6.1	6	20.2
6	268	29.3	21	20.5	24	10.5	239	26.9	15	46.8	2	8.1	6	21.3
8	298	29.2	21	19.7	54	15.4	269	25.9	15	44.8	32	10.1	6	22.4
10	328	29.0	21	18.9	84	20.3	299	24.9	15	42.8	62	12.1	6	23.6
12	358	28.9	21	18.1	114	25.3	329	23.9	15	40.8	92	14.1	6	24.7
14	28	28.8	21	17.2	144	30.2	359	22.9	15	38.8	122	16.1	6	25.8
16	58	28.7	21	16.4	174	35.1	29	22.0	15	36.8	152	18.1	6	26.9
18	88	28.6	21	15.6	204	40.0	59	21.0	15	34.8	182	20.1	6	28.0
20	118	28.5	21	14.7	234	45.0	89	20.0	15	32.8	212	22.1	6	29.1
22	148	28.4	21	13.9	264	49.9	119	19.0	15	30.8	242	24.1	6	30.2
Δ		-1		-4				-5		-10		10		6

φ	SUNCE				TRAJANJE SUMRAKA				MESEC							
	IZLAZ		ZALAZ		GRAĐ.		ASTR.		IZLAZ		Δ/24		ZALAZ		Δ/24	
N	h	min	h	min	h	min	h	min	h	min	min	h	min	min	h	min
60	3	6	21	5	1	16	:	:	:	16	1	4.6	22	47	.	2
55	3	43	20	29	0	52	:	:	:	15	28	3.9	23	22	.	9
50	4	9	20	3	0	42	:	:	:	15	4	3.5	23	48	.	1.2
45	4	28	19	43	0	36	2	19	14	46	3.3	...	...	.	0	
40	4	44	19	27	0	32	1	56	14	31	3.1	...	...	.	0	
35	4	58	19	14	0	29	1	43	14	19	2.9	0	3	.	1.4	
30	5	10	19	2	0	27	1	33	14	8	2.8	0	12	.	1.6	
20	5	29	18	43	0	24	1	22	13	50	2.6	0	27	.	1.8	
10	5	47	18	25	0	23	1	16	13	34	2.4	0	40	.	2.0	
0	6	2	18	10	0	22	1	14	13	19	2.3	0	53	.	2.1	
10	6	18	17	54	0	22	1	14	13	4	2.1	1	5	.	2.3	
20	6	35	17	37	0	24	1	18	12	49	1.9	1	19	.	2.5	
30	6	54	17	18	0	26	1	24	12	31	1.7	1	35	.	2.7	
35	7	5	17	7	0	28	1	29	12	21	1.6	1	44	.	2.8	
40	7	18	16	55	0	30	1	36	12	9	1.5	1	54	.	3.0	
45	7	33	16	40	0	33	1	45	11	55	1.3	2	7	.	3.2	
50	7	51	16	22	0	37	1	56	11	39	1.0	2	22	.	3.4	
55	8	14	15	58	0	43	2	13	11	18	.7	2	41	.	3.8	
60	8	47	15	26	0	53	2	38	10	49	.2	3	7	.	4.4	

UT	MESEC				JUPITER				SATURN							
	S <sub>♃</sub>		Δ		δ <sub>♃</sub>		Δ		S <sub>♃</sub>		δ <sub>♃</sub>		S <sub>♄</sub>		δ <sub>♄</sub>	
h	°	'	°	'	°	'	°	'	°	'	°	'	°	'	°	'
0	77	5.4	116	-16	35.0	-130	103	4.3	-3	18.7	171	45.5	20	25.9		
2	106	6.5	113	-17	1.0	-129	133	8.8	-3	18.9	201	49.7	20	25.7		
4	135	7.2	111	-17	26.8	-127	163	13.2	-3	19.2	231	54.0	20	25.6		
6	164	7.4	108	-17	52.3	-126	193	17.6	-3	19.4	261	58.3	20	25.5		
8	193	7.1	106	-18	17.5	-125	223	22.1	-3	19.6	292	2.5	20	25.3		
10	222	6.3	103	-18	42.4	-123	253	26.5	-3	19.9	322	6.8	20	25.2		
12	251	4.9	101	-19	7.0	-121	283	30.9	-3	20.1	352	11.0	20	25.1		
14	280	3.1	98	-19	31.2	-120	313	35.3	-3	20.3	22	15.3	20	25.0		
16	309	.7	96	-19	55.1	-118	343	39.7	-3	20.6	52	19.5	20	24.8		
18	337	57.9	93	-20	18.7	-116	13	44.2	-3	20.8	82	23.8	20	24.7		
20	6	54.4	90	-20	41.9	-114	43	48.6	-3	21.0	112	28.0	20	24.6		
22	35	50.4	87	-21	4.7	-112	73	53.0	-3	21.3	142	32.3	20	24.4		
Δ							22		-1		21			-1		

SUNCE				MESEC					
UT	e = T <sub>p</sub> - UT	Δ/24	r	Prolaz	Δ/24	π <sub>♃</sub>	r		
h	min	s	s	h	min	min	'	'	
00	-6	1.4	-.2	15.8	T <sub>m</sub>	19 31	2.3	57.4	15.6
12	-6	4.1	T <sub>m☉</sub>	12 h 6.1 min	Starost	9.5 d	Faza	☉	

PLANETE											
Pl.	T <sub>m</sub>	π	360-α	Vel.	Pl.	T <sub>m</sub>	π	360-α	Vel.		
h	min	'	°	°	h	min	'	°	°		
♀	14	2	.1	216	-3.8	♃	17	5	.0	169	-1.8
♂	5	51	.2	338	-.2	♄	12	31	.0	238	.4

UT	SUNCE				PROLEĆ. TAČKA S <sub>γ</sub>	VENERA				MARS				
	S <sub>☉</sub>		δ <sub>☉</sub>			S <sub>♀</sub>		δ <sub>♀</sub>		S <sub>♂</sub>		δ <sub>♂</sub>		
h	°	'	°	'	°	'	°	'	°	'	°	'		
0	178	28.3	21	13.0	294	54.8	149	18.1	15	28.8	272	26.1	6	31.3
2	208	28.2	21	12.2	324	59.8	179	17.1	15	26.7	302	28.1	6	32.4
4	238	28.1	21	11.3	355	4.7	209	16.1	15	24.7	332	30.1	6	33.5
6	268	28.0	21	10.5	25	9.6	239	15.2	15	22.7	2	32.1	6	34.7
8	298	27.8	21	9.6	55	14.5	269	14.2	15	20.7	32	34.1	6	35.8
10	328	27.7	21	8.8	85	19.5	299	13.2	15	18.6	62	36.1	6	36.9
12	358	27.6	21	7.9	115	24.4	329	12.3	15	16.6	92	38.1	6	38.0
14	28	27.5	21	7.1	145	29.3	359	11.3	15	14.5	122	40.1	6	39.1
16	58	27.4	21	6.2	175	34.3	29	10.4	15	12.5	152	42.1	6	40.2
18	88	27.3	21	5.3	205	39.2	59	9.4	15	10.5	182	44.1	6	41.3
20	118	27.2	21	4.5	235	44.1	89	8.5	15	8.4	212	46.1	6	42.4
22	148	27.1	21	3.6	265	49.0	119	7.5	15	6.4	242	48.1	6	43.5
Δ		-1		-4				-5		-10		10		6

φ	SUNCE				TRAJANJE SUMRAKA				MESEC							
	IZLAZ		ZALAZ		GRAĐ.		ASTR.		IZLAZ		Δ/24		ZALAZ		Δ/24	
N	h	min	h	min	h	min	h	min	h	min	min	h	min	min	h	min
60	3	8	21	3	1	15	:	:	:	17	50	4.7	22	52	.	7
55	3	44	20	27	0	52	:	:	:	17	1	3.8	23	43	.	1.5
50	4	10	20	2	0	42	3	12	16	29	3.5	...	...	.	0	
45	4	29	19	42	0	36	2	18	16	4	3.3	0	8	.	1.5	
40	4	45	19	27	0	32	1	56	15	45	3.1	0	24	.	1.6	
35	4	59	19	13	0	29	1	42	15	29	3.0	0	37	.	1.8	
30	5	10	19	2	0	27	1	33	15	15	2.9	0	49	.	1.9	
20	5	30	18	42	0	24	1	22	14	52	2.8	1	10	.	2.1	
10	5	47	18	25	0	23	1	16	14	32	2.6	1	27	.	2.2	
0	6	3	18	10	0	22	1	14	14	13	2.5	1	44	.	2.4	
10	6	18	17	54	0	22	1	14	13	55	2.4	2	1	.	2.5	
20	6	35	17	38	0	24	1	17	13	35	2.3	2	19	.	2.7	
30	6	54	17	19	0	26	1	24	13	12	2.1	2	40	.	2.9	
35	7	5	17	8	0	28	1	29	12	59	2.0	2	52	.	3.0	
40	7	17	16	56	0	30	1	36	12	44	1.9	3	6	.	3.1	
45	7	32	16	41	0	33	1	44	12	26	1.7	3	23	.	3.3	
50	7	50	16	23	0	37	1	56	12	4	1.5	3	44	.	3.5	
55	8	13	15	60	0	43	2	13	11	35	1.2	4	12	.	3.9	
60	8	45	15	28	0	53	2	37	10	53	.5	4	52	.	4.6	

UT	MESEC				JUPITER				SATURN							
	S <sub>♃</sub>		Δ		δ <sub>♃</sub>		Δ		S <sub>♃</sub>		δ <sub>♃</sub>		S <sub>♄</sub>		δ <sub>♄</sub>	
h	°	'	°	'	°	'	°	'	°	'	°	'	°	'	°	'
0	64	45.9	85	-21	27.1	-110	103	57.4	-3	21.5	172	36.6	20	24.3		
2	93	40.8	82	-21	49.1	-108	134	1.8	-3	21.8	202	40.8	20	24.2		
4	122	35.2	79	-22	10.6	-105	164	6.3	-3	22.0	232	45.1	20	24.0		
6	151	29.0	76	-22	31.7	-103	194	10.7	-3	22.2	262	49.3	20	23.9		
8	180	22.2	73	-22	52.3	-101	224	15.1	-3	22.5						

UT	SUNCE				PROLEĆ. TAČKA S <sub>γ</sub>	VENERA				MARS					
	S <sub>☉</sub>		δ <sub>☉</sub>			S <sub>♀</sub>		δ <sub>♀</sub>		S <sub>♂</sub>		δ <sub>♂</sub>			
h	°	'	°	'	°	'	°	'	°	'	°	'			
0	178	27.1	21	2.7	295	54.0	149	6.6	15	4.3	272	50.1	6	44.6	
2	208	27.0	21	1.8	325	58.9	179	5.6	15	2.3	302	52.2	6	45.7	
4	238	26.9	21	1.0	356	3.8	209	4.7	15	.2	332	54.2	6	46.8	
6	268	26.8	21	.1	26	8.8	239	3.8	14	58.1	2	56.2	6	47.9	
8	298	26.7	20	59.2	56	13.7	269	2.8	14	56.1	32	58.2	6	49.0	
10	328	26.6	20	58.3	86	18.6	299	1.9	14	54.0	63	.2	6	50.1	
12	358	26.5	20	57.4	116	23.5	329	1.0	14	52.0	93	2.2	6	51.2	
14	28	26.4	20	56.5	146	28.5	359	.0	14	49.9	123	4.3	6	52.3	
16	58	26.3	20	55.6	176	33.4	28	59.1	14	47.8	153	6.3	6	53.3	
18	88	26.2	20	54.7	206	38.3	58	58.2	14	45.7	183	8.3	6	54.4	
20	118	26.1	20	53.8	236	43.3	88	57.3	14	43.7	213	10.3	6	55.5	
22	148	26.1	20	52.9	266	48.2	118	56.3	14	41.6	243	12.3	6	56.6	
Δ		0		-4				-5		-10		10			5

φ	SUNCE		TRAJANJE SUMRAKA		MESEC			
	IZLAZ	ZALAZ	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	21 1	1 14	:::	19 42	3.6	23 9	2.2
55	3 46	20 26	0 51	:::	18 33	3.2	.. .	.0
50	4 11	20 1	0 41	3 8	17 52	3.1	0 18	1.8
45	4 30	19 42	0 35	2 17	17 23	3.0	0 43	2.0
40	4 46	19 26	0 32	1 55	17 0	3.0	1 3	2.1
35	4 59	19 13	0 29	1 42	16 42	2.9	1 20	2.2
30	5 11	19 1	0 27	1 33	16 25	2.9	1 34	2.3
20	5 30	18 42	0 24	1 22	15 58	2.8	1 59	2.4
10	5 47	18 25	0 23	1 16	15 35	2.8	2 21	2.5
0	6 3	18 10	0 22	1 14	15 13	2.7	2 41	2.6
10	6 18	17 54	0 22	1 14	14 52	2.7	3 2	2.7
20	6 35	17 38	0 24	1 17	14 29	2.6	3 23	2.8
30	6 53	17 19	0 26	1 24	14 2	2.5	3 49	2.9
35	7 4	17 9	0 27	1 29	13 47	2.5	4 4	3.0
40	7 16	16 56	0 30	1 35	13 29	2.4	4 21	3.1
45	7 31	16 42	0 33	1 44	13 7	2.3	4 42	3.2
50	7 49	16 24	0 37	1 56	12 40	2.2	5 9	3.3
55	8 12	16 1	0 43	2 12	12 3	2.0	5 45	3.6
60	8 43	15 30	0 53	2 37	11 4	1.3	6 42	4.2
S								

UT	MESEC				JUPITER		SATURN								
	S <sub>♃</sub>	Δ	δ <sub>♃</sub>	Δ	S <sub>♃</sub>	δ <sub>♃</sub>	S <sub>♄</sub>	δ <sub>♄</sub>							
h	°	'	°	'	°	'	°	'							
0	51	7.8	51	-25	18.6	-78	104	50.4	-3	24.4	173	27.6	20	22.7	
2	79	55.9	48	-25	34.3	-75	134	54.8	-3	24.6	203	31.9	20	22.6	
4	108	43.6	46	-25	49.3	-72	164	59.2	-3	24.9	233	36.1	20	22.5	
6	137	30.7	43	-26	3.7	-69	195	3.6	-3	25.1	263	40.4	20	22.3	
8	166	17.3	40	-26	17.5	-65	225	8.0	-3	25.3	293	44.6	20	22.2	
10	195	3.4	38	-26	30.5	-62	255	12.4	-3	25.6	323	48.9	20	22.1	
12	223	48.9	35	-26	42.9	-58	285	16.8	-3	25.8	353	53.1	20	22.0	
14	252	34.0	33	-26	54.6	-55	315	21.2	-3	26.1	23	57.4	20	21.8	
16	281	18.7	31	-27	5.5	-51	345	25.6	-3	26.3	54	1.6	20	21.7	
18	310	2.8	29	-27	15.7	-47	15	30.0	-3	26.6	84	5.9	20	21.6	
20	338	46.6	27	-27	25.2	-43	45	34.4	-3	26.8	114	10.2	20	21.4	
22	7	29.9	25	-27	33.8	-40	75	38.8	-3	27.0	144	14.4	20	21.3	
Δ								22		-1		21			-1

SUNCE				MESEC					
UT	e = T <sub>p</sub> - UT	Δ/24	r	Prolaz	Δ/24	π <sub>♃</sub>	r		
h	min	s	s	h min	min	'	'		
00	- 6 11.6	-.2	15.8	T <sub>m</sub>	21 29	2.8	59.3	16.2	
12	- 6 13.8	T <sub>m☉</sub>	12 h 6.2 min	Starost	11.5 d	Faza	☉		
PLANETE									
Pl.	T <sub>m</sub>	π	360-α	Vel.	Pl.	T <sub>m</sub>	π	360-α	Vel.
♀	h min	'	°		♃	h min	'	°	
♂	14 4	.1	213	-3.8	♄	16 58	.0	169	-1.8
	5 48	.2	337	-.3	♅	12 24	.0	238	.4

UT	SUNCE				PROLEĆ. TAČKA S <sub>γ</sub>	VENERA				MARS					
	S <sub>☉</sub>		δ <sub>☉</sub>			S <sub>♀</sub>		δ <sub>♀</sub>		S <sub>♂</sub>		δ <sub>♂</sub>			
h	°	'	°	'	°	'	°	'	°	'	°	'			
0	178	26.0	20	52.0	296	53.1	148	55.4	14	39.5	273	14.4	6	57.7	
2	208	25.9	20	51.1	326	58.0	178	54.5	14	37.4	303	16.4	6	58.8	
4	238	25.8	20	50.2	357	3.0	208	53.6	14	35.3	333	18.4	6	59.9	
6	268	25.7	20	49.3	27	7.9	238	52.7	14	33.2	3	20.4	7	1.0	
8	298	25.6	20	48.4	57	12.8	268	51.8	14	31.1	33	22.5	7	2.1	
10	328	25.6	20	47.5	87	17.8	298	50.9	14	29.0	63	24.5	7	3.1	
12	358	25.5	20	46.6	117	22.7	328	50.0	14	26.9	93	26.5	7	4.2	
14	28	25.4	20	45.7	147	27.6	358	49.1	14	24.8	123	28.5	7	5.3	
16	58	25.3	20	44.7	177	32.5	28	48.2	14	22.7	153	30.6	7	6.4	
18	88	25.3	20	43.8	207	37.5	58	47.3	14	20.6	183	32.6	7	7.5	
20	118	25.2	20	42.9	237	42.4	88	46.4	14	18.5	213	34.6	7	8.6	
22	148	25.1	20	42.0	267	47.3	118	45.5	14	16.4	243	36.7	7	9.6	
Δ		0		-5				-5		-10		10			5

φ	SUNCE		TRAJANJE SUMRAKA		MESEC			
	IZLAZ	ZALAZ	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 60	1 12	:::	21 9	1.5	.. .	.0
55	3 47	20 25	0 51	:::	19 50	2.2	0 20	2.5
50	4 12	19 60	0 41	3 5	19 6	2.4	1 1	2.6
45	4 31	19 41	0 35	2 16	18 35	2.5	1 31	2.7
40	4 47	19 25	0 31	1 55	18 11	2.5	1 54	2.7
35	4 60	19 12	0 29	1 42	17 51	2.6	2 13	2.7
30	5 11	19 1	0 27	1 33	17 34	2.6	2 30	2.7
20	5 31	18 42	0 24	1 22	17 6	2.7	2 58	2.7
10	5 47	18 25	0 23	1 16	16 41	2.8	3 22	2.8
0	6 3	18 10	0 22	1 14	16 19	2.8	3 44	2.8
10	6 18	17 55	0 22	1 14	15 56	2.8	4 6	2.8
20	6 34	17 38	0 24	1 17	15 31	2.9	4 31	2.8
30	6 53	17 20	0 26	1 24	15 3	2.9	4 59	2.8
35	7 4	17 9	0 27	1 29	14 46	2.9	5 15	2.8
40	7 16	16 57	0 30	1 35	14 27	3.0	5 34	2.8
45	7 30	16 43	0 33	1 44	14 3	3.0	5 58	2.8
50	7 48	16 25	0 37	1 56	13 33	3.1	6 28	2.7
55	8 10	16 3	0 43	2 12	12 51	3.1	7 10	2.7
60	8 42	15 32	0 52	2 36	11 37	3.3	8 24	2.5
S								

UT	MESEC				JUPITER		SATURN								
	S <sub>♃</sub>	Δ	δ <sub>♃</sub>	Δ	S <sub>♃</sub>	δ <sub>♃</sub>	S <sub>♄</sub>	δ <sub>♄</sub>							
h	°	'	°	'	°	'	°	'							
0	36	12.8	23	-27	41.7	-36	105	43.2	-3	27.3	174	18.7	20	21.2	
2	64	55.3	21	-27	48.8	-32	135	47.6	-3	27.5	204	22.9	20	21.0	
4	93	37.5	19	-27	55.1	-27	165	52.0	-3	27.8	234	27.2	20	20.9	
6	122	19.3	18	-28	.6	-23	195	56.4	-3	28.0	264	31.4	20	20.8	
8	151	.9	16	-28	5.3	-19	226	.8	-3	28.3	294	35.7	20	20.6	
10	179	42.1	15	-28	9.1	-15	256	5.2	-3	28.5	324	39.9	20	20.5	
12	208	23.1	14	-28	12.1	-11	286	9.6	-3	28.8	354	44.2	20	20.4	
14	237	3.8	13	-28	14.2	-6	316	14.0	-3	29.0	24	48.4	20	20.2	
16	265	44.3	12	-28	15.5	-2	346	18.4	-3	29.3	54	52.7	20	20.1	
18	294	24.7	11	-28	15.9	2	16	22.7	-3	29.5	84	57.0	20	20.0	
20	323	4.9	10	-28	15.4	7	46	27.1	-3	29.8	115	1.2	20	19.9	
22	351	44.9	10	-28	14.0	11	76	31.5	-3	30.0	145	5.5	20	19.7	
Δ								22		-1		21			-1

SUNCE				MESEC				
UT	e = T <sub>p</sub> - UT	Δ/24	r	Prolaz	Δ/24	π <sub>♃</sub>	r	
h	min	s	s	h min	min	'	'	
00	- 6 15.9	-.2	15.8	T <sub>m</sub>	22 35	2.7	60.2	16.4
12	- 6 17.8	T <sub>m☉</sub>	12 h 6.					



UT	SUNCE		PROLEĆ. TAČKA S <sub>γ</sub>	VENERA		MARS	
	S <sub>☉</sub>	δ <sub>☉</sub>		S <sub>♀</sub>	δ <sub>♀</sub>	S <sub>♂</sub>	δ <sub>♂</sub>
h	° / ' / "	° / ' / "	° / ' / "	° / ' / "	° / ' / "	° / ' / "	° / ' / "
0	178 25.0	20 41.0	297 52.3	148 44.6	14 14.3	273 38.7	7 10.7
2	208 25.0	20 40.1	327 57.2	178 43.7	14 12.2	303 40.7	7 11.8
4	238 24.9	20 39.2	358 2.1	208 42.8	14 10.1	333 42.8	7 12.9
6	268 24.8	20 38.2	28 7.0	238 41.9	14 7.9	3 44.8	7 14.0
8	298 24.8	20 37.3	58 12.0	268 41.0	14 5.8	33 46.9	7 15.0
10	328 24.7	20 36.3	88 16.9	298 40.1	14 3.7	63 48.9	7 16.1
12	358 24.6	20 35.4	118 21.8	328 39.3	14 1.6	93 50.9	7 17.2
14	28 24.6	20 34.4	148 26.7	358 38.4	13 59.4	123 53.0	7 18.3
16	58 24.5	20 33.5	178 31.7	28 37.5	13 57.3	153 55.0	7 19.3
18	88 24.4	20 32.5	208 36.6	58 36.6	13 55.2	183 57.1	7 20.4
20	118 24.4	20 31.6	238 41.5	88 35.8	13 53.0	213 59.1	7 21.5
22	148 24.3	20 30.6	268 46.5	118 34.9	13 50.9	244 1.2	7 22.6
Δ	0	-5		-4	-11	10	5

UT	MESEC				JUPITER		SATURN	
	S <sub>♃</sub>	Δ	δ <sub>♃</sub>	Δ	S <sub>♃</sub>	δ <sub>♃</sub>	S <sub>♄</sub>	δ <sub>♄</sub>
h	° / ' / "	° / ' / "	° / ' / "	° / ' / "	° / ' / "	° / ' / "	° / ' / "	° / ' / "
0	20 24.9	9 -28	11.8	16	106 35.9	-3 30.2	175 9.7	20 19.6
2	49 4.8	9 -28	8.7	20	136 40.3	-3 30.5	205 14.0	20 19.5
4	77 44.6	9 -28	4.7	24	166 44.7	-3 30.7	235 18.2	20 19.3
6	106 24.5	9 -27	59.8	29	196 49.1	-3 31.0	265 22.5	20 19.2
8	135 4.3	10 -27	54.1	33	226 53.5	-3 31.2	295 26.7	20 19.1
10	163 44.2	10 -27	47.4	38	256 57.8	-3 31.5	325 31.0	20 18.9
12	192 24.2	10 -27	39.9	42	287 2.2	-3 31.7	355 35.2	20 18.8
14	221 4.3	11 -27	31.5	46	317 6.6	-3 32.0	25 39.5	20 18.7
16	249 44.5	12 -27	22.3	51	347 11.0	-3 32.2	55 43.8	20 18.5
18	278 24.8	13 -27	12.2	55	17 15.4	-3 32.5	85 48.0	20 18.4
20	307 5.4	14 -27	1.2	59	47 19.7	-3 32.7	115 52.3	20 18.3
22	335 46.1	15 -26	49.4	63	77 24.1	-3 33.0	145 56.5	20 18.1
Δ					22	-1	21	-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	3 14	20 58	1 11	:::	21 44	.4	0 1	4.4
55	3 49	20 23	0 51	:::	20 42	1.3	1 20	3.7
50	4 13	19 59	0 41	3 2	20 3	1.7	2 4	3.4
45	4 32	19 40	0 35	2 15	19 35	1.9	2 35	3.3
40	4 48	19 25	0 31	1 54	19 12	2.1	2 59	3.2
35	5 1	19 12	0 29	1 41	18 54	2.2	3 18	3.1
30	5 12	19 1	0 27	1 32	18 38	2.3	3 35	3.0
20	5 31	18 42	0 24	1 22	18 11	2.5	4 4	2.9
10	5 47	18 25	0 23	1 16	17 47	2.6	4 28	2.9
0	6 3	18 10	0 22	1 14	17 26	2.7	4 50	2.8
10	6 18	17 55	0 22	1 14	17 4	2.8	5 13	2.7
20	6 34	17 39	0 24	1 17	16 40	3.0	5 37	2.6
30	6 52	17 21	0 26	1 24	16 13	3.1	6 5	2.5
35	7 3	17 10	0 27	1 29	15 57	3.2	6 22	2.4
40	7 15	16 58	0 30	1 35	15 38	3.3	6 41	2.3
45	7 29	16 44	0 33	1 44	15 15	3.5	7 4	2.2
50	7 47	16 26	0 37	1 55	14 46	3.7	7 34	2.0
55	8 9	16 4	0 43	2 11	14 6	4.0	8 15	1.7
60	8 40	15 33	0 52	2 35	12 57	4.8	9 24	.9

SUNCE				MESEC				
UT	e = T <sub>p</sub> - UT	Δ/24	r	Prolaz	Δ/24	π <sub>♃</sub>	r	
h	min s	s / ' / "	' / "	h min	min	' / "	' / "	
00	- 6 19.7	-.1	15.8	T <sub>m</sub>	23 41	2.7	60.8	16.6
12	- 6 21.3	T <sub>m☉</sub>	12 h 6.4 min	Starost	13.5 d	Faza	☉	

PLANETE									
Pl.	T <sub>m</sub>	π	360-α	Vel.	Pl.	T <sub>m</sub>	π	360-α	Vel.
♃	h min / ' / "	' / "	°	°	♄	h min / ' / "	' / "	°	°
♃	14 5	.1	211	-3.8	♄	16 51	.0	169	-1.8
♅	5 45	.2	336	-3.3	♅	12 18	.0	237	.4

UT	SUNCE		PROLEĆ. TAČKA S <sub>γ</sub>	VENERA		MARS	
	S <sub>☉</sub>	δ <sub>☉</sub>		S <sub>♀</sub>	δ <sub>♀</sub>	S <sub>♂</sub>	δ <sub>♂</sub>
h	° / ' / "	° / ' / "	° / ' / "	° / ' / "	° / ' / "	° / ' / "	° / ' / "
0	178 24.2	20 29.7	298 51.4	148 34.0	13 48.7	274 3.2	7 23.6
2	208 24.2	20 28.7	328 56.3	178 33.2	13 46.6	304 5.3	7 24.7
4	238 24.1	20 27.7	359 1.2	208 32.3	13 44.4	334 7.3	7 25.8
6	268 24.1	20 26.8	29 6.2	238 31.4	13 42.3	4 9.4	7 26.8
8	298 24.0	20 25.8	59 11.1	268 30.6	13 40.1	34 11.4	7 27.9
10	328 24.0	20 24.8	89 16.0	298 29.7	13 38.0	64 13.5	7 29.0
12	358 23.9	20 23.8	119 21.0	328 28.9	13 35.8	94 15.5	7 30.0
14	28 23.8	20 22.9	149 25.9	358 28.0	13 33.7	124 17.6	7 31.1
16	58 23.8	20 21.9	179 30.8	28 27.2	13 31.5	154 19.6	7 32.2
18	88 23.7	20 20.9	209 35.7	58 26.3	13 29.3	184 21.7	7 33.2
20	118 23.7	20 19.9	239 40.7	88 25.5	13 27.2	214 23.7	7 34.3
22	148 23.6	20 18.9	269 45.6	118 24.6	13 25.0	244 25.8	7 35.3
Δ	0	-5		-4	-11	10	5

UT	MESEC				JUPITER		SATURN	
	S <sub>♃</sub>	Δ	δ <sub>♃</sub>	Δ	S <sub>♃</sub>	δ <sub>♃</sub>	S <sub>♄</sub>	δ <sub>♄</sub>
h	° / ' / "	° / ' / "	° / ' / "	° / ' / "	° / ' / "	° / ' / "	° / ' / "	° / ' / "
0	4 27.1	16 -26	36.7	67	107 28.5	-3 33.3	176 .8	20 18.0
2	33 8.3	18 -26	23.2	72	137 32.9	-3 33.5	206 5.0	20 17.9
4	61 49.8	19 -26	8.9	76	167 37.3	-3 33.8	236 9.3	20 17.7
6	90 31.7	21 -25	53.8	80	197 41.6	-3 34.0	266 13.5	20 17.6
8	119 13.8	22 -25	37.8	83	227 46.0	-3 34.3	296 17.8	20 17.5
10	147 56.3	24 -25	21.1	87	257 50.4	-3 34.5	326 22.0	20 17.3
12	176 39.1	26 -25	3.7	91	287 54.7	-3 34.8	356 26.3	20 17.2
14	205 22.3	28 -24	45.4	95	317 59.1	-3 35.0	26 30.5	20 17.1
16	234 5.9	30 -24	26.5	98	348 3.5	-3 35.3	56 34.8	20 16.9
18	262 49.9	32 -24	6.8	102	18 7.9	-3 35.5	86 39.1	20 16.8
20	291 34.3	34 -23	46.3	105	48 12.2	-3 35.8	116 43.3	20 16.7
22	320 19.1	36 -23	25.3	109	78 16.6	-3 36.0	146 47.6	20 16.5
Δ					22	-1	21	-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	3 16	20 55	1 10	:::	21 55	.1	1 47	5.1
55	3 50	20 22	0 50	:::	21 12	.8	2 48	4.3
50	4 15	19 57	0 41	2 59	20 43	1.1	3 26	3.9
45	4 33	19 39	0 35	2 15	20 20	1.4	3 54	3.6
40	4 49	19 24	0 31	1 54	20 2	1.6	4 15	3.4
35	5 1	19 11	0 29	1 41	19 46	1.8	4 33	3.3
30	5 12	19 0	0 27	1 32	19 33	1.9	4 48	3.2
20	5 31	18 41	0 24	1 21	19 10	2.2	5 14	3.0
10	5 48	18 25	0 23	1 16	18 50	2.3	5 36	2.8
0	6 3	18 10	0 22	1 13	18 31	2.5	5 57	2.6
10	6 18	17 55	0 22	1 14	18 12	2.7	6 17	2.5
20	6 34	17 39	0 23	1 17	17 52	2.9	6 39	2.3
30	6 52	17 21	0 26	1 24	17 28	3.1	7 4	2.1
35	7 2	17 11	0 27	1 29	17 14	3.3	7 19	2.0
40	7 14	16 59	0 30	1 35	16 58	3.4	7 36	1.8
45	7 28	16 45	0 32	1 44	16 39	3.6	7 56	1.6
50	7 46	16 28	0 37	1 55	16 15	3.9	8 22	1.4
55	8 8	16 6	0 42	2 11	15 42	4.3	8 55	1.0
60	8 38	15 35	0 52	2 35	14 53	5.0	9 46	.3

SUNCE				MESEC			
UT	e = T <sub>p</sub> - UT	Δ/24	r	Prolaz	Δ/24	π <sub>♃</sub>	r
h	min s	s / ' / "	' / "	h min	min	' / "	' / "
00	- 6 22.9	-.1	15.8	T <sub>m</sub>	1.0	61.3	16.7
12	- 6 24.2	T <sub>m☉</sub>	12 h 6.4 min	Starost	14.5 d	Faza	☉

PLANETE									
Pl.	T <sub>m</sub>	π	360-α	Vel.	Pl.	T <sub>m</sub>	π	360-α	Vel.
♃	h min / ' / "	' / "	°	°	♄	h min / ' / "	' / "	°	°
♃	14 6	.1	210	-3.8	♄	16 48	.0	169	-1.8
♅	5 43	.2	335	-3.3	♅	12 14	.0	237	.4

UT	SUNCE		PROLEĆ. TAČKA S <sub>γ</sub>	VENERA		MARS	
	S <sub>☉</sub>	δ <sub>☉</sub>		S <sub>♀</sub>	δ <sub>♀</sub>	S <sub>♂</sub>	δ <sub>♂</sub>
h	° / ' / "	° / ' / "	° / ' / "	° / ' / "	° / ' / "	° / ' / "	° / ' / "
0	178 23.6	20 17.9	299 50.5	148 23.8	13 22.8	274 27.9	7 36.4
2	208 23.5	20 16.9	329 55.5	178 22.9	13 20.7	304 29.9	7 37.5
4	238 23.5	20 16.0	0 .4	208 22.1	13 18.5	334 32.0	7 38.5
6	268 23.4	20 15.0	30 5.3	238 21.3	13 16.3	4 34.0	7 39.6
8	298 23.4	20 14.0	60 10.2	268 20.4	13 14.1	34 36.1	7 40.6
10	328 23.4	20 13.0	90 15.2	298 19.6	13 11.9	64 38.2	7 41.7
12	358 23.3	20 12.0	120 20.1	328 18.8	13 9.8	94 40.2	7 42.7
14	28 23.3	20 11.0	150 25.0	358 17.9	13 7.6	124 42.3	7 43.8
16	58 23.2	20 9.9	180 30.0	28 17.1	13 5.4	154 44.4	7 44.9
18	88 23.2	20 8.9	210 34.9	58 16.3	13 3.2	184 46.4	7 45.9
20	118 23.2	20 7.9	240 39.8	88 15.5	13 1.0	214 48.5	7 47.0
22	148 23.1	20 6.9	270 44.7	118 14.7	12 58.8	244 50.6	7 48.0
Δ	0	-5		-4	-11	10	5

UT	MESEC				JUPITER		SATURN	
	S <sub>♃</sub>	Δ	δ <sub>♃</sub>	Δ	S <sub>♃</sub>	δ <sub>♃</sub>	S <sub>♄</sub>	δ <sub>♄</sub>
h	° / ' / "	° / ' / "	° / ' / "	° / ' / "	° / ' / "	° / ' / "	° / ' / "	° / ' / "
0	349 4.4	39 -23	3.5	112	108 21.0	-3 36.3	176 51.8	20 16.4
2	17 50.2	41 -22	41.0	115	138 25.3	-3 36.6	206 56.1	20 16.3
4	46 36.3	43 -22	18.0	118	168 29.7	-3 36.8	237 .3	20 16.1
6	75 23.0	46 -21	54.3	121	198 34.1	-3 37.1	267 4.6	20 16.0
8	104 10.1	48 -21	30.0	124	228 38.4	-3 37.3	297 8.8	20 15.9
10	132 57.8	50 -21	5.1	127	258 42.8	-3 37.6	327 13.1	20 15.7
12	161 45.9	53 -20	39.6	130	288 47.2	-3 37.8	357 17.3	20 15.6
14	190 34.4	55 -20	13.6	133	318 51.5	-3 38.1	27 21.6	20 15.5
16	219 23.5	58 -19	47.1	135	348 55.9	-3 38.4	57 25.9	20 15.3
18	248 13.0	60 -19	20.1	138	19 .2	-3 38.6	87 30.1	20 15.2
20	277 3.1	63 -18	52.5	140	49 4.6	-3 38.9	117 34.4	20 15.1
22	305 53.6	65 -18	24.5	142	79 9.0	-3 39.1	147 38.6	20 14.9
Δ					22	-1	21	-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	3 18	20 53	1 9	:::	21 58	.0	3 50	5.0
55	3 52	20 20	0 50	:::	21 31	.5	4 31	4.3
50	4 16	19 56	0 41	2 56	21 10	.8	4 59	3.9
45	4 34	19 38	0 35	2 14	20 54	1.1	5 20	3.6
40	4 49	19 23	0 31	1 53	20 40	1.3	5 37	3.4
35	5 2	19 10	0 28	1 41	20 29	1.5	5 52	3.2
30	5 13	18 60	0 26	1 32	20 19	1.6	6 4	3.1
20	5 32	18 41	0 24	1 21	20 1	1.9	6 25	2.8
10	5 48	18 25	0 23	1 16	19 46	2.1	6 43	2.6
0	6 3	18 10	0 22	1 13	19 31	2.3	7 0	2.4
10	6 18	17 55	0 22	1 14	19 17	2.5	7 17	2.2
20	6 33	17 40	0 23	1 17	19 1	2.7	7 35	2.0
30	6 51	17 22	0 26	1 24	18 43	3.0	7 55	1.8
35	7 2	17 11	0 27	1 28	18 33	3.2	8 7	1.6
40	7 14	16 60	0 29	1 35	18 21	3.3	8 20	1.5
45	7 28	16 46	0 32	1 43	18 6	3.6	8 36	1.2
50	7 45	16 29	0 36	1 55	17 49	3.8	8 55	1.0
55	8 6	16 7	0 42	2 11	17 26	4.2	9 20	.6
60	8 36	15 37	0 51	2 34	16 54	4.8	9 54	.1
S								

SUNCE				MESEC			
UT	e = T <sub>p</sub> - UT	Δ/24	r	Prolaz	Δ/24	π <sub>☉</sub>	r
h	min s	s /		h min	min	/	/
00	- 6 25.5	-.1	15.8	T <sub>m</sub>	0 46	2.5	61.4
12	- 6 26.5	T <sub>m☉</sub>	12 h 6.4 min	Starost	15.5 d	Faza	☉

PLANETE									
Pl.	T <sub>m</sub>	π	360-α	Vel.	Pl.	T <sub>m</sub>	π	360-α	Vel.
h	min	/	°		h	min	/	°	
♀	14 7	.1	209	-3.8	♃	16 44	.0	169	-1.7
♂	5 42	.2	335	-3.3	♄	12 11	.0	237	.4

UT	SUNCE		PROLEĆ. TAČKA S <sub>γ</sub>	VENERA		MARS	
	S <sub>☉</sub>	δ <sub>☉</sub>		S <sub>♀</sub>	δ <sub>♀</sub>	S <sub>♂</sub>	δ <sub>♂</sub>
h	° / ' / "	° / ' / "	° / ' / "	° / ' / "	° / ' / "	° / ' / "	° / ' / "
0	178 23.1	20 5.9	300 49.7	148 13.8	12 56.6	274 52.7	7 49.1
2	208 23.0	20 4.9	330 54.6	178 13.0	12 54.4	304 54.7	7 50.1
4	238 23.0	20 3.8	0 59.5	208 12.2	12 52.2	334 56.8	7 51.2
6	268 23.0	20 2.8	31 4.5	238 11.4	12 50.0	4 58.9	7 52.2
8	298 22.9	20 1.8	61 9.4	268 10.6	12 47.8	35 1.0	7 53.3
10	328 22.9	20 .8	91 14.3	298 9.8	12 45.6	65 3.0	7 54.3
12	358 22.9	19 59.7	121 19.2	328 9.0	12 43.3	95 5.1	7 55.3
14	28 22.8	19 58.7	151 24.2	358 8.2	12 41.1	125 7.2	7 56.4
16	58 22.8	19 57.7	181 29.1	28 7.4	12 38.9	155 9.3	7 57.4
18	88 22.8	19 56.6	211 34.0	58 6.6	12 36.7	185 11.4	7 58.5
20	118 22.8	19 55.6	241 38.9	88 5.8	12 34.5	215 13.5	7 59.5
22	148 22.7	19 54.5	271 43.9	118 5.0	12 32.3	245 15.5	8 .6
Δ	0	-5		-4	-11	10	5

UT	MESEC				JUPITER		SATURN	
	S <sub>♃</sub>	Δ	δ <sub>♃</sub>	Δ	S <sub>♃</sub>	δ <sub>♃</sub>	S <sub>♄</sub>	δ <sub>♄</sub>
h	° / ' / "	° / ' / "	° / ' / "	° / ' / "	° / ' / "	° / ' / "	° / ' / "	° / ' / "
0	334 44.6	67 -17	56.1	144	109 13.3	-3 39.4	177 42.9	20 14.8
2	3 36.1	70 -17	27.2	146	139 17.7	-3 39.7	207 47.1	20 14.7
4	32 28.1	72 -16	57.9	148	169 22.0	-3 39.9	237 51.4	20 14.6
6	61 20.5	75 -16	28.2	150	199 26.4	-3 40.2	267 55.6	20 14.4
8	90 13.4	77 -15	58.2	152	229 30.7	-3 40.4	297 59.9	20 14.3
10	119 6.8	79 -15	27.8	154	259 35.1	-3 40.7	328 4.1	20 14.2
12	148 .6	81 -14	57.0	155	289 39.5	-3 41.0	358 8.4	20 14.0
14	176 54.9	84 -14	25.9	157	319 43.8	-3 41.2	28 12.6	20 13.9
16	205 49.6	86 -13	54.6	158	349 48.2	-3 41.5	58 16.9	20 13.8
18	234 44.8	88 -13	22.9	160	19 52.5	-3 41.8	88 21.2	20 13.6
20	263 40.4	90 -12	51.0	161	49 56.9	-3 42.0	118 25.4	20 13.5
22	292 36.4	92 -12	18.8	162	80 1.2	-3 42.3	148 29.7	20 13.4
Δ					22	-1	21	-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	3 20	20 51	1 8	:::	21 59	.0	5 49	4.6
55	3 53	20 18	0 49	:::	21 43	.4	6 15	4.1
50	4 17	19 55	0 40	2 54	21 30	.7	6 33	3.8
45	4 35	19 37	0 35	2 13	21 20	.9	6 48	3.5
40	4 50	19 22	0 31	1 53	21 12	1.1	6 59	3.3
35	5 3	19 10	0 28	1 40	21 4	1.3	7 9	3.1
30	5 14	18 59	0 26	1 32	20 58	1.4	7 18	2.9
20	5 32	18 41	0 24	1 21	20 46	1.7	7 33	2.7
10	5 48	18 25	0 22	1 15	20 36	1.9	7 46	2.4
0	6 3	18 10	0 22	1 13	20 27	2.1	7 58	2.2
10	6 18	17 55	0 22	1 14	20 17	2.3	8 10	2.0
20	6 33	17 40	0 23	1 17	20 7	2.6	8 23	1.8
30	6 51	17 22	0 26	1 23	19 56	2.8	8 37	1.5
35	7 1	17 12	0 27	1 28	19 49	3.0	8 46	1.4
40	7 13	17 0	0 29	1 35	19 41	3.2	8 55	1.2
45	7 27	16 47	0 32	1 43	19 32	3.4	9 6	1.0
50	7 43	16 30	0 36	1 55	19 21	3.7	9 19	.8
55	8 5	16 9	0 42	2 10	19 7	4.0	9 35	.4
60	8 34	15 39	0 51	2 34	18 48	4.4	9 57	.0
S								

SUNCE				MESEC			
UT	e = T <sub>p</sub> - UT	Δ/24	r	Prolaz	Δ/24	π <sub>☉</sub>	r
h	min s	s /		h min	min	/	/
00	- 6 27.5	-.1	15.8	T <sub>m</sub>	1 45	2.3	61.2
12	- 6 28.3	T <sub>m☉</sub>	12 h 6.5 min	Starost	16.5 d	Faza	☉

PLANETE									
Pl.	T <sub>m</sub>	π	360-α	Vel.	Pl.	T <sub>m</sub>	π	360-α	Vel.
h	min	/	°		h	min	/	°	
♀	14 7	.1	207	-3.8	♃	16 41	.0	168	-1.7
♂	5 40	.2	334	-3.3	♄	12 7	.0	237	.4

UT	SUNCE		PROLEĆ. TAČKA S <sub>γ</sub>	VENERA		MARS		
	S <sub>☉</sub>	δ <sub>☉</sub>		S <sub>♀</sub>	δ <sub>♀</sub>	S <sub>♂</sub>	δ <sub>♂</sub>	
h	°	'	°	'	°	'	°	'
0	178 22.7	19 53.5	301 48.8	148 4.2	12 30.0	275 17.6	8 1.6	
2	208 22.7	19 52.5	331 53.7	178 3.4	12 27.8	305 19.7	8 2.6	
4	238 22.7	19 51.4	1 58.7	208 2.6	12 25.6	335 21.8	8 3.7	
6	268 22.6	19 50.4	32 3.6	238 1.8	12 23.3	5 23.9	8 4.7	
8	298 22.6	19 49.3	62 8.5	268 1.0	12 21.1	35 26.0	8 5.7	
10	328 22.6	19 48.2	92 13.4	298 .2	12 18.9	65 28.1	8 6.8	
12	358 22.6	19 47.2	122 18.4	327 59.5	12 16.6	95 30.2	8 7.8	
14	28 22.6	19 46.1	152 23.3	357 58.7	12 14.4	125 32.3	8 8.9	
16	58 22.5	19 45.1	182 28.2	27 57.9	12 12.1	155 34.4	8 9.9	
18	88 22.5	19 44.0	212 33.2	57 57.1	12 9.9	185 36.5	8 10.9	
20	118 22.5	19 42.9	242 38.1	87 56.3	12 7.6	215 38.6	8 12.0	
22	148 22.5	19 41.9	272 43.0	117 55.6	12 5.4	245 40.7	8 13.0	
Δ	0	-5		-4	-11	10	5	

φ	SUNCE		TRAJANJE SUMRAKA		MESEC			
	IZLAZ	ZALAZ	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 49	1 7	:::	21 59	.0	7 40	4.3
55	3 55	20 17	0 49	:::	21 52	.3	7 53	3.9
50	4 18	19 54	0 40	2 51	21 47	.6	8 3	3.6
45	4 36	19 36	0 35	2 12	21 42	.8	8 11	3.3
40	4 51	19 21	0 31	1 52	21 38	1.0	8 18	3.1
35	5 3	19 9	0 28	1 40	21 35	1.2	8 24	2.9
30	5 14	18 58	0 26	1 31	21 32	1.3	8 29	2.8
20	5 32	18 40	0 24	1 21	21 27	1.6	8 37	2.5
10	5 48	18 25	0 22	1 15	21 22	1.8	8 45	2.3
0	6 3	18 10	0 22	1 13	21 18	2.0	8 52	2.1
10	6 17	17 56	0 22	1 14	21 14	2.2	8 58	1.8
20	6 33	17 40	0 23	1 17	21 9	2.4	9 6	1.6
30	6 50	17 23	0 26	1 23	21 4	2.7	9 14	1.4
35	7 1	17 13	0 27	1 28	21 1	2.9	9 19	1.2
40	7 12	17 1	0 29	1 35	20 57	3.0	9 24	1.1
45	7 26	16 48	0 32	1 43	20 53	3.2	9 30	.9
50	7 42	16 31	0 36	1 54	20 48	3.5	9 37	.6
55	8 3	16 10	0 42	2 10	20 42	3.8	9 46	.4
60	8 32	15 42	0 51	2 33	20 34	4.2	9 57	.0
S								

UT	MESEC				JUPITER		SATURN	
	S <sub>♃</sub>	Δ	δ <sub>♃</sub>	Δ	S <sub>♃</sub>	δ <sub>♃</sub>	S <sub>♄</sub>	δ <sub>♄</sub>
h	°	'	°	'	°	'	°	'
0	321 32.8	94 -11	46.4	163	110 5.6	-3 42.5	178 33.9	20 13.2
2	350 29.6	96 -11	13.8	164	140 9.9	-3 42.8	208 38.2	20 13.1
4	19 26.8	98 -10	41.1	165	170 14.3	-3 43.1	238 42.5	20 13.0
6	48 24.4	100 -10	8.1	166	200 18.6	-3 43.3	268 46.7	20 12.8
8	77 22.3	102 -9	35.0	166	230 22.9	-3 43.6	298 51.0	20 12.7
10	106 20.6	103 -9	1.7	167	260 27.3	-3 43.9	328 55.2	20 12.5
12	135 19.3	105 -8	28.3	168	290 31.6	-3 44.1	358 59.5	20 12.4
14	164 18.3	107 -7	54.8	168	320 36.0	-3 44.4	29 3.7	20 12.3
16	193 17.6	108 -7	21.1	168	350 40.3	-3 44.7	59 8.0	20 12.1
18	222 17.2	110 -6	47.4	169	20 44.7	-3 44.9	89 12.2	20 12.0
20	251 17.2	111 -6	13.7	169	50 49.0	-3 45.2	119 16.5	20 11.9
22	280 17.4	113 -5	39.9	169	80 53.3	-3 45.5	149 20.7	20 11.7
Δ					22	-1	21	-1

SUNCE				MESEC					
UT	e = T <sub>p</sub> - UT	Δ/24	r	Prolaz	Δ/24	π <sub>☾</sub>	r		
h	min	s	s	h min	min	'	'		
00	- 6 29.0	.0	15.8	T <sub>m</sub>	2 39	2.1	60.6	16.5	
12	- 6 29.4	T <sub>m☉</sub>	12 h 6.5 min	Starost	17.5 d	Faza	☉		
PLANETE									
Pl.	T <sub>m</sub>	π	360-α	Vel.	Pl.	T <sub>m</sub>	π	360-α	Vel.
♀	h min	'	°	h min	h min	'	°	h min	'
♂	14 8	.1	206	-3.8	♃	16 37	.0	168	-1.7
♄	5 38	.2	333	-4	♄	12 4	.0	237	.4

UT	SUNCE		PROLEĆ. TAČKA S <sub>γ</sub>	VENERA		MARS		
	S <sub>☉</sub>	δ <sub>☉</sub>		S <sub>♀</sub>	δ <sub>♀</sub>	S <sub>♂</sub>	δ <sub>♂</sub>	
h	°	'	°	'	°	'	°	'
0	178 22.5	19 40.8	302 47.9	147 54.8	12 3.1	275 42.8	8 14.0	
2	208 22.5	19 39.7	332 52.9	177 54.0	12 .9	305 44.9	8 15.0	
4	238 22.5	19 38.6	2 57.8	207 53.3	11 58.6	335 47.0	8 16.1	
6	268 22.5	19 37.6	33 2.7	237 52.5	11 56.4	5 49.1	8 17.1	
8	298 22.4	19 36.5	63 7.7	267 51.7	11 54.1	35 51.2	8 18.1	
10	328 22.4	19 35.4	93 12.6	297 51.0	11 51.9	65 53.3	8 19.1	
12	358 22.4	19 34.3	123 17.5	327 50.2	11 49.6	95 55.4	8 20.2	
14	28 22.4	19 33.2	153 22.4	357 49.5	11 47.3	125 57.5	8 21.2	
16	58 22.4	19 32.1	183 27.4	27 48.7	11 45.1	155 59.6	8 22.2	
18	88 22.4	19 31.0	213 32.3	57 47.9	11 42.8	186 1.7	8 23.2	
20	118 22.4	19 29.9	243 37.2	87 47.2	11 40.5	216 3.8	8 24.3	
22	148 22.4	19 28.8	273 42.2	117 46.4	11 38.2	246 5.9	8 25.3	
Δ	0	-5		-4	-11	11	5	

φ	SUNCE		TRAJANJE SUMRAKA		MESEC			
	IZLAZ	ZALAZ	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 25	20 47	1 6	:::	21 58	.0	9 23	4.1
55	3 57	20 15	0 49	:::	21 60	.3	9 26	3.7
50	4 20	19 52	0 40	2 49	22 1	.6	9 29	3.4
45	4 38	19 35	0 35	2 11	22 2	.8	9 31	3.2
40	4 52	19 21	0 31	1 52	22 2	1.0	9 33	3.0
35	5 4	19 8	0 28	1 40	22 3	1.1	9 34	2.8
30	5 15	18 58	0 26	1 31	22 4	1.3	9 35	2.7
20	5 33	18 40	0 24	1 21	22 5	1.5	9 38	2.4
10	5 48	18 24	0 22	1 15	22 5	1.7	9 39	2.2
0	6 3	18 10	0 22	1 13	22 6	1.9	9 41	2.0
10	6 17	17 56	0 22	1 13	22 7	2.1	9 43	1.8
20	6 33	17 41	0 23	1 17	22 8	2.4	9 45	1.5
30	6 50	17 23	0 26	1 23	22 9	2.6	9 47	1.3
35	6 60	17 13	0 27	1 28	22 10	2.8	9 48	1.1
40	7 11	17 2	0 29	1 34	22 10	2.9	9 49	1.0
45	7 25	16 49	0 32	1 43	22 11	3.1	9 51	.8
50	7 41	16 33	0 36	1 54	22 12	3.4	9 52	.6
55	8 2	16 12	0 42	2 10	22 13	3.7	9 54	.3
60	8 30	15 44	0 50	2 32	22 15	4.0	9 57	.0
S								

UT	MESEC				JUPITER		SATURN	
	S <sub>♃</sub>	Δ	δ <sub>♃</sub>	Δ	S <sub>♃</sub>	δ <sub>♃</sub>	S <sub>♄</sub>	δ <sub>♄</sub>
h	°	'	°	'	°	'	°	'
0	309 17.9	114 -5	6.0	169	110 57.7	-3 45.7	179 25.0	20 11.6
2	338 18.7	115 -4	32.1	169	141 2.0	-3 46.0	209 29.2	20 11.5
4	7 19.7	116 -3	58.2	169	171 6.4	-3 46.3	239 33.5	20 11.3
6	36 21.0	118 -3	24.3	169	201 10.7	-3 46.5	269 37.8	20 11.2
8	65 22.5	119 -2	50.4	169	231 15.0	-3 46.8	299 42.0	20 11.1
10	94 24.3	120 -2	16.6	169	261 19.4	-3 47.1	329 46.3	20 10.9
12	123 26.2	121 -1	42.8	169	291 23.7	-3 47.3	359 50.5	20 10.8
14	152 28.4	122 -1	9.0	168	321 28.0	-3 47.6	29 54.8	20 10.7
16	181 30.7	123 -0	35.3	168	351 32.4	-3 47.9	59 59.0	20 10.5
18	210 33.2	123 -0	1.7	168	21 36.7	-3 48.2	90 3.3	20 10.4
20	239 35.9	124 0	31.8	167	51 41.0	-3 48.4	120 7.5	20 10.3
22	268 38.7	125 1	5.3	167	81 45.4	-3 48.7	150 11.8	20 10.1
Δ					22	-1	21	-1

SUNCE				MESEC					
UT	e = T <sub>p</sub> - UT	Δ/24	r	Prolaz	Δ/24	π <sub>☾</sub>	r		
h	min	s	s	h min	min	'	'		
00	- 6 29.9	.0	15.8	T <sub>m</sub>	3 30	2.0	59.9	16.3	
12	- 6 30.0	T <sub>m☉</sub>	12 h 6.5 min	Starost	18.5 d	Faza	☉		
PLANETE									
Pl.	T <sub>m</sub>	π	360-α	Vel.	Pl.	T <sub>m</sub>	π	360-α	Vel.
♀	h min	'	°	h min	h min	'	°	h min	'
♂	14 9	.1	205	-3.8	♃	16 34	.0	168	-1.7
♄	5 37	.2	333	-4	♄	12 1	.0	237	.4

UT	SUNCE		PROLEĆ. TAČKA S <sub>γ</sub>	VENERA		MARS	
	S <sub>☉</sub>	δ <sub>☉</sub>		S <sub>♀</sub>	δ <sub>♀</sub>	S <sub>♂</sub>	δ <sub>♂</sub>
h	° / ' / "	° / ' / "	° / ' / "	° / ' / "	° / ' / "	° / ' / "	° / ' / "
0	178 22.4	19 27.7	303 47.1	147 45.7	11 36.0	276 8.1	8 26.3
2	208 22.4	19 26.6	333 52.0	177 45.0	11 33.7	306 10.2	8 27.3
4	238 22.4	19 25.5	3 56.9	207 44.2	11 31.4	336 12.3	8 28.3
6	268 22.4	19 24.4	34 1.9	237 43.5	11 29.1	6 14.4	8 29.3
8	298 22.4	19 23.3	64 6.8	267 42.7	11 26.8	36 16.5	8 30.4
10	328 22.4	19 22.2	94 11.7	297 42.0	11 24.5	66 18.7	8 31.4
12	358 22.4	19 21.1	124 16.7	327 41.2	11 22.3	96 20.8	8 32.4
14	28 22.4	19 20.0	154 21.6	357 40.5	11 20.0	126 22.9	8 33.4
16	58 22.4	19 18.9	184 26.5	27 39.8	11 17.7	156 25.0	8 34.4
18	88 22.4	19 17.7	214 31.4	57 39.0	11 15.4	186 27.2	8 35.4
20	118 22.5	19 16.6	244 36.4	87 38.3	11 13.1	216 29.3	8 36.4
22	148 22.5	19 15.5	274 41.3	117 37.6	11 10.8	246 31.4	8 37.4
Δ	0	-6		-4	-11	11	5

φ	SUNCE		TRAJANJE SUMRAKA		MESEC			
	IZLAZ	ZALAZ	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 27	20 45	1 5	:::	21 58	.0	11 1	4.0
55	3 58	20 14	0 48	:::	22 7	.4	10 55	3.6
50	4 21	19 51	0 40	2 46	22 15	.6	10 51	3.3
45	4 39	19 34	0 34	2 10	22 21	.8	10 47	3.1
40	4 53	19 20	0 31	1 51	22 26	1.0	10 44	2.9
35	5 5	19 8	0 28	1 39	22 30	1.2	10 42	2.7
30	5 15	18 57	0 26	1 31	22 34	1.3	10 39	2.6
20	5 33	18 40	0 24	1 21	22 41	1.5	10 35	2.3
10	5 49	18 24	0 22	1 15	22 47	1.7	10 32	2.1
0	6 3	18 10	0 22	1 13	22 53	1.9	10 28	1.9
10	6 17	17 56	0 22	1 13	22 59	2.1	10 25	1.7
20	6 32	17 41	0 23	1 17	23 5	2.3	10 22	1.5
30	6 49	17 24	0 25	1 23	23 12	2.6	10 18	1.3
35	6 59	17 14	0 27	1 28	23 16	2.7	10 15	1.2
40	7 10	17 3	0 29	1 34	23 21	2.9	10 13	1.0
45	7 24	16 50	0 32	1 43	23 26	3.1	10 10	.8
50	7 40	16 34	0 36	1 54	23 33	3.3	10 6	.6
55	8 0	16 13	0 42	2 9	23 41	3.6	10 2	.3
60	8 28	15 46	0 50	2 32	23 51	4.0	9 56	.0
S								

UT	MESEC				JUPITER		SATURN	
	S <sub>♃</sub>	Δ	δ <sub>♃</sub>	Δ	S <sub>♃</sub>	δ <sub>♃</sub>	S <sub>♄</sub>	δ <sub>♄</sub>
h	° / ' / "	° / ' / "	° / ' / "	° / ' / "	° / ' / "	° / ' / "	° / ' / "	° / ' / "
0	297 41.7	126	1 38.6	166	111 49.7	- 3 49.0	180 16.1	20 10.0
2	326 44.8	126	2 11.8	165	141 54.0	- 3 49.2	210 20.3	20 9.9
4	355 48.0	127	2 44.9	165	171 58.3	- 3 49.5	240 24.6	20 9.7
6	24 51.4	127	3 17.8	164	202 2.7	- 3 49.8	270 28.8	20 9.6
8	53 54.8	128	3 50.6	163	232 7.0	- 3 50.1	300 33.1	20 9.4
10	82 58.3	128	4 23.2	162	262 11.3	- 3 50.3	330 37.3	20 9.3
12	112 1.9	128	4 55.7	161	292 15.7	- 3 50.6	0 41.6	20 9.2
14	141 5.6	129	5 27.9	160	322 20.0	- 3 50.9	30 45.8	20 9.0
16	170 9.3	129	6 .0	159	352 24.3	- 3 51.1	60 50.1	20 8.9
18	199 13.1	129	6 31.9	158	22 28.6	- 3 51.4	90 54.4	20 8.8
20	228 16.9	129	7 3.6	157	52 32.9	- 3 51.7	120 58.6	20 8.6
22	257 20.8	129	7 35.0	156	82 37.3	- 3 52.0	151 2.9	20 8.5
Δ					22	-1	21	-1

SUNCE				MESEC				
UT	e = T <sub>p</sub> - UT	Δ/24	r	Prolaz	Δ/24	π <sub>♃</sub>	r	
h	min s	s	'	h min	min	'	'	
00	- 6 30.2	.0	15.8	T <sub>m</sub>	4 17	2.0	59.0	16.1
12	- 6 30.1	T <sub>m☉</sub>	12 h 6.5 min	Starost	19.5 d	Faza	☉	

PLANETE									
Pl.	T <sub>m</sub>	π	360-α	Vel.	Pl.	T <sub>m</sub>	π	360-α	Vel.
h	min	'	°		h	min	'	°	
♀	14 9	.1	204	-3.8	♃	16 30	.0	168	-1.7
♁	5 35	.2	332	-4	♄	11 57	.0	236	.4

UT	SUNCE		PROLEĆ. TAČKA S <sub>γ</sub>	VENERA		MARS	
	S <sub>☉</sub>	δ <sub>☉</sub>		S <sub>♀</sub>	δ <sub>♀</sub>	S <sub>♂</sub>	δ <sub>♂</sub>
h	° / ' / "	° / ' / "	° / ' / "	° / ' / "	° / ' / "	° / ' / "	° / ' / "
0	178 22.5	19 14.4	304 46.2	147 36.9	11 8.5	276 33.5	8 38.4
2	208 22.5	19 13.2	334 51.2	177 36.1	11 6.2	306 35.7	8 39.5
4	238 22.5	19 12.1	4 56.1	207 35.4	11 3.9	336 37.8	8 40.5
6	268 22.5	19 11.0	35 1.0	237 34.7	11 1.6	6 39.9	8 41.5
8	298 22.5	19 9.8	65 5.9	267 34.0	10 59.3	36 42.1	8 42.5
10	328 22.5	19 8.7	95 10.9	297 33.3	10 57.0	66 44.2	8 43.5
12	358 22.6	19 7.6	125 15.8	327 32.5	10 54.6	96 46.3	8 44.5
14	28 22.6	19 6.4	155 20.7	357 31.8	10 52.3	126 48.5	8 45.5
16	58 22.6	19 5.3	185 25.6	27 31.1	10 50.0	156 50.6	8 46.5
18	88 22.6	19 4.1	215 30.6	57 30.4	10 47.7	186 52.8	8 47.5
20	118 22.6	19 3.0	245 35.5	87 29.7	10 45.4	216 54.9	8 48.5
22	148 22.7	19 1.8	275 40.4	117 29.0	10 43.1	246 57.1	8 49.5
Δ	0	-6		-4	-12	11	5

φ	SUNCE		TRAJANJE SUMRAKA		MESEC			
	IZLAZ	ZALAZ	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 29	20 42	1 4	:::	21 58	.0	12 38	4.0
55	4 0	20 12	0 48	:::	22 16	.4	12 22	3.6
50	4 22	19 50	0 39	2 44	22 30	.7	12 11	3.3
45	4 40	19 33	0 34	2 9	22 41	.9	12 2	3.0
40	4 54	19 19	0 31	1 51	22 50	1.1	11 54	2.9
35	5 6	19 7	0 28	1 39	22 59	1.3	11 47	2.7
30	5 16	18 57	0 26	1 31	23 6	1.4	11 42	2.6
20	5 34	18 39	0 24	1 20	23 18	1.6	11 32	2.3
10	5 49	18 24	0 22	1 15	23 29	1.8	11 23	2.1
0	6 3	18 10	0 22	1 13	23 39	2.0	11 15	2.0
10	6 17	17 56	0 22	1 13	23 50	2.2	11 7	1.8
20	6 32	17 41	0 23	1 16	...	.0	10 58	1.6
30	6 49	17 25	0 25	1 23	...	.0	10 49	1.3
35	6 58	17 15	0 27	1 28	...	.0	10 43	1.2
40	7 10	17 4	0 29	1 34	...	.0	10 37	1.1
45	7 23	16 51	0 32	1 42	...	.0	10 29	.9
50	7 38	16 35	0 36	1 54	...	.0	10 21	.7
55	7 58	16 15	0 41	2 9	...	.0	10 10	.4
60	8 26	15 48	0 50	2 31	...	.0	9 56	.0
S								

UT	MESEC				JUPITER		SATURN	
	S <sub>♃</sub>	Δ	δ <sub>♃</sub>	Δ	S <sub>♃</sub>	δ <sub>♃</sub>	S <sub>♄</sub>	δ <sub>♄</sub>
h	° / ' / "	° / ' / "	° / ' / "	° / ' / "	° / ' / "	° / ' / "	° / ' / "	° / ' / "
0	286 24.6	129	8 6.3	155	112 41.6	- 3 52.2	181 7.1	20 8.4
2	315 28.5	129	8 37.3	154	142 45.9	- 3 52.5	211 11.4	20 8.2
4	344 32.3	129	9 8.0	153	172 50.2	- 3 52.8	241 15.6	20 8.1
6	13 36.2	129	9 38.5	151	202 54.5	- 3 53.1	271 19.9	20 8.0
8	42 40.0	129	10 8.7	150	232 58.9	- 3 53.3	301 24.1	20 7.8
10	71 43.8	129	10 38.7	148	263 3.2	- 3 53.6	331 28.4	20 7.7
12	100 47.6	129	11 8.4	147	293 7.5	- 3 53.9	1 32.7	20 7.6
14	129 51.3	128	11 37.8	146	323 11.8	- 3 54.2	31 36.9	20 7.4
16	158 54.9	128	12 6.9	144	353 16.1	- 3 54.4	61 41.2	20 7.3
18	187 58.5	128	12 35.8	143	23 20.4	- 3 54.7	91 45.4	20 7.1
20	217 2.0	127	13 4.3	141	53 24.7	- 3 55.0	121 49.7	20 7.0
22	246 5.5	127	13 32.5	139	83 29.1	- 3 55.3	151 53.9	20 6.9
Δ					22	-1	21	-1

SUNCE				MESEC				
UT	e = T <sub>p</sub> - UT	Δ/24	r	Prolaz	Δ/24	π <sub>♃</sub>	r	
h	min s	s	'	h min	min	'	'	
00	- 6 29.9	.0	15.8	T <sub>m</sub>	5 4	1.9	58.1	15.8
12	- 6 29.5	T <sub>m☉</sub>	12 h 6.5 min	Starost	20.5 d	Faza	☉	

PLANETE									
Pl.	T <sub>m</sub>	π	360-α	Vel.	Pl.	T <sub>m</sub>	π	360-α	Vel.
h	min	'	°		h	min	'	°	
♀	14 10	.1	203	-3.8	♃	16 27	.0	168	-1.7
♁	5 33	.2	332	-4	♄	11 54	.0	236	.4

UT	SUNCE		PROLEĆ. TAČKA S <sub>γ</sub>	VENERA		MARS	
	S <sub>☉</sub>	δ <sub>☉</sub>		S <sub>♀</sub>	δ <sub>♀</sub>	S <sub>♂</sub>	δ <sub>♂</sub>
h	° / ' / "	° / ' / "	° / ' / "	° / ' / "	° / ' / "	° / ' / "	° / ' / "
0	178 22.7 19 .7		305 45.4	147 28.3 10 40.7	276 59.2 8 50.5		
2	208 22.7 18 59.5		335 50.3	177 27.6 10 38.4	307 1.3 8 51.5		
4	238 22.7 18 58.4		5 55.2	207 26.9 10 36.1	337 3.5 8 52.5		
6	268 22.8 18 57.2		36 .1	237 26.2 10 33.8	7 5.6 8 53.5		
8	298 22.8 18 56.0		66 5.1	267 25.5 10 31.4	37 7.8 8 54.4		
10	328 22.8 18 54.9		96 10.0	297 24.8 10 29.1	67 9.9 8 55.4		
12	358 22.8 18 53.7		126 14.9	327 24.1 10 26.8	97 12.1 8 56.4		
14	28 22.9 18 52.6		156 19.9	357 23.4 10 24.4	127 14.3 8 57.4		
16	58 22.9 18 51.4		186 24.8	27 22.7 10 22.1	157 16.4 8 58.4		
18	88 22.9 18 50.2		216 29.7	57 22.0 10 19.7	187 18.6 8 59.4		
20	118 23.0 18 49.0		246 34.6	87 21.3 10 17.4	217 20.7 9 .4		
22	148 23.0 18 47.9		276 39.6	117 20.6 10 15.1	247 22.9 9 1.4		
Δ	0	-6		-3	-12	11	5

φ	SUNCE		TRAJANJE SUMRAKA		MESEC			
	IZLAZ	ZALAZ	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 40	1 3	:::	21 58	.1	14 14	4.1
55	4 2	20 10	0 47	:::	22 27	.6	13 49	3.6
50	4 24	19 48	0 39	2 42	22 47	.9	13 30	3.2
45	4 41	19 32	0 34	2 8	23 4	1.1	13 15	3.0
40	4 55	19 18	0 31	1 50	23 17	1.3	13 3	2.8
35	5 6	19 6	0 28	1 39	23 29	1.4	12 52	2.7
30	5 17	18 56	0 26	1 30	23 39	1.5	12 43	2.6
20	5 34	18 39	0 24	1 20	23 57	1.7	12 28	2.3
10	5 49	18 24	0 22	1 15	...	.0	12 14	2.2
0	6 3	18 10	0 22	1 13	...	.0	12 2	2.0
10	6 17	17 56	0 22	1 13	...	.0	11 49	1.8
20	6 31	17 42	0 23	1 16	0 1	2.3	11 36	1.7
30	6 48	17 25	0 25	1 23	0 14	2.6	11 21	1.5
35	6 58	17 16	0 27	1 28	0 21	2.7	11 12	1.3
40	7 9	17 5	0 29	1 34	0 30	2.8	11 2	1.2
45	7 21	16 52	0 32	1 42	0 40	3.0	10 51	1.0
50	7 37	16 36	0 36	1 53	0 52	3.3	10 37	.8
55	7 57	16 17	0 41	2 9	1 8	3.6	10 19	.5
60	8 24	15 50	0 50	2 31	1 29	4.1	9 56	.1

UT	MESEC				JUPITER		SATURN	
	S <sub>♃</sub>	Δ	δ <sub>♃</sub>	Δ	S <sub>♃</sub>	δ <sub>♃</sub>	S <sub>♄</sub>	δ <sub>♄</sub>
h	° / ' / "	° / ' / "	° / ' / "	° / ' / "	° / ' / "	° / ' / "	° / ' / "	° / ' / "
0	275 8.8 126 14 .3	138	113 33.4 - 3 55.6	181 58.2 20 6.7				
2	304 12.1 126 14 27.9	136	143 37.7 - 3 55.8	212 2.4 20 6.6				
4	333 15.3 125 14 55.1	134	173 42.0 - 3 56.1	242 6.7 20 6.5				
6	2 18.3 125 15 22.0	133	203 46.3 - 3 56.4	272 11.0 20 6.3				
8	31 21.3 124 15 48.5	131	233 50.6 - 3 56.7	302 15.2 20 6.2				
10	60 24.1 123 16 14.7	129	263 54.9 - 3 57.0	332 19.5 20 6.1				
12	89 26.8 123 16 40.5	127	293 59.2 - 3 57.2	2 23.7 20 5.9				
14	118 29.4 122 17 5.9	125	324 3.5 - 3 57.5	32 28.0 20 5.8				
16	147 31.8 121 17 30.9	123	354 7.8 - 3 57.8	62 32.2 20 5.7				
18	176 34.1 121 17 55.6	121	24 12.1 - 3 58.1	92 36.5 20 5.5				
20	205 36.2 120 18 19.9	119	54 16.4 - 3 58.4	122 40.8 20 5.4				
22	234 38.2 119 18 43.8	117	84 20.7 - 3 58.6	152 45.0 20 5.2				
Δ			22	-1	21	-1		

SUNCE				MESEC			
UT	e = T <sub>p</sub> - UT	Δ/24	r	Prolaz	Δ/24	π <sub>♃</sub>	r
h	min s	s / ' / "	h min	h min	min	' / "	' / "
00	- 6 29.1	.1 15.8	T <sub>m</sub>	5 50	2.0	57.2	15.6
12	- 6 28.4	T <sub>m☉</sub> 12 h 6.5 min	Starost 21.5 d	Faza ☉			

PLANETE									
Pl.	T <sub>m</sub>	π	360-α	Vel.	Pl.	T <sub>m</sub>	π	360-α	Vel.
h	h min	' / "	°	°	h min	' / "	°	°	°
♀	14 10	.1	202	-3.8	♃	16 23	.0	168	-1.7
♂	5 32	.2	331	-4	♄	11 50	.0	236	.4

UT	SUNCE		PROLEĆ. TAČKA S <sub>γ</sub>	VENERA		MARS	
	S <sub>☉</sub>	δ <sub>☉</sub>		S <sub>♀</sub>	δ <sub>♀</sub>	S <sub>♂</sub>	δ <sub>♂</sub>
h	° / ' / "	° / ' / "	° / ' / "	° / ' / "	° / ' / "	° / ' / "	° / ' / "
0	178 23.0 18 46.7		306 44.5	147 20.0 10 12.7	277 25.0 9 2.4		
2	208 23.1 18 45.5		336 49.4	177 19.3 10 10.4	307 27.2 9 3.3		
4	238 23.1 18 44.3		6 54.4	207 18.6 10 8.0	337 29.4 9 4.3		
6	268 23.1 18 43.1		36 59.3	237 17.9 10 5.7	7 31.5 9 5.3		
8	298 23.2 18 41.9		67 4.2	267 17.2 10 3.3	37 33.7 9 6.3		
10	328 23.2 18 40.8		97 9.1	297 16.6 10 1.0	67 35.9 9 7.3		
12	358 23.3 18 39.6		127 14.1	327 15.9 9 58.6	97 38.0 9 8.3		
14	28 23.3 18 38.4		157 19.0	357 15.2 9 56.2	127 40.2 9 9.2		
16	58 23.4 18 37.2		187 23.9	27 14.5 9 53.9	157 42.4 9 10.2		
18	88 23.4 18 36.0		217 28.9	57 13.9 9 51.5	187 44.6 9 11.2		
20	118 23.4 18 34.8		247 33.8	87 13.2 9 49.2	217 46.7 9 12.2		
22	148 23.5 18 33.6		277 38.7	117 12.5 9 46.8	247 48.9 9 13.1		
Δ	0	-6		-3	-12	11	5

φ	SUNCE		TRAJANJE SUMRAKA		MESEC			
	IZLAZ	ZALAZ	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 34	20 38	1 2	:::	22 1	.3	15 52	4.1
55	4 3	20 8	0 47	:::	22 41	.9	15 14	3.4
50	4 25	19 47	0 39	2 40	23 9	1.2	14 47	3.1
45	4 42	19 30	0 34	2 7	23 31	1.4	14 27	2.9
40	4 56	19 17	0 31	1 50	23 49	1.5	14 10	2.8
35	5 7	19 5	0 28	1 38	...	.0	13 57	2.6
30	5 17	18 55	0 26	1 30	...	.0	13 45	2.5
20	5 34	18 38	0 24	1 20	...	.0	13 24	2.4
10	5 49	18 24	0 22	1 15	0 12	1.9	13 6	2.2
0	6 3	18 10	0 22	1 13	0 27	2.0	12 50	2.1
10	6 17	17 56	0 22	1 13	0 41	2.2	12 34	2.0
20	6 31	17 42	0 23	1 16	0 57	2.4	12 16	1.8
30	6 47	17 26	0 25	1 23	1 15	2.5	11 56	1.6
35	6 57	17 16	0 27	1 28	1 26	2.7	11 44	1.5
40	7 8	17 6	0 29	1 34	1 38	2.8	11 31	1.4
45	7 20	16 53	0 32	1 42	1 53	3.0	11 15	1.2
50	7 36	16 38	0 36	1 53	2 11	3.2	10 56	1.0
55	7 55	16 18	0 41	2 8	2 34	3.5	10 31	.7
60	8 21	15 52	0 49	2 30	3 7	4.1	9 57	.2

UT	MESEC				JUPITER		SATURN	
	S <sub>♃</sub>	Δ	δ <sub>♃</sub>	Δ	S <sub>♃</sub>	δ <sub>♃</sub>	S <sub>♄</sub>	δ <sub>♄</sub>
h	° / ' / "	° / ' / "	° / ' / "	° / ' / "	° / ' / "	° / ' / "	° / ' / "	° / ' / "
0	263 40.1 118 19 7.2	115	114 25.0 - 3 58.9	182 49.3 20 5.1				
2	292 41.8 118 19 30.3	113	144 29.3 - 3 59.2	212 53.5 20 5.0				
4	321 43.3 117 19 52.9	111	174 33.6 - 3 59.5	242 57.8 20 4.8				
6	350 44.6 116 20 15.2	109	204 37.9 - 3 59.8	273 2.0 20 4.7				
8	19 45.8 115 20 36.9	107	234 42.2 - 4 .0	303 6.3 20 4.6				
10	48 46.9 114 20 58.3	105	264 46.5 - 4 .3	333 10.5 20 4.4				
12	77 47.7 113 21 19.2	102	294 50.8 - 4 .6	3 14.8 20 4.3				
14	106 48.4 113 21 39.7	100	324 55.1 - 4 .9	33 19.1 20 4.2				
16	135 48.9 112 21 59.7	98	354 59.4 - 4 1.2	63 23.3 20 4.0				
18	164 49.2 111 22 19.3	95	25 3.7 - 4 1.5	93 27.6 20 3.9				
20	193 49.4 110 22 38.3	93	55 8.0 - 4 1.8	123 31.8 20 3.7				
22	222 49.4 109 22 57.0	91	85 12.3 - 4 2.0	153 36.1 20 3.6				
Δ			21	-1	21	-1		

SUNCE				MESEC			
UT	e = T <sub>p</sub> - UT	Δ/24	r	Prolaz	Δ/24	π <sub>♃</sub>	r
h	min s	s / ' / "	h min	h min	min	' / "	' / "
00	- 6 27.7	.1 15.8	T <sub>m</sub>	6 38	2.1	56.4	15.4
12	- 6 26.7	T <sub>m☉</sub> 12 h 6.4 min	Starost 22.5 d	Faza ☉			

PLANETE									
Pl.	T <sub>m</sub>	π	360-α	Vel.	Pl.	T <sub>m</sub>	π	360-α	Vel.
h	h min	' / "	°	°	h min	' / "	°	°	°
♀	14 11	.1	201	-3.8	♃	16 20	.0	168	-1.7
♂	5 30	.2	331	-4	♄	11 47	.0	236	.4

UT	SUNCE		PROLEĆ. TAČKA S <sub>γ</sub>	VENERA		MARS	
	S <sub>☉</sub>	δ <sub>☉</sub>		S <sub>♀</sub>	δ <sub>♀</sub>	S <sub>♂</sub>	δ <sub>♂</sub>
h	° / ' / "	° / ' / "	° / ' / "	° / ' / "	° / ' / "	° / ' / "	° / ' / "
0	178 23.5	18 32.4	307 43.6	147 11.9	9 44.4	277 51.1	9 14.1
2	208 23.6	18 31.2	337 48.6	177 11.2	9 42.1	307 53.3	9 15.1
4	238 23.6	18 30.0	7 53.5	207 10.5	9 39.7	337 55.5	9 16.1
6	268 23.7	18 28.7	37 58.4	237 9.9	9 37.3	7 57.6	9 17.0
8	298 23.7	18 27.5	68 3.4	267 9.2	9 35.0	37 59.8	9 18.0
10	328 23.8	18 26.3	98 8.3	297 8.6	9 32.6	68 2.0	9 19.0
12	358 23.8	18 25.1	128 13.2	327 7.9	9 30.2	98 4.2	9 19.9
14	28 23.9	18 23.9	158 18.1	357 7.3	9 27.8	128 6.4	9 20.9
16	58 24.0	18 22.7	188 23.1	27 6.6	9 25.4	158 8.6	9 21.9
18	88 24.0	18 21.4	218 28.0	57 6.0	9 23.1	188 10.8	9 22.8
20	118 24.1	18 20.2	248 32.9	87 5.3	9 20.7	218 13.0	9 23.8
22	148 24.1	18 19.0	278 37.8	117 4.7	9 18.3	248 15.1	9 24.8
Δ	0	-6		-3	-12	11	5

φ	SUNCE		TRAJANJE SUMRAKA		MESEC			
	IZLAZ	ZALAZ	GRAD.	ASTR.	IZLAZ	Δ/24	ZALAZ	Δ/24
N	h min	h min	h min	h min	h min	min	h min	min
60	3 36	20 35	1 1	:::	22 8	.7	17 30	3.8
55	4 5	20 6	0 47	:::	23 3	1.4	16 36	3.1
50	4 26	19 45	0 39	2 38	23 38	1.6	16 2	2.9
45	4 43	19 29	0 34	2 7	...	.0	15 37	2.7
40	4 56	19 16	0 30	1 49	...	.0	15 16	2.6
35	5 8	19 5	0 28	1 38	0 3	1.6	14 60	2.5
30	5 18	18 55	0 26	1 30	0 16	1.7	14 45	2.4
20	5 35	18 38	0 24	1 20	0 38	1.9	14 21	2.3
10	5 49	18 23	0 22	1 15	0 58	2.0	13 60	2.2
0	6 3	18 10	0 22	1 12	1 16	2.1	13 40	2.2
10	6 16	17 57	0 22	1 13	1 34	2.2	13 20	2.1
20	6 31	17 42	0 23	1 16	1 54	2.3	12 59	2.0
30	6 47	17 26	0 25	1 23	2 16	2.5	12 35	1.8
35	6 56	17 17	0 27	1 27	2 30	2.6	12 21	1.8
40	7 7	17 6	0 29	1 34	2 45	2.7	12 5	1.7
45	7 19	16 54	0 32	1 42	3 4	2.8	11 45	1.6
50	7 34	16 39	0 35	1 53	3 27	3.0	11 21	1.4
55	7 53	16 20	0 41	2 8	3 58	3.3	10 49	1.1
60	8 19	15 54	0 49	2 30	4 45	4.0	10 1	.4

UT	MESEC				JUPITER			SATURN		
	S <sub>♃</sub>	Δ	δ <sub>♃</sub>	Δ	S <sub>♃</sub>	δ <sub>♃</sub>	Δ	S <sub>♄</sub>	δ <sub>♄</sub>	Δ
h	° / ' / "	° / ' / "	° / ' / "	° / ' / "	° / ' / "	° / ' / "	° / ' / "	° / ' / "	° / ' / "	° / ' / "
0	251 49.2	108	23 15.1	88	115 16.6	- 4 2.3		183 40.3	20 3.5	
2	280 48.8	107	23 32.8	86	145 20.9	- 4 2.6		213 44.6	20 3.3	
4	309 48.3	106	23 49.9	83	175 25.2	- 4 2.9		243 48.9	20 3.2	
6	338 47.6	106	24 6.6	81	205 29.5	- 4 3.2		273 53.1	20 3.1	
8	7 46.7	105	24 22.8	78	235 33.8	- 4 3.5		303 57.4	20 2.9	
10	36 45.7	104	24 38.5	76	265 38.1	- 4 3.8		334 1.6	20 2.8	
12	65 44.5	103	24 53.7	73	295 42.3	- 4 4.0		4 5.9	20 2.7	
14	94 43.1	102	25 8.3	71	325 46.6	- 4 4.3		34 10.2	20 2.5	
16	123 41.6	102	25 22.5	68	355 50.9	- 4 4.6		64 14.4	20 2.4	
18	152 39.9	101	25 36.1	66	25 55.2	- 4 4.9		94 18.7	20 2.2	
20	181 38.1	100	25 49.2	63	55 59.5	- 4 5.2		124 22.9	20 2.1	
22	210 36.2	100	26 1.8	60	86 3.8	- 4 5.5		154 27.2	20 2.0	
Δ					21	-1		21	-1	

SUNCE				MESEC			
UT	e = T <sub>p</sub> - UT	Δ/24	r	Prolaz	Δ/24	π <sub>♃</sub>	r
h	min s	s / ' / "	h min	h min	min / ' / "	° / ' / "	h min
00	- 6 25.7	.1 15.8	T <sub>m</sub>	7 28	2.1	55.7	15.2
12	- 6 24.4	T <sub>m</sub> 12 h 6.4 min	Starost 23.5 d	Faza ☉			

PLANETE									
Pl.	T <sub>m</sub>	π	360-α	Vel.	Pl.	T <sub>m</sub>	π	360-α	Vel.
h	h min	'	°	h min	h min	'	°	h min	'
♀	14 12	.1	199	-3.8	♃	16 17	.0	168	-1.7
♂	5 28	.2	330	-4	♄	11 44	.0	236	.4

UT	SUNCE		PROLEĆ. TAČKA S <sub>γ</sub>	VENERA		MARS	
	S <sub>☉</sub>	δ <sub>☉</sub>		S <sub>♀</sub>	δ <sub>♀</sub>	S <sub>♂</sub>	δ <sub>♂</sub>
h	° / ' / "	° / ' / "	° / ' / "	° / ' / "	° / ' / "	° / ' / "	° / ' / "
0	178 24.2	18 17.7	308 42.8	147 4.0	9 15.9	278 17.3	9 25.7
2	208 24.2	18 16.5	338 47.7	177 3.4	9 13.5	308 19.5	9 26.7
4	238 24.3	18 15.3	8 52.6	207 2.7	9 11.1	338 21.7	9 27.6
6	268 24.4	18 14.0	38 57.6	237 2.1	9 8.7	8 23.9	9 28.6
8	298 24.4	18 12.8	69 2.5	267 1.5	9 6.4	38 26.1	9 29.6
10	328 24.5	18 11.6	99 7.4	297 .8	9 4.0	68 28.3	9 30.5
12	358 24.6	18 10.3	129 12.3	327 .2	9 1.6	98 30.5	9 31.5
14	28 24.6	18 9.1	159 17.3	356 59.6	8 59.2	128 32.8	9 32.4
16	58 24.7	18 7.8	189 22.2	26 58.9	8 56.8	158 35.0	9 33.4
18	88 24.8	18 6.6	219 27.1	56 58.3	8 54.4	188 37.2	9 34.3
20	118 24.8	18 5.3	249 32.1	86 57.7	8 52.0	218 39.4	9 35.3
22	148 24.9	18 4.1	279 37.0	116 57.0	8 49.6	248 41.6	9 36.2
Δ	0	-6		-3	-12	11	5

φ	SUNCE		TRAJANJE SUMRAKA		MESEC			
	IZLAZ	ZALAZ	GRAD.	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 33	1 1	:::	22 26	1.8	19 0	2.8
55	4 7	20 5	0 46	:::	23 36	2.0	17 51	2.5
50	4 28	19 44	0 39	2 36	...	.0	17 11	2.4
45	4 44	19 28	0 34	2 6	0 5	1.7	16 42	2.4
40	4 57	19 15	0 30	1 49	0 25	1.8	16 19	2.3
35	5 9	19 4	0 28	1 38	0 43	1.9	16 0	2.3
30	5 18	18 54	0 26	1 30	0 58	1.9	15 44	2.3
20	5 35	18 37	0 23	1 20	1 24	2.0	15 17	2.3
10	5 49	18 23	0 22	1 14	1 46	2.1	14 53	2.2
0	6 3	18 10	0 22	1 12	2 7	2.2	14 32	2.2
10	6 16	17 57	0 22	1 13	2 27	2.2	14 10	2.1
20	6 30	17 43	0 23	1 16	2 50	2.3	13 47	2.1
30	6 46	17 27	0 25	1 22	3 16	2.4	13 19	2.1
35	6 55	17 18	0 27	1 27	3 32	2.4	13 4	2.0
40	7 6	17 7	0 29	1 34	3 50	2.5	12 45	1.9
45	7 18	16 55	0 32	1 42	4 12	2.6	12 23	2.0
50	7 33	16 40	0 35	1 53	4 39	2.7	11 54	1.8
55	7 52	16 22	0 41	2 8	5 18	2.8	11 15	1.7
60	8 17	15 57	0 49	2 29	6 21	3.4	10 11	1.1

UT	MESEC				JUPITER			SATURN		
	S <sub>♃</sub>	Δ	δ <sub>♃</sub>	Δ	S <sub>♃</sub>	δ <sub>♃</sub>	Δ	S <sub>♄</sub>	δ <sub>♄</sub>	Δ
h	° / ' / "	° / ' / "	° / ' / "	° / ' / "	° / ' / "	° / ' / "	° / ' / "	° / ' / "	° / ' / "	° / ' / "
0	239 34.1	99	26 13.8	58	116 8.1	- 4 5.8		184 31.4	20 1.8	
2	268 31.9	98	26 25.3	55	146 12.3	- 4 6.1		214 35.7	20 1.7	
4	297 29.5	98	26 36.3	52	176 16.6	- 4 6.3		244 40.0	20 1.6	
6	326 27.0	97	26 46.7	49	206 20.9	- 4 6.6		274 44.2	20 1.4	
8	355 24.5	97	26 56.5	47	236 25.2	- 4 6.9		304 48.5	20 1.3	
10	24 21.8	96	27 5.9	44	266 29.5	- 4 7.2		334 52.7	20 1.1	
12	53 19.0	96	27 14.6	41	296 33.7	- 4 7.5		4 57.0	20 1.0	
14	82 16.1	95	27 22.8	38	326 38.0	- 4 7.8		35 1.3	20 .9	
16	111 13.2	95	27 30.5	36	356 42.3	- 4 8.1		65 5.5	20 .7	
18	140 10.2	95	27 37.6	33	26 46.6	- 4 8.4		95 9.8	20 .6	
20	169 7.1	94	27 44.1	30	56 50.9	- 4 8.7		125 14.0	20 .5	
22	198 3.9	94	27 50.1	27	86 55.1	- 4 9.0		155 18.3	20 .3	
Δ					21	-1		21	-1	

SUNCE				MESEC			
UT	e = T <sub>p</sub> - UT	Δ/24	r	Prolaz	Δ/24	π <sub>♃</sub>	r
h	min s	s / ' / "	h min	h min	min / ' / "	° / ' / "	h min
00	- 6 23.1	.1 15.8	T <sub>m</sub>	8 19	2.2	55.1	15.0
12	- 6 21.5	T <sub>m</sub> 12 h 6.4 min	Starost 24.5 d	Faza ☉			

PLANETE									
Pl.	T <sub>m</sub>	π	360-α	Vel.	Pl.	T <sub>m</sub>	π	360-α	Vel.
h	h min	'	°	h min	h min	'	°	h min	'
♀	14 12	.1	198	-3.8	♃	16 13	.0	167	-1.7
♂	5 26	.2	330	-5	♄	11 40	.0	236	.4

1. AVGUST

2005.

PONEDELJAK

UT	SUNCE				PROLEĆ. TAČKA S <sub>γ</sub>	VENERA			MARS					
	S <sub>☉</sub>	δ <sub>☉</sub>				S <sub>♀</sub>	δ <sub>♀</sub>			S <sub>♂</sub>	δ <sub>♂</sub>			
h	°	'	°	'	°	'	°	'	°	'	°	'		
0	178	25.0	18	2.8	309	41.9	146	56.4	8	47.2	278	43.8	9	37.2
2	208	25.1	18	1.6	339	46.8	176	55.8	8	44.8	308	46.0	9	38.2
4	238	25.1	18	.3	9	51.8	206	55.2	8	42.3	338	48.2	9	39.1
6	268	25.2	17	59.1	39	56.7	236	54.5	8	39.9	8	50.5	9	40.0
8	298	25.3	17	57.8	70	1.6	266	53.9	8	37.5	38	52.7	9	41.0
10	328	25.4	17	56.5	100	6.6	296	53.3	8	35.1	68	54.9	9	41.9
12	358	25.4	17	55.3	130	11.5	326	52.7	8	32.7	98	57.1	9	42.9
14	28	25.5	17	54.0	160	16.4	356	52.1	8	30.3	128	59.3	9	43.8
16	58	25.6	17	52.7	190	21.3	26	51.5	8	27.9	159	1.6	9	44.8
18	88	25.7	17	51.4	220	26.3	56	50.8	8	25.4	189	3.8	9	45.7
20	118	25.8	17	50.2	250	31.2	86	50.2	8	23.0	219	6.0	9	46.7
22	148	25.8	17	48.9	280	36.1	116	49.6	8	20.6	249	8.2	9	47.6
Δ	0	-6					-3	-12			11	5		

φ	SUNCE		TRAJANJE SUMRAKA		MESEC			
	IZLAZ	ZALAZ	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 41	20 30	0 60	:::	23 8	3.1	20 8	1.4
55	4 9	20 3	0 46	:::	..	.0	18 52	1.8
50	4 29	19 42	0 38	2 34	0 17	2.1	18 9	1.9
45	4 45	19 27	0 34	2 5	0 46	2.1	17 39	2.0
40	4 58	19 14	0 30	1 48	1 9	2.1	17 15	2.0
35	5 9	19 3	0 28	1 37	1 28	2.1	16 56	2.1
30	5 19	18 53	0 26	1 29	1 45	2.1	16 39	2.1
20	5 35	18 37	0 23	1 20	2 12	2.2	16 11	2.1
10	5 50	18 23	0 22	1 14	2 36	2.2	15 47	2.1
0	6 3	18 10	0 22	1 12	2 59	2.2	15 24	2.2
10	6 16	17 57	0 22	1 13	3 21	2.2	15 1	2.2
20	6 30	17 43	0 23	1 16	3 45	2.2	14 37	2.2
30	6 45	17 28	0 25	1 22	4 13	2.2	14 9	2.2
35	6 54	17 18	0 27	1 27	4 30	2.2	13 52	2.2
40	7 5	17 8	0 29	1 33	4 49	2.2	13 32	2.3
45	7 17	16 56	0 32	1 42	5 13	2.2	13 9	2.3
50	7 31	16 42	0 35	1 52	5 43	2.2	12 38	2.3
55	7 50	16 23	0 40	2 7	6 26	2.2	11 55	2.4
60	8 15	15 59	0 48	2 29	7 43	2.1	10 38	2.5

UT	MESEC				JUPITER			SATURN						
	S <sub>♃</sub>	Δ	δ <sub>♃</sub>	Δ	S <sub>♃</sub>	δ <sub>♃</sub>			S <sub>♄</sub>	δ <sub>♄</sub>				
h	°	'	°	'	°	'	°	'	°	'	°	'		
0	227	.8	94	27	55.5	24	116	59.4	-4	9.3	185	22.5	20	.2
2	255	57.5	94	28	.4	21	147	3.7	-4	9.5	215	26.8	20	.1
4	284	54.3	94	28	4.6	19	177	8.0	-4	9.8	245	31.1	19	59.9
6	313	51.0	94	28	8.3	16	207	12.2	-4	10.1	275	35.3	19	59.8
8	342	47.8	94	28	11.5	13	237	16.5	-4	10.4	305	39.6	19	59.6
10	11	44.5	94	28	14.1	10	267	20.8	-4	10.7	335	43.8	19	59.5
12	40	41.2	94	28	16.1	7	297	25.0	-4	11.0	5	48.1	19	59.4
14	69	38.0	94	28	17.5	4	327	29.3	-4	11.3	35	52.4	19	59.2
16	98	34.8	94	28	18.4	2	357	33.6	-4	11.6	65	56.6	19	59.1
18	127	31.6	94	28	18.7	-1	27	37.8	-4	11.9	96	.9	19	59.0
20	156	28.5	95	28	18.5	-4	57	42.1	-4	12.2	126	5.1	19	58.8
22	185	25.5	95	28	17.6	-7	87	46.4	-4	12.5	156	9.4	19	58.7
Δ							21	-1			21	-1		

SUNCE				MESEC				
UT	e = T <sub>p</sub> - UT	Δ/24	r	Prolaz	Δ/24	π <sub>♃</sub>	r	
h	min	s	s	h min	min	'	'	
00	- 6 19.9	.2	15.8	T <sub>m</sub>	9 11	2.2	54.7	14.9
12	- 6 18.0	T <sub>m☉</sub>	12 h 6.3 min	Starost	25.5 d	Faza	☉	

PLANETE									
Pl.	T <sub>m</sub>	π	360-α	Vel.	Pl.	T <sub>m</sub>	π	360-α	Vel.
h	min	'	°	h min	'	°	'	°	h min
♀	14 13	.1	197	-3.8	♃	16 10	.0	167	-1.7
♁	5 25	.2	329	-5	♄	11 37	.0	236	.4

2. AVGUST

UTORAK

UT	SUNCE				PROLEĆ. TAČKA S <sub>γ</sub>	VENERA			MARS					
	S <sub>☉</sub>	δ <sub>☉</sub>				S <sub>♀</sub>	δ <sub>♀</sub>			S <sub>♂</sub>	δ <sub>♂</sub>			
h	°	'	°	'	°	'	°	'	°	'	°	'		
0	178	25.9	17	47.6	310	41.1	146	49.0	8	18.2	279	10.5	9	48.5
2	208	26.0	17	46.3	340	46.0	176	48.4	8	15.8	309	12.7	9	49.5
4	238	26.1	17	45.0	10	50.9	206	47.8	8	13.3	339	14.9	9	50.4
6	268	26.2	17	43.8	40	55.8	236	47.2	8	10.9	9	17.2	9	51.3
8	298	26.3	17	42.5	71	.8	266	46.6	8	8.5	39	19.4	9	52.3
10	328	26.4	17	41.2	101	5.7	296	46.0	8	6.0	69	21.7	9	53.2
12	358	26.5	17	39.9	131	10.6	326	45.4	8	3.6	99	23.9	9	54.1
14	28	26.5	17	38.6	161	15.6	356	44.8	8	1.2	129	26.1	9	55.1
16	58	26.6	17	37.3	191	20.5	26	44.2	7	58.8	159	28.4	9	56.0
18	88	26.7	17	36.0	221	25.4	56	43.6	7	56.3	189	30.6	9	56.9
20	118	26.8	17	34.7	251	30.3	86	43.0	7	53.9	219	32.9	9	57.9
22	148	26.9	17	33.4	281	35.3	116	42.4	7	51.4	249	35.1	9	58.8
Δ	0	-6					-3	-12			11	5		

φ	SUNCE		TRAJANJE SUMRAKA		MESEC			
	IZLAZ	ZALAZ	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 28	0 59	:::	..	.0	20 41	.5
55	4 11	20 1	0 46	:::	0 24	2.7	19 35	1.2
50	4 31	19 41	0 38	2 32	1 6	2.5	18 55	1.4
45	4 46	19 25	0 33	2 4	1 37	2.4	18 26	1.6
40	4 59	19 13	0 30	1 48	2 0	2.4	18 4	1.7
35	5 10	19 2	0 28	1 37	2 20	2.3	17 45	1.8
30	5 20	18 53	0 26	1 29	2 36	2.3	17 29	1.8
20	5 36	18 36	0 23	1 19	3 4	2.2	17 2	1.9
10	5 50	18 23	0 22	1 14	3 28	2.2	16 38	2.0
0	6 3	18 10	0 22	1 12	3 51	2.1	16 16	2.1
10	6 16	17 57	0 22	1 13	4 13	2.1	15 54	2.2
20	6 29	17 43	0 23	1 16	4 38	2.0	15 30	2.3
30	6 45	17 28	0 25	1 22	5 6	2.0	15 2	2.3
35	6 54	17 19	0 27	1 27	5 22	1.9	14 46	2.4
40	7 4	17 9	0 29	1 33	5 42	1.9	14 27	2.5
45	7 16	16 57	0 31	1 41	6 5	1.8	14 4	2.6
50	7 30	16 43	0 35	1 52	6 35	1.7	13 34	2.7
55	7 48	16 25	0 40	2 7	7 18	1.5	12 52	2.9
60	8 12	16 1	0 48	2 28	8 32	.8	11 37	3.6

UT	MESEC				JUPITER			SATURN						
	S <sub>♃</sub>	Δ	δ <sub>♃</sub>	Δ	S <sub>♃</sub>	δ <sub>♃</sub>			S <sub>♄</sub>	δ <sub>♄</sub>				
h	°	'	°	'	°	'	°	'	°	'	°	'		
0	214	22.5	96	28	16.3	-10	117	50.6	-4	12.8	186	13.7	19	58.5
2	243	19.7	96	28	14.3	-12	147	54.9	-4	13.1	216	17.9	19	58.4
4	272	16.9	97	28	11.8	-15	177	59.2	-4	13.4	246	22.2	19	58.3
6	301	14.2	97	28	8.8	-18	208	3.4	-4	13.7	276	26.4	19	58.1
8	330	11.6	98	28	5.2	-21	238	7.7	-4	14.0	306	30.7	19	58.0
10	359	9.2	98	28	1.0	-23	268	12.0	-4	14.3	336	35.0	19	57.9
12	28	6.9	99	27	56.4	-26	298	16.2	-4	14.6	6	39.2	19	57.7
14	57	4.7	100	27	51.1	-29	328	20.5	-4	14.9	36	43.5	19	57.6
16	86	2.7	101	27	45.4	-32	358	24.8	-4	15.1	66	47.7	19	57.4
18	115	.8	102	27	39.0	-34	28	29.0	-4	15.4	96	52.0	19	57.3
20	143	59.1	102	27	32.2	-37	58	33.3	-4	15.7	126	56.3	19	57.2
22	172	57.6	103	27	24.9	-39	88	37.5	-4	16.0	157	.5	19	57.0
Δ							21	-1			21	-1		

SUNCE				MESEC				
UT	e = T <sub>p</sub> - UT	Δ/24	r	Prolaz	Δ/24	π <sub>♃</sub>	r	
h	min	s	s	h min	min	'	'	
00	- 6 16.1	.2	15.8	T <sub>m</sub>	10 4	2.1	54.3	14.8
12	- 6 13.9	T <sub>m☉</sub>	12 h 6.2 min	Starost	26.5 d	Faza	☉	

UT	SUNCE		PROLEĆ. TAČKA S <sub>γ</sub>	VENERA		MARS	
	S <sub>☉</sub>	δ <sub>☉</sub>		S <sub>♀</sub>	δ <sub>♀</sub>	S <sub>♂</sub>	δ <sub>♂</sub>
h	° / ' / "	° / ' / "	° / ' / "	° / ' / "	° / ' / "	° / ' / "	° / ' / "
0	178 27.0	17 32.1	311 40.2	146 41.8	7 49.0	279 37.4	9 59.7
2	208 27.1	17 30.8	341 45.1	176 41.2	7 46.6	309 39.6	10 .7
4	238 27.2	17 29.5	11 50.1	206 40.6	7 44.1	339 41.9	10 1.6
6	268 27.3	17 28.2	41 55.0	236 40.1	7 41.7	9 44.1	10 2.5
8	298 27.4	17 26.9	71 59.9	266 39.5	7 39.2	39 46.4	10 3.4
10	328 27.5	17 25.6	102 4.8	296 38.9	7 36.8	69 48.7	10 4.3
12	358 27.6	17 24.2	132 9.8	326 38.3	7 34.3	99 50.9	10 5.3
14	28 27.7	17 22.9	162 14.7	356 37.7	7 31.9	129 53.2	10 6.2
16	58 27.8	17 21.6	192 19.6	26 37.1	7 29.4	159 55.4	10 7.1
18	88 27.9	17 20.3	222 24.5	56 36.6	7 27.0	189 57.7	10 8.0
20	118 28.0	17 19.0	252 29.5	86 36.0	7 24.5	219 60.0	10 8.9
22	148 28.2	17 17.6	282 34.4	116 35.4	7 22.1	250 2.2	10 9.9
Δ	1	-7		-3	-12	11	5

φ	SUNCE		TRAJANJE SUMRAKA		MESEC			
	IZLAZ	ZALAZ	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 45	20 25	0 58	:::	0 22	3.7	20 54	.2
55	4 12	19 59	0 45	:::	1 28	3.1	20 3	.8
50	4 32	19 39	0 38	2 31	2 7	2.8	19 30	1.1
45	4 48	19 24	0 33	2 3	2 35	2.7	19 4	1.3
40	5 0	19 12	0 30	1 47	2 57	2.5	18 44	1.4
35	5 11	19 1	0 28	1 36	3 16	2.4	18 27	1.5
30	5 20	18 52	0 26	1 29	3 31	2.4	18 13	1.6
20	5 36	18 36	0 23	1 19	3 58	2.2	17 48	1.7
10	5 50	18 22	0 22	1 14	4 21	2.1	17 26	1.9
0	6 3	18 10	0 22	1 12	4 42	2.0	17 6	2.0
10	6 15	17 57	0 22	1 13	5 3	1.9	16 46	2.1
20	6 29	17 44	0 23	1 16	5 26	1.8	16 24	2.2
30	6 44	17 29	0 25	1 22	5 53	1.7	15 59	2.4
35	6 53	17 20	0 27	1 27	6 8	1.6	15 44	2.5
40	7 3	17 10	0 29	1 33	6 26	1.5	15 26	2.6
45	7 14	16 58	0 31	1 41	6 48	1.4	15 5	2.7
50	7 28	16 45	0 35	1 52	7 15	1.2	14 38	2.9
55	7 46	16 27	0 40	2 7	7 53	.9	14 2	3.2
60	8 10	16 3	0 48	2 27	8 53	.3	13 3	3.9
S								

UT	MESEC				JUPITER		SATURN	
	S <sub>♃</sub>	Δ	δ <sub>♃</sub>	Δ	S <sub>♃</sub>	δ <sub>♃</sub>	S <sub>♄</sub>	δ <sub>♄</sub>
h	° / ' / "	° / ' / "	° / ' / "	° / ' / "	° / ' / "	° / ' / "	° / ' / "	° / ' / "
0	201 56.2	104	27 17.0	-42	118 41.8	-4 16.3	187 4.8	19 56.9
2	230 55.1	105	27 8.6	-45	148 46.0	-4 16.6	217 9.1	19 56.8
4	259 54.1	106	26 59.7	-47	178 50.3	-4 16.9	247 13.3	19 56.6
6	288 53.4	107	26 50.2	-50	208 54.6	-4 17.2	277 17.6	19 56.5
8	317 52.9	108	26 40.3	-52	238 58.8	-4 17.5	307 21.8	19 56.3
10	346 52.5	110	26 29.9	-55	269 3.1	-4 17.8	337 26.1	19 56.2
12	15 52.4	111	26 19.0	-57	299 7.3	-4 18.1	7 30.4	19 56.1
14	44 52.6	112	26 7.6	-59	329 11.6	-4 18.4	37 34.6	19 55.9
16	73 52.9	113	25 55.7	-62	359 15.8	-4 18.7	67 38.9	19 55.8
18	102 53.5	114	25 43.4	-64	29 20.1	-4 19.0	97 43.1	19 55.7
20	131 54.4	115	25 30.6	-66	59 24.3	-4 19.3	127 47.4	19 55.5
22	160 55.5	117	25 17.3	-69	89 28.6	-4 19.6	157 51.7	19 55.4
Δ					21	-2	21	-1

SUNCE				MESEC					
UT	e = T <sub>p</sub> - UT	Δ/24	r	Prolaz	Δ/24	π <sub>♃</sub>	r		
h	min s	s	'	h min	min	'	'		
00	- 6 11.7	.2	15.8	T <sub>m</sub>	10 54	2.0	54.1 14.7		
12	- 6 9.3	T <sub>m</sub> ☉	12 h 6.2 min	Starost	27.5 d	Faza	●		
PLANETE									
Pl.	T <sub>m</sub>	π	360-α	Vel.	Pl.	T <sub>m</sub>	π	360-α	Vel.
♀	h min	'	°		♃	h min	'	°	
♂	14 13	.1	195	-3.8	♄	16 3	.0	167	-1.7
	5 21	.2	328	-5	♅	11 30	.0	235	.4

UT	SUNCE		PROLEĆ. TAČKA S <sub>γ</sub>	VENERA		MARS	
	S <sub>☉</sub>	δ <sub>☉</sub>		S <sub>♀</sub>	δ <sub>♀</sub>	S <sub>♂</sub>	δ <sub>♂</sub>
h	° / ' / "	° / ' / "	° / ' / "	° / ' / "	° / ' / "	° / ' / "	° / ' / "
0	178 28.3	17 16.3	312 39.3	146 34.8	7 19.6	280 4.5	10 10.8
2	208 28.4	17 15.0	342 44.3	176 34.3	7 17.2	310 6.8	10 11.7
4	238 28.5	17 13.7	12 49.2	206 33.7	7 14.7	340 9.1	10 12.6
6	268 28.6	17 12.3	42 54.1	236 33.1	7 12.2	10 11.3	10 13.5
8	298 28.7	17 11.0	72 59.0	266 32.6	7 9.8	40 13.6	10 14.4
10	328 28.8	17 9.7	103 4.0	296 32.0	7 7.3	70 15.9	10 15.3
12	358 28.9	17 8.3	133 8.9	326 31.4	7 4.9	100 18.2	10 16.2
14	28 29.1	17 7.0	163 13.8	356 30.9	7 2.4	130 20.4	10 17.1
16	58 29.2	17 5.6	193 18.8	26 30.3	6 59.9	160 22.7	10 18.1
18	88 29.3	17 4.3	223 23.7	56 29.7	6 57.5	190 25.0	10 19.0
20	118 29.4	17 2.9	253 28.6	86 29.2	6 55.0	220 27.3	10 19.9
22	148 29.5	17 1.6	283 33.5	116 28.6	6 52.5	250 29.6	10 20.8
Δ	1	-7		-3	-12	11	5

φ	SUNCE		TRAJANJE SUMRAKA		MESEC			
	IZLAZ	ZALAZ	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 23	0 57	:::	1 52	3.8	20 59	.1
55	4 14	19 57	0 45	:::	2 42	3.3	20 22	.5
50	4 34	19 38	0 38	2 29	3 15	3.0	19 55	.8
45	4 49	19 23	0 33	2 2	3 39	2.8	19 34	1.0
40	5 1	19 10	0 30	1 47	3 58	2.6	19 18	1.2
35	5 12	19 0	0 28	1 36	4 14	2.5	19 4	1.3
30	5 21	18 51	0 26	1 29	4 28	2.4	18 51	1.4
20	5 36	18 35	0 23	1 19	4 52	2.2	18 30	1.6
10	5 50	18 22	0 22	1 14	5 12	2.1	18 11	1.7
0	6 3	18 10	0 22	1 12	5 31	1.9	17 54	1.9
10	6 15	17 57	0 22	1 13	5 50	1.8	17 37	2.0
20	6 28	17 44	0 23	1 16	6 10	1.7	17 18	2.2
30	6 43	17 29	0 25	1 22	6 34	1.5	16 56	2.4
35	6 52	17 21	0 27	1 27	6 47	1.4	16 43	2.5
40	7 2	17 11	0 29	1 33	7 3	1.3	16 28	2.6
45	7 13	16 60	0 31	1 41	7 22	1.1	16 10	2.8
50	7 27	16 46	0 35	1 52	7 45	.9	15 48	3.0
55	7 44	16 29	0 40	2 6	8 15	.6	15 19	3.3
60	8 7	16 5	0 47	2 27	8 60	.1	14 36	3.8
S								

UT	MESEC				JUPITER		SATURN	
	S <sub>♃</sub>	Δ	δ <sub>♃</sub>	Δ	S <sub>♃</sub>	δ <sub>♃</sub>	S <sub>♄</sub>	δ <sub>♄</sub>
h	° / ' / "	° / ' / "	° / ' / "	° / ' / "	° / ' / "	° / ' / "	° / ' / "	° / ' / "
0	189 56.8	118	25 3.6	-71	119 32.8	-4 19.9	187 55.9	19 55.2
2	218 58.4	119	24 49.4	-73	149 37.1	-4 20.2	218 .2	19 55.1
4	248 .3	121	24 34.8	-75	179 41.3	-4 20.5	248 4.5	19 55.0
6	277 2.4	122	24 19.7	-77	209 45.6	-4 20.9	278 8.7	19 54.8
8	306 4.7	123	24 4.2	-80	239 49.8	-4 21.2	308 13.0	19 54.7
10	335 7.4	124	23 48.3	-82	269 54.1	-4 21.5	338 17.2	19 54.6
12	4 10.3	126	23 32.0	-84	299 58.3	-4 21.8	8 21.5	19 54.4
14	33 13.4	127	23 15.3	-86	330 2.5	-4 22.1	38 25.8	19 54.3
16	62 16.8	128	22 58.1	-88	0 6.8	-4 22.4	68 30.0	19 54.1
18	91 20.5	130	22 40.6	-90	30 11.0	-4 22.7	98 34.3	19 54.0
20	120 24.5	131	22 22.7	-91	60 15.3	-4 23.0	128 38.6	19 53.9
22	149 28.7	132	22 4.4	-93	90 19.5	-4 23.3	158 42.8	19 53.7
Δ					21	-2	21	-1

SUNCE				MESEC					
UT	e = T <sub>p</sub> - UT	Δ/24	r	Prolaz	Δ/24	π <sub>♃</sub>	r		
h	min s	s	'	h min	min	'	'		
00	- 6 6.8	.2	15.8	T <sub>m</sub>	11 43	1.9	54.0 14.7		
12	- 6 4.0	T <sub>m</sub> ☉	12 h 6.1 min	Starost	28.5 d	Faza	●		
PLANETE									
Pl.	T <sub>m</sub>	π	360-α	Vel.	Pl.	T <sub>m</sub>	π	360-α	Vel.
♀	h min	'	°		♃	h min	'	°	
♂	14 14	.1	194	-3.8	♄	15 60	.0	167	-1.7
	5 19	.2	327	-5	♅	11 27	.0	235	.4



UT	SUNCE		PROLEĆ. TAČKA S <sub>γ</sub>	VENERA		MARS	
	S <sub>☉</sub>	δ <sub>☉</sub>		S <sub>♀</sub>	δ <sub>♀</sub>	S <sub>♂</sub>	δ <sub>♂</sub>
h	° / ' / "	° / ' / "	° / ' / "	° / ' / "	° / ' / "	° / ' / "	° / ' / "
0	178 29.7	17 02.2	313 38.5	146 28.1	6 50.1	280 31.9	10 21.7
2	208 29.8	16 58.9	343 43.4	176 27.5	6 47.6	310 34.2	10 22.6
4	238 29.9	16 57.5	13 48.3	206 26.9	6 45.1	340 36.5	10 23.5
6	268 30.0	16 56.2	43 53.3	236 26.4	6 42.6	10 38.8	10 24.4
8	298 30.2	16 54.8	73 58.2	266 25.8	6 40.2	40 41.1	10 25.3
10	328 30.3	16 53.5	104 3.1	296 25.3	6 37.7	70 43.4	10 26.2
12	358 30.4	16 52.1	134 8.0	326 24.7	6 35.2	100 45.7	10 27.1
14	28 30.5	16 50.7	164 13.0	356 24.2	6 32.7	130 48.0	10 28.0
16	58 30.7	16 49.4	194 17.9	26 23.6	6 30.2	160 50.3	10 28.9
18	88 30.8	16 48.0	224 22.8	56 23.1	6 27.8	190 52.6	10 29.8
20	118 30.9	16 46.6	254 27.8	86 22.5	6 25.3	220 54.9	10 30.6
22	148 31.1	16 45.3	284 32.7	116 22.0	6 22.8	250 57.2	10 31.5
Δ	1	-7		-3	-12	12	4

φ	SUNCE		TRAJANJE SUMRAKA		MESEC			
	IZLAZ	ZALAZ	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 50	20 20	0 57	:::	3 24	3.7	21 1	.0
55	4 16	19 55	0 45	3 42	4 0	3.3	20 34	.4
50	4 35	19 36	0 38	2 28	4 25	3.0	20 14	.6
45	4 50	19 21	0 33	2 2	4 45	2.8	19 59	.8
40	5 2	19 9	0 30	1 46	5 1	2.6	19 46	1.0
35	5 12	18 59	0 27	1 36	5 14	2.5	19 35	1.1
30	5 21	18 50	0 26	1 28	5 25	2.3	19 25	1.2
20	5 37	18 35	0 23	1 19	5 45	2.1	19 8	1.4
10	5 50	18 22	0 22	1 14	6 2	2.0	18 53	1.6
0	6 3	18 9	0 22	1 12	6 18	1.8	18 39	1.8
10	6 15	17 57	0 22	1 12	6 33	1.7	18 25	1.9
20	6 28	17 44	0 23	1 16	6 50	1.5	18 10	2.1
30	6 42	17 30	0 25	1 22	7 9	1.3	17 53	2.3
35	6 51	17 21	0 27	1 27	7 21	1.2	17 42	2.4
40	7 0	17 12	0 29	1 33	7 33	1.1	17 31	2.6
45	7 12	17 1	0 31	1 41	7 48	.9	17 17	2.7
50	7 25	16 47	0 35	1 51	8 7	.7	16 60	3.0
55	7 42	16 30	0 40	2 6	8 30	.4	16 38	3.2
60	8 5	16 8	0 47	2 26	9 3	.0	16 7	3.7
S								

UT	MESEC				JUPITER		SATURN	
	S <sub>♃</sub>	Δ	δ <sub>♃</sub>	Δ	S <sub>♃</sub>	δ <sub>♃</sub>	S <sub>♄</sub>	δ <sub>♄</sub>
h	° / ' / "	° / ' / "	° / ' / "	° / ' / "	° / ' / "	° / ' / "	° / ' / "	° / ' / "
0	178 33.2	134 21	45.7	-95	120 23.8	-4 23.6	188 47.1	19 53.6
2	207 37.9	135 21	26.7	-97	150 28.0	-4 23.9	218 51.4	19 53.4
4	236 42.9	136 21	7.3	-99	180 32.2	-4 24.2	248 55.6	19 53.3
6	265 48.2	138 20	47.6	-100	210 36.5	-4 24.5	278 59.9	19 53.2
8	294 53.7	139 20	27.5	-102	240 40.7	-4 24.8	309 4.1	19 53.0
10	323 59.5	140 20	7.1	-104	270 45.0	-4 25.1	339 8.4	19 52.9
12	353 5.5	141 19	46.3	-105	300 49.2	-4 25.4	9 12.7	19 52.8
14	22 11.8	143 19	25.2	-107	330 53.4	-4 25.7	39 16.9	19 52.6
16	51 18.3	144 19	3.8	-109	0 57.7	-4 26.0	69 21.2	19 52.5
18	80 25.1	145 18	42.1	-110	31 1.9	-4 26.3	99 25.5	19 52.3
20	109 32.1	146 18	20.1	-112	61 6.1	-4 26.6	129 29.7	19 52.2
22	138 39.3	147 17	57.8	-113	91 10.4	-4 27.0	159 34.0	19 52.1
Δ					21	-2	21	-1

SUNCE				MESEC					
UT	e = T <sub>p</sub> - UT	Δ/24	r	Prolaz	Δ/24	π <sub>♃</sub>	r		
h	min s	s	'	h min	min	'	'		
00	- 6 1.2	.3	15.8	T <sub>m</sub>	12 28	1.8	53.9 14.7		
12	- 5 58.1	T <sub>m☉</sub>	12 h 6.0 min	Starost	29.5 d	Faza	●		
PLANETE									
Pl.	T <sub>m</sub>	π	360-α	Vel.	Pl.	T <sub>m</sub>	π	360-α	Vel.
♀	h min	'	°	°	♃	h min	'	°	°
♂	14 14	.1	193	-3.8	♃	15 56	.0	167	-1.7
♂	5 17	.2	327	-5	♄	11 23	.0	235	.4

UT	SUNCE		PROLEĆ. TAČKA S <sub>γ</sub>	VENERA		MARS	
	S <sub>☉</sub>	δ <sub>☉</sub>		S <sub>♀</sub>	δ <sub>♀</sub>	S <sub>♂</sub>	δ <sub>♂</sub>
h	° / ' / "	° / ' / "	° / ' / "	° / ' / "	° / ' / "	° / ' / "	° / ' / "
0	178 31.2	16 43.9	314 37.6	146 21.5	6 20.3	280 59.5	10 32.4
2	208 31.3	16 42.5	344 42.5	176 20.9	6 17.8	311 1.8	10 33.3
4	238 31.5	16 41.1	14 47.5	206 20.4	6 15.3	341 4.1	10 34.2
6	268 31.6	16 39.8	44 52.4	236 19.8	6 12.9	11 6.4	10 35.1
8	298 31.8	16 38.4	74 57.3	266 19.3	6 10.4	41 8.7	10 36.0
10	328 31.9	16 37.0	105 2.3	296 18.8	6 7.9	71 11.1	10 36.9
12	358 32.0	16 35.6	135 7.2	326 18.2	6 5.4	101 13.4	10 37.7
14	28 32.2	16 34.2	165 12.1	356 17.7	6 2.9	131 15.7	10 38.6
16	58 32.3	16 32.8	195 17.0	26 17.2	6 .4	161 18.0	10 39.5
18	88 32.5	16 31.5	225 22.0	56 16.6	5 57.9	191 20.4	10 40.4
20	118 32.6	16 30.1	255 26.9	86 16.1	5 55.4	221 22.7	10 41.3
22	148 32.8	16 28.7	285 31.8	116 15.6	5 52.9	251 25.0	10 42.2
Δ	1	-7		-3	-12	12	4

φ	SUNCE		TRAJANJE SUMRAKA		MESEC			
	IZLAZ	ZALAZ	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 53	20 17	0 56	:::	4 54	3.6	21 1	.0
55	4 18	19 53	0 44	3 32	5 18	3.2	20 43	.3
50	4 36	19 34	0 37	2 26	5 37	2.9	20 30	.5
45	4 51	19 20	0 33	2 1	5 51	2.7	20 19	.7
40	5 3	19 8	0 30	1 46	6 3	2.5	20 9	.9
35	5 13	18 58	0 27	1 35	6 13	2.4	20 2	1.0
30	5 22	18 49	0 26	1 28	6 21	2.3	19 55	1.1
20	5 37	18 34	0 23	1 19	6 36	2.1	19 42	1.3
10	5 50	18 21	0 22	1 14	6 49	1.9	19 32	1.5
0	6 2	18 9	0 22	1 12	7 1	1.7	19 22	1.7
10	6 14	17 57	0 22	1 12	7 14	1.6	19 12	1.9
20	6 27	17 45	0 23	1 15	7 26	1.4	19 1	2.1
30	6 42	17 30	0 25	1 22	7 41	1.2	18 48	2.3
35	6 50	17 22	0 27	1 26	7 49	1.1	18 41	2.4
40	6 59	17 13	0 29	1 33	7 59	.9	18 32	2.5
45	7 10	17 2	0 31	1 41	8 10	.8	18 22	2.7
50	7 24	16 49	0 35	1 51	8 24	.6	18 10	2.9
55	7 40	16 32	0 40	2 6	8 41	.3	17 55	3.2
60	8 3	16 10	0 47	2 26	9 3	.0	17 35	3.5
S								

UT	MESEC				JUPITER		SATURN	
	S <sub>♃</sub>	Δ	δ <sub>♃</sub>	Δ	S <sub>♃</sub>	δ <sub>♃</sub>	S <sub>♄</sub>	δ <sub>♄</sub>
h	° / ' / "	° / ' / "	° / ' / "	° / ' / "	° / ' / "	° / ' / "	° / ' / "	° / ' / "
0	167 46.8	148 17	35.2	-114	121 14.6	-4 27.3	189 38.3	19 51.9
2	196 54.5	150 17	12.3	-116	151 18.8	-4 27.6	219 42.5	19 51.8
4	226 2.4	151 16	49.1	-117	181 23.1	-4 27.9	249 46.8	19 51.7
6	255 10.6	152 16	25.7	-118	211 27.3	-4 28.2	279 51.1	19 51.5
8	284 18.9	153 16	2.0	-120	241 31.5	-4 28.5	309 55.3	19 51.4
10	313 27.5	154 15	38.1	-121	271 35.7	-4 28.8	339 59.6	19 51.2
12	342 36.2	155 15	13.9	-122	301 40.0	-4 29.1	10 3.9	19 51.1
14	11 45.2	156 14	49.4	-123	331 44.2	-4 29.4	40 8.1	19 51.0
16	40 54.3	157 14	24.8	-124	1 48.4	-4 29.7	70 12.4	19 50.8
18	70 3.7	158 13	59.9	-126	31 52.7	-4 30.0	100 16.7	19 50.7
20	99 13.2	158 13	34.7	-127	61 56.9	-4 30.4	130 20.9	19 50.5
22	128 22.9	159 13	9.4	-128	92 1.1	-4 30.7	160 25.2	19 50.4
Δ					21	-2	21	-1

SUNCE				MESEC					
UT	e = T <sub>p</sub> - UT	Δ/24	r	Prolaz	Δ/24	π <sub>♃</sub>	r		
h	min s	s	'	h min	min	'	'		
00	- 5 55.0	.3	15.8	T <sub>m</sub>	13 12	1.7	54.0 14.7		
12	- 5 51.6	T <sub>m☉</sub>	12 h 5.9 min	Starost	.9 d	Faza	●		
PLANETE									
Pl.	T <sub>m</sub>	π	360-α	Vel.	Pl.	T <sub>m</sub>	π	360-α	Vel.
♀	h min	'	°	°	♃	h min	'	°	°
♂	14 15	.1	192	-3.8	♃	15 53	.0	167	-1.7
♂	5 16	.2	326	-6	♄	11 20	.0	235	.4

UT	SUNCE		PROLEĆ. TAČKA S <sub>γ</sub>	VENERA		MARS	
	S <sub>☉</sub>	δ <sub>☉</sub>		S <sub>♀</sub>	δ <sub>♀</sub>	S <sub>♂</sub>	δ <sub>♂</sub>
h	° / ' / "	° / ' / "	° / ' / "	° / ' / "	° / ' / "	° / ' / "	° / ' / "
0	178 32.9	16 27.3	315 36.7	146 15.0	5 50.4	281 27.3	10 43.0
2	208 33.0	16 25.9	345 41.7	176 14.5	5 47.9	311 29.7	10 43.9
4	238 33.2	16 24.5	15 46.6	206 14.0	5 45.4	341 32.0	10 44.8
6	268 33.3	16 23.1	45 51.5	236 13.5	5 42.9	11 34.4	10 45.7
8	298 33.5	16 21.7	75 56.5	266 12.9	5 40.4	41 36.7	10 46.5
10	328 33.7	16 20.3	106 1.4	296 12.4	5 37.9	71 39.0	10 47.4
12	358 33.8	16 18.9	136 6.3	326 11.9	5 35.4	101 41.4	10 48.3
14	28 34.0	16 17.5	166 11.2	356 11.4	5 32.9	131 43.7	10 49.1
16	58 34.1	16 16.1	196 16.2	26 10.9	5 30.4	161 46.1	10 50.0
18	88 34.3	16 14.6	226 21.1	56 10.3	5 27.9	191 48.4	10 50.9
20	118 34.4	16 13.2	256 26.0	86 9.8	5 25.4	221 50.8	10 51.8
22	148 34.6	16 11.8	286 31.0	116 9.3	5 22.9	251 53.1	10 52.6
Δ	1	-7		-3	-13	12	4

φ	SUNCE		TRAJANJE SUMRAKA		MESEC			
	IZLAZ	ZALAZ	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 55	20 15	0 55	:::	6 20	3.5	21 0	.0
55	4 20	19 51	0 44	3 24	6 35	3.1	20 50	.3
50	4 38	19 33	0 37	2 24	6 47	2.9	20 42	.5
45	4 52	19 19	0 33	2 0	6 56	2.7	20 36	.7
40	5 4	19 7	0 30	1 45	7 4	2.5	20 31	.8
35	5 14	18 57	0 27	1 35	7 10	2.4	20 26	1.0
30	5 23	18 48	0 26	1 28	7 16	2.3	20 22	1.1
20	5 37	18 34	0 23	1 18	7 26	2.0	20 15	1.3
10	5 50	18 21	0 22	1 14	7 35	1.8	20 8	1.5
0	6 2	18 9	0 22	1 12	7 43	1.7	20 2	1.7
10	6 14	17 57	0 22	1 12	7 51	1.5	19 56	1.8
20	6 27	17 45	0 23	1 15	7 60	1.3	19 50	2.0
30	6 41	17 31	0 25	1 22	8 9	1.1	19 42	2.2
35	6 49	17 23	0 26	1 26	8 15	1.0	19 38	2.4
40	6 58	17 14	0 28	1 32	8 21	.9	19 33	2.5
45	7 9	17 3	0 31	1 40	8 29	.7	19 27	2.7
50	7 22	16 50	0 35	1 51	8 38	.5	19 20	2.9
55	7 38	16 34	0 39	2 5	8 49	.3	19 11	3.1
60	8 0	16 12	0 47	2 25	9 3	.0	18 60	3.5
S								

UT	MESEC				JUPITER		SATURN	
	S <sub>♃</sub>	Δ	δ <sub>♃</sub>	Δ	S <sub>♃</sub>	δ <sub>♃</sub>	S <sub>♄</sub>	δ <sub>♄</sub>
h	° / ' / "	° / ' / "	° / ' / "	° / ' / "	° / ' / "	° / ' / "	° / ' / "	° / ' / "
0	157 32.7	160	12 43.8	-129	122 5.3	-4 31.0	190 29.4	19 50.3
2	186 42.7	161	12 18.1	-130	152 9.6	-4 31.3	220 33.7	19 50.1
4	215 52.9	162	11 52.1	-131	182 13.8	-4 31.6	250 38.0	19 50.0
6	245 3.2	162	11 26.0	-132	212 18.0	-4 31.9	280 42.3	19 49.9
8	274 13.6	163	10 59.7	-132	242 22.2	-4 32.2	310 46.5	19 49.7
10	303 24.2	164	10 33.2	-133	272 26.4	-4 32.5	340 50.8	19 49.6
12	332 34.9	164	10 6.5	-134	302 30.7	-4 32.8	10 55.1	19 49.4
14	1 45.8	165	9 39.7	-135	332 34.9	-4 33.2	40 59.3	19 49.3
16	30 56.7	165	9 12.7	-136	2 39.1	-4 33.5	71 3.6	19 49.2
18	60 7.7	166	8 45.5	-136	32 43.3	-4 33.8	101 7.9	19 49.0
20	89 18.9	166	8 18.2	-137	62 47.5	-4 34.1	131 12.1	19 48.9
22	118 30.1	167	7 50.8	-138	92 51.8	-4 34.4	161 16.4	19 48.7
Δ					21	-2	21	-1

SUNCE				MESEC					
UT	e = T <sub>p</sub> - UT	Δ/24	r	Prolaz	Δ/24	π <sub>♃</sub>	r		
h	min s	s	'	h min	min	'	'		
00	- 5 48.2	.3	15.8	T <sub>m</sub>	13 53	1.7	54.1	14.7	
12	- 5 44.5	T <sub>m☉</sub>	12 h 5.7 min	Starost	1.9 d	Faza	●		
PLANETE									
Pl.	T <sub>m</sub>	π	360-α	Vel.	Pl.	T <sub>m</sub>	π	360-α	Vel.
♀	h min	'	°	°	♃	h min	'	°	°
♂	14 15	.1	191	-3.8	♄	15 49	.0	166	-1.7
	5 14	.2	326	-.6	♅	11 16	.0	235	.4

UT	SUNCE		PROLEĆ. TAČKA S <sub>γ</sub>	VENERA		MARS	
	S <sub>☉</sub>	δ <sub>☉</sub>		S <sub>♀</sub>	δ <sub>♀</sub>	S <sub>♂</sub>	δ <sub>♂</sub>
h	° / ' / "	° / ' / "	° / ' / "	° / ' / "	° / ' / "	° / ' / "	° / ' / "
0	178 34.7	16 10.4	316 35.9	146 8.8	5 20.4	281 55.5	10 53.5
2	208 34.9	16 9.0	346 40.8	176 8.3	5 17.8	311 57.8	10 54.4
4	238 35.1	16 7.6	16 45.7	206 7.8	5 15.3	342 .2	10 55.2
6	268 35.2	16 6.1	46 50.7	236 7.3	5 12.8	12 2.5	10 56.1
8	298 35.4	16 4.7	76 55.6	266 6.7	5 10.3	42 4.9	10 56.9
10	328 35.6	16 3.3	107 .5	296 6.2	5 7.8	72 7.3	10 57.8
12	358 35.7	16 1.9	137 5.5	326 5.7	5 5.3	102 9.6	10 58.7
14	28 35.9	16 .4	167 10.4	356 5.2	5 2.8	132 12.0	10 59.5
16	58 36.1	15 59.0	197 15.3	26 4.7	5 .2	162 14.4	11 .4
18	88 36.2	15 57.6	227 20.2	56 4.2	4 57.7	192 16.7	11 1.2
20	118 36.4	15 56.1	257 25.2	86 3.7	4 55.2	222 19.1	11 2.1
22	148 36.6	15 54.7	287 30.1	116 3.2	4 52.7	252 21.5	11 2.9
Δ	1	-7		-3	-13	12	4

φ	SUNCE		TRAJANJE SUMRAKA		MESEC			
	IZLAZ	ZALAZ	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 57	20 12	0 55	:::	7 44	3.5	20 59	.0
55	4 21	19 49	0 44	3 18	7 51	3.1	20 56	.2
50	4 39	19 31	0 37	2 23	7 56	2.9	20 54	.5
45	4 53	19 17	0 33	1 59	8 1	2.7	20 52	.7
40	5 5	19 6	0 30	1 45	8 4	2.5	20 51	.8
35	5 15	18 56	0 27	1 35	8 7	2.4	20 49	1.0
30	5 23	18 48	0 25	1 28	8 10	2.2	20 48	1.1
20	5 38	18 33	0 23	1 18	8 15	2.0	20 46	1.3
10	5 50	18 21	0 22	1 13	8 19	1.8	20 44	1.5
0	6 2	18 9	0 21	1 12	8 23	1.7	20 42	1.7
10	6 14	17 58	0 22	1 12	8 27	1.5	20 40	1.8
20	6 26	17 45	0 23	1 15	8 31	1.3	20 38	2.0
30	6 40	17 32	0 25	1 22	8 36	1.1	20 36	2.3
35	6 48	17 24	0 26	1 26	8 39	1.0	20 35	2.4
40	6 57	17 15	0 28	1 32	8 42	.8	20 33	2.5
45	7 8	17 4	0 31	1 40	8 45	.7	20 31	2.7
50	7 20	16 52	0 34	1 51	8 50	.5	20 29	2.9
55	7 36	16 36	0 39	2 5	8 55	.2	20 27	3.2
60	7 57	16 15	0 46	2 25	9 2	.0	20 23	3.5
S								

UT	MESEC				JUPITER		SATURN	
	S <sub>♃</sub>	Δ	δ <sub>♃</sub>	Δ	S <sub>♃</sub>	δ <sub>♃</sub>	S <sub>♄</sub>	δ <sub>♄</sub>
h	° / ' / "	° / ' / "	° / ' / "	° / ' / "	° / ' / "	° / ' / "	° / ' / "	° / ' / "
0	147 41.4	167	7 23.2	-138	122 56.0	-4 34.7	191 20.7	19 48.6
2	176 52.8	167	6 55.6	-139	153 .2	-4 35.0	221 24.9	19 48.5
4	206 4.2	167	6 27.7	-140	183 4.4	-4 35.4	251 29.2	19 48.3
6	235 15.7	168	5 59.8	-140	213 8.6	-4 35.7	281 33.5	19 48.2
8	264 27.2	168	5 31.8	-141	243 12.8	-4 36.0	311 37.7	19 48.1
10	293 38.8	168	5 3.6	-141	273 17.0	-4 36.3	341 42.0	19 47.9
12	322 50.4	168	4 35.4	-142	303 21.3	-4 36.6	11 46.3	19 47.8
14	352 2.1	168	4 7.0	-142	333 25.5	-4 36.9	41 50.5	19 47.6
16	21 13.7	168	3 38.6	-143	3 29.7	-4 37.2	71 54.8	19 47.5
18	50 25.4	168	3 10.1	-143	33 33.9	-4 37.6	101 59.1	19 47.4
20	79 37.0	168	2 41.5	-143	63 38.1	-4 37.9	132 3.3	19 47.2
22	108 48.7	168	2 12.9	-144	93 42.3	-4 38.2	162 7.6	19 47.1
Δ					21	-2	21	-1

SUNCE				MESEC					
UT	e = T <sub>p</sub> - UT	Δ/24	r	Prolaz	Δ/24	π <sub>♃</sub>	r		
h	min s	s	'	h min	min	'	'		
00	- 5 40.8	.3	15.8	T <sub>m</sub>	14 33	1.7	54.4	14.8	
12	- 5 36.8	T <sub>m☉</sub>	12 h 5.6 min	Starost	2.9 d	Faza	●		
PLANETE									
Pl.	T <sub>m</sub>	π	360-α	Vel.	Pl.	T <sub>m</sub>	π	360-α	Vel.
♀	h min	'	°	°	♃	h min	'	°	°
♂	14 16	.1	190	-3.8	♄	15 46	.0	166	-1.7
	5 12	.2	325	-.6	♅	11 13	.0	235	.4

UT	SUNCE		PROLEĆ. TAČKA S <sub>γ</sub>	VENERA		MARS	
	S <sub>☉</sub>	δ <sub>☉</sub>		S <sub>♀</sub>	δ <sub>♀</sub>	S <sub>♂</sub>	δ <sub>♂</sub>
h	° / ' / "	° / ' / "	° / ' / "	° / ' / "	° / ' / "	° / ' / "	° / ' / "
0	178 36.7	15 53.3	317 35.0	146 2.7	4 50.2	282 23.9	11 3.8
2	208 36.9	15 51.8	347 40.0	176 2.2	4 47.6	312 26.2	11 4.6
4	238 37.1	15 50.4	17 44.9	206 1.7	4 45.1	342 28.6	11 5.5
6	268 37.3	15 48.9	47 49.8	236 1.2	4 42.6	12 31.0	11 6.3
8	298 37.4	15 47.5	77 54.7	266 .7	4 40.1	42 33.4	11 7.2
10	328 37.6	15 46.0	107 59.7	296 .2	4 37.5	72 35.8	11 8.0
12	358 37.8	15 44.6	138 4.6	325 59.7	4 35.0	102 38.2	11 8.9
14	28 38.0	15 43.1	168 9.5	355 59.2	4 32.5	132 40.5	11 9.7
16	58 38.2	15 41.7	198 14.5	25 58.7	4 30.0	162 42.9	11 10.6
18	88 38.3	15 40.2	228 19.4	55 58.2	4 27.4	192 45.3	11 11.4
20	118 38.5	15 38.8	258 24.3	85 57.7	4 24.9	222 47.7	11 12.3
22	148 38.7	15 37.3	288 29.2	115 57.3	4 22.4	252 50.1	11 13.1
Δ	1	-7		-2	-13	12	4

φ	SUNCE		TRAJANJE SUMRAKA		MESEC			
	IZLAZ	ZALAZ	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 60	20 10	0 54	:	9 7	3.5	20 58	.0
55	4 23	19 46	0 43	3 13	9 6	3.2	21 2	.3
50	4 41	19 29	0 37	2 22	9 5	2.9	21 5	.5
45	4 55	19 16	0 33	1 59	9 5	2.7	21 8	.7
40	5 6	19 5	0 29	1 44	9 5	2.6	21 10	.9
35	5 15	18 55	0 27	1 34	9 4	2.4	21 12	1.0
30	5 24	18 47	0 25	1 27	9 4	2.3	21 14	1.1
20	5 38	18 33	0 23	1 18	9 4	2.1	21 17	1.3
10	5 51	18 20	0 22	1 13	9 3	1.9	21 20	1.5
0	6 2	18 9	0 21	1 11	9 3	1.7	21 22	1.7
10	6 13	17 58	0 22	1 12	9 3	1.5	21 25	1.9
20	6 25	17 46	0 23	1 15	9 2	1.3	21 27	2.1
30	6 39	17 32	0 25	1 21	9 2	1.1	21 30	2.3
35	6 47	17 24	0 26	1 26	9 2	1.0	21 32	2.5
40	6 56	17 16	0 28	1 32	9 2	.8	21 34	2.6
45	7 6	17 5	0 31	1 40	9 1	.7	21 36	2.8
50	7 19	16 53	0 34	1 51	9 1	.5	21 39	3.0
55	7 34	16 37	0 39	2 5	9 1	.3	21 42	3.2
60	7 55	16 17	0 46	2 25	9 0	.0	21 47	3.6

UT	MESEC				JUPITER		SATURN	
	S <sub>♃</sub>	Δ	δ <sub>♃</sub>	Δ	S <sub>♃</sub>	δ <sub>♃</sub>	S <sub>♄</sub>	δ <sub>♄</sub>
h	° / ' / "	° / ' / "	° / ' / "	° / ' / "	° / ' / "	° / ' / "	° / ' / "	° / ' / "
0	138 .3	168 1	44.2	-144	123 46.5	-4 38.5	192 11.9	19 46.9
2	167 11.9	168 1	15.4	-144	153 50.7	-4 38.8	222 16.2	19 46.8
4	196 23.5	168 0	46.6	-144	183 54.9	-4 39.1	252 20.4	19 46.7
6	225 35.0	167 0	17.7	-144	213 59.1	-4 39.5	282 24.7	19 46.5
8	254 46.5	167 -0	11.2	-145	244 3.3	-4 39.8	312 29.0	19 46.4
10	283 57.8	167 -0	40.1	-145	274 7.5	-4 40.1	342 33.2	19 46.2
12	313 9.2	166 -1	9.1	-145	304 11.7	-4 40.4	12 37.5	19 46.1
14	342 20.4	166 -1	38.0	-145	334 16.0	-4 40.7	42 41.8	19 46.0
16	11 31.6	165 -2	7.0	-145	4 20.2	-4 41.1	72 46.1	19 45.8
18	40 42.6	165 -2	36.0	-145	34 24.4	-4 41.4	102 50.3	19 45.7
20	69 53.5	164 -3	5.0	-145	64 28.6	-4 41.7	132 54.6	19 45.6
22	99 4.3	163 -3	34.0	-145	94 32.8	-4 42.0	162 58.9	19 45.4
Δ					21	-2	21	-1

SUNCE				MESEC			
UT	e = T <sub>p</sub> - UT	Δ/24	r	Prolaz	Δ/24	π <sub>♃</sub>	r
h	min s	s	'	h min	min	'	'
00	- 5 32.9	.4	15.8	T <sub>m</sub>	15 13	1.7	54.7 14.9
12	- 5 28.6	T <sub>m☉</sub>	12 h 5.5 min	Starost	3.9 d	Faza	☉

PLANETE									
Pl.	T <sub>m</sub>	π	360-α	Vel.	Pl.	T <sub>m</sub>	π	360-α	Vel.
h min	'	°	°	°	h min	'	°	°	°
♀	14 16	.1	188	-3.8	♃	15 43	.0	166	-1.7
♂	5 10	.2	325	-.6	♄	11 10	.0	235	.4

10. AVGUST

SREDA

UT	SUNCE		PROLEĆ. TAČKA S <sub>γ</sub>	VENERA		MARS	
	S <sub>☉</sub>	δ <sub>☉</sub>		S <sub>♀</sub>	δ <sub>♀</sub>	S <sub>♂</sub>	δ <sub>♂</sub>
h	° / ' / "	° / ' / "	° / ' / "	° / ' / "	° / ' / "	° / ' / "	° / ' / "
0	178 38.9	15 35.9	318 34.2	145 56.8	4 19.8	282 52.5	11 14.0
2	208 39.1	15 34.4	348 39.1	175 56.3	4 17.3	312 54.9	11 14.8
4	238 39.3	15 32.9	18 44.0	205 55.8	4 14.8	342 57.3	11 15.6
6	268 39.4	15 31.5	48 49.0	235 55.3	4 12.2	12 59.7	11 16.5
8	298 39.6	15 30.0	78 53.9	265 54.8	4 9.7	43 2.1	11 17.3
10	328 39.8	15 28.5	108 58.8	295 54.3	4 7.2	73 4.5	11 18.1
12	358 40.0	15 27.1	139 3.7	325 53.9	4 4.6	103 6.9	11 19.0
14	28 40.2	15 25.6	169 8.7	355 53.4	4 2.1	133 9.4	11 19.8
16	58 40.4	15 24.1	199 13.6	25 52.9	3 59.6	163 11.8	11 20.6
18	88 40.6	15 22.6	229 18.5	55 52.4	3 57.0	193 14.2	11 21.5
20	118 40.8	15 21.2	259 23.4	85 51.9	3 54.5	223 16.6	11 22.3
22	148 41.0	15 19.7	289 28.4	115 51.5	3 52.0	253 19.0	11 23.1
Δ	1	-7		-2	-13	12	4

φ	SUNCE		TRAJANJE SUMRAKA		MESEC			
	IZLAZ	ZALAZ	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	20 7	0 54	:	10 32	3.7	20 57	.0
55	4 25	19 44	0 43	3 8	10 23	3.3	21 8	.3
50	4 42	19 27	0 37	2 20	10 16	3.1	21 18	.6
45	4 56	19 14	0 32	1 58	10 11	2.8	21 25	.8
40	5 7	19 3	0 29	1 44	10 6	2.7	21 31	1.0
35	5 16	18 54	0 27	1 34	10 2	2.5	21 37	1.1
30	5 24	18 46	0 25	1 27	9 59	2.4	21 41	1.2
20	5 38	18 32	0 23	1 18	9 53	2.2	21 50	1.5
10	5 51	18 20	0 22	1 13	9 48	2.0	21 57	1.7
0	6 2	18 9	0 21	1 11	9 44	1.8	22 4	1.8
10	6 13	17 58	0 22	1 12	9 39	1.6	22 10	2.0
20	6 25	17 46	0 23	1 15	9 34	1.4	22 18	2.2
30	6 38	17 33	0 25	1 21	9 29	1.2	22 26	2.4
35	6 46	17 25	0 26	1 26	9 25	1.1	22 31	2.6
40	6 55	17 17	0 28	1 32	9 22	.9	22 36	2.7
45	7 5	17 6	0 31	1 40	9 18	.7	22 43	2.9
50	7 17	16 54	0 34	1 50	9 13	.5	22 51	3.1
55	7 32	16 39	0 39	2 4	9 7	.3	23 0	3.4
60	7 52	16 19	0 46	2 24	8 59	.0	23 13	3.8

UT	MESEC				JUPITER		SATURN	
	S <sub>♃</sub>	Δ	δ <sub>♃</sub>	Δ	S <sub>♃</sub>	δ <sub>♃</sub>	S <sub>♄</sub>	δ <sub>♄</sub>
h	° / ' / "	° / ' / "	° / ' / "	° / ' / "	° / ' / "	° / ' / "	° / ' / "	° / ' / "
0	128 15.0	163 -4	3.0	-145	124 37.0	-4 42.3	193 3.1	19 45.3
2	157 25.6	162 -4	32.0	-145	154 41.2	-4 42.6	223 7.4	19 45.1
4	186 36.0	161 -5	.9	-144	184 45.4	-4 43.0	253 11.7	19 45.0
6	215 46.2	160 -5	29.8	-144	214 49.6	-4 43.3	283 16.0	19 44.9
8	244 56.2	159 -5	58.6	-144	244 53.8	-4 43.6	313 20.2	19 44.7
10	274 6.1	158 -6	27.5	-144	274 58.0	-4 43.9	343 24.5	19 44.6
12	303 15.8	157 -6	56.2	-143	305 2.1	-4 44.3	13 28.8	19 44.4
14	332 25.3	156 -7	24.9	-143	335 6.3	-4 44.6	43 33.0	19 44.3
16	1 34.6	155 -7	53.5	-143	5 10.5	-4 44.9	73 37.3	19 44.2
18	30 43.7	154 -8	22.1	-142	35 14.7	-4 45.2	103 41.6	19 44.0
20	59 52.5	153 -8	50.6	-142	65 18.9	-4 45.5	133 45.9	19 43.9
22	89 1.1	152 -9	19.0	-141	95 23.1	-4 45.9	163 50.1	19 43.8
Δ					21	-2	21	-1

SUNCE				MESEC			
UT	e = T <sub>p</sub> - UT	Δ/24	r	Prolaz	Δ/24	π <sub>♃</sub>	r
h	min s	s	'	h min	min	'	'
00	- 5 24.3	.4	15.8	T <sub>m</sub>	15 54	1.8	55.2 15.0
12	- 5 19.7	T <sub>m☉</sub>	12 h 5.3 min	Starost	4.9 d	Faza	☉

PLANETE									
Pl.	T <sub>m</sub>	π	360-α	Vel.	Pl.	T <sub>m</sub>	π	360-α	Vel.
h min	'	°	°	°	h min	'	°	°	°
♀	14 16	.1	187	-3.8	♃	15 39	.0	166	-1.7
♂	5 8	.2	324	-.6	♄	11 6	.0	234	.4

UT	SUNCE		PROLEĆ. TAČKA S <sub>γ</sub>	VENERA		MARS	
	S <sub>☉</sub>	δ <sub>☉</sub>		S <sub>♀</sub>	δ <sub>♀</sub>	S <sub>♂</sub>	δ <sub>♂</sub>
h	° / ' / "	° / ' / "	° / ' / "	° / ' / "	° / ' / "	° / ' / "	° / ' / "
0	178 41.2	15 18.2	319 33.3	145 51.0	3 49.4	283 21.4	11 24.0
2	208 41.4	15 16.7	349 38.2	175 50.5	3 46.9	313 23.9	11 24.8
4	238 41.6	15 15.3	19 43.2	205 50.0	3 44.3	343 26.3	11 25.6
6	268 41.8	15 13.8	49 48.1	235 49.6	3 41.8	13 28.7	11 26.4
8	298 42.0	15 12.3	79 53.0	265 49.1	3 39.2	43 31.2	11 27.3
10	328 42.2	15 10.8	109 57.9	295 48.6	3 36.7	73 33.6	11 28.1
12	358 42.4	15 9.3	140 2.9	325 48.1	3 34.2	103 36.0	11 28.9
14	28 42.6	15 7.8	170 7.8	355 47.7	3 31.6	133 38.5	11 29.7
16	58 42.8	15 6.3	200 12.7	25 47.2	3 29.1	163 40.9	11 30.5
18	88 43.0	15 4.8	230 17.7	55 46.7	3 26.5	193 43.3	11 31.4
20	118 43.2	15 3.3	260 22.6	85 46.3	3 24.0	223 45.8	11 32.2
22	148 43.4	15 1.8	290 27.5	115 45.8	3 21.4	253 48.2	11 33.0
Δ	1	-7		-2	-13	12	4

φ	SUNCE		TRAJANJE SUMRAKA		MESEC			
	IZLAZ	ZALAZ	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	20 4	0 53	:	12 0	4.0	20 56	.0
55	4 27	19 42	0 43	3 4	11 43	3.5	21 16	.4
50	4 44	19 26	0 37	2 19	11 29	3.2	21 32	.7
45	4 57	19 13	0 32	1 57	11 19	3.0	21 44	1.0
40	5 8	19 2	0 29	1 43	11 10	2.8	21 54	1.1
35	5 17	18 53	0 27	1 34	11 3	2.6	22 3	1.3
30	5 25	18 45	0 25	1 27	10 56	2.5	22 11	1.4
20	5 39	18 31	0 23	1 18	10 45	2.3	22 25	1.6
10	5 51	18 20	0 22	1 13	10 35	2.1	22 36	1.8
0	6 2	18 9	0 21	1 11	10 26	1.9	22 48	2.0
10	6 13	17 58	0 22	1 12	10 17	1.7	22 59	2.2
20	6 24	17 46	0 23	1 15	10 8	1.5	23 11	2.4
30	6 37	17 33	0 25	1 21	9 57	1.3	23 25	2.6
35	6 45	17 26	0 26	1 26	9 51	1.2	23 33	2.7
40	6 53	17 17	0 28	1 32	9 44	1.1	23 42	2.9
45	7 3	17 8	0 31	1 40	9 36	.9	23 52	3.0
50	7 15	16 56	0 34	1 50	9 26	.7	...	.0
55	7 30	16 41	0 39	2 4	9 14	.4	...	.0
60	7 50	16 21	0 46	2 24	8 59	.0	...	.0
S								

UT	MESEC				JUPITER		SATURN	
	S <sub>♃</sub>	Δ	δ <sub>♃</sub>	Δ	S <sub>♃</sub>	δ <sub>♃</sub>	S <sub>♄</sub>	δ <sub>♄</sub>
h	° / ' / "	° / ' / "	° / ' / "	° / ' / "	° / ' / "	° / ' / "	° / ' / "	° / ' / "
0	118 9.4	150 - 9	47.2 -141		125 27.3	- 4 46.2	193 54.4	19 43.6
2	147 17.5	149 -10	15.4 -140		155 31.5	- 4 46.5	223 58.7	19 43.5
4	176 25.3	148 -10	43.5 -140		185 35.7	- 4 46.8	254 3.0	19 43.3
6	205 32.9	146 -11	11.4 -139		215 39.9	- 4 47.1	284 7.2	19 43.2
8	234 40.1	145 -11	39.2 -138		245 44.1	- 4 47.5	314 11.5	19 43.1
10	263 47.0	143 -12	6.9 -138		275 48.3	- 4 47.8	344 15.8	19 42.9
12	292 53.7	142 -12	34.4 -137		305 52.5	- 4 48.1	14 20.0	19 42.8
14	322 .0	140 -13	1.8 -136		335 56.6	- 4 48.4	44 24.3	19 42.6
16	351 5.9	138 -13	29.0 -135		6 .8	- 4 48.8	74 28.6	19 42.5
18	20 11.6	136 -13	56.0 -134		36 5.0	- 4 49.1	104 32.9	19 42.4
20	49 16.8	135 -14	22.8 -133		66 9.2	- 4 49.4	134 37.1	19 42.2
22	78 21.7	133 -14	49.5 -132		96 13.4	- 4 49.7	164 41.4	19 42.1
Δ					21	-2	21	-1

SUNCE				MESEC					
UT	e = T <sub>p</sub> - UT	Δ/24	r	Prolaz	Δ/24	π <sub>☾</sub>	r		
h	min s	s	'	h min	min	'	'		
00	- 5 15.1	.4	15.8	T <sub>m</sub>	16 37	2.0	55.7 15.2		
12	- 5 10.2			T <sub>m☉</sub>	12 h 5.2 min	Starost	5.9 d Faza ●		
PLANETE									
Pl.	T <sub>m</sub>	π	360-α	Vel.	Pl.	T <sub>m</sub>	π	360-α	Vel.
♀	h min	'	°		♃	h min	'	°	
♂	14 17	.1	186	-3.8	♃	15 36	.0	166	-1.7
♂	5 6	.2	324	-.6	♄	11 3	.0	234	.4

12. AVGUST

PETAK

UT	SUNCE		PROLEĆ. TAČKA S <sub>γ</sub>	VENERA		MARS	
	S <sub>☉</sub>	δ <sub>☉</sub>		S <sub>♀</sub>	δ <sub>♀</sub>	S <sub>♂</sub>	δ <sub>♂</sub>
h	° / ' / "	° / ' / "	° / ' / "	° / ' / "	° / ' / "	° / ' / "	° / ' / "
0	178 43.6	15 .3	320 32.4	145 45.3	3 18.9	283 50.7	11 33.8
2	208 43.8	14 58.8	350 37.4	175 44.9	3 16.3	313 53.1	11 34.6
4	238 44.0	14 57.3	20 42.3	205 44.4	3 13.8	343 55.6	11 35.4
6	268 44.2	14 55.8	50 47.2	235 43.9	3 11.2	13 58.0	11 36.3
8	298 44.5	14 54.3	80 52.2	265 43.5	3 8.7	44 .5	11 37.1
10	328 44.7	14 52.8	110 57.1	295 43.0	3 6.1	74 2.9	11 37.9
12	358 44.9	14 51.3	141 2.0	325 42.5	3 3.6	104 5.4	11 38.7
14	28 45.1	14 49.8	171 6.9	355 42.1	3 1.0	134 7.9	11 39.5
16	58 45.3	14 48.3	201 11.9	25 41.6	2 58.5	164 10.3	11 40.3
18	88 45.5	14 46.8	231 16.8	55 41.2	2 55.9	194 12.8	11 41.1
20	118 45.8	14 45.2	261 21.7	85 40.7	2 53.4	224 15.2	11 41.9
22	148 46.0	14 43.7	291 26.7	115 40.3	2 50.8	254 17.7	11 42.7
Δ	1	-8		-2	-13	12	4

φ	SUNCE		TRAJANJE SUMRAKA		MESEC			
	IZLAZ	ZALAZ	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	20 1	0 52	:	13 36	4.3	20 56	.1
55	4 29	19 40	0 43	3 0	13 7	3.7	21 27	.7
50	4 45	19 24	0 36	2 18	12 46	3.4	21 50	1.0
45	4 58	19 11	0 32	1 56	12 30	3.1	22 7	1.3
40	5 9	19 1	0 29	1 43	12 17	2.9	22 27	1.4
35	5 18	18 52	0 27	1 33	12 6	2.8	22 34	1.6
30	5 26	18 44	0 25	1 27	11 56	2.7	22 45	1.7
20	5 39	18 31	0 23	1 18	11 40	2.4	23 4	1.9
10	5 51	18 19	0 22	1 13	11 25	2.3	23 20	2.1
0	6 2	18 8	0 21	1 11	11 12	2.1	23 35	2.2
10	6 12	17 58	0 22	1 12	10 59	1.9	23 51	2.4
20	6 24	17 47	0 23	1 15	10 45	1.8	...	.0
30	6 36	17 34	0 25	1 21	10 29	1.5	...	.0
35	6 44	17 27	0 26	1 26	10 19	1.4	...	.0
40	6 52	17 18	0 28	1 32	10 9	1.3	...	.0
45	7 2	17 9	0 31	1 40	9 57	1.1	...	.0
50	7 13	16 57	0 34	1 50	9 42	.9	0 6	3.3
55	7 28	16 43	0 39	2 4	9 23	.6	0 23	3.6
60	7 47	16 24	0 45	2 23	8 59	.1	0 45	4.1
S								

UT	MESEC				JUPITER		SATURN	
	S <sub>♃</sub>	Δ	δ <sub>♃</sub>	Δ	S <sub>♃</sub>	δ <sub>♃</sub>	S <sub>♄</sub>	δ <sub>♄</sub>
h	° / ' / "	° / ' / "	° / ' / "	° / ' / "	° / ' / "	° / ' / "	° / ' / "	° / ' / "
0	107 26.3	131 -15	15.9 -131		126 17.6	- 4 50.1	194 45.7	19 41.9
2	136 30.4	129 -15	42.2 -130		156 21.8	- 4 50.4	224 50.0	19 41.8
4	165 34.2	127 -16	8.2 -129		186 25.9	- 4 50.7	254 54.2	19 41.7
6	194 37.6	125 -16	33.9 -128		216 30.1	- 4 51.0	284 58.5	19 41.5
8	223 40.5	123 -16	59.4 -126		246 34.3	- 4 51.4	315 2.8	19 41.4
10	252 43.1	121 -17	24.7 -125		276 38.5	- 4 51.7	345 7.1	19 41.3
12	281 45.2	118 -17	49.7 -124		306 42.7	- 4 52.0	15 11.4	19 41.1
14	310 46.9	116 -18	14.4 -122		336 46.9	- 4 52.3	45 15.6	19 41.0
16	339 48.1	114 -18	38.8 -121		6 51.0	- 4 52.7	75 19.9	19 40.8
18	8 48.9	112 -19	2.9 -119		36 55.2	- 4 53.0	105 24.2	19 40.7
20	37 49.2	109 -19	26.7 -117		66 59.4	- 4 53.3	135 28.5	19 40.6
22	66 49.0	107 -19	50.2 -116		97 3.6	- 4 53.7	165 32.7	19 40.4
Δ					21	-2	21	-1

SUNCE				MESEC					
UT	e = T <sub>p</sub> - UT	Δ/24	r	Prolaz	Δ/24	π <sub>☾</sub>	r		
h	min s	s	'	h min	min	'	'		
00	- 5 5.4	.4	15.8	T <sub>m</sub>	17 24	2.1	56.4 15.4		
12	- 5 .2			T <sub>m☉</sub>	12 h 5.0 min	Starost	6.9 d Faza ●		
PLANETE									
Pl.	T <sub>m</sub>	π	360-α	Vel.	Pl.	T <sub>m</sub>	π	360-α	Vel.
♀	h min	'	°		♃	h min	'	°	
♂	14 17	.1	185	-3.9	♃	15 33	.0	166	-1.6
♂	5 4	.2	323	-.7	♄	10 59	.0	234	.4

UT	SUNCE		PROLEĆ. TAČKA S <sub>γ</sub>	VENERA		MARS	
	S <sub>☉</sub>	δ <sub>☉</sub>		S <sub>♀</sub>	δ <sub>♀</sub>	S <sub>♂</sub>	δ <sub>♂</sub>
h	° / ' / "	° / ' / "	° / ' / "	° / ' / "	° / ' / "	° / ' / "	° / ' / "
0	178 46.2	14 42.2	321 31.6	145 39.8	2 48.2	284 20.2	11 43.5
2	208 46.4	14 40.7	351 36.5	175 39.3	2 45.7	314 22.7	11 44.3
4	238 46.6	14 39.2	21 41.4	205 38.9	2 43.1	344 25.1	11 45.1
6	268 46.9	14 37.6	51 46.4	235 38.4	2 40.6	14 27.6	11 45.9
8	298 47.1	14 36.1	81 51.3	265 38.0	2 38.0	44 30.1	11 46.7
10	328 47.3	14 34.6	111 56.2	295 37.5	2 35.5	74 32.6	11 47.5
12	358 47.5	14 33.0	142 1.2	325 37.1	2 32.9	104 35.1	11 48.3
14	28 47.8	14 31.5	172 6.1	355 36.6	2 30.3	134 37.5	11 49.1
16	58 48.0	14 30.0	202 11.0	25 36.2	2 27.8	164 40.0	11 49.9
18	88 48.2	14 28.5	232 15.9	55 35.7	2 25.2	194 42.5	11 50.7
20	118 48.5	14 26.9	262 20.9	85 35.3	2 22.7	224 45.0	11 51.5
22	148 48.7	14 25.4	292 25.8	115 34.8	2 20.1	254 47.5	11 52.3
Δ	1	-8		-2	-13	12	4

UT	MESEC				JUPITER		SATURN	
	S <sub>♃</sub>	Δ	δ <sub>♃</sub>	Δ	S <sub>♃</sub>	δ <sub>♃</sub>	S <sub>♄</sub>	δ <sub>♄</sub>
h	° / ' / "	° / ' / "	° / ' / "	° / ' / "	° / ' / "	° / ' / "	° / ' / "	° / ' / "
0	95 48.4	104 -20	13.3 -114		127 7.8	-4 54.0	195 37.0	19 40.3
2	124 47.2	102 -20	36.1 -112		157 11.9	-4 54.3	225 41.3	19 40.1
4	153 45.6	99 -20	58.5 -110		187 16.1	-4 54.6	255 45.6	19 40.0
6	182 43.5	97 -21	20.6 -108		217 20.3	-4 55.0	285 49.8	19 39.9
8	211 40.9	94 -21	42.2 -106		247 24.5	-4 55.3	315 54.1	19 39.7
10	240 37.8	92 -22	3.4 -104		277 28.6	-4 55.6	345 58.4	19 39.6
12	269 34.2	89 -22	24.3 -102		307 32.8	-4 56.0	16 2.7	19 39.4
14	298 30.0	87 -22	44.6 -100		337 37.0	-4 56.3	46 7.0	19 39.3
16	327 25.4	84 -23	4.6 -97		7 41.1	-4 56.6	76 11.2	19 39.2
18	356 20.2	81 -23	24.1 -95		37 45.3	-4 56.9	106 15.5	19 39.0
20	25 14.5	79 -23	43.1 -93		67 49.5	-4 57.3	136 19.8	19 38.9
22	54 8.2	76 -24	1.6 -90		97 53.7	-4 57.6	166 24.1	19 38.7
Δ					21	-2	21	-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	4 9	19 59	0 52	:::	15 19	4.6	20 59	.4
55	4 31	19 38	0 42	2 57	14 36	3.8	21 43	1.1
50	4 47	19 22	0 36	2 16	14 7	3.4	22 14	1.5
45	4 59	19 10	0 32	1 56	13 45	3.2	22 37	1.7
40	5 10	18 59	0 29	1 42	13 28	3.0	22 56	1.8
35	5 18	18 51	0 27	1 33	13 13	2.9	23 12	2.0
30	5 26	18 43	0 25	1 26	13 0	2.8	23 26	2.0
20	5 39	18 30	0 23	1 17	12 38	2.6	23 49	2.2
10	5 51	18 19	0 22	1 13	12 20	2.5	...	.0
0	6 1	18 8	0 21	1 11	12 2	2.3	...	.0
10	6 12	17 58	0 22	1 12	11 45	2.2	...	.0
20	6 23	17 47	0 23	1 15	11 27	2.0	0 7	2.5
30	6 35	17 35	0 25	1 21	11 6	1.9	0 26	2.7
35	6 43	17 27	0 26	1 26	10 54	1.8	0 38	2.8
40	6 51	17 19	0 28	1 32	10 40	1.6	0 51	3.0
45	7 0	17 10	0 31	1 39	10 23	1.5	1 6	3.2
50	7 12	16 59	0 34	1 50	10 3	1.2	1 25	3.4
55	7 26	16 45	0 39	2 4	9 37	.9	1 49	3.8
60	7 45	16 26	0 45	2 23	9 1	.3	2 24	4.4
S								

SUNCE				MESEC				
UT	e = T <sub>p</sub> - UT	Δ/24	r	Prolaz	Δ/24	π <sub>♃</sub>	r	
h	min s	s	'	h min	min	'	'	
00	- 4 55.1	.5	15.8	T <sub>m</sub>	18 15	2.4	57.2	15.6
12	- 4 49.6	T <sub>m☉</sub>	12 h 4.8 min	Starost	7.9 d	Faza	☉	

PLANETE									
Pl.	T <sub>m</sub>	π	360-α	Vel.	Pl.	T <sub>m</sub>	π	360-α	Vel.
h	min	'	°		h min	'	°		
♀	14 18	.1	184	-3.9	♃	15 29	.0	166	-1.6
♂	5 2	.2	323	-.7	♄	10 56	.0	234	.4

UT	SUNCE		PROLEĆ. TAČKA S <sub>γ</sub>	VENERA		MARS	
	S <sub>☉</sub>	δ <sub>☉</sub>		S <sub>♀</sub>	δ <sub>♀</sub>	S <sub>♂</sub>	δ <sub>♂</sub>
h	° / ' / "	° / ' / "	° / ' / "	° / ' / "	° / ' / "	° / ' / "	° / ' / "
0	178 48.9	14 23.8	322 30.7	145 34.4	2 17.5	284 50.0	11 53.1
2	208 49.1	14 22.3	352 35.6	175 33.9	2 15.0	314 52.5	11 53.9
4	238 49.4	14 20.8	22 40.6	205 33.5	2 12.4	344 55.0	11 54.7
6	268 49.6	14 19.2	52 45.5	235 33.1	2 9.8	14 57.5	11 55.4
8	298 49.9	14 17.7	82 50.4	265 32.6	2 7.3	45 .0	11 56.2
10	328 50.1	14 16.1	112 55.4	295 32.2	2 4.7	75 2.5	11 57.0
12	358 50.3	14 14.6	143 .3	325 31.7	2 2.1	105 5.0	11 57.8
14	28 50.6	14 13.0	173 5.2	355 31.3	1 59.6	135 7.5	11 58.6
16	58 50.8	14 11.5	203 10.1	25 30.8	1 57.0	165 10.1	11 59.4
18	88 51.0	14 9.9	233 15.1	55 30.4	1 54.5	195 12.6	12 .1
20	118 51.3	14 8.4	263 20.0	85 30.0	1 51.9	225 15.1	12 .9
22	148 51.5	14 6.8	293 24.9	115 29.5	1 49.3	255 17.6	12 1.7
Δ	1	-8		-2	-13	13	4

UT	MESEC				JUPITER		SATURN	
	S <sub>♃</sub>	Δ	δ <sub>♃</sub>	Δ	S <sub>♃</sub>	δ <sub>♃</sub>	S <sub>♄</sub>	δ <sub>♄</sub>
h	° / ' / "	° / ' / "	° / ' / "	° / ' / "	° / ' / "	° / ' / "	° / ' / "	° / ' / "
0	83 1.5	74 -24	19.6 -87		127 57.8	-4 57.9	196 28.4	19 38.6
2	111 54.2	71 -24	37.1 -85		158 2.0	-4 58.3	226 32.6	19 38.5
4	140 46.4	68 -24	54.0 -82		188 6.2	-4 58.6	256 36.9	19 38.3
6	169 38.1	66 -25	10.4 -79		218 10.3	-4 58.9	286 41.2	19 38.2
8	198 29.2	63 -25	26.3 -76		248 14.5	-4 59.3	316 45.5	19 38.1
10	227 19.9	61 -25	41.5 -73		278 18.7	-4 59.6	346 49.8	19 37.9
12	256 10.0	58 -25	56.2 -70		308 22.8	-4 59.9	16 54.0	19 37.8
14	284 59.7	56 -26	10.3 -67		338 27.0	-5 .2	46 58.3	19 37.6
16	313 48.8	53 -26	23.7 -64		8 31.2	-5 .6	77 2.6	19 37.5
18	342 37.4	51 -26	36.5 -61		38 35.3	-5 .9	107 6.9	19 37.4
20	11 25.6	48 -26	48.7 -58		68 39.5	-5 1.2	137 11.2	19 37.2
22	40 13.3	46 -27	.2 -54		98 43.7	-5 1.6	167 15.4	19 37.1
Δ					21	-2	21	-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	4 12	19 56	0 51	:::	17 9	4.2	21 7	1.2
55	4 33	19 35	0 42	2 54	16 7	3.4	22 11	2.0
50	4 48	19 20	0 36	2 15	15 29	3.2	22 50	2.2
45	5 0	19 8	0 32	1 55	15 2	3.1	23 18	2.3
40	5 11	18 58	0 29	1 42	14 40	3.0	23 40	2.4
35	5 19	18 50	0 27	1 33	14 22	2.9	23 59	2.4
30	5 27	18 42	0 25	1 26	14 7	2.8	...	.0
20	5 40	18 29	0 23	1 17	13 41	2.7	...	.0
10	5 51	18 18	0 22	1 13	13 19	2.6	0 9	2.3
0	6 1	18 8	0 21	1 11	12 58	2.5	0 28	2.4
10	6 12	17 58	0 22	1 12	12 38	2.5	0 47	2.5
20	6 22	17 47	0 23	1 15	12 16	2.4	1 8	2.7
30	6 35	17 35	0 25	1 21	11 51	2.3	1 32	2.8
35	6 42	17 28	0 26	1 26	11 36	2.2	1 46	2.9
40	6 50	17 20	0 28	1 32	11 19	2.1	2 2	3.0
45	6 59	17 11	0 31	1 39	10 58	2.0	2 22	3.1
50	7 10	17 0	0 34	1 50	10 33	1.8	2 46	3.3
55	7 24	16 46	0 38	2 3	9 59	1.5	3 19	3.6
60	7 42	16 28	0 45	2 23	9 7	.8	4 10	4.4
S								

SUNCE				MESEC				
UT	e = T <sub>p</sub> - UT	Δ/24	r	Prolaz	Δ/24	π <sub>♃</sub>	r	
h	min s	s	'	h min	min	'	'	
00	- 4 44.2	.5	15.8	T <sub>m</sub>	19 12	2.6	58.1	15.8
12	- 4 38.4	T <sub>m☉</sub>	12 h 4.6 min	Starost	8.9 d	Faza	☉	

PLANETE									
Pl.	T <sub>m</sub>	π	360-α	Vel.	Pl.	T <sub>m</sub>	π	360-α	Vel.
h	min	'	°		h min	'	°		
♀	14 18	.1	183	-3.9	♃	15 26	.0	165	-1.6
♂	5 0	.2	322	-.7	♄	10 53	.0	234	.4

UT	SUNCE		PROLEĆ. TAČKA S <sub>γ</sub>	VENERA		MARS	
	S <sub>☉</sub>	δ <sub>☉</sub>		S <sub>♀</sub>	δ <sub>♀</sub>	S <sub>♂</sub>	δ <sub>♂</sub>
h	° / ' / "	° / ' / "	° / ' / "	° / ' / "	° / ' / "	° / ' / "	° / ' / "
0	178 51.8	14 5.3	323 29.9	145 29.1	1 46.7	285 20.1	12 2.5
2	208 52.0	14 3.7	353 34.8	175 28.6	1 44.2	315 22.7	12 3.3
4	238 52.3	14 2.1	23 39.7	205 28.2	1 41.6	345 25.2	12 4.0
6	268 52.5	14 .6	53 44.6	235 27.8	1 39.0	15 27.7	12 4.8
8	298 52.8	13 59.0	83 49.6	265 27.3	1 36.5	45 30.2	12 5.6
10	328 53.0	13 57.4	113 54.5	295 26.9	1 33.9	75 32.8	12 6.4
12	358 53.3	13 55.9	143 59.4	325 26.5	1 31.3	105 35.3	12 7.1
14	28 53.5	13 54.3	174 4.4	355 26.0	1 28.8	135 37.8	12 7.9
16	58 53.8	13 52.7	204 9.3	25 25.6	1 26.2	165 40.4	12 8.7
18	88 54.0	13 51.2	234 14.2	55 25.2	1 23.6	195 42.9	12 9.4
20	118 54.3	13 49.6	264 19.1	85 24.7	1 21.1	225 45.5	12 10.2
22	148 54.5	13 48.0	294 24.1	115 24.3	1 18.5	255 48.0	12 11.0
Δ	1	-8		-2	-13	13	4

φ	SUNCE		TRAJANJE SUMRAKA		MESEC			
	IZLAZ	ZALAZ	GRAĐ.	ASTR.	IZLAZ	Δ/24	ZALAZ	Δ/24
N	h min	h min	h min	h min	h min	min	h min	min
60	4 14	19 53	0 51	:	18 50	2.3	21 37	3.3
55	4 34	19 33	0 42	2 51	17 30	2.6	22 58	3.1
50	4 50	19 18	0 36	2 14	16 46	2.6	23 42	3.0
45	5 2	19 6	0 32	1 54	16 15	2.7	...	.0
40	5 12	18 57	0 29	1 41	15 51	2.7	...	.0
35	5 20	18 48	0 27	1 32	15 32	2.7	...	.0
30	5 27	18 41	0 25	1 26	15 15	2.7	0 15	2.5
20	5 40	18 29	0 23	1 17	14 46	2.7	0 42	2.5
10	5 51	18 18	0 22	1 13	14 22	2.7	1 5	2.6
0	6 1	18 8	0 21	1 11	13 59	2.7	1 27	2.6
10	6 11	17 58	0 22	1 11	13 37	2.7	1 49	2.7
20	6 22	17 47	0 23	1 15	13 13	2.7	2 12	2.7
30	6 34	17 36	0 25	1 21	12 45	2.7	2 39	2.8
35	6 40	17 29	0 26	1 25	12 28	2.7	2 55	2.8
40	6 48	17 21	0 28	1 31	12 9	2.6	3 14	2.8
45	6 57	17 12	0 30	1 39	11 46	2.6	3 37	2.9
50	7 8	17 2	0 34	1 49	11 16	2.6	4 6	2.9
55	7 21	16 48	0 38	2 3	10 35	2.5	4 47	3.0
60	7 39	16 31	0 45	2 22	9 25	2.2	5 56	3.3
S								

UT	MESEC				JUPITER		SATURN	
	S <sub>♃</sub>	Δ	δ <sub>♃</sub>	Δ	S <sub>♃</sub>	δ <sub>♃</sub>	S <sub>♄</sub>	δ <sub>♄</sub>
h	° / ' / "	° / ' / "	° / ' / "	° / ' / "	° / ' / "	° / ' / "	° / ' / "	° / ' / "
0	69 .5	44 -27	11.0	-51	128 47.8	-5 1.9	197 19.7	19 36.9
2	97 47.3	42 -27	21.2	-47	158 52.0	-5 2.2	227 24.0	19 36.8
4	126 33.6	40 -27	30.6	-44	188 56.2	-5 2.6	257 28.3	19 36.7
6	155 19.6	38 -27	39.3	-40	219 .3	-5 2.9	287 32.6	19 36.5
8	184 5.1	36 -27	47.3	-36	249 4.5	-5 3.2	317 36.9	19 36.4
10	212 50.2	34 -27	54.5	-32	279 8.6	-5 3.6	347 41.1	19 36.2
12	241 35.0	32 -28	1.0	-29	309 12.8	-5 3.9	17 45.4	19 36.1
14	270 19.4	30 -28	6.7	-25	339 17.0	-5 4.2	47 49.7	19 36.0
16	299 3.4	29 -28	11.7	-21	9 21.1	-5 4.6	77 54.0	19 35.8
18	327 47.2	27 -28	15.8	-17	39 25.3	-5 4.9	107 58.3	19 35.7
20	356 30.6	26 -28	19.2	-13	69 29.4	-5 5.3	138 2.6	19 35.6
22	25 13.8	25 -28	21.7	-9	99 33.6	-5 5.6	168 6.8	19 35.4
Δ					21	-2	21	-1

SUNCE				MESEC					
UT	e = T <sub>p</sub> - UT	Δ/24	r	Prolaz	Δ/24	π <sub>☉</sub>	r		
h	min s	s / ' / "	h min	h min	min	' / "	' / "		
00	- 4 32.7	.5	15.8	T <sub>m</sub>	20 15	2.7	59.0	16.1	
12	- 4 26.7	T <sub>m☉</sub>	12 h 4.4 min	Starost	9.9 d	Faza ☉			
PLANETE									
Pl.	T <sub>m</sub>	π	360-α	Vel.	Pl.	T <sub>m</sub>	π	360-α	Vel.
♀	h min / ' / "	°	°	°	♃	h min / ' / "	°	°	°
♁	14 18	.1	182	-3.9	♃	15 23	.0	165	-1.6
♂	4 58	.2	322	-.7	♄	10 49	.0	234	.4

UT	SUNCE		PROLEĆ. TAČKA S <sub>γ</sub>	VENERA		MARS	
	S <sub>☉</sub>	δ <sub>☉</sub>		S <sub>♀</sub>	δ <sub>♀</sub>	S <sub>♂</sub>	δ <sub>♂</sub>
h	° / ' / "	° / ' / "	° / ' / "	° / ' / "	° / ' / "	° / ' / "	° / ' / "
0	178 54.8	13 46.4	324 29.0	145 23.9	1 15.9	285 50.6	12 11.7
2	208 55.0	13 44.9	354 33.9	175 23.5	1 13.3	315 53.1	12 12.5
4	238 55.3	13 43.3	24 38.9	205 23.0	1 10.8	345 55.7	12 13.3
6	268 55.5	13 41.7	54 43.8	235 22.6	1 8.2	15 58.2	12 14.0
8	298 55.8	13 40.1	84 48.7	265 22.2	1 5.6	46 .8	12 14.8
10	328 56.1	13 38.5	114 53.6	295 21.7	1 3.0	76 3.3	12 15.5
12	358 56.3	13 37.0	144 58.6	325 21.3	1 .5	106 5.9	12 16.3
14	28 56.6	13 35.4	175 3.5	355 20.9	0 57.9	136 8.5	12 17.1
16	58 56.8	13 33.8	205 8.4	25 20.5	0 55.3	166 11.0	12 17.8
18	88 57.1	13 32.2	235 13.4	55 20.0	0 52.7	196 13.6	12 18.6
20	118 57.4	13 30.6	265 18.3	85 19.6	0 50.2	226 16.2	12 19.3
22	148 57.6	13 29.0	295 23.2	115 19.2	0 47.6	256 18.7	12 20.1
Δ	1	-8		-2	-13	13	4

φ	SUNCE		TRAJANJE SUMRAKA		MESEC			
	IZLAZ	ZALAZ	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 17	19 50	0 50	:	19 46	.7	22 58	4.9
55	4 36	19 31	0 41	2 48	18 32	1.6	...	.0
50	4 51	19 16	0 36	2 13	17 50	1.9	...	.0
45	5 3	19 5	0 32	1 54	17 19	2.1	0 13	2.9
40	5 12	18 55	0 29	1 41	16 56	2.2	0 37	2.9
35	5 21	18 47	0 27	1 32	16 36	2.3	0 57	2.9
30	5 28	18 40	0 25	1 26	16 19	2.4	1 14	2.8
20	5 40	18 28	0 23	1 17	15 51	2.5	1 42	2.8
10	5 51	18 17	0 22	1 12	15 27	2.6	2 7	2.8
0	6 1	18 8	0 21	1 11	15 4	2.7	2 30	2.7
10	6 11	17 58	0 22	1 11	14 41	2.8	2 53	2.7
20	6 21	17 48	0 23	1 15	14 17	2.9	3 17	2.6
30	6 33	17 36	0 25	1 21	13 49	3.0	3 46	2.6
35	6 39	17 30	0 26	1 25	13 32	3.1	4 3	2.5
40	6 47	17 22	0 28	1 31	13 12	3.1	4 22	2.5
45	6 56	17 13	0 30	1 39	12 49	3.2	4 46	2.4
50	7 6	17 3	0 34	1 49	12 18	3.4	5 17	2.3
55	7 19	16 50	0 38	2 3	11 35	3.6	5 60	2.1
60	7 36	16 33	0 45	2 22	10 19	4.3	7 16	1.5
S								

UT	MESEC				JUPITER		SATURN	
	S <sub>♃</sub>	Δ	δ <sub>♃</sub>	Δ	S <sub>♃</sub>	δ <sub>♃</sub>	S <sub>♄</sub>	δ <sub>♄</sub>
h	° / ' / "	° / ' / "	° / ' / "	° / ' / "	° / ' / "	° / ' / "	° / ' / "	° / ' / "
0	53 56.7	23 -28	23.5	-5	129 37.7	-5 5.9	198 11.1	19 35.3
2	82 39.4	22 -28	24.4	-1	159 41.9	-5 6.3	228 15.4	19 35.1
4	111 21.9	21 -28	24.5	4	189 46.1	-5 6.6	258 19.7	19 35.0
6	140 4.1	21 -28	23.8	8	219 50.2	-5 6.9	288 24.0	19 34.9
8	168 46.3	20 -28	22.3	12	249 54.4	-5 7.3	318 28.3	19 34.7
10	197 28.3	19 -28	19.9	16	279 58.5	-5 7.6	348 32.5	19 34.6
12	226 10.1	19 -28	16.6	20	310 2.7	-5 7.9	18 36.8	19 34.4
14	254 51.9	19 -28	12.5	25	340 6.8	-5 8.3	48 41.1	19 34.3
16	283 33.7	18 -28	7.6	29	10 11.0	-5 8.6	78 45.4	19 34.2
18	312 15.4	18 -28	1.8	33	40 15.1	-5 8.9	108 49.7	19 34.0
20	340 57.1	19 -27	55.2	37	70 19.3	-5 9.3	138 54.0	19 33.9
22	9 38.8	19 -27	47.7	42	100 23.4	-5 9.6	168 58.3	19 33.8
Δ					21	-2	21	-1

SUNCE				MESEC					
UT	e = T <sub>p</sub> - UT	Δ/24	r	Prolaz	Δ/24	π <sub>☉</sub>	r		
h	min s	s / ' / "	h min	h min	min	' / "	' / "		
00	- 4 20.7	.5	15.8	T <sub>m</sub>	21 20	2.7	59.8	16.3	
12	- 4 14.5	T <sub>m☉</sub>	12 h 4.2 min	Starost	10.9 d	Faza ☉			
PLANETE									
Pl.	T <sub>m</sub>	π	360-α	Vel.	Pl.	T <sub>m</sub>	π	360-α	Vel.
♀	h min / ' / "	°	°	°	♃	h min / ' / "	°	°	°
♁	14 19	.1	181	-3.9	♃	15 19	.0	165	-1.6
♂	4 56	.2	321	-.7	♄	10 46	.0	234	.4

UT	SUNCE		PROLEĆ. TAČKA S <sub>γ</sub>	VENERA		MARS		
	S <sub>☉</sub>	δ <sub>☉</sub>		S <sub>♀</sub>	δ <sub>♀</sub>	S <sub>♂</sub>	δ <sub>♂</sub>	
h	°	'	°	'	°	'	°	'
0	178 57.9	13 27.4	325 28.1	145 18.8	0 45.0	286 21.3	12 20.8	
2	208 58.2	13 25.8	355 33.1	175 18.4	0 42.4	316 23.9	12 21.6	
4	238 58.4	13 24.2	25 38.0	205 17.9	0 39.9	346 26.5	12 22.3	
6	268 58.7	13 22.6	55 42.9	235 17.5	0 37.3	16 29.1	12 23.1	
8	298 59.0	13 21.0	85 47.9	265 17.1	0 34.7	46 31.7	12 23.8	
10	328 59.2	13 19.4	115 52.8	295 16.7	0 32.1	76 34.2	12 24.6	
12	358 59.5	13 17.8	145 57.7	325 16.3	0 29.6	106 36.8	12 25.3	
14	28 59.8	13 16.2	176 2.6	355 15.8	0 27.0	136 39.4	12 26.1	
16	59 .1	13 14.6	206 7.6	25 15.4	0 24.4	166 42.0	12 26.8	
18	89 .3	13 13.0	236 12.5	55 15.0	0 21.8	196 44.6	12 27.6	
20	119 .6	13 11.4	266 17.4	85 14.6	0 19.3	226 47.2	12 28.3	
22	149 .9	13 9.8	296 22.3	115 14.2	0 16.7	256 49.8	12 29.0	
Δ	1	-8		-2	-13	13	4	

φ	SUNCE		TRAJANJE SUMRAKA		MESEC			
	IZLAZ	ZALAZ	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 47	0 50	:::	20 3	.2	..	.0
55	4 38	19 29	0 41	2 45	19 11	1.0	0 12	4.0
50	4 53	19 14	0 36	2 12	18 36	1.4	0 53	3.7
45	5 4	19 3	0 32	1 53	18 10	1.6	1 23	3.4
40	5 13	18 54	0 29	1 41	17 50	1.8	1 46	3.3
35	5 21	18 46	0 27	1 32	17 32	2.0	2 6	3.2
30	5 29	18 39	0 25	1 25	17 17	2.1	2 22	3.1
20	5 41	18 27	0 23	1 17	16 52	2.3	2 50	2.9
10	5 51	18 17	0 22	1 12	16 30	2.5	3 13	2.8
0	6 1	18 7	0 21	1 11	16 9	2.6	3 35	2.7
10	6 10	17 58	0 22	1 11	15 49	2.8	3 57	2.6
20	6 20	17 48	0 23	1 14	15 26	2.9	4 20	2.4
30	6 32	17 37	0 25	1 21	15 1	3.1	4 47	2.3
35	6 38	17 30	0 26	1 25	14 45	3.3	5 3	2.1
40	6 46	17 23	0 28	1 31	14 27	3.4	5 22	2.0
45	6 54	17 15	0 30	1 39	14 6	3.6	5 44	1.9
50	7 4	17 4	0 34	1 49	13 39	3.8	6 12	1.6
55	7 17	16 52	0 38	2 3	13 2	4.2	6 50	1.3
60	7 34	16 35	0 44	2 22	12 1	5.0	7 51	.5
S								

UT	MESEC				JUPITER		SATURN	
	S <sub>♃</sub>	Δ	δ <sub>♃</sub>	Δ	S <sub>♃</sub>	δ <sub>♃</sub>	S <sub>♄</sub>	δ <sub>♄</sub>
h	°	'	°	'	°	'	°	'
0	38 20.5	19 -27 39.4	46	130 27.6	- 5 10.0	199 2.5	19 33.6	
2	67 2.3	19 -27 30.2	50	160 31.7	- 5 10.3	229 6.8	19 33.5	
4	95 44.2	20 -27 20.2	54	190 35.9	- 5 10.6	259 11.1	19 33.3	
6	124 26.2	21 -27 9.3	58	220 40.0	- 5 11.0	289 15.4	19 33.2	
8	153 8.4	21 -26 57.6	63	250 44.2	- 5 11.3	319 19.7	19 33.1	
10	181 50.6	22 -26 45.1	67	280 48.3	- 5 11.7	349 24.0	19 32.9	
12	210 33.1	23 -26 31.8	71	310 52.4	- 5 12.0	19 28.3	19 32.8	
14	239 15.8	24 -26 17.6	75	340 56.6	- 5 12.3	49 32.6	19 32.6	
16	267 58.7	26 -26 2.7	79	11 .7	- 5 12.7	79 36.8	19 32.5	
18	296 41.8	27 -25 46.9	83	41 4.9	- 5 13.0	109 41.1	19 32.4	
20	325 25.2	28 -25 30.4	86	71 9.0	- 5 13.3	139 45.4	19 32.2	
22	354 8.9	30 -25 13.1	90	101 13.2	- 5 13.7	169 49.7	19 32.1	
Δ				21	-2	21	-1	

SUNCE				MESEC					
UT	e = T <sub>p</sub> - UT	Δ/24	r	Prolaz	Δ/24	π <sub>☉</sub>	r		
h	min	s	s	h min	min	'	'		
00	- 4 8.2	.5	15.8	T <sub>m</sub>	22 24	2.6	60.6	16.5	
12	- 4 1.7	T <sub>m☉</sub>	12 h 4.0 min	Starost	11.9 d	Faza	☉		
PLANETE									
Pl.	T <sub>m</sub>	π	360-α	Vel.	Pl.	T <sub>m</sub>	π	360-α	Vel.
♀	h min	'	°		♃	h min	'	°	
♂	14 19	.1	180	-3.9	♄	15 16	.0	165	-1.6
	4 54	.2	321	-.7	♅	10 42	.0	234	.4

UT	SUNCE		PROLEĆ. TAČKA S <sub>γ</sub>	VENERA		MARS		
	S <sub>☉</sub>	δ <sub>☉</sub>		S <sub>♀</sub>	δ <sub>♀</sub>	S <sub>♂</sub>	δ <sub>♂</sub>	
h	°	'	°	'	°	'	°	'
0	179 1.2	13 8.2	326 27.3	145 13.7	0 14.1	286 52.4	12 29.8	
2	209 1.4	13 6.6	356 32.2	175 13.3	0 11.5	316 55.0	12 30.5	
4	239 1.7	13 5.0	26 37.1	205 12.9	0 8.9	346 57.6	12 31.3	
6	269 2.0	13 3.3	56 42.1	235 12.5	0 6.4	17 .2	12 32.0	
8	299 2.3	13 1.7	86 47.0	265 12.1	0 3.8	47 2.9	12 32.7	
10	329 2.6	13 .1	116 51.9	295 11.7	0 1.2	77 5.5	12 33.5	
12	359 2.8	12 58.5	146 56.8	325 11.3	- 0 1.4	107 8.1	12 34.2	
14	29 3.1	12 56.9	177 1.8	355 10.8	- 0 3.9	137 10.7	12 34.9	
16	59 3.4	12 55.2	207 6.7	25 10.4	- 0 6.5	167 13.3	12 35.7	
18	89 3.7	12 53.6	237 11.6	55 10.0	- 0 9.1	197 16.0	12 36.4	
20	119 4.0	12 52.0	267 16.6	85 9.6	- 0 11.7	227 18.6	12 37.1	
22	149 4.3	12 50.4	297 21.5	115 9.2	- 0 14.3	257 21.2	12 37.9	
Δ	1	-8		-2	-13	13	4	

φ	SUNCE		TRAJANJE SUMRAKA		MESEC			
	IZLAZ	ZALAZ	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 44	0 50	:::	20 9	.1	0 57	5.1
55	4 40	19 26	0 41	2 43	19 34	.6	1 48	4.4
50	4 54	19 13	0 35	2 11	19 9	1.0	2 21	3.9
45	5 5	19 2	0 32	1 52	18 49	1.2	2 46	3.7
40	5 14	18 53	0 29	1 40	18 33	1.4	3 6	3.4
35	5 22	18 45	0 27	1 31	18 19	1.6	3 22	3.3
30	5 29	18 38	0 25	1 25	18 7	1.8	3 36	3.1
20	5 41	18 27	0 23	1 17	17 47	2.0	3 60	2.9
10	5 51	18 16	0 22	1 12	17 29	2.2	4 20	2.7
0	6 0	18 7	0 21	1 10	17 12	2.4	4 39	2.5
10	6 10	17 58	0 21	1 11	16 55	2.6	4 58	2.3
20	6 20	17 48	0 23	1 14	16 37	2.9	5 18	2.2
30	6 31	17 37	0 24	1 21	16 16	3.1	5 41	1.9
35	6 37	17 31	0 26	1 25	16 3	3.3	5 55	1.8
40	6 44	17 24	0 28	1 31	15 49	3.4	6 10	1.6
45	6 52	17 16	0 30	1 39	15 32	3.7	6 29	1.4
50	7 2	17 6	0 34	1 49	15 11	3.9	6 51	1.2
55	7 15	16 54	0 38	2 2	14 43	4.3	7 21	.8
60	7 31	16 38	0 44	2 21	14 2	5.0	8 3	.2
S								

UT	MESEC				JUPITER		SATURN	
	S <sub>♃</sub>	Δ	δ <sub>♃</sub>	Δ	S <sub>♃</sub>	δ <sub>♃</sub>	S <sub>♄</sub>	δ <sub>♄</sub>
h	°	'	°	'	°	'	°	'
0	22 52.9	31 -24 55.1	94	131 17.3	- 5 14.0	199 54.0	19 31.9	
2	51 37.1	33 -24 36.3	98	161 21.5	- 5 14.4	229 58.3	19 31.8	
4	80 21.7	35 -24 16.7	101	191 25.6	- 5 14.7	260 2.6	19 31.7	
6	109 6.6	36 -23 56.5	105	221 29.7	- 5 15.0	290 6.9	19 31.5	
8	137 51.9	38 -23 35.5	108	251 33.9	- 5 15.4	320 11.2	19 31.4	
10	166 37.6	40 -23 13.8	112	281 38.0	- 5 15.7	350 15.4	19 31.3	
12	195 23.6	42 -22 51.5	115	311 42.2	- 5 16.1	20 19.7	19 31.1	
14	224 10.0	44 -22 28.5	118	341 46.3	- 5 16.4	50 24.0	19 31.0	
16	252 56.7	46 -22 4.8	121	11 50.4	- 5 16.8	80 28.3	19 30.8	
18	281 43.9	48 -21 40.6	124	41 54.6	- 5 17.1	110 32.6	19 30.7	
20	310 31.5	50 -21 15.7	127	71 58.7	- 5 17.4	140 36.9	19 30.6	
22	339 19.5	52 -20 50.2	130	102 2.8	- 5 17.8	170 41.2	19 30.4	
Δ				21	-2	21	-1	

SUNCE				MESEC					
UT	e = T <sub>p</sub> - UT	Δ/24	r	Prolaz	Δ/24	π <sub>☉</sub>	r		
h	min	s	s	h min	min	'	'		
00	- 3 55.1	.6	15.8	T <sub>m</sub>	23 26	2.4	61.1	16.6	
12	- 3 48.4	T <sub>m☉</sub>	12 h 3.8 min	Starost	12.9 d	Faza	☉		
PLANETE									
Pl.	T <sub>m</sub>	π	360-α	Vel.	Pl.	T <sub>m</sub>	π	360-α	Vel.
♀	h min	'	°		♃	h min	'	°	
♂	14 19	.1	179	-3.9	♄	15 13	.0	165	-1.6
	4 52	.2	320	-.8	♅	10 39	.0	233	.4

UT	SUNCE				PROLEĆ. TAČKA S <sub>γ</sub>	VENERA				MARS			
	S <sub>☉</sub>		δ <sub>☉</sub>			S <sub>♀</sub>		δ <sub>♀</sub>		S <sub>♂</sub>		δ <sub>♂</sub>	
h	°	'	°	'	°	'	°	'	°	'	°	'	
0	179	4.6	12	48.7	327	26.4	145	8.8 - 0	16.8	287	23.9	12	38.6
2	209	4.8	12	47.1	357	31.3	175	8.4 - 0	19.4	317	26.5	12	39.3
4	239	5.1	12	45.5	27	36.3	205	8.0 - 0	22.0	347	29.1	12	40.0
6	269	5.4	12	43.9	57	41.2	235	7.6 - 0	24.6	17	31.8	12	40.8
8	299	5.7	12	42.2	87	46.1	265	7.2 - 0	27.2	47	34.4	12	41.5
10	329	6.0	12	40.6	117	51.1	295	6.7 - 0	29.7	77	37.0	12	42.2
12	359	6.3	12	38.9	147	56.0	325	6.3 - 0	32.3	107	39.7	12	42.9
14	29	6.6	12	37.3	178	.9	355	5.9 - 0	34.9	137	42.3	12	43.6
16	59	6.9	12	35.7	208	5.8	25	5.5 - 0	37.5	167	45.0	12	44.4
18	89	7.2	12	34.0	238	10.8	55	5.1 - 0	40.1	197	47.7	12	45.1
20	119	7.5	12	32.4	268	15.7	85	4.7 - 0	42.6	227	50.3	12	45.8
22	149	7.8	12	30.7	298	20.6	115	4.3 - 0	45.2	257	53.0	12	46.5
Δ		1		-8				-2	-13		13		4

UT	MESEC				JUPITER				SATURN								
	S <sub>♃</sub>		Δ		δ <sub>♃</sub>		Δ		S <sub>♃</sub>		δ <sub>♃</sub>		S <sub>♄</sub>		δ <sub>♄</sub>		
h	°	'	°	'	°	'	°	'	°	'	°	'	°	'	°	'	
0	8	7.9	54	-20	24.1	133	132	7.0 - 5	18.1	200	45.5	19	30.3	200	45.5	19	30.3
2	36	56.7	56	-19	57.4	136	162	11.1 - 5	18.5	230	49.8	19	30.2	230	49.8	19	30.2
4	65	45.9	58	-19	30.3	139	192	15.2 - 5	18.8	260	54.1	19	30.0	260	54.1	19	30.0
6	94	35.6	60	-19	2.6	141	222	19.4 - 5	19.2	290	58.4	19	29.9	290	58.4	19	29.9
8	123	25.7	62	-18	34.4	143	252	23.5 - 5	19.5	321	2.6	19	29.7	321	2.6	19	29.7
10	152	16.2	65	-18	5.7	146	282	27.6 - 5	19.8	351	6.9	19	29.6	351	6.9	19	29.6
12	181	7.1	67	-17	36.5	148	312	31.8 - 5	20.2	21	11.2	19	29.5	21	11.2	19	29.5
14	209	58.4	69	-17	6.9	150	342	35.9 - 5	20.5	51	15.5	19	29.3	51	15.5	19	29.3
16	238	50.2	71	-16	36.8	152	12	40.0 - 5	20.9	81	19.8	19	29.2	81	19.8	19	29.2
18	267	42.3	73	-16	6.3	154	42	44.2 - 5	21.2	111	24.1	19	29.0	111	24.1	19	29.0
20	296	34.9	75	-15	35.5	156	72	48.3 - 5	21.6	141	28.4	19	28.9	141	28.4	19	28.9
22	325	27.9	77	-15	4.2	158	102	52.4 - 5	21.9	171	32.7	19	28.8	171	32.7	19	28.8
Δ								21	-2		21		-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	4 24	19 42	0 49	:	20 10	.0	2 60	4.9
55	4 42	19 24	0 41	2 41	19 48	.4	3 32	4.3
50	4 56	19 11	0 35	2 10	19 32	.8	3 56	3.9
45	5 6	18 60	0 31	1 52	19 19	1.0	4 14	3.6
40	5 15	18 51	0 29	1 40	19 8	1.2	4 28	3.4
35	5 23	18 44	0 26	1 31	18 58	1.4	4 41	3.2
30	5 30	18 37	0 25	1 25	18 50	1.5	4 51	3.1
20	5 41	18 26	0 23	1 17	18 35	1.8	5 10	2.8
10	5 51	18 16	0 22	1 12	18 22	2.0	5 25	2.6
0	6 0	18 7	0 21	1 10	18 10	2.3	5 40	2.3
10	6 9	17 58	0 21	1 11	17 58	2.5	5 55	2.1
20	6 19	17 49	0 23	1 14	17 45	2.7	6 10	1.9
30	6 30	17 38	0 24	1 20	17 30	3.0	6 28	1.6
35	6 36	17 32	0 26	1 25	17 21	3.1	6 38	1.5
40	6 43	17 25	0 28	1 31	17 11	3.3	6 49	1.3
45	6 51	17 17	0 30	1 39	16 60	3.5	7 3	1.1
50	7 1	17 7	0 33	1 49	16 45	3.8	7 19	.9
55	7 13	16 55	0 38	2 2	16 27	4.2	7 40	.5
60	7 28	16 40	0 44	2 21	16 2	4.7	8 7	.0
S								

SUNCE				MESEC					
UT	e = T <sub>p</sub> - UT	Δ/24	r	Prolaz	Δ/24	π <sub>♃</sub>	r		
h	min	s	s	h min	min	'	'		
00	- 3 41.6	.6	15.8	T <sub>m</sub>	1.0	61.3	16.7		
12	- 3 34.5	T <sub>m☉</sub>	12 h 3.6 min	Starost	13.9 d	Faza	☉		
PLANETE									
Pl.	T <sub>m</sub>	π	360-α	Vel.	Pl.	T <sub>m</sub>	π	360-α	Vel.
♀	h min	'	°		♃	h min	'	°	
♂	14 20	.1	178	-3.9	♃	15 9	.0	165	-1.6
♂	4 50	.2	320	-8	♄	10 35	.0	233	.4

UT	SUNCE				PROLEĆ. TAČKA S <sub>γ</sub>	VENERA				MARS			
	S <sub>☉</sub>		δ <sub>☉</sub>			S <sub>♀</sub>		δ <sub>♀</sub>		S <sub>♂</sub>		δ <sub>♂</sub>	
h	°	'	°	'	°	'	°	'	°	'	°	'	
0	179	8.1	12	29.1	328	25.6	145	3.9 - 0	47.8	287	55.6	12	47.2
2	209	8.4	12	27.5	358	30.5	175	3.5 - 0	50.4	317	58.3	12	47.9
4	239	8.7	12	25.8	28	35.4	205	3.1 - 0	53.0	348	1.0	12	48.6
6	269	9.0	12	24.2	58	40.3	235	2.7 - 0	55.5	18	3.6	12	49.4
8	299	9.3	12	22.5	88	45.3	265	2.3 - 0	58.1	48	6.3	12	50.1
10	329	9.6	12	20.9	118	50.2	295	1.9 - 1	.7	78	9.0	12	50.8
12	359	9.9	12	19.2	148	55.1	325	1.5 - 1	3.3	108	11.7	12	51.5
14	29	10.2	12	17.6	179	.1	355	1.1 - 1	5.9	138	14.3	12	52.2
16	59	10.5	12	16.0	209	5.0	25	.7 - 1	8.4	168	17.0	12	52.9
18	89	10.8	12	14.2	239	9.9	55	.3 - 1	11.0	198	19.7	12	53.6
20	119	11.1	12	12.6	269	14.8	84	59.9 - 1	13.6	228	22.4	12	54.3
22	149	11.4	12	10.9	299	19.8	114	59.5 - 1	16.2	258	25.1	12	55.0
Δ		2		-8				-2	-13		13		4

UT	MESEC				JUPITER				SATURN								
	S <sub>♃</sub>		Δ		δ <sub>♃</sub>		Δ		S <sub>♃</sub>		δ <sub>♃</sub>		S <sub>♄</sub>		δ <sub>♄</sub>		
h	°	'	°	'	°	'	°	'	°	'	°	'	°	'	°	'	
0	354	21.2	79	-14	32.6	160	132	56.6 - 5	22.2	201	37.0	19	28.6	201	37.0	19	28.6
2	23	15.0	81	-14	.7	161	163	.7 - 5	22.6	231	41.3	19	28.5	231	41.3	19	28.5
4	52	9.2	83	-13	28.4	163	193	4.8 - 5	22.9	261	45.6	19	28.4	261	45.6	19	28.4
6	81	3.7	85	-12	55.9	164	223	8.9 - 5	23.3	291	49.9	19	28.2	291	49.9	19	28.2
8	109	58.6	86	-12	23.0	166	253	13.1 - 5	23.6	321	54.2	19	28.1	321	54.2	19	28.1
10	138	53.9	88	-11	49.9	167	283	17.2 - 5	24.0	351	58.5	19	27.9	351	58.5	19	27.9
12	167	49.5	90	-11	16.6	168	313	21.3 - 5	24.3	22	2.8	19	27.8	22	2.8	19	27.8
14	196	45.5	92	-10	43.0	169	343	25.4 - 5	24.7	52	7.1	19	27.7	52	7.1	19	27.7
16	225	41.8	93	-10	9.2	170	13	29.6 - 5	25.0	82	11.4	19	27.5	82	11.4	19	27.5
18	254	38.4	95	-9	35.2	171	43	33.7 - 5	25.4	112	15.7	19	27.4	112	15.7	19	27.4
20	283	35.4	96	-9	1.1	172	73	37.8 - 5	25.7	142	19.9	19	27.2	142	19.9	19	27.2
22	312	32.7	98	-8	26.7	172	103	41.9 - 5	26.0	172	24.2	19	27.1	172	24.2	19	27.1
Δ								21	-2		21		-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	4 26	19 39	0 49	:	20 10	.0	4 56	4.5
55	4 44	19 22	0 40	2 39	19 59	.3	5 15	4.1
50	4 57	19 9	0 35	2 9	19 50	.6	5 29	3.7
45	5 8	18 58	0 31	1 51	19 43	.9	5 41	3.5
40	5 16	18 50	0 29	1 39	19 37	1.1	5 50	3.3
35	5 24	18 42	0 26	1 31	19 31	1.2	5 58	3.1
30	5 30	18 36	0 25	1 25	19 27	1.4	6 5	2.9
20	5 41	18 25	0 23	1 16	19 18	1.7	6 17	2.6
10	5 51	18 16	0 22	1 12	19 11	1.9	6 27	2.4
0	5 60	18 7	0 21	1 10	19 4	2.1	6 36	2.2
10	6 9	17 58	0 21	1 11	18 58	2.3	6 46	2.0
20	6 18	17 49	0 22	1 14	18 50	2.6	6 56	1.7
30	6 29	17 38	0 24	1 20	18 42	2.8	7 7	1.5
35	6 35	17 33	0 26	1 25	18 37	3.0	7 14	1.3
40	6 41	17 26						



UT	SUNCE				PROLEĆ. TAČKA S <sub>γ</sub>	VENERA				MARS				
	S <sub>☉</sub>		δ <sub>☉</sub>			S <sub>♀</sub>		δ <sub>♀</sub>		S <sub>♂</sub>		δ <sub>♂</sub>		
h	°	'	°	'	°	'	°	'	°	'	°	'		
0	179	11.7	12	9.3	329	24.7	144	59.0	-1	18.8	288	27.8	12	55.7
2	209	12.0	12	7.6	359	29.6	174	58.6	-1	21.3	318	30.5	12	56.4
4	239	12.3	12	5.9	29	34.5	204	58.2	-1	23.9	348	33.2	12	57.1
6	269	12.6	12	4.3	59	39.5	234	57.8	-1	26.5	18	35.9	12	57.8
8	299	13.0	12	2.6	89	44.4	264	57.4	-1	29.1	48	38.6	12	58.5
10	329	13.3	12	.9	119	49.3	294	57.0	-1	31.7	78	41.3	12	59.2
12	359	13.6	11	59.3	149	54.3	324	56.6	-1	34.2	108	44.0	12	59.9
14	29	13.9	11	57.6	179	59.2	354	56.2	-1	36.8	138	46.7	13	.6
16	59	14.2	11	55.9	210	4.1	24	55.8	-1	39.4	168	49.4	13	1.3
18	89	14.5	11	54.3	240	9.0	54	55.4	-1	42.0	198	52.1	13	2.0
20	119	14.8	11	52.6	270	14.0	84	55.0	-1	44.6	228	54.8	13	2.7
22	149	15.1	11	50.9	300	18.9	114	54.6	-1	47.1	258	57.6	13	3.4
Δ		2		-8				-2		-13		14		3

φ	SUNCE		TRAJANJE SUMRAKA		MESEC			
	IZLAZ	ZALAZ	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 29	19 36	0 48	4 2	20 10	.0	6 46	4.3
55	4 46	19 19	0 40	2 37	20 7	.3	6 53	3.9
50	4 59	19 7	0 35	2 8	20 5	.6	6 59	3.6
45	5 9	18 57	0 31	1 51	20 4	.8	7 4	3.3
40	5 17	18 48	0 28	1 39	20 2	1.0	7 8	3.1
35	5 24	18 41	0 26	1 31	20 1	1.2	7 12	3.0
30	5 31	18 35	0 25	1 24	20 0	1.3	7 15	2.8
20	5 42	18 24	0 23	1 16	19 58	1.6	7 20	2.5
10	5 51	18 15	0 22	1 12	19 57	1.8	7 24	2.3
0	5 60	18 6	0 21	1 10	19 55	2.0	7 29	2.1
10	6 8	17 58	0 21	1 11	19 54	2.2	7 33	1.8
20	6 17	17 49	0 22	1 14	19 52	2.5	7 37	1.6
30	6 28	17 39	0 24	1 20	19 50	2.7	7 42	1.4
35	6 33	17 33	0 26	1 25	19 49	2.9	7 45	1.2
40	6 40	17 27	0 28	1 31	19 48	3.1	7 48	1.0
45	6 48	17 19	0 30	1 38	19 46	3.3	7 52	.8
50	6 57	17 10	0 33	1 48	19 45	3.5	7 56	.6
55	7 8	16 59	0 38	2 2	19 43	3.8	8 1	.3
60	7 23	16 45	0 44	2 20	19 40	4.2	8 8	.0
S								

UT	MESEC				JUPITER				SATURN							
	S <sub>♃</sub>		Δ		δ <sub>♃</sub>		Δ		S <sub>♃</sub>		δ <sub>♃</sub>		S <sub>♄</sub>		δ <sub>♄</sub>	
h	°	'	°	'	°	'	°	'	°	'	°	'	°	'	°	'
0	341	30.3	99	-7	52.3	173	133	46.1	-5	26.4	202	28.5	19	27.0		
2	10	28.2	101	-7	17.7	173	163	50.2	-5	26.7	232	32.8	19	26.8		
4	39	26.4	102	-6	43.0	174	193	54.3	-5	27.1	262	37.1	19	26.7		
6	68	24.8	104	-6	8.2	174	223	58.4	-5	27.4	292	41.4	19	26.6		
8	97	23.5	105	-5	33.4	175	254	2.5	-5	27.8	322	45.7	19	26.4		
10	126	22.5	106	-4	58.5	175	284	6.7	-5	28.1	352	50.0	19	26.3		
12	155	21.7	107	-4	23.5	175	314	10.8	-5	28.5	22	54.3	19	26.1		
14	184	21.2	108	-3	48.5	175	344	14.9	-5	28.8	52	58.6	19	26.0		
16	213	20.8	109	-3	13.5	175	14	19.0	-5	29.2	83	2.9	19	25.9		
18	242	20.7	110	-2	38.5	175	44	23.1	-5	29.5	113	7.2	19	25.7		
20	271	20.8	111	-2	3.5	175	74	27.2	-5	29.9	143	11.5	19	25.6		
22	300	21.0	112	-1	28.6	175	104	31.4	-5	30.2	173	15.8	19	25.5		
Δ							21			-2	21				-1	

SUNCE				MESEC					
UT	e = T <sub>p</sub> - UT	Δ/24	r	Prolaz	Δ/24	π <sub>☾</sub>	r		
h	min	s		h min	min	'	'		
00	-3	13.0	.6	15.8	T <sub>m</sub>	1 17	2.1	60.8	16.6
12	-3	5.5	T <sub>m☉</sub>	12 h 3.1 min	Starost	15.9 d	Faza	☉	
PLANETE									
Pl.	T <sub>m</sub>	π	360-α	Vel.	Pl.	T <sub>m</sub>	π	360-α	Vel.
♀	h min	'	°		♃	h min	'	°	
♁	14 20	.1	176	-3.9	♃	15 3	.0	164	-1.6
♂	4 46	.2	319	-.8	♄	10 29	.0	233	.4

UT	SUNCE				PROLEĆ. TAČKA S <sub>γ</sub>	VENERA				MARS				
	S <sub>☉</sub>		δ <sub>☉</sub>			S <sub>♀</sub>		δ <sub>♀</sub>		S <sub>♂</sub>		δ <sub>♂</sub>		
h	°	'	°	'	°	'	°	'	°	'	°	'		
0	179	15.5	11	49.2	330	23.8	144	54.2	-1	49.7	289	.3	13	4.0
2	209	15.8	11	47.6	0	28.8	174	53.8	-1	52.3	319	3.0	13	4.7
4	239	16.1	11	45.9	30	33.7	204	53.4	-1	54.9	349	5.7	13	5.4
6	269	16.4	11	44.2	60	38.6	234	53.0	-1	57.5	19	8.5	13	6.1
8	299	16.7	11	42.5	90	43.5	264	52.7	-2	.0	49	11.2	13	6.8
10	329	17.1	11	40.8	120	48.5	294	52.3	-2	2.6	79	13.9	13	7.5
12	359	17.4	11	39.1	150	53.4	324	51.9	-2	5.2	109	16.7	13	8.2
14	29	17.7	11	37.5	180	58.3	354	51.5	-2	7.8	139	19.4	13	8.8
16	59	18.0	11	35.8	211	3.3	24	51.1	-2	10.3	169	22.2	13	9.5
18	89	18.4	11	34.1	241	8.2	54	50.7	-2	12.9	199	24.9	13	10.2
20	119	18.7	11	32.4	271	13.1	84	50.3	-2	15.5	229	27.7	13	10.9
22	149	19.0	11	30.7	301	18.0	114	49.9	-2	18.1	259	30.4	13	11.6
Δ		2		-8				-2		-13		14		3

φ	SUNCE		TRAJANJE SUMRAKA		MESEC			
	IZLAZ	ZALAZ	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 31	19 33	0 48	3 47	20 9	.0	8 29	4.2
55	4 48	19 17	0 40	2 35	20 15	.3	8 27	3.8
50	5 0	19 5	0 35	2 7	20 20	.6	8 26	3.5
45	5 10	18 55	0 31	1 50	20 23	.8	8 24	3.2
40	5 18	18 47	0 28	1 39	20 27	1.0	8 23	3.0
35	5 25	18 40	0 26	1 30	20 29	1.2	8 23	2.9
30	5 31	18 34	0 25	1 24	20 32	1.3	8 22	2.7
20	5 42	18 23	0 23	1 16	20 36	1.6	8 21	2.5
10	5 51	18 15	0 21	1 12	20 40	1.8	8 19	2.2
0	5 60	18 6	0 21	1 10	20 44	2.0	8 18	2.0
10	6 8	17 58	0 21	1 11	20 48	2.2	8 17	1.8
20	6 17	17 49	0 22	1 14	20 52	2.4	8 16	1.6
30	6 26	17 40	0 24	1 20	20 56	2.7	8 15	1.3
35	6 32	17 34	0 26	1 25	20 59	2.8	8 14	1.2
40	6 39	17 28	0 28	1 31	21 2	3.0	8 13	1.0
45	6 46	17 20	0 30	1 38	21 5	3.2	8 12	.8
50	6 55	17 12	0 33	1 48	21 9	3.4	8 11	.6
55	7 6	17 1	0 37	2 2	21 15	3.8	8 9	.3
60	7 20	16 47	0 43	2 20	21 21	4.2	8 7	.0
S								

UT	MESEC				JUPITER				SATURN							
	S <sub>♃</sub>		Δ		δ <sub>♃</sub>		Δ		S <sub>♃</sub>		δ <sub>♃</sub>		S <sub>♄</sub>		δ <sub>♄</sub>	
h	°	'	°	'	°	'	°	'	°	'	°	'	°	'	°	'
0	329	21.5	113	-0	53.7	174	134	35.5	-5	30.6	203	20.1	19	25.3		
2	358	22.1	114	-0	18.9	174	164	39.6	-5	30.9	233	24.4	19	25.2		
4	27	22.9	115	0	15.9	173	194	43.7	-5	31.3	263	28.7	19	25.0		
6	56	23.8	115	0	50.6	173	224	47.8	-5	31.6	293	33.0	19	24.9		
8	85	24.9	116	1	25.2	172	254	51.9	-5	32.0	323	37.3	19	24.8		
10	114	26.0	117	1	59.6	172	284	56.0	-5	32.3	353	41.6	19	24.6		
12	143	27.3	117	2	34.0	171	315	.2	-5	32.7	23	45.9	19	24.5		
14	172	28.8	118	3	8.2	170	345	4.3	-5	33.0	53	50.2	19	24.4		
16	201	30.3	118	3	42.2	169	15	8.4	-5	33.4	83	54.5	19	24.2		
18	230	31.8	118	4	16.1	169	45	12.5	-5	33.7	113	58.8	19	24.1		
20	259	33.5	119	4	49.8	168	75	16.6	-5	34.1	144	3.1	19	23.9		
22	288	35.2	119	5	23.3	167	105	20.7	-5	34.4	174	7.4	19	23.8		
Δ							21			-2	22				-1	

SUNCE				MESEC			
UT	e = T <sub>p</sub> - UT	Δ/24	r	Prolaz	Δ/24	π <sub>☾</sub>	r

UT	SUNCE		PROLEĆ. TAČKA S <sub>γ</sub>	VENERA		MARS		
	S <sub>☉</sub>	δ <sub>☉</sub>		S <sub>♀</sub>	δ <sub>♀</sub>	S <sub>♂</sub>	δ <sub>♂</sub>	
h	°	'	°	'	°	'	°	'
0	179 19.3	11 29.0	331 23.0	144 49.5	- 2 20.7	289 33.2	13 12.2	
2	209 19.7	11 27.3	1 27.9	174 49.1	- 2 23.2	319 35.9	13 12.9	
4	239 20.0	11 25.6	31 32.8	204 48.7	- 2 25.8	349 38.7	13 13.6	
6	269 20.3	11 23.9	61 37.8	234 48.3	- 2 28.4	19 41.5	13 14.2	
8	299 20.6	11 22.2	91 42.7	264 47.9	- 2 31.0	49 44.2	13 14.9	
10	329 21.0	11 20.5	121 47.6	294 47.5	- 2 33.5	79 47.0	13 15.6	
12	359 21.3	11 18.8	151 52.5	324 47.1	- 2 36.1	109 49.8	13 16.3	
14	29 21.6	11 17.1	181 57.5	354 46.7	- 2 38.7	139 52.5	13 16.9	
16	59 22.0	11 15.4	212 2.4	24 46.3	- 2 41.3	169 55.3	13 17.6	
18	89 22.3	11 13.7	242 7.3	54 45.9	- 2 43.8	199 58.1	13 18.3	
20	119 22.6	11 12.0	272 12.3	84 45.5	- 2 46.4	230 .9	13 18.9	
22	149 23.0	11 10.3	302 17.2	114 45.1	- 2 49.0	260 3.7	13 19.6	
Δ	2	-9		-2	-13	14	3	

φ	SUNCE		TRAJANJE SUMRAKA		MESEC			
	IZLAZ	ZALAZ	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 30	0 48	3 38	20 8	.0	10 10	4.2
55	4 49	19 14	0 40	2 33	20 23	.4	9 58	3.7
50	5 2	19 3	0 35	2 6	20 34	.7	9 49	3.4
45	5 11	18 53	0 31	1 49	20 44	.9	9 42	3.2
40	5 19	18 45	0 28	1 38	20 51	1.1	9 36	3.0
35	5 26	18 39	0 26	1 30	20 58	1.3	9 31	2.8
30	5 32	18 33	0 25	1 24	21 4	1.4	9 27	2.7
20	5 42	18 23	0 23	1 14	21 14	1.6	9 19	2.4
10	5 51	18 14	0 21	1 12	21 23	1.8	9 13	2.2
0	5 59	18 6	0 21	1 10	21 32	2.0	9 7	2.0
10	6 7	17 58	0 21	1 11	21 41	2.2	9 0	1.8
20	6 16	17 50	0 22	1 14	21 50	2.4	8 54	1.6
30	6 25	17 40	0 24	1 20	22 1	2.7	8 46	1.4
35	6 31	17 35	0 26	1 25	22 7	2.8	8 42	1.2
40	6 37	17 29	0 28	1 31	22 14	3.0	8 37	1.1
45	6 44	17 22	0 30	1 38	22 22	3.2	8 32	.9
50	6 53	17 13	0 33	1 48	22 32	3.4	8 25	.6
55	7 3	17 3	0 37	2 2	22 45	3.7	8 17	.4
60	7 17	16 49	0 43	2 20	23 2	4.2	8 7	.0
S								

UT	MESEC				JUPITER		SATURN	
	S <sub>♃</sub>	Δ	δ <sub>♃</sub>	Δ	S <sub>♃</sub>	δ <sub>♃</sub>	S <sub>♄</sub>	δ <sub>♄</sub>
h	°	'	°	'	°	'	°	'
0	317 37.0	119	5 56.6	166	135 24.8	- 5 34.8	204 11.7	19 23.7
2	346 38.9	119	6 29.7	164	165 28.9	- 5 35.1	234 16.0	19 23.5
4	15 40.7	119	7 2.6	163	195 33.0	- 5 35.5	264 20.3	19 23.4
6	44 42.6	120	7 35.3	162	225 37.1	- 5 35.8	294 24.6	19 23.3
8	73 44.5	120	8 7.7	161	255 41.2	- 5 36.2	324 28.9	19 23.1
10	102 46.5	120	8 39.9	160	285 45.4	- 5 36.5	354 33.2	19 23.0
12	131 48.4	120	9 11.8	158	315 49.5	- 5 36.9	24 37.6	19 22.8
14	160 50.3	120	9 43.4	157	345 53.6	- 5 37.2	54 41.9	19 22.7
16	189 52.2	119	10 14.8	155	15 57.7	- 5 37.6	84 46.2	19 22.6
18	218 54.1	119	10 45.8	154	46 1.8	- 5 37.9	114 50.5	19 22.4
20	247 55.9	119	11 16.6	152	76 5.9	- 5 38.3	144 54.8	19 22.3
22	276 57.7	119	11 47.0	151	106 10.0	- 5 38.6	174 59.1	19 22.2
Δ					21	-2	22	-1

SUNCE				MESEC					
UT	e = T <sub>p</sub> - UT	Δ/24	r	Prolaz	Δ/24	π <sub>♃</sub>	r		
h	min	s	'	h min	min	'	'		
00	- 2 42.5	.7	15.8	T <sub>m</sub>	2 55	2.0	59.3 16.2		
12	- 2 34.6	T <sub>m☉</sub>	12 h 2.6 min	Starost	17.9 d	Faza	☉		
PLANETE									
Pl.	T <sub>m</sub>	π	360-α	Vel.	Pl.	T <sub>m</sub>	π	360-α	Vel.
♀	h min	'	°		♃	h min	'	°	
♂	14 21	.1	173	-3.9	♄	14 56	.0	164	-1.6
♂	4 41	.2	318	-.8	♂	10 22	.0	233	.4

24. AVGUST

SREDA

UT	SUNCE		PROLEĆ. TAČKA S <sub>γ</sub>	VENERA		MARS		
	S <sub>☉</sub>	δ <sub>☉</sub>		S <sub>♀</sub>	δ <sub>♀</sub>	S <sub>♂</sub>	δ <sub>♂</sub>	
h	°	'	°	'	°	'	°	'
0	179 23.3	11 8.6	332 22.1	144 44.7	- 2 51.6	290 6.5	13 20.3	
2	209 23.6	11 6.9	2 27.0	174 44.3	- 2 54.1	320 9.3	13 20.9	
4	239 24.0	11 5.2	32 32.0	204 43.9	- 2 56.7	350 12.0	13 21.6	
6	269 24.3	11 3.5	62 36.9	234 43.5	- 2 59.3	20 14.8	13 22.2	
8	299 24.6	11 1.8	92 41.8	264 43.1	- 3 1.9	50 17.6	13 22.9	
10	329 25.0	11 .1	122 46.8	294 42.7	- 3 4.4	80 20.4	13 23.5	
12	359 25.3	10 58.3	152 51.7	324 42.3	- 3 7.0	110 23.3	13 24.2	
14	29 25.7	10 56.6	182 56.6	354 41.9	- 3 9.6	140 26.1	13 24.9	
16	59 26.0	10 54.9	213 1.5	24 41.6	- 3 12.1	170 28.9	13 25.5	
18	89 26.3	10 53.2	243 6.5	54 41.2	- 3 14.7	200 31.7	13 26.2	
20	119 26.7	10 51.5	273 11.4	84 40.8	- 3 17.3	230 34.5	13 26.8	
22	149 27.0	10 49.7	303 16.3	114 40.4	- 3 19.9	260 37.3	13 27.5	
Δ	2	-9		-2	-13	14	3	

φ	SUNCE		TRAJANJE SUMRAKA		MESEC			
	IZLAZ	ZALAZ	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 27	0 47	3 30	20 8	.1	11 50	4.2
55	4 51	19 12	0 40	2 31	20 33	.5	11 28	3.7
50	5 3	19 1	0 35	2 5	20 51	.9	11 11	3.4
45	5 12	18 51	0 31	1 49	21 6	1.1	10 58	3.1
40	5 20	18 44	0 28	1 38	21 18	1.3	10 48	2.9
35	5 27	18 37	0 26	1 30	21 28	1.4	10 39	2.8
30	5 33	18 32	0 25	1 24	21 37	1.5	10 31	2.6
20	5 42	18 22	0 23	1 16	21 53	1.7	10 18	2.4
10	5 51	18 13	0 21	1 12	22 7	1.9	10 6	2.2
0	5 59	18 6	0 21	1 10	22 20	2.1	9 55	2.0
10	6 7	17 58	0 21	1 11	22 34	2.2	9 44	1.9
20	6 15	17 50	0 22	1 14	22 48	2.4	9 32	1.7
30	6 24	17 41	0 24	1 20	23 4	2.6	9 19	1.5
35	6 30	17 35	0 26	1 25	23 14	2.8	9 11	1.3
40	6 36	17 30	0 28	1 30	23 25	2.9	9 3	1.2
45	6 43	17 23	0 30	1 38	23 38	3.1	8 53	1.0
50	6 51	17 15	0 33	1 48	23 54	3.3	8 41	.8
55	7 1	17 5	0 37	2 1	...	.0	8 26	.5
60	7 14	16 51	0 43	2 20	...	.0	8 6	.0
S								

UT	MESEC				JUPITER		SATURN	
	S <sub>♃</sub>	Δ	δ <sub>♃</sub>	Δ	S <sub>♃</sub>	δ <sub>♃</sub>	S <sub>♄</sub>	δ <sub>♄</sub>
h	°	'	°	'	°	'	°	'
0	305 59.5	118	12 17.2	149	136 14.1	- 5 39.0	205 3.4	19 22.0
2	335 1.2	118	12 47.0	147	166 18.2	- 5 39.3	235 7.7	19 21.9
4	4 2.8	118	13 16.4	146	196 22.3	- 5 39.7	265 12.0	19 21.7
6	33 4.4	117	13 45.5	144	226 26.4	- 5 40.0	295 16.3	19 21.6
8	62 5.9	117	14 14.3	142	256 30.5	- 5 40.4	325 20.6	19 21.5
10	91 7.3	117	14 42.7	140	286 34.6	- 5 40.8	355 24.9	19 21.3
12	120 8.6	116	15 10.8	138	316 38.7	- 5 41.1	25 29.2	19 21.2
14	149 9.8	116	15 38.4	136	346 42.8	- 5 41.5	55 33.5	19 21.1
16	178 10.9	115	16 5.7	134	16 46.9	- 5 41.8	85 37.8	19 20.9
18	207 11.9	114	16 32.6	132	46 51.0	- 5 42.2	115 42.1	19 20.8
20	236 12.8	114	16 59.0	130	76 55.1	- 5 42.5	145 46.4	19 20.6
22	265 13.6	113	17 25.1	128	106 59.2	- 5 42.9	175 50.8	19 20.5
Δ					20	-2	22	-1

SUNCE				MESEC					
UT	e = T <sub>p</sub> - UT	Δ/24	r	Prolaz	Δ/24	π <sub>♃</sub>	r		
h	min	s	'	h min	min	'	'		
00	- 2 26.6	.7	15.8	T <sub>m</sub>	3 43	2.0	58.3 15.9		
12	- 2 18.5	T <sub>m☉</sub>	12 h 2.3 min	Starost	18.9 d	Faza	☉		
PLANETE									
Pl.	T <sub>m</sub>	π	360-α	Vel.	Pl.	T <sub>m</sub>	π	360-α	Vel.
♀	h min	'	°		♃	h min	'	°	
♂	14 21	.1	172	-3.9	♄	14 53	.0	164	-1.6
♂	4 39	.2	318	-.9	♂	10 18	.0	233	.4

UT	SUNCE		PROLEĆ. TAČKA S <sub>γ</sub>	VENERA		MARS	
	S <sub>☉</sub>	δ <sub>☉</sub>		S <sub>♀</sub>	δ <sub>♀</sub>	S <sub>♂</sub>	δ <sub>♂</sub>
h	° / ' / "	° / ' / "	° / ' / "	° / ' / "	° / ' / "	° / ' / "	° / ' / "
0	179 27.4	10 48.0	333 21.2	144 40.0 - 3	22.4	290 40.2	13 28.1
2	209 27.7	10 46.3	3 26.2	174 39.6 - 3	25.0	320 43.0	13 28.8
4	239 28.1	10 44.6	33 31.1	204 39.2 - 3	27.6	350 45.8	13 29.4
6	269 28.4	10 42.9	63 36.0	234 38.8 - 3	30.1	20 48.6	13 30.1
8	299 28.7	10 41.1	93 41.0	264 38.4 - 3	32.7	50 51.5	13 30.7
10	329 29.1	10 39.4	123 45.9	294 38.0 - 3	35.3	80 54.3	13 31.3
12	359 29.4	10 37.7	153 50.8	324 37.6 - 3	37.8	110 57.2	13 32.0
14	29 29.8	10 35.9	183 55.7	354 37.2 - 3	40.4	141 .0	13 32.6
16	59 30.1	10 34.2	214 .7	24 36.8 - 3	43.0	171 2.8	13 33.3
18	89 30.5	10 32.5	244 5.6	54 36.4 - 3	45.5	201 5.7	13 33.9
20	119 30.8	10 30.7	274 10.5	84 36.0 - 3	48.1	231 8.6	13 34.6
22	149 31.2	10 29.0	304 15.5	114 35.6 - 3	50.7	261 11.4	13 35.2
Δ	2	-9		-2	-13	14	3

φ	SUNCE		TRAJANJE SUMRAKA		MESEC			
	IZLAZ	ZALAZ	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 38	19 24	0 47	3 24	20 10	.2	13 30	4.2
55	4 53	19 10	0 39	2 30	20 46	.8	12 56	3.6
50	5 4	18 59	0 34	2 4	21 12	1.1	12 32	3.3
45	5 14	18 50	0 31	1 48	21 32	1.3	12 13	3.0
40	5 21	18 42	0 28	1 37	21 48	1.5	11 58	2.9
35	5 27	18 36	0 26	1 29	22 2	1.6	11 46	2.7
30	5 33	18 31	0 25	1 24	22 14	1.7	11 34	2.6
20	5 43	18 21	0 23	1 16	22 35	1.9	11 16	2.4
10	5 51	18 13	0 21	1 11	22 53	2.0	10 59	2.3
0	5 59	18 5	0 21	1 10	23 10	2.1	10 44	2.1
10	6 6	17 58	0 21	1 11	23 27	2.3	10 29	2.0
20	6 14	17 50	0 22	1 14	23 46	2.4	10 12	1.8
30	6 23	17 41	0 24	1 20	...	.0	9 54	1.6
35	6 28	17 36	0 26	1 25	...	.0	9 43	1.5
40	6 34	17 30	0 28	1 30	...	.0	9 31	1.4
45	6 41	17 24	0 30	1 38	...	.0	9 17	1.2
50	6 49	17 16	0 33	1 48	...	.0	8 59	1.0
55	6 59	17 6	0 37	2 1	0 15	3.7	8 37	.6
60	7 11	16 54	0 43	2 20	0 44	4.2	8 7	.1
S								

UT	MESEC				JUPITER		SATURN	
	S <sub>♃</sub>	Δ	δ <sub>♃</sub>	Δ	S <sub>♃</sub>	δ <sub>♃</sub>	S <sub>♄</sub>	δ <sub>♄</sub>
h	° / ' / "	° / ' / "	° / ' / "	° / ' / "	° / ' / "	° / ' / "	° / ' / "	° / ' / "
0	294 14.2	113	17 50.8	126	137 3.3 - 5	43.2	205 55.1	19 20.4
2	323 14.8	112	18 16.0	124	167 7.4 - 5	43.6	235 59.4	19 20.2
4	352 15.2	111	18 40.8	122	197 11.5 - 5	43.9	266 3.7	19 20.1
6	21 15.4	111	19 5.2	120	227 15.6 - 5	44.3	296 8.0	19 20.0
8	50 15.6	110	19 29.1	117	257 19.7 - 5	44.7	326 12.3	19 19.8
10	79 15.6	109	19 52.5	115	287 23.7 - 5	45.0	356 16.6	19 19.7
12	108 15.4	109	20 15.6	113	317 27.8 - 5	45.4	26 20.9	19 19.5
14	137 15.1	108	20 38.1	110	347 31.9 - 5	45.7	56 25.2	19 19.4
16	166 14.7	107	21 .2	108	17 36.0 - 5	46.1	86 29.5	19 19.3
18	195 14.1	106	21 21.8	106	47 40.1 - 5	46.4	116 33.8	19 19.1
20	224 13.4	106	21 43.0	103	77 44.2 - 5	46.8	146 38.2	19 19.0
22	253 12.5	105	22 3.6	101	107 48.3 - 5	47.2	176 42.5	19 18.9
Δ					20	-2	22	-1

SUNCE				MESEC					
UT	e = T <sub>p</sub> - UT	Δ/24	r	Prolaz	Δ/24	π <sub>♃</sub>	r		
h	min s	s	'	h min	min	'	'		
00	- 2 10.4	.7	15.8	T <sub>m</sub>	4 32	2.1	57.4 15.6		
12	- 2 2.0	T <sub>m☉</sub>	12 h 2.0 min	Starost	19.9 d	Faza	☉		
PLANETE									
Pl.	T <sub>m</sub>	π	360-α	Vel.	Pl.	T <sub>m</sub>	π	360-α	Vel.
♀	h min	'	°		♃	h min	'	°	
♁	14 22	.1	171	-3.9	♃	14 50	.0	164	-1.6
♂	4 37	.2	317	-.9	♄	10 15	.0	233	.4

UT	SUNCE		PROLEĆ. TAČKA S <sub>γ</sub>	VENERA		MARS	
	S <sub>☉</sub>	δ <sub>☉</sub>		S <sub>♀</sub>	δ <sub>♀</sub>	S <sub>♂</sub>	δ <sub>♂</sub>
h	° / ' / "	° / ' / "	° / ' / "	° / ' / "	° / ' / "	° / ' / "	° / ' / "
0	179 31.5	10 27.3	334 20.4	144 35.2 - 3	53.2	291 14.3	13 35.8
2	209 31.9	10 25.5	4 25.3	174 34.8 - 3	55.8	321 17.1	13 36.5
4	239 32.2	10 23.8	34 30.2	204 34.4 - 3	58.4	351 20.0	13 37.1
6	269 32.6	10 22.1	64 35.2	234 34.0 - 4	.9	21 22.9	13 37.7
8	299 32.9	10 20.3	94 40.1	264 33.6 - 4	3.5	51 25.7	13 38.4
10	329 33.3	10 18.6	124 45.0	294 33.2 - 4	6.1	81 28.6	13 39.0
12	359 33.6	10 16.8	154 50.0	324 32.9 - 4	8.6	111 31.5	13 39.6
14	29 34.0	10 15.1	184 54.9	354 32.5 - 4	11.2	141 34.4	13 40.2
16	59 34.4	10 13.3	214 59.8	24 32.1 - 4	13.8	171 37.3	13 40.9
18	89 34.7	10 11.6	245 4.7	54 31.7 - 4	16.3	201 40.1	13 41.5
20	119 35.1	10 9.8	275 9.7	84 31.3 - 4	18.9	231 43.0	13 42.1
22	149 35.4	10 8.1	305 14.6	114 30.9 - 4	21.4	261 45.9	13 42.7
Δ	2	-9		-2	-13	14	3

φ	SUNCE		TRAJANJE SUMRAKA		MESEC			
	IZLAZ	ZALAZ	GRAĐ.	ASTR.	IZLAZ	Δ/24	ZALAZ	Δ/24
N	h min	h min	h min	h min	h min	min	h min	min
60	4 41	19 21	0 46	3 19	20 14	.5	15 11	4.0
55	4 55	19 7	0 39	2 28	21 5	1.2	14 22	3.3
50	5 6	18 57	0 34	2 3	21 38	1.5	13 50	3.0
45	5 15	18 48	0 31	1 48	22 3	1.6	13 26	2.8
40	5 22	18 41	0 28	1 37	22 23	1.7	13 7	2.7
35	5 28	18 35	0 26	1 29	22 40	1.8	12 51	2.6
30	5 34	18 29	0 25	1 23	22 55	1.9	12 37	2.5
20	5 43	18 20	0 22	1 16	23 20	2.0	12 14	2.4
10	5 51	18 12	0 21	1 11	23 41	2.1	11 53	2.3
0	5 58	18 5	0 21	1 10	...	.0	11 34	2.2
10	6 6	17 58	0 21	1 11	...	.0	11 16	2.1
20	6 13	17 50	0 22	1 14	...	.0	10 56	1.9
30	6 22	17 42	0 24	1 20	0 7	2.6	10 33	1.8
35	6 27	17 37	0 26	1 24	0 20	2.7	10 19	1.7
40	6 33	17 31	0 27	1 30	0 35	2.8	10 4	1.6
45	6 39	17 25	0 30	1 38	0 52	2.9	9 45	1.5
50	6 47	17 18	0 33	1 48	1 14	3.2	9 22	1.3
55	6 56	17 8	0 37	2 1	1 43	3.5	8 52	1.0
60	7 8	16 56	0 43	2 20	2 25	4.2	8 9	.3
S								

UT	MESEC				JUPITER		SATURN	
	S <sub>♃</sub>	Δ	δ <sub>♃</sub>	Δ	S <sub>♃</sub>	δ <sub>♃</sub>	S <sub>♄</sub>	δ <sub>♄</sub>
h	° / ' / "	° / ' / "	° / ' / "	° / ' / "	° / ' / "	° / ' / "	° / ' / "	° / ' / "
0	282 11.5	104	22 23.8	98	137 52.4 - 5	47.5	206 46.8	19 18.7
2	311 10.3	103	22 43.4	96	167 56.5 - 5	47.9	236 51.1	19 18.6
4	340 9.0	103	23 2.6	93	198 .6 - 5	48.2	266 55.4	19 18.5
6	9 7.5	102	23 21.2	91	228 4.7 - 5	48.6	296 59.7	19 18.3
8	38 5.9	101	23 39.4	88	258 8.7 - 5	48.9	327 4.0	19 18.2
10	67 4.1	101	23 57.0	86	288 12.8 - 5	49.3	357 8.3	19 18.0
12	96 2.3	100	24 14.1	83	318 16.9 - 5	49.7	27 12.7	19 17.9
14	125 .2	99	24 30.6	80	348 21.0 - 5	50.0	57 17.0	19 17.8
16	153 58.0	98	24 46.7	78	18 25.1 - 5	50.4	87 21.3	19 17.6
18	182 55.7	98	25 2.2	75	48 29.2 - 5	50.7	117 25.6	19 17.5
20	211 53.3	97	25 17.1	72	78 33.3 - 5	51.1	147 29.9	19 17.4
22	240 50.8	97	25 31.6	69	108 37.3 - 5	51.4	177 34.2	19 17.2
Δ					20	-2	22	-1

SUNCE				MESEC					
UT	e = T <sub>p</sub> - UT	Δ/24	r	Prolaz	Δ/24	π <sub>♃</sub>	r		
h	min s	s	'	h min	min	'	'		
00	- 1 53.7	.7	15.9	T <sub>m</sub>	5 22	2.2	56.5 15.4		
12	- 1 45.2	T <sub>m☉</sub>	12 h 1.8 min	Starost	20.9 d	Faza	☉		
PLANETE									
Pl.	T <sub>m</sub>	π	360-α	Vel.	Pl.	T <sub>m</sub>	π	360-α	Vel.
♀	h min	'	°		♃	h min	'	°	
♁	14 22	.1	170	-3.9	♃	14 46	.0	164	-1.6
♂	4 35	.2	317	-.9	♄	10 11	.0	232	.4

UT	SUNCE				PROLEĆ. TAČKA S <sub>γ</sub>	VENERA				MARS				
	S <sub>☉</sub>		δ <sub>☉</sub>			S <sub>♀</sub>		δ <sub>♀</sub>		S <sub>♂</sub>		δ <sub>♂</sub>		
h	°	'	°	'	°	'	°	'	°	'	°	'		
0	179	35.8	10	6.3	335	19.5	144	30.5	-4	24.0	291	48.8	13	43.4
2	209	36.1	10	4.6	5	24.5	174	30.1	-4	26.6	321	51.7	13	44.0
4	239	36.5	10	2.8	35	29.4	204	29.7	-4	29.1	351	54.6	13	44.6
6	269	36.9	10	1.1	65	34.3	234	29.3	-4	31.7	21	57.5	13	45.2
8	299	37.2	9	59.3	95	39.2	264	28.9	-4	34.2	52	.4	13	45.9
10	329	37.6	9	57.6	125	44.2	294	28.5	-4	36.8	82	3.3	13	46.5
12	359	38.0	9	55.8	155	49.1	324	28.1	-4	39.4	112	6.3	13	47.1
14	29	38.3	9	54.1	185	54.0	354	27.7	-4	41.9	142	9.2	13	47.7
16	59	38.7	9	52.3	215	59.0	24	27.3	-4	44.5	172	12.1	13	48.3
18	89	39.0	9	50.5	246	3.9	54	26.9	-4	47.0	202	15.0	13	48.9
20	119	39.4	9	48.8	276	8.8	84	26.5	-4	49.6	232	17.9	13	49.5
22	149	39.8	9	47.0	306	13.7	114	26.1	-4	52.1	262	20.9	13	50.2
Δ	2		-9				-2		-13		15		3	

φ	SUNCE		TRAJANJE SUMRAKA		MESEC			
	IZLAZ	ZALAZ	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 43	19 18	0 46	3 14	20 27	1.3	16 48	3.3
55	4 57	19 5	0 39	2 26	21 34	1.8	15 42	2.8
50	5 7	18 54	0 34	2 3	22 14	1.9	15 3	2.6
45	5 16	18 46	0 31	1 47	22 43	2.0	14 34	2.5
40	5 23	18 39	0 28	1 37	23 5	2.0	14 12	2.5
35	5 29	18 33	0 26	1 29	23 24	2.1	13 53	2.4
30	5 34	18 28	0 25	1 23	23 40	2.1	13 38	2.4
20	5 43	18 19	0 22	1 15	...	...	13 11	2.3
10	5 51	18 12	0 21	1 11	...	...	12 48	2.3
0	5 58	18 5	0 21	1 10	0 1	2.2	12 26	2.2
10	6 5	17 58	0 21	1 10	0 22	2.3	12 5	2.1
20	6 13	17 51	0 22	1 14	0 43	2.4	11 42	2.1
30	6 21	17 42	0 24	1 20	1 9	2.5	11 16	2.0
35	6 26	17 38	0 26	1 24	1 24	2.5	11 0	2.0
40	6 31	17 32	0 27	1 30	1 41	2.6	10 42	1.9
45	6 37	17 26	0 30	1 38	2 3	2.7	10 20	1.8
50	6 45	17 19	0 33	1 48	2 29	2.8	9 53	1.7
55	6 54	17 10	0 37	2 1	3 6	3.1	9 15	1.5
60	7 6	16 58	0 43	2 19	4 5	3.8	8 15	.8

UT	MESEC				JUPITER				SATURN					
	S <sub>♃</sub>		Δ		S <sub>♃</sub>		δ <sub>♃</sub>		S <sub>♄</sub>		δ <sub>♄</sub>			
h	°	'	°	'	°	'	°	'	°	'	°	'		
0	269	48.1	96	25	45.4	67	138	41.4	-5	51.8	207	38.5	19	17.1
2	298	45.3	95	25	58.8	64	168	45.5	-5	52.2	237	42.9	19	17.0
4	327	42.4	95	26	11.5	61	198	49.6	-5	52.5	267	47.2	19	16.8
6	356	39.4	94	26	23.8	58	228	53.7	-5	52.9	297	51.5	19	16.7
8	25	36.3	94	26	35.4	56	258	57.8	-5	53.2	327	55.8	19	16.5
10	54	33.1	94	26	46.5	53	289	1.8	-5	53.6	358	.1	19	16.4
12	83	29.8	93	26	57.0	50	319	5.9	-5	54.0	28	4.4	19	16.3
14	112	26.4	93	27	7.0	47	349	10.0	-5	54.3	58	8.7	19	16.1
16	141	23.0	93	27	16.4	44	19	14.1	-5	54.7	88	13.1	19	16.0
18	170	19.5	92	27	25.2	41	49	18.2	-5	55.0	118	17.4	19	15.9
20	199	15.9	92	27	33.5	38	79	22.2	-5	55.4	148	21.7	19	15.7
22	228	12.3	92	27	41.2	36	109	26.3	-5	55.8	178	26.0	19	15.6
Δ							20		-2		22		-1	

SUNCE				MESEC			
UT	e = T <sub>p</sub> - UT	Δ/24	r	Prolaz	Δ/24	π <sub>☾</sub>	r
h	min	s	'	h min	min	'	'
00	- 1 36.7	.7	15.9	T <sub>m</sub>	6 14	2.2	55.7 15.2
12	- 1 27.9	T <sub>m☉</sub>	12 h 1.5 min	Starost	21.9 d	Faza	☉

PLANETE									
Pl.	T <sub>m</sub>	π	360-α	Vel.	Pl.	T <sub>m</sub>	π	360-α	Vel.
h	min	'	°	'	h	min	'	°	'
♀	14 22	.1	169	-3.9	♃	14 43	.0	163	-1.6
♂	4 32	.2	316	-.9	♄	10 8	.0	232	.4

UT	SUNCE				PROLEĆ. TAČKA S <sub>γ</sub>	VENERA				MARS				
	S <sub>☉</sub>		δ <sub>☉</sub>			S <sub>♀</sub>		δ <sub>♀</sub>		S <sub>♂</sub>		δ <sub>♂</sub>		
h	°	'	°	'	°	'	°	'	°	'	°	'		
0	179	40.1	9	45.3	336	18.7	144	25.7	-4	54.7	292	23.8	13	50.8
2	209	40.5	9	43.5	6	23.6	174	25.3	-4	57.2	322	26.7	13	51.4
4	239	40.9	9	41.7	36	28.5	204	24.9	-4	59.8	352	29.7	13	52.0
6	269	41.2	9	40.0	66	33.4	234	24.5	-5	2.3	22	32.6	13	52.6
8	299	41.6	9	38.2	96	38.4	264	24.1	-5	4.9	52	35.6	13	53.2
10	329	42.0	9	36.4	126	43.3	294	23.7	-5	7.4	82	38.5	13	53.8
12	359	42.3	9	34.7	156	48.2	324	23.3	-5	10.0	112	41.5	13	54.4
14	29	42.7	9	32.9	186	53.2	354	22.9	-5	12.5	142	44.4	13	55.0
16	59	43.1	9	31.1	216	58.1	24	22.5	-5	15.1	172	47.4	13	55.6
18	89	43.5	9	29.3	247	3.0	54	22.1	-5	17.6	202	50.4	13	56.2
20	119	43.8	9	27.6	277	7.9	84	21.7	-5	20.2	232	53.3	13	56.8
22	149	44.2	9	25.8	307	12.9	114	21.3	-5	22.7	262	56.3	13	57.4
Δ	2		-9				-2		-13		15		3	

φ	SUNCE		TRAJANJE SUMRAKA		MESEC			
	IZLAZ	ZALAZ	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 15	0 46	3 10	20 59	2.7	18 6	1.8
55	4 59	19 2	0 39	2 25	22 17	2.5	16 48	2.0
50	5 9	18 52	0 34	2 2	23 0	2.4	16 5	2.1
45	5 17	18 44	0 31	1 47	23 31	2.3	15 35	2.1
40	5 24	18 38	0 28	1 36	23 55	2.3	15 11	2.1
35	5 30	18 32	0 26	1 29	...	...	14 51	2.1
30	5 35	18 27	0 24	1 23	...	...	14 34	2.2
20	5 43	18 19	0 22	1 15	0 8	2.1	14 6	2.2
10	5 51	18 11	0 21	1 10	0 32	2.2	13 42	2.2
0	5 58	18 4	0 21	1 10	0 54	2.2	13 19	2.2
10	6 5	17 58	0 21	1 10	1 16	2.2	12 57	2.2
20	6 12	17 51	0 22	1 14	1 40	2.2	12 32	2.2
30	6 20	17 43	0 24	1 20	2 8	2.3	12 4	2.2
35	6 24	17 38	0 26	1 24	2 24	2.3	11 47	2.2
40	6 30	17 33	0 27	1 30	2 44	2.3	11 28	2.2
45	6 36	17 27	0 30	1 38	3 7	2.3	11 4	2.2
50	6 43	17 20	0 33	1 48	3 37	2.4	10 33	2.2
55	6 51	17 12	0 37	2 1	4 20	2.4	9 51	2.2
60	7 3	17 1	0 43	2 19	5 36	2.5	8 34	2.0

UT	MESEC				JUPITER				SATURN					
	S <sub>♃</sub>		Δ		S <sub>♃</sub>		δ <sub>♃</sub>		S <sub>♄</sub>		δ <sub>♄</sub>			
h	°	'	°	'	°	'	°	'	°	'	°	'		
0	257	8.7	92	27	48.3	33	139	30.4	-5	56.1	208	30.3	19	15.5
2	286	5.0	92	27	54.8	30	169	34.5	-5	56.5	238	34.7	19	15.3
4	315	1.3	91	28	.7	27	199	38.6	-5	56.9	268	39.0	19	15.2
6	343	57.6	91	28	6.1	24	229	42.6	-5	57.2	298	43.3	19	15.0
8	12	53.9	91	28	10.9	21	259	46.7	-5	57.6	328	47.6	19	14.9
10	41	50.1	91	28	15.1	18	289	50.8	-5	57.9	358	51.9	19	14.8
12	70	46.4	92	28	18.8	15	319	54.9	-5	58.3	28	56.2	19	14.6
14	99	42.8	92	28	21.8	12	349	58.9	-5	58.7	59	.6	19	14.5
16	128	39.1	92	28	24.3	10	20	3.0	-5	59.0	89	4.9	19	14.4
18	157	35.5	92	28	26.2	7	50	7.1	-5	59.4	119	9.2	19	14.2
20	186	32.0	93	28	27.6	4	80	11.2	-5	59.7	149	13.5	19	14.1
22	215	28.5	93	28	28.3	1	110	15.2	-6	.1	179	17.9	19	14.0
Δ							20		-2		22		-1	

SUNCE				MESEC			
UT	e = T <sub>p</sub> - UT	Δ/24	r	Prolaz	Δ/24	π <sub>☾</sub>	r
h	min	s	'	h min	min	'	'
00	- 1 19.3	.7	15.9	T <sub>m</sub>	7 7	2.2	55.1 15.0
12	- 1 10.4	T <sub>m☉</sub>	12 h 1.2 min	Starost	22.9 d	Faza	☉

PLANETE							
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Table with columns for UT, SUNCE, PROLEĆ. TAČKA, VENERA, and MARS. It lists astronomical data for the month of August 31st, 2005, including coordinates and magnitudes.

Table with columns for SUNCE, TRAJANJE SUMRAKA, and MESEC. It provides detailed data on sunrise, sunset, twilight, and moon phases for the month.

Table with columns for UT, MESEC, JUPITER, and SATURN. It lists astronomical data for the planet Jupiter and Saturn during the month.

Summary tables for SUNCE, MESEC, and PLANETE. Includes a table for planet parameters (Pl., Tm, pi, 360-alpha, Vel.) and a table for moon phases (Prolaz, Starost, Faza).

1. SEPTEMBAR

ČETVRTAK

Table with columns for UT, SUNCE, PROLEĆ. TAČKA, VENERA, and MARS. It lists astronomical data for the month of September 1st, 2005.

Table with columns for SUNCE, TRAJANJE SUMRAKA, and MESEC. It provides detailed data on sunrise, sunset, twilight, and moon phases for the month.

Table with columns for UT, MESEC, JUPITER, and SATURN. It lists astronomical data for the planet Jupiter and Saturn during the month.

Summary tables for SUNCE, MESEC, and PLANETE. Includes a table for planet parameters and a table for moon phases.

2. SEPTEMBAR

2005.

PETAK

UT	SUNCE		PROLEĆ. TAČKA S <sub>γ</sub>	VENERA		MARS	
	S <sub>☉</sub>	δ <sub>☉</sub>		S <sub>♀</sub>	δ <sub>♀</sub>	S <sub>♂</sub>	δ <sub>♂</sub>
h	° / ' / "	° / ' / "	° / ' / "	° / ' / "	° / ' / "	° / ' / "	° / ' / "
0	180 3.1 7 57.6		341 14.4	144 1.2 - 7 26.7	295 26.0 14 25.3		
2	210 3.5 7 55.8		11 19.3	174 .8 - 7 29.2	325 29.1 14 25.8		
4	240 3.9 7 53.9		41 24.2	204 .4 - 7 31.7	355 32.3 14 26.4		
6	270 4.3 7 52.1		71 29.1	233 60.0 - 7 34.2	25 35.4 14 26.9		
8	300 4.7 7 50.3		101 34.1	263 59.6 - 7 36.7	55 38.6 14 27.5		
10	330 5.1 7 48.5		131 39.0	293 59.1 - 7 39.2	85 41.7 14 28.0		
12	0 5.5 7 46.6		161 43.9	323 58.7 - 7 41.7	115 44.9 14 28.5		
14	30 5.9 7 44.8		191 48.9	353 58.3 - 7 44.2	145 48.0 14 29.1		
16	60 6.3 7 43.0		221 53.8	23 57.9 - 7 46.7	175 51.2 14 29.6		
18	90 6.7 7 41.1		251 58.7	53 57.4 - 7 49.2	205 54.4 14 30.1		
20	120 7.2 7 39.3		282 3.6	83 57.0 - 7 51.7	235 57.6 14 30.7		
22	150 7.6 7 37.5		312 8.6	113 56.6 - 7 54.2	266 .7 14 31.2		
Δ	2	-9		-2 -13	16	3	

φ	SUNCE		TRAJANJE SUMRAKA		MESEC			
	IZLAZ	ZALAZ	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 57	19 0	0 44	2 54	2 37	3.7	19 13	.0
55	5 8	18 50	0 38	2 19	3 5	3.2	18 53	.3
50	5 16	18 42	0 33	1 58	3 26	3.0	18 37	.6
45	5 23	18 35	0 30	1 45	3 42	2.7	18 25	.8
40	5 29	18 30	0 28	1 35	3 55	2.6	18 15	.9
35	5 33	18 25	0 26	1 28	4 6	2.4	18 6	1.0
30	5 37	18 21	0 24	1 22	4 16	2.3	17 58	1.2
20	5 45	18 14	0 22	1 15	4 32	2.1	17 44	1.4
10	5 51	18 8	0 21	1 11	4 47	1.9	17 32	1.6
0	5 56	18 3	0 21	1 9	4 60	1.8	17 21	1.7
10	6 2	17 58	0 21	1 10	5 13	1.6	17 9	1.9
20	6 8	17 52	0 22	1 13	5 28	1.4	16 57	2.1
30	6 14	17 46	0 24	1 20	5 44	1.2	16 43	2.3
35	6 18	17 42	0 25	1 24	5 53	1.1	16 34	2.4
40	6 22	17 38	0 27	1 30	6 4	1.0	16 25	2.6
45	6 27	17 33	0 30	1 38	6 16	.8	16 14	2.7
50	6 32	17 28	0 33	1 48	6 31	.6	15 60	2.9
55	6 39	17 21	0 37	2 1	6 50	.3	15 43	3.2
60	6 48	17 12	0 42	2 19	7 16	.0	15 19	3.6

UT	MESEC				JUPITER		SATURN	
	S <sub>♃</sub>	Δ	δ <sub>♃</sub>	Δ	S <sub>♃</sub>	δ <sub>♃</sub>	S <sub>♄</sub>	δ <sub>♄</sub>
h	° / ' / "	° / ' / "	° / ' / "	° / ' / "	° / ' / "	° / ' / "	° / ' / "	° / ' / "
0	197 18.6 145	18 44.6	-111	143 34.2 - 6 18.0	212 50.0 19 7.4			
2	226 25.5 146	18 22.4	-113	173 38.2 - 6 18.4	242 54.3 19 7.2			
4	255 32.7 147	17 59.9	-114	203 42.3 - 6 18.8	272 58.6 19 7.1			
6	284 40.1 148	17 37.1	-115	233 46.3 - 6 19.2	303 3.0 19 7.0			
8	313 47.8 149	17 14.0	-117	263 50.4 - 6 19.5	333 7.3 19 6.8			
10	342 55.6 150	16 50.6	-118	293 54.4 - 6 19.9	3 11.6 19 6.7			
12	12 3.7 151	16 27.0	-120	323 58.5 - 6 20.3	33 16.0 19 6.6			
14	41 11.9 152	16 3.1	-121	354 2.5 - 6 20.6	63 20.3 19 6.4			
16	70 20.4 153	15 38.9	-122	24 6.6 - 6 21.0	93 24.7 19 6.3			
18	99 29.1 154	15 14.4	-123	54 10.6 - 6 21.4	123 29.0 19 6.2			
20	128 37.9 155	14 49.8	-125	84 14.7 - 6 21.8	153 33.3 19 6.0			
22	157 46.9 156	14 24.8	-126	114 18.7 - 6 22.1	183 37.7 19 5.9			
Δ				20 -2	22	-1		

SUNCE				MESEC			
UT	e = T <sub>p</sub> - UT	Δ/24	r	Prolaz	Δ/24	π <sub>☾</sub>	r
h	min s	s	'	h min	min	'	'
00	0 12.7	.8	15.9	T <sub>m</sub> 11 10	1.7	54.0	14.7
12	0 22.4	T <sub>m☉</sub> 11 h 59.6 min	Starost 27.9 d	Faza ●			

PLANETE									
Pl.	T <sub>m</sub>	π	360-α	Vel.	Pl.	T <sub>m</sub>	π	360-α	Vel.
♀	h min	'	°		♃	h min	'	°	
♂	14 24	.1	163	-3.9	♄	14 24	.0	162	-1.6
♂	4 18	.2	314	-1.0	♅	9 47	.0	232	.4

3. SEPTEMBAR

SUBOTA

UT	SUNCE		PROLEĆ. TAČKA S <sub>γ</sub>	VENERA		MARS	
	S <sub>☉</sub>	δ <sub>☉</sub>		S <sub>♀</sub>	δ <sub>♀</sub>	S <sub>♂</sub>	δ <sub>♂</sub>
h	° / ' / "	° / ' / "	° / ' / "	° / ' / "	° / ' / "	° / ' / "	° / ' / "
0	180 8.0 7 35.6		342 13.5	143 56.2 - 7 56.7	296 3.9 14 31.7		
2	210 8.4 7 33.8		12 18.4	173 55.7 - 7 59.2	326 7.1 14 32.2		
4	240 8.8 7 32.0		42 23.4	203 55.3 - 8 1.7	356 10.3 14 32.8		
6	270 9.2 7 30.1		72 28.3	233 54.9 - 8 4.2	26 13.5 14 33.3		
8	300 9.6 7 28.3		102 33.2	263 54.5 - 8 6.7	56 16.7 14 33.8		
10	330 10.0 7 26.5		132 38.1	293 54.0 - 8 9.1	86 19.9 14 34.3		
12	0 10.4 7 24.6		162 43.1	323 53.6 - 8 11.6	116 23.1 14 34.9		
14	30 10.8 7 22.8		192 48.0	353 53.2 - 8 14.1	146 26.3 14 35.4		
16	60 11.2 7 20.9		222 52.9	23 52.7 - 8 16.6	176 29.5 14 35.9		
18	90 11.6 7 19.1		252 57.9	53 52.3 - 8 19.1	206 32.7 14 36.4		
20	120 12.0 7 17.3		283 2.8	83 51.9 - 8 21.6	236 36.0 14 36.9		
22	150 12.4 7 15.4		313 7.7	113 51.4 - 8 24.1	266 39.2 14 37.5		
Δ	2	-9		-2 -12	16	3	

φ	SUNCE		TRAJANJE SUMRAKA		MESEC			
	IZLAZ	ZALAZ	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 60	18 57	0 44	2 52	4 5	3.5	19 13	.0
55	5 10	18 47	0 38	2 18	4 23	3.2	19 0	.3
50	5 18	18 40	0 33	1 58	4 37	2.9	18 51	.5
45	5 24	18 34	0 30	1 44	4 48	2.7	18 43	.7
40	5 30	18 28	0 28	1 35	4 57	2.5	18 37	.8
35	5 34	18 24	0 26	1 27	5 4	2.4	18 31	1.0
30	5 38	18 20	0 24	1 22	5 11	2.3	18 26	1.1
20	5 45	18 14	0 22	1 15	5 23	2.1	18 17	1.3
10	5 51	18 8	0 21	1 11	5 33	1.9	18 9	1.5
0	5 56	18 3	0 21	1 9	5 42	1.7	18 2	1.7
10	6 1	17 57	0 21	1 10	5 52	1.5	17 55	1.9
20	6 7	17 52	0 22	1 13	6 2	1.3	17 47	2.0
30	6 13	17 46	0 24	1 20	6 13	1.1	17 37	2.3
35	6 16	17 43	0 25	1 24	6 20	1.0	17 32	2.4
40	6 20	17 39	0 27	1 30	6 27	.9	17 26	2.5
45	6 25	17 34	0 29	1 38	6 36	.7	17 19	2.7
50	6 30	17 29	0 32	1 48	6 46	.5	17 10	2.9
55	6 37	17 23	0 36	2 1	6 59	.3	16 60	3.2
60	6 45	17 15	0 42	2 19	7 15	.0	16 46	3.5

UT	MESEC				JUPITER		SATURN	
	S <sub>♃</sub>	Δ	δ <sub>♃</sub>	Δ	S <sub>♃</sub>	δ <sub>♃</sub>	S <sub>♄</sub>	δ <sub>♄</sub>
h	° / ' / "	° / ' / "	° / ' / "	° / ' / "	° / ' / "	° / ' / "	° / ' / "	° / ' / "
0	186 56.1 157	13 59.7	-127	144 22.8 - 6 22.5	213 42.0 19 5.8			
2	216 5.5 158	13 34.3	-128	174 26.8 - 6 22.9	243 46.3 19 5.6			
4	245 15.0 158	13 8.7	-129	204 30.8 - 6 23.2	273 50.7 19 5.5			
6	274 24.7 159	12 42.9	-130	234 34.9 - 6 23.6	303 55.0 19 5.4			
8	303 34.5 160	12 16.8	-131	264 38.9 - 6 24.0	333 59.4 19 5.2			
10	332 44.5 161	11 50.6	-132	294 43.0 - 6 24.3	4 3.7 19 5.1			
12	1 54.6 161	11 24.2	-133	324 47.0 - 6 24.7	34 8.1 19 5.0			
14	31 4.9 162	10 57.5	-134	354 51.1 - 6 25.1	64 12.4 19 4.8			
16	60 15.3 163	10 30.7	-135	24 55.1 - 6 25.5	94 16.7 19 4.7			
18	89 25.8 163	10 3.8	-136	54 59.1 - 6 25.8	124 21.1 19 4.6			
20	118 36.4 164	9 36.6	-137	85 3.2 - 6 26.2	154 25.4 19 4.4			
22	147 47.1 164	9 9.3	-137	115 7.2 - 6 26.6	184 29.8 19 4.3			
Δ				20 -2	22	-1		

SUNCE				MESEC			
UT	e = T <sub>p</sub> - UT	Δ/24	r	Prolaz	Δ/24	π <sub>☾</sub>	r
h	min s	s	'	h min	min	'	'
00	0 32.0	.8	15.9	T <sub>m</sub> 11 52	1.7	54.2	14.8
12	0 41.8	T <sub>m☉</sub> 11 h 59.3 min	Starost 28.9 d	Faza ●			

PLANETE									
Pl.	T <sub>m</sub>	π	360-α	Vel.	Pl.	T <sub>m</sub>	π	360-α	Vel.
♀	h min	'	°		♃	h min	'	°	
♂	14 24	.1	162	-3.9	♄	14 21	.0	162	-1.6
♂	4 15	.2	314	-1.1	♅	9 44	.0	231	.4







8. SEPTEMBAR

2005.

ČETVRTAK

Table with columns: UT, SUNCE (S\_sun, delta\_sun), PROLEĆ. TAČKA (S\_gamma), VENERA (S\_venus, delta\_venus), MARS (S\_mars, delta\_mars). Rows show time intervals from 0 to 22 hours.

Table with columns: SUNCE (IZLAZ, ZALAZ), TRAJANJE SUMRAKA (GRAĐ., ASTR.), MESEC (IZLAZ, delta/24, ZALAZ, delta/24). Rows show time intervals from 60 to 6:30.

Table with columns: UT, MESEC (S\_zeta, delta\_zeta, delta), JUPITER (S\_jup, delta\_jup), SATURN (S\_sat, delta\_sat). Rows show time intervals from 0 to 22 hours.

Summary table for SUNCE, MESEC, and PLANETE with various astronomical parameters like Tm, pi, 360-alpha, Vel., etc.

9. SEPTEMBAR

PETAK

Table with columns: UT, SUNCE (S\_sun, delta\_sun), PROLEĆ. TAČKA (S\_gamma), VENERA (S\_venus, delta\_venus), MARS (S\_mars, delta\_mars). Rows show time intervals from 0 to 22 hours.

Table with columns: SUNCE (IZLAZ, ZALAZ), TRAJANJE SUMRAKA (GRAĐ., ASTR.), MESEC (IZLAZ, delta/24, ZALAZ, delta/24). Rows show time intervals from 60 to 6:27.

Table with columns: UT, MESEC (S\_zeta, delta\_zeta, delta), JUPITER (S\_jup, delta\_jup), SATURN (S\_sat, delta\_sat). Rows show time intervals from 0 to 22 hours.

Summary table for SUNCE, MESEC, and PLANETE with various astronomical parameters like Tm, pi, 360-alpha, Vel., etc.

Table with columns for UT, SUNCE, PROLEĆ. TAČKA, VENERA, and MARS, containing astronomical data for September 10, 2005.

Table with columns for SUNCE, TRAJANJE SUMRAKA, and MESEC, containing astronomical data for September 10, 2005.

Table with columns for UT, MESEC, JUPITER, and SATURN, containing astronomical data for September 10, 2005.

Table with columns for SUNCE, MESEC, and PLANETE, containing astronomical data for September 10, 2005.

Table with columns for UT, SUNCE, PROLEĆ. TAČKA, VENERA, and MARS, containing astronomical data for September 11, 2005.

Table with columns for SUNCE, TRAJANJE SUMRAKA, and MESEC, containing astronomical data for September 11, 2005.

Table with columns for UT, MESEC, JUPITER, and SATURN, containing astronomical data for September 11, 2005.

Table with columns for SUNCE, MESEC, and PLANETE, containing astronomical data for September 11, 2005.













Table with 4 main columns: SUNCE, PROLEĆ. TAČKA, VENERA, MARS. Each sub-column lists astronomical data like S\_0, delta\_0, S\_p, delta\_p, S\_mars, delta\_mars over hours (h) from 0 to 22.

Table with 4 main columns: SUNCE, TRAJANJE SUMRAKA, MESEC. Sub-columns include izlaz, zalaz, grad, astr., izlaz, delta/24, zalaz, delta/24 over time (phi) from 60 to 0.

Table with 3 main columns: MESEC, JUPITER, SATURN. Sub-columns include S\_m, delta\_m, S\_j, delta\_j, S\_s, delta\_s over hours (h) from 0 to 22.

Summary table for SUNCE, MESEC, and PLANETE. Includes parameters like e=Tp-UT, Prolaz, Tm, pi, 360-alpha, Vel., and data for planets (phi, Tm, pi, 360-alpha, Vel.).

Table with 4 main columns: SUNCE, PROLEĆ. TAČKA, VENERA, MARS. Similar to the 22nd table, listing astronomical data for September 23rd.

Table with 4 main columns: SUNCE, TRAJANJE SUMRAKA, MESEC. Similar to the 22nd table, listing astronomical data for September 23rd.

Table with 3 main columns: MESEC, JUPITER, SATURN. Similar to the 22nd table, listing astronomical data for September 23rd.

Summary table for SUNCE, MESEC, and PLANETE. Similar to the 22nd table, providing summary parameters for September 23rd.



UT	SUNCE		PROLEĆ. TAČKA S <sub>γ</sub>	VENERA		MARS	
	S <sub>☉</sub>	δ <sub>☉</sub>		S <sub>♀</sub>	δ <sub>♀</sub>	S <sub>♂</sub>	δ <sub>♂</sub>
h	°	'	°	°	'	°	'
0	182	8.3	-	1	11.7	4	53.7
2	212	8.7	-	1	13.6	34	58.6
4	242	9.1	-	1	15.6	65	3.5
6	272	9.6	-	1	17.5	95	8.5
8	302	10.0	-	1	19.5	125	13.4
10	332	10.4	-	1	21.4	155	18.3
12	2	10.8	-	1	23.4	185	23.3
14	32	11.3	-	1	25.3	215	28.2
16	62	11.7	-	1	27.3	245	33.1
18	92	12.1	-	1	29.2	275	38.0
20	122	12.5	-	1	31.2	305	43.0
22	152	13.0	-	1	33.1	335	47.9
Δ	2	-10			-4	-10	

φ	SUNCE		TRAJANJE SUMRAKA		MESEC			
	IZLAZ	ZALAZ	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	17 48	0 41	2 23	21 10	3.9	17 15	.3
55	5 53	17 49	0 36	2 3	22 13	3.2	16 13	1.0
50	5 52	17 49	0 32	1 49	22 51	2.9	15 34	1.3
45	5 52	17 50	0 29	1 38	23 19	2.7	15 6	1.5
40	5 51	17 51	0 27	1 30	23 40	2.6	14 43	1.6
35	5 51	17 51	0 25	1 24	23 58	2.5	14 25	1.7
30	5 50	17 52	0 24	1 19	...	.0	14 9	1.8
20	5 50	17 53	0 22	1 13	...	.0	13 42	1.9
10	5 49	17 54	0 21	1 10	0 10	2.2	13 19	2.0
0	5 48	17 55	0 21	1 9	0 32	2.1	12 57	2.1
10	5 47	17 56	0 21	1 10	0 55	2.1	12 35	2.2
20	5 46	17 57	0 22	1 13	1 19	2.0	12 12	2.3
30	5 45	17 58	0 24	1 20	1 47	1.9	11 44	2.4
35	5 44	17 59	0 25	1 25	2 3	1.8	11 28	2.5
40	5 43	18 1	0 27	1 31	2 23	1.7	11 9	2.5
45	5 41	18 2	0 29	1 40	2 46	1.6	10 46	2.7
50	5 40	18 3	0 32	1 51	3 16	1.5	10 16	2.8
55	5 38	18 6	0 36	2 7	3 58	1.2	9 35	3.1
60	5 36	18 8	0 42	2 30	5 12	.5	8 22	3.8

UT	MESEC				JUPITER		SATURN	
	S <sub>♃</sub>	Δ	δ <sub>♃</sub>	Δ	S <sub>♃</sub>	δ <sub>♃</sub>	S <sub>♄</sub>	δ <sub>♄</sub>
h	°	'	°	'	°	'	°	'
0	262	22.8	95	28	13.9	-26	162	44.2
2	291	19.9	96	28	8.7	-29	192	48.2
4	320	17.1	97	28	2.9	-32	222	52.1
6	349	14.6	99	27	56.6	-34	252	56.1
8	18	12.3	100	27	49.7	-37	283	.0
10	47	10.2	101	27	42.4	-40	313	4.0
12	76	8.4	102	27	34.4	-42	343	7.9
14	105	6.8	103	27	26.0	-45	373	11.9
16	134	5.4	104	27	17.0	-47	403	15.8
18	163	4.2	105	27	7.6	-50	433	19.7
20	192	3.3	107	26	57.6	-52	463	23.7
22	221	2.7	108	26	47.1	-55	493	27.6
Δ							20	-2

SUNCE				MESEC			
UT	e = T <sub>p</sub> - UT	Δ/24	r	Prolaz	Δ/24	π <sub>☾</sub>	r
h	min	s	s	h min	min	'	'
00	8 33.3	.9	16.0	T <sub>m</sub>	6 45	2.1	54.6
12	8 43.6	T <sub>m☉</sub>	11 h 51.3 min	Starost	22.2 d	Faza	☉

PLANETE									
Pl.	T <sub>m</sub>	π	360-α	Vel.	Pl.	T <sub>m</sub>	π	360-α	Vel.
h min	'	°	°	°	h min	'	°	°	°
♀	14 35	.2	137	-4.0	♃	13 7	.0	158	-1.5
♁	3 5	.3	309	-1.6	♄	8 23	.0	229	.3

UT	SUNCE		PROLEĆ. TAČKA S <sub>γ</sub>	VENERA		MARS	
	S <sub>☉</sub>	δ <sub>☉</sub>		S <sub>♀</sub>	δ <sub>♀</sub>	S <sub>♂</sub>	δ <sub>♂</sub>
h	°	'	°	°	'	°	'
0	182	13.4	-	1	35.0	5	52.8
2	212	13.8	-	1	37.0	35	57.8
4	242	14.2	-	1	38.9	66	2.7
6	272	14.7	-	1	40.9	96	7.6
8	302	15.1	-	1	42.8	126	12.5
10	332	15.5	-	1	44.8	156	17.5
12	2	15.9	-	1	46.7	186	22.4
14	32	16.4	-	1	48.7	216	27.3
16	62	16.8	-	1	50.6	246	32.3
18	92	17.2	-	1	52.6	276	37.2
20	122	17.6	-	1	54.5	306	42.1
22	152	18.0	-	1	56.5	336	47.0
Δ	2	-10			-4	-10	

φ	SUNCE		TRAJANJE SUMRAKA		MESEC			
	IZLAZ	ZALAZ	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 56	17 45	0 41	2 23	22 43	3.8	17 24	.1
55	5 55	17 46	0 36	2 3	23 30	3.3	16 37	.6
50	5 54	17 47	0 32	1 48	...	.0	16 5	.9
45	5 53	17 48	0 29	1 38	...	.0	15 41	1.1
40	5 52	17 49	0 27	1 30	...	.0	15 21	1.3
35	5 52	17 50	0 25	1 24	...	.0	15 5	1.4
30	5 51	17 50	0 24	1 19	0 14	2.4	14 51	1.5
20	5 50	17 52	0 22	1 13	0 40	2.2	14 27	1.7
10	5 49	17 53	0 21	1 10	1 2	2.1	14 6	1.8
0	5 48	17 54	0 21	1 9	1 23	2.0	13 47	2.0
10	5 46	17 56	0 21	1 10	1 44	1.9	13 27	2.1
20	5 45	17 57	0 22	1 13	2 6	1.8	13 6	2.2
30	5 43	17 59	0 24	1 20	2 32	1.6	12 41	2.4
35	5 42	18 0	0 25	1 25	2 47	1.5	12 27	2.5
40	5 41	18 2	0 27	1 32	3 5	1.4	12 10	2.6
45	5 40	18 3	0 29	1 40	3 26	1.3	11 49	2.8
50	5 38	18 5	0 32	1 51	3 52	1.1	11 24	3.0
55	5 36	18 7	0 36	2 7	4 28	.8	10 49	3.3
60	5 33	18 11	0 42	2 31	5 24	.2	9 54	3.9

UT	MESEC				JUPITER		SATURN	
	S <sub>♃</sub>	Δ	δ <sub>♃</sub>	Δ	S <sub>♃</sub>	δ <sub>♃</sub>	S <sub>♄</sub>	δ <sub>♄</sub>
h	°	'	°	'	°	'	°	'
0	250	2.3	109	26	36.2	-57	163	31.6
2	279	2.1	111	26	24.7	-60	193	35.5
4	308	2.2	112	26	12.8	-62	223	39.5
6	337	2.6	113	26	.4	-64	253	43.4
8	6	3.2	115	25	47.5	-67	283	47.3
10	35	4.2	116	25	34.2	-69	313	51.3
12	64	5.3	117	25	20.4	-71	343	55.2
14	93	6.8	119	25	6.1	-73	373	59.2
16	122	8.5	120	24	51.4	-76	403	63.3
18	151	10.5	121	24	36.3	-78	433	67.4
20	180	12.8	123	24	20.8	-80	463	71.5
22	209	15.3	124	24	4.8	-82	493	75.6
Δ							20	-2

SUNCE				MESEC			
UT	e = T <sub>p</sub> - UT	Δ/24	r	Prolaz	Δ/24	π <sub>☾</sub>	r
h	min	s	s	h min	min	'	'
00	8 53.8	.8	16.0	T <sub>m</sub>	7 35	2.0	54.3
12	9 3.9	T <sub>m☉</sub>	11 h 50.9 min	Starost	23.2 d	Faza	☉

PLANETE									
Pl.	T <sub>m</sub>	π	360-α	Vel.	Pl.	T <sub>m</sub>	π	360-α	Vel.
h min	'	°	°	°	h min	'	°	°	°
♀	14 35	.2	135	-4.0	♃	13 4	.0	158	-1.5
♁	3 2	.3	309	-1.6	♄	8 20	.0	229	.3

Table with columns: UT, SUNCE (S\_sun, delta\_sun), PROLEĆ. TAČKA (S\_gamma), VENERA (S\_venus, delta\_venus), MARS (S\_mars, delta\_mars). Rows include times from 0 to 22 and summary rows for delta.

Table with columns: SUNCE (IZLAZ, ZALAZ), TRAJANJE SUMRAKA (GRAD., ASTR.), MESEC (IZLAZ, delta/24, ZALAZ, delta/24). Rows include times from 0 to 30 and summary row for S.

Table with columns: UT, MESEC (S\_omega, delta\_omega, delta), JUPITER (S\_jup, delta\_jup), SATURN (S\_sat, delta\_sat). Rows include times from 0 to 22 and summary rows for delta.

Summary tables for SUNCE, MESEC, and PLANETE. Includes tables for SUNE, MESEC, and PLANETE with various parameters like T\_m, pi, 360-alpha, Vel., and phi.

Table with columns: UT, SUNCE (S\_sun, delta\_sun), PROLEĆ. TAČKA (S\_gamma), VENERA (S\_venus, delta\_venus), MARS (S\_mars, delta\_mars). Rows include times from 0 to 22 and summary rows for delta.

Table with columns: SUNCE (IZLAZ, ZALAZ), TRAJANJE SUMRAKA (GRAD., ASTR.), MESEC (IZLAZ, delta/24, ZALAZ, delta/24). Rows include times from 0 to 30 and summary row for S.

Table with columns: UT, MESEC (S\_omega, delta\_omega, delta), JUPITER (S\_jup, delta\_jup), SATURN (S\_sat, delta\_sat). Rows include times from 0 to 22 and summary rows for delta.

Summary tables for SUNCE, MESEC, and PLANETE. Includes tables for SUNE, MESEC, and PLANETE with various parameters like T\_m, pi, 360-alpha, Vel., and phi.





Table with 5 columns: UT, SUNCE, PROLEĆ. TAČKA, VENERA, MARS. Rows show astronomical data for the 24 hours of October 4, 2005.

Table with 12 columns: SUNCE, TRAJANJE SUMRAKA, MESEC. Rows show sunrise/sunset times, twilight durations, and moon phases for October 4, 2005.

Table with 7 columns: UT, MESEC, JUPITER, SATURN. Rows show moon phases and positions of Jupiter and Saturn for October 4, 2005.

Summary tables for SUNCE, MESEC, and PLANETE, including orbital parameters and planetary positions.

Table with 5 columns: UT, SUNCE, PROLEĆ. TAČKA, VENERA, MARS. Rows show astronomical data for the 24 hours of October 5, 2005.

Table with 12 columns: SUNCE, TRAJANJE SUMRAKA, MESEC. Rows show sunrise/sunset times, twilight durations, and moon phases for October 5, 2005.

Table with 7 columns: UT, MESEC, JUPITER, SATURN. Rows show moon phases and positions of Jupiter and Saturn for October 5, 2005.

Summary tables for SUNCE, MESEC, and PLANETE, including orbital parameters and planetary positions.















Table with columns: UT, SUNCE (S\_sun, delta\_sun), PROLEĆ. TAČKA (S\_gamma), VENERA (S\_venus, delta\_venus), MARS (S\_mars, delta\_mars). Rows 0-22 and Delta.

Table with columns: SUNCE (IZLAZ, ZALAZ), TRAJANJE SUMRAKA (GRAĐ, ASTR.), MESEC (IZLAZ, delta/24, ZALAZ, delta/24). Rows 0-60 and S.

Table with columns: MESEC (S\_zeta, delta\_zeta, delta), JUPITER (S\_jupiter, delta\_jupiter), SATURN (S\_saturn, delta\_saturn). Rows 0-22 and Delta.

Summary tables for SUNCE, MESEC, and PLANETE with various astronomical parameters like T\_m, pi, 360-alpha, Vel.

Table with columns: UT, SUNCE (S\_sun, delta\_sun), PROLEĆ. TAČKA (S\_gamma), VENERA (S\_venus, delta\_venus), MARS (S\_mars, delta\_mars). Rows 0-22 and Delta.

Table with columns: SUNCE (IZLAZ, ZALAZ), TRAJANJE SUMRAKA (GRAĐ, ASTR.), MESEC (IZLAZ, delta/24, ZALAZ, delta/24). Rows 0-60 and S.

Table with columns: MESEC (S\_zeta, delta\_zeta, delta), JUPITER (S\_jupiter, delta\_jupiter), SATURN (S\_saturn, delta\_saturn). Rows 0-22 and Delta.

Summary tables for SUNCE, MESEC, and PLANETE with various astronomical parameters like T\_m, pi, 360-alpha, Vel.

Table with columns: UT, SUNCE (S\_sun, delta\_sun), PROLEĆ. TAČKA (S\_gamma), VENERA (S\_ven, delta\_ven), MARS (S\_mar, delta\_mar). Rows from 0 to 22.

Table with columns: SUNCE (IZLAZ, ZALAZ), TRAJANJE SUMRAKA (GRAĐ, ASTR.), MESEC (IZLAZ, delta/24, ZALAZ, delta/24). Rows from 0 to 60.

Table with columns: MESEC (S\_cet, delta\_cet, delta), JUPITER (S\_jup, delta\_jup), SATURN (S\_sat, delta\_sat). Rows from 0 to 22.

Summary table with columns: SUNCE, MESEC, PLANETE. Includes parameters like e=T\_p-UT, delta/24, r, Prolaz, delta/24, pi\_cet, r, and planetary data for Jupiter and Saturn.

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Table with columns: UT, SUNCE (S\_sun, delta\_sun), PROLEĆ. TAČKA (S\_gamma), VENERA (S\_ven, delta\_ven), MARS (S\_mar, delta\_mar). Rows from 0 to 22.

Table with columns: SUNCE (IZLAZ, ZALAZ), TRAJANJE SUMRAKA (GRAĐ, ASTR.), MESEC (IZLAZ, delta/24, ZALAZ, delta/24). Rows from 0 to 60.

Table with columns: MESEC (S\_cet, delta\_cet, delta), JUPITER (S\_jup, delta\_jup), SATURN (S\_sat, delta\_sat). Rows from 0 to 22.

Summary table with columns: SUNCE, MESEC, PLANETE. Includes parameters like e=T\_p-UT, delta/24, r, Prolaz, delta/24, pi\_cet, r, and planetary data for Jupiter and Saturn.

Table with columns for UT, SUNCE (S\_sun, delta\_sun), PROLEC. TACKA (S\_tau), VENERA (S\_venus, delta\_venus), and MARS (S\_mars, delta\_mars). Rows show data for hours 0 through 22.

Table with columns for SUNCE (IZLAZ, ZALAZ), TRAJANJE SUMRAKA (GRAD, ASTR.), and MESEC (IZLAZ, DELTA/24, ZALAZ, DELTA/24). Rows show data for hours 0 through 22 and a summary row S.

Table with columns for UT, MESEC (S\_mec, delta\_mec, delta), JUPITER (S\_jup, delta\_jup), and SATURN (S\_sat, delta\_sat). Rows show data for hours 0 through 22 and a summary row Delta.

Summary tables for SUNCE and MESEC (including UT, e=TP-UT, Prolaz, Starost), PLANETE (with Pl., Tm, pi, 360-alpha, Vel., and zodiac signs).

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Table with columns for UT, SUNCE (S\_sun, delta\_sun), PROLEC. TACKA (S\_tau), VENERA (S\_venus, delta\_venus), and MARS (S\_mars, delta\_mars). Rows show data for hours 0 through 22 and a summary row Delta.

Table with columns for SUNCE (IZLAZ, ZALAZ), TRAJANJE SUMRAKA (GRAD, ASTR.), and MESEC (IZLAZ, DELTA/24, ZALAZ, DELTA/24). Rows show data for hours 0 through 22 and a summary row S.

Table with columns for UT, MESEC (S\_mec, delta\_mec, delta), JUPITER (S\_jup, delta\_jup), and SATURN (S\_sat, delta\_sat). Rows show data for hours 0 through 22 and a summary row Delta.

Summary tables for SUNCE and MESEC (including UT, e=TP-UT, Prolaz, Starost), PLANETE (with Pl., Tm, pi, 360-alpha, Vel., and zodiac signs).







Table with columns: UT, SUNCE (S\_sun, delta\_sun), PROLEĆ. TAČKA (S\_gamma), VENERA (S\_ven, delta\_ven), MARS (S\_mar, delta\_mar). Rows for hours 0 to 22 and a delta row.

Table with columns: UT, MESEC (S\_mec, delta\_mec, delta), JUPITER (S\_jup, delta\_jup), SATURN (S\_sat, delta\_sat). Rows for hours 0 to 22 and a delta row.

Table with columns: phi, SUNCE (IZLAZ, ZALAZ, GRAĐ., ASTR.), TRAJANJE SUMRAKA, MESEC (IZLAZ, delta/24, ZALAZ, delta/24). Rows for hours 60 to 60 and a delta row.

Summary table with columns: SUNCE (UT, e=TP-UT, delta/24, r), MESEC (Prolaz, delta/24, pi\_c, r), PLANETE (Pl., T\_m, pi, 360-alpha, Vel., h min, /, o, /, /, /). Includes data for Sun, Moon, and planets.

Table with columns: UT, SUNCE (S\_sun, delta\_sun), PROLEĆ. TAČKA (S\_gamma), VENERA (S\_ven, delta\_ven), MARS (S\_mar, delta\_mar). Rows for hours 0 to 22 and a delta row.

Table with columns: UT, MESEC (S\_mec, delta\_mec, delta), JUPITER (S\_jup, delta\_jup), SATURN (S\_sat, delta\_sat). Rows for hours 0 to 22 and a delta row.

Table with columns: phi, SUNCE (IZLAZ, ZALAZ, GRAĐ., ASTR.), TRAJANJE SUMRAKA, MESEC (IZLAZ, delta/24, ZALAZ, delta/24). Rows for hours 60 to 60 and a delta row.

Summary table with columns: SUNCE (UT, e=TP-UT, delta/24, r), MESEC (Prolaz, delta/24, pi\_c, r), PLANETE (Pl., T\_m, pi, 360-alpha, Vel., h min, /, o, /, /, /). Includes data for Sun, Moon, and planets.



















Table with columns for UT, SUNCE, PROLEĆ. TAČKA, VENERA, and MARS. Rows show celestial coordinates for various times of the day.

Table with columns for UT, MESEC, JUPITER, and SATURN. Rows show celestial coordinates for various times of the day.

Table with columns for SUNCE, TRAJANJE SUMRAKA, and MESEC. Rows show sunset times and twilight durations.

Summary table for SUNCE (Sun) and MESEC (Moon) including parameters like e=TP-UT, Δ/24, r, Prolaz, Δ/24, πζ, r. Also includes a PLANETE section with parameters for Mars (♂) and Venus (♀).

Table with columns for UT, SUNCE, PROLEĆ. TAČKA, VENERA, and MARS. Rows show celestial coordinates for various times of the day.

Table with columns for UT, MESEC, JUPITER, and SATURN. Rows show celestial coordinates for various times of the day.

Table with columns for SUNCE, TRAJANJE SUMRAKA, and MESEC. Rows show sunset times and twilight durations.

Summary table for SUNCE (Sun) and MESEC (Moon) including parameters like e=TP-UT, Δ/24, r, Prolaz, Δ/24, πζ, r. Also includes a PLANETE section with parameters for Mars (♂) and Venus (♀).

Table with columns: UT, SUNCE (S\_sun, delta\_sun), PROLEĆ. TAČKA (S\_T), VENERA (S\_v, delta\_v), MARS (S\_m, delta\_m). Rows from 0 to 22h and a summary row with delta values.

Table with columns: UT, MESEC (S\_m, delta\_m, delta), JUPITER (S\_j, delta\_j), SATURN (S\_s, delta\_s). Rows from 0 to 22h and a summary row with delta values.

Table with columns: SUNCE (IZLAZ, ZALAZ, GRAĐ, ASTR.), TRAJANJE SUMRAKA, MESEC (IZLAZ, delta/24, ZALAZ, delta/24). Rows from 60 to 30 minutes and a summary row with S.

Tables for SUNCE (UT, e = T\_p - UT, delta/24, r), MESEC (Prolaz, delta/24, pi\_c, r), PLANETE (Pl., T\_m, pi, 360-alpha, Vel., etc.) with summary rows for planetary data.

Table with columns: UT, SUNCE (S\_sun, delta\_sun), PROLEĆ. TAČKA (S\_T), VENERA (S\_v, delta\_v), MARS (S\_m, delta\_m). Rows from 0 to 22h and a summary row with delta values.

Table with columns: UT, MESEC (S\_m, delta\_m, delta), JUPITER (S\_j, delta\_j), SATURN (S\_s, delta\_s). Rows from 0 to 22h and a summary row with delta values.

Table with columns: SUNCE (IZLAZ, ZALAZ, GRAĐ, ASTR.), TRAJANJE SUMRAKA, MESEC (IZLAZ, delta/24, ZALAZ, delta/24). Rows from 60 to 30 minutes and a summary row with S.

Tables for SUNCE (UT, e = T\_p - UT, delta/24, r), MESEC (Prolaz, delta/24, pi\_c, r), PLANETE (Pl., T\_m, pi, 360-alpha, Vel., etc.) with summary rows for planetary data.













Table with columns for UT, SUNCE, PROLEĆ. TAČKA, VENERA, MARS. Rows show astronomical data from 0h to 22h.

Table with columns for SUNCE, TRAJANJE SUMRAKA, MESEC. Rows show astronomical data from 60h to 6h.

Table with columns for UT, MESEC, JUPITER, SATURN. Rows show astronomical data from 0h to 22h.

Table with columns for SUNCE, MESEC, PLANETE. Includes summary data for sun, moon, and planets.

Table with columns for UT, SUNCE, PROLEĆ. TAČKA, VENERA, MARS. Rows show astronomical data from 0h to 22h.

Table with columns for SUNCE, TRAJANJE SUMRAKA, MESEC. Rows show astronomical data from 60h to 6h.

Table with columns for UT, MESEC, JUPITER, SATURN. Rows show astronomical data from 0h to 22h.

Table with columns for SUNCE, MESEC, PLANETE. Includes summary data for sun, moon, and planets.

Table with columns: UT, SUNCE (S\_sun, delta\_sun), PROLEĆ. TAČKA (S\_gamma), VENERA (S\_venus, delta\_venus), MARS (S\_mars, delta\_mars). Rows 0-22.

Table with columns: SUNCE (IZLAZ, ZALAZ), TRAJANJE SUMRAKA (GRAĐ., ASTR.), MESEC (IZLAZ, delta/24, ZALAZ, delta/24). Rows 0-60.

Table with columns: MESEC (S\_zeta, delta\_zeta, delta), JUPITER (S\_jupiter, delta\_jupiter), SATURN (S\_saturn, delta\_saturn). Rows 0-22.

Table with columns: SUNCE (e = Tp - UT, delta/24, r), MESEC (Prolaz, delta/24, pi\_zeta, r), PLANETE (Pl., T\_m, pi, 360-alpha, Vel., Pl., T\_m, pi, 360-alpha, Vel.).

Table with columns: UT, SUNCE (S\_sun, delta\_sun), PROLEĆ. TAČKA (S\_gamma), VENERA (S\_venus, delta\_venus), MARS (S\_mars, delta\_mars). Rows 0-22.

Table with columns: SUNCE (IZLAZ, ZALAZ), TRAJANJE SUMRAKA (GRAĐ., ASTR.), MESEC (IZLAZ, delta/24, ZALAZ, delta/24). Rows 0-60.

Table with columns: MESEC (S\_zeta, delta\_zeta, delta), JUPITER (S\_jupiter, delta\_jupiter), SATURN (S\_saturn, delta\_saturn). Rows 0-22.

Table with columns: SUNCE (e = Tp - UT, delta/24, r), MESEC (Prolaz, delta/24, pi\_zeta, r), PLANETE (Pl., T\_m, pi, 360-alpha, Vel., Pl., T\_m, pi, 360-alpha, Vel.).











Table with columns: UT, SUNCE (S\_sun, delta\_sun), PROLEC. TACKA (S\_gamma), VENERA (S\_venus, delta\_venus), MARS (S\_mars, delta\_mars). Rows show astronomical data for the week.

Table with columns: SUNCE (IZLAZ, ZALAZ), TRAJANJE SUMRAKA (GRAĐ, ASTR.), MESEC (IZLAZ, delta/24, ZALAZ, delta/24). Rows show sunrise/sunset and moon phase data.

Table with columns: MESEC (S\_gamma, delta\_gamma, delta), JUPITER (S\_jupiter, delta\_jupiter), SATURN (S\_saturn, delta\_saturn). Rows show data for Jupiter and Saturn.

Summary table for SUNCE, MESEC, and PLANETE. Includes solar parameters (e, Tm, r), lunar parameters (Prolaz, Tm, Starost), and planetary data (Pl., Tm, pi, 360-alpha, Vel.).

Table with columns: UT, SUNCE (S\_sun, delta\_sun), PROLEC. TACKA (S\_gamma), VENERA (S\_venus, delta\_venus), MARS (S\_mars, delta\_mars). Rows show astronomical data for the week.

Table with columns: SUNCE (IZLAZ, ZALAZ), TRAJANJE SUMRAKA (GRAĐ, ASTR.), MESEC (IZLAZ, delta/24, ZALAZ, delta/24). Rows show sunrise/sunset and moon phase data.

Table with columns: MESEC (S\_gamma, delta\_gamma, delta), JUPITER (S\_jupiter, delta\_jupiter), SATURN (S\_saturn, delta\_saturn). Rows show data for Jupiter and Saturn.

Summary table for SUNCE, MESEC, and PLANETE. Includes solar parameters (e, Tm, r), lunar parameters (Prolaz, Tm, Starost), and planetary data (Pl., Tm, pi, 360-alpha, Vel.).

13. DECEMBAR

2005.

UTORAK

Table with columns for UT, SUNCE (S\_sun, delta\_sun), PROLEC. TAČKA (S\_gamma), VENERA (S\_venus, delta\_venus), and MARS (S\_mars, delta\_mars). Rows represent hours from 0 to 22.

Table with columns for SUNCE (IZLAZ, ZALAZ), TRAJANJE SUMRAKA (GRAD., ASTR.), and MESEC (IZLAZ, delta/24, ZALAZ, delta/24). Rows represent minutes from 0 to 60.

Table with columns for UT, MESEC (S\_c, delta\_c, delta), JUPITER (S\_j, delta\_j), and SATURN (S\_h, delta\_h). Rows represent hours from 0 to 22.

Summary tables for SUNCE, MESEC, and PLANETE. Includes parameters like e = T\_p - UT, Prolaz, T\_m, and planetary data for Venus, Mars, Jupiter, Saturn, Uranus, and Neptune.

14. DECEMBAR

SREDA

Table with columns for UT, SUNCE (S\_sun, delta\_sun), PROLEC. TAČKA (S\_gamma), VENERA (S\_venus, delta\_venus), and MARS (S\_mars, delta\_mars). Rows represent hours from 0 to 22.

Table with columns for SUNCE (IZLAZ, ZALAZ), TRAJANJE SUMRAKA (GRAD., ASTR.), and MESEC (IZLAZ, delta/24, ZALAZ, delta/24). Rows represent minutes from 0 to 60.

Table with columns for UT, MESEC (S\_c, delta\_c, delta), JUPITER (S\_j, delta\_j), and SATURN (S\_h, delta\_h). Rows represent hours from 0 to 22.

Summary tables for SUNCE, MESEC, and PLANETE. Includes parameters like e = T\_p - UT, Prolaz, T\_m, and planetary data for Venus, Mars, Jupiter, Saturn, Uranus, and Neptune.





Table with 5 columns: UT, SUNCE (S\_sun, delta\_sun), PROLEĆ. TAČKA (S\_gamma), VENERA (S\_venus, delta\_venus), MARS (S\_mars, delta\_mars). Rows 0-22 and delta values.

Table with 4 main columns: SUNCE, TRAJANJE SUMRAKA (GRAĐ., ASTR.), MESEC. Sub-columns include izlaz, zalaz, grad, astr., izlaz, delta/24, zalaz, delta/24. Rows 0-60 and S.

Table with 3 columns: MESEC (S\_zeta, delta\_zeta, delta), JUPITER (S\_jup, delta\_jup), SATURN (S\_sat, delta\_sat). Rows 0-22 and delta values.

Summary table for SUNCE and MESEC with columns: UT, e = Tp - UT, delta/24, r, Prolaz, delta/24, pi\_zeta, r. Includes PLANETE section with columns: Pl., Tm, pi, 360-alpha, Vel., and other parameters.

Table with 5 columns: UT, SUNCE (S\_sun, delta\_sun), PROLEĆ. TAČKA (S\_gamma), VENERA (S\_venus, delta\_venus), MARS (S\_mars, delta\_mars). Rows 0-22 and delta values.

Table with 4 main columns: SUNCE, TRAJANJE SUMRAKA (GRAĐ., ASTR.), MESEC. Sub-columns include izlaz, zalaz, grad, astr., izlaz, delta/24, zalaz, delta/24. Rows 0-60 and S.

Table with 3 columns: MESEC (S\_zeta, delta\_zeta, delta), JUPITER (S\_jup, delta\_jup), SATURN (S\_sat, delta\_sat). Rows 0-22 and delta values.

Summary table for SUNCE and MESEC with columns: UT, e = Tp - UT, delta/24, r, Prolaz, delta/24, pi\_zeta, r. Includes PLANETE section with columns: Pl., Tm, pi, 360-alpha, Vel., and other parameters.











Table with columns: UT, SUNCE (S\_sun, delta\_sun), PROLEĆ. TAČKA (S\_gamma), VENERA (S\_venus, delta\_venus), MARS (S\_mars, delta\_mars). Rows include hourly data from 0 to 22h and daily averages.

Table with columns: SUNCE (IZLAZ, ZALAZ), TRAJANJE SUMRAKA (GRAĐ, ASTR.), MESEC (IZLAZ, delta/24, ZALAZ, delta/24). Rows include hourly data from 0 to 22h and daily averages.

Table with columns: UT, MESEC (S\_zeta, delta\_zeta, delta), JUPITER (S\_jup, delta\_jup), SATURN (S\_sat, delta\_sat). Rows include hourly data from 0 to 22h and daily averages.

Summary table for SUNCE and MESEC with columns: UT, e=T\_p-UT, delta/24, r, Prolaz, delta/24, pi\_zeta, r. Includes planetary data for PLANETE.

Table with columns: UT, SUNCE (S\_sun, delta\_sun), PROLEĆ. TAČKA (S\_gamma), VENERA (S\_venus, delta\_venus), MARS (S\_mars, delta\_mars). Rows include hourly data from 0 to 22h and daily averages.

Table with columns: SUNCE (IZLAZ, ZALAZ), TRAJANJE SUMRAKA (GRAĐ, ASTR.), MESEC (IZLAZ, delta/24, ZALAZ, delta/24). Rows include hourly data from 0 to 22h and daily averages.

Table with columns: UT, MESEC (S\_zeta, delta\_zeta, delta), JUPITER (S\_jup, delta\_jup), SATURN (S\_sat, delta\_sat). Rows include hourly data from 0 to 22h and daily averages.

Summary table for SUNCE and MESEC with columns: UT, e=T\_p-UT, delta/24, r, Prolaz, delta/24, pi\_zeta, r. Includes planetary data for PLANETE.





# ***Efemeride***

*NAUTIČKIH ZVEZDA*

# SUREKTASCENZIJE NAUČIČKIH ZVEZDA

za 1. u mesecu

R. b.	Ime zvezde	$360^\circ - \alpha$	2005 JAN	FEB	MAR	APR	MAJ	JUN	JUL	AVG	SEP	OKT	NOV	DEC	2006 JAN
1	ALPHERATZ	357	50.5	50.6	50.7	50.6	50.5	50.3	50.0	49.8	49.6	49.5	49.5	49.6	49.7
2	CAPH	357	38.7	38.9	39.1	39.0	38.8	38.5	38.1	37.7	37.5	37.4	37.5	37.6	37.8
3	DIPHDA	349	2.5	2.6	2.6	2.6	2.5	2.3	2.1	1.8	1.6	1.5	1.5	1.5	1.6
4	ACHERNAR	335	31.2	31.5	31.7	31.8	31.8	31.6	31.3	30.9	30.6	30.4	30.3	30.4	30.6
5	HAMAL	328	8.2	8.3	8.4	8.4	8.4	8.2	8.0	7.7	7.5	7.3	7.2	7.2	7.2
6	POLARIS	320	32.7	45.2	56.9	5.6	7.4	2.0	51.1	36.8	22.8	12.1	5.9	6.2	13.3
7	MIRFAK	308	49.7	49.8	50.0	50.1	50.2	50.0	49.8	49.5	49.1	48.8	48.6	48.5	48.5
8	ALDEBARAN	290	56.7	56.8	56.9	57.0	57.0	57.0	56.9	56.6	56.4	56.2	56.0	55.8	55.8
9	RIGEL	281	18.1	18.1	18.2	18.4	18.4	18.5	18.4	18.2	18.0	17.7	17.5	17.4	17.3
10	CAPELLA	280	43.8	43.9	44.0	44.2	44.3	44.3	44.2	43.9	43.6	43.2	43.0	42.7	42.6
11	BELLATRIX	278	38.8	38.8	38.9	39.0	39.1	39.1	39.0	38.8	38.6	38.4	38.2	38.0	37.9
12	EL NATH	278	20.6	20.7	20.8	20.9	21.0	21.0	20.9	20.7	20.4	20.1	19.9	19.7	19.6
13	ALNILAM	275	52.8	52.8	52.9	53.0	53.1	53.1	53.0	52.8	52.6	52.4	52.2	52.0	51.9
14	BETELGEUSE	271	8.1	8.1	8.2	8.3	8.4	8.5	8.4	8.2	8.0	7.8	7.5	7.4	7.2
15	CANOPUS	263	58.6	58.6	58.8	59.1	59.3	59.5	59.5	59.4	59.1	58.8	58.5	58.3	58.2
16	SIRIUS	258	39.2	39.2	39.3	39.4	39.5	39.6	39.6	39.5	39.3	39.1	38.8	38.6	38.5
17	ADHARA	255	17.4	17.4	17.4	17.6	17.7	17.8	17.8	17.7	17.5	17.3	17.1	16.9	16.7
18	PROCYON	245	6.3	6.3	6.3	6.4	6.5	6.6	6.6	6.5	6.3	6.1	5.9	5.6	5.5
19	POLLUX	243	35.4	35.3	35.4	35.5	35.6	35.7	35.7	35.5	35.4	35.1	34.9	34.6	34.4
20	AVIOR	234	20.3	20.2	20.4	20.6	20.9	21.2	21.4	21.4	21.3	21.0	20.6	20.3	20.0
21	AL SUHAIL	222	57.1	57.0	57.0	57.1	57.3	57.4	57.5	57.6	57.5	57.3	57.0	56.7	56.5
22	MIAPLACIDUS	221	40.7	40.5	40.6	40.9	41.4	41.8	42.2	42.3	42.3	42.0	41.5	41.0	40.6
23	ALPHARD	218	2.4	2.2	2.2	2.2	2.3	2.4	2.5	2.5	2.4	2.2	2.0	1.8	1.6
24	REGULUS	207	50.3	50.1	50.1	50.1	50.1	50.2	50.3	50.3	50.2	50.1	49.9	49.7	49.4
25	DUBHE	193	59.1	58.7	58.5	58.5	58.7	58.9	59.2	59.3	59.3	59.2	59.0	58.6	58.1
26	DENEbola	182	40.3	40.0	39.9	39.9	39.9	39.9	40.0	40.1	40.1	40.1	39.9	39.7	39.4
27	ACRUX	173	17.1	16.7	16.4	16.3	16.4	16.5	16.8	17.0	17.2	17.3	17.1	16.7	16.2
28	GACRUX	172	8.6	8.2	8.0	7.9	7.9	8.0	8.2	8.4	8.6	8.6	8.4	8.1	7.7
29	MINOSA	168	0.1	59.7	59.5	59.3	59.3	59.4	59.6	59.8	0.0	0.1	59.9	59.6	59.2
30	ALIOTh	166	26.2	25.9	25.6	25.4	25.4	25.6	25.8	26.0	26.1	26.2	26.1	25.9	25.5
31	MIZAR	158	58.1	57.8	57.5	57.3	57.3	57.4	57.6	57.8	57.9	58.0	58.0	57.8	57.5
32	SPICA	158	38.4	38.1	37.9	37.8	37.7	37.7	37.8	37.9	37.9	38.0	37.9	37.7	37.5
33	ALKAIID	153	4.1	3.7	3.4	3.3	3.2	3.3	3.4	3.6	3.7	3.8	3.8	3.7	3.4
34	MENKENT	148	15.7	15.4	15.2	15.0	14.9	14.8	14.9	15.0	15.1	15.2	15.2	15.0	14.7
35	ARCTURUS	146	1.9	1.6	1.4	1.2	1.2	1.1	1.2	1.3	1.4	1.5	1.5	1.3	1.1
36	RIGEL KENTAURUS	140	1.6	1.1	0.7	0.4	0.2	0.2	0.3	0.6	0.8	1.0	1.0	0.8	0.4
37	KOHAB	137	19.9	19.3	18.7	18.2	18.0	18.2	18.5	19.1	19.7	20.1	20.4	20.3	19.9
38	ALPHECCA	126	16.8	16.6	16.3	16.1	16.0	15.9	15.9	16.0	16.2	16.3	16.4	16.3	16.1
39	DSCHUBBA	119	51.0	50.7	50.5	50.3	50.1	50.0	49.9	50.0	50.1	50.2	50.3	50.2	50.0
40	ANTARES	112	34.8	34.5	34.3	34.0	33.8	33.7	33.6	33.7	33.8	33.9	34.0	33.9	33.7
41	ATRIA	107	43.2	42.7	42.2	41.6	41.1	40.8	40.7	40.8	41.1	41.5	41.8	41.8	41.5
42	SHAULA	96	31.3	31.1	30.9	30.6	30.3	30.1	30.0	30.0	30.1	30.2	30.3	30.4	30.2
43	RASALHAGUE	96	12.9	12.8	12.6	12.3	12.1	12.0	11.9	11.9	12.0	12.1	12.2	12.3	12.2
44	ELTANIN	90	49.8	49.6	49.3	49.0	48.7	48.6	48.5	48.6	48.8	49.0	49.3	49.4	49.4
45	KAUS AUSTRALIS	83	53.0	52.8	52.6	52.3	52.0	51.8	51.6	51.6	51.7	51.8	51.9	52.0	51.9
46	VEGA	80	43.9	43.8	43.6	43.3	43.1	42.9	42.8	42.8	42.9	43.1	43.3	43.4	43.4
47	NUNKI	76	6.9	6.7	6.5	6.3	6.0	5.8	5.6	5.6	5.6	5.7	5.8	5.9	5.8
48	ALTAIR	62	15.0	15.0	14.8	14.6	14.4	14.2	14.0	13.9	13.9	14.0	14.2	14.2	14.2
49	PEACOCK	53	30.0	29.9	29.7	29.4	29.0	28.6	28.3	28.1	28.1	28.2	28.5	28.6	28.7
50	DENEB	49	36.5	36.5	36.4	36.2	35.9	35.7	35.4	35.3	35.4	35.5	35.7	35.9	36.0
51	ENIF	33	53.9	53.9	53.8	53.7	53.5	53.2	53.0	52.9	52.8	52.8	52.9	53.0	53.1
52	AL NA IR	27	52.1	52.2	52.1	51.9	51.7	51.3	51.0	50.8	50.6	50.7	50.8	51.0	51.1
53	FOMALHAUT	15	31.3	31.4	31.4	31.3	31.1	30.8	30.5	30.3	30.2	30.1	30.2	30.3	30.4
54	MARKAB	13	45.1	45.2	45.2	45.1	44.9	44.7	44.5	44.2	44.1	44.1	44.1	44.2	44.3

# DEKLINACIJE NAUTIČKIH ZVEZDA

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R.b.	Zvezda–Sazvežđe	δ	2005 JAN	FEB	MAR	APR	MAJ	JUN	JUL	AVG	SEP	OKT	NOV	DEC	2006 JAN
1	α Andromedae	29	7.2	7.1	7.0	7.0	7.0	7.0	7.1	7.2	7.3	7.4	7.5	7.6	7.5&
2	β Cassiopeae	59	10.9	10.8	10.7	10.6	10.5	10.4	10.5	10.6	10.8	11.0	11.1	11.2	11.2&
3	β Ceti	-17	57.7	57.7	57.7	57.6	57.5	57.4	57.3	57.2	57.2	57.2	57.2	57.3	57.3&
4	α Eridani	-57	13.0	13.0	12.9	12.7	12.5	12.4	12.2	12.2	12.2	12.3	12.4	12.6	12.6&
5	α Arietis	23	29.3	29.3	29.2	29.2	29.2	29.2	29.2	29.3	29.4	29.5	29.6	29.6	29.6&
6	α Ursae Minoris	89	17.5	17.6	17.5	17.4	17.3	17.1	17.0	17.0	17.1	17.3	17.4	17.6	17.8&
7	α Persei	49	53.0	53.0	53.0	52.9	52.8	52.8	52.7	52.7	52.8	52.9	53.0	53.1	53.2&
8	α Tauri	16	31.3	31.3	31.2	31.2	31.2	31.3	31.3	31.3	31.4	31.4	31.4	31.4	31.4&
9	β Orionis	- 8	11.7	11.8	11.8	11.8	11.7	11.7	11.6	11.5	11.4	11.4	11.4	11.5	11.6&
10	α Aurigae	46	0.3	0.4	0.4	0.4	0.4	0.3	0.2	0.2	0.2	0.2	0.3	0.3	0.4&
11	γ Orionis	6	21.3	21.3	21.3	21.3	21.3	21.3	21.4	21.5	21.5	21.5	21.5	21.5	21.4&
12	β Tauri	28	36.8	36.8	36.9	36.8	36.8	36.8	36.8	36.8	36.8	36.8	36.8	36.9	36.9&
13	ε Orionis	- 1	11.9	11.9	11.9	11.9	11.9	11.8	11.8	11.7	11.6	11.6	11.7	11.7	11.8&
14	α Orionis	7	24.6	24.5	24.5	24.5	24.5	24.6	24.6	24.7	24.7	24.7	24.7	24.6	24.6&
15	α Carinae	-52	41.8	42.0	42.1	42.1	42.0	41.9	41.8	41.6	41.5	41.5	41.5	41.7	41.8&
16	α Canis Majoris	-16	43.3	43.4	43.5	43.5	43.5	43.4	43.3	43.2	43.1	43.1	43.1	43.2	43.4&
17	ε Canis Majoris	-28	58.6	58.8	58.8	58.9	58.9	58.8	58.6	58.5	58.4	58.4	58.4	58.5	58.7&
18	α Canis Minoris	5	12.8	12.8	12.7	12.7	12.7	12.8	12.8	12.8	12.9	12.9	12.8	12.7	12.7&
19	β Geminorum	28	0.9	0.9	0.9	1.0	1.0	1.0	1.0	0.9	0.9	0.8	0.8	0.8	0.7&
20	ε Carinae	-59	31.3	31.5	31.6	31.8	31.8	31.7	31.6	31.5	31.3	31.2	31.2	31.3	31.5&
21	λ Velorum	-43	26.9	27.1	27.3	27.4	27.4	27.4	27.3	27.2	27.1	27.0	27.0	27.0	27.2&
22	β Carinae	-69	44.0	44.2	44.3	44.5	44.6	44.6	44.5	44.3	44.2	44.1	44.0	44.1	44.2&
23	α Hydrae	- 8	40.7	40.8	40.9	40.9	40.9	40.9	40.9	40.8	40.8	40.7	40.8	40.9	41.0&
24	α Leonis	11	56.6	56.5	56.5	56.5	56.5	56.6	56.6	56.6	56.6	56.5	56.5	56.4	56.3&
25	α Ursae Majoris	61	43.2	43.3	43.4	43.5	43.6	43.6	43.6	43.5	43.4	43.2	43.0	42.9	42.9&
26	β Leonis	14	32.6	32.5	32.5	32.5	32.5	32.6	32.6	32.6	32.6	32.5	32.5	32.3	32.2&
27	α Crucis	-63	7.3	7.4	7.6	7.7	7.9	8.0	8.0	8.0	7.9	7.8	7.6	7.6	7.6&
28	γ Crucis	-57	8.2	8.3	8.4	8.6	8.8	8.9	8.9	8.9	8.8	8.6	8.5	8.5	8.5&
29	β Crucis	-59	42.7	42.8	42.9	43.1	43.2	43.4	43.4	43.4	43.3	43.2	43.0	43.0	43.0&
30	ε Ursae Majoris	55	55.7	55.6	55.7	55.8	55.9	56.1	56.1	56.1	56.0	55.8	55.6	55.5	55.3&
31	ζ Ursae Majoris	54	53.7	53.6	53.6	53.8	53.9	54.0	54.1	54.1	54.0	53.8	53.6	53.5	53.3&
32	α Virginis	-11	11.2	11.3	11.4	11.4	11.5	11.5	11.5	11.4	11.4	11.4	11.4	11.4	11.5&
33	η Ursae Majoris	49	17.0	17.0	17.0	17.1	17.2	17.3	17.4	17.4	17.3	17.2	17.0	16.8	16.7&
34	θ Centauri	-36	23.5	23.6	23.7	23.8	23.9	24.0	24.0	24.0	24.0	23.9	23.8	23.8	23.8&
35	α Bootis	19	9.2	9.1	9.1	9.1	9.2	9.2	9.3	9.3	9.3	9.3	9.2	9.0	8.9&
36	α Centauri	-60	51.1	51.2	51.3	51.4	51.6	51.7	51.8	51.8	51.8	51.7	51.6	51.5	51.4&
37	β Ursae Minoris	74	7.8	7.7	7.7	7.8	7.9	8.1	8.2	8.2	8.2	8.0	7.9	7.7	7.5&
38	α Coronae Borealis	26	41.7	41.6	41.5	41.5	41.6	41.7	41.8	41.9	41.9	41.8	41.7	41.6	41.4&
39	δ Scorpii	-22	38.2	38.2	38.3	38.3	38.3	38.4	38.4	38.4	38.4	38.4	38.3	38.3	38.4&
40	α Scorpii	-26	26.6	26.6	26.7	26.7	26.7	26.8	26.8	26.8	26.8	26.8	26.8	26.7	26.8&
41	α Trianguli Australi	-69	2.1	2.1	2.1	2.1	2.2	2.3	2.5	2.6	2.6	2.6	2.5	2.4	2.3&
42	λ Scorpii	-37	6.5	6.5	6.5	6.5	6.5	6.6	6.6	6.6	6.7	6.7	6.6	6.6	6.6&
43	α Ophiuchi	12	33.2	33.1	33.1	33.1	33.1	33.2	33.3	33.4	33.4	33.4	33.4	33.3	33.2&
44	γ Draconis	51	29.1	28.9	28.9	28.8	28.9	29.1	29.2	29.4	29.5	29.5	29.4	29.3	29.1&
45	ε Sagittarii	-34	23.1	23.0	23.0	23.0	23.0	23.0	23.0	23.1	23.1	23.1	23.1	23.1	23.0&
46	α Lyrae	38	47.2	47.0	46.9	46.9	46.9	47.1	47.2	47.4	47.5	47.5	47.5	47.4	47.2&
47	σ Sagittarii	-26	17.6	17.6	17.5	17.5	17.5	17.5	17.5	17.5	17.5	17.5	17.5	17.5	17.5&
48	α Aquilae	8	52.8	52.7	52.6	52.6	52.7	52.8	52.9	53.0	53.0	53.1	53.0	53.0	52.9&
49	α Pavonis	-56	43.4	43.3	43.2	43.1	43.0	43.0	43.0	43.1	43.2	43.3	43.3	43.3	43.2&
50	α Cygni	45	17.9	17.7	17.6	17.5	17.5	17.6	17.8	18.0	18.1	18.2	18.3	18.2	18.1&
51	ε Pegasi	9	53.8	53.7	53.7	53.7	53.7	53.8	53.9	54.0	54.1	54.1	54.2	54.1	54.1&
52	α Gruis	-46	56.5	56.4	56.3	56.2	56.1	56.0	55.9	56.0	56.0	56.1	56.2	56.2	56.2&
53	α Piscis Austrini	-29	36.0	36.0	35.9	35.8	35.7	35.6	35.5	35.4	35.5	35.5	35.6	35.6	35.6&
54	α Pegasi	15	13.9	13.9	13.8	13.8	13.8	13.9	14.0	14.1	14.2	14.3	14.3	14.3	14.3&

# VREMENA GORNJIH PROLAZA NAUTIČKIH ZVEZDA

kroz meridijan u Griniču

za 1. u mesecu

R.b.	Ime zvezde	2005 JAN	FEB	MAR	APR	MAJ	JUN	JUL	AVG	SEP	OKT	NOV	DEC	2006 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 26	15 23	13 33	11 31	9 33	7 30	5 32	3 30	1 28	23 29	21 27	19 29	17 27
2	CAPH	17 26	15 24	13 34	11 32	9 33	7 31	5 33	3 31	1 28	23 30	21 28	19 30	17 27
3	DIPHDA	18 1	15 59	14 8	12 6	10 8	8 6	6 7	4 5	2 3	0 5	22 2	20 4	18 2
4	ACHERNAR	18 55	16 53	15 2	13 0	11 2	8 60	7 1	4 59	2 57	0 59	22 56	20 58	18 56
5	HAMAL	19 24	17 22	15 32	13 30	11 31	9 29	7 31	5 29	3 26	1 28	23 26	21 28	19 25
6	POLARIS	19 55	17 51	16 1	13 58	11 59	9 58	8 0	5 59	3 58	2 0	23 58	22 0	19 57
7	MIRFAK	20 42	18 39	16 49	14 47	12 49	10 46	8 48	6 46	4 44	2 45	0 43	22 45	20 43
8	ALDEBARAN	21 53	19 51	18 1	15 58	14 0	11 58	9 60	7 57	5 55	3 57	1 55	23 56	21 54
9	RIGEL	22 32	20 30	18 39	16 37	14 39	12 36	10 38	8 36	6 34	4 36	2 33	0 35	22 33
10	CAPELLA	22 34	20 32	18 41	16 39	14 41	12 39	10 40	8 38	6 36	4 38	2 36	0 37	22 35
11	BELLATRIX	22 42	20 40	18 50	16 48	14 49	12 47	10 49	8 47	6 44	4 46	2 44	0 46	22 43
12	EL NATH	22 44	20 41	18 51	16 49	14 51	12 48	10 50	8 48	6 46	4 47	2 45	0 47	22 45
13	ALNILAM	22 54	20 51	19 1	16 59	15 0	12 58	10 60	8 58	6 55	4 57	2 55	0 57	22 55
14	BETELGEUSE	23 12	21 10	19 20	17 18	15 19	13 17	11 19	9 17	7 14	5 16	3 14	1 16	23 13
15	CANOPUS	23 41	21 39	19 48	17 46	15 48	13 46	11 47	9 45	7 43	5 45	3 43	1 44	23 42
16	SIRIUS	0 2	22 0	20 10	18 8	16 9	14 7	12 9	10 7	8 4	6 6	4 4	2 6	0 3
17	ADHARA	0 16	22 14	20 23	18 21	16 23	14 21	12 22	10 20	8 18	6 20	4 17	2 19	0 17
18	PROCYON	0 57	22 54	21 4	19 2	17 3	15 1	13 3	11 1	8 59	7 0	4 58	2 60	0 58
19	POLLUX	1 3	23 0	21 10	19 8	17 10	15 7	13 9	11 7	9 5	7 6	5 4	3 6	1 4
20	AVIOR	1 40	23 37	21 47	19 45	17 47	15 44	13 46	11 44	9 42	7 43	5 41	3 43	1 41
21	AL SUHAIL	2 25	0 23	22 33	20 30	18 32	16 30	14 32	12 29	10 27	8 29	6 27	4 28	2 26
22	MIAPLACIDUS	2 30	0 28	22 38	20 35	18 37	16 35	14 37	12 34	10 32	8 34	6 32	4 33	2 31
23	ALPHARD	2 45	0 43	22 52	20 50	18 52	16 50	14 51	12 49	10 47	8 49	6 46	4 48	2 46
24	REGULUS	3 26	1 23	23 33	21 31	19 33	17 30	15 32	13 30	11 28	9 29	7 27	5 29	3 27
25	DUBHE	4 21	2 19	0 29	22 26	20 28	18 26	16 27	14 25	12 23	10 25	8 23	6 24	4 22
26	DENEbola	5 6	3 4	1 14	23 12	21 13	19 11	17 13	15 11	13 8	11 10	9 8	7 10	5 7
27	ACRUX	5 44	3 42	1 51	23 49	21 51	19 49	17 50	15 48	13 46	11 48	9 45	7 47	5 45
28	GACRUX	5 48	3 46	1 56	23 54	21 55	19 53	17 55	15 53	13 50	11 52	9 50	7 52	5 49
29	MINOSA	6 5	4 3	2 12	0 10	22 12	20 10	18 11	16 9	14 7	12 9	10 6	8 8	6 6
30	ALIOTh	6 11	4 9	2 19	0 16	22 18	20 16	18 18	16 15	14 13	12 15	10 13	8 14	6 12
31	MIZAR	6 41	4 39	2 49	0 46	22 48	20 46	18 48	16 45	14 43	12 45	10 43	8 44	6 42
32	SPICA	6 42	4 40	2 50	0 48	22 49	20 47	18 49	16 47	14 44	12 46	10 44	8 46	6 43
33	ALKAID	7 5	5 3	3 12	1 10	23 12	21 9	19 11	17 9	15 7	13 8	11 6	9 8	7 6
34	MENKENT	7 24	5 22	3 31	1 29	23 31	21 29	19 30	17 28	15 26	13 28	11 25	9 27	7 25
35	ARCTURUS	7 33	5 31	3 40	1 38	23 40	21 38	19 39	17 37	15 35	13 37	11 34	9 36	7 34
36	RIGEL KENTAURUS	7 57	5 55	4 4	2 2	0 4	22 2	20 3	18 1	15 59	14 1	11 58	10 0	7 58
37	KOHAB	8 8	6 6	4 15	2 13	0 15	22 12	20 14	18 12	16 10	14 11	12 9	10 11	8 9
38	ALPHECCA	8 52	6 50	4 59	2 57	0 59	22 57	20 58	18 56	16 54	14 56	12 53	10 55	8 53
39	DSCHUBBA	9 18	7 15	5 25	3 23	1 25	23 22	21 24	19 22	17 20	15 21	13 19	11 21	9 19
40	ANTARES	9 47	7 45	5 54	3 52	1 54	23 51	21 53	19 51	17 49	15 50	13 48	11 50	9 48
41	ATRIA	10 6	8 4	6 14	4 11	2 13	0 11	22 13	20 10	18 8	16 10	14 8	12 9	10 7
42	SHAULA	10 51	8 49	6 58	4 56	2 58	0 56	22 57	20 55	18 53	16 55	14 52	12 54	10 52
43	RASALHAGUE	10 52	8 50	6 60	4 57	2 59	0 57	22 59	20 56	18 54	16 56	14 54	12 55	10 53
44	ELTANIN	11 14	9 11	7 21	5 19	3 21	1 18	23 20	21 18	19 16	17 17	15 15	13 17	11 15
45	KAUS AUSTRALIS	11 41	9 39	7 49	5 47	3 48	1 46	23 48	21 46	19 44	17 45	15 43	13 45	11 43
46	VEGA	11 54	9 52	8 2	5 59	4 1	1 59	0 1	21 58	19 56	17 58	15 56	13 57	11 55
47	NUNKI	12 13	10 10	8 20	6 18	4 20	2 17	0 19	22 17	20 15	18 16	16 14	14 16	12 14
48	ALTAIR	13 8	11 6	9 15	7 13	5 15	3 13	1 14	23 12	21 10	19 12	17 10	15 11	13 9
49	PEACOCK	13 43	11 41	9 50	7 48	5 50	3 48	1 50	23 47	21 45	19 47	17 45	15 46	13 44
50	DENEB	13 59	11 56	10 6	8 4	6 6	4 3	2 5	0 3	22 1	20 2	18 0	16 2	13 60
51	ENIF	15 1	12 59	11 9	9 7	7 8	5 6	3 8	1 6	23 3	21 5	19 3	17 5	15 2
52	AL NA IR	15 26	13 23	11 33	9 31	7 32	5 30	3 32	1 30	23 28	21 29	19 27	17 29	15 27
53	FOMALHAUT	16 15	14 13	12 22	10 20	8 22	6 20	4 21	2 19	0 17	22 19	20 16	18 18	16 16
54	MARKAB	16 22	14 20	12 29	10 27	8 29	6 27	4 28	2 26	0 24	22 26	20 24	18 25	16 23

### 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 <sub>γ</sub>	Popravka	S <sub>γ</sub>	Popravka	S <sub>γ</sub>	Popravka	S <sub>γ</sub>	Popravka	S <sub>γ</sub>	Popravka	S <sub>γ</sub>	Popravka
o	/	o	/	o	/	o	/	o	/	o	/
0	-34.1	60	-40.4	120	-6.3	180	34.1	240	40.4	300	6.3
1	-34.6	61	-40.2	121	-5.6	181	34.6	241	40.2	301	5.6
2	-35.0	62	-39.9	122	-4.8	182	35.0	242	39.9	302	4.8
3	-35.5	63	-39.5	123	-4.1	183	35.5	243	39.5	303	4.1
4	-35.9	64	-39.2	124	-3.3	184	35.9	244	39.2	304	3.3
5	-36.3	65	-38.9	125	-2.6	185	36.3	245	38.9	305	2.6
6	-36.7	66	-38.5	126	-1.8	186	36.7	246	38.5	306	1.8
7	-37.1	67	-38.2	127	-1.1	187	37.1	247	38.2	307	1.1
8	-37.5	68	-37.8	128	-0.3	188	37.5	248	37.8	308	0.3
9	-37.9	69	-37.4	129	0.5	189	37.9	249	37.4	309	-0.5
10	-38.3	70	-37.0	130	1.2	190	38.3	250	37.0	310	-1.2
11	-38.6	71	-36.6	131	2.0	191	38.6	251	36.6	311	-2.0
12	-39.0	72	-36.2	132	2.7	192	39.0	252	36.2	312	-2.7
13	-39.3	73	-35.8	133	3.5	193	39.3	253	35.8	313	-3.5
14	-39.6	74	-35.4	134	4.3	194	39.6	254	35.4	314	-4.3
15	-39.9	75	-34.9	135	5.0	195	39.9	255	34.9	315	-5.0
16	-40.2	76	-34.5	136	5.8	196	40.2	256	34.5	316	-5.8
17	-40.5	77	-34.0	137	6.5	197	40.5	257	34.0	317	-6.5
18	-40.8	78	-33.5	138	7.3	198	40.8	258	33.5	318	-7.3
19	-41.0	79	-33.0	139	8.0	199	41.0	259	33.0	319	-8.0
20	-41.3	80	-32.5	140	8.8	200	41.3	260	32.5	320	-8.8
21	-41.5	81	-32.0	141	9.5	201	41.5	261	32.0	321	-9.5
22	-41.7	82	-31.5	142	10.2	202	41.7	262	31.5	322	-10.2
23	-41.9	83	-31.0	143	11.0	203	41.9	263	31.0	323	-11.0
24	-42.1	84	-30.4	144	11.7	204	42.1	264	30.4	324	-11.7
25	-42.3	85	-29.9	145	12.4	205	42.3	265	29.9	325	-12.4
26	-42.5	86	-29.3	146	13.2	206	42.5	266	29.3	326	-13.2
27	-42.6	87	-28.8	147	13.9	207	42.6	267	28.8	327	-13.9
28	-42.8	88	-28.2	148	14.6	208	42.8	268	28.2	328	-14.6
29	-42.9	89	-27.6	149	15.3	209	42.9	269	27.6	329	-15.3
30	-43.0	90	-27.0	150	16.0	210	43.0	270	27.0	330	-16.0
31	-43.1	91	-26.4	151	16.7	211	43.1	271	26.4	331	-16.7
32	-43.2	92	-25.8	152	17.4	212	43.2	272	25.8	332	-17.4
33	-43.3	93	-25.2	153	18.1	213	43.3	273	25.2	333	-18.1
34	-43.4	94	-24.6	154	18.8	214	43.4	274	24.6	334	-18.8
35	-43.4	95	-23.9	155	19.5	215	43.4	275	23.9	335	-19.5
36	-43.5	96	-23.3	156	20.2	216	43.5	276	23.3	336	-20.2
37	-43.5	97	-22.7	157	20.8	217	43.5	277	22.7	337	-20.8
38	-43.5	98	-22.0	158	21.5	218	43.5	278	22.0	338	-21.5
39	-43.5	99	-21.3	159	22.2	219	43.5	279	21.3	339	-22.2
40	-43.5	100	-20.7	160	22.8	220	43.5	280	20.7	340	-22.8
41	-43.5	101	-20.0	161	23.4	221	43.5	281	20.0	341	-23.4
42	-43.4	102	-19.3	162	24.1	222	43.4	282	19.3	342	-24.1
43	-43.4	103	-18.6	163	24.7	223	43.4	283	18.6	343	-24.7
44	-43.3	104	-18.0	164	25.3	224	43.3	284	18.0	344	-25.3
45	-43.2	105	-17.3	165	25.9	225	43.2	285	17.3	345	-25.9
46	-43.1	106	-16.6	166	26.5	226	43.1	286	16.6	346	-26.5
47	-43.0	107	-15.9	167	27.1	227	43.0	287	15.9	347	-27.1
48	-42.9	108	-15.2	168	27.7	228	42.9	288	15.2	348	-27.7
49	-42.8	109	-14.4	169	28.3	229	42.8	289	14.4	349	-28.3
50	-42.6	110	-13.7	170	28.9	230	42.6	290	13.7	350	-28.9
51	-42.5	111	-13.0	171	29.5	231	42.5	291	13.0	351	-29.5
52	-42.3	112	-12.3	172	30.0	232	42.3	292	12.3	352	-30.0
53	-42.1	113	-11.5	173	30.6	233	42.1	293	11.5	353	-30.6
54	-41.9	114	-10.8	174	31.1	234	41.9	294	10.8	354	-31.1
55	-41.7	115	-10.1	175	31.6	235	41.7	295	10.1	355	-31.6
56	-41.5	116	-9.3	176	32.1	236	41.5	296	9.3	356	-32.1
57	-41.2	117	-8.6	177	32.6	237	41.2	297	8.6	357	-32.6
58	-41.0	118	-7.8	178	33.1	238	41.0	298	7.8	358	-33.1
59	-40.7	119	-7.1	179	33.6	239	40.7	299	7.1	359	-33.6
60	-40.4	120	-6.3	180	34.1	240	40.4	300	6.3	360	-34.1

**TABLICA II**

S <sub>γ</sub> \ φ		φ																φ \ S <sub>γ</sub>	
		0°	10°	15°	20°	25°	30°	35°	40°	45°	50°	55°	60°	62°	64°	66°			
h	°	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	°	h	
1	15	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.1	.1	.1	.1	.1	15	1	
2	30	.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	45	3	
4	60	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.1	.1	.1	60	4	
5	75	.0	.0	.0	.0	.0	.0	.1	.1	.1	.1	.1	.1	.2	.2	.2	75	5	
6	90	.0	.0	.0	.0	.1	.1	.1	.1	.1	.1	.2	.2	.2	.3	.3	90	6	
7	105	.0	.0	.0	.1	.1	.1	.1	.1	.2	.2	.2	.3	.3	.4	.5	105	7	
8	120	.0	.0	.0	.1	.1	.1	.2	.2	.2	.3	.3	.4	.5	.5	.6	120	8	
9	135	.0	.0	.0	.1	.1	.1	.2	.2	.2	.3	.3	.4	.5	.6	.6	135	9	
10	150	.0	.0	.0	.1	.1	.1	.1	.2	.2	.2	.3	.3	.5	.5	.5	150	10	
11	165	.0	.0	.0	.0	.1	.1	.1	.1	.2	.2	.2	.3	.3	.4	.4	165	11	
12	180	.0	.0	.0	.0	.0	.1	.1	.1	.1	.1	.1	.2	.2	.2	.2	180	12	
13	195	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.1	.1	.1	.1	.1	195	13	
14	210	.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	225	15	
16	240	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.1	.1	.1	240	16	
17	255	.0	.0	.0	.0	.0	.0	.1	.1	.1	.1	.1	.1	.2	.2	.2	255	17	
18	270	.0	.0	.0	.0	.1	.1	.1	.1	.1	.2	.2	.2	.3	.3	.4	270	18	
19	285	.0	.0	.0	.1	.1	.1	.1	.2	.2	.2	.3	.3	.4	.5	.5	285	19	
20	300	.0	.0	.0	.1	.1	.1	.2	.2	.2	.3	.3	.4	.5	.5	.6	300	20	
21	315	.0	.0	.0	.1	.1	.1	.2	.2	.2	.3	.3	.4	.5	.6	.6	315	21	
22	330	.0	.0	.0	.1	.1	.1	.1	.2	.2	.2	.3	.3	.5	.5	.5	330	22	
23	345	.0	.0	.0	.0	.1	.1	.1	.1	.2	.2	.2	.3	.3	.4	.4	345	23	
24	360	.0	.0	.0	.0	.0	.1	.1	.1	.1	.1	.1	.2	.2	.2	.2	360	24	

**TABLICA III**

S <sub>γ</sub> \ Datum		Datum													Datum \ S <sub>γ</sub>	
		2004 1. JAN	1. FEB	1. MAR	1. APR	1. MAJ	1. JUN	1. JUL	1. AVG	1. SEP	1. OKT	1. NOV	1. DEC	2005 1. JAN		
h	°	/	/	/	/	/	/	/	/	/	/	/	/	/	°	h
1	15	.1	.2	.2	.1	.0	-.2	-.3	-.3	-.2	-.1	.0	.2	.4	15	1
2	30	.1	.3	.2	.1	.0	-.2	-.3	-.3	-.3	-.1	.0	.2	.4	30	2
3	45	.2	.2	.1	.0	-.1	-.3	-.4	-.3	-.2	.0	.1	.3	.5	45	3
4	60	.1	.2	.1	.0	-.1	-.3	-.3	-.3	-.2	.0	.1	.3	.4	60	4
5	75	.1	.2	.1	.0	-.1	-.2	-.3	-.3	-.2	.0	.1	.3	.4	75	5
6	90	.1	.1	.0	.0	-.1	-.2	-.3	-.2	-.1	.0	.1	.2	.3	90	6
7	105	.1	.1	.0	-.1	-.1	-.2	-.2	-.1	-.1	.1	.1	.2	.3	105	7
8	120	.0	.0	.0	-.1	-.1	-.1	-.1	-.1	.0	.1	.1	.1	.1	120	8
9	135	.0	-.1	-.1	-.1	-.1	-.1	.0	.0	.1	.1	.1	.1	.0	135	9
10	150	.0	-.1	-.1	-.1	-.1	.0	.1	.1	.1	.1	.1	.1	.0	150	10
11	165	-.1	-.2	-.1	-.1	.0	.1	.2	.2	.2	.1	.1	-.1	-.2	165	11
12	180	-.1	-.2	-.2	-.1	.0	.1	.2	.3	.2	.1	.0	-.1	-.3	180	12
13	195	-.1	-.2	-.2	-.1	.0	.2	.3	.3	.2	.1	.0	-.2	-.4	195	13
14	210	-.1	-.3	-.2	-.1	.0	.2	.3	.3	.3	.1	.0	-.2	-.4	210	14
15	225	-.2	-.2	-.1	.0	.1	.3	.4	.3	.2	.0	-.1	-.3	-.5	225	15
16	240	-.1	-.2	-.1	.0	.1	.3	.3	.3	.2	.0	-.1	-.3	-.4	240	16
17	255	-.1	-.2	-.1	.0	.1	.2	.3	.3	.2	.0	-.1	-.3	-.4	255	17
18	270	-.1	-.1	.0	.0	.1	.2	.3	.2	.1	.0	-.1	-.2	-.3	270	18
19	285	-.1	-.1	.0	.1	.1	.2	.2	.1	.1	-.1	-.1	-.2	-.3	285	19
20	300	.0	.0	.0	.1	.1	.1	.1	.1	.0	-.1	-.1	-.1	-.1	300	20
21	315	.0	.1	.1	.1	.1	.1	.0	.0	-.1	-.1	-.1	-.1	.0	315	21
22	330	.0	.1	.1	.1	.1	.0	-.1	-.1	-.1	-.1	-.1	.0	.1	330	22
23	345	.1	.2	.1	.1	.0	-.1	-.2	-.2	-.2	-.1	-.1	.1	.2	345	23
24	360	.1	.2	.2	.1	.0	-.1	-.2	-.3	-.2	-.1	.0	.1	.3	360	24

# AZIMUTI SEVERNJAČE

$\varphi$ $s_{\gamma}$	0°	30°	40°	50°	55°	60°	65°	70°	75°	+ $\varphi = \nu$
0	0.5	0.5	0.6	0.7	0.8	0.9	1.1	1.4	1.8	0
15	0.3	0.3	0.4	0.5	0.5	0.6	0.7	0.9	1.2	15
30	0.1	0.1	0.2	0.2	0.2	0.2	0.3	0.4	0.5	30
45	359.9	359.9	359.9	359.9	359.9	359.9	359.8	359.8	359.7	45
60	359.7	359.7	359.7	359.6	359.5	359.5	359.4	359.2	359.0	60
75	359.6	359.5	359.4	359.3	359.3	359.1	359.0	358.7	358.3	75
90	359.4	359.3	359.3	359.1	359.0	358.9	358.7	358.3	357.8	90
105	359.3	359.2	359.1	359.0	358.8	358.7	358.4	358.0	357.4	105
120	359.3	359.2	359.1	358.9	358.7	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	358.7	358.4	358.0	357.4	150
165	359.4	359.3	359.2	359.1	359.0	358.8	358.6	358.3	357.8	165
180	359.5	359.5	359.4	359.3	359.2	359.1	358.9	358.7	358.3	180
195	359.7	359.7	359.6	359.5	359.5	359.4	359.3	359.2	358.9	195
210	359.9	359.9	359.8	359.8	359.8	359.8	359.7	359.7	359.6	210
225	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.2	0.3	225
240	0.3	0.3	0.3	0.4	0.4	0.5	0.6	0.7	0.9	240
255	0.4	0.5	0.5	0.6	0.7	0.8	1.0	1.2	1.6	255
270	0.6	0.6	0.7	0.9	1.0	1.1	1.3	1.6	2.1	270
285	0.7	0.8	0.9	1.0	1.1	1.3	1.5	1.9	2.5	285
300	0.7	0.8	0.9	1.1	1.2	1.4	1.7	2.1	2.7	300
315	0.7	0.8	0.9	1.1	1.3	1.4	1.7	2.1	2.8	315
330	0.7	0.8	0.9	1.1	1.2	1.4	1.6	2.0	2.7	330
345	0.6	0.7	0.8	0.9	1.0	1.2	1.4	1.8	2.3	345
360	0.5	0.5	0.6	0.7	0.8	0.9	1.1	1.4	1.8	360

## O B J A Š N J E N J 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.

★ ★ ★ ★ ★

# ***$I_n$ terpolacione***

|

*POMOĆNE TABLICE*

# INTERPOLACIONA TABLICA

za izračunavanje trenutaka izlaza i zalaza Sunca i Meseca

ZA $\varphi = 0^\circ$ DO $\pm 30^\circ$									
$\Delta\varphi$ $\Delta t_s$	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 $\varphi = 0^\circ$ DO $\pm 30^\circ$									
0°.1	0°.2	0°.3	0°.4	0°.5	0°.6	0°.7	0°.8	0°.9	$\Delta\varphi$ $\Delta t_s$
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	0.1	0.2	2
0.0	0.1	0.1	0.1	0.1	0.2	0.2	0.2	0.2	3
0.0	0.1	0.1	0.2	0.2	0.2	0.2	0.3	0.3	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 $\varphi = \pm(30^\circ \text{ DO } 60^\circ)$				
$\Delta\varphi$ $\Delta t_s$	1°	2°	3°	4°
1	0.2	0.4	0.6	0.8
2	0.4	0.8	1.2	1.6
3	0.6	1.2	1.8	2.4
4	0.8	1.6	2.4	3.2
5	1.0	2.0	3.0	4.0
6	1.2	2.4	3.6	4.8
7	1.4	2.8	4.2	5.6
8	1.6	3.2	4.8	6.4
9	1.8	3.6	5.4	7.2
10	2.0	4.0	6.0	8.0
11	2.2	4.4	6.6	8.8
12	2.4	4.8	7.2	9.6
13	2.6	5.2	7.8	10.4
14	2.8	5.6	8.4	11.2
15	3.0	6.0	9.0	12.0
16	3.2	6.4	9.6	12.8
17	3.4	6.8	10.2	13.6
18	3.6	7.2	10.8	14.4
19	3.8	7.6	11.4	15.2
20	4.0	8.0	12.0	16.0
21	4.2	8.4	12.6	16.8
22	4.4	8.8	13.2	17.6
23	4.6	9.2	13.8	18.4
24	4.8	9.6	14.4	19.2
25	5.0	10.0	15.0	20.0
26	5.2	10.4	15.6	20.8
27	5.4	10.8	16.2	21.6
28	5.6	11.2	16.8	22.4
29	5.8	11.6	17.4	23.2
30	6.0	12.0	18.0	24.0
31	6.2	12.4	18.6	24.8
32	6.4	12.8	19.2	25.6
33	6.6	13.2	19.8	26.4
34	6.8	13.6	20.4	27.2
35	7.0	14.0	21.0	28.0
36	7.2	14.4	21.6	28.8
37	7.4	14.8	22.2	29.6
38	7.6	15.2	22.8	30.4
39	7.8	15.6	23.4	31.2
40	8.0	16.0	24.0	32.0
41	8.2	16.4	24.6	32.8
42	8.4	16.8	25.2	33.6
43	8.6	17.2	25.8	34.4
44	8.8	17.6	26.4	35.2
45	9.0	18.0	27.0	36.0
46	9.2	18.4	27.6	36.8
47	9.4	18.8	28.2	37.6
48	9.6	19.2	28.8	38.4
49	9.8	19.6	29.4	39.2
50	10.0	20.0	30.0	40.0
51	10.2	20.4	30.6	40.8
52	10.4	20.8	31.2	41.6
53	10.6	21.2	31.8	42.4
54	10.8	21.6	32.4	43.2
55	11.0	22.0	33.0	44.0
56	11.2	22.4	33.6	44.8
57	11.4	22.8	34.2	45.6
58	11.6	23.2	34.8	46.4
59	11.8	23.6	35.4	47.2
60	12.0	24.0	36.0	48.0

ZA $\varphi = \pm(30^\circ \text{ DO } 60^\circ)$													
0°.1	0°.2	0°.3	0°.4	0°.5	0°.6	0°.7	0°.8	0°.9	$\Delta\varphi$ $\Delta t_s$				
0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.2	0.2	1				
0.0	0.1	0.1	0.2	0.2	0.2	0.3	0.3	0.3	2				
0.1	0.1	0.2	0.2	0.3	0.4	0.4	0.5	0.5	3				
0.1	0.2	0.2	0.3	0.4	0.5	0.6	0.6	0.7	4				
0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9	5				
0.1	0.2	0.4	0.5	0.6	0.7	0.8	1.0	1.1	6				
0.1	0.3	0.4	0.6	0.7	0.8	1.0	1.1	1.3	7				
0.2	0.3	0.5	0.6	0.8	1.0	1.1	1.3	1.4	8				
0.2	0.4	0.5	0.7	0.9	1.1	1.3	1.4	1.6	9				
0.2	0.4	0.6	0.8	1.0	1.2	1.4	1.6	1.8	10				
0.2	0.4	0.7	0.9	1.1	1.3	1.5	1.8	2.0	11				
0.2	0.5	0.7	1.0	1.2	1.4	1.7	1.9	2.2	12				
0.3	0.5	0.8	1.0	1.3	1.6	1.8	2.1	2.3	13				
0.3	0.6	0.8	1.1	1.4	1.7	2.0	2.2	2.5	14				
0.3	0.6	0.9	1.2	1.5	1.8	2.1	2.4	2.7	15				
0.3	0.6	1.0	1.3	1.6	1.9	2.2	2.6	2.9	16				
0.3	0.7	1.0	1.4	1.7	2.0	2.4	2.7	3.1	17				
0.4	0.7	1.1	1.4	1.8	2.2	2.5	2.9	3.2	18				
0.4	0.8	1.1	1.5	1.9	2.3	2.7	3.0	3.4	19				
0.4	0.8	1.2	1.6	2.0	2.4	2.8	3.2	3.6	20				
0.4	0.8	1.3	1.7	2.1	2.5	2.9	3.4	3.8	21				
0.4	0.9	1.3	1.8	2.2	2.6	3.1	3.5	4.0	22				
0.5	0.9	1.4	1.8	2.3	2.8	3.2	3.7	4.1	23				
0.5	1.0	1.4	1.9	2.4	2.9	3.4	3.8	4.3	24				
0.5	1.0	1.5	2.0	2.5	3.0	3.5	4.0	4.5	25				
0.5	1.0	1.6	2.1	2.6	3.1	3.6	4.2	4.7	26				
0.5	1.1	1.6	2.2	2.7	3.2	3.8	4.3	4.9	27				
0.6	1.1	1.7	2.2	2.8	3.4	3.9	4.5	5.0	28				
0.6	1.2	1.7	2.3	2.9	3.5	4.1	4.6	5.2	29				
0.6	1.2	1.8	2.4	3.0	3.6	4.2	4.8	5.4	30				
0.6	1.2	1.9	2.5	3.1	3.7	4.3	5.0	5.6	31				
0.6	1.3	1.9	2.6	3.2	3.8	4.5	5.1	5.8	32				
0.7	1.3	2.0	2.6	3.3	4.0	4.6	5.3	5.9	33				
0.7	1.4	2.0	2.7	3.4	4.1	4.8	5.4	6.1	34				
0.7	1.4	2.1	2.8	3.5	4.2	4.9	5.6	6.3	35				
0.7	1.4	2.2	2.9	3.6	4.3	5.0	5.8	6.5	36				
0.7	1.5	2.2	3.0	3.7	4.4	5.2	5.9	6.7	37				
0.8	1.5	2.3	3.0	3.8	4.6	5.3	6.1	6.8	38				
0.8	1.6	2.3	3.1	3.9	4.7	5.5	6.2	7.0	39				
0.8	1.6	2.4	3.2	4.0	4.8	5.6	6.4	7.2	40				
0.8	1.6	2.5	3.3	4.1	4.9	5.7	6.6	7.4	41				
0.8	1.7	2.5	3.4	4.2	5.0	5.9	6.7	7.6	42				
0.9	1.7	2.6	3.4	4.3	5.2	6.0	6.9	7.7	43				
0.9	1.8	2.6	3.5	4.4	5.3	6.2	7.0	7.9	44				
0.9	1.8	2.7	3.6	4.5	5.4	6.3	7.2	8.1	45				
0.9	1.8	2.8	3.7	4.6	5.5	6.4	7.4	8.3	46				
0.9	1.9	2.8	3.8	4.7	5.6	6.6	7.5	8.5	47				
1.0	1.9	2.9	3.8	4.8	5.8	6.7	7.7	8.6	48				
1.0	2.0	2.9	3.9	4.9	5.9	6.9	7.8	8.8	49				
1.0	2.0	3.0	4.0	5.0	6.0	7.0	8.0	9.0	50				
1.0	2.0	3.1	4.1	5.1	6.1	7.1	8.2	9.2	51				
1.0	2.1	3.1	4.2	5.2	6.2	7.3	8.3	9.4	52				
1.1	2.1	3.2	4.2	5.3	6.4	7.4	8.5	9.5	53				
1.1	2.2	3.2	4.3	5.4	6.5	7.6	8.6	9.7	54				
1.1	2.2	3.3	4.4	5.5	6.6	7.7	8.8	9.9	55				
1.1	2.2	3.4	4.5	5.6	6.7	7.8	9.0	10.1	56				
1.1	2.3	3.4	4.6	5.7	6.8	8.0	9.1	10.3	57				
1.2	2.3	3.5	4.6	5.8	7.0	8.1	9.3	10.4	58				
1.2	2.4	3.5	4.7	5.9	7.1	8.3	9.4	10.6	59				
1.2	2.4	3.6	4.8	6.0	7.2	8.4	9.6	10.8	60				

# INTERPOLACIONA TABLICA

## za izračunavanje trenutaka izlaza, zalaza i prolaza Meseca kroz meridijan

$\lambda$ $\frac{\Delta}{24}$	1°	2°	3°	4°	5°	6°	7°	8°	9°	10°	11°	12°	13°	14°	15°	16°	17°	18°	19°	20°	$\lambda$ $\frac{\Delta}{24}$
0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
0.2	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.3	0.3	0.2
0.3	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.2	0.2	0.2	0.2	0.2	0.3	0.3	0.3	0.3	0.3	0.4	0.4	0.4	0.3
0.4	0.0	0.1	0.1	0.1	0.1	0.2	0.2	0.2	0.2	0.3	0.3	0.3	0.3	0.4	0.4	0.4	0.5	0.5	0.5	0.5	0.4
0.5	0.0	0.1	0.1	0.1	0.2	0.2	0.2	0.3	0.3	0.3	0.4	0.4	0.4	0.5	0.5	0.5	0.6	0.6	0.6	0.7	0.5
0.6	0.0	0.1	0.1	0.2	0.2	0.2	0.3	0.3	0.4	0.4	0.4	0.5	0.5	0.6	0.6	0.6	0.7	0.7	0.8	0.8	0.6
0.7	0.0	0.1	0.1	0.2	0.2	0.3	0.3	0.4	0.4	0.5	0.5	0.6	0.6	0.7	0.7	0.7	0.8	0.8	0.9	0.9	0.7
0.8	0.1	0.1	0.2	0.2	0.3	0.3	0.4	0.4	0.5	0.5	0.6	0.6	0.7	0.7	0.8	0.8	0.9	1.0	1.0	1.1	0.8
0.9	0.1	0.1	0.2	0.2	0.3	0.4	0.4	0.5	0.5	0.6	0.7	0.7	0.8	0.8	0.9	1.0	1.0	1.1	1.1	1.2	0.9
1.0	0.1	0.1	0.2	0.3	0.3	0.4	0.5	0.5	0.6	0.7	0.7	0.8	0.9	0.9	1.0	1.1	1.1	1.2	1.3	1.3	1.0
1.1	0.1	0.1	0.2	0.3	0.4	0.4	0.5	0.6	0.7	0.7	0.8	0.9	1.0	1.0	1.1	1.2	1.2	1.3	1.4	1.5	1.1
1.2	0.1	0.2	0.2	0.3	0.4	0.5	0.6	0.6	0.7	0.8	0.9	1.0	1.0	1.1	1.2	1.3	1.4	1.4	1.5	1.6	1.2
1.3	0.1	0.2	0.3	0.3	0.4	0.5	0.6	0.7	0.8	0.9	1.0	1.0	1.1	1.2	1.3	1.4	1.5	1.6	1.6	1.7	1.3
1.4	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.7	0.8	0.9	1.0	1.1	1.2	1.3	1.4	1.5	1.6	1.7	1.8	1.9	1.4
1.5	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9	1.0	1.1	1.2	1.3	1.4	1.5	1.6	1.7	1.8	1.9	2.0	1.5
1.6	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.9	1.0	1.1	1.2	1.3	1.4	1.5	1.6	1.7	1.8	1.9	2.0	2.1	1.6
1.7	0.1	0.2	0.3	0.5	0.6	0.7	0.8	0.9	1.0	1.1	1.2	1.4	1.5	1.6	1.7	1.8	1.9	2.0	2.2	2.3	1.7
1.8	0.1	0.2	0.4	0.5	0.6	0.7	0.8	1.0	1.1	1.2	1.3	1.4	1.6	1.7	1.8	1.9	2.0	2.2	2.3	2.4	1.8
1.9	0.1	0.3	0.4	0.5	0.6	0.8	0.9	1.0	1.1	1.3	1.4	1.5	1.6	1.8	1.9	2.0	2.2	2.3	2.4	2.5	1.9
2.0	0.1	0.3	0.4	0.5	0.7	0.8	0.9	1.1	1.2	1.3	1.5	1.6	1.7	1.9	2.0	2.1	2.3	2.4	2.5	2.7	2.0
2.1	0.1	0.3	0.4	0.6	0.7	0.8	1.0	1.1	1.3	1.4	1.5	1.7	1.8	2.0	2.1	2.2	2.4	2.5	2.7	2.8	2.1
2.2	0.1	0.3	0.4	0.6	0.7	0.9	1.0	1.2	1.3	1.5	1.6	1.8	1.9	2.1	2.2	2.3	2.5	2.6	2.8	2.9	2.2
2.3	0.2	0.3	0.5	0.6	0.8	0.9	1.1	1.2	1.4	1.5	1.7	1.8	2.0	2.1	2.3	2.5	2.6	2.8	2.9	3.1	2.3
2.4	0.2	0.3	0.5	0.6	0.8	1.0	1.1	1.3	1.4	1.6	1.8	1.9	2.1	2.2	2.4	2.6	2.7	2.9	3.0	3.2	2.4
2.5	0.2	0.3	0.5	0.7	0.8	1.0	1.2	1.3	1.5	1.7	1.8	2.0	2.2	2.3	2.5	2.7	2.8	3.0	3.2	3.3	2.5
2.6	0.2	0.3	0.5	0.7	0.9	1.0	1.2	1.4	1.6	1.7	1.9	2.1	2.3	2.4	2.6	2.8	2.9	3.1	3.3	3.5	2.6
2.7	0.2	0.4	0.5	0.7	0.9	1.1	1.3	1.4	1.6	1.8	2.0	2.2	2.3	2.5	2.7	2.9	3.1	3.2	3.4	3.6	2.7
2.8	0.2	0.4	0.6	0.7	0.9	1.1	1.3	1.5	1.7	1.9	2.1	2.2	2.4	2.6	2.8	3.0	3.2	3.4	3.5	3.7	2.8
2.9	0.2	0.4	0.6	0.8	1.0	1.2	1.4	1.5	1.7	1.9	2.1	2.3	2.5	2.7	2.9	3.1	3.3	3.5	3.7	3.9	2.9
3.0	0.2	0.4	0.6	0.8	1.0	1.2	1.4	1.6	1.8	2.0	2.2	2.4	2.6	2.8	3.0	3.2	3.4	3.6	3.8	4.0	3.0
3.1	0.2	0.4	0.6	0.8	1.0	1.2	1.4	1.7	1.9	2.1	2.3	2.5	2.7	2.9	3.1	3.3	3.5	3.7	3.9	4.1	3.1
3.2	0.2	0.4	0.6	0.9	1.1	1.3	1.5	1.7	1.9	2.1	2.3	2.6	2.8	3.0	3.2	3.4	3.6	3.8	4.1	4.3	3.2
3.3	0.2	0.4	0.7	0.9	1.1	1.3	1.5	1.8	2.0	2.2	2.4	2.6	2.9	3.1	3.3	3.5	3.7	4.0	4.2	4.4	3.3
3.4	0.2	0.5	0.7	0.9	1.1	1.4	1.6	1.8	2.0	2.3	2.5	2.7	2.9	3.2	3.4	3.6	3.9	4.1	4.3	4.5	3.4
3.5	0.2	0.5	0.7	0.9	1.2	1.4	1.6	1.9	2.1	2.3	2.6	2.8	3.0	3.3	3.5	3.7	4.0	4.2	4.4	4.7	3.5
3.6	0.2	0.5	0.7	1.0	1.2	1.4	1.7	1.9	2.2	2.4	2.6	2.9	3.1	3.4	3.6	3.8	4.1	4.3	4.6	4.8	3.6
3.7	0.2	0.5	0.7	1.0	1.2	1.5	1.7	2.0	2.2	2.5	2.7	3.0	3.2	3.5	3.7	3.9	4.2	4.4	4.7	4.9	3.7
3.8	0.3	0.5	0.8	1.0	1.3	1.5	1.8	2.0	2.3	2.5	2.8	3.0	3.3	3.5	3.8	4.1	4.3	4.6	4.8	5.1	3.8
3.9	0.3	0.5	0.8	1.0	1.3	1.6	1.8	2.1	2.3	2.6	2.9	3.1	3.4	3.6	3.9	4.2	4.4	4.7	4.9	5.2	3.9
4.0	0.3	0.5	0.8	1.1	1.3	1.6	1.9	2.1	2.4	2.7	2.9	3.2	3.5	3.7	4.0	4.3	4.5	4.8	5.1	5.3	4.0
4.1	0.3	0.5	0.8	1.1	1.4	1.6	1.9	2.2	2.5	2.7	3.0	3.3	3.6	3.8	4.1	4.4	4.6	4.9	5.2	5.5	4.1
4.2	0.3	0.6	0.8	1.1	1.4	1.7	2.0	2.2	2.5	2.8	3.1	3.4	3.6	3.9	4.2	4.5	4.8	5.0	5.3	5.6	4.2
4.3	0.3	0.6	0.9	1.1	1.4	1.7	2.0	2.3	2.6	2.9	3.2	3.4	3.7	4.0	4.3	4.6	4.9	5.2	5.4	5.7	4.3
4.4	0.3	0.6	0.9	1.2	1.5	1.8	2.1	2.3	2.6	2.9	3.2	3.5	3.8	4.1	4.4	4.7	5.0	5.3	5.6	5.9	4.4
4.5	0.3	0.6	0.9	1.2	1.5	1.8	2.1	2.4	2.7	3.0	3.3	3.6	3.9	4.2	4.5	4.8	5.1	5.4	5.7	6.0	4.5
4.6	0.3	0.6	0.9	1.2	1.5	1.8	2.1	2.5	2.8	3.1	3.4	3.7	4.0	4.3	4.6	4.9	5.2	5.5	5.8	6.1	4.6
4.7	0.3	0.6	0.9	1.3	1.6	1.9	2.2	2.5	2.8	3.1	3.4	3.8	4.1	4.4	4.7	5.0	5.3	5.6	6.0	6.3	4.7
4.8	0.3	0.6	1.0	1.3	1.6	1.9	2.2	2.6	2.9	3.2	3.5	3.8	4.2	4.5	4.8	5.1	5.4	5.8	6.1	6.4	4.8
4.9	0.3	0.7	1.0	1.3	1.6	2.0	2.3	2.6	2.9	3.3	3.6	3.9	4.2	4.6	4.9	5.2	5.6	5.9	6.2	6.5	4.9
5.0	0.3	0.7	1.0	1.3	1.7	2.0	2.3	2.7	3.0	3.3	3.7	4.0	4.3	4.7	5.0	5.3	5.7	6.0	6.3	6.7	5.0

# INTERPOLACIONA TABLICA

za izračunavanje trenutaka izlaza, zalaza i prolaza Meseca kroz meridijan

$\lambda$																	$\lambda$	
$\frac{\Delta}{24}$	20°	30°	40°	50°	60°	70°	80°	90°	100°	110°	120°	130°	140°	150°	160°	170°	180°	$\frac{\Delta}{24}$
0.1	0.1	0.2	0.3	0.3	0.4	0.5	0.5	0.6	0.7	0.7	0.8	0.9	0.9	1.0	1.1	1.1	1.2	0.1
0.2	0.3	0.4	0.5	0.7	0.8	0.9	1.1	1.2	1.3	1.5	1.6	1.7	1.9	2.0	2.1	2.3	2.4	0.2
0.3	0.4	0.6	0.8	1.0	1.2	1.4	1.6	1.8	2.0	2.2	2.4	2.6	2.8	3.0	3.2	3.4	3.6	0.3
0.4	0.5	0.8	1.1	1.3	1.6	1.9	2.1	2.4	2.7	2.9	3.2	3.5	3.7	4.0	4.3	4.5	4.8	0.4
0.5	0.7	1.0	1.3	1.7	2.0	2.3	2.7	3.0	3.3	3.7	4.0	4.3	4.7	5.0	5.3	5.7	6.0	0.5
0.6	0.8	1.2	1.6	2.0	2.4	2.8	3.2	3.6	4.0	4.4	4.8	5.2	5.6	6.0	6.4	6.8	7.2	0.6
0.7	0.9	1.4	1.9	2.3	2.8	3.3	3.7	4.2	4.7	5.1	5.6	6.1	6.5	7.0	7.5	7.9	8.4	0.7
0.8	1.1	1.6	2.1	2.7	3.2	3.7	4.3	4.8	5.3	5.9	6.4	6.9	7.5	8.0	8.5	9.1	9.6	0.8
0.9	1.2	1.8	2.4	3.0	3.6	4.2	4.8	5.4	6.0	6.6	7.2	7.8	8.4	9.0	9.6	10.2	10.8	0.9
1.0	1.3	2.0	2.7	3.3	4.0	4.7	5.3	6.0	6.7	7.3	8.0	8.7	9.3	10.0	10.7	11.3	12.0	1.0
1.1	1.5	2.2	2.9	3.7	4.4	5.1	5.9	6.6	7.3	8.1	8.8	9.5	10.3	11.0	11.7	12.5	13.2	1.1
1.2	1.6	2.4	3.2	4.0	4.8	5.6	6.4	7.2	8.0	8.8	9.6	10.4	11.2	12.0	12.8	13.6	14.4	1.2
1.3	1.7	2.6	3.5	4.3	5.2	6.1	6.9	7.8	8.7	9.5	10.4	11.3	12.1	13.0	13.9	14.7	15.6	1.3
1.4	1.9	2.8	3.7	4.7	5.6	6.5	7.5	8.4	9.3	10.3	11.2	12.1	13.1	14.0	14.9	15.9	16.8	1.4
1.5	2.0	3.0	4.0	5.0	6.0	7.0	8.0	9.0	10.0	11.0	12.0	13.0	14.0	15.0	16.0	17.0	18.0	1.5
1.6	2.1	3.2	4.3	5.3	6.4	7.5	8.5	9.6	10.7	11.7	12.8	13.9	14.9	16.0	17.1	18.1	19.2	1.6
1.7	2.3	3.4	4.5	5.7	6.8	7.9	9.1	10.2	11.3	12.5	13.6	14.7	15.9	17.0	18.1	19.3	20.4	1.7
1.8	2.4	3.6	4.8	6.0	7.2	8.4	9.6	10.8	12.0	13.2	14.4	15.6	16.8	18.0	19.2	20.4	21.6	1.8
1.9	2.5	3.8	5.1	6.3	7.6	8.9	10.1	11.4	12.7	13.9	15.2	16.5	17.7	19.0	20.3	21.5	22.8	1.9
2.0	2.7	4.0	5.3	6.7	8.0	9.3	10.7	12.0	13.3	14.7	16.0	17.3	18.7	20.0	21.3	22.7	24.0	2.0
2.1	2.8	4.2	5.6	7.0	8.4	9.8	11.2	12.6	14.0	15.4	16.8	18.2	19.6	21.0	22.4	23.8	25.2	2.1
2.2	2.9	4.4	5.9	7.3	8.8	10.3	11.7	13.2	14.7	16.1	17.6	19.1	20.5	22.0	23.5	24.9	26.4	2.2
2.3	3.1	4.6	6.1	7.7	9.2	10.7	12.3	13.8	15.3	16.9	18.4	19.9	21.5	23.0	24.5	26.1	27.6	2.3
2.4	3.2	4.8	6.4	8.0	9.6	11.2	12.8	14.4	16.0	17.6	19.2	20.8	22.4	24.0	25.6	27.2	28.8	2.4
2.5	3.3	5.0	6.7	8.3	10.0	11.7	13.3	15.0	16.7	18.3	20.0	21.7	23.3	25.0	26.7	28.3	30.0	2.5
2.6	3.5	5.2	6.9	8.7	10.4	12.1	13.9	15.6	17.3	19.1	20.8	22.5	24.3	26.0	27.7	29.5	31.2	2.6
2.7	3.6	5.4	7.2	9.0	10.8	12.6	14.4	16.2	18.0	19.8	21.6	23.4	25.2	27.0	28.8	30.6	32.4	2.7
2.8	3.7	5.6	7.5	9.3	11.2	13.1	14.9	16.8	18.7	20.5	22.4	24.3	26.1	28.0	29.9	31.7	33.6	2.8
2.9	3.9	5.8	7.7	9.7	11.6	13.5	15.5	17.4	19.3	21.3	23.2	25.1	27.1	29.0	30.9	32.9	34.8	2.9
3.0	4.0	6.0	8.0	10.0	12.0	14.0	16.0	18.0	20.0	22.0	24.0	26.0	28.0	30.0	32.0	34.0	36.0	3.0
3.1	4.1	6.2	8.3	10.3	12.4	14.5	16.5	18.6	20.7	22.7	24.8	26.9	28.9	31.0	33.1	35.1	37.2	3.1
3.2	4.3	6.4	8.5	10.7	12.8	14.9	17.1	19.2	21.3	23.5	25.6	27.7	29.9	32.0	34.1	36.3	38.4	3.2
3.3	4.4	6.6	8.8	11.0	13.2	15.4	17.6	19.8	22.0	24.2	26.4	28.6	30.8	33.0	35.2	37.4	39.6	3.3
3.4	4.5	6.8	9.1	11.3	13.6	15.9	18.1	20.4	22.7	24.9	27.2	29.5	31.7	34.0	36.3	38.5	40.8	3.4
3.5	4.7	7.0	9.3	11.7	14.0	16.3	18.7	21.0	23.3	25.7	28.0	30.3	32.7	35.0	37.3	39.7	42.0	3.5
3.6	4.8	7.2	9.6	12.0	14.4	16.8	19.2	21.6	24.0	26.4	28.8	31.2	33.6	36.0	38.4	40.8	43.2	3.6
3.7	4.9	7.4	9.9	12.3	14.8	17.3	19.7	22.2	24.7	27.1	29.6	32.1	34.5	37.0	39.5	41.9	44.4	3.7
3.8	5.1	7.6	10.1	12.7	15.2	17.7	20.3	22.8	25.3	27.9	30.4	32.9	35.5	38.0	40.5	43.1	45.6	3.8
3.9	5.2	7.8	10.4	13.0	15.6	18.2	20.8	23.4	26.0	28.6	31.2	33.8	36.4	39.0	41.6	44.2	46.8	3.9
4.0	5.3	8.0	10.7	13.3	16.0	18.7	21.3	24.0	26.7	29.3	32.0	34.7	37.3	40.0	42.7	45.3	48.0	4.0
4.1	5.5	8.2	10.9	13.7	16.4	19.1	21.9	24.6	27.3	30.1	32.8	35.5	38.3	41.0	43.7	46.5	49.2	4.1
4.2	5.6	8.4	11.2	14.0	16.8	19.6	22.4	25.2	28.0	30.8	33.6	36.4	39.2	42.0	44.8	47.6	50.4	4.2
4.3	5.7	8.6	11.5	14.3	17.2	20.1	22.9	25.8	28.7	31.5	34.4	37.3	40.1	43.0	45.9	48.7	51.6	4.3
4.4	5.9	8.8	11.7	14.7	17.6	20.5	23.5	26.4	29.3	32.3	35.2	38.1	41.1	44.0	46.9	49.9	52.8	4.4
4.5	6.0	9.0	12.0	15.0	18.0	21.0	24.0	27.0	30.0	33.0	36.0	39.0	42.0	45.0	48.0	51.0	54.0	4.5
4.6	6.1	9.2	12.3	15.3	18.4	21.5	24.5	27.6	30.7	33.7	36.8	39.9	42.9	46.0	49.1	52.1	55.2	4.6
4.7	6.3	9.4	12.5	15.7	18.8	21.9	25.1	28.2	31.3	34.5	37.6	40.7	43.9	47.0	50.1	53.3	56.4	4.7
4.8	6.4	9.6	12.8	16.0	19.2	22.4	25.6	28.8	32.0	35.2	38.4	41.6	44.8	48.0	51.2	54.4	57.6	4.8
4.9	6.5	9.8	13.1	16.3	19.6	22.9	26.1	29.4	32.7	35.9	39.2	42.5	45.7	49.0	52.3	55.5	58.8	4.9
5.0	6.7	10.0	13.3	16.7	20.0	23.3	26.7	30.0	33.3	36.7	40.0	43.3	46.7	50.0	53.3	56.7	60.0	5.0



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# ***I<sub>n</sub>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.	
	o	'	o	'	o	'	o	'	o	'
0	0	.0	0	.0	0	.0	60	.1	120	.1
1	0	.3	0	.3	0	.2	1	.0	61	.1
2	0	.5	0	.5	0	.5	2	.0	62	.1
3	0	.8	0	.8	0	.7	3	.0	63	.1
4	0	1.0	0	1.0	0	1.0	4	.0	64	.1
5	0	1.3	0	1.3	0	1.2	5	.0	65	.1
6	0	1.5	0	1.5	0	1.4	6	.0	66	.1
7	0	1.8	0	1.8	0	1.7	7	.0	67	.1
8	0	2.0	0	2.0	0	1.9	8	.0	68	.1
9	0	2.3	0	2.3	0	2.1	9	.0	69	.1
10	0	2.5	0	2.5	0	2.4	10	.0	70	.1
11	0	2.8	0	2.8	0	2.6	11	.0	71	.1
12	0	3.0	0	3.0	0	2.9	12	.0	72	.1
13	0	3.3	0	3.3	0	3.1	13	.0	73	.1
14	0	3.5	0	3.5	0	3.3	14	.0	74	.1
15	0	3.8	0	3.8	0	3.6	15	.0	75	.1
16	0	4.0	0	4.0	0	3.8	16	.0	76	.1
17	0	4.3	0	4.3	0	4.1	17	.0	77	.1
18	0	4.5	0	4.5	0	4.3	18	.0	78	.1
19	0	4.8	0	4.8	0	4.5	19	.0	79	.1
20	0	5.0	0	5.0	0	4.8	20	.0	80	.1
21	0	5.3	0	5.3	0	5.0	21	.0	81	.1
22	0	5.5	0	5.5	0	5.2	22	.0	82	.1
23	0	5.8	0	5.8	0	5.5	23	.0	83	.1
24	0	6.0	0	6.0	0	5.7	24	.0	84	.1
25	0	6.3	0	6.3	0	6.0	25	.0	85	.1
26	0	6.5	0	6.5	0	6.2	26	.0	86	.1
27	0	6.8	0	6.8	0	6.4	27	.0	87	.1
28	0	7.0	0	7.0	0	6.7	28	.0	88	.1
29	0	7.3	0	7.3	0	6.9	29	.0	89	.1
30	0	7.5	0	7.5	0	7.2	30	.0	90	.1
31	0	7.8	0	7.8	0	7.4	31	.0	91	.1
32	0	8.0	0	8.0	0	7.6	32	.0	92	.1
33	0	8.3	0	8.3	0	7.9	33	.0	93	.1
34	0	8.5	0	8.5	0	8.1	34	.0	94	.1
35	0	8.8	0	8.8	0	8.4	35	.0	95	.1
36	0	9.0	0	9.0	0	8.6	36	.0	96	.1
37	0	9.3	0	9.3	0	8.8	37	.0	97	.1
38	0	9.5	0	9.5	0	9.1	38	.0	98	.1
39	0	9.8	0	9.8	0	9.3	39	.0	99	.1
40	0	10.0	0	10.0	0	9.5	40	.0	100	.1
41	0	10.3	0	10.3	0	9.8	41	.0	101	.1
42	0	10.5	0	10.5	0	10.0	42	.0	102	.1
43	0	10.8	0	10.8	0	10.3	43	.0	103	.1
44	0	11.0	0	11.0	0	10.5	44	.0	104	.1
45	0	11.3	0	11.3	0	10.7	45	.0	105	.1
46	0	11.5	0	11.5	0	11.0	46	.0	106	.1
47	0	11.8	0	11.8	0	11.2	47	.0	107	.1
48	0	12.0	0	12.0	0	11.5	48	.0	108	.1
49	0	12.3	0	12.3	0	11.7	49	.0	109	.1
50	0	12.5	0	12.5	0	11.9	50	.0	110	.1
51	0	12.8	0	12.8	0	12.2	51	.0	111	.1
52	0	13.0	0	13.0	0	12.4	52	.0	112	.1
53	0	13.3	0	13.3	0	12.6	53	.0	113	.1
54	0	13.5	0	13.5	0	12.9	54	.0	114	.1
55	0	13.8	0	13.8	0	13.1	55	.0	115	.1
56	0	14.0	0	14.0	0	13.4	56	.0	116	.1
57	0	14.3	0	14.3	0	13.6	57	.0	117	.1
58	0	14.5	0	14.5	0	13.8	58	.0	118	.1
59	0	14.8	0	14.8	0	14.1	59	.0	119	.1
60	0	15.0	0	15.0	0	14.3	60	.1	120	.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.	
	o	'	o	'	o	'	o	'	o	'
0	0	15.0	0	15.0	0	14.3	0	.0	60	.2
1	0	15.3	0	15.3	0	14.6	1	.0	61	.2
2	0	15.5	0	15.5	0	14.8	2	.0	62	.2
3	0	15.8	0	15.8	0	15.0	3	.0	63	.2
4	0	16.0	0	16.0	0	15.3	4	.0	64	.2
5	0	16.3	0	16.3	0	15.5	5	.0	65	.2
6	0	16.5	0	16.5	0	15.7	6	.0	66	.2
7	0	16.8	0	16.8	0	16.0	7	.0	67	.2
8	0	17.0	0	17.0	0	16.2	8	.0	68	.2
9	0	17.3	0	17.3	0	16.5	9	.0	69	.2
10	0	17.5	0	17.5	0	16.7	10	.0	70	.2
11	0	17.8	0	17.8	0	16.9	11	.0	71	.2
12	0	18.0	0	18.1	0	17.2	12	.0	72	.2
13	0	18.3	0	18.3	0	17.4	13	.0	73	.2
14	0	18.5	0	18.6	0	17.7	14	.0	74	.2
15	0	18.8	0	18.8	0	17.9	15	.0	75	.2
16	0	19.0	0	19.1	0	18.1	16	.0	76	.2
17	0	19.3	0	19.3	0	18.4	17	.0	77	.2
18	0	19.5	0	19.6	0	18.6	18	.0	78	.2
19	0	19.8	0	19.8	0	18.9	19	.0	79	.2
20	0	20.0	0	20.1	0	19.1	20	.1	80	.2
21	0	20.3	0	20.3	0	19.3	21	.1	81	.2
22	0	20.5	0	20.6	0	19.6	22	.1	82	.2
23	0	20.8	0	20.8	0	19.8	23	.1	83	.2
24	0	21.0	0	21.1	0	20.0	24	.1	84	.2
25	0	21.3	0	21.3	0	20.3	25	.1	85	.2
26	0	21.5	0	21.6	0	20.5	26	.1	86	.2
27	0	21.8	0	21.8	0	20.8	27	.1	87	.2
28	0	22.0	0	22.1	0	21.0	28	.1	88	.2
29	0	22.3	0	22.3	0	21.2	29	.1	89	.2
30	0	22.5	0	22.6	0	21.5	30	.1	90	.2
31	0	22.8	0	22.8	0	21.7	31	.1	91	.2
32	0	23.0	0	23.1	0	22.0	32	.1	92	.2
33	0	23.3	0	23.3	0	22.2	33	.1	93	.2
34	0	23.5	0	23.6	0	22.4	34	.1	94	.2
35	0	23.8	0	23.8	0	22.7	35	.1	95	.2
36	0	24.0	0	24.1	0	22.9	36	.1	96	.2
37	0	24.3	0	24.3	0	23.1	37	.1	97	.2
38	0	24.5	0	24.6	0	23.4	38	.1	98	.2
39	0	24.8	0	24.8	0	23.6	39	.1	99	.2
40	0	25.0	0	25.1	0	23.9	40	.1	100	.3
41	0	25.3	0	25.3	0	24.1	41	.1	101	.3
42	0	25.5	0	25.6	0	24.3	42	.1	102	.3
43	0	25.8	0	25.8	0	24.6	43	.1	103	.3
44	0	26.0	0	26.1	0	24.8	44	.1	104	.3
45	0	26.3	0	26.3	0	25.1	45	.1	105	.3
46	0	26.5	0	26.6	0	25.3	46	.1	106	.3
47	0	26.8	0	26.8	0	25.5	47	.1	107	.3
48	0	27.0	0	27.1	0	25.8	48	.1	108	.3
49	0	27.3	0	27.3	0	26.0	49	.1	109	.3
50	0	27.5	0	27.6	0	26.2	50	.1	110	.3
51	0	27.8	0	27.8	0	26.5	51	.1	111	.3
52	0	28.0	0	28.1	0	26.7	52	.1	112	.3
53	0	28.3	0	28.3	0	27.0	53	.1	113	.3
54	0	28.5	0	28.6	0	27.2	54	.1	114	.3
55	0	28.8	0	28.8	0	27.4	55	.1	115	.3
56	0	29.0	0	29.1	0	27.7	56	.1	116	.3
57	0	29.3	0	29.3	0	27.9	57	.1	117	.3
58	0	29.5	0	29.6	0	28.2	58	.1	118	.3
59	0	29.8	0	29.8	0	28.4	59	.1	119	.3
60	0	30.0	0	30.1	0	28.6	60	.2	120	.3

## 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.
	o	'	o	'	o	'	'
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 .5 134 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.
	o	'	o	'	o	'	'
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.	
	° /	° /	° /	° /	° /	° /	° /
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.	
	° /	° /	° /	° /	° /	° /	° /
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 2.2	
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.	
				°	'	°	'
0	2 30.0	2 30.4	2 23.2	0	.0	60	1.1
1	2 30.3	2 30.7	2 23.4	1	.0	61	1.1
2	2 30.5	2 30.9	2 23.6	2	.0	62	1.1
3	2 30.8	2 31.2	2 23.9	3	.1	63	1.1
4	2 31.0	2 31.4	2 24.1	4	.1	64	1.1
5	2 31.3	2 31.7	2 24.4	5	.1	65	1.1
6	2 31.5	2 31.9	2 24.6	6	.1	66	1.2
7	2 31.8	2 32.2	2 24.8	7	.1	67	1.2
8	2 32.0	2 32.4	2 25.1	8	.1	68	1.2
9	2 32.3	2 32.7	2 25.3	9	.2	69	1.2
10	2 32.5	2 32.9	2 25.6	10	.2	70	1.2
11	2 32.8	2 33.2	2 25.8	11	.2	71	1.2
12	2 33.0	2 33.4	2 26.0	12	.2	72	1.3
13	2 33.3	2 33.7	2 26.3	13	.2	73	1.3
14	2 33.5	2 33.9	2 26.5	14	.2	74	1.3
15	2 33.8	2 34.2	2 26.7	15	.3	75	1.3
16	2 34.0	2 34.4	2 27.0	16	.3	76	1.3
17	2 34.3	2 34.7	2 27.2	17	.3	77	1.3
18	2 34.5	2 34.9	2 27.5	18	.3	78	1.4
19	2 34.8	2 35.2	2 27.7	19	.3	79	1.4
20	2 35.0	2 35.4	2 27.9	20	.4	80	1.4
21	2 35.3	2 35.7	2 28.2	21	.4	81	1.4
22	2 35.5	2 35.9	2 28.4	22	.4	82	1.4
23	2 35.8	2 36.2	2 28.7	23	.4	83	1.5
24	2 36.0	2 36.4	2 28.9	24	.4	84	1.5
25	2 36.3	2 36.7	2 29.1	25	.4	85	1.5
26	2 36.5	2 36.9	2 29.4	26	.5	86	1.5
27	2 36.8	2 37.2	2 29.6	27	.5	87	1.5
28	2 37.0	2 37.4	2 29.8	28	.5	88	1.5
29	2 37.3	2 37.7	2 30.1	29	.5	89	1.6
30	2 37.5	2 37.9	2 30.3	30	.5	90	1.6
31	2 37.8	2 38.2	2 30.6	31	.5	91	1.6
32	2 38.0	2 38.4	2 30.8	32	.6	92	1.6
33	2 38.3	2 38.7	2 31.0	33	.6	93	1.6
34	2 38.5	2 38.9	2 31.3	34	.6	94	1.6
35	2 38.8	2 39.2	2 31.5	35	.6	95	1.7
36	2 39.0	2 39.4	2 31.8	36	.6	96	1.7
37	2 39.3	2 39.7	2 32.0	37	.6	97	1.7
38	2 39.5	2 39.9	2 32.2	38	.7	98	1.7
39	2 39.8	2 40.2	2 32.5	39	.7	99	1.7
40	2 40.0	2 40.4	2 32.7	40	.7	100	1.8
41	2 40.3	2 40.7	2 32.9	41	.7	101	1.8
42	2 40.5	2 40.9	2 33.2	42	.7	102	1.8
43	2 40.8	2 41.2	2 33.4	43	.8	103	1.8
44	2 41.0	2 41.4	2 33.7	44	.8	104	1.8
45	2 41.3	2 41.7	2 33.9	45	.8	105	1.8
46	2 41.5	2 41.9	2 34.1	46	.8	106	1.9
47	2 41.8	2 42.2	2 34.4	47	.8	107	1.9
48	2 42.0	2 42.5	2 34.6	48	.8	108	1.9
49	2 42.3	2 42.7	2 34.9	49	.9	109	1.9
50	2 42.5	2 43.0	2 35.1	50	.9	110	1.9
51	2 42.8	2 43.2	2 35.3	51	.9	111	1.9
52	2 43.0	2 43.5	2 35.6	52	.9	112	2.0
53	2 43.3	2 43.7	2 35.8	53	.9	113	2.0
54	2 43.5	2 44.0	2 36.1	54	.9	114	2.0
55	2 43.8	2 44.2	2 36.3	55	1.0	115	2.0
56	2 44.0	2 44.5	2 36.5	56	1.0	116	2.0
57	2 44.3	2 44.7	2 36.8	57	1.0	117	2.0
58	2 44.5	2 45.0	2 37.0	58	1.0	118	2.1
59	2 44.8	2 45.2	2 37.2	59	1.0	119	2.1
60	2 45.0	2 45.5	2 37.5	60	1.1	120	2.1

## 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.	
				°	'	°	'
0	2 45.0	2 45.5	2 37.5	0	.0	60	1.2
1	2 45.3	2 45.7	2 37.7	1	.0	61	1.2
2	2 45.5	2 46.0	2 38.0	2	.0	62	1.2
3	2 45.8	2 46.2	2 38.2	3	.1	63	1.2
4	2 46.0	2 46.5	2 38.4	4	.1	64	1.2
5	2 46.3	2 46.7	2 38.7	5	.1	65	1.2
6	2 46.5	2 47.0	2 38.9	6	.1	66	1.3
7	2 46.8	2 47.2	2 39.2	7	.1	67	1.3
8	2 47.0	2 47.5	2 39.4	8	.2	68	1.3
9	2 47.3	2 47.7	2 39.6	9	.2	69	1.3
10	2 47.5	2 48.0	2 39.9	10	.2	70	1.3
11	2 47.8	2 48.2	2 40.1	11	.2	71	1.4
12	2 48.0	2 48.5	2 40.3	12	.2	72	1.4
13	2 48.3	2 48.7	2 40.6	13	.2	73	1.4
14	2 48.5	2 49.0	2 40.8	14	.3	74	1.4
15	2 48.8	2 49.2	2 41.1	15	.3	75	1.4
16	2 49.0	2 49.5	2 41.3	16	.3	76	1.5
17	2 49.3	2 49.7	2 41.5	17	.3	77	1.5
18	2 49.5	2 50.0	2 41.8	18	.3	78	1.5
19	2 49.8	2 50.2	2 42.0	19	.4	79	1.5
20	2 50.0	2 50.5	2 42.3	20	.4	80	1.5
21	2 50.3	2 50.7	2 42.5	21	.4	81	1.6
22	2 50.5	2 51.0	2 42.7	22	.4	82	1.6
23	2 50.8	2 51.2	2 43.0	23	.4	83	1.6
24	2 51.0	2 51.5	2 43.2	24	.5	84	1.6
25	2 51.3	2 51.7	2 43.4	25	.5	85	1.6
26	2 51.5	2 52.0	2 43.7	26	.5	86	1.6
27	2 51.8	2 52.2	2 43.9	27	.5	87	1.7
28	2 52.0	2 52.5	2 44.2	28	.5	88	1.7
29	2 52.3	2 52.7	2 44.4	29	.6	89	1.7
30	2 52.5	2 53.0	2 44.6	30	.6	90	1.7
31	2 52.8	2 53.2	2 44.9	31	.6	91	1.7
32	2 53.0	2 53.5	2 45.1	32	.6	92	1.8
33	2 53.3	2 53.7	2 45.4	33	.6	93	1.8
34	2 53.5	2 54.0	2 45.6	34	.7	94	1.8
35	2 53.8	2 54.2	2 45.8	35	.7	95	1.8
36	2 54.0	2 54.5	2 46.1	36	.7	96	1.8
37	2 54.3	2 54.7	2 46.3	37	.7	97	1.9
38	2 54.5	2 55.0	2 46.6	38	.7	98	1.9
39	2 54.8	2 55.2	2 46.8	39	.7	99	1.9
40	2 55.0	2 55.5	2 47.0	40	.8	100	1.9
41	2 55.3	2 55.7	2 47.3	41	.8	101	1.9
42	2 55.5	2 56.0	2 47.5	42	.8	102	2.0
43	2 55.8	2 56.2	2 47.7	43	.8	103	2.0
44	2 56.0	2 56.5	2 48.0	44	.8	104	2.0
45	2 56.3	2 56.7	2 48.2	45	.9	105	2.0
46	2 56.5	2 57.0	2 48.5	46	.9	106	2.0
47	2 56.8	2 57.2	2 48.7	47	.9	107	2.1
48	2 57.0	2 57.5	2 48.9	48	.9	108	2.1
49	2 57.3	2 57.7	2 49.2	49	.9	109	2.1
50	2 57.5	2 58.0	2 49.4	50	1.0	110	2.1
51	2 57.8	2 58.2	2 49.7	51	1.0	111	2.1
52	2 58.0	2 58.5	2 49.9	52	1.0	112	2.1
53	2 58.3	2 58.7	2 50.1	53	1.0	113	2.2
54	2 58.5	2 59.0	2 50.4	54	1.0	114	2.2
55	2 58.8	2 59.2	2 50.6	55	1.1	115	2.2
56	2 59.0	2 59.5	2 50.8	56	1.1	116	2.2
57	2 59.3	2 59.7	2 51.1	57	1.1	117	2.2
58	2 59.5	2 60.0	2 51.3	58	1.1	118	2.3
59	2 59.8	3 .2	2 51.6	59	1.1	119	2.3
60	3 .0	3 .5	2 51.8	60	1.2	120	2.3

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.	
	o /	o /	o /	/	/	/	
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 3.2	
36	3 9.0	3 9.5	3 .4 36	.8 96	2.0 156	3.3 3.3	
37	3 9.3	3 9.8	3 .6 37	.8 97	2.0 157	3.3 3.3	
38	3 9.5	3 10.0	3 .9 38	.8 98	2.0 158	3.3 3.3	
39	3 9.8	3 10.3	3 1.1 39	.8 99	2.1 159	3.3 3.3	
40	3 10.0	3 10.5	3 1.3 40	.8 100	2.1 160	3.3 3.3	
41	3 10.3	3 10.8	3 1.6 41	.9 101	2.1 161	3.4 3.4	
42	3 10.5	3 11.0	3 1.8 42	.9 102	2.1 162	3.4 3.4	
43	3 10.8	3 11.3	3 2.1 43	.9 103	2.1 163	3.4 3.4	
44	3 11.0	3 11.5	3 2.3 44	.9 104	2.2 164	3.4 3.4	
45	3 11.3	3 11.8	3 2.5 45	.9 105	2.2 165	3.4 3.4	
46	3 11.5	3 12.0	3 2.8 46	1.0 106	2.2 166	3.5 3.5	
47	3 11.8	3 12.3	3 3.0 47	1.0 107	2.2 167	3.5 3.5	
48	3 12.0	3 12.5	3 3.3 48	1.0 108	2.3 168	3.5 3.5	
49	3 12.3	3 12.8	3 3.5 49	1.0 109	2.3 169	3.5 3.5	
50	3 12.5	3 13.0	3 3.7 50	1.0 110	2.3 170	3.5 3.5	
51	3 12.8	3 13.3	3 4.0 51	1.1 111	2.3 171	3.6 3.6	
52	3 13.0	3 13.5	3 4.2 52	1.1 112	2.3 172	3.6 3.6	
53	3 13.3	3 13.8	3 4.4 53	1.1 113	2.4 173	3.6 3.6	
54	3 13.5	3 14.0	3 4.7 54	1.1 114	2.4 174	3.6 3.6	
55	3 13.8	3 14.3	3 4.9 55	1.1 115	2.4 175	3.6 3.6	
56	3 14.0	3 14.5	3 5.2 56	1.2 116	2.4 176	3.7 3.7	
57	3 14.3	3 14.8	3 5.4 57	1.2 117	2.4 177	3.7 3.7	
58	3 14.5	3 15.0	3 5.6 58	1.2 118	2.5 178	3.7 3.7	
59	3 14.8	3 15.3	3 5.9 59	1.2 119	2.5 179	3.7 3.7	
60	3 15.0	3 15.5	3 6.1 60	1.3 120	2.5 180	3.8 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.	
	o /	o /	o /	/	/	/	
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.	
				°	'	°	'
0	3 30.0	3 30.6	3 20.4	0	.0	60	1.5
1	3 30.3	3 30.8	3 20.7	1	.0	61	1.5
2	3 30.5	3 31.1	3 20.9	2	.0	62	1.5
3	3 30.8	3 31.3	3 21.1	3	.1	63	1.5
4	3 31.0	3 31.6	3 21.4	4	.1	64	1.5
5	3 31.3	3 31.8	3 21.6	5	.1	65	1.6
6	3 31.5	3 32.1	3 21.9	6	.1	66	1.6
7	3 31.8	3 32.3	3 22.1	7	.2	67	1.6
8	3 32.0	3 32.6	3 22.3	8	.2	68	1.6
9	3 32.3	3 32.8	3 22.6	9	.2	69	1.7
10	3 32.5	3 33.1	3 22.8	10	.2	70	1.7
11	3 32.8	3 33.3	3 23.1	11	.3	71	1.7
12	3 33.0	3 33.6	3 23.3	12	.3	72	1.7
13	3 33.3	3 33.8	3 23.5	13	.3	73	1.8
14	3 33.5	3 34.1	3 23.8	14	.3	74	1.8
15	3 33.8	3 34.3	3 24.0	15	.4	75	1.8
16	3 34.0	3 34.6	3 24.3	16	.4	76	1.8
17	3 34.3	3 34.8	3 24.5	17	.4	77	1.9
18	3 34.5	3 35.1	3 24.7	18	.4	78	1.9
19	3 34.8	3 35.3	3 25.0	19	.5	79	1.9
20	3 35.0	3 35.6	3 25.2	20	.5	80	1.9
21	3 35.3	3 35.8	3 25.4	21	.5	81	2.0
22	3 35.5	3 36.1	3 25.7	22	.5	82	2.0
23	3 35.8	3 36.3	3 25.9	23	.6	83	2.0
24	3 36.0	3 36.6	3 26.2	24	.6	84	2.0
25	3 36.3	3 36.9	3 26.4	25	.6	85	2.1
26	3 36.5	3 37.1	3 26.6	26	.6	86	2.1
27	3 36.8	3 37.4	3 26.9	27	.7	87	2.1
28	3 37.0	3 37.6	3 27.1	28	.7	88	2.1
29	3 37.3	3 37.9	3 27.4	29	.7	89	2.2
30	3 37.5	3 38.1	3 27.6	30	.7	90	2.2
31	3 37.8	3 38.4	3 27.8	31	.7	91	2.2
32	3 38.0	3 38.6	3 28.1	32	.8	92	2.2
33	3 38.3	3 38.9	3 28.3	33	.8	93	2.2
34	3 38.5	3 39.1	3 28.5	34	.8	94	2.3
35	3 38.8	3 39.4	3 28.8	35	.8	95	2.3
36	3 39.0	3 39.6	3 29.0	36	.9	96	2.3
37	3 39.3	3 39.9	3 29.3	37	.9	97	2.3
38	3 39.5	3 40.1	3 29.5	38	.9	98	2.4
39	3 39.8	3 40.4	3 29.7	39	.9	99	2.4
40	3 40.0	3 40.6	3 30.0	40	1.0	100	2.4
41	3 40.3	3 40.9	3 30.2	41	1.0	101	2.4
42	3 40.5	3 41.1	3 30.5	42	1.0	102	2.5
43	3 40.8	3 41.4	3 30.7	43	1.0	103	2.5
44	3 41.0	3 41.6	3 30.9	44	1.1	104	2.5
45	3 41.3	3 41.9	3 31.2	45	1.1	105	2.5
46	3 41.5	3 42.1	3 31.4	46	1.1	106	2.6
47	3 41.8	3 42.4	3 31.6	47	1.1	107	2.6
48	3 42.0	3 42.6	3 31.9	48	1.2	108	2.6
49	3 42.3	3 42.9	3 32.1	49	1.2	109	2.6
50	3 42.5	3 43.1	3 32.4	50	1.2	110	2.7
51	3 42.8	3 43.4	3 32.6	51	1.2	111	2.7
52	3 43.0	3 43.6	3 32.8	52	1.3	112	2.7
53	3 43.3	3 43.9	3 33.1	53	1.3	113	2.7
54	3 43.5	3 44.1	3 33.3	54	1.3	114	2.8
55	3 43.8	3 44.4	3 33.6	55	1.3	115	2.8
56	3 44.0	3 44.6	3 33.8	56	1.4	116	2.8
57	3 44.3	3 44.9	3 34.0	57	1.4	117	2.8
58	3 44.5	3 45.1	3 34.3	58	1.4	118	2.9
59	3 44.8	3 45.4	3 34.5	59	1.4	119	2.9
60	3 45.0	3 45.6	3 34.8	60	1.5	120	2.9

## 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.	
				°	'	°	'
0	3 45.0	3 45.6	3 34.8	0	.0	60	1.6
1	3 45.3	3 45.9	3 35.0	1	.0	61	1.6
2	3 45.5	3 46.1	3 35.2	2	.1	62	1.6
3	3 45.8	3 46.4	3 35.5	3	.1	63	1.6
4	3 46.0	3 46.6	3 35.7	4	.1	64	1.7
5	3 46.3	3 46.9	3 35.9	5	.1	65	1.7
6	3 46.5	3 47.1	3 36.2	6	.2	66	1.7
7	3 46.8	3 47.4	3 36.4	7	.2	67	1.7
8	3 47.0	3 47.6	3 36.7	8	.2	68	1.8
9	3 47.3	3 47.9	3 36.9	9	.2	69	1.8
10	3 47.5	3 48.1	3 37.1	10	.3	70	1.8
11	3 47.8	3 48.4	3 37.4	11	.3	71	1.8
12	3 48.0	3 48.6	3 37.6	12	.3	72	1.9
13	3 48.3	3 48.9	3 37.9	13	.3	73	1.9
14	3 48.5	3 49.1	3 38.1	14	.4	74	1.9
15	3 48.8	3 49.4	3 38.3	15	.4	75	1.9
16	3 49.0	3 49.6	3 38.6	16	.4	76	2.0
17	3 49.3	3 49.9	3 38.8	17	.4	77	2.0
18	3 49.5	3 50.1	3 39.0	18	.5	78	2.0
19	3 49.8	3 50.4	3 39.3	19	.5	79	2.0
20	3 50.0	3 50.6	3 39.5	20	.5	80	2.1
21	3 50.3	3 50.9	3 39.8	21	.5	81	2.1
22	3 50.5	3 51.1	3 40.0	22	.6	82	2.1
23	3 50.8	3 51.4	3 40.2	23	.6	83	2.1
24	3 51.0	3 51.6	3 40.5	24	.6	84	2.2
25	3 51.3	3 51.9	3 40.7	25	.6	85	2.2
26	3 51.5	3 52.1	3 41.0	26	.7	86	2.2
27	3 51.8	3 52.4	3 41.2	27	.7	87	2.2
28	3 52.0	3 52.6	3 41.4	28	.7	88	2.3
29	3 52.3	3 52.9	3 41.7	29	.7	89	2.3
30	3 52.5	3 53.1	3 41.9	30	.8	90	2.3
31	3 52.8	3 53.4	3 42.1	31	.8	91	2.4
32	3 53.0	3 53.6	3 42.4	32	.8	92	2.4
33	3 53.3	3 53.9	3 42.6	33	.9	93	2.4
34	3 53.5	3 54.1	3 42.9	34	.9	94	2.4
35	3 53.8	3 54.4	3 43.1	35	.9	95	2.5
36	3 54.0	3 54.7	3 43.3	36	.9	96	2.5
37	3 54.3	3 54.9	3 43.6	37	1.0	97	2.5
38	3 54.5	3 55.2	3 43.8	38	1.0	98	2.5
39	3 54.8	3 55.4	3 44.1	39	1.0	99	2.6
40	3 55.0	3 55.7	3 44.3	40	1.0	100	2.6
41	3 55.3	3 55.9	3 44.5	41	1.1	101	2.6
42	3 55.5	3 56.2	3 44.8	42	1.1	102	2.6
43	3 55.8	3 56.4	3 45.0	43	1.1	103	2.7
44	3 56.0	3 56.7	3 45.2	44	1.1	104	2.7
45	3 56.3	3 56.9	3 45.5	45	1.2	105	2.7
46	3 56.5	3 57.2	3 45.7	46	1.2	106	2.7
47	3 56.8	3 57.4	3 46.0	47	1.2	107	2.8
48	3 57.0	3 57.7	3 46.2	48	1.2	108	2.8
49	3 57.3	3 57.9	3 46.4	49	1.3	109	2.8
50	3 57.5	3 58.2	3 46.7	50	1.3	110	2.8
51	3 57.8	3 58.4	3 46.9	51	1.3	111	2.9
52	3 58.0	3 58.7	3 47.2	52	1.3	112	2.9
53	3 58.3	3 58.9	3 47.4	53	1.4	113	2.9
54	3 58.5	3 59.2	3 47.6	54	1.4	114	2.9
55	3 58.8	3 59.4	3 47.9	55	1.4	115	3.0
56	3 59.0	3 59.7	3 48.1	56	1.4	116	3.0
57	3 59.3	3 59.9	3 48.4	57	1.5	117	3.0
58	3 59.5	4 .2	3 48.6	58	1.5	118	3.0
59	3 59.8	4 .4	3 48.8	59	1.5	119	3.1
60	4 .0	4 .7	3 49.1	60	1.6	120	3.1

## 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.	
	o	'	o	'	'	'	'	
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.	
	o	'	o	'	'	'	'	
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.	
				°	'	°	'
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.	
				°	'	°	'
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.
	o	'	o	'	'	'	'
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.
	o	'	o	'	'	'	'
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.
	o	'	o	'	'	'	'
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.
	o	'	o	'	'	'	'
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.	
	°	'			'	"	"	"
0	7	.0	7	40.9	0	.0	60	2.9
1	7	.3	7	41.1	1	.0	61	2.9
2	7	.5	7	41.3	2	.1	62	2.9
3	7	.8	7	41.6	3	.1	63	3.0
4	7	1.0	7	41.8	4	.2	64	3.0
5	7	1.3	7	42.1	5	.2	65	3.1
6	7	1.5	7	42.3	6	.3	66	3.1
7	7	1.8	7	42.5	7	.3	67	3.2
8	7	2.0	7	42.8	8	.4	68	3.2
9	7	2.3	7	43.0	9	.4	69	3.3
10	7	2.5	7	43.3	10	.5	70	3.3
11	7	2.8	7	43.5	11	.5	71	3.4
12	7	3.0	7	43.7	12	.6	72	3.4
13	7	3.3	7	44.0	13	.6	73	3.5
14	7	3.5	7	44.2	14	.7	74	3.5
15	7	3.8	7	44.4	15	.7	75	3.6
16	7	4.0	7	44.7	16	.8	76	3.6
17	7	4.3	7	44.9	17	.8	77	3.7
18	7	4.5	7	45.2	18	.9	78	3.7
19	7	4.8	7	45.4	19	.9	79	3.8
20	7	5.0	7	45.6	20	1.0	80	3.8
21	7	5.3	7	45.9	21	1.0	81	3.8
22	7	5.5	7	46.1	22	1.0	82	3.9
23	7	5.8	7	46.4	23	1.1	83	3.9
24	7	6.0	7	46.6	24	1.1	84	4.0
25	7	6.3	7	46.8	25	1.2	85	4.0
26	7	6.5	7	47.1	26	1.2	86	4.1
27	7	6.8	7	47.3	27	1.3	87	4.1
28	7	7.0	7	47.5	28	1.3	88	4.2
29	7	7.3	7	47.8	29	1.4	89	4.2
30	7	7.5	7	48.0	30	1.4	90	4.3
31	7	7.8	7	48.3	31	1.5	91	4.3
32	7	8.0	7	48.5	32	1.5	92	4.4
33	7	8.3	7	48.7	33	1.6	93	4.4
34	7	8.5	7	49.0	34	1.6	94	4.5
35	7	8.8	7	49.2	35	1.7	95	4.5
36	7	9.0	7	49.5	36	1.7	96	4.6
37	7	9.3	7	49.7	37	1.8	97	4.6
38	7	9.5	7	49.9	38	1.8	98	4.7
39	7	9.8	7	50.2	39	1.9	99	4.7
40	7	10.0	7	50.4	40	1.9	100	4.8
41	7	10.3	7	50.6	41	1.9	101	4.8
42	7	10.5	7	50.9	42	2.0	102	4.8
43	7	10.8	7	51.1	43	2.0	103	4.9
44	7	11.0	7	51.4	44	2.1	104	4.9
45	7	11.3	7	51.6	45	2.1	105	5.0
46	7	11.5	7	51.8	46	2.2	106	5.0
47	7	11.8	7	52.1	47	2.2	107	5.1
48	7	12.0	7	52.3	48	2.3	108	5.1
49	7	12.3	7	52.6	49	2.3	109	5.2
50	7	12.5	7	52.8	50	2.4	110	5.2
51	7	12.8	7	53.0	51	2.4	111	5.3
52	7	13.0	7	53.3	52	2.5	112	5.3
53	7	13.3	7	53.5	53	2.5	113	5.4
54	7	13.5	7	53.8	54	2.6	114	5.4
55	7	13.8	7	54.0	55	2.6	115	5.5
56	7	14.0	7	54.2	56	2.7	116	5.5
57	7	14.3	7	54.5	57	2.7	117	5.6
58	7	14.5	7	54.7	58	2.8	118	5.6
59	7	14.8	7	54.9	59	2.8	119	5.7
60	7	15.0	7	55.2	60	2.9	120	5.7

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.	
	°	'			'	"	"	"
0	7	15.0	7	55.2	0	.0	60	3.0
1	7	15.3	7	55.4	1	.0	61	3.0
2	7	15.5	7	55.7	2	.1	62	3.0
3	7	15.8	7	55.9	3	.1	63	3.1
4	7	16.0	7	56.1	4	.2	64	3.1
5	7	16.3	7	56.4	5	.2	65	3.2
6	7	16.5	7	56.6	6	.3	66	3.2
7	7	16.8	7	56.9	7	.3	67	3.3
8	7	17.0	7	57.1	8	.4	68	3.3
9	7	17.3	7	57.3	9	.4	69	3.4
10	7	17.5	7	57.6	10	.5	70	3.4
11	7	17.8	7	57.8	11	.5	71	3.5
12	7	18.0	7	58.0	12	.6	72	3.5
13	7	18.3	7	58.3	13	.6	73	3.6
14	7	18.5	7	58.5	14	.7	74	3.6
15	7	18.8	7	58.8	15	.7	75	3.7
16	7	19.0	7	59.0	16	.8	76	3.7
17	7	19.3	7	59.2	17	.8	77	3.8
18	7	19.5	7	59.5	18	.9	78	3.8
19	7	19.8	7	59.7	19	.9	79	3.9
20	7	20.0	7	60.0	20	1.0	80	3.9
21	7	20.3	7	60.2	21	1.0	81	4.0
22	7	20.5	7	60.4	22	1.1	82	4.0
23	7	20.8	7	60.6	23	1.1	83	4.1
24	7	21.0	7	60.8	24	1.2	84	4.1
25	7	21.3	7	61.1	25	1.2	85	4.2
26	7	21.5	7	61.4	26	1.3	86	4.2
27	7	21.8	7	61.7	27	1.3	87	4.3
28	7	22.0	7	62.0	28	1.4	88	4.3
29	7	22.3	7	62.3	29	1.4	89	4.4
30	7	22.5	7	62.6	30	1.5	90	4.4
31	7	22.8	7	62.9	31	1.5	91	4.5
32	7	23.0	7	63.2	32	1.6	92	4.5
33	7	23.3	7	63.5	33	1.6	93	4.6
34	7	23.5	7	63.8	34	1.7	94	4.6
35	7	23.8	7	64.1	35	1.7	95	4.7
36	7	24.0	7	64.4	36	1.8	96	4.7
37	7	24.3	7	64.7	37	1.8	97	4.8
38	7	24.5	7	65.0	38	1.9	98	4.8
39	7	24.8	7	65.3	39	1.9	99	4.9
40	7	25.0	7	65.6	40	2.0	100	4.9
41	7	25.3	7	65.9	41	2.0	101	5.0
42	7	25.5	7	66.2	42	2.1	102	5.0
43	7	25.8	7	66.5	43	2.1	103	5.1
44	7	26.0	7	66.8	44	2.2	104	5.1
45	7	26.3	7	67.1	45	2.2	105	5.2
46	7	26.5	7	67.4	46	2.3	106	5.2
47	7	26.8	7	67.7	47	2.3	107	5.3
48	7	27.0	7	68.0	48	2.4	108	5.3
49	7	27.3	7	68.3	49	2.4	109	5.4
50	7	27.5	7	68.6	50	2.5	110	5.4
51	7	27.8	7	68.9	51	2.5	111	5.5
52	7	28.0	7	69.2	52	2.6	112	5.5
53	7	28.3	7	69.5	53	2.6	113	5.6
54	7	28.5	7	69.8	54	2.7	114	5.6
55	7	28.8	7	70.1	55	2.7	115	5.7
56	7	29.0	7	70.4	56	2.8	116	5.7
57	7	29.3	7	70.7	57	2.8	117	5.8
58	7	29.5	7	71.0	58	2.9	118	5.8
59	7	29.8	7	71.3	59	2.9	119	5.9
60	7	30.0	7	71.6	60	3.0	120	5.9



## 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.	
				°	'	°	'
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.	
				°	'	°	'
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 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.	
				°	'	°	'
0	8 30.0	8 31.4	8 6.8	0	.0	60	3.5
1	8 30.3	8 31.7	8 7.0	1	.1	61	3.5
2	8 30.5	8 31.9	8 7.2	2	.1	62	3.6
3	8 30.8	8 32.2	8 7.5	3	.2	63	3.6
4	8 31.0	8 32.4	8 7.7	4	.2	64	3.7
5	8 31.3	8 32.7	8 8.0	5	.3	65	3.7
6	8 31.5	8 32.9	8 8.2	6	.3	66	3.8
7	8 31.8	8 33.2	8 8.4	7	.4	67	3.9
8	8 32.0	8 33.4	8 8.7	8	.5	68	3.9
9	8 32.3	8 33.7	8 8.9	9	.5	69	4.0
10	8 32.5	8 33.9	8 9.2	10	.6	70	4.0
11	8 32.8	8 34.2	8 9.4	11	.6	71	4.1
12	8 33.0	8 34.4	8 9.6	12	.7	72	4.1
13	8 33.3	8 34.7	8 9.9	13	.7	73	4.2
14	8 33.5	8 34.9	8 10.1	14	.8	74	4.3
15	8 33.8	8 35.2	8 10.3	15	.9	75	4.3
16	8 34.0	8 35.4	8 10.6	16	.9	76	4.4
17	8 34.3	8 35.7	8 10.8	17	1.0	77	4.4
18	8 34.5	8 35.9	8 11.1	18	1.0	78	4.5
19	8 34.8	8 36.2	8 11.3	19	1.1	79	4.5
20	8 35.0	8 36.4	8 11.5	20	1.2	80	4.6
21	8 35.3	8 36.7	8 11.8	21	1.2	81	4.7
22	8 35.5	8 36.9	8 12.0	22	1.3	82	4.7
23	8 35.8	8 37.2	8 12.3	23	1.3	83	4.8
24	8 36.0	8 37.4	8 12.5	24	1.4	84	4.8
25	8 36.3	8 37.7	8 12.7	25	1.4	85	4.9
26	8 36.5	8 37.9	8 13.0	26	1.5	86	4.9
27	8 36.8	8 38.2	8 13.2	27	1.6	87	5.0
28	8 37.0	8 38.4	8 13.4	28	1.6	88	5.1
29	8 37.3	8 38.7	8 13.7	29	1.7	89	5.1
30	8 37.5	8 38.9	8 13.9	30	1.7	90	5.2
31	8 37.8	8 39.2	8 14.2	31	1.8	91	5.2
32	8 38.0	8 39.4	8 14.4	32	1.8	92	5.3
33	8 38.3	8 39.7	8 14.6	33	1.9	93	5.3
34	8 38.5	8 39.9	8 14.9	34	2.0	94	5.4
35	8 38.8	8 40.2	8 15.1	35	2.0	95	5.5
36	8 39.0	8 40.4	8 15.4	36	2.1	96	5.5
37	8 39.3	8 40.7	8 15.6	37	2.1	97	5.6
38	8 39.5	8 40.9	8 15.8	38	2.2	98	5.6
39	8 39.8	8 41.2	8 16.1	39	2.2	99	5.7
40	8 40.0	8 41.4	8 16.3	40	2.3	100	5.8
41	8 40.3	8 41.7	8 16.5	41	2.4	101	5.8
42	8 40.5	8 41.9	8 16.8	42	2.4	102	5.9
43	8 40.8	8 42.2	8 17.0	43	2.5	103	5.9
44	8 41.0	8 42.4	8 17.3	44	2.5	104	6.0
45	8 41.3	8 42.7	8 17.5	45	2.6	105	6.0
46	8 41.5	8 42.9	8 17.7	46	2.6	106	6.1
47	8 41.8	8 43.2	8 18.0	47	2.7	107	6.2
48	8 42.0	8 43.5	8 18.2	48	2.8	108	6.2
49	8 42.3	8 43.7	8 18.5	49	2.8	109	6.3
50	8 42.5	8 44.0	8 18.7	50	2.9	110	6.3
51	8 42.8	8 44.2	8 18.9	51	2.9	111	6.4
52	8 43.0	8 44.5	8 19.2	52	3.0	112	6.4
53	8 43.3	8 44.7	8 19.4	53	3.0	113	6.5
54	8 43.5	8 45.0	8 19.7	54	3.1	114	6.6
55	8 43.8	8 45.2	8 19.9	55	3.2	115	6.6
56	8 44.0	8 45.5	8 20.1	56	3.2	116	6.7
57	8 44.3	8 45.7	8 20.4	57	3.3	117	6.7
58	8 44.5	8 46.0	8 20.6	58	3.3	118	6.8
59	8 44.8	8 46.2	8 20.8	59	3.4	119	6.8
60	8 45.0	8 46.5	8 21.1	60	3.5	120	6.9

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.	
				°	'	°	'
0	8 45.0	8 46.5	8 21.1	0	.0	60	3.6
1	8 45.3	8 46.7	8 21.3	1	.1	61	3.6
2	8 45.5	8 47.0	8 21.6	2	.1	62	3.7
3	8 45.8	8 47.2	8 21.8	3	.2	63	3.7
4	8 46.0	8 47.5	8 22.0	4	.2	64	3.8
5	8 46.3	8 47.7	8 22.3	5	.3	65	3.8
6	8 46.5	8 48.0	8 22.5	6	.4	66	3.9
7	8 46.8	8 48.2	8 22.8	7	.4	67	4.0
8	8 47.0	8 48.5	8 23.0	8	.5	68	4.0
9	8 47.3	8 48.7	8 23.2	9	.5	69	4.1
10	8 47.5	8 49.0	8 23.5	10	.6	70	4.1
11	8 47.8	8 49.2	8 23.7	11	.7	71	4.2
12	8 48.0	8 49.5	8 23.9	12	.7	72	4.3
13	8 48.3	8 49.7	8 24.2	13	.8	73	4.3
14	8 48.5	8 50.0	8 24.4	14	.8	74	4.4
15	8 48.8	8 50.2	8 24.7	15	.9	75	4.4
16	8 49.0	8 50.5	8 24.9	16	.9	76	4.5
17	8 49.3	8 50.7	8 25.1	17	1.0	77	4.6
18	8 49.5	8 51.0	8 25.4	18	1.1	78	4.6
19	8 49.8	8 51.2	8 25.6	19	1.1	79	4.7
20	8 50.0	8 51.5	8 25.9	20	1.2	80	4.7
21	8 50.3	8 51.7	8 26.1	21	1.2	81	4.8
22	8 50.5	8 52.0	8 26.3	22	1.3	82	4.9
23	8 50.8	8 52.2	8 26.6	23	1.4	83	4.9
24	8 51.0	8 52.5	8 26.8	24	1.4	84	5.0
25	8 51.3	8 52.7	8 27.0	25	1.5	85	5.0
26	8 51.5	8 53.0	8 27.3	26	1.5	86	5.1
27	8 51.8	8 53.2	8 27.5	27	1.6	87	5.1
28	8 52.0	8 53.5	8 27.8	28	1.7	88	5.2
29	8 52.3	8 53.7	8 28.0	29	1.7	89	5.3
30	8 52.5	8 54.0	8 28.2	30	1.8	90	5.3
31	8 52.8	8 54.2	8 28.5	31	1.8	91	5.4
32	8 53.0	8 54.5	8 28.7	32	1.9	92	5.4
33	8 53.3	8 54.7	8 29.0	33	2.0	93	5.5
34	8 53.5	8 55.0	8 29.2	34	2.0	94	5.6
35	8 53.8	8 55.2	8 29.4	35	2.1	95	5.6
36	8 54.0	8 55.5	8 29.7	36	2.1	96	5.7
37	8 54.3	8 55.7	8 29.9	37	2.2	97	5.7
38	8 54.5	8 56.0	8 30.2	38	2.2	98	5.8
39	8 54.8	8 56.2	8 30.4	39	2.3	99	5.9
40	8 55.0	8 56.5	8 30.6	40	2.4	100	5.9
41	8 55.3	8 56.7	8 30.9	41	2.4	101	6.0
42	8 55.5	8 57.0	8 31.1	42	2.5	102	6.0
43	8 55.8	8 57.2	8 31.3	43	2.5	103	6.1
44	8 56.0	8 57.5	8 31.6	44	2.6	104	6.2
45	8 56.3	8 57.7	8 31.8	45	2.7	105	6.2
46	8 56.5	8 58.0	8 32.1	46	2.7	106	6.3
47	8 56.8	8 58.2	8 32.3	47	2.8	107	6.3
48	8 57.0	8 58.5	8 32.5	48	2.8	108	6.4
49	8 57.3	8 58.7	8 32.8	49	2.9	109	6.4
50	8 57.5	8 59.0	8 33.0	50	3.0	110	6.5
51	8 57.8	8 59.2	8 33.3	51	3.0	111	6.6
52	8 58.0	8 59.5	8 33.5	52	3.1	112	6.6
53	8 58.3	8 59.7	8 33.7	53	3.1	113	6.7
54	8 58.5	8 60.0	8 34.0	54	3.2	114	6.7
55	8 58.8	9 .2	8 34.2	55	3.3	115	6.8
56	8 59.0	9 .5	8 34.4	56	3.3	116	6.9
57	8 59.3	9 .7	8 34.7	57	3.4	117	6.9
58	8 59.5	9 1.0	8 34.9	58	3.4	118	7.0
59	8 59.8	9 1.2	8 35.2	59	3.5	119	7.0
60	9 .0	9 1.5	8 35.4	60	3.6	120	7.1



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.	
				°	'	°	'
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.	
				°	'	°	'
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 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 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









## 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 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 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 14 min**

POPRAVKA ČASOVNOG UGLA				POPRAVKA DRUGOG REDA za časovni ugao i deklinaciju Sunca, Meseca i planeta		
S	SUNCA I PLANETA	PROLEĆNE TAČKE ↑	MESECA (C)	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 (C)	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 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

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 .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

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 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.
	o /	o /	o /	/	/	/
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.
	o /	o /	o /	/	/	/
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 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	2							

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.
	o /	o /	o /	/	/	/
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.
	o /	o /	o /	/	/	/
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.
	o	'	o	'	o	'	'
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.
	o	'	o	'	o	'	'
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 44 min**

POPRAVKA ČASOVNOG UGLA				POPRAVKA DRUGOG REDA za časovni ugao i deklinaciju Sunca, Meseca i planeta								
S	SUNCA I PLANETA		PROLEĆNE TAČKE $\Uparrow$	MESECA ( $\zeta$ )	$\Delta$	popr.	$\Delta$	popr.	$\Delta$	popr.		
	$^{\circ}$	'	$^{\circ}$	'	'	'	'	'	'	'		
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 $\Uparrow$	MESECA ( $\zeta$ )	$\Delta$	popr.	$\Delta$	popr.	$\Delta$	popr.		
	$^{\circ}$	'	$^{\circ}$	'	'	'	'	'	'	'		
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										



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.
	o /	o /	o /	o /	o /	o /
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.
	o /	o /	o /	o /	o /	o /
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****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 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

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

# 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 .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

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	

## 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

## VREMENSKIH U UGAONE

UGAONIH U VREMENSKE VREDNOSTI												VREMENSKIH U UGAONE									
o	h	min	o	h	min	o	h	min	o	h	min	/'	min	s	''	s	h	o	min	o	/'
																			s	/'	''
0	0	0	60	4	0	120	8	0	180	12	0	240	16	0	300	20	0	0	0	0	0
1	0	4	61	4	4	121	8	4	181	12	4	241	16	4	301	20	4	1	0	15	1
2	0	8	62	4	8	122	8	8	182	12	8	242	16	8	302	20	8	2	0	30	2
3	0	12	63	4	12	123	8	12	183	12	12	243	16	12	303	20	12	3	0	45	3
4	0	16	64	4	16	124	8	16	184	12	16	244	16	16	304	20	16	4	0	15	4
5	0	20	65	4	20	125	8	20	185	12	20	245	16	20	305	20	20	5	0	30	5
6	0	24	66	4	24	126	8	24	186	12	24	246	16	24	306	20	24	6	0	45	6
7	0	28	67	4	28	127	8	28	187	12	28	247	16	28	307	20	28	7	0	15	7
8	0	32	68	4	32	128	8	32	188	12	32	248	16	32	308	20	32	8	0	30	8
9	0	36	69	4	36	129	8	36	189	12	36	249	16	36	309	20	36	9	0	45	9
10	0	40	70	4	40	130	8	40	190	12	40	250	16	40	310	20	40	10	0	15	10
11	0	44	71	4	44	131	8	44	191	12	44	251	16	44	311	20	44	11	0	30	11
12	0	48	72	4	48	132	8	48	192	12	48	252	16	48	312	20	48	12	0	45	12
13	0	52	73	4	52	133	8	52	193	12	52	253	16	52	313	20	52	13	0	15	13
14	0	56	74	4	56	134	8	56	194	12	56	254	16	56	314	20	56	14	0	30	14
15	1	0	75	5	0	135	9	0	195	13	0	255	17	0	315	21	0	15	1	0	15
16	1	4	76	5	4	136	9	4	196	13	4	256	17	4	316	21	4	16	1	15	16
17	1	8	77	5	8	137	9	8	197	13	8	257	17	8	317	21	8	17	1	30	17
18	1	12	78	5	12	138	9	12	198	13	12	258	17	12	318	21	12	18	1	45	18
19	1	16	79	5	16	139	9	16	199	13	16	259	17	16	319	21	16	19	1	15	19
20	1	20	80	5	20	140	9	20	200	13	20	260	17	20	320	21	20	20	1	30	20
21	1	24	81	5	24	141	9	24	201	13	24	261	17	24	321	21	24	21	1	45	21
22	1	28	82	5	28	142	9	28	202	13	28	262	17	28	322	21	28	22	1	15	22
23	1	32	83	5	32	143	9	32	203	13	32	263	17	32	323	21	32	23	1	30	23
24	1	36	84	5	36	144	9	36	204	13	36	264	17	36	324	21	36	24	1	45	24
25	1	40	85	5	40	145	9	40	205	13	40	265	17	40	325	21	40	25	1	15	25
26	1	44	86	5	44	146	9	44	206	13	44	266	17	44	326	21	44	26	1	30	26
27	1	48	87	5	48	147	9	48	207	13	48	267	17	48	327	21	48	27	1	45	27
28	1	52	88	5	52	148	9	52	208	13	52	268	17	52	328	21	52	28	1	15	28
29	1	56	89	5	56	149	9	56	209	13	56	269	17	56	329	21	56	29	1	30	29
30	2	0	90	6	0	150	10	0	210	14	0	270	18	0	330	22	0	30	2	0	30
31	2	4	91	6	4	151	10	4	211	14	4	271	18	4	331	22	4	31	2	15	31
32	2	8	92	6	8	152	10	8	212	14	8	272	18	8	332	22	8	32	2	30	32
33	2	12	93	6	12	153	10	12	213	14	12	273	18	12	333	22	12	33	2	45	33
34	2	16	94	6	16	154	10	16	214	14	16	274	18	16	334	22	16	34	2	15	34
35	2	20	95	6	20	155	10	20	215	14	20	275	18	20	335	22	20	35	2	30	35
36	2	24	96	6	24	156	10	24	216	14	24	276	18	24	336	22	24	36	2	45	36
37	2	28	97	6	28	157	10	28	217	14	28	277	18	28	337	22	28	37	2	15	37
38	2	32	98	6	32	158	10	32	218	14	32	278	18	32	338	22	32	38	2	30	38
39	2	36	99	6	36	159	10	36	219	14	36	279	18	36	339	22	36	39	2	45	39
40	2	40	100	6	40	160	10	40	220	14	40	280	18	40	340	22	40	40	2	15	40
41	2	44	101	6	44	161	10	44	221	14	44	281	18	44	341	22	44	41	2	30	41
42	2	48	102	6	48	162	10	48	222	14	48	282	18	48	342	22	48	42	2	45	42
43	2	52	103	6	52	163	10	52	223	14	52	283	18	52	343	22	52	43	2	15	43
44	2	56	104	6	56	164	10	56	224	14	56	284	18	56	344	22	56	44	2	30	44
45	3	0	105	7	0	165	11	0	225	15	0	285	19	0	345	23	0	45	3	0	45
46	3	4	106	7	4	166	11	4	226	15	4	286	19	4	346	23	4	46	3	15	46
47	3	8	107	7	8	167	11	8	227	15	8	287	19	8	347	23	8	47	3	30	47
48	3	12	108	7	12	168	11	12	228	15	12	288	19	12	348	23	12	48	3	45	48
49	3	16	109	7	16	169	11	16	229	15	16	289	19	16	349	23	16	49	3	15	49
50	3	20	110	7	20	170	11	20	230	15	20	290	19	20	350	23	20	50	3	30	50
51	3	24	111	7	24	171	11	24	231	15	24	291	19	24	351	23	24	51	3	45	51
52	3	28	112	7	28	172	11	28	232	15	28	292	19	28	352	23	28	52	3	15	52
53	3	32	113	7	32	173	11	32	233	15	32	293	19	32	353	23	32	53	3	30	53
54	3	36	114	7	36	174	11	36	234	15	36	294	19	36	354	23	36	54	3	45	54
55	3	40	115	7	40	175	11	40	235	15	40	295	19	40	355	23	40	55	3	15	55
56	3	44	116	7	44	176	11	44	236	15	44	296	19	44	356	23	44	56	3	30	56
57	3	48	117	7	48	177	11	48	237	15	48	297	19	48	357	23	48	57	3	45	57
58	3	52	118	7	52	178	11	52	238	15	52	298	19	52	358	23	52	58	3	15	58
59	3	56	119	7	56	179	11	56	239	15	56	299	19	56	359	23	56	59	3	30	59
60	4	0	120	8	0	180	12	0	240	16	0	300	20	0	360	24	0	60	4	0	60

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***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 2005. 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  $60^{\circ}$  N do  $60^{\circ}$  S;
- d) jednačinu vremena za  $00^{\text{h}}$  i  $12^{\text{h}}$  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  $00^{\text{h}}$  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  $00^{\text{h}}$  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  $j = 0^{\circ}$  do  $30^{\circ}$  i za  $j = 30^{\circ}$  do  $60^{\circ}$ ;
- b) interpolacione tablice za određivanje  $\lambda_v$  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 |



	Primer:
3. Određivanje gornjeg prolaza nebeskih tela kroz meridijan	<b>13, 14</b>
3.1. Određivanje gornjeg prolaza Sunca kroz meridijan	<b>13, 14</b>
3.2. Određivanje gornjeg prolaza Meseca kroz meridijan	<b>15, 16</b>
3.3. Određivanje gornjeg prolaza planeta kroz meridijan	<b>17</b>
3.4. Određivanje gornjeg prolaza zvezda kroz meridijan	<b>18</b>
4. Severnjača	
4.1. Određivanje geografske širine pomoću visine Severnjače i određivanje azimuta Severnjače	<b>19</b>
5. Pretvaranje raznih vrsta vremena	
5.1. Pretvaranje zonskog, mesnog srednjeg vremena i vremena po časovniku u univerzalno vreme i obratno	<b>20–22</b>
5.2. Pretvaranje zvezdanog vremena u zonsko i mesno srednje vreme	<b>23</b>
6. Identifikacija zvezda pomoću zvezdanih karata	<b>24–27</b>

## 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  $15^\circ$ , za Prolećnu tačku  $15^\circ 02' .5$  i za Mesec  $14^\circ 19'$ . 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  $\Delta$  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  $15^\circ 02' .5$  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  $\Delta$ .

### 1.1. ODREĐIVANJE ČASOVNOG UGLA I DEKLINACIJE SUNCA

► **PRIMER 1.** Odrediti mesni časovni ugao i deklinaciju Sunca za 14. april 2005. godine u  $UT = 7^h 31^m 46^s$  na  $\lambda = 96^\circ 14' .6 E$ .

**a) časovni ugao**

Sa strane za 14. april S za $6^h$ .....	269°55'.2
Iz interpolacionih tablica za $1^h 31^m 46^s$ popravka časovnog ugla Sunca .....	22°56'.5
Iz interpolacionih tablica za $1^h 31^m$ popravka drugog reda za $S(\Delta = +2)$ .....	0'.3

S .....	292°52'.0
$+\lambda$ .....	$+ 96^\circ 14' .6$

$s$  .....

---

$389^\circ 06' .6 \rightarrow s_W = 29^\circ 06' .6$

**b) deklinacija**

Sa strane za 14. april $\delta$ za $6^h$ .....	+9°27'.4
Iz interpol. tablica za $1^h 31^m$ popravka za $\delta(\Delta = +9)$ ..	+ 1'.4
$\delta$ .....	+9°28'.8

► **PRIMER 2.** Odrediti mesni časovni ugao i deklinaciju Sunca za 18. septembar 2005. godine u  $UT = 13^h 05^m 14^s$  na  $\lambda = 28^\circ 53' .6 W$ .

**a) časovni ugao**

Sa strane za 18. septembar S za $12^h$ .....	1°28'.7
Iz interpolacionih tablica za $1^h 5^m 14^s$ popravka časovnog ugla Sunca .....	16°18'.5
Popravka drugog reda za $S(\Delta = +2)$ .....	0'.2

S .....	17°47'.4
$+\lambda$ .....	$- 28^\circ 53' .6$

$s_W$  .....

---

$348^\circ 53' .8 \rightarrow s_E = 11^\circ 06' .2$

**b) deklinacija**

Sa strane za 18. septembar $\delta$ za $12^h$ .....	+1°43'.3
Iz interpol. tablica za $1^h 5^m$ popravka za $\delta(\Delta = -10)$ ..	- 1'.1
$\delta$ .....	+1°42'.2

## 1.2. ODREĐIVANJE ČASOVNOG UGLA I DEKLINACIJE MESECA

► **PRIMER 3.** Odrediti mesni časovni ugao i deklinaciju Meseca za 15. mart 2005. godine u UT = 8<sup>h</sup>15<sup>m</sup>25<sup>s</sup> na  $\lambda = 15^{\circ}32'.0W$ .

### a) časovni ugao

Sa strane za 15. mart S za 8 <sup>h</sup> .....	239°2'.5
Iz interpolacionih tablica za 0 <sup>h</sup> 15 <sup>m</sup> 25 <sup>s</sup> popravka časovnog ugla Meseca .....	3°40'.7
Iz interpol. tablica za 0 <sup>h</sup> 15 <sup>m</sup> popravka za S( $\Delta = +110$ ) .....	2'.8

S .....	242°46'.0
+ $\lambda$ .....	- 15°32'.0

$$s_W \dots\dots\dots 227^{\circ}14'.0 \rightarrow s_E = 132^{\circ}46'.0$$

### b) deklinacija

Sa strane za 15. mart $\delta$ za 8 <sup>h</sup> .....	+22°20'.1
Iz interpol. tablica za 0 <sup>h</sup> 15 <sup>m</sup> popravka za $\delta(\Delta = +96)$ .....	+ 2'.5
$\delta$ .....	22°22'.6

► **PRIMER 4.** Odrediti mesni časovni ugao i deklinaciju Meseca za 20. jun 2005. godine u UT = 10<sup>h</sup>31<sup>m</sup>18<sup>s</sup> na  $\lambda = 34^{\circ}23'.8E$ .

### a) časovni ugao

Sa strane za 20. jun S za 10 <sup>h</sup> .....	176°25'.9
Iz interpolacionih tablica za 0 <sup>h</sup> 31 <sup>m</sup> 18 <sup>s</sup> popravka časovnog ugla Meseca .....	7°28'.1
Iz interpol. tablica za 0 <sup>h</sup> 31 <sup>m</sup> popravka za S( $\Delta = +49$ ) .....	2'.6

S .....	183°56'.6
+ $\lambda$ .....	+ 34°23'.8

$$s_W \dots\dots\dots 218^{\circ}20'.4 \rightarrow s_E = 141^{\circ}39'.6$$

### b) deklinacija

Sa strane za 20. jun $\delta$ za 10 <sup>h</sup> .....	-24°36'.2
Iz interpol. tablica za 0 <sup>h</sup> 31 <sup>m</sup> popravka za $\delta(\Delta = -87)$ .....	- 4'.6
$\delta$ .....	-24°40'.8

## 1.3. ODREĐIVANJE ČASOVNOG UGLA I DEKLINACIJE PLANETA

► **PRIMER 5.** Odrediti mesni časovni ugao i deklinaciju Venere za 7. decembar 2005. godine u UT = 21<sup>h</sup>15<sup>m</sup>7<sup>s</sup> na  $\lambda = 58^{\circ}34'.2E$ .

### a) časovni ugao

Sa strane za 7. decembar S za 20 <sup>h</sup> .....	77°39'.1
Iz interpolacionih tablica za 1 <sup>h</sup> 15 <sup>m</sup> 7 <sup>s</sup> popravka časovnog ugla planete .....	18°46'.8
Iz interpolacionih tablica za 1 <sup>h</sup> 15 <sup>m</sup> popravka drugog reda za S( $\Delta = 10$ ) .....	+ 1'.3

S .....	96°27'.2
+ $\lambda$ .....	+ 58°34'.2

$$s_W \dots\dots\dots 155^{\circ} 1'.4 \rightarrow s_E = 204^{\circ}58'.6$$

### b) deklinacija

Sa strane za 7. decembar $\delta$ za 20 <sup>h</sup> .....	-23° 6'.4
Iz interpol. tablica za 1 <sup>h</sup> 15 <sup>m</sup> popravka za $\delta(\Delta = +5)$ .....	+ 0'.6
$\delta$ .....	-23° 5'.8

► **PRIMER 6.** Odrediti mesni časovni ugao i deklinaciju Jupitera za 23. oktobar 2005. godine u UT = 8<sup>h</sup>55<sup>m</sup>28<sup>s</sup> na  $\lambda = 145^{\circ}20'.1W$ .

### a) časovni ugao

Sa strane za 23. oktobar S za 8 <sup>h</sup> .....	304° 8'.0
Iz interpolacionih tablica za 0 <sup>h</sup> 55 <sup>m</sup> 28 <sup>s</sup> popravka časovnog ugla planete .....	13°52'.0
Iz interpolacionih tablica za 0 <sup>h</sup> 55 <sup>m</sup> popravka drugog reda za S( $\Delta = +19$ ) .....	1'.8

S .....	318° 1'.8
+ $\lambda$ .....	-145°20'.1

$$s \dots\dots\dots 172^{\circ}41'.7 \rightarrow s_E = 187^{\circ}18'.3$$

### b) deklinacija

Sa strane za 23. oktobar $\delta$ za 8 <sup>h</sup> .....	-10°16'.9
Iz interpol. tablica za 0 <sup>h</sup> 55 <sup>m</sup> popravka za $\delta(\Delta = -2)$ .....	- 0'.2
$\delta$ .....	-10°17'.1

## 1.4. ODREĐIVANJE ČASOVNOG UGLA I DEKLINACIJE ZVEZDE

Za određivanje časovnog ugla zvezde prvo se određuje časovni ugao Prolećne tačke  $S_{\Upsilon}$ , 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 ( $\alpha$  Leo) za 16. mart 2005. godine u UT = 18<sup>h</sup>11<sup>m</sup>26<sup>s</sup> na  $\lambda = 62^{\circ}13'.2W$ .

**a) časovni ugao Prolećne ( $\Upsilon$ ) tačke**

Sa strane za 16. mart $S_{\Upsilon}$ za 18 <sup>h</sup> .....	84°25'.1
Iz interpolacionih tablica za 0 <sup>h</sup> 11 <sup>m</sup> 26 <sup>s</sup> popravka časovnog ugla $\Upsilon$ tačke .....	2°52'.0
<hr/>	
$S_{\Upsilon}$ .....	87°17'.1
<hr/>	
Deklinacija (iz tablice deklinacija nautičkih zvezda pod r.b. 24 za 1. mart): $\delta$ .....	+11°56'.5

**b) časovni ugao zvezde**

$S_{\Upsilon}$ .....	87°17'.1
Iz tablice surektascenzija nautičkih zvezda pod r.b. 24 za 1. mart .....	207°50'.1
<hr/>	
$S_{*}$ .....	295°07'.2
+ $\lambda$ .....	- 62°13'.2
<hr/>	
$S_{*}$ .....	232°54'.0
$S_E$ .....	127° 6'.0

► **PRIMER 8.** Odrediti mesni časovni ugao i deklinaciju zvezde Deneb ( $\alpha$  Cyg) za 10. avgust 2005. godine u UT = 21<sup>h</sup>42<sup>m</sup>8<sup>s</sup> na  $\lambda = 93^{\circ}14'.2E$ .

**a) časovni ugao Prolećne ( $\Upsilon$ ) tačke**

Sa strane za 10. avgust $S_{\Upsilon}$ za 20 <sup>h</sup> .....	258°24'.3
Iz interpolacionih tablica za 1 <sup>h</sup> 42 <sup>m</sup> 8 <sup>s</sup> popravka časovnog ugla $\Upsilon$ tačke .....	25°36'.3
<hr/>	
$S_{\Upsilon}$ .....	284° 0'.6
<hr/>	
Deklinacija (iz tablice deklinacija nautičkih zvezda pod r.b. 50 za 1. avgust): $\delta$ .....	+ 45°18'.0

**b) časovni ugao zvezde**

$S_{\Upsilon}$ .....	284° 0'.6
Iz tablice surektascenzija nautičkih zvezda pod r.b. 50 za 1. avgust .....	49°35'.3
<hr/>	
$S_{*}$ .....	333°35'.9
+ $\lambda$ .....	+ 93°14'.2
<hr/>	
$S_{*}$ .....	426°50'.1
$S_{*}$ .....	66°50'.1

## 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 2005. godine na  $\varphi = 48^{\circ}28'.2S$ ,  $\lambda = 72^{\circ}43'.6E$ ,  $\varphi = 48^{\circ}.5S$ ,  $\lambda = 4^{\text{h}}50^{\text{m}}.9$  ( $x = +5^{\text{h}}$ ).

**a) izlaz**

UT = $t_s$ izlaza za $\varphi = 45^{\circ}S$ .....	7 <sup>h</sup> 38 <sup>m</sup> .0
Popravka za 3° .5 iz interpolacionih tablica ( $\Delta = +20^{\text{m}}$ ) .....	+ 14 <sup>m</sup> .0
<hr/>	
$t_s$ izlaza za $\varphi = 48^{\circ}.5S$ .....	7 <sup>h</sup> 52 <sup>m</sup> .0
+ ( $x - \lambda$ ) .....	+ 9 <sup>m</sup> .1
<hr/>	
$t_x$ .....	8 <sup>h</sup> 01 <sup>m</sup> .1
- trajanje građanskog sumraka .....	- 37 <sup>m</sup> .0
<hr/>	
početak građanskog svitanja .....	7 <sup>h</sup> 24 <sup>m</sup> .1

**b) zalaz**

UT = $t_s$ zalaza za $\varphi = 45^{\circ}S$ .....	16 <sup>h</sup> 31 <sup>m</sup> .0
Popravka za 3° .5 iz interpolacionih tablica ( $\Delta = -20^{\text{m}}$ ) .....	- 14 <sup>m</sup> .0
<hr/>	
$t_s$ zalaza za $\varphi = 48^{\circ}.5S$ .....	16 <sup>h</sup> 17 <sup>m</sup> .0
+ ( $x - \lambda$ ) .....	+ 9 <sup>m</sup> .1
<hr/>	
$t_x$ .....	16 <sup>h</sup> 26 <sup>m</sup> .1
+ trajanje građanskog sumraka .....	+ 37 <sup>m</sup> .0
<hr/>	
završetak građanskog sumraka .....	17 <sup>h</sup> 03 <sup>m</sup> .1

► **PRIMER 10.** Odrediti vreme izlaza i zalaza Sunca, početak astronomskog svitanja i završetak astronomskog sumraka za 21. septembar 2005. godine na  $\varphi = 22^{\circ}14'.0N$ ,  $\lambda = 56^{\circ}41'.2W$ ,  $\varphi = 22^{\circ}.2N$ ,  $\lambda = 3^{\text{h}}46^{\text{m}}.7$  ( $x = -4^{\text{h}}$ ).

**a) izlaz**

UT = $t_s$ izlaza za $\varphi = 20^{\circ}N$ .....	5 <sup>h</sup> 49 <sup>m</sup> .0
Popravka za 2° .2 iz interpolacionih tablica ( $\Delta = -1^{\text{m}}$ ) .....	- 0 <sup>m</sup> .2

**b) zalaz**

UT = $t_s$ zalaza za $\varphi = 20^{\circ}N$ .....	17 <sup>h</sup> 57 <sup>m</sup> .0
Popravka za 2° .2 iz interpolacionih tablica ( $\Delta = +2^{\text{m}}$ ) .....	+ 0 <sup>m</sup> .2

$t_s$ izlaza za $\varphi = 22^\circ.2N$	5 <sup>h</sup> 48 <sup>m</sup> .8
+ (x - $\lambda$ )	- 13 <sup>m</sup> .3
$t_x$	5 <sup>h</sup> 35 <sup>m</sup> .5
- trajanje astronomskog sumraka	-1 <sup>h</sup> 15 <sup>m</sup> .0
početak astronomskog svitanja	4 <sup>h</sup> 20 <sup>m</sup> .5

$t_s$ zalaza za $\varphi = 22^\circ.2N$	17 <sup>h</sup> 57 <sup>m</sup> .2
+ (x - $\lambda$ )	- 13 <sup>m</sup> .3
$t_x$	17 <sup>h</sup> 43 <sup>m</sup> .9
+ trajanje astronomskog sumraka	+ 1 <sup>h</sup> 15 <sup>m</sup> .0
završetak astronomskog sumraka	18 <sup>h</sup> 58 <sup>m</sup> .9

## 2.2. ODREĐIVANJE IZLAZA I ZALAZA MESECA

Vremena izlaza i zalaza Meseca (gornjeg ruba) za svaki dan, za severne i južne geografske širine od  $0^\circ$  do  $60^\circ$ , te njihove promene za jedan čas  $\Delta/24$  date su u efemeridama. Pomoću izmene  $\Delta/24$  određuje se popravka  $\lambda v$  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  $\lambda v$  se uvek algebarski oduzima od vremena izlaza ili zalaza Meseca u Griniču. Mora da se vodi računa o znacima vrednosti  $\lambda\Delta/24$ . Popravka  $\lambda v$  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 2005. godine na  $\varphi = 17^\circ 36'.0N$ ,  $\lambda = 72^\circ 15'.0E$ ,  $\varphi = 17^\circ.6N$ ,  $\lambda = 4^h 49^m.0E$  ( $x = +5^h$ ).

### a) izlaz

UT = $t_s$ izlaza za $\varphi = 10^\circ N$	15 <sup>h</sup> 49 <sup>m</sup> .0
Popravka za $7^\circ.6$ iz interpolacionih tabl. ( $\Delta = +18^m$ )	+ 13 <sup>m</sup> .5
UT izlaza za $\varphi = 17^\circ.6N$	16 <sup>h</sup> 2 <sup>m</sup> .5
$\lambda = 72^\circ.3E$	
$\Delta/24 = v = 2^m.6$	- $\lambda v$
$t_s$	15 <sup>h</sup> 50 <sup>m</sup> .0
+ (x - $\lambda$ )	+ 11 <sup>m</sup> .0
$t_x$	16 <sup>h</sup> 1 <sup>m</sup> .0

### b) zalaz

UT = $t_s$ zalaza za $\varphi = 10^\circ N$	2 <sup>h</sup> 50 <sup>m</sup> .0
Popravka za $7^\circ.6$ iz interpolacionih tabl. ( $\Delta = -16^m$ )	- 12 <sup>m</sup> .1
UT zalaza za $\varphi = 17^\circ.6N$	2 <sup>h</sup> 37 <sup>m</sup> .9
$\lambda = 72^\circ.3E$	
$\Delta/24 = v = 2^m.1$	- $\lambda v$
$t_s$	2 <sup>h</sup> 27 <sup>m</sup> .8
+ (x - $\lambda$ )	+ 11 <sup>m</sup> .0
$t_x$	2 <sup>h</sup> 38 <sup>m</sup> .8

► **PRIMER 12.** Odrediti vreme izlaza i zalaza Meseca za 23. oktobar 2005. godine na  $\varphi = 33^\circ 25'.0S$ ,  $\lambda = 38^\circ 53'.0W$ ,  $\varphi = 33^\circ.4S$ ,  $\lambda = 2^h 35^m.5W$  ( $x = -3^h$ ).

### a) izlaz

UT = $t_s$ izlaza za $\varphi = 30^\circ S$	- <sup>h</sup> 22 <sup>m</sup> .0
Popravka za $3^\circ.4$ iz interpolacionih tabl. ( $\Delta = 17^m$ )	+ 11 <sup>m</sup> .5
UT izlaza za $\varphi = 33^\circ.4S$	- <sup>h</sup> 10 <sup>m</sup> .5
$\lambda = 38^\circ.9W$	
$\Delta/24 = v = 2^m.0$	- $\lambda v$
$t_s$	- <sup>h</sup> 16 <sup>m</sup> .0
+ (x - $\lambda$ )	- 24 <sup>m</sup> .5
$t_x$	- <sup>h</sup> 40 <sup>m</sup> .5

### b) zalaz

UT = $t_s$ zalaza za $\varphi = 30^\circ S$	9 <sup>h</sup> 33 <sup>m</sup> .0
Popravka za $3^\circ.4$ iz interpolacionih tabl. ( $\Delta = -17^m$ )	- 11 <sup>m</sup> .5
UT zalaza za $\varphi = 33^\circ.4S$	9 <sup>h</sup> 21 <sup>m</sup> .5
$\lambda = 38^\circ.9W$	
$\Delta/24 = v = 2^m.4$	- $\lambda v$
$t_s$	9 <sup>h</sup> 15 <sup>m</sup> .2
+ (x - $\lambda$ )	- 24 <sup>m</sup> .5
$t_x$	8 <sup>h</sup> 50 <sup>m</sup> .7

## 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 NEBSKIH 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  $0^\circ$ . Zapadna geografska dužina određenog mesta, gde je časovni ugao Sunca  $0^\circ$ , 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  $\lambda_W$  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 2005. godine na  $\lambda = 103^\circ 28' .8W$ ,  $\lambda = 6^h 53^m 55^s$  ( $x = -7^h$ ).

**a) pomoću časovnog ugla**

$\lambda_W = S_\odot$ .....	103°28'.8
u UT 18 <sup>h</sup> $S_\odot$ .....	87°19'.5

Iz interpolacione tablice za Sunce u 1 <sup>h</sup> 04 <sup>m</sup> 37 <sup>s</sup> .0 .....	16° 9'.3
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UT .....	19 <sup>h</sup> 04 <sup>m</sup> 37 <sup>s</sup> .0
+x .....	- 7 <sup>h</sup> 00 <sup>m</sup> 00 <sup>s</sup> .0

$t_x$ .....	12 <sup>h</sup> 04 <sup>m</sup> 37 <sup>s</sup> .0
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**b) pomoću jednačine vremena**

$t_p$ .....	12 <sup>h</sup> 00 <sup>m</sup> 00 <sup>s</sup> .0	$e_{12^h}$ .....	-10 <sup>m</sup> 45 <sup>s</sup> .5
$-\lambda$ .....	+ 6 <sup>h</sup> 53 <sup>m</sup> 55 <sup>s</sup> .0	$\Delta/24$ .....	+ 0 <sup>s</sup> .6

$T_p$ .....	18 <sup>h</sup> 53 <sup>m</sup> 55 <sup>s</sup> .0	Popravka	
-e .....	+ 10 <sup>m</sup> 41 <sup>s</sup> .4	6.9 × 0.6 .....	4 <sup>s</sup> .1

UT .....	19 <sup>h</sup> 04 <sup>m</sup> 36 <sup>s</sup> .4	$e_{12^h}$ .....	-10 <sup>m</sup> 45 <sup>s</sup> .5
+x .....	- 7 <sup>h</sup> 00 <sup>m</sup> 00 <sup>s</sup> .0	Popravka .....	+ 4 <sup>s</sup> .1

$t_x$ .....	12 <sup>h</sup> 04 <sup>m</sup> 36 <sup>s</sup> .4	e .....	-10 <sup>m</sup> 41 <sup>s</sup> .4
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► **PRIMER 14.** Odrediti vreme gornjeg prolaza Sunca kroz meridijan za 22. januar 2005. godine na  $\lambda = 145^\circ 52' .1E$ ,  $\lambda = 9^h 43^m 28^s$  ( $x = +10^h$ ).

**a) pomoću časovnog ugla**

$(360^\circ - \lambda_E) = S_\odot$ .....	214°07'.9
u UT 2 <sup>h</sup> $S_\odot$ .....	207° 6'.7

Iz interpolacione tablice za Sunce u 0 <sup>h</sup> 28 <sup>m</sup> 4 <sup>s</sup> .7 .....	7° 1'.2
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UT .....	2 <sup>h</sup> 28 <sup>m</sup> 4 <sup>s</sup> .7
+x .....	+10 <sup>h</sup> 00 <sup>m</sup> 00 <sup>s</sup> .0

$t_x$ .....	12 <sup>h</sup> 28 <sup>m</sup> 4 <sup>s</sup> .7
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**b) skraćeni postupak**

$T_m = t_m$ .....	12 <sup>h</sup> 11 <sup>m</sup> .7	$T_m = t_m$ .....	12 <sup>h</sup> 11 <sup>m</sup> .7
$-\lambda$ .....	- 9 <sup>h</sup> 43 <sup>m</sup> .5	+ (x - $\lambda$ ) .....	0 <sup>h</sup> 16 <sup>m</sup> .5

UT .....	2 <sup>h</sup> 28 <sup>m</sup> .2
+x .....	+10 <sup>h</sup> 00 <sup>m</sup> .0

$t_x$ .....	12 <sup>h</sup> 28 <sup>m</sup> .2	$t_x$ .....	12 <sup>h</sup> 28 <sup>m</sup> .2
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#### 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  $\lambda_v$  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  $\lambda_v$  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. mart 2005. godine na  $\lambda = 48^\circ 6' .0W$ .

$T_m$ .....	18 <sup>h</sup> 55 <sup>m</sup> .0	$\Delta/24 = v$ .....	2 <sup>m</sup> .1	x .....	- 3 <sup>h</sup> 00 <sup>m</sup> .0
$-\lambda_v$ .....	+ 6 <sup>m</sup> .7	$\lambda$ .....	48° .1	$-\lambda$ .....	+ 3 <sup>h</sup> 12 <sup>m</sup> .4

$t_m$ .....	19 <sup>h</sup> 1 <sup>m</sup> .7	$\lambda_v$ .....	- 6 <sup>m</sup> .7	+ (x - $\lambda$ ) .....	+ 0 <sup>h</sup> 12 <sup>m</sup> .4
+ (x - $\lambda$ ) .....	12 <sup>m</sup> .4				

$t_x$ .....	19 <sup>h</sup> 14 <sup>m</sup> .1
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► **PRIMER 16.** Odrediti vreme gornjeg prolaza Meseca kroz meridijan u Griniču za 23. jun 2005. godine na  $\lambda = 126^{\circ}40'.2E$ .

$T_m$ .....	$0^h 57^m.0$	$\Delta/24 = v$ .....	$2^m.8$	$x$ .....	$+ 8^h 00^m.0$
$-\lambda v$ .....	$- 23^m.6$	$\lambda$ .....	$126^{\circ}.7$	$-\lambda$ .....	$- 8^h 26^m.7$
$t_m$ .....	$0^h 33^m.4$	$\lambda v$ .....	$23^m.6$	$+(x - \lambda)$ .....	$- 0^h 26^m.7$
$+(x - \lambda)$ .....	$- 0^h 26^m.7$				
$t_x$ .....	$0^h 6^m.7$				

### 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  $\lambda v$ . 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  $\lambda v$  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 2005. godine na  $\lambda = 46^{\circ}17'.3W$ ,  $\lambda = 3^h 5^m.2$  ( $x = -3^h$ ).

<b>a) tačan postupak</b>	<b>b) približan postupak—u praksi dovoljno tačan</b>
$T_m$ .....	$T_m$ .....
$-\lambda v$ .....	$+(x - \lambda)$ .....
$t_m$ .....	$t_x$ .....
$+(x - \lambda)$ .....	
$t_x$ .....	

### 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  $\lambda v$ , 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 ( $\alpha$  Boo) kroz meridijan 23. maja 2001. godine na  $\lambda = 28^{\circ}14'.2E$ ,  $\lambda = 1^h 52^m.9$ , ( $x = +2^h$ ).

Iz tablice gornjih prolaza zvezda kroz meridijan za	
1. maj 2005. godine (r.b. zvezde 35) $T_m = t_m$ .....	$23^h 40^m.0$
Popravka za 23 dana iz iste tablice .....	$- 1^h 31^m.0$
$t_m$ .....	$22^h 9^m.0$
$+(x - \lambda)$ .....	$7^m.1$
$t_x$ .....	$22^h 16^m.1$

## 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 2005. 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  $s_\gamma$

$S_\gamma$ za UT 22 <sup>h</sup> .....	327°54'.8
Iz interpolacionih tablica popravka $S_\gamma$ za 36 <sup>m</sup> .....	9°10'.5
<hr/>	
$S_\gamma$ .....	337° 5'.3
+ $\lambda$ .....	- 38°47'.0
<hr/>	
$s_\gamma$ .....	298°13'.5

b) određivanje visine

$V_p$ .....	41°54'.2
I .....	+ 7'.7
II .....	+ 0'.2
III .....	- 0'.1
<hr/>	
$\varphi$ .....	42° 2'.2
$\omega$ .....	1°.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  $\lambda = 13^\circ51'.0E$ ,  $\lambda = 0^h55^m24^s$  ( $x = +1^h$ ).

a) prelaz sa  $t_x$  na UT

$t_x$ .....	7 <sup>h</sup> 39 <sup>m</sup> 19 <sup>s</sup>
-x .....	-1 <sup>h</sup> 00 <sup>m</sup> 00 <sup>s</sup>
<hr/>	
UT .....	6 <sup>h</sup> 39 <sup>m</sup> 19 <sup>s</sup>

b) prelaz sa  $t_c$  na UT

$t_c$ .....	7 <sup>h</sup> 31 <sup>m</sup> 55 <sup>s</sup>
+U .....	- 53 <sup>m</sup> 48 <sup>s</sup>
<hr/>	
$t_h$ .....	6 <sup>h</sup> 38 <sup>m</sup> 07 <sup>s</sup>
+S .....	+ 1 <sup>m</sup> 12 <sup>s</sup>
<hr/>	
UT .....	6 <sup>h</sup> 39 <sup>m</sup> 19 <sup>s</sup>

c) prelaz sa  $t_s$  na UT

$t_s$ .....	7 <sup>h</sup> 34 <sup>m</sup> 43 <sup>s</sup>
- $\lambda$ .....	- 55 <sup>m</sup> 24 <sup>s</sup>
<hr/>	
UT .....	6 <sup>h</sup> 36 <sup>m</sup> 19 <sup>s</sup>

**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  $\lambda = 57^\circ24'.0E$ ,  $\lambda = 3^h49^m36^s$  ( $x = -4^h$ ).

a) prelaz sa UT na  $t_x$

UT .....	9 <sup>h</sup> 46 <sup>m</sup> 12 <sup>s</sup>
+x .....	-4 <sup>h</sup> 00 <sup>m</sup> 00 <sup>s</sup>
<hr/>	
$t_x$ .....	5 <sup>h</sup> 46 <sup>m</sup> 12 <sup>s</sup>

b) prelaz sa UT na  $t_c$

UT .....	9 <sup>h</sup> 46 <sup>m</sup> 12.0 <sup>s</sup>
-S .....	+ 2 <sup>m</sup> 06 <sup>s</sup> .5
<hr/>	
$t_h$ .....	9 <sup>h</sup> 48 <sup>m</sup> 18.5 <sup>s</sup>
-U .....	+3 <sup>h</sup> 53 <sup>m</sup> 27.5 <sup>s</sup>
<hr/>	
$t_c$ .....	5 <sup>h</sup> 54 <sup>m</sup> 51.0 <sup>s</sup>

c) prelaz sa UT na  $t_s$

UT .....	9 <sup>h</sup> 46 <sup>m</sup> 12 <sup>s</sup>
+ $\lambda$ .....	-3 <sup>h</sup> 49 <sup>m</sup> 36 <sup>s</sup>
<hr/>	
$t_s$ .....	5 <sup>h</sup> 56 <sup>m</sup> 36 <sup>s</sup>

**Napomena:** U—poređenje hronometra sa časovnikom,  
S—stanje hronometra.

► **PRIMER 22.** Odrediti zonsko vreme  $t_x$  za mesno srednje vreme  $t_s = 13^h 15^m 36^s$  na  $\lambda = 107^\circ 28' .0 W$ ,  $\lambda = 7^h 9^m 52^s$  ( $x = -7$ ).

a) duži postupak

$t_s$ .....	13 <sup>h</sup> 15 <sup>m</sup> 36 <sup>s</sup>
$-\lambda$ .....	7 <sup>h</sup> 09 <sup>m</sup> 52 <sup>s</sup>
UT .....	20 <sup>h</sup> 25 <sup>m</sup> 28 <sup>s</sup>
$+x$ .....	- 7 <sup>h</sup> 00 <sup>m</sup> 00 <sup>s</sup>
$t_x$ .....	13 <sup>h</sup> 25 <sup>m</sup> 28 <sup>s</sup>

b) kraći postupak

$t_s$ .....	13 <sup>h</sup> 15 <sup>m</sup> 36 <sup>s</sup>	$x$ .....	-7 <sup>h</sup> 00 <sup>m</sup> 00 <sup>s</sup>
$+(x - \lambda)$ .....	+ 9 <sup>m</sup> 52 <sup>s</sup>	$-\lambda$ .....	7 <sup>h</sup> 09 <sup>m</sup> 52 <sup>s</sup>
$t_x$ .....	13 <sup>h</sup> 25 <sup>m</sup> 28 <sup>s</sup>	$(x - \lambda)$ .....	9 <sup>m</sup> 52 <sup>s</sup>

## 5.2. PRETVARANJE ZVEZDANOG VREMENA U ZONSKO I MESNO SREDNJE VREME

Određeno zvezdano vreme pretvorimo u mesni časovni ugao Prolećne tačke. Grinički 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 se 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  $S_\varphi$  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 2005. godine ako je zvezdano vreme  $t_z = 6^h 36^m 3^s$  na  $\lambda = 112^\circ 10' .5 E$ ,  $\lambda = 7^h 28^m 42^s$  ( $x = +7$ ).

<table style="width: 100%; border-collapse: collapse;"> <tr> <td style="border-bottom: 1px solid black;"><math>t_z = 6^h 36^m 03^s = s_\gamma</math> .....</td> <td style="border-bottom: 1px solid black; text-align: right;">99<sup>o</sup>0'.8 + 360<sup>o</sup></td> </tr> <tr> <td style="border-bottom: 1px solid black;"><math>-\lambda</math> .....</td> <td style="border-bottom: 1px solid black; text-align: right;">-112<sup>o</sup>10'.5</td> </tr> <tr> <td style="border-bottom: 1px solid black;"><math>S_\gamma</math> .....</td> <td style="border-bottom: 1px solid black; text-align: right;">346<sup>o</sup>50'.3</td> </tr> <tr> <td style="border-bottom: 1px solid black;">19. januar u UT .....</td> <td style="border-bottom: 1px solid black; text-align: right;">14<sup>h</sup>00<sup>m</sup>00<sup>s</sup></td> </tr> <tr> <td style="border-bottom: 1px solid black;"><math>-S_\gamma</math> .....</td> <td style="border-bottom: 1px solid black; text-align: right;">-329<sup>o</sup> 3'.5</td> </tr> <tr> <td style="border-bottom: 1px solid black;">Iz interpol. tablice za Prolećnu tačku u .....</td> <td style="border-bottom: 1px solid black; text-align: right;">← 17<sup>o</sup>46'.8</td> </tr> <tr> <td style="border-bottom: 1px solid black;">UT .....</td> <td style="border-bottom: 1px solid black; text-align: right;">15<sup>h</sup>11<sup>m</sup> 7<sup>s</sup></td> </tr> </table>	$t_z = 6^h 36^m 03^s = s_\gamma$ .....	99 <sup>o</sup> 0'.8 + 360 <sup>o</sup>	$-\lambda$ .....	-112 <sup>o</sup> 10'.5	$S_\gamma$ .....	346 <sup>o</sup> 50'.3	19. januar u UT .....	14 <sup>h</sup> 00 <sup>m</sup> 00 <sup>s</sup>	$-S_\gamma$ .....	-329 <sup>o</sup> 3'.5	Iz interpol. tablice za Prolećnu tačku u .....	← 17 <sup>o</sup> 46'.8	UT .....	15 <sup>h</sup> 11 <sup>m</sup> 7 <sup>s</sup>	<table style="width: 100%; border-collapse: collapse;"> <tr> <td style="border-bottom: 1px solid black;"><b>a) <math>t_s</math></b></td> <td style="border-bottom: 1px solid black;"><math>UT</math> .....</td> <td style="border-bottom: 1px solid black; text-align: right;">15<sup>h</sup>11<sup>m</sup> 7<sup>s</sup></td> </tr> <tr> <td style="border-bottom: 1px solid black;"><math>+\lambda</math> .....</td> <td style="border-bottom: 1px solid black;"><math>+x</math> .....</td> <td style="border-bottom: 1px solid black; text-align: right;">+ 7<sup>h</sup>00<sup>m</sup>00<sup>s</sup></td> </tr> <tr> <td style="border-bottom: 1px solid black;"><math>t_s</math> .....</td> <td style="border-bottom: 1px solid black;"><math>t_x</math> .....</td> <td style="border-bottom: 1px solid black; text-align: right;">22<sup>h</sup>39<sup>m</sup>49<sup>s</sup></td> </tr> </table>	<b>a) <math>t_s</math></b>	$UT$ .....	15 <sup>h</sup> 11 <sup>m</sup> 7 <sup>s</sup>	$+\lambda$ .....	$+x$ .....	+ 7 <sup>h</sup> 00 <sup>m</sup> 00 <sup>s</sup>	$t_s$ .....	$t_x$ .....	22 <sup>h</sup> 39 <sup>m</sup> 49 <sup>s</sup>
$t_z = 6^h 36^m 03^s = s_\gamma$ .....	99 <sup>o</sup> 0'.8 + 360 <sup>o</sup>																							
$-\lambda$ .....	-112 <sup>o</sup> 10'.5																							
$S_\gamma$ .....	346 <sup>o</sup> 50'.3																							
19. januar u UT .....	14 <sup>h</sup> 00 <sup>m</sup> 00 <sup>s</sup>																							
$-S_\gamma$ .....	-329 <sup>o</sup> 3'.5																							
Iz interpol. tablice za Prolećnu tačku u .....	← 17 <sup>o</sup> 46'.8																							
UT .....	15 <sup>h</sup> 11 <sup>m</sup> 7 <sup>s</sup>																							
<b>a) <math>t_s</math></b>	$UT$ .....	15 <sup>h</sup> 11 <sup>m</sup> 7 <sup>s</sup>																						
$+\lambda$ .....	$+x$ .....	+ 7 <sup>h</sup> 00 <sup>m</sup> 00 <sup>s</sup>																						
$t_s$ .....	$t_x$ .....	22 <sup>h</sup> 39 <sup>m</sup> 49 <sup>s</sup>																						
<b>b) <math>t_x</math></b>	$UT$ .....	15 <sup>h</sup> 11 <sup>m</sup> 7 <sup>s</sup>																						
$+x$ .....	$+x$ .....	+ 7 <sup>h</sup> 00 <sup>m</sup> 00 <sup>s</sup>																						
$t_x$ .....	$t_x$ .....	22 <sup>h</sup> 11 <sup>m</sup> 7 <sup>s</sup>																						

## 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  $\lambda_W$  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 grinički časovni ugao zvezde  $S_*$  jednak griničkom časovnom uglu Prolećne tačke umanjenom za rektascenziju zvezde ( $S_* = S_\gamma - \alpha_*$ ), onda je ( $\alpha_* = S_\gamma - S_*$ ). Surektascenzija je jednaka časovnom uglu zvezde umanjenom za časovni ugao Prolećne tačke ( $360^\circ - \alpha_*) = S_* - S_\gamma$ . Grinički časovni ugao zvezde odgovara zapadnoj geografskoj dužini ( $S_* = \lambda_W$ ), pa je ( $360^\circ - \alpha_*) = \lambda_W - S_\gamma$ , dok je za istočne geografske dužine ( $360^\circ - \alpha_*) = (360^\circ - \lambda_E) - S_\gamma$ .

► **PRIMER 24.** Odrediti za 5. jul 2005. godine u UT = 00<sup>h</sup>06<sup>m</sup>.3 na zvezdanoj karti meridijan posmatrača i prepoznajte zvezdu u zenitu ako je posmatrač na  $\varphi = 45^\circ 11' N$ ,  $\lambda = 25^\circ 45' .6 E$ .

a) određivanje  $S_\gamma$

5. jul za 00 <sup>h</sup> $S_\gamma$ .....	283 <sup>o</sup> 5'.5
Popravka časovnog ugla Prolećne tačke za 06 <sup>m</sup> 18 <sup>s</sup> .....	+ 1 <sup>o</sup> 34'.8
$S_\gamma$ .....	284 <sup>o</sup> 40'.0

b) određivanje surektascenzije zvezde pomoću izraza

$(360^\circ - \alpha_*) = (360^\circ - \lambda_E) - S_\gamma$	
$-\lambda$ .....	360 <sup>o</sup> 00'.0
$-\lambda$ .....	- 25 <sup>o</sup> 45'.6
$(360^\circ - \lambda)$ .....	334 <sup>o</sup> 14'.4
$-S_\gamma$ .....	284 <sup>o</sup> 40'.0
$(360^\circ - \alpha_*)$ .....	49 <sup>o</sup> 34'.4
	$\cong 49^\circ .6$



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  $49^{\circ}.6$ , a njena deklinacija oko  $45^{\circ}11'.0N$ . Iz pregleda zvezda Godišnjaka ili zvezdane karte vidljivo je da je to zvezda Deneb ( $\alpha$  Cyg) sa stvarnom surektascenzijom  $49^{\circ}36'.0$  i deklinacijom  $45^{\circ}17'.7$ . Ostale zvezde koje nisu u zenitu raspoznaju se upoređenjem slike zvezdanog neba sa zvezdanom kartom.

► **PRIMER 25.** Odrediti za 22. januar 2005. godine u  $t_x = 4^h 08^m.6$  ( $x = +2$ ) na zvezdanoj karti meridijan posmatrača i prepoznajte zvezdu blizu zenita. Posmatrač se nalazi na  $\varphi = 54^{\circ}50'N$ ,  $\lambda = 47^{\circ}20'E$ .

a) određivanje UT	b) određivanje $S_{\gamma}$	c) određivanje surektascenzije zvezde pomoću izraza $(360^{\circ} - \alpha_*) = (360^{\circ} - \lambda_E) - S_{\gamma}$
$t_x$ ..... $4^h 08^m.6$	22. januar u $02^h S_{\gamma}$ ..... $151^{\circ}31'.3$	$(360^{\circ} - \lambda)$ ..... $312^{\circ}39'.9$
$-x$ ..... $-2^h 00^m.0$	Popravka časovnog ugla Prolećne tačke za $08^m.6$ ..... $2^{\circ}09'.4$	$-S_{\gamma}$ ..... $153^{\circ}40'.7$
<hr/> UT ..... $2^h 08^m.6$	<hr/> $S_{\gamma}$ ..... $153^{\circ}40'.7$	<hr/> $(360^{\circ} - \alpha_*)$ ..... $158^{\circ}59'.2$

Iz zvezdane karte ili pregleda zvezda vidljivo je da je zvezda blizu zenita Mizar ( $\zeta$  Ursae Majoris) čija je deklinacija  $54^{\circ}53'.9N$ , a surektascenzija  $158^{\circ}57'.3$ .

**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  $360^{\circ}$ . 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 2005. godine u  $t_x = 23^h 17^m.9$  ( $x = +2$ ) na  $\varphi = 52^{\circ}36'N$ ,  $\lambda = 37^{\circ}55'.6E$ .

a) određivanje UT	b) određivanje $s_{\gamma}$
$t_x$ ..... $23^h 17^m.9$	14. april za $20^h S_{\gamma}$ ..... $143^{\circ} 5'.1$
$x$ ..... $- 2^h 00^m.0$	Popravka časovnog ugla Prolećne tačke za $1^h 17^m 53^s$ ..... $19^{\circ}31'.5$
<hr/> UT ..... $21^h 17^m.9$	<hr/> $-S_{\gamma}$ ..... $162^{\circ}36'.6$
	$+\lambda$ ..... $+ 37^{\circ}55'.6$
	<hr/> $s_{\gamma}$ ..... $200^{\circ}32'.2$
	$\alpha$ ..... $200^{\circ}32'.2$
	$(360^{\circ} - s_{\gamma})$ ..... $159^{\circ}27'.8$
	$(360^{\circ} - \alpha)$ ..... $159^{\circ}27'.8$

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 ( $\zeta$  UMa), čija je stvarna deklinacija  $54^{\circ}53'.9$  i surektascenzija  $158^{\circ}57'.3$ .

**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 ( $\varphi$ ) 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 2005. godine na poziciji  $\varphi = 41^{\circ}20'N$  i  $\lambda = 17^{\circ}56'E$  u  $t_x = 22^h 15^m$  ( $x = +1$ ).

a) određivanje $t_s$	b) razlika u odnosu na ponoć
$t_x$ ..... $22^h 15^m$	$t_{s1}$ ..... $0^h 00^m$
$-(x - \lambda)$ ..... $+ 12^m$	$-t_{s2}$ ..... $22^h 27^m$
<hr/> $t_s$ ..... $22^h 27^m$	<hr/> $\Delta t_s$ (pre ponoći) ..... $1^h 33^m$

Postupajući na gore opisani način, naći će se pozicija zenita u ponoć, sa koordinatama:  $\phi = \delta = 41^{\circ}.3N$  i  $(360^{\circ} - \alpha) = 215^{\circ}$  (11. mart). Od ove pozicije, približno u smeru  $168^{\circ}$  i na udaljenosti  $29^{\circ}$ , pronalazimo zvezdu Regulus ( $\alpha$  Leonis).



***Zvanična***  
/  
ZONSKA VREMENA

# ZVANIČNA I ZONSKA VREMENA

## ZONSKO VREME

Podela Zemlje na vremenske zone izvršena je tako da svaka vremenska zona obuhvata područje od  $15^\circ$  geografske dužine. Početna vremenska zona sa zonskim indeksom 0 ( $x = 0^h$ ) proteže se od griničkog meridijana na istok i na zapad do  $\lambda = 7^\circ.5 E$  i  $\lambda = 7^\circ.5 W$ , 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  $\lambda = 172^\circ.5 E$  i  $\lambda = 172^\circ.5 W$ , sa središnjim meridijanom  $180^\circ$  po Griniču.

Za prelaz sa zonskog na griničko vreme koristi se obrazac, gde  $x$  označava zonski indeks:

$$UT = t_x - x$$

(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  $180^\circ$ , već zaobilazi nastanjeno kopno i ostrva, pa ide linijom koja se dobije spojnicom sledećih tačaka:

$\varphi$	$\lambda$	$\varphi$	$\lambda$
$90^\circ.0 N$	$180^\circ$	$48^\circ.0 N$	$180^\circ$
$75^\circ.0 N$	$180^\circ$	$05^\circ.0 S$	$180^\circ$
$68^\circ.0 N$	$168^\circ 58' 22'' W$ (ostrva Diomedea)	$15^\circ.0 S$	$172^\circ.5 W$
$65^\circ.5 N$	$168^\circ 58' 22'' W$ (Beringov moreuz)	$45^\circ.0 S$	$172^\circ.5 W$
$53^\circ.0 N$	$170^\circ E$	$51^\circ.0 S$	$180^\circ$
		$90^\circ.0 S$	$180^\circ$

Prilikom prelaza granice datuma, ploveći prema zapadu datum se *povećava* za jedan dan. Kada se ona prelazi ploveći prema istoku, *manjuje* 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

$$UT = t_{zv} - zv,$$

gde  $zv$  označava indeks zvaničnog vremena.

## HRONOLOŠKI CIKLUSI I ERE

Epakta .....	19	Julijanski period .....	6718		
Zlatni broj (Mesečev ciklus) .....	XI	Sunčev ciklus .....	26		
ERA	GODINA	POCINJE	ERA	GODINA	POCINJE
Vizantijska .....	7514	14. Sep.	Japanska .....	2665	1. Jan.
Jevrejska .....	5766	3. Okt.	Grčka (Seleukidova) .....	2317	14. Sep.
Kineska (Ji-you) .....	(4642)	9. Feb.	Indijska (Saka) .....	1927	22. Mart
Rimska .....	2758	14. Jan.	Dioklecijanovna .....	1722	11. Sep.
Nabonasarova .....	2754	22. Apr.	Islamska (Hegira) .....	1426	9. Feb.

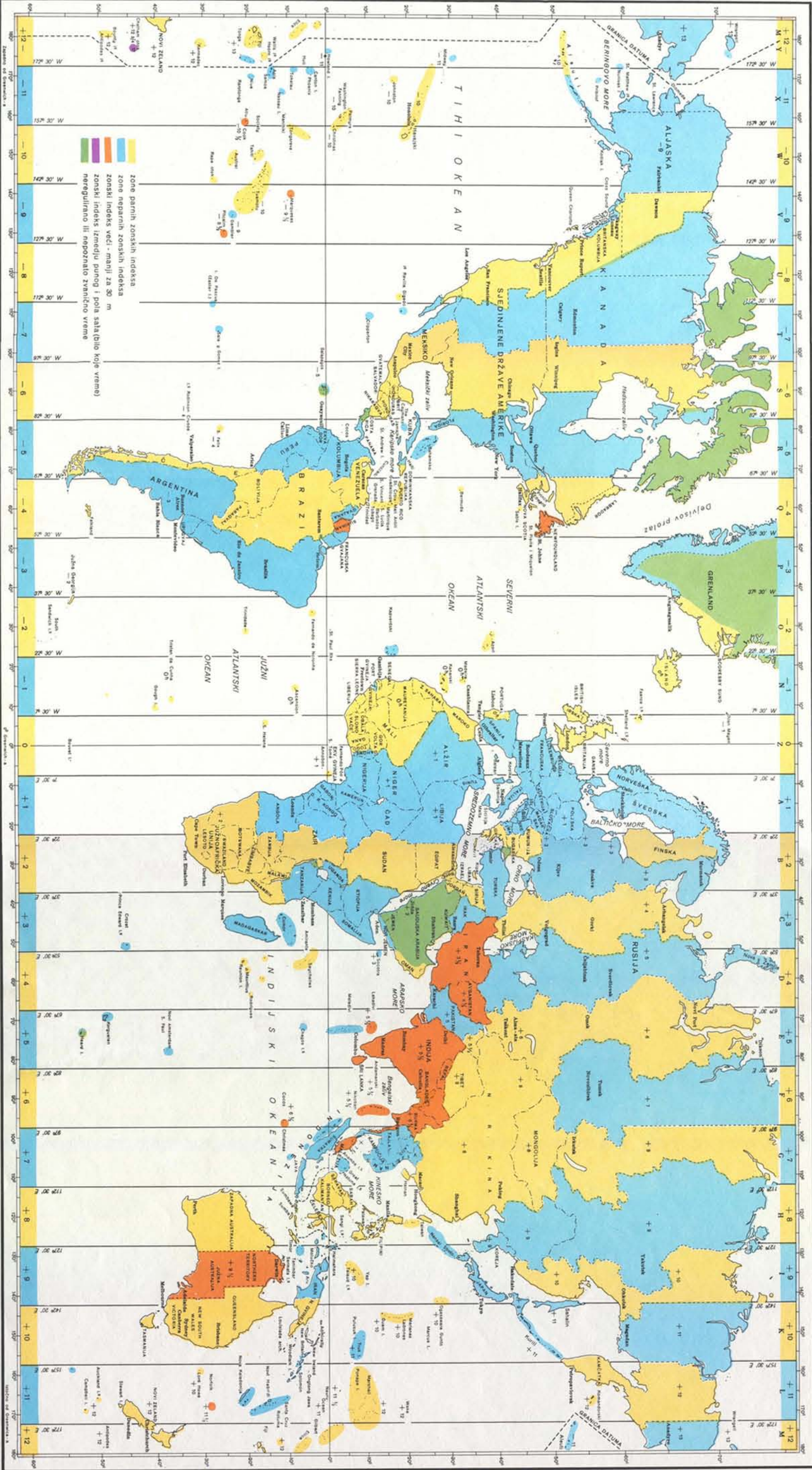
# PREGLED ZVANIČNIH VREMENA

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
Fokladska 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
Yucón	8 00
Kanarska ostrva	0 00
Kapverdaska 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



Hydrografički Institut, PIM Split, 1990 - Prilog Nautičkom godišnjaku

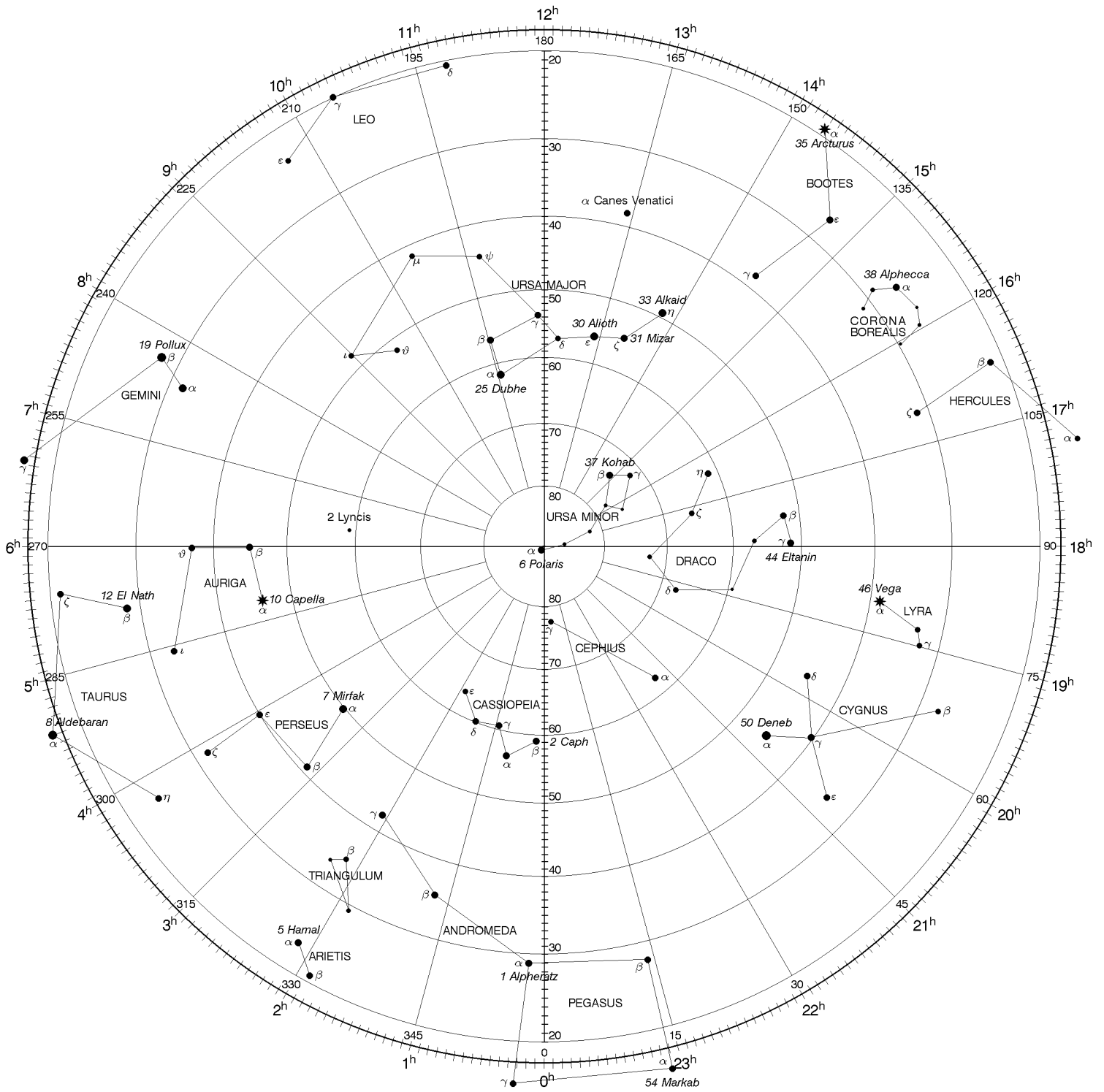


# *Karte*

ZVEZDANOG NEBA



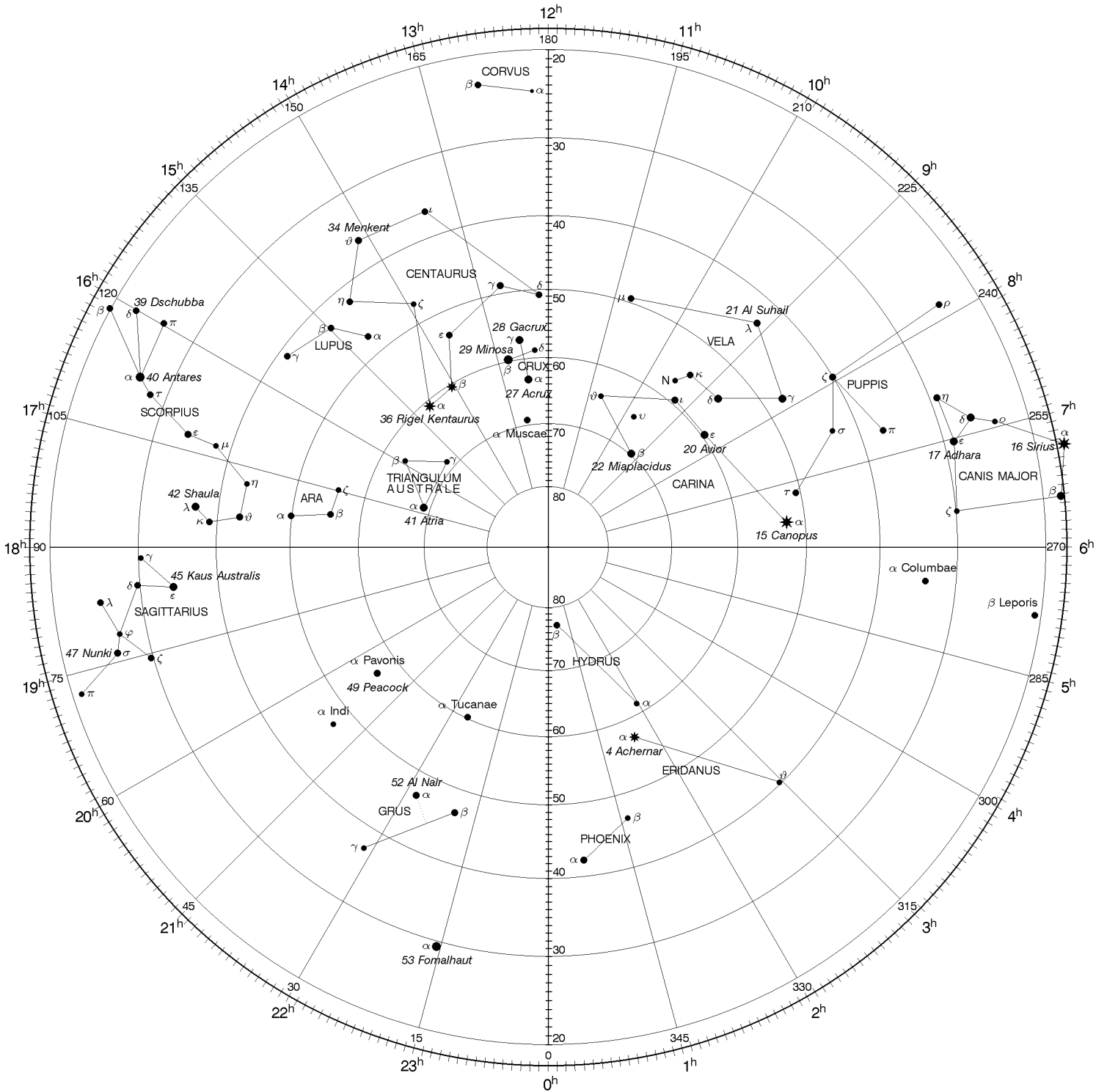
# KARTA SAZVEŽDA SEVERNOG NEBA



## 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 SAZVEŽDA JUŽNOG NEBA



## VELIČINE ZVEZDA

- |                      |                      |                      |                      |                      |                      |
|----------------------|----------------------|----------------------|----------------------|----------------------|----------------------|
| ★ $0.0 \geq m$       | ★ $0.0 < m \leq 0.5$ | ★ $0.5 < m \leq 1.0$ | ● $1.0 < m \leq 1.5$ | ● $1.5 < m \leq 2.0$ | ● $2.0 < m \leq 2.5$ |
| ● $2.5 < m \leq 3.0$ | ● $3.0 < m \leq 3.5$ | ● $3.5 < m \leq 4.0$ | ● $4.0 < m \leq 4.5$ | ● $4.5 < m \leq 5.0$ |                      |



