

h	Aries	Sun		Venus		Jupiter		Saturn		Mars	
	GHA	GHA	dec	GHA	dec	GHA	dec	GHA	dec	GHA	dec
0	100°07.1'	179°13.7'	S 23°03.5'	142°40.9'	S 18°15.9'	182°51.5'	S 23°10.8'	167°00.2'	S 21°41.1'	223°53.5'	S 19°26.7'
1	115°09.5'	194°13.4'	S 23°03.3'	157°40.2'	S 18°15.0'	197°53.3'	S 23°10.8'	182°02.3'	S 21°41.0'	238°54.2'	S 19°27.1'
2	130°12.0'	209°13.1'	S 23°03.1'	172°39.6'	S 18°14.1'	212°55.2'	S 23°10.7'	197°04.5'	S 21°41.0'	253°54.9'	S 19°27.5'
3	145°14.4'	224°12.8'	S 23°03.0'	187°39.0'	S 18°13.2'	227°57.0'	S 23°10.7'	212°06.6'	S 21°40.9'	268°55.7'	S 19°27.9'
4	160°16.9'	239°12.5'	S 23°02.8'	202°38.4'	S 18°12.2'	242°58.9'	S 23°10.7'	227°08.8'	S 21°40.9'	283°56.4'	S 19°28.3'
5	175°19.4'	254°12.2'	S 23°02.6'	217°37.8'	S 18°11.3'	258°00.7'	S 23°10.7'	242°10.9'	S 21°40.8'	298°57.1'	S 19°28.7'
6	190°21.8'	269°11.9'	S 23°02.4'	232°37.2'	S 18°10.4'	273°02.5'	S 23°10.6'	257°13.1'	S 21°40.8'	313°57.9'	S 19°29.1'
7	205°24.3'	284°11.6'	S 23°02.2'	247°36.6'	S 18°09.5'	288°04.4'	S 23°10.6'	272°15.2'	S 21°40.8'	328°58.6'	S 19°29.5'
8	220°26.8'	299°11.3'	S 23°02.0'	262°36.0'	S 18°08.6'	303°06.2'	S 23°10.6'	287°17.4'	S 21°40.7'	343°59.3'	S 19°29.9'
9	235°29.2'	314°11.0'	S 23°01.8'	277°35.4'	S 18°07.6'	318°08.1'	S 23°10.6'	302°19.5'	S 21°40.7'	359°00.0'	S 19°30.3'
10	250°31.7'	329°10.8'	S 23°01.6'	292°34.8'	S 18°06.7'	333°09.9'	S 23°10.5'	317°21.7'	S 21°40.6'	14°00.8'	S 19°30.6'
11	265°34.2'	344°10.5'	S 23°01.4'	307°34.1'	S 18°05.8'	348°11.7'	S 23°10.5'	332°23.8'	S 21°40.6'	29°01.5'	S 19°31.0'
12	280°36.6'	359°10.2'	S 23°01.2'	322°33.5'	S 18°04.8'	3°13.6'	S 23°10.5'	347°26.0'	S 21°40.5'	44°02.2'	S 19°31.4'
13	295°39.1'	14°09.9'	S 23°01.0'	337°32.9'	S 18°03.9'	18°15.4'	S 23°10.5'	2°28.1'	S 21°40.5'	59°03.0'	S 19°31.8'
14	310°41.6'	29°09.6'	S 23°00.8'	352°32.3'	S 18°03.0'	33°17.2'	S 23°10.4'	17°30.3'	S 21°40.5'	74°03.7'	S 19°32.2'
15	325°44.0'	44°09.3'	S 23°00.6'	7°31.7'	S 18°02.1'	48°19.1'	S 23°10.4'	32°32.5'	S 21°40.4'	89°04.4'	S 19°32.6'
16	340°46.5'	59°09.0'	S 23°00.4'	22°31.1'	S 18°01.1'	63°20.9'	S 23°10.4'	47°34.6'	S 21°40.4'	104°05.2'	S 19°33.0'
17	355°48.9'	74°08.7'	S 23°00.2'	37°30.5'	S 18°00.2'	78°22.8'	S 23°10.4'	62°36.8'	S 21°40.3'	119°05.9'	S 19°33.4'
18	10°51.4'	89°08.4'	S 22°60.0'	52°29.9'	S 17°59.3'	93°24.6'	S 23°10.3'	77°38.9'	S 21°40.3'	134°06.6'	S 19°33.8'
19	25°53.9'	104°08.1'	S 22°59.7'	67°29.3'	S 17°58.3'	108°26.4'	S 23°10.3'	92°41.1'	S 21°40.2'	149°07.3'	S 19°34.2'
20	40°56.3'	119°07.8'	S 22°59.5'	82°28.7'	S 17°57.4'	123°28.3'	S 23°10.3'	107°43.2'	S 21°40.2'	164°08.1'	S 19°34.6'
21	55°58.8'	134°07.5'	S 22°59.3'	97°28.1'	S 17°56.5'	138°30.1'	S 23°10.2'	122°45.4'	S 21°40.2'	179°08.8'	S 19°35.0'
22	71°01.3'	149°07.2'	S 22°59.1'	112°27.5'	S 17°55.5'	153°31.9'	S 23°10.2'	137°47.5'	S 21°40.1'	194°09.5'	S 19°35.3'
23	86°03.7'	164°06.9'	S 22°58.9'	127°26.9'	S 17°54.6'	168°33.8'	S 23°10.2'	152°49.7'	S 21°40.1'	209°10.2'	S 19°35.7'
		SD 16.3'	d 0.2'	v -0.6'	d 0.9'	v 1.8'	d 0.0'	v 2.2'	d 0.0'	v 0.7'	d -0.4'
Mer. pass.		12 h 3 m 20 s		14 h 30 m		11 h 47 m		12 h 50 m		9 h 4 m	

h	Moon				Lunar distance								
	GHA	dec	v	d	HP	-Betelgeuse	-Capella	-Rigel	-Aldebaran	+Fomalhaut	+Venus	+Altair	+Sun
0	110°56.9'	S 9°58.5'	15.4'	10.7'	54.2'	100°57.8'	97°25.1'	88°18.2'	83°30.7'	19°59.5'	31°49.0'	54°23.3'	66°13.3'
1	125°31.3'	S 9°47.8'	15.4'	10.7'	54.2'	100°29.2'	96°58.1'	87°52.2'	83°01.1'	20°15.7'	32°15.6'	54°46.1'	66°40.4'
2	140°05.7'	S 9°37.1'	15.4'	10.8'	54.2'	100°00.6'	96°31.1'	87°26.3'	82°31.5'	20°32.4'	32°42.2'	55°09.1'	67°07.6'
3	154°40.1'	S 9°26.3'	15.5'	10.8'	54.2'	99°32.0'	96°04.1'	87°00.4'	82°01.8'	20°49.5'	33°08.8'	55°32.1'	67°34.7'
4	169°14.6'	S 9°15.5'	15.5'	10.8'	54.2'	99°03.4'	95°37.1'	86°34.5'	81°32.2'	21°07.1'	33°35.4'	55°55.1'	68°01.8'
5	183°49.1'	S 9°04.7'	15.5'	10.9'	54.2'	98°34.8'	95°10.1'	86°08.6'	81°02.6'	21°25.1'	34°01.9'	56°18.2'	68°28.9'
6	198°23.7'	S 8°53.8'	15.6'	10.9'	54.2'	98°06.2'	94°43.1'	85°42.7'	80°33.0'	21°43.6'	34°28.5'	56°41.4'	68°56.0'
7	212°58.3'	S 8°42.9'	15.6'	10.9'	54.2'	97°37.6'	94°16.1'	85°16.8'	80°03.4'	22°02.3'	34°55.1'	57°04.7'	69°23.1'
8	227°32.9'	S 8°32.0'	15.7'	11.0'	54.2'	97°09.1'	93°49.1'	84°51.0'	79°33.9'	22°21.5'	35°21.6'	57°28.0'	69°50.2'
9	242°07.5'	S 8°21.0'	15.7'	11.0'	54.2'	96°40.5'	93°22.1'	84°25.2'	79°04.3'	22°41.0'	35°48.2'	57°51.3'	70°17.2'
10	256°42.2'	S 8°10.0'	15.7'	11.0'	54.2'	96°11.9'	92°55.1'	83°59.3'	78°34.7'	23°00.9'	36°14.7'	58°14.7'	70°44.3'
11	271°16.9'	S 7°59.0'	15.7'	11.0'	54.2'	95°43.3'	92°28.1'	83°33.5'	78°05.2'	23°21.0'	36°41.2'	58°38.2'	71°11.4'
12	285°51.7'	S 7°48.0'	15.8'	11.1'	54.2'	95°14.8'	92°01.1'	83°07.7'	77°35.6'	23°41.5'	37°07.8'	59°01.7'	71°38.4'
13	300°26.5'	S 7°36.9'	15.8'	11.1'	54.2'	94°46.2'	91°34.2'	82°41.9'	77°06.1'	24°02.3'	37°34.3'	59°25.2'	72°05.5'
14	315°01.3'	S 7°25.8'	15.8'	11.1'	54.1'	94°17.7'	91°07.2'	82°16.1'	76°36.5'	24°23.3'	38°00.8'	59°48.8'	72°32.5'
15	329°36.1'	S 7°14.7'	15.9'	11.2'	54.1'	93°49.1'	90°40.2'	81°50.4'	76°07.0'	24°44.7'	38°27.3'	60°12.5'	72°59.6'
16	344°11.0'	S 7°03.5'	15.9'	11.2'	54.1'	93°20.6'	90°13.3'	81°24.6'	75°37.5'	25°06.2'	38°53.8'	60°36.2'	73°26.6'
17	358°45.9'	S 6°52.3'	15.9'	11.2'	54.1'	92°52.0'	89°46.3'	80°58.9'	75°08.0'	25°28.1'	39°20.3'	60°60.0'	73°53.6'
18	13°20.8'	S 6°41.1'	15.9'	11.2'	54.1'	92°23.5'	89°19.4'	80°33.1'	74°38.4'	25°50.1'	39°46.8'	61°23.8'	74°20.6'
19	27°55.7'	S 6°29.9'	16.0'	11.2'	54.1'	91°55.0'	88°52.4'	80°07.4'	74°08.9'	26°12.4'	40°13.3'	61°47.6'	74°47.6'
20	42°30.7'	S 6°18.7'	16.0'	11.3'	54.1'	91°26.4'	88°25.5'	79°41.7'	73°39.4'	26°34.9'	40°39.8'	62°11.5'	75°14.7'
21	57°05.7'	S 6°07.4'	16.0'	11.3'	54.1'	90°57.9'	87°58.5'	79°16.0'	73°09.9'	26°57.6'	41°06.3'	62°35.5'	75°41.7'
22	71°40.7'	S 5°56.1'	16.0'	11.3'	54.1'	90°29.4'	87°31.6'	78°50.4'	72°40.4'	27°20.6'	41°32.8'	62°59.4'	76°08.7'
23	86°15.7'	S 5°44.8'	16.1'	11.3'	54.1'	90°00.9'	87°04.7'	78°24.7'	72°10.9'	27°43.7'	41°59.2'	63°23.5'	76°35.7'
Mer. pass.		17 h 5 m	SD 14.8'	phase 30%									

Star	mag	SHA	dec	Star	mag	SHA	dec	Star	mag	SHA	dec
Fomalhaut	+1.2	15°19.2'	S 29°31.2'	Spica	+1.0	158°26.6'	S 11°15.8'	Betelgeuse	+0.5	270°56.1'	N 7°24.5'
Deneb	+1.2	49°28.9'	N 45°21.2'	Acrux	+0.8	173°04.3'	S 63°12.2'	Capella	+0.1	280°27.3'	N 46°01.0'
Altair	+0.8	62°04.2'	N 8°55.3'	Regulus	+1.4	207°38.5'	N 11°52.1'	Rigel	+0.2	281°07.4'	S 8°10.9'
Vega	+0.0	80°36.4'	N 38°48.2'	Pollux	+1.2	243°21.9'	N 27°58.5'	Aldebaran	+0.9	290°43.9'	N 16°32.8'
Antares	+1.1	112°21.1'	S 26°28.4'	Procyon	+0.4	244°54.7'	N 5°10.3'	Polaris	+2.0	315°31.0'	N 89°21.1'
Rigil Kent	-0.0	139°46.0'	S 60°54.6'	Adhara	+1.5	255°08.6'	S 29°00.0'	Achernar	+0.5	335°23.2'	S 57°08.5'
Arcturus	-0.1	145°51.8'	N 19°04.7'	Sirius	-1.4	258°29.4'	S 16°44.7'				
Hadar	+0.6	148°41.8'	S 60°27.7'	Canopus	-0.6	263°53.6'	S 52°42.5'				

h	Aries		Sun		Venus		Jupiter		Saturn		Mars	
	GHA		GHA	dec	GHA	dec	GHA	dec	GHA	dec	GHA	dec
0	101°06.2'	179°06.6'	S 22°58.7'	142°26.3'	S 17°53.7'	183°35.6'	S 23°10.2'	167°51.8'	S 21°40.0'	224°11.0'	S 19°36.1'	
1	116°08.7'	194°06.3'	S 22°58.5'	157°25.7'	S 17°52.7'	198°37.5'	S 23°10.1'	182°54.0'	S 21°40.0'	239°11.7'	S 19°36.5'	
2	131°11.1'	209°06.0'	S 22°58.3'	172°25.1'	S 17°51.8'	213°39.3'	S 23°10.1'	197°56.1'	S 21°39.9'	254°12.4'	S 19°36.9'	
3	146°13.6'	224°05.7'	S 22°58.1'	187°24.5'	S 17°50.8'	228°41.1'	S 23°10.1'	212°58.3'	S 21°39.9'	269°13.2'	S 19°37.3'	
4	161°16.1'	239°05.4'	S 22°57.9'	202°23.9'	S 17°49.9'	243°43.0'	S 23°10.1'	228°00.4'	S 21°39.9'	284°13.9'	S 19°37.7'	
5	176°18.5'	254°05.1'	S 22°57.6'	217°23.3'	S 17°49.0'	258°44.8'	S 23°10.0'	243°02.6'	S 21°39.8'	299°14.6'	S 19°38.1'	
6	191°21.0'	269°04.8'	S 22°57.4'	232°22.7'	S 17°48.0'	273°46.7'	S 23°10.0'	258°04.7'	S 21°39.8'	314°15.3'	S 19°38.5'	
7	206°23.4'	284°04.6'	S 22°57.2'	247°22.2'	S 17°47.1'	288°48.5'	S 23°10.0'	273°06.9'	S 21°39.7'	329°16.1'	S 19°38.8'	
8	221°25.9'	299°04.3'	S 22°57.0'	262°21.6'	S 17°46.1'	303°50.3'	S 23°10.0'	288°09.0'	S 21°39.7'	344°16.8'	S 19°39.2'	
9	236°28.4'	314°04.0'	S 22°56.8'	277°21.0'	S 17°45.2'	318°52.2'	S 23°09.9'	303°11.2'	S 21°39.6'	359°17.5'	S 19°39.6'	
10	251°30.8'	329°03.7'	S 22°56.6'	292°20.4'	S 17°44.2'	333°54.0'	S 23°09.9'	318°13.3'	S 21°39.6'	14°18.2'	S 19°40.0'	
11	266°33.3'	344°03.4'	S 22°56.3'	307°19.8'	S 17°43.3'	348°55.8'	S 23°09.9'	333°15.5'	S 21°39.5'	29°19.0'	S 19°40.4'	
12	281°35.8'	359°03.1'	S 22°56.1'	322°19.2'	S 17°42.3'	3°57.7'	S 23°09.9'	348°17.6'	S 21°39.5'	44°19.7'	S 19°40.8'	
13	296°38.2'	14°02.8'	S 22°55.9'	337°18.6'	S 17°41.4'	18°59.5'	S 23°09.8'	3°19.8'	S 21°39.5'	59°20.4'	S 19°41.2'	
14	311°40.7'	29°02.5'	S 22°55.7'	352°18.0'	S 17°40.4'	34°01.4'	S 23°09.8'	18°22.0'	S 21°39.4'	74°21.1'	S 19°41.6'	
15	326°43.2'	44°02.2'	S 22°55.5'	7°17.4'	S 17°39.5'	49°03.2'	S 23°09.8'	33°24.1'	S 21°39.4'	89°21.9'	S 19°41.9'	
16	341°45.6'	59°01.9'	S 22°55.2'	22°16.8'	S 17°38.5'	64°05.0'	S 23°09.7'	48°26.3'	S 21°39.3'	104°22.6'	S 19°42.3'	
17	356°48.1'	74°01.6'	S 22°55.0'	37°16.2'	S 17°37.6'	79°06.9'	S 23°09.7'	63°28.4'	S 21°39.3'	119°23.3'	S 19°42.7'	
18	11°50.5'	89°01.3'	S 22°54.8'	52°15.7'	S 17°36.6'	94°08.7'	S 23°09.7'	78°30.6'	S 21°39.2'	134°24.0'	S 19°43.1'	
19	26°53.0'	104°01.0'	S 22°54.6'	67°15.1'	S 17°35.7'	109°10.6'	S 23°09.7'	93°32.7'	S 21°39.2'	149°24.8'	S 19°43.5'	
20	41°55.5'	119°00.8'	S 22°54.3'	82°14.5'	S 17°34.7'	124°12.4'	S 23°09.6'	108°34.9'	S 21°39.2'	164°25.5'	S 19°43.9'	
21	56°57.9'	134°00.5'	S 22°54.1'	97°13.9'	S 17°33.8'	139°14.2'	S 23°09.6'	123°37.0'	S 21°39.1'	179°26.2'	S 19°44.2'	
22	72°00.4'	149°00.9'	S 22°53.9'	112°13.3'	S 17°32.8'	154°16.1'	S 23°09.6'	138°39.2'	S 21°39.1'	194°26.9'	S 19°44.6'	
23	87°02.9'	163°59.9'	S 22°53.7'	127°12.7'	S 17°31.9'	169°17.9'	S 23°09.6'	153°41.3'	S 21°39.0'	209°27.7'	S 19°45.0'	
		SD 16.3' d 0.2'		v -0.6' d 0.9'		v 1.8' d 0.0'		v 2.2' d 0.0'		v 0.7' d -0.4'		
Mer. pass.		12 h 3 m 48 s		14 h 31 m		11 h 44 m		12 h 47 m		9 h 3 m		

h	Moon					Lunar distance							
	GHA	dec	v	d	HP	-Betelgeuse	-Capella	-Rigel	-Aldebaran	+Fomalhaut	+Venus	+Altair	+Sun
0	100°50.8'	S 5°33.4'	16.1'	11.4'	54.1'	89°32.3'	86°37.7'	77°59.1'	71°41.4'	28°07.0'	42°25.7'	63°47.5'	77°02.7'
1	115°25.8'	S 5°22.1'	16.1'	11.4'	54.1'	89°03.8'	86°10.8'	77°33.4'	71°11.9'	28°30.4'	42°52.2'	64°11.6'	77°29.7'
2	130°00.9'	S 5°10.7'	16.1'	11.4'	54.1'	88°35.3'	85°43.9'	77°07.8'	70°42.4'	28°54.1'	43°18.7'	64°35.8'	77°56.7'
3	144°36.0'	S 4°59.3'	16.1'	11.4'	54.1'	88°06.8'	85°17.0'	76°42.2'	70°12.9'	29°17.8'	43°45.2'	64°59.9'	78°23.7'
4	159°11.2'	S 4°47.9'	16.1'	11.4'	54.1'	87°38.3'	84°50.1'	76°16.6'	69°43.4'	29°41.8'	44°11.6'	65°24.2'	78°50.7'
5	173°46.3'	S 4°36.5'	16.2'	11.5'	54.1'	87°09.8'	84°23.2'	75°51.1'	69°13.9'	30°05.9'	44°38.1'	65°48.4'	79°17.7'
6	188°21.4'	S 4°25.0'	16.2'	11.5'	54.1'	86°41.2'	83°56.3'	75°25.5'	68°44.4'	30°30.2'	45°04.6'	66°12.7'	79°44.7'
7	202°56.6'	S 4°13.5'	16.2'	11.5'	54.1'	86°12.7'	83°29.4'	74°60.0'	68°14.9'	30°54.5'	45°31.1'	66°37.1'	80°11.7'
8	217°31.8'	S 4°02.1'	16.2'	11.5'	54.1'	85°44.2'	83°02.5'	74°34.5'	67°45.4'	31°19.1'	45°57.5'	67°01.4'	80°38.7'
9	232°07.0'	S 3°50.6'	16.2'	11.5'	54.1'	85°15.7'	82°35.6'	74°09.0'	67°15.9'	31°43.7'	46°24.0'	67°25.8'	81°05.7'
10	246°42.2'	S 3°39.0'	16.2'	11.5'	54.1'	84°47.2'	82°08.7'	73°43.5'	66°46.5'	32°08.5'	46°50.5'	67°50.3'	81°32.7'
11	261°17.4'	S 3°27.5'	16.2'	11.5'	54.1'	84°18.7'	81°41.8'	73°18.0'	66°17.0'	32°33.4'	47°17.0'	68°14.7'	81°59.7'
12	275°52.6'	S 3°16.0'	16.2'	11.6'	54.1'	83°50.2'	81°14.9'	72°52.6'	65°47.5'	32°58.4'	47°43.5'	68°39.2'	82°26.7'
13	290°27.8'	S 3°04.4'	16.2'	11.6'	54.1'	83°21.6'	80°48.1'	72°27.1'	65°18.0'	33°23.5'	48°10.0'	69°03.8'	82°53.7'
14	305°03.1'	S 2°52.8'	16.2'	11.6'	54.2'	82°53.1'	80°21.2'	72°01.7'	64°48.4'	33°48.8'	48°36.5'	69°28.3'	83°20.7'
15	319°38.3'	S 2°41.3'	16.2'	11.6'	54.2'	82°24.6'	79°54.3'	71°36.3'	64°18.9'	34°14.1'	49°03.0'	69°53.0'	83°47.8'
16	334°13.5'	S 2°29.7'	16.2'	11.6'	54.2'	81°56.1'	79°27.5'	71°10.9'	63°49.4'	34°39.5'	49°29.5'	70°17.6'	84°14.8'
17	348°48.8'	S 2°18.1'	16.3'	11.6'	54.2'	81°27.6'	79°00.6'	70°45.6'	63°19.9'	35°05.1'	49°56.0'	70°42.3'	84°41.8'
18	3°24.0'	S 2°06.5'	16.3'	11.6'	54.2'	80°59.0'	78°33.7'	70°20.2'	62°50.4'	35°30.7'	50°22.5'	71°07.0'	85°08.8'
19	17°59.3'	S 1°54.8'	16.3'	11.6'	54.2'	80°30.5'	78°06.9'	69°54.9'	62°20.9'	35°56.4'	50°49.0'	71°31.7'	85°35.9'
20	32°34.6'	S 1°43.2'	16.3'	11.6'	54.2'	80°02.0'	77°40.1'	69°29.6'	61°51.3'	36°22.2'	51°15.5'	71°56.4'	86°02.9'
21	47°09.8'	S 1°31.6'	16.3'	11.7'	54.2'	79°33.5'	77°13.2'	69°04.4'	61°21.8'	36°48.1'	51°42.0'	72°21.2'	86°30.0'
22	61°45.1'	S 1°19.9'	16.3'	11.7'	54.2'	79°04.9'	76°46.4'	68°39.1'	60°52.3'	37°14.1'	52°08.6'	72°46.0'	86°57.0'
23	76°20.3'	S 1°08.2'	16.2'	11.7'	54.2'	78°36.4'	76°19.5'	68°13.9'	60°22.7'	37°40.2'	52°35.1'	73°10.9'	87°24.1'
Mer. pass.		17 h 46 m SD 14.8'		phase 39%									

Star	mag	SHA	dec	Star	mag	SHA	dec	Star	mag	SHA	dec
Fomalhaut	+1.2	15°19.2'	S 29°31.2'	Spica	+1.0	158°26.6'	S 11°15.8'	Betelgeuse	+0.5	270°56.1'	N 7°24.5'
Deneb	+1.2	49°28.9'	N 45°21.2'	Acrux	+0.8	173°04.3'	S 63°12.2'	Capella	+0.1	280°27.3'	N 46°01.0'
Altair	+0.8	62°04.2'	N 8°55.3'	Regulus	+1.4	207°38.5'	N 11°52.1'	Rigel	+0.2	281°07.4'	S 8°10.9'
Vega	+0.0	80°36.4'	N 38°48.2'	Pollux	+1.2	243°21.9'	N 27°58.5'	Aldebaran	+0.9	290°43.9'	N 16°32.8'
Antares	+1.1	112°21.1'	S 26°28.4'	Procyon	+0.4	244°54.7'	N 5°10.3'	Polaris	+2.0	315°31.4'	N 89°21.1'
Rigil Kent	-0.0	139°46.0'	S 60°54.6'	Adhara	+1.5	255°08.6'	S 29°00.0'	Achernar	+0.5	335°23.2'	S 57°08.5'
Arcturus	-0.1	145°51.8'	N 19°04.7'	Sirius	-1.4	258°29.4'	S 16°44.7'				
Hadar	+0.6	148°41.8'	S 60°27.7'	Canopus	-0.6	263°53.6'	S 52°42.5'				

h	Aries		Sun		Venus		Jupiter		Saturn		Mars	
	GHA		GHA	dec	GHA	dec	GHA	dec	GHA	dec	GHA	dec
0	102°05.3'	178°59.6'	S 22°53.4'	142°12.2'	S 17°30.9'	184°19.8'	S 23°09.5'	168°43.5'	S 21°39.0'	224°28.4'	S 19°45.4'	
1	117°07.8'	193°59.3'	S 22°53.2'	157°11.6'	S 17°30.0'	199°21.6'	S 23°09.5'	183°45.6'	S 21°38.9'	239°29.1'	S 19°45.8'	
2	132°10.3'	208°59.0'	S 22°53.0'	172°11.0'	S 17°29.0'	214°23.4'	S 23°09.5'	198°47.8'	S 21°38.9'	254°29.8'	S 19°46.2'	
3	147°12.7'	223°58.7'	S 22°52.7'	187°10.4'	S 17°28.0'	229°25.3'	S 23°09.5'	213°49.9'	S 21°38.9'	269°30.5'	S 19°46.5'	
4	162°15.2'	238°58.4'	S 22°52.5'	202°09.8'	S 17°27.1'	244°27.1'	S 23°09.4'	228°52.1'	S 21°38.8'	284°31.3'	S 19°46.9'	
5	177°17.7'	253°58.1'	S 22°52.3'	217°09.3'	S 17°26.1'	259°28.9'	S 23°09.4'	243°54.2'	S 21°38.8'	299°32.0'	S 19°47.3'	
6	192°20.1'	268°57.8'	S 22°52.0'	232°08.7'	S 17°25.1'	274°30.8'	S 23°09.4'	258°56.4'	S 21°38.7'	314°32.7'	S 19°47.7'	
7	207°22.6'	283°57.6'	S 22°51.8'	247°08.1'	S 17°24.2'	289°32.6'	S 23°09.3'	273°58.5'	S 21°38.7'	329°33.4'	S 19°48.1'	
8	222°25.0'	298°57.3'	S 22°51.6'	262°07.5'	S 17°23.2'	304°34.5'	S 23°09.3'	289°00.7'	S 21°38.6'	344°34.2'	S 19°48.5'	
9	237°27.5'	313°57.0'	S 22°51.3'	277°06.9'	S 17°22.3'	319°36.3'	S 23°09.3'	304°02.8'	S 21°38.6'	359°34.9'	S 19°48.8'	
10	252°30.0'	328°56.7'	S 22°51.1'	292°06.4'	S 17°21.3'	334°38.1'	S 23°09.3'	319°05.0'	S 21°38.6'	14°35.6'	S 19°49.2'	
11	267°32.4'	343°56.4'	S 22°50.8'	307°05.8'	S 17°20.3'	349°40.0'	S 23°09.2'	334°07.1'	S 21°38.5'	29°36.3'	S 19°49.6'	
12	282°34.9'	358°56.1'	S 22°50.6'	322°05.2'	S 17°19.4'	4°41.8'	S 23°09.2'	349°09.3'	S 21°38.5'	44°37.0'	S 19°50.0'	
13	297°37.4'	13°55.8'	S 22°50.4'	337°04.6'	S 17°18.4'	19°43.7'	S 23°09.2'	4°11.4'	S 21°38.4'	59°37.8'	S 19°50.4'	
14	312°39.8'	28°55.5'	S 22°50.1'	352°04.1'	S 17°17.4'	34°45.5'	S 23°09.2'	19°13.6'	S 21°38.4'	74°38.5'	S 19°50.7'	
15	327°42.3'	43°55.2'	S 22°49.9'	7°03.5'	S 17°16.5'	49°47.3'	S 23°09.1'	34°15.7'	S 21°38.3'	89°39.2'	S 19°51.1'	
16	342°44.8'	58°55.0'	S 22°49.6'	22°02.9'	S 17°15.5'	64°49.2'	S 23°09.1'	49°17.9'	S 21°38.3'	104°39.9'	S 19°51.5'	
17	357°47.2'	73°54.7'	S 22°49.4'	37°02.3'	S 17°14.5'	79°51.0'	S 23°09.1'	64°20.0'	S 21°38.2'	119°40.6'	S 19°51.9'	
18	12°49.7'	88°54.4'	S 22°49.2'	52°01.8'	S 17°13.5'	94°52.9'	S 23°09.0'	79°22.2'	S 21°38.2'	134°41.4'	S 19°52.2'	
19	27°52.1'	103°54.1'	S 22°48.9'	67°01.2'	S 17°12.6'	109°54.7'	S 23°09.0'	94°24.4'	S 21°38.2'	149°42.1'	S 19°52.6'	
20	42°54.6'	118°53.8'	S 22°48.7'	82°00.6'	S 17°11.6'	124°56.5'	S 23°09.0'	109°26.5'	S 21°38.1'	164°42.8'	S 19°53.0'	
21	57°57.1'	133°53.5'	S 22°48.4'	97°00.1'	S 17°10.6'	139°58.4'	S 23°09.0'	124°28.7'	S 21°38.1'	179°43.5'	S 19°53.4'	
22	72°59.5'	148°53.2'	S 22°48.2'	111°59.5'	S 17°09.6'	155°00.2'	S 23°08.9'	139°30.8'	S 21°38.0'	194°44.2'	S 19°53.8'	
23	88°02.0'	163°52.9'	S 22°47.9'	126°58.9'	S 17°08.7'	170°02.0'	S 23°08.9'	154°33.0'	S 21°38.0'	209°45.0'	S 19°54.1'	
		SD 16.3' d 0.2'		v -0.6' d 1.0'		v 1.8' d 0.0'		v 2.2' d 0.0'		v 0.7' d -0.4'		
Mer. pass.		12 h 4 m 16 s		14 h 32 m		11 h 41 m		12 h 43 m		9 h 2 m		

h	Moon				Lunar distance								
	GHA	dec	v	d	HP	-Betelgeuse	-Capella	-Rigel	-Aldebaran	+Fomalhaut	+Venus	+Altair	+Sun
0	90°55.6'	S 0°56.6'	16.2'	11.7'	54.2'	78°07.8'	75°52.7'	67°48.7'	59°53.2'	38°06.3'	53°01.6'	73°35.8'	87°51.1'
1	105°30.8'	S 0°44.9'	16.2'	11.7'	54.2'	77°39.3'	75°25.9'	67°23.5'	59°23.6'	38°32.5'	53°28.2'	74°00.7'	88°18.2'
2	120°06.1'	S 0°33.2'	16.2'	11.7'	54.2'	77°10.8'	74°59.1'	66°58.3'	58°54.0'	38°58.8'	53°54.8'	74°25.6'	88°45.3'
3	134°41.3'	S 0°21.5'	16.2'	11.7'	54.2'	76°42.2'	74°32.3'	66°33.2'	58°24.5'	39°25.2'	54°21.3'	74°50.6'	89°12.4'
4	149°16.5'	S 0°09.9'	16.2'	11.7'	54.2'	76°13.7'	74°05.5'	66°08.0'	57°54.9'	39°51.7'	54°47.9'	75°15.5'	89°39.5'
5	163°51.7'	N 0°01.8'	16.2'	11.7'	54.2'	75°45.1'	73°38.7'	65°42.9'	57°25.3'	40°18.2'	55°14.5'	75°40.6'	90°06.6'
6	178°27.0'	N 0°13.5'	16.2'	11.7'	54.3'	75°16.5'	73°11.9'	65°17.9'	56°55.7'	40°44.8'	55°41.1'	76°05.6'	90°33.7'
7	193°02.2'	N 0°25.2'	16.2'	11.7'	54.3'	74°48.0'	72°45.1'	64°52.8'	56°26.1'	41°11.4'	56°07.7'	76°30.7'	91°00.8'
8	207°37.4'	N 0°36.9'	16.2'	11.7'	54.3'	74°19.4'	72°18.3'	64°27.8'	55°56.5'	41°38.1'	56°34.3'	76°55.7'	91°28.0'
9	222°12.5'	N 0°48.6'	16.2'	11.7'	54.3'	73°50.8'	71°51.5'	64°02.8'	55°26.8'	42°04.9'	57°00.9'	77°20.9'	91°55.1'
10	236°47.7'	N 1°00.3'	16.2'	11.7'	54.3'	73°22.3'	71°24.8'	63°37.8'	54°57.2'	42°31.7'	57°27.6'	77°46.0'	92°22.3'
11	251°22.9'	N 1°12.0'	16.1'	11.7'	54.3'	72°53.7'	70°58.0'	63°12.9'	54°27.6'	42°58.6'	57°54.2'	78°11.2'	92°49.4'
12	265°58.0'	N 1°23.7'	16.1'	11.7'	54.3'	72°25.1'	70°31.2'	62°48.0'	53°57.9'	43°25.6'	58°20.9'	78°36.4'	93°16.6'
13	280°33.1'	N 1°35.4'	16.1'	11.7'	54.3'	71°56.5'	70°04.5'	62°23.1'	53°28.2'	43°52.6'	58°47.6'	79°01.6'	93°43.8'
14	295°08.2'	N 1°47.1'	16.1'	11.7'	54.3'	71°27.9'	69°37.7'	61°58.3'	52°58.5'	44°19.7'	59°14.2'	79°26.8'	94°11.0'
15	309°43.3'	N 1°58.8'	16.1'	11.7'	54.3'	70°59.3'	69°11.0'	61°33.5'	52°28.9'	44°46.8'	59°40.9'	79°52.1'	94°38.2'
16	324°18.4'	N 2°10.5'	16.1'	11.7'	54.4'	70°30.7'	68°44.3'	61°08.7'	51°59.1'	45°14.0'	60°07.6'	80°17.4'	95°05.5'
17	338°53.5'	N 2°22.2'	16.0'	11.7'	54.4'	70°02.0'	68°17.5'	60°43.9'	51°29.4'	45°41.2'	60°34.4'	80°42.7'	95°32.7'
18	353°28.5'	N 2°33.9'	16.0'	11.7'	54.4'	69°33.4'	67°50.8'	60°19.2'	50°59.7'	46°08.5'	61°01.1'	81°08.0'	95°60.0'
19	8°03.5'	N 2°45.6'	16.0'	11.7'	54.4'	69°04.8'	67°24.1'	59°54.5'	50°30.0'	46°35.9'	61°27.9'	81°33.4'	96°27.2'
20	22°38.5'	N 2°57.3'	16.0'	11.7'	54.4'	68°36.2'	66°57.4'	59°29.9'	50°00.2'	47°03.3'	61°54.6'	81°58.8'	96°54.5'
21	37°13.5'	N 3°09.0'	15.9'	11.7'	54.4'	68°07.5'	66°30.7'	59°05.3'	49°30.4'	47°30.7'	62°21.4'	82°24.2'	97°21.8'
22	51°48.4'	N 3°20.6'	15.9'	11.7'	54.4'	67°38.9'	66°04.0'	58°40.7'	49°00.6'	47°58.2'	62°48.2'	82°49.6'	97°49.1'
23	66°23.3'	N 3°32.3'	15.9'	11.7'	54.4'	67°10.2'	65°37.4'	58°16.1'	48°30.8'	48°25.8'	63°15.0'	83°15.1'	98°16.5'
Mer. pass.		18 h 27 m SD 14.8'		phase 48%									

Star	mag	SHA	dec	Star	mag	SHA	dec	Star	mag	SHA	dec
Fomalhaut	+1.2	15°19.2'	S 29°31.2'	Spica	+1.0	158°26.6'	S 11°15.8'	Betelgeuse	+0.5	270°56.1'	N 7°24.5'
Deneb	+1.2	49°28.9'	N 45°21.2'	Acrux	+0.8	173°04.3'	S 63°12.2'	Capella	+0.1	280°27.3'	N 46°01.0'
Altair	+0.8	62°04.2'	N 8°55.3'	Regulus	+1.4	207°38.5'	N 11°52.1'	Rigel	+0.2	281°07.4'	S 8°10.9'
Vega	+0.0	80°36.4'	N 38°48.2'	Pollux	+1.2	243°21.9'	N 27°58.5'	Aldebaran	+0.9	290°43.9'	N 16°32.8'
Antares	+1.1	112°21.1'	S 26°28.4'	Procyon	+0.4	244°54.7'	N 5°10.3'	Polaris	+2.0	315°31.8'	N 89°21.1'
Rigel Kent	-0.0	139°46.0'	S 60°54.6'	Adhara	+1.5	255°08.6'	S 29°00.0'	Achernar	+0.5	335°23.2'	S 57°08.6'
Arcturus	-0.1	145°51.8'	N 19°04.7'	Sirius	-1.4	258°29.4'	S 16°44.7'				
Hadar	+0.6	148°41.8'	S 60°27.7'	Canopus	-0.6	263°53.6'	S 52°42.5'				

h	Aries			Sun			Venus			Jupiter			Saturn			Mars		
	GHA	GHA	dec	GHA	dec	GHA	GHA	dec	GHA	dec	GHA	dec	GHA	dec	GHA	dec		
0	103°04.5'	178°52.7'	S 22°47.7'	141°58.4'	S 17°07.7'	185°03.9'	S 23°08.9'	169°35.1'	S 21°37.9'	224°45.7'	S 19°54.5'							
1	118°06.9'	193°52.4'	S 22°47.4'	156°57.8'	S 17°06.7'	200°05.7'	S 23°08.8'	184°37.3'	S 21°37.9'	239°46.4'	S 19°54.9'							
2	133°09.4'	208°52.1'	S 22°47.2'	171°57.2'	S 17°05.7'	215°07.6'	S 23°08.8'	199°39.4'	S 21°37.9'	254°47.1'	S 19°55.3'							
3	148°11.9'	223°51.8'	S 22°46.9'	186°56.7'	S 17°04.8'	230°09.4'	S 23°08.8'	214°41.6'	S 21°37.8'	269°47.8'	S 19°55.6'							
4	163°14.3'	238°51.5'	S 22°46.7'	201°56.1'	S 17°03.8'	245°11.2'	S 23°08.8'	229°43.7'	S 21°37.8'	284°48.6'	S 19°56.0'							
5	178°16.8'	253°51.2'	S 22°46.4'	216°55.5'	S 17°02.8'	260°13.1'	S 23°08.7'	244°45.9'	S 21°37.7'	299°49.3'	S 19°56.4'							
6	193°19.3'	268°50.9'	S 22°46.2'	231°55.0'	S 17°01.8'	275°14.9'	S 23°08.7'	259°48.0'	S 21°37.7'	314°50.0'	S 19°56.8'							
7	208°21.7'	283°50.6'	S 22°45.9'	246°54.4'	S 17°00.8'	290°16.8'	S 23°08.7'	274°50.2'	S 21°37.6'	329°50.7'	S 19°57.1'							
8	223°24.2'	298°50.4'	S 22°45.7'	261°53.8'	S 16°59.9'	305°18.6'	S 23°08.6'	289°52.3'	S 21°37.6'	344°51.4'	S 19°57.5'							
9	238°26.6'	313°50.1'	S 22°45.4'	276°53.3'	S 16°58.9'	320°20.4'	S 23°08.6'	304°54.5'	S 21°37.6'	359°52.1'	S 19°57.9'							
10	253°29.1'	328°49.8'	S 22°45.2'	291°52.7'	S 16°57.9'	335°22.3'	S 23°08.6'	319°56.6'	S 21°37.5'	14°52.9'	S 19°58.3'							
11	268°31.6'	343°49.5'	S 22°44.9'	306°52.2'	S 16°56.9'	350°24.1'	S 23°08.6'	334°58.8'	S 21°37.5'	29°53.6'	S 19°58.6'							
12	283°34.0'	358°49.2'	S 22°44.6'	321°51.6'	S 16°55.9'	5°26.0'	S 23°08.5'	350°00.9'	S 21°37.4'	44°54.3'	S 19°59.0'							
13	298°36.5'	13°48.9'	S 22°44.4'	336°51.0'	S 16°54.9'	20°27.8'	S 23°08.5'	5°03.1'	S 21°37.4'	59°55.0'	S 19°59.4'							
14	313°39.0'	28°48.7'	S 22°44.1'	351°50.5'	S 16°53.9'	35°29.6'	S 23°08.5'	20°05.2'	S 21°37.3'	74°55.7'	S 19°59.8'							
15	328°41.4'	43°48.4'	S 22°43.9'	6°49.9'	S 16°53.0'	50°31.5'	S 23°08.4'	35°07.4'	S 21°37.3'	89°56.4'	S 20°00.1'							
16	343°43.9'	58°48.1'	S 22°43.6'	21°49.4'	S 16°52.0'	65°33.3'	S 23°08.4'	50°09.5'	S 21°37.2'	104°57.2'	S 20°00.5'							
17	358°46.4'	73°47.8'	S 22°43.3'	36°48.8'	S 16°51.0'	80°35.2'	S 23°08.4'	65°11.7'	S 21°37.2'	119°57.9'	S 20°00.9'							
18	13°48.8'	88°47.5'	S 22°43.1'	51°48.3'	S 16°50.0'	95°37.0'	S 23°08.4'	80°13.8'	S 21°37.2'	134°58.6'	S 20°01.2'							
19	28°51.3'	103°47.2'	S 22°42.8'	66°47.7'	S 16°49.0'	110°38.8'	S 23°08.3'	95°16.0'	S 21°37.1'	149°59.3'	S 20°01.6'							
20	43°53.8'	118°47.0'	S 22°42.6'	81°47.1'	S 16°48.0'	125°40.7'	S 23°08.3'	110°18.1'	S 21°37.1'	165°00.0'	S 20°02.0'							
21	58°56.2'	133°46.7'	S 22°42.3'	96°46.6'	S 16°47.0'	140°42.5'	S 23°08.3'	125°20.3'	S 21°37.0'	180°00.7'	S 20°02.4'							
22	73°58.7'	148°46.4'	S 22°42.0'	111°46.0'	S 16°46.0'	155°44.4'	S 23°08.2'	140°22.4'	S 21°37.0'	195°01.5'	S 20°02.7'							
23	89°01.1'	163°46.1'	S 22°41.8'	126°45.5'	S 16°45.0'	170°46.2'	S 23°08.2'	155°24.6'	S 21°36.9'	210°02.2'	S 20°03.1'							
Mer. pass.			SD 16.3' d 0.3'	v -0.6' d 1.0'	v 1.8' d 0.0'	v 2.2' d 0.0'	v 0.7' d -0.4'											
Mer. pass.			12 h 4 m 43 s	14 h 33 m	11 h 38 m	12 h 40 m	9 h 1 m											

h	Moon					Lunar distance							
	GHA	dec	v	d	HP	-Betelgeuse	-Capella	-Rigel	-Aldebaran	+Fomalhaut	+Venus	+Altair	+Sun
0	80°58.2'	N 3°44.0'	15.9'	11.6'	54.5'	66°41.5'	65°10.7'	57°51.6'	48°01.0'	48°53.4'	63°41.8'	83°40.5'	98°43.8'
1	95°33.1'	N 3°55.6'	15.8'	11.6'	54.5'	66°12.9'	64°44.0'	57°27.2'	47°31.2'	49°21.0'	64°08.7'	84°06.0'	99°11.2'
2	110°07.9'	N 4°07.3'	15.8'	11.6'	54.5'	65°44.2'	64°17.4'	57°02.8'	47°01.3'	49°48.7'	64°35.6'	84°31.5'	99°38.6'
3	124°42.7'	N 4°18.9'	15.8'	11.6'	54.5'	65°15.5'	63°50.8'	56°38.4'	46°31.5'	50°16.5'	65°02.4'	84°57.1'	100°06.0'
4	139°17.5'	N 4°30.5'	15.7'	11.6'	54.5'	64°46.8'	63°24.1'	56°14.1'	46°01.6'	50°44.2'	65°29.3'	85°22.6'	100°33.4'
5	153°52.2'	N 4°42.1'	15.7'	11.6'	54.5'	64°18.1'	62°57.5'	55°49.8'	45°31.7'	51°12.1'	65°56.2'	85°48.2'	101°00.8'
6	168°26.9'	N 4°53.7'	15.7'	11.6'	54.6'	63°49.4'	62°30.9'	55°25.5'	45°01.8'	51°40.0'	66°23.2'	86°13.8'	101°28.3'
7	183°01.6'	N 5°05.3'	15.6'	11.6'	54.6'	63°20.7'	62°04.3'	55°01.3'	44°31.9'	52°07.9'	66°50.1'	86°39.4'	101°55.7'
8	197°36.2'	N 5°16.9'	15.6'	11.6'	54.6'	62°52.0'	61°37.8'	54°37.2'	44°01.9'	52°35.9'	67°17.1'	87°05.1'	102°23.2'
9	212°10.8'	N 5°28.4'	15.6'	11.5'	54.6'	62°23.3'	61°11.2'	54°13.1'	43°32.0'	53°03.9'	67°44.1'	87°30.8'	102°50.7'
10	226°45.4'	N 5°40.0'	15.5'	11.5'	54.6'	61°54.5'	60°44.7'	53°49.1'	43°02.0'	53°31.9'	68°11.1'	87°56.4'	103°18.3'
11	241°20.0'	N 5°51.5'	15.5'	11.5'	54.6'	61°25.8'	60°18.1'	53°25.1'	42°32.0'	54°00.0'	68°38.1'	88°22.1'	103°45.8'
12	255°54.4'	N 6°03.0'	15.5'	11.5'	54.7'	60°57.0'	59°51.6'	53°01.2'	42°02.0'	54°28.2'	69°05.2'	88°47.9'	104°13.4'
13	270°28.9'	N 6°14.5'	15.4'	11.5'	54.7'	60°28.3'	59°25.1'	52°37.3'	41°31.9'	54°56.4'	69°32.3'	89°13.6'	104°41.0'
14	285°03.3'	N 6°26.0'	15.4'	11.5'	54.7'	59°59.5'	58°58.7'	52°13.5'	41°01.9'	55°24.6'	69°59.4'	89°39.4'	105°08.6'
15	299°37.7'	N 6°37.5'	15.3'	11.5'	54.7'	59°30.8'	58°32.2'	51°49.7'	40°31.8'	55°52.9'	70°26.5'	90°05.1'	105°36.2'
16	314°12.0'	N 6°49.0'	15.3'	11.4'	54.7'	59°02.0'	58°05.7'	51°26.0'	40°01.7'	56°21.2'	70°53.6'	90°30.9'	106°03.9'
17	328°46.3'	N 7°00.4'	15.2'	11.4'	54.7'	58°33.2'	57°39.3'	51°02.4'	39°31.6'	56°49.6'	71°20.8'	90°56.8'	106°31.5'
18	343°20.6'	N 7°11.8'	15.2'	11.4'	54.8'	58°04.4'	57°12.9'	50°38.8'	39°01.4'	57°18.0'	71°47.9'	91°22.6'	106°59.2'
19	357°54.8'	N 7°23.2'	15.2'	11.4'	54.8'	57°35.6'	56°46.5'	50°15.3'	38°31.3'	57°46.4'	72°15.2'	91°48.4'	107°27.0'
20	12°28.9'	N 7°34.6'	15.1'	11.3'	54.8'	57°06.8'	56°20.2'	49°51.9'	38°01.1'	58°14.9'	72°42.4'	92°14.3'	107°54.7'
21	27°03.0'	N 7°45.9'	15.1'	11.3'	54.8'	56°38.0'	55°53.8'	49°28.6'	37°30.9'	58°43.4'	73°09.6'	92°40.2'	108°22.5'
22	41°37.1'	N 7°57.2'	15.0'	11.3'	54.8'	56°09.2'	55°27.5'	49°05.3'	37°00.7'	59°12.0'	73°36.9'	93°06.1'	108°50.3'
23	56°11.1'	N 8°08.5'	15.0'	11.3'	54.9'	55°40.4'	55°01.2'	48°42.1'	36°30.4'	59°40.6'	74°04.2'	93°32.0'	109°18.1'
Mer. pass.			19 h 9 m SD 14.9'	phase 58%									

Star	mag	SHA	dec	Star	mag	SHA	dec	Star	mag	SHA	dec
Fomalhaut	+1.2	15°19.2'	S 29°31.2'	Spica	+1.0	158°26.6'	S 11°15.8'	Betelgeuse	+0.5	270°56.1'	N 7°24.5'
Deneb	+1.2	49°28.9'	N 45°21.2'	Acrux	+0.8	173°04.3'	S 63°12.2'	Capella	+0.1	280°27.3'	N 46°01.0'
Altair	+0.8	62°04.2'	N 8°55.3'	Regulus	+1.4	207°38.5'	N 11°52.1'	Rigel	+0.2	281°07.4'	S 8°10.9'
Vega	+0.0	80°36.4'	N 38°48.2'	Pollux	+1.2	243°21.9'	N 27°58.5'	Aldebaran	+0.9	290°43.9'	N 16°32.8'
Antares	+1.1	112°21.1'	S 26°28.4'	Procyon	+0.4	244°54.7'	N 5°10.3'	Polaris	+2.0	315°32.2'	N 89°21.1'
Rigil Kent	-0.0	139°46.0'	S 60°54.6'	Adhara	+1.5	255°08.6'	S 29°00.0'	Achernar	+0.5	335°23.2'	S 57°08.6'
Arcturus	-0.1	145°51.8'	N 19°04.7'	Sirius	-1.4	258°29.4'	S 16°44.7'				
Hadar	+0.6	148°41.8'	S 60°27.7'	Canopus	-0.6	263°53.6'	S 52°42.5'				

Sunday 05 January 2020 UT1

h	Aries GHA	Sun GHA	dec	Venus GHA	dec	Jupiter GHA	dec	Saturn GHA	dec	Mars GHA	dec
0	104°03.6'	178°45.8'	S 22°41.5'	141°44.9'	S 16°44.0'	185°48.0'	S 23°08.2'	170°26.7'	S 21°36.9'	225°02.9'	S 20°03.5'
1	119°06.1'	193°45.5'	S 22°41.2'	156°44.4'	S 16°43.0'	200°49.9'	S 23°08.2'	185°28.9'	S 21°36.8'	240°03.6'	S 20°03.8'
2	134°08.5'	208°45.3'	S 22°41.0'	171°43.8'	S 16°42.0'	215°51.7'	S 23°08.1'	200°31.0'	S 21°36.8'	255°04.3'	S 20°04.2'
3	149°11.0'	223°45.0'	S 22°40.7'	186°43.3'	S 16°41.0'	230°53.6'	S 23°08.1'	215°33.2'	S 21°36.8'	270°05.0'	S 20°04.6'
4	164°13.5'	238°44.7'	S 22°40.4'	201°42.7'	S 16°40.0'	245°55.4'	S 23°08.1'	230°35.3'	S 21°36.7'	285°05.7'	S 20°04.9'
5	179°15.9'	253°44.4'	S 22°40.1'	216°42.2'	S 16°39.0'	260°57.2'	S 23°08.0'	245°37.5'	S 21°36.7'	300°06.5'	S 20°05.3'
6	194°18.4'	268°44.1'	S 22°39.9'	231°41.6'	S 16°38.0'	275°59.1'	S 23°08.0'	260°39.6'	S 21°36.6'	315°07.2'	S 20°05.7'
7	209°20.9'	283°43.8'	S 22°39.6'	246°41.1'	S 16°37.0'	291°00.9'	S 23°08.0'	275°41.8'	S 21°36.6'	330°07.9'	S 20°06.1'
8	224°23.3'	298°43.6'	S 22°39.3'	261°40.5'	S 16°36.0'	306°02.8'	S 23°08.0'	290°43.9'	S 21°36.5'	345°08.6'	S 20°06.4'
9	239°25.8'	313°43.3'	S 22°39.1'	276°40.0'	S 16°35.0'	321°04.6'	S 23°07.9'	305°46.1'	S 21°36.5'	0°09.3'	S 20°06.8'
10	254°28.2'	328°43.0'	S 22°38.8'	291°39.4'	S 16°34.0'	336°06.4'	S 23°07.9'	320°48.2'	S 21°36.5'	15°10.0'	S 20°07.2'
11	269°30.7'	343°42.7'	S 22°38.5'	306°38.9'	S 16°33.0'	351°08.3'	S 23°07.9'	335°50.4'	S 21°36.4'	30°10.7'	S 20°07.5'
12	284°33.2'	358°42.4'	S 22°38.2'	321°38.4'	S 16°32.0'	6°10.1'	S 23°07.8'	350°52.5'	S 21°36.4'	45°11.4'	S 20°07.9'
13	299°35.6'	13°42.2'	S 22°37.9'	336°37.8'	S 16°31.0'	21°12.0'	S 23°07.8'	5°54.7'	S 21°36.3'	60°12.2'	S 20°08.3'
14	314°38.1'	28°41.9'	S 22°37.7'	351°37.3'	S 16°30.0'	36°13.8'	S 23°07.8'	20°56.8'	S 21°36.3'	75°12.9'	S 20°08.6'
15	329°40.6'	43°41.6'	S 22°37.4'	6°36.7'	S 16°29.0'	51°15.6'	S 23°07.7'	35°59.0'	S 21°36.2'	90°13.6'	S 20°09.0'
16	344°43.0'	58°41.3'	S 22°37.1'	21°36.2'	S 16°28.0'	66°17.5'	S 23°07.7'	51°01.1'	S 21°36.2'	105°14.3'	S 20°09.4'
17	359°45.5'	73°41.0'	S 22°36.8'	36°35.6'	S 16°27.0'	81°19.3'	S 23°07.7'	66°03.3'	S 21°36.1'	120°15.0'	S 20°09.7'
18	14°48.0'	88°40.8'	S 22°36.6'	51°35.1'	S 16°26.0'	96°21.2'	S 23°07.7'	81°05.4'	S 21°36.1'	135°15.7'	S 20°10.1'
19	29°50.4'	103°40.5'	S 22°36.3'	66°34.6'	S 16°25.0'	111°23.0'	S 23°07.6'	96°07.6'	S 21°36.1'	150°16.4'	S 20°10.5'
20	44°52.9'	118°40.2'	S 22°36.0'	81°34.0'	S 16°24.0'	126°24.8'	S 23°07.6'	111°09.7'	S 21°36.0'	165°17.1'	S 20°10.8'
21	59°55.4'	133°39.9'	S 22°35.7'	96°33.5'	S 16°23.0'	141°26.7'	S 23°07.6'	126°11.9'	S 21°36.0'	180°17.9'	S 20°11.2'
22	74°57.8'	148°39.7'	S 22°35.4'	111°32.9'	S 16°21.9'	156°28.5'	S 23°07.5'	141°14.1'	S 21°35.9'	195°18.6'	S 20°11.5'
23	90°00.3'	163°39.4'	S 22°35.1'	126°32.4'	S 16°20.9'	171°30.4'	S 23°07.5'	156°16.2'	S 21°35.9'	210°19.3'	S 20°11.9'
		SD 16.3' d 0.3'		v -0.5' d 1.0'		v 1.8' d 0.0'		v 2.2' d 0.0'		v 0.7' d -0.4'	
Mer. pass.		12 h 5 m 11 s		14 h 34 m		11 h 35 m		12 h 36 m		8 h 59 m	

h	Moon					Lunar distance							
	GHA	dec	v	d	HP	-Betelgeuse	-Capella	-Rigel	-Aldebaran	+Fomalhaut	+Achernar	+Venus	+Sun
0	70°45.1'	N 8°19.8'	14.9'	11.3'	54.9'	55°11.6'	54°34.9'	48°19.0'	36°00.1'	60°09.2'		74°31.5'	109°45.9'
1	85°19.0'	N 8°31.1'	14.9'	11.2'	54.9'	54°42.7'	54°08.7'	47°55.9'	35°29.9'	60°37.9'		74°58.9'	110°13.8'
2	99°52.8'	N 8°42.3'	14.8'	11.2'	54.9'	54°13.9'	53°42.5'	47°33.0'	34°59.5'	61°06.6'		75°26.3'	110°41.7'
3	114°26.6'	N 8°53.5'	14.8'	11.2'	54.9'	53°45.1'	53°16.3'	47°10.1'	34°29.2'	61°35.4'		75°53.7'	111°09.6'
4	129°00.4'	N 9°04.7'	14.7'	11.1'	55.0'	53°16.2'	52°50.2'	46°47.4'	33°58.9'	62°04.2'		76°21.1'	111°37.6'
5	143°34.1'	N 9°15.8'	14.6'	11.1'	55.0'	52°47.4'	52°24.0'	46°24.7'	33°28.5'	62°33.1'		76°48.5'	112°05.5'
6	158°07.7'	N 9°26.9'	14.6'	11.1'	55.0'	52°18.6'	51°58.0'	46°02.1'	32°58.1'	63°02.0'		77°16.0'	112°33.5'
7	172°41.3'	N 9°38.0'	14.5'	11.1'	55.0'	51°49.7'	51°31.9'	45°39.6'	32°27.6'	63°30.9'		77°43.5'	113°01.5'
8	187°14.8'	N 9°49.1'	14.5'	11.0'	55.1'	51°20.9'	51°05.9'	45°17.2'	31°57.2'	63°59.9'		78°11.1'	113°29.6'
9	201°48.3'	N 10°00.1'	14.4'	11.0'	55.1'	50°52.0'	50°39.9'	44°55.0'	31°26.7'	64°28.9'		78°38.6'	113°57.7'
10	216°21.7'	N 10°11.1'	14.3'	11.0'	55.1'	50°23.1'	50°14.0'	44°32.8'	30°56.2'	64°57.9'		79°06.2'	114°25.8'
11	230°55.1'	N 10°22.1'	14.3'	10.9'	55.1'	49°54.3'	49°48.1'	44°10.7'	30°25.7'	65°27.0'		79°33.8'	114°53.9'
12	245°28.3'	N 10°33.0'	14.2'	10.9'	55.2'	49°25.4'	49°22.2'	43°48.8'	29°55.2'	65°56.1'	68°44.2'	80°01.5'	115°22.1'
13	260°01.6'	N 10°43.9'	14.2'	10.9'	55.2'	48°56.6'	48°56.4'	43°27.0'	29°24.6'	66°25.3'	68°59.2'	80°29.1'	115°50.3'
14	274°34.7'	N 10°54.8'	14.1'	10.8'	55.2'	48°27.7'	48°30.7'	43°05.3'	28°54.0'	66°54.5'	69°14.3'	80°56.9'	116°18.5'
15	289°07.8'	N 11°05.6'	14.0'	10.8'	55.2'	47°58.9'	48°04.9'	42°43.7'	28°23.4'	67°23.8'	69°29.5'	81°24.6'	116°46.7'
16	303°40.9'	N 11°16.4'	14.0'	10.8'	55.3'	47°30.0'	47°39.3'	42°22.3'	27°52.8'	67°53.1'	69°44.8'	81°52.4'	117°15.0'
17	318°13.8'	N 11°27.1'	13.9'	10.7'	55.3'	47°01.2'	47°13.7'	42°01.0'	27°22.1'	68°22.4'	70°00.2'	82°20.1'	117°43.3'
18	332°46.7'	N 11°37.9'	13.8'	10.7'	55.3'	46°32.3'	46°48.1'	41°39.9'	26°51.4'	68°51.7'	70°15.7'	82°48.0'	118°11.7'
19	347°19.6'	N 11°48.5'	13.8'	10.6'	55.3'	46°03.5'	46°22.6'	41°18.9'	26°20.7'	69°21.2'	70°31.3'	83°15.8'	118°40.0'
20	1°52.3'	N 11°59.2'	13.7'	10.6'	55.4'	45°34.7'	45°57.2'	40°58.0'	25°50.0'	69°50.6'	70°47.0'	83°43.7'	119°08.4'
21	16°25.0'	N 12°09.7'	13.6'	10.5'	55.4'	45°05.9'	45°31.8'	40°37.3'	25°19.2'	70°20.1'	71°02.7'	84°11.6'	119°36.9'
22	30°57.7'	N 12°20.3'	13.6'	10.5'	55.4'	44°37.0'	45°06.5'	40°16.8'	24°48.4'	70°49.6'	71°18.6'	84°39.6'	
23	45°30.2'	N 12°30.8'	13.5'	10.5'	55.4'	44°08.2'	44°41.2'	39°56.4'	24°17.6'	71°19.2'	71°34.5'	85°07.6'	
Mer. pass.		19 h 52 m SD 15.0'		phase 67%									

Star	mag	SHA	dec	Star	mag	SHA	dec	Star	mag	SHA	dec
Fomalhaut	+1.2	15°19.2'	S 29°31.2'	Spica	+1.0	158°26.6'	S 11°15.8'	Betelgeuse	+0.5	270°56.1'	N 7°24.5'
Deneb	+1.2	49°28.9'	N 45°21.2'	Acrux	+0.8	173°04.3'	S 63°12.2'	Capella	+0.1	280°27.3'	N 46°01.0'
Altair	+0.8	62°04.2'	N 8°55.3'	Regulus	+1.4	207°38.5'	N 11°52.1'	Rigel	+0.2	281°07.4'	S 8°10.9'
Vega	+0.0	80°36.4'	N 38°48.2'	Pollux	+1.2	243°21.9'	N 27°58.5'	Aldebaran	+0.9	290°43.9'	N 16°32.8'
Antares	+1.1	112°21.1'	S 26°28.4'	Procyon	+0.4	244°54.7'	N 5°10.3'	Polaris	+2.0	315°32.6'	N 89°21.1'
Rigil Kent	-0.0	139°45.9'	S 60°54.6'	Adhara	+1.5	255°08.6'	S 29°00.0'	Achernar	+0.5	335°23.2'	S 57°08.6'
Arcturus	-0.1	145°51.8'	N 19°04.7'	Sirius	-1.4	258°29.4'	S 16°44.7'				
Hadar	+0.6	148°41.7'	S 60°27.7'	Canopus	-0.6	263°53.6'	S 52°42.5'				

Monday 06 January 2020 UT1

h	Aries		Sun		Venus		Jupiter		Saturn		Mars	
	GHA	GHA	dec	GHA	dec	GHA	dec	GHA	dec	GHA	dec	
0	105°02.7'	178°39.1'	S 22°34.8'	141°31.9'	S 16°19.9'	186°32.2'	S 23°07.5'	171°18.4'	S 21°35.8'	225°20.0'	S 20°12.3'	
1	120°05.2'	193°38.8'	S 22°34.6'	156°31.3'	S 16°18.9'	201°34.0'	S 23°07.5'	186°20.5'	S 21°35.8'	240°20.7'	S 20°12.6'	
2	135°07.7'	208°38.5'	S 22°34.3'	171°30.8'	S 16°17.9'	216°35.9'	S 23°07.4'	201°22.7'	S 21°35.7'	255°21.4'	S 20°13.0'	
3	150°10.1'	223°38.3'	S 22°34.0'	186°30.3'	S 16°16.9'	231°37.7'	S 23°07.4'	216°24.8'	S 21°35.7'	270°22.1'	S 20°13.4'	
4	165°12.6'	238°38.0'	S 22°33.7'	201°29.7'	S 16°15.9'	246°39.6'	S 23°07.4'	231°27.0'	S 21°35.7'	285°22.8'	S 20°13.7'	
5	180°15.1'	253°37.7'	S 22°33.4'	216°29.2'	S 16°14.8'	261°41.4'	S 23°07.3'	246°29.1'	S 21°35.6'	300°23.5'	S 20°14.1'	
6	195°17.5'	268°37.4'	S 22°33.1'	231°28.7'	S 16°13.8'	276°43.2'	S 23°07.3'	261°31.3'	S 21°35.6'	315°24.2'	S 20°14.4'	
7	210°20.0'	283°37.2'	S 22°32.8'	246°28.1'	S 16°12.8'	291°45.1'	S 23°07.3'	276°33.4'	S 21°35.5'	330°25.0'	S 20°14.8'	
8	225°22.5'	298°36.9'	S 22°32.5'	261°27.6'	S 16°11.8'	306°46.9'	S 23°07.2'	291°35.6'	S 21°35.5'	345°25.7'	S 20°15.2'	
9	240°24.9'	313°36.6'	S 22°32.2'	276°27.1'	S 16°10.8'	321°48.8'	S 23°07.2'	306°37.7'	S 21°35.4'	0°26.4'	S 20°15.5'	
10	255°27.4'	328°36.3'	S 22°31.9'	291°26.5'	S 16°09.7'	336°50.6'	S 23°07.2'	321°39.9'	S 21°35.4'	15°27.1'	S 20°15.9'	
11	270°29.9'	343°36.1'	S 22°31.7'	306°26.0'	S 16°08.7'	351°52.4'	S 23°07.1'	336°42.0'	S 21°35.3'	30°27.8'	S 20°16.2'	
12	285°32.3'	358°35.8'	S 22°31.4'	321°25.5'	S 16°07.7'	6°54.3'	S 23°07.1'	351°44.2'	S 21°35.3'	45°28.5'	S 20°16.6'	
13	300°34.8'	13°35.5'	S 22°31.1'	336°25.0'	S 16°06.7'	21°56.1'	S 23°07.1'	6°46.3'	S 21°35.3'	60°29.2'	S 20°17.0'	
14	315°37.2'	28°35.2'	S 22°30.8'	351°24.4'	S 16°05.6'	36°58.0'	S 23°07.1'	21°48.5'	S 21°35.2'	75°29.9'	S 20°17.3'	
15	330°39.7'	43°35.0'	S 22°30.5'	6°23.9'	S 16°04.6'	51°59.8'	S 23°07.0'	36°50.6'	S 21°35.2'	90°30.6'	S 20°17.7'	
16	345°42.2'	58°34.7'	S 22°30.2'	21°23.4'	S 16°03.6'	67°01.6'	S 23°07.0'	51°52.8'	S 21°35.1'	105°31.3'	S 20°18.0'	
17	0°44.6'	73°34.4'	S 22°29.9'	36°22.8'	S 16°02.6'	82°03.5'	S 23°07.0'	66°54.9'	S 21°35.1'	120°32.0'	S 20°18.4'	
18	15°47.1'	88°34.1'	S 22°29.6'	51°22.3'	S 16°01.5'	97°05.3'	S 23°06.9'	81°57.1'	S 21°35.0'	135°32.7'	S 20°18.8'	
19	30°49.6'	103°33.9'	S 22°29.3'	66°21.8'	S 16°00.5'	112°07.2'	S 23°06.9'	96°59.2'	S 21°35.0'	150°33.5'	S 20°19.1'	
20	45°52.0'	118°33.6'	S 22°29.0'	81°21.3'	S 15°59.5'	127°09.0'	S 23°06.9'	112°01.4'	S 21°34.9'	165°34.2'	S 20°19.5'	
21	60°54.5'	133°33.3'	S 22°28.7'	96°20.7'	S 15°58.5'	142°10.8'	S 23°06.8'	127°03.5'	S 21°34.9'	180°34.9'	S 20°19.8'	
22	75°57.0'	148°33.0'	S 22°28.4'	111°20.2'	S 15°57.4'	157°12.7'	S 23°06.8'	142°05.7'	S 21°34.9'	195°35.6'	S 20°20.2'	
23	90°59.4'	163°32.8'	S 22°28.1'	126°19.7'	S 15°56.4'	172°14.5'	S 23°06.8'	157°07.8'	S 21°34.8'	210°36.3'	S 20°20.6'	
		SD 16.3'	d 0.3'	v -0.5'	d 1.0'	v 1.8'	d 0.0'	v 2.2'	d 0.0'	v 0.7'	d -0.4'	
Mer. pass.		12 h 5 m 37 s		14 h 34 m		11 h 32 m		12 h 33 m		8 h 58 m		

h	Moon					Lunar distance							
	GHA	dec	v	d	HP	-Capella	-Betelgeuse	-Rigel	-Aldebaran	+Fomalhaut	+Achernar	+Venus	+Altair
0	60°02.7'	N 12°41.3'	13.4'	10.4'	55.5'	44°16.1'	43°39.4'	39°36.2'	23°46.8'	71°48.8'	71°50.5'	85°35.6'	104°24.6'
1	74°35.1'	N 12°51.7'	13.3'	10.4'	55.5'	43°51.0'	43°10.7'	39°16.2'	23°16.0'	72°18.4'	72°06.6'	86°03.6'	104°50.8'
2	89°07.5'	N 13°02.0'	13.3'	10.3'	55.5'	43°26.0'	42°41.9'	38°56.3'	22°45.1'	72°48.1'	72°22.8'	86°31.7'	105°17.1'
3	103°39.7'	N 13°12.4'	13.2'	10.3'	55.5'	43°01.0'	42°13.1'	38°36.7'	22°14.2'	73°17.8'	72°39.0'	86°59.8'	105°43.3'
4	118°11.9'	N 13°22.6'	13.1'	10.2'	55.6'	42°36.2'	41°44.4'	38°17.2'	21°43.3'	73°47.6'	72°55.4'	87°27.9'	106°09.6'
5	132°44.0'	N 13°32.9'	13.0'	10.2'	55.6'	42°11.4'	41°15.7'	37°58.0'	21°12.4'	74°17.4'	73°11.8'	87°56.1'	106°35.8'
6	147°16.1'	N 13°43.0'	13.0'	10.1'	55.6'	41°46.7'	40°47.0'	37°38.9'	20°41.5'	74°47.2'	73°28.3'	88°24.3'	107°02.1'
7	161°48.0'	N 13°53.1'	12.9'	10.1'	55.7'	41°22.1'	40°18.3'	37°20.1'	20°10.5'	75°17.1'	73°44.9'	88°52.6'	107°28.3'
8	176°19.9'	N 14°03.2'	12.8'	10.0'	55.7'	40°57.6'	39°49.6'	37°01.4'	19°39.5'	75°47.0'	74°01.5'	89°20.9'	107°54.6'
9	190°51.7'	N 14°13.2'	12.7'	10.0'	55.7'	40°33.2'	39°21.0'	36°43.1'	19°08.5'	76°17.0'	74°18.3'	89°49.2'	108°20.9'
10	205°23.5'	N 14°23.2'	12.6'	9.9'	55.7'	40°09.0'	38°52.4'	36°24.9'	18°37.5'	76°46.9'	74°35.1'	90°17.5'	108°47.1'
11	219°55.1'	N 14°33.1'	12.6'	9.9'	55.8'	39°44.8'	38°23.8'	36°07.0'	18°06.5'	77°17.0'	74°52.0'	90°45.9'	109°13.4'
12	234°26.7'	N 14°42.9'	12.5'	9.8'	55.8'	39°20.7'	37°55.3'	35°49.3'	17°35.5'	77°47.1'	75°08.9'	91°14.3'	109°39.7'
13	248°58.2'	N 14°52.7'	12.4'	9.7'	55.8'	38°56.8'	37°26.8'	35°31.9'	17°04.4'	78°17.2'	75°26.0'	91°42.8'	110°05.9'
14	263°29.6'	N 15°02.5'	12.3'	9.7'	55.9'	38°33.0'	36°58.3'	35°14.7'	16°33.4'	78°47.3'	75°43.1'	92°11.3'	110°32.2'
15	278°00.9'	N 15°12.1'	12.2'	9.6'	55.9'	38°09.3'	36°29.9'	34°57.9'	16°02.3'	79°17.5'	76°00.3'	92°39.8'	110°58.5'
16	292°32.1'	N 15°21.8'	12.2'	9.6'	55.9'	37°45.8'	36°01.5'	34°41.3'	15°31.3'	79°47.7'	76°17.5'	93°08.3'	111°24.7'
17	307°03.3'	N 15°31.3'	12.1'	9.5'	55.9'	37°22.4'	35°33.2'	34°24.9'	15°00.2'	80°18.0'	76°34.8'	93°36.9'	111°51.0'
18	321°34.4'	N 15°40.8'	12.0'	9.4'	56.0'	36°59.2'	35°04.9'	34°08.9'	14°29.2'	80°48.3'	76°52.2'	94°05.6'	112°17.2'
19	336°05.3'	N 15°50.2'	11.9'	9.4'	56.0'	36°36.1'	34°36.6'	33°53.2'	13°58.2'	81°18.7'	77°09.7'	94°34.2'	112°43.4'
20	350°36.2'	N 15°59.6'	11.8'	9.3'	56.0'	36°13.1'	34°08.5'	33°37.8'	13°27.2'	81°49.1'	77°27.2'	95°02.9'	113°09.7'
21	5°07.1'	N 16°08.9'	11.7'	9.2'	56.1'	35°50.4'	33°40.3'		12°56.2'	82°19.5'	77°44.8'	95°31.7'	113°35.9'
22	19°37.8'	N 16°18.1'	11.6'	9.2'	56.1'	35°27.8'	33°12.3'		12°25.2'	82°49.9'	78°02.4'	96°00.5'	114°02.1'
23	34°08.4'	N 16°27.3'	11.6'	9.1'	56.1'	35°05.4'	32°44.3'		11°54.3'	83°20.4'	78°20.1'	96°29.3'	114°28.3'
Mer. pass.		20 h 39 m SD 15.1'	phase 76%										

Star	mag	SHA	dec	Star	mag	SHA	dec	Star	mag	SHA	dec
Fomalhaut	+1.2	15°19.2'	S 29°31.2'	Spica	+1.0	158°26.6'	S 11°15.8'	Betelgeuse	+0.5	270°56.1'	N 7°24.5'
Deneb	+1.2	49°28.9'	N 45°21.2'	Acrux	+0.8	173°04.2'	S 63°12.2'	Capella	+0.1	280°27.3'	N 46°01.0'
Altair	+0.8	62°04.2'	N 8°55.3'	Regulus	+1.4	207°38.5'	N 11°52.1'	Rigel	+0.2	281°07.4'	S 8°10.9'
Vega	+0.0	80°36.4'	N 38°48.2'	Pollux	+1.2	243°21.9'	N 27°58.5'	Aldebaran	+0.9	290°43.9'	N 16°32.8'
Antares	+1.1	112°21.0'	S 26°28.4'	Procyon	+0.4	244°54.7'	N 5°10.3'	Polaris	+2.0	315°32.9'	N 89°21.1'
Rigel Kent	-0.0	139°45.9'	S 60°54.6'	Adhara	+1.5	255°08.6'	S 29°00.1'	Achernar	+0.5	335°23.3'	S 57°08.6'
Arcturus	-0.1	145°51.7'	N 19°04.7'	Sirius	-1.4	258°29.4'	S 16°44.7'				
Hadar	+0.6	148°41.7'	S 60°27.7'	Canopus	-0.6	263°53.6'	S 52°42.5'				

h	Aries		Sun		Venus		Jupiter		Saturn		Mars	
	GHA	dec	GHA	dec	GHA	dec	GHA	dec	GHA	dec	GHA	dec
0	106°01.9'	S 22°27.8'	178°32.5'	S 22°27.8'	141°19.2'	S 15°55.4'	187°16.4'	S 23°06.7'	172°10.0'	S 21°34.8'	225°37.0'	S 20°20.9'
1	121°04.4'	S 22°27.5'	193°32.2'	S 22°27.5'	156°18.7'	S 15°54.3'	202°18.2'	S 23°06.7'	187°12.1'	S 21°34.7'	240°37.7'	S 20°21.3'
2	136°06.8'	S 22°27.1'	208°31.9'	S 22°27.1'	171°18.1'	S 15°53.3'	217°20.1'	S 23°06.7'	202°14.3'	S 21°34.7'	255°38.4'	S 20°21.6'
3	151°09.3'	S 22°26.8'	223°31.7'	S 22°26.8'	186°17.6'	S 15°52.3'	232°21.9'	S 23°06.7'	217°16.4'	S 21°34.6'	270°39.1'	S 20°22.0'
4	166°11.7'	S 22°26.5'	238°31.4'	S 22°26.5'	201°17.1'	S 15°51.2'	247°23.7'	S 23°06.6'	232°18.6'	S 21°34.6'	285°39.8'	S 20°22.3'
5	181°14.2'	S 22°26.2'	253°31.1'	S 22°26.2'	216°16.6'	S 15°50.2'	262°25.6'	S 23°06.6'	247°20.7'	S 21°34.5'	300°40.5'	S 20°22.7'
6	196°16.7'	S 22°25.9'	268°30.9'	S 22°25.9'	231°16.1'	S 15°49.2'	277°27.4'	S 23°06.6'	262°22.9'	S 21°34.5'	315°41.2'	S 20°23.0'
7	211°19.1'	S 22°25.6'	283°30.6'	S 22°25.6'	246°15.5'	S 15°48.1'	292°29.3'	S 23°06.5'	277°25.0'	S 21°34.5'	330°41.9'	S 20°23.4'
8	226°21.6'	S 22°25.3'	298°30.3'	S 22°25.3'	261°15.0'	S 15°47.1'	307°31.1'	S 23°06.5'	292°27.2'	S 21°34.4'	345°42.6'	S 20°23.8'
9	241°24.1'	S 22°25.0'	313°30.0'	S 22°25.0'	276°14.5'	S 15°46.1'	322°32.9'	S 23°06.5'	307°29.3'	S 21°34.4'	0°43.3'	S 20°24.1'
10	256°26.5'	S 22°24.7'	328°29.8'	S 22°24.7'	291°14.0'	S 15°45.0'	337°34.8'	S 23°06.4'	322°31.5'	S 21°34.3'	15°44.0'	S 20°24.5'
11	271°29.0'	S 22°24.4'	343°29.5'	S 22°24.4'	306°13.5'	S 15°44.0'	352°36.6'	S 23°06.4'	337°33.6'	S 21°34.3'	30°44.8'	S 20°24.8'
12	286°31.5'	S 22°24.0'	358°29.2'	S 22°24.0'	321°13.0'	S 15°42.9'	7°38.5'	S 23°06.4'	352°35.8'	S 21°34.2'	45°45.5'	S 20°25.2'
13	301°33.9'	S 22°23.7'	13°29.0'	S 22°23.7'	336°12.4'	S 15°41.9'	22°40.3'	S 23°06.3'	7°37.9'	S 21°34.2'	60°46.2'	S 20°25.5'
14	316°36.4'	S 22°23.4'	28°28.7'	S 22°23.4'	351°11.9'	S 15°40.9'	37°42.1'	S 23°06.3'	22°40.1'	S 21°34.1'	75°46.9'	S 20°25.9'
15	331°38.8'	S 22°23.1'	43°28.4'	S 22°23.1'	6°11.4'	S 15°39.8'	52°44.0'	S 23°06.3'	37°42.2'	S 21°34.1'	90°47.6'	S 20°26.2'
16	346°41.3'	S 22°22.8'	58°28.1'	S 22°22.8'	21°10.9'	S 15°38.8'	67°45.8'	S 23°06.2'	52°44.4'	S 21°34.1'	105°48.3'	S 20°26.6'
17	1°43.8'	S 22°22.5'	73°27.9'	S 22°22.5'	36°10.4'	S 15°37.7'	82°47.7'	S 23°06.2'	67°46.5'	S 21°34.0'	120°49.0'	S 20°26.9'
18	16°46.2'	S 22°22.2'	88°27.6'	S 22°22.2'	51°09.9'	S 15°36.7'	97°49.5'	S 23°06.2'	82°48.7'	S 21°34.0'	135°49.7'	S 20°27.3'
19	31°48.7'	S 22°21.8'	103°27.3'	S 22°21.8'	66°09.4'	S 15°35.6'	112°51.4'	S 23°06.2'	97°50.8'	S 21°33.9'	150°50.4'	S 20°27.6'
20	46°51.2'	S 22°21.5'	118°27.1'	S 22°21.5'	81°08.9'	S 15°34.6'	127°53.2'	S 23°06.1'	112°53.0'	S 21°33.9'	165°51.1'	S 20°28.0'
21	61°53.6'	S 22°21.2'	133°26.8'	S 22°21.2'	96°08.4'	S 15°33.6'	142°55.0'	S 23°06.1'	127°55.1'	S 21°33.8'	180°51.8'	S 20°28.3'
22	76°56.1'	S 22°20.9'	148°26.5'	S 22°20.9'	111°07.9'	S 15°32.5'	157°56.9'	S 23°06.1'	142°57.3'	S 21°33.8'	195°52.5'	S 20°28.7'
23	91°58.6'	S 22°20.5'	163°26.3'	S 22°20.5'	126°07.3'	S 15°31.5'	172°58.7'	S 23°06.0'	157°59.4'	S 21°33.7'	210°53.2'	S 20°29.0'
		SD 16.3' d 0.3'		v -0.5' d 1.0'		v 1.8' d 0.0'		v 2.2' d 0.0'		v 0.7' d -0.4'		
Mer. pass.		12 h 6 m 3 s		14 h 35 m		11 h 30 m		12 h 30 m		8 h 57 m		

h	Moon				Lunar distance								
	GHA	dec	v	d	HP	-Sirius	-Capella	-Betelgeuse	-Aldebaran	+Achernar	+Fomalhaut	+Venus	+Altair
0	48°39.0'	N 16°36.4'	11.5'	9.0'	56.2'	54°48.4'	34°43.1'	32°16.4'	11°23.4'	78°37.9'	83°51.0'	96°58.1'	114°54.5'
1	63°09.5'	N 16°45.4'	11.4'	8.9'	56.2'	54°28.7'	34°21.1'	31°48.5'	10°52.6'	78°55.8'	84°21.6'	97°27.0'	115°20.6'
2	77°39.8'	N 16°54.3'	11.3'	8.9'	56.2'	54°09.1'	33°59.3'	31°20.8'	10°21.9'	79°13.7'	84°52.2'	97°56.0'	115°46.8'
3	92°10.1'	N 17°03.2'	11.2'	8.8'	56.2'	53°49.7'	33°37.7'	30°53.1'	9°51.3'	79°31.6'	85°22.8'	98°24.9'	116°12.9'
4	106°40.3'	N 17°12.0'	11.1'	8.7'	56.3'	53°30.3'	33°16.3'	30°25.6'	9°20.8'	79°49.6'	85°53.5'	98°53.9'	116°39.0'
5	121°10.4'	N 17°20.7'	11.0'	8.6'	56.3'	53°11.1'	32°55.2'	29°58.1'	8°50.4'	80°07.7'	86°24.3'	99°23.0'	117°05.1'
6	135°40.4'	N 17°29.4'	10.9'	8.6'	56.3'	52°51.9'	32°34.2'	29°30.8'	8°20.3'	80°25.9'	86°55.1'	99°52.0'	117°31.2'
7	150°10.4'	N 17°37.9'	10.8'	8.5'	56.4'	52°33.0'	32°13.6'	29°03.5'	7°50.3'	80°44.1'	87°25.9'	100°21.2'	117°57.3'
8	164°40.2'	N 17°46.4'	10.7'	8.4'	56.4'	52°14.1'	31°53.2'	28°36.4'	7°20.6'	81°02.3'	87°56.7'	100°50.3'	118°23.3'
9	179°10.0'	N 17°54.8'	10.7'	8.3'	56.4'	51°55.4'	31°33.0'	28°09.4'	6°51.3'	81°20.6'	88°27.6'	101°19.5'	118°49.3'
10	193°39.6'	N 18°03.2'	10.6'	8.2'	56.5'	51°36.8'	31°13.2'	27°42.6'	6°22.4'	81°39.0'	88°58.5'	101°48.8'	119°15.3'
11	208°09.2'	N 18°11.4'	10.5'	8.2'	56.5'	51°18.3'	30°53.6'	27°15.9'	5°54.0'	81°57.4'	89°29.5'	102°18.0'	119°41.2'
12	222°38.7'	N 18°19.6'	10.4'	8.1'	56.5'	50°60.0'	30°34.3'	26°49.3'		82°15.8'	90°00.5'	102°47.4'	
13	237°08.0'	N 18°27.7'	10.3'	8.0'	56.6'	50°41.8'	30°15.4'	26°23.0'		82°34.4'	90°31.5'	103°16.7'	
14	251°37.3'	N 18°35.7'	10.2'	7.9'	56.6'	50°23.8'	29°56.8'	25°56.8'		82°52.9'	91°02.6'	103°46.1'	
15	266°06.5'	N 18°43.6'	10.1'	7.8'	56.6'	50°05.9'	29°38.5'	25°30.8'		83°11.5'	91°33.7'	104°15.5'	
16	280°35.6'	N 18°51.4'	10.0'	7.7'	56.7'	49°48.2'	29°20.5'	25°05.0'		83°30.2'	92°04.9'	104°45.0'	
17	295°04.6'	N 18°59.1'	9.9'	7.6'	56.7'	49°30.7'	29°03.0'	24°39.4'		83°48.9'	92°36.1'	105°14.5'	
18	309°33.6'	N 19°06.7'	9.8'	7.5'	56.7'	49°13.3'	28°45.8'	24°14.1'		84°07.6'	93°07.3'	105°44.1'	
19	324°02.4'	N 19°14.3'	9.7'	7.4'	56.8'	48°56.1'	28°29.0'	23°49.0'		84°26.4'	93°38.6'	106°13.7'	
20	338°31.1'	N 19°21.7'	9.6'	7.4'	56.8'	48°39.1'	28°12.6'	23°24.1'		84°45.3'	94°09.9'	106°43.3'	
21	352°59.8'	N 19°29.1'	9.5'	7.3'	56.8'	48°22.2'	27°56.6'	22°59.6'		85°04.1'	94°41.2'	107°13.0'	
22	7°28.3'	N 19°36.3'	9.5'	7.2'	56.9'	48°05.5'	27°41.0'	22°35.3'		85°23.1'	95°12.6'	107°42.7'	
23	21°56.8'	N 19°43.5'	9.4'	7.1'	56.9'	47°49.1'		22°11.4'		85°42.0'	95°44.0'	108°12.4'	
Mer. pass.		21 h 29 m SD 15.3' phase 84%											

Star	mag	SHA	dec	Star	mag	SHA	dec	Star	mag	SHA	dec
Fomalhaut	+1.2	15°19.2'	S 29°31.2'	Spica	+1.0	158°26.5'	S 11°15.8'	Betelgeuse	+0.5	270°56.1'	N 7°24.5'
Deneb	+1.2	49°28.9'	N 45°21.2'	Acrux	+0.8	173°04.2'	S 63°12.2'	Capella	+0.1	280°27.3'	N 46°01.0'
Altair	+0.8	62°04.2'	N 8°55.3'	Regulus	+1.4	207°38.5'	N 11°52.1'	Rigel	+0.2	281°07.4'	S 8°10.9'
Vega	+0.0	80°36.4'	N 38°48.2'	Pollux	+1.2	243°21.9'	N 27°58.5'	Aldebaran	+0.9	290°43.9'	N 16°32.8'
Antares	+1.1	112°21.0'	S 26°28.4'	Procyon	+0.4	244°54.7'	N 5°10.3'	Polaris	+2.0	315°33.3'	N 89°21.1'
Rigil Kent	-0.0	139°45.9'	S 60°54.6'	Adhara	+1.5	255°08.6'	S 29°00.1'	Achernar	+0.5	335°23.3'	S 57°08.6'
Arcturus	-0.1	145°51.7'	N 19°04.7'	Sirius	-1.4	258°29.4'	S 16°44.7'				
Hadar	+0.6	148°41.7'	S 60°27.7'	Canopus	-0.6	263°53.6'	S 52°42.5'				

h	Aries		Sun		Venus		Jupiter		Saturn		Mars	
	GHA	dec	GHA	dec	GHA	dec	GHA	dec	GHA	dec	GHA	dec
0	107°01.0'	178°26.0'	S 22°20.2'	141°06.8'	S 15°30.4'	188°00.6'	S 23°06.0'	173°01.6'	S 21°33.7'	225°53.9'	S 20°29.4'	
1	122°03.5'	193°25.7'	S 22°19.9'	156°06.3'	S 15°29.4'	203°02.4'	S 23°06.0'	188°03.7'	S 21°33.7'	240°54.6'	S 20°29.7'	
2	137°06.0'	208°25.5'	S 22°19.6'	171°05.8'	S 15°28.3'	218°04.2'	S 23°05.9'	203°05.9'	S 21°33.6'	255°55.3'	S 20°30.1'	
3	152°08.4'	223°25.2'	S 22°19.3'	186°05.3'	S 15°27.3'	233°06.1'	S 23°05.9'	218°08.0'	S 21°33.6'	270°56.0'	S 20°30.4'	
4	167°10.9'	238°24.9'	S 22°18.9'	201°04.8'	S 15°26.2'	248°07.9'	S 23°05.9'	233°10.2'	S 21°33.5'	285°56.7'	S 20°30.8'	
5	182°13.3'	253°24.7'	S 22°18.6'	216°04.3'	S 15°25.2'	263°09.8'	S 23°05.8'	248°12.3'	S 21°33.5'	300°57.4'	S 20°31.1'	
6	197°15.8'	268°24.4'	S 22°18.3'	231°03.8'	S 15°24.1'	278°11.6'	S 23°05.8'	263°14.5'	S 21°33.4'	315°58.1'	S 20°31.5'	
7	212°18.3'	283°24.1'	S 22°17.9'	246°03.3'	S 15°23.1'	293°13.5'	S 23°05.8'	278°16.6'	S 21°33.4'	330°58.8'	S 20°31.8'	
8	227°20.7'	298°23.9'	S 22°17.6'	261°02.8'	S 15°22.0'	308°15.3'	S 23°05.7'	293°18.8'	S 21°33.3'	345°59.5'	S 20°32.2'	
9	242°23.2'	313°23.6'	S 22°17.3'	276°02.3'	S 15°21.0'	323°17.1'	S 23°05.7'	308°20.9'	S 21°33.3'	1°00.2'	S 20°32.5'	
10	257°25.7'	328°23.3'	S 22°17.0'	291°01.8'	S 15°19.9'	338°19.0'	S 23°05.7'	323°23.1'	S 21°33.2'	16°00.9'	S 20°32.9'	
11	272°28.1'	343°23.1'	S 22°16.6'	306°01.3'	S 15°18.8'	353°20.8'	S 23°05.6'	338°25.2'	S 21°33.2'	31°01.6'	S 20°33.2'	
12	287°30.6'	358°22.8'	S 22°16.3'	321°00.8'	S 15°17.8'	8°22.7'	S 23°05.6'	353°27.4'	S 21°33.2'	46°02.3'	S 20°33.6'	
13	302°33.1'	13°22.5'	S 22°16.0'	336°00.3'	S 15°16.7'	23°24.5'	S 23°05.6'	8°29.5'	S 21°33.1'	61°03.0'	S 20°33.9'	
14	317°35.5'	28°22.3'	S 22°15.6'	350°59.8'	S 15°15.7'	38°26.3'	S 23°05.5'	23°31.7'	S 21°33.1'	76°03.7'	S 20°34.3'	
15	332°38.0'	43°22.0'	S 22°15.3'	5°59.3'	S 15°14.6'	53°28.2'	S 23°05.5'	38°33.8'	S 21°33.0'	91°04.4'	S 20°34.6'	
16	347°40.5'	58°21.7'	S 22°15.0'	20°58.8'	S 15°13.6'	68°30.0'	S 23°05.5'	53°36.0'	S 21°33.0'	106°05.1'	S 20°34.9'	
17	2°42.9'	73°21.5'	S 22°14.6'	35°58.3'	S 15°12.5'	83°31.9'	S 23°05.4'	68°38.1'	S 21°32.9'	121°05.8'	S 20°35.3'	
18	17°45.4'	88°21.2'	S 22°14.3'	50°57.8'	S 15°11.4'	98°33.7'	S 23°05.4'	83°40.3'	S 21°32.9'	136°06.5'	S 20°35.6'	
19	32°47.8'	103°21.0'	S 22°14.0'	65°57.3'	S 15°10.4'	113°35.6'	S 23°05.4'	98°42.4'	S 21°32.8'	151°07.2'	S 20°36.0'	
20	47°50.3'	118°20.7'	S 22°13.6'	80°56.8'	S 15°09.3'	128°37.4'	S 23°05.4'	113°44.6'	S 21°32.8'	166°07.9'	S 20°36.3'	
21	62°52.8'	133°20.4'	S 22°13.3'	95°56.3'	S 15°08.2'	143°39.2'	S 23°05.3'	128°46.7'	S 21°32.8'	181°08.6'	S 20°36.7'	
22	77°55.2'	148°20.2'	S 22°12.9'	110°55.8'	S 15°07.2'	158°41.1'	S 23°05.3'	143°48.9'	S 21°32.7'	196°09.3'	S 20°37.0'	
23	92°57.7'	163°19.9'	S 22°12.6'	125°55.4'	S 15°06.1'	173°42.9'	S 23°05.3'	158°51.0'	S 21°32.7'	211°10.0'	S 20°37.4'	
		SD 16.3'	d 0.3'		v -0.5'	d 1.1'		v 1.8'	d 0.0'		v 2.1'	d 0.0'
Mer. pass.		12 h 6 m 29 s		14 h 36 m		11 h 27 m		12 h 26 m		8 h 56 m		

h	Moon					Lunar distance							
	GHA	dec	v	d	HP	-Sirius	-Procyon	-Pollux	-Betelgeuse	+Aldebaran	+Achernar	+Fomalhaut	+Venus
0	36°25.1'	N 19°50.6'	9.3'	7.0'	56.9'	47°32.8'	45°39.8'	42°37.0'	21°47.8'		86°01.0'	96°15.4'	108°42.2'
1	50°53.4'	N 19°57.5'	9.2'	6.9'	57.0'	47°16.7'	45°10.0'	42°04.4'	21°24.5'		86°20.0'	96°46.9'	109°12.1'
2	65°21.6'	N 20°04.4'	9.1'	6.8'	57.0'	47°00.8'	44°40.2'	41°31.8'	21°01.7'		86°39.1'	97°18.4'	109°41.9'
3	79°49.7'	N 20°11.2'	9.0'	6.7'	57.0'	46°45.1'	44°10.4'	40°59.2'	20°39.2'		86°58.2'	97°50.0'	110°11.8'
4	94°17.7'	N 20°17.8'	8.9'	6.6'	57.1'	46°29.7'	43°40.7'	40°26.5'	20°17.2'		87°17.4'	98°21.6'	110°41.8'
5	108°45.6'	N 20°24.4'	8.8'	6.4'	57.1'	46°14.4'	43°11.0'	39°53.8'	19°55.6'		87°36.5'	98°53.2'	111°11.8'
6	123°13.4'	N 20°30.8'	8.7'	6.3'	57.1'		42°41.3'	39°21.0'	19°34.5'	6°01.0'	87°55.8'	99°24.8'	111°41.8'
7	137°41.1'	N 20°37.1'	8.6'	6.2'	57.1'		42°11.7'	38°48.2'	19°13.9'	6°30.2'	88°15.0'	99°56.5'	112°11.9'
8	152°08.8'	N 20°43.4'	8.5'	6.1'	57.2'		41°42.1'	38°15.4'	18°53.9'	7°00.0'	88°34.3'	100°28.3'	112°42.0'
9	166°36.3'	N 20°49.5'	8.5'	6.0'	57.2'		41°12.5'	37°42.6'	18°34.5'	7°30.4'	88°53.6'	101°00.0'	113°12.2'
10	181°03.8'	N 20°55.5'	8.4'	5.9'	57.2'		40°43.0'	37°09.7'	18°15.7'	8°01.1'	89°12.9'	101°31.8'	113°42.4'
11	195°31.1'	N 21°01.4'	8.3'	5.8'	57.3'		40°13.5'	36°36.8'	17°57.5'	8°32.2'	89°32.2'	102°03.6'	114°12.6'
12	209°58.4'	N 21°07.2'	8.2'	5.7'	57.3'		39°44.1'	36°03.9'	17°40.0'	9°03.6'	89°51.6'	102°35.5'	114°42.9'
13	224°25.6'	N 21°12.9'	8.1'	5.6'	57.3'		39°14.7'	35°30.9'	17°23.2'	9°35.3'	90°11.0'	103°07.4'	115°13.2'
14	238°52.7'	N 21°18.4'	8.0'	5.4'	57.4'		38°45.3'	34°57.9'		10°07.2'	90°30.4'	103°39.3'	115°43.5'
15	253°19.7'	N 21°23.9'	7.9'	5.3'	57.4'		38°16.1'	34°24.9'		10°39.3'	90°49.9'	104°11.2'	116°13.9'
16	267°46.6'	N 21°29.2'	7.8'	5.2'	57.4'		37°46.9'	33°51.8'		11°11.5'	91°09.4'	104°43.2'	116°44.4'
17	282°13.5'	N 21°34.4'	7.8'	5.1'	57.5'		37°17.7'	33°18.8'		11°43.9'	91°28.8'	105°15.2'	117°14.8'
18	296°40.2'	N 21°39.5'	7.7'	5.0'	57.5'		36°48.7'	32°45.7'		12°16.4'	91°48.3'	105°47.3'	117°45.4'
19	311°06.9'	N 21°44.4'	7.6'	4.8'	57.5'		36°19.7'	32°12.5'		12°49.1'	92°07.9'	106°19.4'	118°15.9'
20	325°33.5'	N 21°49.2'	7.5'	4.7'	57.6'		35°50.7'	31°39.4'		13°21.9'	92°27.4'	106°51.5'	118°46.5'
21	340°00.0'	N 21°54.0'	7.4'	4.6'	57.6'		35°21.9'	31°06.2'		13°54.8'	92°46.9'	107°23.6'	119°17.1'
22	354°26.4'	N 21°58.5'	7.3'	4.5'	57.6'		34°53.2'	30°33.0'		14°27.8'	93°06.5'	107°55.7'	119°47.8'
23	8°52.8'	N 22°03.0'	7.3'	4.3'	57.7'		34°24.6'	29°59.8'		15°00.9'	93°26.1'	108°27.9'	
Mer. pass.		22 h 23 m SD 15.5'	phase 91%										

Star	mag	SHA	dec	Star	mag	SHA	dec	Star	mag	SHA	dec
Fomalhaut	+1.2	15°19.2'	S 29°31.2'	Spica	+1.0	158°26.5'	S 11°15.8'	Betelgeuse	+0.5	270°56.1'	N 7°24.5'
Deneb	+1.2	49°28.9'	N 45°21.2'	Acrux	+0.8	173°04.2'	S 63°12.2'	Capella	+0.1	280°27.3'	N 46°01.0'
Altair	+0.8	62°04.2'	N 8°55.3'	Regulus	+1.4	207°38.5'	N 11°52.1'	Rigel	+0.2	281°07.4'	S 8°10.9'
Vega	+0.0	80°36.3'	N 38°48.2'	Pollux	+1.2	243°21.9'	N 27°58.5'	Aldebaran	+0.9	290°43.9'	N 16°32.8'
Antares	+1.1	112°21.0'	S 26°28.4'	Procyon	+0.4	244°54.7'	N 5°10.3'	Polaris	+2.0	315°33.6'	N 89°21.1'
Rigil Kent	-0.0	139°45.9'	S 60°54.6'	Adhara	+1.5	255°08.6'	S 29°00.1'	Achernar	+0.5	335°23.3'	S 57°08.6'
Arcturus	-0.1	145°51.7'	N 19°04.7'	Sirius	-1.4	258°29.4'	S 16°44.8'				
Hadar	+0.6	148°41.7'	S 60°27.7'	Canopus	-0.6	263°53.6'	S 52°42.5'				



h	Aries		Sun		Venus		Jupiter		Saturn		Mars	
	GHA		GHA	dec	GHA	dec	GHA	dec	GHA	dec	GHA	dec
0	108°00.2'		178°19.6'	S 22°12.3'	140°54.9'	S 15°05.1'	188°44.8'	S 23°05.2'	173°53.2'	S 21°32.6'	226°10.7'	S 20°37.7'
1	123°02.6'		193°19.4'	S 22°11.9'	155°54.4'	S 15°04.0'	203°46.6'	S 23°05.2'	188°55.3'	S 21°32.6'	241°11.4'	S 20°38.0'
2	138°05.1'		208°19.1'	S 22°11.6'	170°53.9'	S 15°02.9'	218°48.5'	S 23°05.2'	203°57.5'	S 21°32.5'	256°12.1'	S 20°38.4'
3	153°07.6'		223°18.9'	S 22°11.2'	185°53.4'	S 15°01.9'	233°50.3'	S 23°05.1'	218°59.6'	S 21°32.5'	271°12.8'	S 20°38.7'
4	168°10.0'		238°18.6'	S 22°10.9'	200°52.9'	S 15°00.8'	248°52.1'	S 23°05.1'	234°01.8'	S 21°32.4'	286°13.5'	S 20°39.1'
5	183°12.5'		253°18.3'	S 22°10.5'	215°52.4'	S 14°59.7'	263°54.0'	S 23°05.1'	249°03.9'	S 21°32.4'	301°14.2'	S 20°39.4'
6	198°15.0'		268°18.1'	S 22°10.2'	230°51.9'	S 14°58.7'	278°55.8'	S 23°05.0'	264°06.1'	S 21°32.3'	316°14.9'	S 20°39.8'
7	213°17.4'		283°17.8'	S 22°09.8'	245°51.4'	S 14°57.6'	293°57.7'	S 23°05.0'	279°08.2'	S 21°32.3'	331°15.6'	S 20°40.1'
8	228°19.9'		298°17.5'	S 22°09.5'	260°51.0'	S 14°56.5'	308°59.5'	S 23°05.0'	294°10.4'	S 21°32.3'	346°16.3'	S 20°40.4'
9	243°22.3'		313°17.3'	S 22°09.2'	275°50.5'	S 14°55.4'	324°01.4'	S 23°04.9'	309°12.5'	S 21°32.2'	1°17.0'	S 20°40.8'
10	258°24.8'		328°17.0'	S 22°08.8'	290°50.0'	S 14°54.4'	339°03.2'	S 23°04.9'	324°14.7'	S 21°32.2'	16°17.7'	S 20°41.1'
11	273°27.3'		343°16.8'	S 22°08.5'	305°49.5'	S 14°53.3'	354°05.0'	S 23°04.9'	339°16.8'	S 21°32.1'	31°18.4'	S 20°41.5'
12	288°29.7'		358°16.5'	S 22°08.1'	320°49.0'	S 14°52.2'	9°06.9'	S 23°04.8'	354°19.0'	S 21°32.1'	46°19.1'	S 20°41.8'
13	303°32.2'		13°16.2'	S 22°07.8'	335°48.5'	S 14°51.2'	24°08.7'	S 23°04.8'	9°21.1'	S 21°32.0'	61°19.8'	S 20°42.1'
14	318°34.7'		28°16.0'	S 22°07.4'	350°48.0'	S 14°50.1'	39°10.6'	S 23°04.8'	24°23.3'	S 21°32.0'	76°20.5'	S 20°42.5'
15	333°37.1'		43°15.7'	S 22°07.1'	5°47.6'	S 14°49.0'	54°12.4'	S 23°04.7'	39°25.4'	S 21°31.9'	91°21.2'	S 20°42.8'
16	348°39.6'		58°15.5'	S 22°06.7'	20°47.1'	S 14°47.9'	69°14.3'	S 23°04.7'	54°27.6'	S 21°31.9'	106°21.9'	S 20°43.2'
17	3°42.1'		73°15.2'	S 22°06.3'	35°46.6'	S 14°46.9'	84°16.1'	S 23°04.7'	69°29.7'	S 21°31.8'	121°22.5'	S 20°43.5'
18	18°44.5'		88°15.0'	S 22°06.0'	50°46.1'	S 14°45.8'	99°17.9'	S 23°04.6'	84°31.9'	S 21°31.8'	136°23.2'	S 20°43.8'
19	33°47.0'		103°14.7'	S 22°05.6'	65°45.6'	S 14°44.7'	114°19.8'	S 23°04.6'	99°34.0'	S 21°31.8'	151°23.9'	S 20°44.2'
20	48°49.5'		118°14.4'	S 22°05.3'	80°45.2'	S 14°43.6'	129°21.6'	S 23°04.6'	114°36.2'	S 21°31.7'	166°24.6'	S 20°44.5'
21	63°51.9'		133°14.2'	S 22°04.9'	95°44.7'	S 14°42.5'	144°23.5'	S 23°04.5'	129°38.3'	S 21°31.7'	181°25.3'	S 20°44.8'
22	78°54.4'		148°13.9'	S 22°04.6'	110°44.2'	S 14°41.5'	159°25.3'	S 23°04.5'	144°40.5'	S 21°31.6'	196°26.0'	S 20°45.2'
23	93°56.8'		163°13.7'	S 22°04.2'	125°43.7'	S 14°40.4'	174°27.2'	S 23°04.5'	159°42.6'	S 21°31.6'	211°26.7'	S 20°45.5'
			SD 16.3'	d 0.4'	v -0.5'	d 1.1'	v 1.8'	d 0.0'	v 2.1'	d 0.0'	v 0.7'	d -0.3'
Mer. pass.			12 h 6 m 54 s		14 h 37 m		11 h 24 m		12 h 23 m		8 h 55 m	

h	Moon					Lunar distance							
	GHA	dec	v	d	HP	-Regulus	-Procyon	-Pollux	-Betelgeuse	+Aldebaran	+Capella	+Rigel	+Achernar
0	23°19.1'	N 22°07.3'	7.2'	4.2'	57.7'	65°02.9'	33°56.0'	29°26.6'		15°34.0'			93°45.6'
1	37°45.2'	N 22°11.5'	7.1'	4.1'	57.7'	64°29.2'	33°27.6'	28°53.3'		16°07.3'			94°05.2'
2	52°11.4'	N 22°15.6'	7.0'	3.9'	57.8'	63°55.3'	32°59.3'	28°20.1'		16°40.6'			94°24.8'
3	66°37.4'	N 22°19.6'	7.0'	3.8'	57.8'	63°21.5'	32°31.1'	27°46.8'		17°14.0'			94°44.4'
4	81°03.3'	N 22°23.4'	6.9'	3.7'	57.8'	62°47.6'	32°03.1'	27°13.5'		17°47.5'			95°04.0'
5	95°29.2'	N 22°27.1'	6.8'	3.5'	57.9'	62°13.7'	31°35.2'	26°40.2'		18°21.1'			95°23.6'
6	109°55.0'	N 22°30.6'	6.7'	3.4'	57.9'	61°39.7'	31°07.4'	26°06.9'		18°54.7'			95°43.3'
7	124°20.8'	N 22°34.0'	6.7'	3.3'	57.9'	61°05.7'	30°39.9'	25°33.6'		19°28.4'			96°02.9'
8	138°46.4'	N 22°37.3'	6.6'	3.1'	58.0'	60°31.7'	30°12.4'	25°00.2'		20°02.1'			96°22.5'
9	153°12.0'	N 22°40.4'	6.5'	3.0'	58.0'	59°57.6'	29°45.2'	24°26.9'		20°35.9'		32°46.7'	96°42.1'
10	167°37.6'	N 22°43.4'	6.5'	2.9'	58.0'	59°23.5'	29°18.1'	23°53.6'		21°09.7'		33°02.0'	97°01.7'
11	182°03.0'	N 22°46.3'	6.4'	2.7'	58.0'	58°49.3'	28°51.3'	23°20.3'		21°43.6'		33°17.7'	97°21.3'
12	196°28.4'	N 22°49.0'	6.3'	2.6'	58.1'	58°15.1'	28°24.6'	22°46.9'		22°17.6'		33°33.8'	97°40.8'
13	210°53.7'	N 22°51.6'	6.3'	2.4'	58.1'	57°40.9'	27°58.2'	22°13.6'		22°51.6'		33°50.4'	98°00.4'
14	225°19.0'	N 22°54.0'	6.2'	2.3'	58.1'	57°06.7'	27°32.1'	21°40.3'		23°25.7'		34°07.4'	98°20.0'
15	239°44.2'	N 22°56.3'	6.1'	2.2'	58.2'	56°32.4'	27°06.1'	21°07.0'		23°59.8'		34°24.7'	98°39.5'
16	254°09.3'	N 22°58.5'	6.1'	2.0'	58.2'	55°58.0'	26°40.5'	20°33.8'		24°34.0'		34°42.5'	98°59.1'
17	268°34.4'	N 23°00.5'	6.0'	1.9'	58.2'	55°23.7'	26°15.1'	20°00.6'		25°08.2'		35°00.6'	99°18.6'
18	282°59.4'	N 23°02.4'	6.0'	1.7'	58.3'	54°49.3'	25°50.0'	19°27.4'		25°42.4'		35°19.1'	99°38.1'
19	297°24.4'	N 23°04.1'	5.9'	1.6'	58.3'	54°14.8'	25°25.3'	18°54.2'		26°16.8'		35°38.0'	99°57.6'
20	311°49.3'	N 23°05.7'	5.9'	1.4'	58.3'	53°40.3'	25°00.8'	18°21.1'		26°51.1'		35°57.2'	100°17.0'
21	326°14.2'	N 23°07.1'	5.8'	1.3'	58.3'	53°05.8'	24°36.8'	17°48.0'		27°25.5'	27°10.3'	36°16.8'	100°36.4'
22	340°39.0'	N 23°08.4'	5.8'	1.1'	58.4'	52°31.3'	24°13.1'	17°15.1'	18°02.5'	27°59.9'	27°25.7'	36°36.8'	100°55.9'
23	355°03.8'	N 23°09.5'	5.7'	1.0'	58.4'	51°56.7'	23°49.8'	16°42.1'	18°21.6'	28°34.4'	27°41.7'	36°57.0'	101°15.2'
Mer. pass.			23 h 21 m SD 15.7'		phase 96%								

Star	mag	SHA	dec	Star	mag	SHA	dec	Star	mag	SHA	dec
Fomalhaut	+1.2	15°19.2'	S 29°31.2'	Spica	+1.0	158°26.5'	S 11°15.8'	Betelgeuse	+0.5	270°56.1'	N 7°24.5'
Deneb	+1.2	49°28.9'	N 45°21.2'	Acrux	+0.8	173°04.2'	S 63°12.2'	Capella	+0.1	280°27.3'	N 46°01.0'
Altair	+0.8	62°04.2'	N 8°55.3'	Regulus	+1.4	207°38.5'	N 11°52.1'	Rigel	+0.2	281°07.4'	S 8°10.9'
Vega	+0.0	80°36.3'	N 38°48.1'	Pollux	+1.2	243°21.9'	N 27°58.5'	Aldebaran	+0.9	290°43.9'	N 16°32.8'
Antares	+1.1	112°21.0'	S 26°28.4'	Procyon	+0.4	244°54.7'	N 5°10.3'	Polaris	+2.0	315°33.9'	N 89°21.1'
Rigel Kent	-0.0	139°45.9'	S 60°54.6'	Adhara	+1.5	255°08.6'	S 29°00.1'	Achernar	+0.5	335°23.3'	S 57°08.6'
Arcturus	-0.1	145°51.7'	N 19°04.7'	Sirius	-1.4	258°29.4'	S 16°44.8'				
Hadar	+0.6	148°41.7'	S 60°27.7'	Canopus	-0.6	263°53.6'	S 52°42.5'				

h	Aries		Sun		Venus		Jupiter		Saturn		Mars	
	GHA		GHA	dec	GHA	dec	GHA	dec	GHA	dec	GHA	dec
0	108°59.3'	178°13.4'	S 22°03.9'	140°43.2'	S 14°39.3'	189°29.0'	S 23°04.4'	174°44.8'	S 21°31.5'	226°27.4'	S 20°45.8'	
1	124°01.8'	193°13.2'	S 22°03.5'	155°42.8'	S 14°38.2'	204°30.8'	S 23°04.4'	189°46.9'	S 21°31.5'	241°28.1'	S 20°46.2'	
2	139°04.2'	208°12.9'	S 22°03.1'	170°42.3'	S 14°37.1'	219°32.7'	S 23°04.4'	204°49.1'	S 21°31.4'	256°28.8'	S 20°46.5'	
3	154°06.7'	223°12.6'	S 22°02.8'	185°41.8'	S 14°36.1'	234°34.5'	S 23°04.3'	219°51.2'	S 21°31.4'	271°29.5'	S 20°46.9'	
4	169°09.2'	238°12.4'	S 22°02.4'	200°41.3'	S 14°35.0'	249°36.4'	S 23°04.3'	234°53.4'	S 21°31.3'	286°30.2'	S 20°47.2'	
5	184°11.6'	253°12.1'	S 22°02.0'	215°40.9'	S 14°33.9'	264°38.2'	S 23°04.3'	249°55.5'	S 21°31.3'	301°30.9'	S 20°47.5'	
6	199°14.1'	268°11.9'	S 22°01.7'	230°40.4'	S 14°32.8'	279°40.1'	S 23°04.2'	264°57.7'	S 21°31.3'	316°31.6'	S 20°47.9'	
7	214°16.6'	283°11.6'	S 22°01.3'	245°39.9'	S 14°31.7'	294°41.9'	S 23°04.2'	279°59.8'	S 21°31.2'	331°32.3'	S 20°48.2'	
8	229°19.0'	298°11.4'	S 22°01.0'	260°39.4'	S 14°30.6'	309°43.7'	S 23°04.2'	295°02.0'	S 21°31.2'	346°33.0'	S 20°48.5'	
9	244°21.5'	313°11.1'	S 22°00.6'	275°39.0'	S 14°29.6'	324°45.6'	S 23°04.1'	310°04.1'	S 21°31.1'	1°33.7'	S 20°48.9'	
10	259°24.0'	328°10.9'	S 22°00.2'	290°38.5'	S 14°28.5'	339°47.4'	S 23°04.1'	325°06.3'	S 21°31.1'	16°34.3'	S 20°49.2'	
11	274°26.4'	343°10.6'	S 21°59.9'	305°38.0'	S 14°27.4'	354°49.3'	S 23°04.0'	340°08.4'	S 21°31.0'	31°35.0'	S 20°49.5'	
12	289°28.9'	358°10.3'	S 21°59.5'	320°37.6'	S 14°26.3'	9°51.1'	S 23°04.0'	355°10.6'	S 21°31.0'	46°35.7'	S 20°49.9'	
13	304°31.3'	13°10.1'	S 21°59.1'	335°37.1'	S 14°25.2'	24°53.0'	S 23°04.0'	10°12.7'	S 21°30.9'	61°36.4'	S 20°50.2'	
14	319°33.8'	28°09.8'	S 21°58.7'	350°36.6'	S 14°24.1'	39°54.8'	S 23°03.9'	25°14.9'	S 21°30.9'	76°37.1'	S 20°50.5'	
15	334°36.3'	43°09.6'	S 21°58.4'	5°36.2'	S 14°23.0'	54°56.7'	S 23°03.9'	40°17.0'	S 21°30.8'	91°37.8'	S 20°50.9'	
16	349°38.7'	58°09.3'	S 21°58.0'	20°35.7'	S 14°21.9'	69°58.5'	S 23°03.9'	55°19.2'	S 21°30.8'	106°38.5'	S 20°51.2'	
17	4°41.2'	73°09.1'	S 21°57.6'	35°35.2'	S 14°20.8'	85°00.3'	S 23°03.8'	70°21.3'	S 21°30.8'	121°39.2'	S 20°51.5'	
18	19°43.7'	88°08.8'	S 21°57.3'	50°34.8'	S 14°19.7'	100°02.2'	S 23°03.8'	85°23.5'	S 21°30.7'	136°39.9'	S 20°51.9'	
19	34°46.1'	103°08.6'	S 21°56.9'	65°34.3'	S 14°18.7'	115°04.0'	S 23°03.8'	100°25.6'	S 21°30.7'	151°40.6'	S 20°52.2'	
20	49°48.6'	118°08.3'	S 21°56.5'	80°33.8'	S 14°17.6'	130°05.9'	S 23°03.7'	115°27.8'	S 21°30.6'	166°41.3'	S 20°52.5'	
21	64°51.1'	133°08.1'	S 21°56.1'	95°33.4'	S 14°16.5'	145°07.7'	S 23°03.7'	130°29.9'	S 21°30.6'	181°42.0'	S 20°52.8'	
22	79°53.5'	148°07.8'	S 21°55.8'	110°32.9'	S 14°15.4'	160°09.6'	S 23°03.7'	145°32.1'	S 21°30.5'	196°42.6'	S 20°53.2'	
23	94°56.0'	163°07.6'	S 21°55.4'	125°32.4'	S 14°14.3'	175°11.4'	S 23°03.6'	160°34.2'	S 21°30.5'	211°43.3'	S 20°53.5'	
		SD 16.3'	d 0.4'	v -0.5'	d 1.1'	v 1.8'	d 0.0'	v 2.1'	d 0.0'	v 0.7'	d -0.3'	
Mer. pass.		12 h 7 m 19 s		14 h 38 m		11 h 21 m		12 h 19 m		8 h 54 m		

h	Moon					Lunar distance							
	GHA	dec	v	d	HP	-Arcturus	-Regulus	-Procyon	-Pollux	+Betelgeuse	+Capella	+Aldebaran	+Rigel
0	9°28.5'	N 23°10.5'	5.7'	0.8'	58.4'	103°29.7'	51°22.1'	23°26.9'	16°09.3'	18°41.5'	27°58.2'	29°09.0'	37°17.6'
1	23°53.1'	N 23°11.4'	5.6'	0.7'	58.5'	102°58.6'	50°47.5'	23°04.5'	15°36.6'	19°02.1'	28°15.2'	29°43.5'	37°38.5'
2	38°17.7'	N 23°12.1'	5.6'	0.5'	58.5'	102°27.4'	50°12.8'	22°42.5'	15°04.0'	19°23.4'	28°32.7'	30°18.1'	37°59.7'
3	52°42.3'	N 23°12.6'	5.5'	0.4'	58.5'	101°56.2'	49°38.1'	22°21.0'	14°31.5'	19°45.3'	28°50.8'	30°52.8'	38°21.2'
4	67°06.9'	N 23°13.0'	5.5'	0.2'	58.5'	101°24.9'	49°03.4'	22°00.1'	13°59.2'	20°07.8'	29°09.3'	31°27.5'	38°43.0'
5	81°31.3'	N 23°13.2'	5.5'	0.1'	58.6'	100°53.6'	48°28.6'	21°39.7'	13°27.0'	20°30.9'	29°28.3'	32°02.2'	39°05.1'
6	95°55.8'	N 23°13.3'	5.4'	-0.1'	58.6'	100°22.2'	47°53.8'	21°19.8'	12°55.1'	20°54.5'	29°47.7'	32°37.0'	39°27.5'
7	110°20.2'	N 23°13.2'	5.4'	-0.2'	58.6'	99°50.8'	47°19.0'	21°00.6'	12°23.4'	21°18.6'	30°07.6'	33°11.8'	39°50.2'
8	124°44.6'	N 23°13.0'	5.4'	-0.4'	58.7'	99°19.4'	46°44.1'	20°42.0'	11°51.9'	21°43.3'	30°28.0'	33°46.6'	40°13.1'
9	139°09.0'	N 23°12.6'	5.3'	-0.5'	58.7'	98°47.9'	46°09.2'	20°24.1'	11°20.8'	22°08.4'	30°48.7'	34°21.5'	40°36.2'
10	153°33.3'	N 23°12.1'	5.3'	-0.7'	58.7'	98°16.4'	45°34.3'	20°06.9'	10°50.0'	22°33.9'	31°09.8'	34°56.4'	40°59.7'
11	167°57.6'	N 23°11.4'	5.3'	-0.8'	58.7'	97°44.8'	44°59.3'	19°50.4'	10°19.7'	22°59.9'	31°31.4'	35°31.4'	41°23.4'
12	182°21.8'	N 23°10.6'	5.2'	-1.0'	58.8'	97°13.2'	44°24.4'		9°49.8'	23°26.3'	31°53.3'	36°06.4'	41°47.3'
13	196°46.1'	N 23°09.6'	5.2'	-1.1'	58.8'	96°41.6'	43°49.4'		9°20.6'	23°53.0'	32°15.6'	36°41.4'	42°11.4'
14	211°10.3'	N 23°08.4'	5.2'	-1.3'	58.8'	96°09.9'	43°14.3'			24°20.1'	32°38.2'	37°16.4'	42°35.8'
15	225°34.5'	N 23°07.1'	5.2'	-1.5'	58.8'	95°38.2'	42°39.3'			24°47.6'	33°01.2'	37°51.5'	43°00.4'
16	239°58.7'	N 23°05.7'	5.2'	-1.6'	58.9'	95°06.4'	42°04.2'			25°15.3'	33°24.5'	38°26.7'	43°25.3'
17	254°22.8'	N 23°04.1'	5.1'	-1.8'	58.9'	94°34.6'	41°29.1'			25°43.4'	33°48.2'	39°01.8'	43°50.3'
18	268°47.0'	N 23°02.3'	5.1'	-1.9'	58.9'	94°02.8'	40°53.9'			26°11.8'	34°12.1'	39°37.0'	44°15.5'
19	283°11.1'	N 23°00.4'	5.1'	-2.1'	58.9'	93°31.0'	40°18.7'			26°40.4'	34°36.4'	40°12.2'	44°41.0'
20	297°35.2'	N 22°58.3'	5.1'	-2.2'	59.0'	92°59.1'	39°43.6'			27°09.4'	35°01.0'	40°47.5'	45°06.6'
21	311°59.3'	N 22°56.1'	5.1'	-2.4'	59.0'	92°27.2'	39°08.3'			27°38.5'	35°25.8'	41°22.8'	45°32.5'
22	326°23.4'	N 22°53.7'	5.1'	-2.5'	59.0'	91°55.3'	38°33.1'			28°08.0'	35°50.9'	41°58.1'	45°58.5'
23	340°47.5'	N 22°51.1'	5.1'	-2.7'	59.0'	91°23.3'	37°57.8'			28°37.6'	36°16.3'	42°33.4'	46°24.7'
Mer. pass.		0 h 20 m SD 15.9'	phase 99%										

Star	mag	SHA	dec	Star	mag	SHA	dec	Star	mag	SHA	dec
Fomalhaut	+1.2	15°19.2'	S 29°31.2'	Spica	+1.0	158°26.5'	S 11°15.8'	Betelgeuse	+0.5	270°56.1'	N 7°24.5'
Deneb	+1.2	49°28.9'	N 45°21.2'	Acrux	+0.8	173°04.2'	S 63°12.2'	Capella	+0.1	280°27.3'	N 46°01.0'
Altair	+0.8	62°04.2'	N 8°55.3'	Regulus	+1.4	207°38.5'	N 11°52.1'	Rigel	+0.2	281°07.4'	S 8°10.9'
Vega	+0.0	80°36.3'	N 38°48.1'	Pollux	+1.2	243°21.8'	N 27°58.5'	Aldebaran	+0.9	290°43.9'	N 16°32.8'
Antares	+1.1	112°21.0'	S 26°28.4'	Procyon	+0.4	244°54.7'	N 5°10.3'	Polaris	+2.0	315°34.3'	N 89°21.1'
Rigel Kent	-0.0	139°45.9'	S 60°54.6'	Adhara	+1.5	255°08.6'	S 29°00.1'	Achernar	+0.5	335°23.3'	S 57°08.6'
Arcturus	-0.1	145°51.7'	N 19°04.7'	Sirius	-1.4	258°29.4'	S 16°44.8'				
Hadar	+0.6	148°41.7'	S 60°27.7'	Canopus	-0.6	263°53.6'	S 52°42.5'				

Saturday 11 January 2020 UT1

h	Aries		Sun		Venus		Jupiter		Saturn		Mars	
	GHA		GHA	dec	GHA	dec	GHA	dec	GHA	dec	GHA	dec
0	109°58.5'		178°07.3'	S 21°55.0'	140°32.0'	S 14°13.2'	190°13.3'	S 23°03.6'	175°36.4'	S 21°30.4'	226°44.0'	S 20°53.8'
1	125°00.9'		193°07.1'	S 21°54.6'	155°31.5'	S 14°12.1'	205°15.1'	S 23°03.6'	190°38.5'	S 21°30.4'	241°44.7'	S 20°54.2'
2	140°03.4'		208°06.8'	S 21°54.3'	170°31.0'	S 14°11.0'	220°16.9'	S 23°03.5'	205°40.7'	S 21°30.3'	256°45.4'	S 20°54.5'
3	155°05.8'		223°06.6'	S 21°53.9'	185°30.6'	S 14°09.9'	235°18.8'	S 23°03.5'	220°42.8'	S 21°30.3'	271°46.1'	S 20°54.8'
4	170°08.3'		238°06.3'	S 21°53.5'	200°30.1'	S 14°08.8'	250°20.6'	S 23°03.5'	235°45.0'	S 21°30.3'	286°46.8'	S 20°55.1'
5	185°10.8'		253°06.1'	S 21°53.1'	215°29.7'	S 14°07.7'	265°22.5'	S 23°03.4'	250°47.1'	S 21°30.2'	301°47.5'	S 20°55.5'
6	200°13.2'		268°05.8'	S 21°52.7'	230°29.2'	S 14°06.6'	280°24.3'	S 23°03.4'	265°49.3'	S 21°30.2'	316°48.2'	S 20°55.8'
7	215°15.7'		283°05.6'	S 21°52.4'	245°28.7'	S 14°05.5'	295°26.2'	S 23°03.4'	280°51.4'	S 21°30.1'	331°48.9'	S 20°56.1'
8	230°18.2'		298°05.3'	S 21°52.0'	260°28.3'	S 14°04.4'	310°28.0'	S 23°03.3'	295°53.5'	S 21°30.1'	346°49.5'	S 20°56.5'
9	245°20.6'		313°05.1'	S 21°51.6'	275°27.8'	S 14°03.3'	325°29.9'	S 23°03.3'	310°55.7'	S 21°30.0'	1°50.2'	S 20°56.8'
10	260°23.1'		328°04.8'	S 21°51.2'	290°27.4'	S 14°02.2'	340°31.7'	S 23°03.3'	325°57.8'	S 21°30.0'	16°50.9'	S 20°57.1'
11	275°25.6'		343°04.6'	S 21°50.8'	305°26.9'	S 14°01.1'	355°33.5'	S 23°03.2'	340°60.0'	S 21°29.9'	31°51.6'	S 20°57.4'
12	290°28.0'		358°04.3'	S 21°50.4'	320°26.5'	S 13°60.0'	10°35.4'	S 23°03.2'	356°02.1'	S 21°29.9'	46°52.3'	S 20°57.8'
13	305°30.5'		13°04.1'	S 21°50.0'	335°26.0'	S 13°58.9'	25°37.2'	S 23°03.1'	11°04.3'	S 21°29.8'	61°53.0'	S 20°58.1'
14	320°32.9'		28°03.8'	S 21°49.7'	350°25.6'	S 13°57.8'	40°39.1'	S 23°03.1'	26°06.4'	S 21°29.8'	76°53.7'	S 20°58.4'
15	335°35.4'		43°03.6'	S 21°49.3'	5°25.1'	S 13°56.7'	55°40.9'	S 23°03.1'	41°08.6'	S 21°29.8'	91°54.4'	S 20°58.7'
16	350°37.9'		58°03.3'	S 21°48.9'	20°24.6'	S 13°55.6'	70°42.8'	S 23°03.0'	56°10.7'	S 21°29.7'	106°55.0'	S 20°59.1'
17	5°40.3'		73°03.1'	S 21°48.5'	35°24.2'	S 13°54.5'	85°44.6'	S 23°03.0'	71°12.9'	S 21°29.7'	121°55.7'	S 20°59.4'
18	20°42.8'		88°02.8'	S 21°48.1'	50°23.7'	S 13°53.4'	100°46.5'	S 23°03.0'	86°15.0'	S 21°29.6'	136°56.4'	S 20°59.7'
19	35°45.3'		103°02.6'	S 21°47.7'	65°23.3'	S 13°52.2'	115°48.3'	S 23°02.9'	101°17.2'	S 21°29.6'	151°57.1'	S 21°00.0'
20	50°47.7'		118°02.3'	S 21°47.3'	80°22.8'	S 13°51.1'	130°50.1'	S 23°02.9'	116°19.3'	S 21°29.5'	166°57.8'	S 21°00.4'
21	65°50.2'		133°02.1'	S 21°46.9'	95°22.4'	S 13°50.0'	145°52.0'	S 23°02.9'	131°21.5'	S 21°29.5'	181°58.5'	S 21°00.7'
22	80°52.7'		148°01.9'	S 21°46.5'	110°21.9'	S 13°48.9'	160°53.8'	S 23°02.8'	146°23.6'	S 21°29.4'	196°59.2'	S 21°01.0'
23	95°55.1'		163°01.6'	S 21°46.1'	125°21.5'	S 13°47.8'	175°55.7'	S 23°02.8'	161°25.8'	S 21°29.4'	211°59.9'	S 21°01.3'
			SD 16.3'	d 0.4'	v -0.5'	d 1.1'	v 1.8'	d 0.0'	v 2.1'	d 0.0'	v 0.7'	d -0.3'
Mer. pass.			12 h 7 m 43 s		14 h 38 m		11 h 18 m		12 h 16 m		8 h 53 m	

h	Moon				Lunar distance								
	GHA	dec	v	d	HP	-Arcturus	-Regulus	-Procyon	-Pollux	+Betelgeuse	+Capella	+Sirius	+Aldebaran
0	355°11.6'	N 22°48.4'	5.1'	-2.9'	59.1'	90°51.4'	37°22.6'			29°07.5'	36°42.0'		43°08.8'
1	9°35.6'	N 22°45.6'	5.1'	-3.0'	59.1'	90°19.4'	36°47.3'			29°37.6'	37°07.9'		43°44.2'
2	23°59.7'	N 22°42.6'	5.1'	-3.2'	59.1'	89°47.3'	36°11.9'			30°07.9'	37°34.1'		44°19.7'
3	38°23.8'	N 22°39.4'	5.1'	-3.3'	59.1'	89°15.3'	35°36.6'			30°38.3'	38°00.5'		44°55.1'
4	52°47.9'	N 22°36.1'	5.1'	-3.5'	59.1'	88°43.2'	35°01.2'			31°09.0'	38°27.1'		45°30.6'
5	67°12.0'	N 22°32.6'	5.1'	-3.6'	59.2'	88°11.1'	34°25.8'			31°39.9'	38°53.9'		46°06.1'
6	81°36.1'	N 22°29.0'	5.1'	-3.8'	59.2'	87°39.0'	33°50.4'			32°10.9'	39°21.0'		46°41.7'
7	96°00.2'	N 22°25.2'	5.1'	-3.9'	59.2'	87°06.8'	33°15.0'			32°42.0'	39°48.2'		47°17.2'
8	110°24.3'	N 22°21.2'	5.1'	-4.1'	59.2'	86°34.7'	32°39.6'			33°13.4'	40°15.7'		47°52.8'
9	124°48.4'	N 22°17.1'	5.1'	-4.2'	59.3'	86°02.5'	32°04.1'			33°44.8'	40°43.4'		48°28.5'
10	139°12.5'	N 22°12.9'	5.1'	-4.4'	59.3'	85°30.3'	31°28.7'			34°16.5'	41°11.2'		49°04.1'
11	153°36.7'	N 22°08.5'	5.2'	-4.5'	59.3'	84°58.1'	30°53.2'			34°48.2'	41°39.2'		49°39.8'
12	168°00.8'	N 22°04.0'	5.2'	-4.7'	59.3'	84°25.9'	30°17.7'			35°20.1'	42°07.4'		50°15.5'
13	182°25.0'	N 21°59.3'	5.2'	-4.9'	59.3'	83°53.7'	29°42.2'			35°52.1'	42°35.8'		50°51.2'
14	196°49.2'	N 21°54.4'	5.2'	-5.0'	59.3'	83°21.4'	29°06.7'			36°24.3'	43°04.4'		51°26.9'
15	211°13.4'	N 21°49.4'	5.2'	-5.2'	59.4'	82°49.2'	28°31.1'			36°56.5'	43°33.1'		52°02.7'
16	225°37.7'	N 21°44.3'	5.3'	-5.3'	59.4'	82°16.9'	27°55.6'		9°19.4'	37°28.9'	44°01.9'		52°38.5'
17	240°01.9'	N 21°39.0'	5.3'	-5.4'	59.4'	81°44.6'	27°20.1'		9°49.2'	37°28.9'	44°31.0'	45°05.5'	53°14.3'
18	254°26.2'	N 21°33.5'	5.3'	-5.6'	59.4'	81°12.3'	26°44.5'		10°50.8'	38°33.9'	45°00.1'	45°20.8'	53°50.1'
19	268°50.6'	N 21°27.9'	5.4'	-5.7'	59.4'	80°40.0'	26°09.0'		11°22.3'	39°06.6'	45°29.4'	45°36.4'	54°26.0'
20	283°14.9'	N 21°22.2'	5.4'	-5.9'	59.5'	80°07.7'	25°33.4'	20°12.3'	11°54.3'	39°39.4'	45°58.9'	45°52.3'	55°01.9'
21	297°39.3'	N 21°16.3'	5.4'	-6.0'	59.5'	79°35.5'	24°57.9'	20°30.2'	12°26.6'	40°12.3'	46°28.5'	46°08.5'	55°37.7'
22	312°03.7'	N 21°10.2'	5.4'	-6.2'	59.5'	79°03.1'	24°22.3'	20°48.8'	12°59.3'	40°45.2'	46°58.2'	46°25.0'	56°13.7'
23	326°28.2'	N 21°04.1'	5.5'	-6.3'	59.5'	78°30.8'	23°46.8'	21°08.2'	13°32.2'	41°18.2'	47°28.0'	46°41.8'	56°49.6'
Mer. pass.			0 h 20 m SD 16.1'		phase 100%								

Star	mag	SHA	dec	Star	mag	SHA	dec	Star	mag	SHA	dec
Fomalhaut	+1.2	15°19.2'	S 29°31.2'	Spica	+1.0	158°26.5'	S 11°15.8'	Betelgeuse	+0.5	270°56.1'	N 7°24.5'
Deneb	+1.2	49°28.9'	N 45°21.2'	Acrux	+0.8	173°04.2'	S 63°12.2'	Capella	+0.1	280°27.3'	N 46°01.0'
Altair	+0.8	62°04.2'	N 8°55.3'	Regulus	+1.4	207°38.5'	N 11°52.1'	Rigel	+0.2	281°07.4'	S 8°10.9'
Vega	+0.0	80°36.3'	N 38°48.1'	Pollux	+1.2	243°21.8'	N 27°58.5'	Aldebaran	+0.9	290°43.9'	N 16°32.8'
Antares	+1.1	112°21.0'	S 26°28.4'	Procyon	+0.4	244°54.7'	N 5°10.3'	Polaris	+2.0	315°34.6'	N 89°21.1'
Rigil Kent	-0.0	139°45.8'	S 60°54.6'	Adhara	+1.5	255°08.6'	S 29°00.1'	Achernar	+0.5	335°23.3'	S 57°08.6'
Arcturus	-0.1	145°51.7'	N 19°04.7'	Sirius	-1.4	258°29.4'	S 16°44.8'				
Hadar	+0.6	148°41.6'	S 60°27.7'	Canopus	-0.6	263°53.6'	S 52°42.5'				

h	Aries	Sun		Venus		Jupiter		Saturn		Mars	
	GHA	GHA	dec	GHA	dec	GHA	dec	GHA	dec	GHA	dec
0	110°57.6'	178°01.4'	S 21°45.8'	140°21.0'	S 13°46.7'	190°57.5'	S 23°02.8'	176°27.9'	S 21°29.3'	227°00.5'	S 21°01.6'
1	126°00.1'	193°01.1'	S 21°45.4'	155°20.6'	S 13°45.6'	205°59.4'	S 23°02.7'	191°30.1'	S 21°29.3'	242°01.2'	S 21°02.0'
2	141°02.5'	208°00.9'	S 21°45.0'	170°20.1'	S 13°44.5'	221°01.2'	S 23°02.7'	206°32.2'	S 21°29.2'	257°01.9'	S 21°02.3'
3	156°05.0'	223°00.6'	S 21°44.6'	185°19.7'	S 13°43.4'	236°03.1'	S 23°02.7'	221°34.4'	S 21°29.2'	272°02.6'	S 21°02.6'
4	171°07.4'	238°00.4'	S 21°44.2'	200°19.3'	S 13°42.2'	251°04.9'	S 23°02.6'	236°36.5'	S 21°29.2'	287°03.3'	S 21°02.9'
5	186°09.9'	253°00.1'	S 21°43.8'	215°18.8'	S 13°41.1'	266°06.7'	S 23°02.6'	251°38.7'	S 21°29.1'	302°04.0'	S 21°03.3'
6	201°12.4'	267°59.9'	S 21°43.4'	230°18.4'	S 13°40.0'	281°08.6'	S 23°02.5'	266°40.8'	S 21°29.1'	317°04.7'	S 21°03.6'
7	216°14.8'	282°59.7'	S 21°43.0'	245°17.9'	S 13°38.9'	296°10.4'	S 23°02.5'	281°43.0'	S 21°29.0'	332°05.3'	S 21°03.9'
8	231°17.3'	297°59.4'	S 21°42.6'	260°17.5'	S 13°37.8'	311°12.3'	S 23°02.5'	296°45.1'	S 21°29.0'	347°06.0'	S 21°04.2'
9	246°19.8'	312°59.2'	S 21°42.2'	275°17.0'	S 13°36.7'	326°14.1'	S 23°02.4'	311°47.3'	S 21°28.9'	2°06.7'	S 21°04.5'
10	261°22.2'	327°58.9'	S 21°41.8'	290°16.6'	S 13°35.6'	341°16.0'	S 23°02.4'	326°49.4'	S 21°28.9'	17°07.4'	S 21°04.9'
11	276°24.7'	342°58.7'	S 21°41.4'	305°16.1'	S 13°34.4'	356°17.8'	S 23°02.4'	341°51.6'	S 21°28.8'	32°08.1'	S 21°05.2'
12	291°27.2'	357°58.4'	S 21°41.0'	320°15.7'	S 13°33.3'	11°19.7'	S 23°02.3'	356°53.7'	S 21°28.8'	47°08.8'	S 21°05.5'
13	306°29.6'	12°58.2'	S 21°40.6'	335°15.3'	S 13°32.2'	26°21.5'	S 23°02.3'	11°55.9'	S 21°28.7'	62°09.4'	S 21°05.8'
14	321°32.1'	27°58.0'	S 21°40.2'	350°14.8'	S 13°31.1'	41°23.4'	S 23°02.3'	26°58.0'	S 21°28.7'	77°10.1'	S 21°06.1'
15	336°34.6'	42°57.7'	S 21°39.7'	5°14.4'	S 13°30.0'	56°25.2'	S 23°02.2'	42°00.2'	S 21°28.7'	92°10.8'	S 21°06.4'
16	351°37.0'	57°57.5'	S 21°39.3'	20°13.9'	S 13°28.8'	71°27.0'	S 23°02.2'	57°02.3'	S 21°28.6'	107°11.5'	S 21°06.8'
17	6°39.5'	72°57.2'	S 21°38.9'	35°13.5'	S 13°27.7'	86°28.9'	S 23°02.1'	72°04.5'	S 21°28.6'	122°12.2'	S 21°07.1'
18	21°41.9'	87°57.0'	S 21°38.5'	50°13.1'	S 13°26.6'	101°30.7'	S 23°02.1'	87°06.6'	S 21°28.5'	137°12.9'	S 21°07.4'
19	36°44.4'	102°56.8'	S 21°38.1'	65°12.6'	S 13°25.5'	116°32.6'	S 23°02.1'	102°08.8'	S 21°28.5'	152°13.5'	S 21°07.7'
20	51°46.9'	117°56.5'	S 21°37.7'	80°12.2'	S 13°24.4'	131°34.4'	S 23°02.0'	117°10.9'	S 21°28.4'	167°14.2'	S 21°08.0'
21	66°49.3'	132°56.3'	S 21°37.3'	95°11.8'	S 13°23.2'	146°36.3'	S 23°02.0'	132°13.1'	S 21°28.4'	182°14.9'	S 21°08.3'
22	81°51.8'	147°56.0'	S 21°36.9'	110°11.3'	S 13°22.1'	161°38.1'	S 23°02.0'	147°15.2'	S 21°28.3'	197°15.6'	S 21°08.7'
23	96°54.3'	162°55.8'	S 21°36.5'	125°10.9'	S 13°21.0'	176°40.0'	S 23°01.9'	162°17.4'	S 21°28.3'	212°16.3'	S 21°09.0'
		SD 16.3' d 0.4'		v -0.4' d 1.1'		v 1.8' d 0.0'		v 2.1' d 0.0'		v 0.7' d -0.3'	
Mer. pass.		12 h 8 m 7 s		14 h 39 m		11 h 15 m		12 h 12 m		8 h 52 m	

h	Moon					Lunar distance							
	GHA	dec	v	d	HP	-Acruz	-Arcturus	-Spica	-Regulus	+Pollux	+Procyon	+Betelgeuse	+Sirius
0	340°52.6'	N 20°57.7'	5.5'	-6.5'	59.5'	95°06.8'	77°58.5'	77°13.6'	23°11.2'	14°05.5'	21°28.3'	41°51.4'	46°58.9'
1	355°17.2'	N 20°51.3'	5.6'	-6.6'	59.5'	94°47.4'	77°26.2'	76°37.9'	22°35.7'	14°38.9'	21°49.0'	42°24.6'	47°16.3'
2	9°41.7'	N 20°44.6'	5.6'	-6.8'	59.5'	94°28.0'	76°53.9'	76°02.1'	22°00.1'	15°12.6'	22°10.4'	42°57.9'	47°33.9'
3	24°06.3'	N 20°37.9'	5.6'	-6.9'	59.6'	94°08.6'	76°21.6'	75°26.4'	21°24.6'	15°46.4'	22°32.4'	43°31.2'	47°51.8'
4	38°30.9'	N 20°31.0'	5.7'	-7.0'	59.6'	93°49.1'	75°49.3'	74°50.6'	20°49.1'	16°20.4'	22°54.9'	44°04.6'	48°10.0'
5	52°55.6'	N 20°24.0'	5.7'	-7.2'	59.6'	93°29.6'	75°17.1'	74°14.8'	20°13.6'	16°54.6'	23°18.0'	44°38.1'	48°28.4'
6	67°20.3'	N 20°16.8'	5.8'	-7.3'	59.6'	93°10.1'	74°44.8'	73°39.0'	19°38.2'	17°28.9'	23°41.6'	45°11.7'	48°47.1'
7	81°45.1'	N 20°09.5'	5.8'	-7.4'	59.6'	92°50.6'	74°12.5'	73°03.2'	19°02.7'	18°03.3'	24°05.7'	45°45.3'	49°06.0'
8	96°09.9'	N 20°02.0'	5.9'	-7.6'	59.6'	92°31.0'	73°40.2'	72°27.3'	18°27.3'	18°37.9'	24°30.3'	46°19.0'	49°25.2'
9	110°34.8'	N 19°54.5'	5.9'	-7.7'	59.6'	92°11.4'	73°08.0'	71°51.5'	17°51.9'	19°12.5'	24°55.3'	46°52.8'	49°44.6'
10	124°59.7'	N 19°46.8'	6.0'	-7.8'	59.7'	91°51.9'	72°35.8'	71°15.6'	17°16.6'	19°47.3'	25°20.8'	47°26.6'	50°04.2'
11	139°24.6'	N 19°38.9'	6.0'	-8.0'	59.7'	91°32.3'	72°03.5'	70°39.8'	16°41.3'	20°22.1'	25°46.7'	48°00.4'	50°24.1'
12	153°49.6'	N 19°30.9'	6.1'	-8.1'	59.7'	91°12.6'	71°31.3'	70°03.9'	16°06.0'	20°57.1'	26°12.9'	48°34.3'	50°44.2'
13	168°14.7'	N 19°22.8'	6.1'	-8.2'	59.7'	90°53.0'	70°59.1'	69°28.0'	15°30.8'	21°32.1'	26°39.5'	49°08.3'	51°04.6'
14	182°39.8'	N 19°14.6'	6.2'	-8.4'	59.7'	90°33.4'	70°26.9'	68°52.1'	14°55.7'	22°07.2'	27°06.5'	49°42.3'	51°25.1'
15	197°04.9'	N 19°06.2'	6.2'	-8.5'	59.7'	90°13.7'	69°54.8'	68°16.2'	14°20.7'	22°42.3'	27°33.8'	50°16.4'	51°45.9'
16	211°30.1'	N 18°57.7'	6.3'	-8.6'	59.7'	89°54.1'	69°22.7'	67°40.3'	13°45.7'	23°17.5'	28°01.5'	50°50.5'	52°06.8'
17	225°55.4'	N 18°49.1'	6.3'	-8.7'	59.7'	89°34.4'	68°50.5'	67°04.4'	13°10.9'	23°52.8'	28°29.4'	51°24.6'	52°28.0'
18	240°20.7'	N 18°40.3'	6.4'	-8.9'	59.7'	89°14.7'	68°18.4'	66°28.5'	12°36.2'	24°28.1'	28°57.6'	51°58.8'	52°49.3'
19	254°46.1'	N 18°31.5'	6.4'	-9.0'	59.7'	88°55.1'	67°46.4'	65°52.6'	12°01.6'	25°03.5'	29°26.1'	52°33.0'	53°10.9'
20	269°11.5'	N 18°22.5'	6.5'	-9.1'	59.8'	88°35.4'	67°14.3'	65°16.7'	11°27.1'	25°38.9'	29°54.9'	53°07.3'	53°32.6'
21	283°37.0'	N 18°13.4'	6.5'	-9.2'	59.8'	88°15.7'	66°42.3'	64°40.7'	10°52.9'	26°14.3'	30°23.9'	53°41.6'	53°54.6'
22	298°02.6'	N 18°04.1'	6.6'	-9.4'	59.8'	87°56.1'	66°10.4'	64°04.8'	10°18.9'	26°49.8'	30°53.1'	54°16.0'	54°16.7'
23	312°28.2'	N 17°54.8'	6.7'	-9.5'	59.8'	87°36.4'	65°38.4'	63°28.8'	9°45.1'	27°25.4'	31°22.6'	54°50.4'	54°39.0'
Mer. pass.		1 h 20 m SD 16.2'		phase 98%									

Star	mag	SHA	dec	Star	mag	SHA	dec	Star	mag	SHA	dec
Fomalhaut	+1.2	15°19.2'	S 29°31.2'	Spica	+1.0	158°26.5'	S 11°15.8'	Betelgeuse	+0.5	270°56.1'	N 7°24.5'
Deneb	+1.2	49°28.9'	N 45°21.2'	Acruz	+0.8	173°04.1'	S 63°12.2'	Capella	+0.1	280°27.3'	N 46°01.0'
Altair	+0.8	62°04.2'	N 8°55.3'	Regulus	+1.4	207°38.5'	N 11°52.1'	Rigel	+0.2	281°07.4'	S 8°10.9'
Vega	+0.0	80°36.3'	N 38°48.1'	Pollux	+1.2	243°21.8'	N 27°58.5'	Aldebaran	+0.9	290°43.9'	N 16°32.8'
Antares	+1.1	112°21.0'	S 26°28.4'	Procyon	+0.4	244°54.7'	N 5°10.3'	Polaris	+2.0	315°35.0'	N 89°21.1'
Rigil Kent	-0.0	139°45.8'	S 60°54.6'	Adhara	+1.5	255°08.6'	S 29°00.1'	Achernar	+0.5	335°23.3'	S 57°08.6'
Arcturus	-0.1	145°51.7'	N 19°04.7'	Sirius	-1.4	258°29.4'	S 16°44.8'				
Hadar	+0.6	148°41.6'	S 60°27.7'	Canopus	-0.6	263°53.6'	S 52°42.5'				

h	Aries		Sun		Venus		Jupiter		Saturn		Mars	
	GHA		GHA	dec	GHA	dec	GHA	dec	GHA	dec	GHA	dec
0	111°56.7'		177°55.6'	S 21°36.1'	140°10.5'	S 13°19.9'	191°41.8'	S 23°01.9'	177°19.5'	S 21°28.2'	227°17.0'	S 21°09.3'
1	126°59.2'		192°55.3'	S 21°35.7'	155°10.0'	S 13°18.7'	206°43.7'	S 23°01.9'	192°21.7'	S 21°28.2'	242°17.6'	S 21°09.6'
2	142°01.7'		207°55.1'	S 21°35.2'	170°09.6'	S 13°17.6'	221°45.5'	S 23°01.8'	207°23.8'	S 21°28.1'	257°18.3'	S 21°09.9'
3	157°04.1'		222°54.9'	S 21°34.8'	185°09.2'	S 13°16.5'	236°47.4'	S 23°01.8'	222°26.0'	S 21°28.1'	272°19.0'	S 21°10.2'
4	172°06.6'		237°54.6'	S 21°34.4'	200°08.7'	S 13°15.4'	251°49.2'	S 23°01.7'	237°28.1'	S 21°28.0'	287°19.7'	S 21°10.5'
5	187°09.1'		252°54.4'	S 21°34.0'	215°08.3'	S 13°14.2'	266°51.0'	S 23°01.7'	252°30.3'	S 21°28.0'	302°20.4'	S 21°10.9'
6	202°11.5'		267°54.1'	S 21°33.6'	230°07.9'	S 13°13.1'	281°52.9'	S 23°01.7'	267°32.4'	S 21°28.0'	317°21.0'	S 21°11.2'
7	217°14.0'		282°53.9'	S 21°33.2'	245°07.4'	S 13°12.0'	296°54.7'	S 23°01.6'	282°34.6'	S 21°27.9'	332°21.7'	S 21°11.5'
8	232°16.4'		297°53.7'	S 21°32.7'	260°07.0'	S 13°10.8'	311°56.6'	S 23°01.6'	297°36.7'	S 21°27.9'	347°22.4'	S 21°11.8'
9	247°18.9'		312°53.4'	S 21°32.3'	275°06.6'	S 13°09.7'	326°58.4'	S 23°01.6'	312°38.9'	S 21°27.8'	2°23.1'	S 21°12.1'
10	262°21.4'		327°53.2'	S 21°31.9'	290°06.1'	S 13°08.6'	342°00.3'	S 23°01.5'	327°41.0'	S 21°27.8'	17°23.8'	S 21°12.4'
11	277°23.8'		342°53.0'	S 21°31.5'	305°05.7'	S 13°07.4'	357°02.1'	S 23°01.5'	342°43.1'	S 21°27.7'	32°24.4'	S 21°12.7'
12	292°26.3'		357°52.7'	S 21°31.1'	320°05.3'	S 13°06.3'	12°04.0'	S 23°01.5'	357°45.3'	S 21°27.7'	47°25.1'	S 21°13.0'
13	307°28.8'		12°52.5'	S 21°30.6'	335°04.9'	S 13°05.2'	27°05.8'	S 23°01.4'	12°47.4'	S 21°27.6'	62°25.8'	S 21°13.4'
14	322°31.2'		27°52.3'	S 21°30.2'	350°04.4'	S 13°04.1'	42°07.7'	S 23°01.4'	27°49.5'	S 21°27.5'	77°26.5'	S 21°13.7'
15	337°33.7'		42°52.0'	S 21°29.8'	5°04.0'	S 13°02.9'	57°09.5'	S 23°01.3'	42°51.8'	S 21°27.4'	92°27.2'	S 21°14.0'
16	352°36.2'		57°51.8'	S 21°29.4'	20°03.6'	S 13°01.8'	72°11.4'	S 23°01.3'	57°54.1'	S 21°27.4'	107°27.8'	S 21°14.3'
17	7°38.6'		72°51.5'	S 21°29.0'	35°03.2'	S 13°00.6'	87°13.2'	S 23°01.3'	72°56.2'	S 21°27.4'	122°28.5'	S 21°14.6'
18	22°41.1'		87°51.3'	S 21°28.5'	50°02.7'	S 12°59.5'	102°15.1'	S 23°01.2'	87°58.3'	S 21°27.4'	137°29.2'	S 21°14.9'
19	37°43.5'		102°51.1'	S 21°28.1'	65°02.3'	S 12°58.4'	117°16.9'	S 23°01.2'	103°00.4'	S 21°27.4'	152°29.9'	S 21°15.2'
20	52°46.0'		117°50.8'	S 21°27.7'	80°01.9'	S 12°57.2'	132°18.7'	S 23°01.2'	118°02.6'	S 21°27.3'	167°30.6'	S 21°15.5'
21	67°48.5'		132°50.6'	S 21°27.2'	95°01.5'	S 12°56.1'	147°20.6'	S 23°01.1'	133°04.7'	S 21°27.3'	182°31.2'	S 21°15.8'
22	82°50.9'		147°50.4'	S 21°26.8'	110°01.0'	S 12°55.0'	162°22.4'	S 23°01.1'	148°06.9'	S 21°27.2'	197°31.9'	S 21°16.1'
23	97°53.4'		162°50.1'	S 21°26.4'	125°00.6'	S 12°53.8'	177°24.3'	S 23°01.0'	163°09.0'	S 21°27.2'	212°32.6'	S 21°16.5'
			SD 16.3'	d 0.4'	v -0.4'	d 1.1'	v 1.8'	d 0.0'	v 2.2'	d 0.0'	v 0.7'	d -0.3'
Mer. pass.			12 h 8 m 29 s		14 h 40 m		11 h 12 m		12 h 9 m		8 h 50 m	

h	Moon				Lunar distance								
	GHA	dec	v	d	HP	-Acrux	-Arcturus	-Spica	-Regulus	+Pollux	+Procyon	+Sirius	+Betelgeuse
0	326°53.8'	N 17°45.3'	6.7'	-9.6'	59.8'	87°16.8'	65°06.5'	62°52.9'	9°11.7'	28°00.9'	31°52.3'	55°01.4'	55°24.8'
1	341°19.5'	N 17°35.7'	6.8'	-9.7'	59.8'	86°57.2'	64°34.6'	62°17.0'	8°38.6'	28°36.5'	32°22.2'	55°24.0'	55°59.2'
2	355°45.3'	N 17°26.0'	6.8'	-9.8'	59.8'	86°37.5'	64°02.8'	61°41.0'	8°06.0'	29°12.2'	32°52.2'	55°46.8'	56°33.7'
3	10°11.1'	N 17°16.2'	6.9'	-9.9'	59.8'	86°17.9'	63°31.0'	61°05.1'	7°34.0'	29°47.9'	33°22.5'	56°09.8'	57°08.2'
4	24°37.0'	N 17°06.3'	7.0'	-10.0'	59.8'	85°58.3'	62°59.2'	60°29.1'		30°23.5'	33°53.0'	56°32.9'	57°42.7'
5	39°03.0'	N 16°56.2'	7.0'	-10.1'	59.8'	85°38.7'	62°27.5'	59°53.2'		30°59.3'	34°23.6'	56°56.1'	58°17.3'
6	53°29.0'	N 16°46.1'	7.1'	-10.3'	59.8'	85°19.2'	61°55.8'	59°17.2'		31°35.0'	34°54.4'	57°19.5'	58°51.9'
7	67°55.1'	N 16°35.8'	7.1'	-10.4'	59.8'	84°59.7'	61°24.2'	58°41.3'		32°10.8'	35°25.3'	57°43.1'	59°26.5'
8	82°21.3'	N 16°25.5'	7.2'	-10.5'	59.8'	84°40.1'	60°52.6'	58°05.3'		32°46.6'	35°56.4'	58°06.8'	60°01.1'
9	96°47.5'	N 16°15.0'	7.3'	-10.6'	59.8'	84°20.6'	60°21.1'	57°29.4'		33°22.4'	36°27.7'	58°30.6'	60°35.8'
10	111°13.7'	N 16°04.4'	7.3'	-10.7'	59.8'	84°01.2'	59°49.6'	56°53.5'		33°58.2'	36°59.0'	58°54.6'	61°10.5'
11	125°40.1'	N 15°53.8'	7.4'	-10.8'	59.8'	83°41.7'	59°18.2'	56°17.5'		34°34.1'	37°30.5'	59°18.7'	61°45.2'
12	140°06.5'	N 15°43.0'	7.5'	-10.9'	59.8'	83°22.3'	58°46.8'	55°41.6'		35°09.9'	38°02.2'	59°42.9'	62°19.9'
13	154°32.9'	N 15°32.1'	7.5'	-11.0'	59.8'	83°03.0'	58°15.5'	55°05.7'		35°45.8'	38°33.9'	60°07.3'	62°54.6'
14	168°59.5'	N 15°21.2'	7.6'	-11.1'	59.8'	82°43.6'	57°44.3'	54°29.8'		36°21.7'	39°05.8'	60°31.7'	63°29.4'
15	183°26.0'	N 15°10.1'	7.7'	-11.2'	59.8'	82°24.3'	57°13.1'	53°53.9'		36°57.6'	39°37.7'	60°56.3'	64°04.1'
16	197°52.7'	N 14°58.9'	7.7'	-11.2'	59.8'	82°05.0'	56°42.0'	53°18.0'		37°33.5'	40°09.8'	61°21.0'	64°38.9'
17	212°19.4'	N 14°47.7'	7.8'	-11.3'	59.8'	81°45.8'	56°10.9'	52°42.1'		38°09.4'	40°41.9'	61°45.9'	65°13.7'
18	226°46.2'	N 14°36.4'	7.8'	-11.4'	59.9'	81°26.6'	55°39.9'	52°06.2'		38°45.3'	41°14.2'	62°10.8'	65°48.5'
19	241°13.0'	N 14°24.9'	7.9'	-11.5'	59.9'	81°07.5'	55°09.0'	51°30.3'		39°21.3'	41°46.6'	62°35.8'	66°23.4'
20	255°39.9'	N 14°13.4'	8.0'	-11.6'	59.9'	80°48.3'	54°38.2'	50°54.4'		39°57.2'	42°19.0'	63°01.0'	66°58.2'
21	270°06.9'	N 14°01.8'	8.0'	-11.7'	59.9'	80°29.3'	54°07.5'	50°18.6'		40°33.2'	42°51.5'	63°26.2'	67°33.1'
22	284°33.9'	N 13°50.1'	8.1'	-11.8'	59.9'	80°10.3'	53°36.8'	49°42.7'		41°09.2'	43°24.1'	63°51.5'	68°07.9'
23	299°01.0'	N 13°38.3'	8.2'	-11.9'	59.9'	79°51.3'	53°06.2'	49°06.9'		41°45.1'	43°56.8'	64°16.9'	68°42.8'
Mer. pass.			2 h 18 m SD 16.3'		phase 94%								

Star	mag	SHA	dec	Star	mag	SHA	dec	Star	mag	SHA	dec
Fomalhaut	+1.2	15°19.2'	S 29°31.2'	Spica	+1.0	158°26.5'	S 11°15.8'	Betelgeuse	+0.5	270°56.1'	N 7°24.5'
Deneb	+1.2	49°28.9'	N 45°21.2'	Acrux	+0.8	173°04.1'	S 63°12.2'	Capella	+0.1	280°27.3'	N 46°01.0'
Altair	+0.8	62°04.2'	N 8°55.3'	Regulus	+1.4	207°38.4'	N 11°52.1'	Rigel	+0.2	281°07.4'	S 8°10.9'
Vega	+0.0	80°36.3'	N 38°48.1'	Pollux	+1.2	243°21.8'	N 27°58.5'	Aldebaran	+0.9	290°43.9'	N 16°32.8'
Antares	+1.1	112°21.0'	S 26°28.4'	Procyon	+0.4	244°54.7'	N 5°10.3'	Polaris	+2.0	315°35.5'	N 89°21.1'
Rigil Kent	-0.0	139°45.8'	S 60°54.6'	Adhara	+1.5	255°08.6'	S 29°00.1'	Achernar	+0.5	335°23.3'	S 57°08.6'
Arcturus	-0.1	145°51.7'	N 19°04.7'	Sirius	-1.4	258°29.4'	S 16°44.8'				
Hadar	+0.6	148°41.6'	S 60°27.7'	Canopus	-0.6	263°53.6'	S 52°42.5'				

h	Aries			Sun			Venus			Jupiter			Saturn			Mars			
	GHA	GHA	dec	GHA	dec		GHA	dec		GHA	dec		GHA	dec		GHA	dec		
0	112°55.9'	177°49.9'	S 21°26.0'	140°00.2'	S 12°52.7'		192°26.1'	S 23°01.0'		178°11.2'	S 21°27.1'		227°33.3'	S 21°16.8'					
1	127°58.3'	192°49.7'	S 21°25.5'	154°59.8'	S 12°51.6'		207°28.0'	S 23°01.0'		193°13.3'	S 21°27.1'		242°34.0'	S 21°17.1'					
2	143°00.8'	207°49.5'	S 21°25.1'	169°59.4'	S 12°50.4'		222°29.8'	S 23°00.9'		208°15.4'	S 21°27.0'		257°34.6'	S 21°17.4'					
3	158°03.3'	222°49.2'	S 21°24.7'	184°58.9'	S 12°49.3'		237°31.7'	S 23°00.9'		223°17.6'	S 21°27.0'		272°35.3'	S 21°17.7'					
4	173°05.7'	237°49.0'	S 21°24.2'	199°58.5'	S 12°48.1'		252°33.5'	S 23°00.9'		238°19.7'	S 21°26.9'		287°36.0'	S 21°18.0'					
5	188°08.2'	252°48.8'	S 21°23.8'	214°58.1'	S 12°47.0'		267°35.4'	S 23°00.8'		253°21.9'	S 21°26.9'		302°36.7'	S 21°18.3'					
6	203°10.7'	267°48.5'	S 21°23.4'	229°57.7'	S 12°45.8'		282°37.2'	S 23°00.8'		268°24.0'	S 21°26.9'		317°37.3'	S 21°18.6'					
7	218°13.1'	282°48.3'	S 21°22.9'	244°57.3'	S 12°44.7'		297°39.1'	S 23°00.7'		283°26.2'	S 21°26.8'		332°38.0'	S 21°18.9'					
8	233°15.6'	297°48.1'	S 21°22.5'	259°56.9'	S 12°43.6'		312°40.9'	S 23°00.7'		298°28.3'	S 21°26.8'		347°38.7'	S 21°19.2'					
9	248°18.0'	312°47.8'	S 21°22.1'	274°56.4'	S 12°42.4'		327°42.8'	S 23°00.7'		313°30.5'	S 21°26.7'		2°39.4'	S 21°19.5'					
10	263°20.5'	327°47.6'	S 21°21.6'	289°56.0'	S 12°41.3'		342°44.6'	S 23°00.6'		328°32.6'	S 21°26.7'		17°40.0'	S 21°19.8'					
11	278°23.0'	342°47.4'	S 21°21.2'	304°55.6'	S 12°40.1'		357°46.5'	S 23°00.6'		343°34.8'	S 21°26.6'		32°40.7'	S 21°20.1'					
12	293°25.4'	357°47.1'	S 21°20.8'	319°55.2'	S 12°39.0'		12°48.3'	S 23°00.6'		358°36.9'	S 21°26.6'		47°41.4'	S 21°20.4'					
13	308°27.9'	12°46.9'	S 21°20.3'	334°54.8'	S 12°37.8'		27°50.2'	S 23°00.5'		13°39.1'	S 21°26.5'		62°42.1'	S 21°20.7'					
14	323°30.4'	27°46.7'	S 21°19.9'	349°54.4'	S 12°36.7'		42°52.0'	S 23°00.5'		28°41.2'	S 21°26.5'		77°42.8'	S 21°21.0'					
15	338°32.8'	42°46.5'	S 21°19.4'	4°54.0'	S 12°35.5'		57°53.8'	S 23°00.4'		43°43.4'	S 21°26.4'		92°43.4'	S 21°21.3'					
16	353°35.3'	57°46.2'	S 21°19.0'	19°53.6'	S 12°34.4'		72°55.7'	S 23°00.4'		58°45.5'	S 21°26.4'		107°44.1'	S 21°21.6'					
17	8°37.8'	72°46.0'	S 21°18.6'	34°53.1'	S 12°33.2'		87°57.5'	S 23°00.4'		73°47.7'	S 21°26.3'		122°44.8'	S 21°22.0'					
18	23°40.2'	87°45.8'	S 21°18.1'	49°52.7'	S 12°32.1'		102°59.4'	S 23°00.3'		88°49.8'	S 21°26.3'		137°45.5'	S 21°22.3'					
19	38°42.7'	102°45.6'	S 21°17.7'	64°52.3'	S 12°31.0'		118°01.2'	S 23°00.3'		103°52.0'	S 21°26.2'		152°46.1'	S 21°22.6'					
20	53°45.2'	117°45.3'	S 21°17.2'	79°51.9'	S 12°29.8'		133°03.1'	S 23°00.3'		118°54.1'	S 21°26.2'		167°46.8'	S 21°22.9'					
21	68°47.6'	132°45.1'	S 21°16.8'	94°51.5'	S 12°28.7'		148°04.9'	S 23°00.2'		133°56.3'	S 21°26.2'		182°47.5'	S 21°23.2'					
22	83°50.1'	147°44.9'	S 21°16.3'	109°51.1'	S 12°27.5'		163°06.8'	S 23°00.2'		148°58.4'	S 21°26.1'		197°48.2'	S 21°23.5'					
23	98°52.5'	162°44.6'	S 21°15.9'	124°50.7'	S 12°26.3'		178°08.6'	S 23°00.1'		164°00.6'	S 21°26.1'		212°48.8'	S 21°23.8'					
		SD 16.3'	d 0.4'		v -0.4'	d 1.1'		v 1.8'	d 0.0'		v 2.1'	d 0.0'		v 0.7'	d -0.3'				
Mer. pass.		12 h 8 m 52 s		14 h 40 m			11 h 9 m			12 h 6 m			8 h 49 m						

h	Moon				Lunar distance									
	GHA	dec	v	d	HP	-Hadar	-Acrux	-Arcturus	-Spica	+Regulus	+Pollux	+Procyon	+Sirius	
0	313°28.2'	N 13°26.5'	8.2'	-11.9'	59.8'	84°36.4'	79°32.4'	52°35.7'	48°31.1'		42°21.1'	44°29.5'	64°42.5'	
1	327°55.4'	N 13°14.5'	8.3'	-12.0'	59.8'	84°12.1'	79°13.5'	52°05.3'	47°55.3'	7°37.8'	42°57.1'	45°02.3'	63°08.1'	
2	342°22.7'	N 13°02.5'	8.3'	-12.1'	59.8'	83°47.8'	78°54.7'	51°35.0'	47°19.5'	8°09.9'	43°33.0'	45°35.2'	63°33.7'	
3	356°50.0'	N 12°50.4'	8.4'	-12.2'	59.8'	83°23.6'	78°36.0'	51°04.8'	46°43.7'	8°42.6'	44°09.0'	46°08.1'	65°59.5'	
4	11°17.4'	N 12°38.3'	8.5'	-12.2'	59.8'	82°59.4'	78°17.3'	50°34.7'	46°07.9'	9°15.7'	44°45.0'	46°41.1'	66°25.4'	
5	25°44.9'	N 12°26.0'	8.5'	-12.3'	59.8'	82°35.2'	77°58.7'	50°04.7'	45°32.2'	9°49.2'	45°21.0'	47°14.2'	66°51.3'	
6	40°12.4'	N 12°13.7'	8.6'	-12.4'	59.8'	82°11.0'	77°40.1'	49°34.8'	44°56.5'	10°23.0'	45°57.0'	47°47.3'	67°17.3'	
7	54°40.0'	N 12°01.3'	8.6'	-12.5'	59.8'	81°46.9'	77°21.7'	49°05.0'	44°20.8'	10°57.0'	46°33.0'	48°20.5'	67°43.4'	
8	69°07.6'	N 11°48.9'	8.7'	-12.5'	59.8'	81°22.8'	77°03.2'	48°35.3'	43°45.1'	11°31.3'	47°08.9'	48°53.7'	68°09.5'	
9	83°35.4'	N 11°36.3'	8.8'	-12.6'	59.8'	80°58.7'	76°44.9'	48°05.8'	43°09.4'	12°05.8'	47°44.9'	49°26.9'	68°35.8'	
10	98°03.1'	N 11°23.8'	8.8'	-12.7'	59.8'	80°34.7'	76°26.6'	47°36.4'	42°33.7'	12°40.4'	48°20.9'	50°00.2'	69°02.0'	
11	112°30.9'	N 11°11.1'	8.9'	-12.7'	59.8'	80°10.7'	76°08.4'	47°07.1'	41°58.1'	13°15.1'	48°56.9'	50°33.6'	69°28.4'	
12	126°58.8'	N 10°58.4'	8.9'	-12.8'	59.8'	79°46.8'	75°50.2'	46°37.9'	41°22.5'	13°50.0'	49°32.8'	51°07.0'	69°54.8'	
13	141°26.8'	N 10°45.6'	9.0'	-12.8'	59.8'	79°22.9'	75°32.2'	46°08.8'	40°46.9'	14°24.9'	50°08.8'	51°40.4'	70°21.3'	
14	155°54.8'	N 10°32.7'	9.1'	-12.9'	59.8'	78°59.0'	75°14.2'	45°39.9'	40°11.4'	14°60.0'	50°44.8'	52°13.9'	70°47.8'	
15	170°22.8'	N 10°19.8'	9.1'	-13.0'	59.8'	78°35.2'	74°56.3'	45°11.2'	39°35.8'	15°35.1'	51°20.7'	52°47.4'	71°14.4'	
16	184°50.9'	N 10°06.9'	9.2'	-13.0'	59.8'	78°11.5'	74°38.5'	44°42.6'	39°00.3'	16°10.3'	51°56.7'	53°20.9'	71°41.0'	
17	199°19.1'	N 9°53.9'	9.2'	-13.1'	59.8'	77°47.8'	74°20.7'	44°14.1'	38°24.8'	16°45.6'	52°32.6'	53°54.4'	72°07.7'	
18	213°47.3'	N 9°40.8'	9.3'	-13.1'	59.8'	77°24.2'	74°03.1'	43°45.8'	37°49.4'	17°20.9'	53°08.6'	54°28.0'	72°34.4'	
19	228°15.6'	N 9°27.7'	9.3'	-13.2'	59.8'	77°00.6'	73°45.5'	43°17.7'	37°14.0'	17°56.3'	53°44.5'	55°01.7'	73°01.2'	
20	242°43.9'	N 9°14.5'	9.4'	-13.2'	59.8'	76°37.0'	73°28.0'	42°49.7'	36°38.6'	18°31.7'	54°20.5'	55°35.3'	73°28.0'	
21	257°12.3'	N 9°01.3'	9.4'	-13.3'	59.8'	76°13.6'	73°10.6'	42°21.9'	36°03.2'	19°07.1'	54°56.4'	56°09.0'	73°54.9'	
22	271°40.7'	N 8°48.0'	9.5'	-13.3'	59.8'	75°50.2'	72°53.4'	41°54.3'	35°27.9'	19°42.6'	55°32.3'	56°42.7'	74°21.8'	
23	286°09.2'	N 8°34.7'	9.5'	-13.4'	59.7'	75°26.8'	72°36.2'	41°26.9'	34°52.6'	20°18.1'	56°08.2'	57°16.4'	74°48.7'	
Mer. pass.	3 h 13 m	SD 16.3'	phase 87%											

Star	mag	SHA	dec	Star	mag	SHA	dec	Star	mag	SHA	dec
Fomalhaut	+1.2	15°19.2'	S 29°31.2'	Spica	+1.0	158°26.5'	S 11°15.8'	Betelgeuse	+0.5	270°56.1'	N 7°24.5'
Deneb	+1.2	49°28.9'	N 45°21.2'	Acrux	+0.8	173°04.1'	S 63°12.2'	Capella	+0.1	280°27.3'	N 46°01.0'
Altair	+0.8	62°04.2'	N 8°55.3'	Regulus	+1.4	207°38.4'	N 11°52.1'	Rigel	+0.2	281°07.4'	S 8°10.9'
Vega	+0.0	80°36.3'	N 38°48.1'	Pollux	+1.2	243°21.8'	N 27°58.5'	Aldebaran	+0.9	290°43.9'	N 16°32.8'
Antares	+1.1	112°21.0'	S 26°28.4'	Procyon	+0.4	244°54.7'	N 5°10.3'	Polaris	+2.0	315°36.0'	N 89°21.1'
Rigel Kent	-0.0	139°45.8'	S 60°54.6'	Adhara	+1.5	255°08.6'	S 29°00.1'	Achernar	+0.5	335°23.3'	S 57°08.6'
Arcturus	-0.1	145°51.7'	N 19°04.7'	Sirius	-1.4	258°29.4'	S 16°44.8'				
Hadar	+0.6	148°41.6'	S 60°27.7'	Canopus	-0.6	263°53.6'	S 52°42.6'				

h	Aries		Sun		Venus		Jupiter		Saturn		Mars	
	GHA		GHA	dec	GHA	dec	GHA	dec	GHA	dec	GHA	dec
0	113°55.0'		177°44.4'	S 21°15.4'	139°50.3'	S 12°25.2'	193°10.5'	S 23°00.1'	179°02.7'	S 21°26.0'	227°49.5'	S 21°24.1'
1	128°57.5'		192°44.2'	S 21°15.0'	154°49.9'	S 12°24.0'	208°12.3'	S 23°00.1'	194°04.9'	S 21°26.0'	242°50.2'	S 21°24.4'
2	143°59.9'		207°44.0'	S 21°14.5'	169°49.5'	S 12°22.9'	223°14.2'	S 23°00.0'	209°07.0'	S 21°25.9'	257°50.8'	S 21°24.7'
3	159°02.4'		222°43.7'	S 21°14.1'	184°49.1'	S 12°21.7'	238°16.0'	S 22°60.0'	224°09.2'	S 21°25.9'	272°51.5'	S 21°25.0'
4	174°04.9'		237°43.5'	S 21°13.7'	199°48.7'	S 12°20.6'	253°17.9'	S 22°59.9'	239°11.3'	S 21°25.8'	287°52.2'	S 21°25.3'
5	189°07.3'		252°43.3'	S 21°13.2'	214°48.3'	S 12°19.4'	268°19.7'	S 22°59.9'	254°13.5'	S 21°25.8'	302°52.9'	S 21°25.6'
6	204°09.8'		267°43.1'	S 21°12.8'	229°47.8'	S 12°18.3'	283°21.6'	S 22°59.9'	269°15.6'	S 21°25.7'	317°53.5'	S 21°25.9'
7	219°12.3'		282°42.8'	S 21°12.3'	244°47.4'	S 12°17.1'	298°23.4'	S 22°59.8'	284°17.8'	S 21°25.7'	332°54.2'	S 21°26.2'
8	234°14.7'		297°42.6'	S 21°11.8'	259°47.0'	S 12°16.0'	313°25.3'	S 22°59.8'	299°19.9'	S 21°25.6'	347°54.9'	S 21°26.5'
9	249°17.2'		312°42.4'	S 21°11.4'	274°46.6'	S 12°14.8'	328°27.1'	S 22°59.8'	314°22.1'	S 21°25.6'	2°55.6'	S 21°26.8'
10	264°19.6'		327°42.2'	S 21°10.9'	289°46.2'	S 12°13.6'	343°29.0'	S 22°59.7'	329°24.2'	S 21°25.5'	17°56.2'	S 21°27.1'
11	279°22.1'		342°42.0'	S 21°10.5'	304°45.8'	S 12°12.5'	358°30.8'	S 22°59.7'	344°26.4'	S 21°25.5'	32°56.9'	S 21°27.3'
12	294°24.6'		357°41.7'	S 21°10.0'	319°45.4'	S 12°11.3'	13°32.7'	S 22°59.6'	359°28.5'	S 21°25.5'	47°57.6'	S 21°27.6'
13	309°27.0'		12°41.5'	S 21°09.6'	334°45.0'	S 12°10.2'	28°34.5'	S 22°59.6'	14°30.7'	S 21°25.4'	62°58.3'	S 21°27.9'
14	324°29.5'		27°41.3'	S 21°09.1'	349°44.6'	S 12°09.0'	43°36.4'	S 22°59.6'	29°32.8'	S 21°25.4'	77°58.9'	S 21°28.2'
15	339°32.0'		42°41.1'	S 21°08.7'	4°44.2'	S 12°07.9'	58°38.2'	S 22°59.5'	44°35.0'	S 21°25.3'	92°59.6'	S 21°28.5'
16	354°34.4'		57°40.8'	S 21°08.2'	19°43.8'	S 12°06.7'	73°40.1'	S 22°59.5'	59°37.1'	S 21°25.3'	108°00.3'	S 21°28.8'
17	9°36.9'		72°40.6'	S 21°07.7'	34°43.4'	S 12°05.5'	88°41.9'	S 22°59.4'	74°39.3'	S 21°25.2'	123°00.9'	S 21°29.1'
18	24°39.4'		87°40.4'	S 21°07.3'	49°43.0'	S 12°04.4'	103°43.8'	S 22°59.4'	89°41.4'	S 21°25.2'	138°01.6'	S 21°29.4'
19	39°41.8'		102°40.2'	S 21°06.8'	64°42.7'	S 12°03.2'	118°45.6'	S 22°59.4'	104°43.6'	S 21°25.1'	153°02.3'	S 21°29.7'
20	54°44.3'		117°40.0'	S 21°06.4'	79°42.3'	S 12°02.0'	133°47.5'	S 22°59.3'	119°45.7'	S 21°25.1'	168°03.0'	S 21°30.0'
21	69°46.8'		132°39.7'	S 21°05.9'	94°41.9'	S 12°00.9'	148°49.3'	S 22°59.3'	134°47.9'	S 21°25.0'	183°03.6'	S 21°30.3'
22	84°49.2'		147°39.5'	S 21°05.4'	109°41.5'	S 11°59.7'	163°51.2'	S 22°59.3'	149°50.0'	S 21°25.0'	198°04.3'	S 21°30.6'
23	99°51.7'		162°39.3'	S 21°05.0'	124°41.1'	S 11°58.6'	178°53.0'	S 22°59.2'	164°52.2'	S 21°24.9'	213°05.0'	S 21°30.9'
			SD 16.3'	d 0.5'	v -0.4'	d 1.2'	v 1.8'	d 0.0'	v 2.1'	d 0.0'	v 0.7'	d -0.3'
Mer. pass.			12 h 9 m 13 s		14 h 41 m		11 h 6 m		12 h 2 m		8 h 48 m	

h	Moon				Lunar distance								
	GHA	dec	v	d	HP	-Sun	-Acrux	-Arcturus	-Spica	+Regulus	+Pollux	+Procyon	+Sirius
0	300°37.8'	N 8°21.3'	9.6'	-13.4'	59.7'		72°19.1'	40°59.7'	34°17.4'	20°53.6'	56°44.1'	57°50.1'	75°15.7'
1	315°06.4'	N 8°07.9'	9.6'	-13.4'	59.7'		72°02.1'	40°32.6'	33°42.2'	21°29.1'	57°20.0'	58°23.8'	75°42.7'
2	329°35.0'	N 7°54.5'	9.7'	-13.5'	59.7'		71°45.2'	40°05.8'	33°07.0'	22°04.7'	57°55.9'	58°57.6'	76°09.8'
3	344°03.7'	N 7°41.0'	9.7'	-13.5'	59.7'		71°28.4'	39°39.2'	32°31.9'	22°40.3'	58°31.7'	59°31.4'	76°36.9'
4	358°32.4'	N 7°27.5'	9.8'	-13.6'	59.7'		71°11.7'	39°12.8'	31°56.8'	23°15.8'	59°07.6'	60°05.2'	77°04.0'
5	13°01.2'	N 7°13.9'	9.8'	-13.6'	59.7'		70°55.1'	38°46.7'	31°21.8'	23°51.4'	59°43.5'	60°39.0'	77°31.1'
6	27°30.0'	N 7°00.3'	9.9'	-13.6'	59.7'		70°38.7'	38°20.7'	30°46.8'	24°27.0'	60°19.3'	61°12.8'	77°58.3'
7	41°58.9'	N 6°46.7'	9.9'	-13.7'	59.7'	119°41.3'	70°22.3'	37°55.1'	30°11.8'	25°02.6'	60°55.1'	61°46.7'	78°25.5'
8	56°27.8'	N 6°33.0'	10.0'	-13.7'	59.7'	119°07.9'	70°06.1'	37°29.6'	29°36.9'	25°38.2'	61°30.9'	62°20.5'	78°52.7'
9	70°56.8'	N 6°19.3'	10.0'	-13.7'	59.7'	118°34.4'	69°49.9'	37°04.4'	29°02.1'	26°13.9'	62°06.7'	62°54.4'	79°19.9'
10	85°25.8'	N 6°05.6'	10.0'	-13.8'	59.6'	118°01.0'	69°33.9'	36°39.5'	28°27.3'	26°49.5'	62°42.5'	63°28.3'	79°47.1'
11	99°54.8'	N 5°51.8'	10.1'	-13.8'	59.6'	117°27.5'	69°18.0'	36°14.9'	27°52.6'	27°25.1'	63°18.3'	64°02.1'	80°14.4'
12	114°23.9'	N 5°38.0'	10.1'	-13.8'	59.6'	116°54.1'	69°02.3'	35°50.6'	27°18.0'	28°00.7'	63°54.1'	64°36.0'	80°41.7'
13	128°53.0'	N 5°24.2'	10.2'	-13.8'	59.6'	116°20.7'	68°46.6'	35°26.5'	26°43.4'	28°36.3'	64°29.8'	65°09.9'	81°09.0'
14	143°22.2'	N 5°10.4'	10.2'	-13.9'	59.6'	115°47.4'	68°31.1'	35°02.8'	26°08.9'	29°11.9'	65°05.6'	65°43.8'	81°36.3'
15	157°51.4'	N 4°56.5'	10.2'	-13.9'	59.6'	115°14.0'	68°15.7'	34°39.3'	25°34.5'	29°47.5'	65°41.3'	66°17.7'	82°03.6'
16	172°20.7'	N 4°42.6'	10.3'	-13.9'	59.6'	114°40.7'	68°00.4'	34°16.2'	25°00.1'	30°23.1'	66°17.0'	66°51.6'	82°31.0'
17	186°49.9'	N 4°28.7'	10.3'	-13.9'	59.6'	114°07.3'	67°45.3'	33°53.4'	24°25.9'	30°58.7'	66°52.7'	67°25.5'	82°58.3'
18	201°19.3'	N 4°14.8'	10.4'	-13.9'	59.6'	113°34.0'		33°31.0'	23°51.7'	31°34.3'	67°28.4'	67°59.4'	83°25.7'
19	215°48.6'	N 4°00.9'	10.4'	-14.0'	59.5'	113°00.7'		33°08.9'	23°17.6'	32°09.9'	68°04.0'	68°33.3'	83°53.0'
20	230°18.0'	N 3°46.9'	10.4'	-14.0'	59.5'	112°27.4'		32°47.2'	22°43.6'	32°45.5'	68°39.7'	69°07.2'	84°20.4'
21	244°47.4'	N 3°32.9'	10.5'	-14.0'	59.5'	111°54.2'		32°25.9'	22°09.7'	33°21.0'	69°15.3'	69°41.1'	84°47.7'
22	259°16.9'	N 3°18.9'	10.5'	-14.0'	59.5'	111°20.9'		32°05.0'	21°36.0'	33°56.6'	69°51.0'	70°15.0'	85°15.1'
23	273°46.4'	N 3°05.0'	10.5'	-14.0'	59.5'	110°47.7'		31°44.5'	21°02.3'	34°32.1'	70°26.6'	70°48.9'	85°42.4'
Mer. pass.			4 h 6 m SD 16.3'	phase 78%									

Star	mag	SHA	dec	Star	mag	SHA	dec	Star	mag	SHA	dec
Fomalhaut	+1.2	15°19.2'	S 29°31.2'	Spica	+1.0	158°26.5'	S 11°15.8'	Betelgeuse	+0.5	270°56.1'	N 7°24.5'
Deneb	+1.2	49°28.9'	N 45°21.1'	Acrux	+0.8	173°04.1'	S 63°12.2'	Capella	+0.1	280°27.3'	N 46°01.0'
Altair	+0.8	62°04.2'	N 8°55.3'	Regulus	+1.4	207°38.4'	N 11°52.1'	Rigel	+0.2	281°07.4'	S 8°10.9'
Vega	+0.0	80°36.3'	N 38°48.1'	Pollux	+1.2	243°21.8'	N 27°58.5'	Aldebaran	+0.9	290°43.9'	N 16°32.8'
Antares	+1.1	112°21.0'	S 26°28.4'	Procyon	+0.4	244°54.7'	N 5°10.3'	Polaris	+2.0	315°36.5'	N 89°21.1'
Rigil Kent	-0.0	139°45.8'	S 60°54.6'	Adhara	+1.5	255°08.6'	S 29°00.1'	Achernar	+0.5	335°23.3'	S 57°08.6'
Arcturus	-0.1	145°51.7'	N 19°04.7'	Sirius	-1.4	258°29.4'	S 16°44.8'				
Hadar	+0.6	148°41.6'	S 60°27.7'	Canopus	-0.6	263°53.6'	S 52°42.6'				

h	Aries		Sun		Venus		Jupiter		Saturn		Mars	
	GHA		GHA	dec	GHA	dec	GHA	dec	GHA	dec	GHA	dec
0	114°54.1'		177°39.1'	S 21°04.5'	139°40.7'	S 11°57.4'	193°54.9'	S 22°59.2'	179°54.3'	S 21°24.9'	228°05.6'	S 21°31.2'
1	129°56.6'		192°38.9'	S 21°04.1'	154°40.3'	S 11°56.2'	208°56.7'	S 22°59.1'	194°56.5'	S 21°24.8'	243°06.3'	S 21°31.5'
2	144°59.1'		207°38.6'	S 21°03.6'	169°39.9'	S 11°55.1'	223°58.6'	S 22°59.1'	209°58.6'	S 21°24.8'	258°07.0'	S 21°31.8'
3	160°01.5'		222°38.4'	S 21°03.1'	184°39.5'	S 11°53.9'	239°00.4'	S 22°59.1'	225°00.8'	S 21°24.8'	273°07.6'	S 21°32.1'
4	175°04.0'		237°38.2'	S 21°02.7'	199°39.1'	S 11°52.7'	254°02.3'	S 22°59.0'	240°02.9'	S 21°24.7'	288°08.3'	S 21°32.4'
5	190°06.5'		252°38.0'	S 21°02.2'	214°38.7'	S 11°51.6'	269°04.1'	S 22°59.0'	255°05.1'	S 21°24.7'	303°09.0'	S 21°32.6'
6	205°08.9'		267°37.8'	S 21°01.7'	229°38.3'	S 11°50.4'	284°06.0'	S 22°58.9'	270°07.2'	S 21°24.6'	318°09.7'	S 21°32.9'
7	220°11.4'		282°37.6'	S 21°01.3'	244°37.9'	S 11°49.2'	299°07.8'	S 22°58.9'	285°09.4'	S 21°24.6'	333°10.3'	S 21°33.2'
8	235°13.9'		297°37.3'	S 21°00.8'	259°37.5'	S 11°48.1'	314°09.7'	S 22°58.9'	300°11.5'	S 21°24.5'	348°11.0'	S 21°33.5'
9	250°16.3'		312°37.1'	S 21°00.3'	274°37.2'	S 11°46.9'	329°11.5'	S 22°58.8'	315°13.7'	S 21°24.5'	3°11.7'	S 21°33.8'
10	265°18.8'		327°36.9'	S 20°59.8'	289°36.8'	S 11°45.7'	344°13.4'	S 22°58.8'	330°15.8'	S 21°24.4'	18°12.3'	S 21°34.1'
11	280°21.3'		342°36.7'	S 20°59.4'	304°36.4'	S 11°44.5'	359°15.2'	S 22°58.7'	345°18.0'	S 21°24.4'	33°13.0'	S 21°34.4'
12	295°23.7'		357°36.5'	S 20°58.9'	319°36.0'	S 11°43.4'	14°17.1'	S 22°58.7'	0°20.1'	S 21°24.3'	48°13.7'	S 21°34.7'
13	310°26.2'		12°36.3'	S 20°58.4'	334°35.6'	S 11°42.2'	29°18.9'	S 22°58.7'	15°22.3'	S 21°24.3'	63°14.3'	S 21°35.0'
14	325°28.6'		27°36.0'	S 20°58.0'	349°35.2'	S 11°41.0'	44°20.8'	S 22°58.6'	30°24.4'	S 21°24.2'	78°15.0'	S 21°35.3'
15	340°31.1'		42°35.8'	S 20°57.5'	4°34.8'	S 11°39.9'	59°22.6'	S 22°58.6'	45°26.6'	S 21°24.2'	93°15.7'	S 21°35.6'
16	355°33.6'		57°35.6'	S 20°57.0'	19°34.4'	S 11°38.7'	74°24.5'	S 22°58.5'	60°28.7'	S 21°24.1'	108°16.3'	S 21°35.8'
17	10°36.0'		72°35.4'	S 20°56.5'	34°34.1'	S 11°37.5'	89°26.3'	S 22°58.5'	75°30.9'	S 21°24.1'	123°17.0'	S 21°36.1'
18	25°38.5'		87°35.2'	S 20°56.1'	49°33.7'	S 11°36.3'	104°28.2'	S 22°58.5'	90°33.0'	S 21°24.0'	138°17.7'	S 21°36.4'
19	40°41.0'		102°35.0'	S 20°55.6'	64°33.3'	S 11°35.2'	119°30.0'	S 22°58.4'	105°35.2'	S 21°24.0'	153°18.3'	S 21°36.7'
20	55°43.4'		117°34.8'	S 20°55.1'	79°32.9'	S 11°34.0'	134°31.9'	S 22°58.4'	120°37.3'	S 21°24.0'	168°19.0'	S 21°37.0'
21	70°45.9'		132°34.5'	S 20°54.6'	94°32.5'	S 11°32.8'	149°33.7'	S 22°58.3'	135°39.5'	S 21°23.9'	183°19.7'	S 21°37.3'
22	85°48.4'		147°34.3'	S 20°54.1'	109°32.1'	S 11°31.6'	164°35.6'	S 22°58.3'	150°41.6'	S 21°23.9'	198°20.3'	S 21°37.6'
23	100°50.8'		162°34.1'	S 20°53.7'	124°31.8'	S 11°30.5'	179°37.4'	S 22°58.3'	165°43.8'	S 21°23.8'	213°21.0'	S 21°37.8'
			SD 16.3' d 0.5'		v -0.4' d 1.2'		v 1.9' d 0.0'		v 2.1' d 0.0'		v 0.7' d -0.3'	
Mer. pass.			12 h 9 m 34 s		14 h 42 m		11 h 3 m		11 h 59 m		8 h 47 m	

h	Moon				Lunar distance								
	GHA	dec	v	d	HP	-Sun	-Mars	-Arcturus	-Spica	+Regulus	+Pollux	+Procyon	+Adhara
0	288°15.9'	N 2°50.9'	10.5'	-14.0'	59.5'	110°14.5'	63°38.7'	31°24.4'	20°28.8'	35°07.7'	71°02.1'	71°22.8'	84°13.0'
1	302°45.4'	N 2°36.9'	10.6'	-14.0'	59.5'	109°41.3'	63°04.7'	31°04.7'	19°55.5'	35°43.2'	71°37.7'	71°56.7'	84°34.7'
2	317°15.0'	N 2°22.9'	10.6'	-14.0'	59.5'	109°08.1'	62°30.7'	30°45.5'	19°22.3'	36°18.7'	72°13.3'	72°30.5'	84°56.4'
3	331°44.6'	N 2°08.9'	10.6'	-14.0'	59.4'	108°35.0'	61°56.7'	30°26.7'	18°49.2'	36°54.2'	72°48.8'	73°04.4'	85°18.2'
4	346°14.2'	N 1°54.9'	10.7'	-14.0'	59.4'	108°01.8'	61°22.7'	30°08.4'	18°16.3'	37°29.7'	73°24.3'	73°38.3'	85°39.9'
5	0°43.9'	N 1°40.8'	10.7'	-14.0'	59.4'	107°28.7'	60°48.8'	29°50.6'	17°43.7'	38°05.2'	73°59.8'	74°12.2'	86°01.7'
6	15°13.6'	N 1°26.8'	10.7'	-14.0'	59.4'	106°55.6'	60°14.9'	29°33.3'	17°11.2'	38°40.6'	74°35.3'	74°46.0'	86°23.4'
7	29°43.3'	N 1°12.8'	10.7'	-14.0'	59.4'	106°22.5'	59°41.0'	29°16.4'	16°39.0'	39°16.1'	75°10.8'	75°19.9'	86°45.2'
8	44°13.0'	N 0°58.7'	10.7'	-14.0'	59.4'	105°49.4'	59°07.1'	29°00.2'	16°07.0'	39°51.5'	75°46.3'	75°53.7'	87°06.9'
9	58°42.7'	N 0°44.7'	10.8'	-14.0'	59.4'	105°16.4'	58°33.2'	28°44.4'	15°35.2'	40°26.9'	76°21.7'	76°27.5'	87°28.7'
10	73°12.5'	N 0°30.7'	10.8'	-14.0'	59.3'	104°43.4'	57°59.4'		15°03.8'	41°02.3'	76°57.1'	77°01.4'	87°50.5'
11	87°42.3'	N 0°16.6'	10.8'	-14.0'	59.3'	104°10.4'	57°25.5'		14°32.7'	41°37.7'	77°32.5'	77°35.2'	88°12.2'
12	102°12.1'	N 0°02.6'	10.8'	-14.0'	59.3'	103°37.4'	56°51.7'		14°02.0'	42°13.1'	78°07.9'	78°09.0'	88°34.0'
13	116°41.9'	S 0°11.4'	10.8'	-14.0'	59.3'	103°04.4'	56°17.9'		13°31.6'	42°48.5'	78°43.3'	78°42.8'	88°55.7'
14	131°11.8'	S 0°25.4'	10.9'	-14.0'	59.3'	102°31.4'	55°44.2'		13°01.7'	43°23.8'	79°18.6'	79°16.6'	89°17.5'
15	145°41.6'	S 0°39.4'	10.9'	-14.0'	59.3'	101°58.5'	55°10.4'		12°32.3'	43°59.1'	79°53.9'	79°50.3'	89°39.2'
16	160°11.5'	S 0°53.4'	10.9'	-14.0'	59.3'	101°25.6'	54°36.7'		12°03.5'	44°34.5'	80°29.2'	80°24.1'	90°00.9'
17	174°41.4'	S 1°07.4'	10.9'	-14.0'	59.2'	100°52.7'	54°03.0'		11°35.3'	45°09.8'	81°04.5'	80°57.8'	90°22.6'
18	189°11.3'	S 1°21.3'	10.9'	-13.9'	59.2'	100°19.8'	53°29.3'		11°07.7'	45°45.0'	81°39.8'	81°31.6'	90°44.3'
19	203°41.2'	S 1°35.3'	10.9'	-13.9'	59.2'	99°47.0'	52°55.6'			46°20.3'	82°15.0'	82°05.3'	91°06.0'
20	218°11.1'	S 1°49.2'	10.9'	-13.9'	59.2'	99°14.1'	52°22.0'			46°55.5'	82°50.3'	82°39.0'	91°27.7'
21	232°41.0'	S 2°03.1'	10.9'	-13.9'	59.2'	98°41.3'	51°48.4'			47°30.8'	83°25.5'	83°12.7'	91°49.3'
22	247°11.0'	S 2°17.0'	10.9'	-13.9'	59.2'	98°08.5'	51°14.8'			48°06.0'	84°00.7'	83°46.3'	92°11.0'
23	261°40.9'	S 2°30.8'	11.0'	-13.8'	59.1'	97°35.8'	50°41.2'			48°41.2'	84°35.8'	84°20.0'	92°32.6'
Mer. pass.			4 h 57 m SD 16.2' phase 67%										

Star	mag	SHA	dec	Star	mag	SHA	dec	Star	mag	SHA	dec
Fomalhaut	+1.2	15°19.2'	S 29°31.2'	Spica	+1.0	158°26.5'	S 11°15.8'	Betelgeuse	+0.5	270°56.1'	N 7°24.5'
Deneb	+1.2	49°28.9'	N 45°21.1'	Acrux	+0.8	173°04.1'	S 63°12.2'	Capella	+0.1	280°27.3'	N 46°01.0'
Altair	+0.8	62°04.2'	N 8°55.3'	Regulus	+1.4	207°38.4'	N 11°52.1'	Rigel	+0.2	281°07.4'	S 8°10.9'
Vega	+0.0	80°36.3'	N 38°48.1'	Pollux	+1.2	243°21.8'	N 27°58.5'	Aldebaran	+0.9	290°43.9'	N 16°32.8'
Antares	+1.1	112°21.0'	S 26°28.4'	Procyon	+0.4	244°54.7'	N 5°10.3'	Polaris	+2.0	315°37.0'	N 89°21.1'
Rigil Kent	-0.0	139°45.8'	S 60°54.6'	Adhara	+1.5	255°08.6'	S 29°00.1'	Achernar	+0.5	335°23.3'	S 57°08.6'
Arcturus	-0.1	145°51.7'	N 19°04.7'	Sirius	-1.4	258°29.4'	S 16°44.8'				
Hadar	+0.6	148°41.6'	S 60°27.8'	Canopus	-0.6	263°53.6'	S 52°42.6'				



Table with columns for planets: Aries, Sun, Venus, Jupiter, Saturn, Mars. Each planet has columns for GHA and dec. Includes a 'Mer. pass.' row with time and duration.

Table with columns for Moon (GHA, dec, v, d, HP), Lunar distance (Spica, Regulus, Procyon, Pollux, Adhara), and various stars. Includes a 'Mer. pass.' row with phase percentage.

Table with columns for Star, mag, SHA, dec. Lists stars like Fomalhaut, Spica, Betelgeuse, etc.

h	Aries	Sun		Venus		Jupiter		Saturn		Mars	
	GHA	GHA	dec	GHA	dec	GHA	dec	GHA	dec	GHA	dec
0	116°52.4'	177°28.9'	S 20°41.5'	139°22.4'	S 11°00.9'	195°23.7'	S 22°57.3'	181°37.5'	S 21°22.6'	228°37.6'	S 21°44.9'
1	131°54.9'	192°28.7'	S 20°41.0'	154°22.0'	S 10°59.7'	210°25.5'	S 22°57.2'	196°39.7'	S 21°22.6'	243°38.3'	S 21°45.2'
2	146°57.4'	207°28.5'	S 20°40.5'	169°21.7'	S 10°58.5'	225°27.4'	S 22°57.2'	211°41.8'	S 21°22.5'	258°38.9'	S 21°45.5'
3	161°59.8'	222°28.3'	S 20°40.0'	184°21.3'	S 10°57.3'	240°29.2'	S 22°57.1'	226°44.0'	S 21°22.5'	273°39.6'	S 21°45.7'
4	177°02.3'	237°28.1'	S 20°39.5'	199°20.9'	S 10°56.1'	255°31.1'	S 22°57.1'	241°46.1'	S 21°22.4'	288°40.3'	S 21°46.0'
5	192°04.7'	252°27.9'	S 20°39.0'	214°20.6'	S 10°54.9'	270°32.9'	S 22°57.0'	256°48.3'	S 21°22.4'	303°40.9'	S 21°46.3'
6	207°07.2'	267°27.7'	S 20°38.5'	229°20.2'	S 10°53.8'	285°34.8'	S 22°57.0'	271°50.4'	S 21°22.4'	318°41.6'	S 21°46.6'
7	222°09.7'	282°27.5'	S 20°38.0'	244°19.8'	S 10°52.6'	300°36.7'	S 22°57.0'	286°52.6'	S 21°22.3'	333°42.3'	S 21°46.8'
8	237°12.1'	297°27.3'	S 20°37.5'	259°19.5'	S 10°51.4'	315°38.5'	S 22°56.9'	301°54.7'	S 21°22.3'	348°42.9'	S 21°47.1'
9	252°14.6'	312°27.1'	S 20°37.0'	274°19.1'	S 10°50.2'	330°40.4'	S 22°56.9'	316°56.9'	S 21°22.2'	3°43.6'	S 21°47.4'
10	267°17.1'	327°26.9'	S 20°36.5'	289°18.8'	S 10°49.0'	345°42.2'	S 22°56.8'	331°59.0'	S 21°22.2'	18°44.2'	S 21°47.7'
11	282°19.5'	342°26.7'	S 20°36.0'	304°18.4'	S 10°47.8'	0°44.1'	S 22°56.8'	347°01.2'	S 21°22.1'	33°44.9'	S 21°47.9'
12	297°22.0'	357°26.5'	S 20°35.4'	319°18.0'	S 10°46.6'	15°45.9'	S 22°56.8'	2°03.3'	S 21°22.1'	48°45.6'	S 21°48.2'
13	312°24.5'	12°26.3'	S 20°34.9'	334°17.7'	S 10°45.4'	30°47.8'	S 22°56.7'	17°05.5'	S 21°22.0'	63°46.2'	S 21°48.5'
14	327°26.9'	27°26.1'	S 20°34.4'	349°17.3'	S 10°44.2'	45°49.6'	S 22°56.7'	32°07.6'	S 21°22.0'	78°46.9'	S 21°48.8'
15	342°29.4'	42°25.9'	S 20°33.9'	4°16.9'	S 10°43.0'	60°51.5'	S 22°56.6'	47°09.8'	S 21°21.9'	93°47.5'	S 21°49.0'
16	357°31.8'	57°25.7'	S 20°33.4'	19°16.6'	S 10°41.8'	75°53.3'	S 22°56.6'	62°11.9'	S 21°21.9'	108°48.2'	S 21°49.3'
17	12°34.3'	72°25.5'	S 20°32.9'	34°16.2'	S 10°40.6'	90°55.2'	S 22°56.6'	77°14.1'	S 21°21.8'	123°48.9'	S 21°49.6'
18	27°36.8'	87°25.3'	S 20°32.4'	49°15.9'	S 10°39.4'	105°57.0'	S 22°56.5'	92°16.2'	S 21°21.8'	138°49.5'	S 21°49.9'
19	42°39.2'	102°25.1'	S 20°31.9'	64°15.5'	S 10°38.2'	120°58.9'	S 22°56.5'	107°18.4'	S 21°21.7'	153°50.2'	S 21°50.1'
20	57°41.7'	117°24.9'	S 20°31.4'	79°15.2'	S 10°37.0'	136°00.7'	S 22°56.4'	122°20.5'	S 21°21.7'	168°50.8'	S 21°50.4'
21	72°44.2'	132°24.7'	S 20°30.9'	94°14.8'	S 10°35.8'	151°02.6'	S 22°56.4'	137°22.7'	S 21°21.6'	183°51.5'	S 21°50.7'
22	87°46.6'	147°24.5'	S 20°30.4'	109°14.4'	S 10°34.6'	166°04.4'	S 22°56.3'	152°24.8'	S 21°21.6'	198°52.2'	S 21°51.0'
23	102°49.1'	162°24.3'	S 20°29.9'	124°14.1'	S 10°33.4'	181°06.3'	S 22°56.3'	167°27.0'	S 21°21.5'	213°52.8'	S 21°51.2'
		SD 16.3'	d 0.5'	v -0.4'	d 1.2'	v 1.9'	d 0.0'	v 2.2'	d 0.0'	v 0.7'	d -0.3'
Mer. pass.		12 h 10 m 14 s		14 h 43 m		10 h 57 m		11 h 52 m		8 h 45 m	

h	Moon				Lunar distance								
	GHA	dec	v	d	HP	-Sun	-Rigil Kent	-Antares	-Mars	+Spica	+Arcturus	+Regulus	+Procyon
0	264°09.6'	S 8°07.4'	10.8'	-12.9'	58.7'	84°03.3'	53°05.1'	37°52.0'	36°48.6'	11°26.0'		63°14.8'	98°15.2'
1	278°39.4'	S 8°20.3'	10.8'	-12.9'	58.7'	83°31.0'	52°49.7'	37°17.9'	36°15.6'	11°53.4'		63°49.5'	98°48.3'
2	293°09.3'	S 8°33.2'	10.8'	-12.8'	58.7'	82°58.8'		36°43.9'	35°42.6'	12°21.5'		64°24.2'	99°21.4'
3	307°39.1'	S 8°46.0'	10.8'	-12.8'	58.6'	82°26.7'		36°09.9'	35°09.6'	12°50.1'		64°58.8'	99°54.5'
4	322°08.9'	S 8°58.7'	10.8'	-12.7'	58.6'	81°54.5'		35°35.9'	34°36.7'	13°19.1'		65°33.4'	100°27.5'
5	336°38.6'	S 9°11.5'	10.8'	-12.6'	58.6'	81°22.4'		35°02.0'	34°03.8'	13°48.6'		66°08.0'	101°00.5'
6	351°08.4'	S 9°24.1'	10.7'	-12.6'	58.6'	80°50.2'		34°28.2'	33°30.9'	14°18.4'		66°42.6'	101°33.5'
7	5°38.1'	S 9°36.7'	10.7'	-12.5'	58.6'	80°18.1'		33°54.4'	32°58.0'	14°48.6'	28°47.1'	67°17.2'	102°06.5'
8	20°07.8'	S 9°49.2'	10.7'	-12.5'	58.6'	79°46.1'		33°20.6'	32°25.2'	15°19.0'	29°02.5'	67°51.7'	102°39.4'
9	34°37.5'	S 10°01.7'	10.7'	-12.4'	58.5'	79°14.0'		32°46.9'	31°52.3'	15°49.7'	29°18.4'	68°26.2'	103°12.3'
10	49°07.2'	S 10°14.1'	10.6'	-12.3'	58.5'	78°42.0'		32°13.2'	31°19.5'	16°20.6'	29°34.8'	69°00.7'	103°45.2'
11	63°36.9'	S 10°26.4'	10.6'	-12.3'	58.5'	78°10.0'		31°39.6'	30°46.8'	16°51.8'	29°51.6'	69°35.2'	104°18.0'
12	78°06.5'	S 10°38.7'	10.6'	-12.2'	58.5'	77°38.0'		31°06.0'	30°14.0'	17°23.1'	30°08.9'	70°09.7'	104°50.9'
13	92°36.1'	S 10°50.9'	10.6'	-12.1'	58.5'	77°06.0'		30°32.5'	29°41.3'	17°54.6'	30°26.6'	70°44.1'	105°23.7'
14	107°05.7'	S 11°03.1'	10.6'	-12.1'	58.4'	76°34.1'		29°59.1'	29°08.6'	18°26.3'	30°44.7'	71°18.5'	105°56.4'
15	121°35.2'	S 11°15.1'	10.5'	-12.0'	58.4'	76°02.2'		29°25.6'	28°35.9'	18°58.1'	31°03.2'	71°52.9'	106°29.1'
16	136°04.7'	S 11°27.2'	10.5'	-11.9'	58.4'	75°30.3'		28°52.3'	28°03.3'	19°30.0'	31°22.2'	72°27.3'	107°01.8'
17	150°34.2'	S 11°39.1'	10.5'	-11.9'	58.4'	74°58.4'		28°19.0'	27°30.6'	20°02.0'	31°41.5'	73°01.7'	107°34.5'
18	165°03.7'	S 11°51.0'	10.4'	-11.8'	58.4'	74°26.5'		27°45.8'	26°58.0'	20°34.2'	32°01.2'	73°36.0'	108°07.1'
19	179°33.2'	S 12°02.8'	10.4'	-11.7'	58.3'	73°54.7'		27°12.6'	26°25.5'	21°06.4'	32°21.2'	74°10.3'	108°39.7'
20	194°02.6'	S 12°14.5'	10.4'	-11.7'	58.3'	73°22.9'		26°39.6'	25°52.9'	21°38.8'	32°41.6'	74°44.6'	109°12.3'
21	208°32.0'	S 12°26.2'	10.4'	-11.6'	58.3'	72°51.1'		26°06.5'	25°20.4'	22°11.2'	33°02.3'	75°18.9'	109°44.9'
22	223°01.3'	S 12°37.8'	10.3'	-11.5'	58.3'	72°19.3'		25°33.6'	24°47.9'	22°43.6'	33°23.3'	75°53.1'	110°17.4'
23	237°30.7'	S 12°49.3'	10.3'	-11.4'	58.3'	71°47.6'		25°00.7'	24°15.4'	23°16.2'	33°44.6'	76°27.4'	110°49.8'
Mer. pass.		6 h 37 m SD 16.0'	phase 45%										

Star	mag	SHA	dec	Star	mag	SHA	dec	Star	mag	SHA	dec
Fomalhaut	+1.2	15°19.2'	S 29°31.2'	Spica	+1.0	158°26.5'	S 11°15.8'	Betelgeuse	+0.5	270°56.1'	N 7°24.5'
Deneb	+1.2	49°28.9'	N 45°21.1'	Acrux	+0.8	173°04.1'	S 63°12.2'	Capella	+0.1	280°27.4'	N 46°01.0'
Altair	+0.8	62°04.2'	N 8°55.3'	Regulus	+1.4	207°38.4'	N 11°52.1'	Rigel	+0.2	281°07.4'	S 8°10.9'
Vega	+0.0	80°36.3'	N 38°48.1'	Pollux	+1.2	243°21.8'	N 27°58.5'	Aldebaran	+0.9	290°43.9'	N 16°32.8'
Antares	+1.1	112°21.0'	S 26°28.4'	Procyon	+0.4	244°54.7'	N 5°10.3'	Polaris	+2.0	315°37.9'	N 89°21.1'
Rigil Kent	-0.0	139°45.8'	S 60°54.6'	Adhara	+1.5	255°08.6'	S 29°00.1'	Achernar	+0.5	335°23.3'	S 57°08.6'
Arcturus	-0.1	145°51.6'	N 19°04.7'	Sirius	-1.4	258°29.4'	S 16°44.8'				
Hadar	+0.6	148°41.5'	S 60°27.8'	Canopus	-0.6	263°53.6'	S 52°42.6'				

Sunday 19 January 2020 UT1

h	Aries		Sun		Venus		Jupiter		Saturn		Mars	
	GHA		GHA	dec	GHA	dec	GHA	dec	GHA	dec	GHA	dec
0	117°51.6'		177°24.1'	S 20°29.3'	139°13.7'	S 10°32.2'	196°08.2'	S 22°56.3'	182°29.1'	S 21°21.5'	228°53.5'	S 21°51.5'
1	132°54.0'		192°23.9'	S 20°28.8'	154°13.4'	S 10°31.0'	211°10.0'	S 22°56.2'	197°31.3'	S 21°21.5'	243°54.1'	S 21°51.8'
2	147°56.5'		207°23.7'	S 20°28.3'	169°13.0'	S 10°29.8'	226°11.9'	S 22°56.2'	212°33.4'	S 21°21.4'	258°54.8'	S 21°52.0'
3	162°59.0'		222°23.5'	S 20°27.8'	184°12.7'	S 10°28.6'	241°13.7'	S 22°56.1'	227°35.6'	S 21°21.4'	273°55.5'	S 21°52.3'
4	178°01.4'		237°23.3'	S 20°27.3'	199°12.3'	S 10°27.4'	256°15.6'	S 22°56.1'	242°37.7'	S 21°21.3'	288°56.1'	S 21°52.6'
5	193°03.9'		252°23.1'	S 20°26.8'	214°12.0'	S 10°26.2'	271°17.4'	S 22°56.1'	257°39.9'	S 21°21.3'	303°56.8'	S 21°52.8'
6	208°06.3'		267°22.9'	S 20°26.2'	229°11.6'	S 10°25.0'	286°19.3'	S 22°56.0'	272°42.0'	S 21°21.2'	318°57.4'	S 21°53.1'
7	223°08.8'		282°22.7'	S 20°25.7'	244°11.2'	S 10°23.8'	301°21.1'	S 22°56.0'	287°44.2'	S 21°21.2'	333°58.1'	S 21°53.4'
8	238°11.3'		297°22.5'	S 20°25.2'	259°10.9'	S 10°22.6'	316°23.0'	S 22°55.9'	302°46.3'	S 21°21.1'	348°58.7'	S 21°53.7'
9	253°13.7'		312°22.3'	S 20°24.7'	274°10.5'	S 10°21.4'	331°24.8'	S 22°55.9'	317°48.5'	S 21°21.1'	3°59.4'	S 21°53.9'
10	268°16.2'		327°22.1'	S 20°24.2'	289°10.2'	S 10°20.2'	346°26.7'	S 22°55.8'	332°50.6'	S 21°21.0'	19°00.1'	S 21°54.2'
11	283°18.7'		342°21.9'	S 20°23.7'	304°09.8'	S 10°19.0'	1°28.5'	S 22°55.8'	347°52.8'	S 21°21.0'	34°00.7'	S 21°54.5'
12	298°21.1'		357°21.7'	S 20°23.1'	319°09.5'	S 10°17.8'	16°30.4'	S 22°55.8'	2°55.0'	S 21°20.9'	49°01.4'	S 21°54.7'
13	313°23.6'		12°21.5'	S 20°22.6'	334°09.1'	S 10°16.6'	31°32.2'	S 22°55.7'	17°57.1'	S 21°20.9'	64°02.0'	S 21°55.0'
14	328°26.1'		27°21.3'	S 20°22.1'	349°08.8'	S 10°15.4'	46°34.1'	S 22°55.7'	32°59.3'	S 21°20.8'	79°02.7'	S 21°55.3'
15	343°28.5'		42°21.1'	S 20°21.6'	4°08.4'	S 10°14.2'	61°36.0'	S 22°55.6'	48°01.4'	S 21°20.8'	94°03.3'	S 21°55.5'
16	358°31.0'		57°20.9'	S 20°21.0'	19°08.1'	S 10°13.0'	76°37.8'	S 22°55.6'	63°03.6'	S 21°20.7'	109°04.0'	S 21°55.8'
17	13°33.5'		72°20.8'	S 20°20.5'	34°07.8'	S 10°11.8'	91°39.7'	S 22°55.5'	78°05.7'	S 21°20.7'	124°04.7'	S 21°56.1'
18	28°35.9'		87°20.6'	S 20°20.0'	49°07.4'	S 10°10.6'	106°41.5'	S 22°55.5'	93°07.9'	S 21°20.6'	139°05.3'	S 21°56.3'
19	43°38.4'		102°20.4'	S 20°19.5'	64°07.1'	S 10°09.4'	121°43.4'	S 22°55.5'	108°10.0'	S 21°20.6'	154°06.0'	S 21°56.6'
20	58°40.8'		117°20.2'	S 20°18.9'	79°06.7'	S 10°08.2'	136°45.2'	S 22°55.4'	123°12.2'	S 21°20.5'	169°06.6'	S 21°56.8'
21	73°43.3'		132°20.0'	S 20°18.4'	94°06.4'	S 10°06.9'	151°47.1'	S 22°55.4'	138°14.3'	S 21°20.5'	184°07.3'	S 21°57.1'
22	88°45.8'		147°19.8'	S 20°17.9'	109°06.0'	S 10°05.7'	166°48.9'	S 22°55.3'	153°16.5'	S 21°20.5'	199°07.9'	S 21°57.4'
23	103°48.2'		162°19.6'	S 20°17.4'	124°05.7'	S 10°04.5'	181°50.8'	S 22°55.3'	168°18.6'	S 21°20.4'	214°08.6'	S 21°57.6'
			SD 16.3'	d 0.5'	v -0.3'	d 1.2'	v 1.9'	d 0.0'	v 2.2'	d 0.0'	v 0.7'	d -0.3'
Mer. pass.			12 h 10 m 33 s		14 h 43 m		10 h 54 m		11 h 48 m		8 h 44 m	

h	Moon				Lunar distance								
	GHA	dec	v	d	HP	-Sun	-Jupiter	-Antares	-Mars	+Spica	+Arcturus	+Regulus	+Adhara
0	251°60.0'	S 13°00.7'	10.3'	-11.4'	58.2'	71°15.9'	53°45.2'	24°28.0'	23°43.0'	23°48.8'	34°06.2'	77°01.6'	109°15.3'
1	266°29.2'	S 13°12.1'	10.2'	-11.3'	58.2'	70°44.2'	53°11.5'	23°55.3'	23°10.6'	24°21.4'	34°28.1'	77°35.8'	109°34.0'
2	280°58.5'	S 13°23.3'	10.2'	-11.2'	58.2'	70°12.5'	52°37.8'	23°22.7'	22°38.2'	24°54.1'	34°50.3'	78°09.9'	109°52.6'
3	295°27.7'	S 13°34.5'	10.2'	-11.1'	58.2'	69°40.8'	52°04.1'	22°50.2'	22°05.8'	25°26.8'	35°12.8'	78°44.1'	110°11.1'
4	309°56.9'	S 13°45.6'	10.1'	-11.0'	58.2'	69°09.2'	51°30.5'	22°17.8'	21°33.5'	25°59.6'	35°35.5'	79°18.2'	110°29.5'
5	324°26.0'	S 13°56.7'	10.1'	-11.0'	58.1'	68°37.6'	50°56.9'	21°45.5'	21°01.2'	26°32.4'	35°58.5'	79°52.3'	110°47.8'
6	338°55.1'	S 14°07.6'	10.1'	-10.9'	58.1'	68°06.0'	50°23.3'	21°13.3'	20°28.9'	27°05.3'	36°21.7'	80°26.4'	111°05.9'
7	353°24.2'	S 14°18.5'	10.1'	-10.8'	58.1'	67°34.4'	49°49.7'	20°41.2'	19°56.7'	27°38.1'	36°45.1'	81°00.5'	111°24.0'
8	7°53.3'	S 14°29.3'	10.0'	-10.7'	58.1'	67°02.8'	49°16.2'	20°09.3'	19°24.5'	28°11.0'	37°08.8'	81°34.5'	111°42.0'
9	22°22.3'	S 14°40.0'	10.0'	-10.6'	58.1'	66°31.3'	48°42.6'	19°37.5'	18°52.3'	28°43.9'	37°32.7'	82°08.5'	111°59.9'
10	36°51.3'	S 14°50.6'	10.0'	-10.5'	58.0'	65°59.8'	48°09.1'	19°05.8'	18°20.2'	29°16.9'	37°56.7'	82°42.5'	112°17.6'
11	51°20.2'	S 15°01.1'	9.9'	-10.4'	58.0'	65°28.3'	47°35.6'	18°34.3'	17°48.1'	29°49.8'	38°21.0'	83°16.5'	112°35.3'
12	65°49.1'	S 15°11.6'	9.9'	-10.3'	58.0'	64°56.8'	47°02.2'	18°03.0'	17°16.0'	30°22.8'	38°45.5'	83°50.5'	112°52.8'
13	80°18.0'	S 15°21.9'	9.8'	-10.3'	58.0'	64°25.4'	46°28.7'	17°31.9'	16°44.0'	30°55.8'	39°10.2'	84°24.4'	113°10.3'
14	94°46.9'	S 15°32.2'	9.8'	-10.2'	58.0'	63°53.9'	45°55.3'	17°00.9'	16°12.0'	31°28.8'	39°35.0'	84°58.3'	113°27.6'
15	109°15.7'	S 15°42.3'	9.8'	-10.1'	57.9'	63°22.5'	45°21.9'	16°30.2'	15°40.0'	32°01.8'	40°00.0'	85°32.2'	113°44.7'
16	123°44.5'	S 15°52.4'	9.7'	-10.0'	57.9'	62°51.2'	44°48.5'	15°59.7'	15°08.1'	32°34.8'	40°25.2'	86°06.1'	114°01.8'
17	138°13.2'	S 16°02.4'	9.7'	-9.9'	57.9'	62°19.8'	44°15.2'	15°29.4'	14°36.2'	33°07.9'	40°50.5'	86°39.9'	114°18.8'
18	152°41.9'	S 16°12.3'	9.7'	-9.8'	57.9'	61°48.5'	43°41.8'	14°59.4'	14°04.4'	33°40.9'	41°16.0'	87°13.8'	114°35.6'
19	167°10.6'	S 16°22.1'	9.6'	-9.7'	57.9'	61°17.1'	43°08.5'	14°29.7'	13°32.6'	34°13.9'	41°41.6'	87°47.6'	114°52.3'
20	181°39.2'	S 16°31.8'	9.6'	-9.6'	57.8'	60°45.8'	42°35.2'	14°00.4'	13°00.9'	34°47.0'	42°07.4'	88°21.4'	115°08.8'
21	196°07.8'	S 16°41.4'	9.6'	-9.5'	57.8'	60°14.6'	42°01.9'	13°31.4'	12°29.3'	35°20.0'	42°33.3'	88°55.1'	115°25.3'
22	210°36.4'	S 16°50.9'	9.5'	-9.4'	57.8'	59°43.3'	41°28.7'	13°02.8'	11°57.7'	35°53.1'	42°59.4'	89°28.9'	115°41.6'
23	225°04.9'	S 17°00.3'	9.5'	-9.3'	57.8'	59°12.1'	40°55.4'	12°34.6'	11°26.2'	36°26.1'	43°25.6'	90°02.6'	115°57.7'
Mer. pass.			7 h 27 m SD 15.9'	phase 34%									

Star	mag	SHA	dec	Star	mag	SHA	dec	Star	mag	SHA	dec
Fomalhaut	+1.2	15°19.2'	S 29°31.2'	Spica	+1.0	158°26.4'	S 11°15.8'	Betelgeuse	+0.5	270°56.1'	N 7°24.5'
Deneb	+1.2	49°28.9'	N 45°21.1'	Acrux	+0.8	173°04.1'	S 63°12.2'	Capella	+0.1	280°27.4'	N 46°01.0'
Altair	+0.8	62°04.2'	N 8°55.3'	Regulus	+1.4	207°38.4'	N 11°52.1'	Rigel	+0.2	281°07.4'	S 8°10.9'
Vega	+0.0	80°36.3'	N 38°48.1'	Pollux	+1.2	243°21.8'	N 27°58.5'	Aldebaran	+0.9	290°43.9'	N 16°32.8'
Antares	+1.1	112°20.9'	S 26°28.4'	Procyon	+0.4	244°54.7'	N 5°10.3'	Polaris	+2.0	315°38.3'	N 89°21.1'
Rigil Kent	-0.0	139°45.7'	S 60°54.6'	Adhara	+1.5	255°08.6'	S 29°00.1'	Achernar	+0.5	335°23.4'	S 57°08.6'
Arcturus	-0.1	145°51.6'	N 19°04.7'	Sirius	-1.4	258°29.4'	S 16°44.8'				
Hadar	+0.6	148°41.5'	S 60°27.8'	Canopus	-0.6	263°53.6'	S 52°42.6'				

Monday 20 January 2020 UT1

h	Aries		Sun		Venus		Jupiter		Saturn		Mars	
	GHA	dec	GHA	dec	GHA	dec	GHA	dec	GHA	dec	GHA	dec
0	118°50.7'	177°19.4'	S 20°16.8'	139°05.3'	S 10°03.3'	196°52.6'	S 22°55.2'	183°20.8'	S 21°20.4'	229°09.2'	S 21°57.9'	
1	133°53.2'	192°19.2'	S 20°16.3'	154°05.0'	S 10°02.1'	211°54.5'	S 22°55.2'	198°22.9'	S 21°20.3'	244°09.9'	S 21°58.2'	
2	148°55.6'	207°19.0'	S 20°15.8'	169°04.7'	S 10°00.9'	226°56.4'	S 22°55.2'	213°25.1'	S 21°20.3'	259°10.6'	S 21°58.4'	
3	163°58.1'	222°18.8'	S 20°15.2'	184°04.3'	S 9°59.7'	241°58.2'	S 22°55.1'	228°27.2'	S 21°20.2'	274°11.2'	S 21°58.7'	
4	179°00.6'	237°18.7'	S 20°14.7'	199°04.0'	S 9°58.5'	257°00.1'	S 22°55.1'	243°29.4'	S 21°20.2'	289°11.9'	S 21°59.0'	
5	194°03.0'	252°18.5'	S 20°14.2'	214°03.6'	S 9°57.3'	272°01.9'	S 22°55.0'	258°31.5'	S 21°20.1'	304°12.5'	S 21°59.2'	
6	209°05.5'	267°18.3'	S 20°13.6'	229°03.3'	S 9°56.0'	287°03.8'	S 22°55.0'	273°33.7'	S 21°20.1'	319°13.2'	S 21°59.5'	
7	224°07.9'	282°18.1'	S 20°13.1'	244°02.9'	S 9°54.8'	302°05.6'	S 22°54.9'	288°35.8'	S 21°20.0'	334°13.8'	S 21°59.7'	
8	239°10.4'	297°17.9'	S 20°12.6'	259°02.6'	S 9°53.6'	317°07.5'	S 22°54.9'	303°38.0'	S 21°20.0'	349°14.5'	S 22°00.0'	
9	254°12.9'	312°17.7'	S 20°12.0'	274°02.3'	S 9°52.4'	332°09.3'	S 22°54.9'	318°40.1'	S 21°19.9'	4°15.1'	S 22°00.3'	
10	269°15.3'	327°17.5'	S 20°11.5'	289°01.9'	S 9°51.2'	347°11.2'	S 22°54.8'	333°42.3'	S 21°19.9'	19°15.8'	S 22°00.5'	
11	284°17.8'	342°17.3'	S 20°11.0'	304°01.6'	S 9°50.0'	2°13.1'	S 22°54.8'	348°44.4'	S 21°19.8'	34°16.4'	S 22°00.8'	
12	299°20.3'	357°17.1'	S 20°10.4'	319°01.3'	S 9°48.8'	17°14.9'	S 22°54.7'	3°46.6'	S 21°19.8'	49°17.1'	S 22°01.0'	
13	314°22.7'	12°17.0'	S 20°09.9'	334°00.9'	S 9°47.5'	32°16.8'	S 22°54.7'	18°48.7'	S 21°19.7'	64°17.8'	S 22°01.3'	
14	329°25.2'	27°16.8'	S 20°09.4'	349°00.6'	S 9°46.3'	47°18.6'	S 22°54.6'	33°50.9'	S 21°19.7'	79°18.4'	S 22°01.6'	
15	344°27.7'	42°16.6'	S 20°08.8'	4°00.2'	S 9°45.1'	62°20.5'	S 22°54.6'	48°53.0'	S 21°19.6'	94°19.1'	S 22°01.8'	
16	359°30.1'	57°16.4'	S 20°08.3'	18°59.9'	S 9°43.9'	77°22.3'	S 22°54.6'	63°55.2'	S 21°19.6'	109°19.7'	S 22°02.1'	
17	14°32.6'	72°16.2'	S 20°07.7'	33°59.6'	S 9°42.7'	92°24.2'	S 22°54.5'	78°57.3'	S 21°19.5'	124°20.4'	S 22°02.3'	
18	29°35.1'	87°16.0'	S 20°07.2'	48°59.2'	S 9°41.5'	107°26.0'	S 22°54.5'	93°59.5'	S 21°19.5'	139°21.0'	S 22°02.6'	
19	44°37.5'	102°15.8'	S 20°06.7'	63°58.9'	S 9°40.2'	122°27.9'	S 22°54.4'	109°01.6'	S 21°19.4'	154°21.7'	S 22°02.9'	
20	59°40.0'	117°15.7'	S 20°06.1'	78°58.6'	S 9°39.0'	137°29.8'	S 22°54.4'	124°03.8'	S 21°19.4'	169°22.3'	S 22°03.1'	
21	74°42.4'	132°15.5'	S 20°05.6'	93°58.2'	S 9°37.8'	152°31.6'	S 22°54.3'	139°05.9'	S 21°19.4'	184°23.0'	S 22°03.4'	
22	89°44.9'	147°15.3'	S 20°05.0'	108°57.9'	S 9°36.6'	167°33.5'	S 22°54.3'	154°08.1'	S 21°19.3'	199°23.6'	S 22°03.6'	
23	104°47.4'	162°15.1'	S 20°04.5'	123°57.6'	S 9°35.4'	182°35.3'	S 22°54.3'	169°10.2'	S 21°19.3'	214°24.3'	S 22°03.9'	
		SD 16.2'	d 0.5'	v -0.3'	d 1.2'		v 1.9'	d 0.0'	v 2.2'	d 0.0'	v 0.7'	d -0.3'
Mer. pass.		12 h 10 m 52 s		14 h 44 m		10 h 51 m		11 h 45 m		8 h 43 m		

h	Moon					Lunar distance							
	GHA	dec	v	d	HP	-Sun	-Jupiter	-Antares	-Mars	+Spica	+Arcturus	+Regulus	+Adhara
0	239°33.4'	S 17°09.6'	9.5'	-9.2'	57.8'	58°40.9'	40°22.2'	12°07.0'	10°54.7'	36°59.2'	43°51.9'	90°36.3'	116°13.8'
1	254°01.9'	S 17°18.8'	9.4'	-9.1'	57.7'	58°09.7'	39°49.0'	11°39.9'	10°23.4'	37°32.2'	44°18.3'	91°10.0'	116°29.7'
2	268°30.3'	S 17°27.9'	9.4'	-9.0'	57.7'	57°38.5'	39°15.8'	11°13.4'	9°52.1'	38°05.2'	44°44.8'	91°43.7'	116°45.4'
3	282°58.7'	S 17°36.9'	9.4'	-8.9'	57.7'	57°07.4'	38°42.7'	10°47.5'	9°20.9'	38°38.3'	45°11.5'	92°17.3'	117°01.1'
4	297°27.0'	S 17°45.8'	9.3'	-8.8'	57.7'	56°36.2'	38°09.6'		8°49.9'	39°11.3'	45°38.2'	92°51.0'	117°16.5'
5	311°55.4'	S 17°54.6'	9.3'	-8.7'	57.7'	56°05.1'	37°36.5'		8°19.0'	39°44.3'	46°05.1'	93°24.6'	117°31.9'
6	326°23.6'	S 18°03.2'	9.2'	-8.6'	57.6'	55°34.0'	37°03.4'		7°48.3'	40°17.4'	46°32.0'	93°58.1'	117°47.1'
7	340°51.9'	S 18°11.8'	9.2'	-8.5'	57.6'	55°03.0'	36°30.3'		7°17.7'	40°50.4'	46°59.1'	94°31.7'	
8	355°20.1'	S 18°20.3'	9.2'	-8.4'	57.6'	54°31.9'	35°57.2'		6°47.4'	41°23.4'	47°26.2'	95°05.2'	
9	9°48.3'	S 18°28.7'	9.1'	-8.3'	57.6'	54°00.9'	35°24.2'		6°17.4'	41°56.4'	47°53.4'	95°38.8'	
10	24°16.4'	S 18°36.9'	9.1'	-8.1'	57.6'	53°29.9'	34°51.2'		5°47.7'	42°29.4'	48°20.7'	96°12.3'	
11	38°44.5'	S 18°45.1'	9.1'	-8.0'	57.5'	52°58.9'	34°18.2'		5°18.5'	43°02.4'	48°48.1'	96°45.7'	
12	53°12.6'	S 18°53.1'	9.0'	-7.9'	57.5'	52°28.0'	33°45.3'		4°49.8'	43°35.3'	49°15.6'	97°19.2'	
13	67°40.7'	S 19°01.0'	9.0'	-7.8'	57.5'	51°57.1'	33°12.3'			44°08.3'	49°43.1'	97°52.6'	
14	82°08.7'	S 19°08.9'	9.0'	-7.7'	57.5'	51°26.1'	32°39.4'			44°41.3'	50°10.7'	98°26.1'	
15	96°36.7'	S 19°16.6'	8.9'	-7.6'	57.5'	50°55.2'	32°06.5'			45°14.2'	50°38.4'	98°59.4'	
16	111°04.6'	S 19°24.2'	8.9'	-7.5'	57.4'	50°24.4'	31°33.6'			45°47.1'	51°06.1'	99°32.8'	
17	125°32.5'	S 19°31.6'	8.9'	-7.4'	57.4'	49°53.5'	31°00.8'			46°20.1'	51°34.0'	100°06.2'	
18	140°00.4'	S 19°39.0'	8.9'	-7.3'	57.4'	49°22.7'	30°27.9'			46°53.0'	52°01.8'	100°39.5'	
19	154°28.2'	S 19°46.3'	8.8'	-7.1'	57.4'	48°51.9'	29°55.1'			47°25.9'	52°29.8'	101°12.8'	
20	168°56.1'	S 19°53.4'	8.8'	-7.0'	57.4'	48°21.1'	29°22.3'			47°58.8'	52°57.7'	101°46.1'	
21	183°23.9'	S 20°00.4'	8.8'	-6.9'	57.3'	47°50.3'	28°49.5'			48°31.7'	53°25.8'	102°19.4'	
22	197°51.6'	S 20°07.3'	8.7'	-6.8'	57.3'	47°19.6'	28°16.8'			49°04.5'	53°53.9'	102°52.6'	
23	212°19.3'	S 20°14.1'	8.7'	-6.7'	57.3'	46°48.9'	27°44.0'			49°37.4'	54°22.0'	103°25.9'	
Mer. pass.		8 h 19 m SD 15.8'	phase 24%										

Star	mag	SHA	dec	Star	mag	SHA	dec	Star	mag	SHA	dec
Fomalhaut	+1.2	15°19.2'	S 29°31.2'	Spica	+1.0	158°26.4'	S 11°15.8'	Betelgeuse	+0.5	270°56.1'	N 7°24.5'
Deneb	+1.2	49°28.9'	N 45°21.1'	Acrux	+0.8	173°04.0'	S 63°12.2'	Capella	+0.1	280°27.4'	N 46°01.0'
Altair	+0.8	62°04.2'	N 8°55.3'	Regulus	+1.4	207°38.4'	N 11°52.1'	Rigel	+0.2	281°07.4'	S 8°10.9'
Vega	+0.0	80°36.3'	N 38°48.1'	Pollux	+1.2	243°21.8'	N 27°58.5'	Aldebaran	+0.9	290°43.9'	N 16°32.8'
Antares	+1.1	112°20.9'	S 26°28.4'	Procyon	+0.4	244°54.7'	N 5°10.3'	Polaris	+2.0	315°38.7'	N 89°21.1'
Rigil Kent	-0.0	139°45.7'	S 60°54.6'	Adhara	+1.5	255°08.6'	S 29°00.1'	Achernar	+0.5	335°23.4'	S 57°08.6'
Arcturus	-0.1	145°51.6'	N 19°04.7'	Sirius	-1.4	258°29.4'	S 16°44.8'				
Hadar	+0.6	148°41.5'	S 60°27.8'	Canopus	-0.6	263°53.6'	S 52°42.6'				

Tuesday 21 January 2020 UT1

h	Aries	Sun		Venus		Jupiter		Saturn		Mars	
	GHA	GHA	dec	GHA	dec	GHA	dec	GHA	dec	GHA	dec
0	119°49.8'	177°14.9'	S 20°03.9'	138°57.2'	S 9°34.1'	197°37.2'	S 22°54.2'	184°12.4'	S 21°19.2'	229°24.9'	S 22°04.1'
1	134°52.3'	192°14.7'	S 20°03.4'	153°56.9'	S 9°32.9'	212°39.0'	S 22°54.2'	199°14.5'	S 21°19.2'	244°25.6'	S 22°04.4'
2	149°54.8'	207°14.6'	S 20°02.8'	168°56.6'	S 9°31.7'	227°40.9'	S 22°54.1'	214°16.7'	S 21°19.1'	259°26.2'	S 22°04.6'
3	164°57.2'	222°14.4'	S 20°02.3'	183°56.2'	S 9°30.5'	242°42.7'	S 22°54.1'	229°18.8'	S 21°19.1'	274°26.9'	S 22°04.9'
4	179°59.7'	237°14.2'	S 20°01.7'	198°55.9'	S 9°29.3'	257°44.6'	S 22°54.0'	244°21.0'	S 21°19.0'	289°27.5'	S 22°05.2'
5	195°02.2'	252°14.0'	S 20°01.2'	213°55.6'	S 9°28.0'	272°46.5'	S 22°54.0'	259°23.2'	S 21°19.0'	304°28.2'	S 22°05.4'
6	210°04.6'	267°13.8'	S 20°00.7'	228°55.3'	S 9°26.8'	287°48.3'	S 22°54.0'	274°25.3'	S 21°18.9'	319°28.8'	S 22°05.7'
7	225°07.1'	282°13.7'	S 20°00.1'	243°54.9'	S 9°25.6'	302°50.2'	S 22°53.9'	289°27.5'	S 21°18.9'	334°29.5'	S 22°05.9'
8	240°09.6'	297°13.5'	S 19°59.6'	258°54.6'	S 9°24.4'	317°52.0'	S 22°53.9'	304°29.6'	S 21°18.8'	349°30.1'	S 22°06.2'
9	255°12.0'	312°13.3'	S 19°59.0'	273°54.3'	S 9°23.1'	332°53.9'	S 22°53.8'	319°31.8'	S 21°18.8'	4°30.8'	S 22°06.4'
10	270°14.5'	327°13.1'	S 19°58.5'	288°53.9'	S 9°21.9'	347°55.7'	S 22°53.8'	334°33.9'	S 21°18.7'	19°31.4'	S 22°06.7'
11	285°16.9'	342°12.9'	S 19°57.9'	303°53.6'	S 9°20.7'	2°57.6'	S 22°53.7'	349°36.1'	S 21°18.7'	34°32.1'	S 22°06.9'
12	300°19.4'	357°12.8'	S 19°57.3'	318°53.3'	S 9°19.5'	17°59.5'	S 22°53.7'	4°38.2'	S 21°18.6'	49°32.7'	S 22°07.2'
13	315°21.9'	12°12.6'	S 19°56.8'	333°53.0'	S 9°18.2'	33°01.3'	S 22°53.7'	19°40.4'	S 21°18.6'	64°33.4'	S 22°07.4'
14	330°24.3'	27°12.4'	S 19°56.2'	348°52.6'	S 9°17.0'	48°03.2'	S 22°53.6'	34°42.5'	S 21°18.5'	79°34.0'	S 22°07.7'
15	345°26.8'	42°12.2'	S 19°55.7'	3°52.3'	S 9°15.8'	63°05.0'	S 22°53.6'	49°44.7'	S 21°18.5'	94°34.7'	S 22°07.9'
16	0°29.3'	57°12.0'	S 19°55.1'	18°52.0'	S 9°14.6'	78°06.9'	S 22°53.5'	64°46.8'	S 21°18.4'	109°35.3'	S 22°08.2'
17	15°31.7'	72°11.9'	S 19°54.6'	33°51.7'	S 9°13.3'	93°08.7'	S 22°53.5'	79°49.0'	S 21°18.4'	124°36.0'	S 22°08.4'
18	30°34.2'	87°11.7'	S 19°54.0'	48°51.3'	S 9°12.1'	108°10.6'	S 22°53.4'	94°51.1'	S 21°18.3'	139°36.6'	S 22°08.7'
19	45°36.7'	102°11.5'	S 19°53.5'	63°51.0'	S 9°10.9'	123°12.5'	S 22°53.4'	109°53.3'	S 21°18.3'	154°37.3'	S 22°08.9'
20	60°39.1'	117°11.3'	S 19°52.9'	78°50.7'	S 9°09.7'	138°14.3'	S 22°53.3'	124°55.4'	S 21°18.3'	169°37.9'	S 22°09.2'
21	75°41.6'	132°11.2'	S 19°52.3'	93°50.4'	S 9°08.4'	153°16.2'	S 22°53.3'	139°57.6'	S 21°18.2'	184°38.6'	S 22°09.4'
22	90°44.1'	147°11.0'	S 19°51.8'	108°50.1'	S 9°07.2'	168°18.0'	S 22°53.3'	154°59.7'	S 21°18.2'	199°39.2'	S 22°09.7'
23	105°46.5'	162°10.8'	S 19°51.2'	123°49.7'	S 9°06.0'	183°19.9'	S 22°53.2'	170°01.9'	S 21°18.1'	214°39.9'	S 22°09.9'
		SD 16.2' d 0.6'		v -0.3' d 1.2'		v 1.9' d 0.0'		v 2.2' d 0.0'		v 0.7' d -0.3'	
Mer. pass.		12 h 11 m 9 s		14 h 45 m		10 h 48 m		11 h 42 m		8 h 42 m	

h	Moon					Lunar distance							
	GHA	dec	v	d	HP	-Altair	-Sun	-Jupiter	+Mars	+Antares	+Spica	+Arcturus	+Regulus
0	226°47.0'	S 20°20.8'	8.7'	-6.5'	57.3'	52°57.6'	46°18.2'	27°11.3'			50°10.2'	54°50.2'	103°59.1'
1	241°14.7'	S 20°27.3'	8.6'	-6.4'	57.3'	52°32.4'	45°47.5'	26°38.6'			50°43.0'	55°18.5'	104°32.2'
2	255°42.4'	S 20°33.7'	8.6'	-6.3'	57.2'	52°07.3'	45°16.8'	26°05.9'			51°15.9'	55°46.7'	105°05.4'
3	270°10.0'	S 20°40.0'	8.6'	-6.2'	57.2'	51°42.4'	44°46.2'	25°33.3'			51°48.6'	56°15.1'	105°38.6'
4	284°37.6'	S 20°46.2'	8.6'	-6.1'	57.2'	51°17.5'	44°15.6'	25°00.6'	4°41.2'		52°21.4'	56°43.4'	106°11.7'
5	299°05.2'	S 20°52.3'	8.5'	-5.9'	57.2'	50°52.8'	43°45.0'	24°28.0'	5°09.3'		52°54.2'	57°11.8'	106°44.8'
6	313°32.7'	S 20°58.2'	8.5'	-5.8'	57.2'	50°28.3'	43°14.4'	23°55.4'	5°38.0'		53°27.0'	57°40.3'	107°17.9'
7	328°00.2'	S 21°04.1'	8.5'	-5.7'	57.1'	50°03.8'	42°43.9'	23°22.9'	6°07.2'		53°59.7'	58°08.8'	107°50.9'
8	342°27.7'	S 21°09.8'	8.5'	-5.6'	57.1'	49°39.5'	42°13.4'	22°50.3'	6°36.7'	10°36.5'	54°32.4'	58°37.3'	108°24.0'
9	356°55.2'	S 21°15.3'	8.5'	-5.5'	57.1'	49°15.4'	41°42.9'	22°17.8'	7°06.4'	11°01.5'	55°05.1'	59°05.8'	108°57.0'
10	11°22.6'	S 21°20.8'	8.4'	-5.3'	57.1'	48°51.4'	41°12.4'	21°45.3'	7°36.3'	11°27.2'	55°37.8'	59°34.4'	109°30.0'
11	25°50.1'	S 21°26.1'	8.4'	-5.2'	57.1'	48°27.5'	40°41.9'	21°12.8'	8°06.4'	11°53.5'	56°10.5'	60°03.0'	110°02.9'
12	40°17.5'	S 21°31.3'	8.4'	-5.1'	57.0'	48°03.8'	40°11.5'	20°40.3'	8°36.6'	12°20.3'	56°43.2'	60°31.6'	110°35.9'
13	54°44.9'	S 21°36.4'	8.4'	-4.9'	57.0'	47°40.2'		20°07.9'	9°07.0'	12°47.6'	57°15.8'	61°00.3'	111°08.8'
14	69°12.3'	S 21°41.3'	8.4'	-4.8'	57.0'	47°16.8'		19°35.5'	9°37.4'	13°15.2'	57°48.5'	61°28.9'	111°41.7'
15	83°39.6'	S 21°46.2'	8.3'	-4.7'	57.0'	46°53.6'		19°03.1'	10°07.9'	13°43.3'	58°21.1'	61°57.7'	112°14.6'
16	98°06.9'	S 21°50.9'	8.3'	-4.6'	57.0'	46°30.5'		18°30.7'	10°38.4'	14°11.6'	58°53.7'	62°26.4'	112°47.5'
17	112°34.3'	S 21°55.4'	8.3'	-4.4'	56.9'	46°07.6'		17°58.3'	11°09.0'	14°40.3'	59°26.3'	62°55.1'	113°20.3'
18	127°01.6'	S 21°59.9'	8.3'	-4.3'	56.9'	45°44.9'		17°26.0'	11°39.6'	15°09.2'	59°58.8'	63°23.9'	113°53.2'
19	141°28.9'	S 22°04.2'	8.3'	-4.2'	56.9'	45°22.3'		16°53.6'	12°10.2'	15°38.4'	60°31.4'	63°52.7'	114°26.0'
20	155°56.2'	S 22°08.4'	8.3'	-4.1'	56.9'	44°59.9'		16°21.3'	12°40.9'	16°07.8'	61°03.9'	64°21.5'	114°58.8'
21	170°23.4'	S 22°12.4'	8.3'	-3.9'	56.9'	44°37.7'		15°49.1'	13°11.6'	16°37.3'	61°36.4'	64°50.3'	115°31.5'
22	184°50.7'	S 22°16.4'	8.2'	-3.8'	56.8'	44°15.7'		15°16.8'	13°42.3'	17°07.1'	62°08.9'	65°19.2'	116°04.3'
23	199°17.9'	S 22°20.2'	8.2'	-3.7'	56.8'	43°53.9'		14°44.6'	14°13.0'	17°37.0'	62°41.4'	65°48.0'	116°37.0'
Mer. pass.		9 h 13 m SD 15.6'		phase 15%									

Star	mag	SHA	dec	Star	mag	SHA	dec	Star	mag	SHA	dec
Fomalhaut	+1.2	15°19.2'	S 29°31.2'	Spica	+1.0	158°26.4'	S 11°15.8'	Betelgeuse	+0.5	270°56.1'	N 7°24.5'
Deneb	+1.2	49°28.9'	N 45°21.1'	Acrux	+0.8	173°04.0'	S 63°12.2'	Capella	+0.1	280°27.4'	N 46°01.0'
Altair	+0.8	62°04.2'	N 8°55.3'	Regulus	+1.4	207°38.4'	N 11°52.1'	Rigel	+0.2	281°07.4'	S 8°10.9'
Vega	+0.0	80°36.3'	N 38°48.1'	Pollux	+1.2	243°21.8'	N 27°58.5'	Aldebaran	+0.9	290°43.9'	N 16°32.8'
Antares	+1.1	112°20.9'	S 26°28.4'	Procyon	+0.4	244°54.7'	N 5°10.3'	Polaris	+2.0	315°39.0'	N 89°21.1'
Rigil Kent	-0.0	139°45.7'	S 60°54.7'	Adhara	+1.5	255°08.6'	S 29°00.1'	Achernar	+0.5	335°23.4'	S 57°08.6'
Arcturus	-0.1	145°51.6'	N 19°04.6'	Sirius	-1.4	258°29.4'	S 16°44.8'				
Hadar	+0.6	148°41.5'	S 60°27.8'	Canopus	-0.6	263°53.6'	S 52°42.6'				

Wednesday 22 January 2020 UT1

h	Aries		Sun		Venus		Jupiter		Saturn		Mars	
	GHA		GHA	dec	GHA	dec	GHA	dec	GHA	dec	GHA	dec
0	120°49.0'	177°10.6'	S 19°50.7'	138°49.4'	S 9°04.7'	198°21.7'	S 22°53.2'	185°04.0'	S 21°18.1'	229°40.5'	S 22°10.2'	
1	135°51.4'	192°10.5'	S 19°50.1'	153°49.1'	S 9°03.5'	213°23.6'	S 22°53.1'	200°06.2'	S 21°18.0'	244°41.2'	S 22°10.4'	
2	150°53.9'	207°10.3'	S 19°49.5'	168°48.8'	S 9°02.3'	228°25.5'	S 22°53.1'	215°08.3'	S 21°18.0'	259°41.8'	S 22°10.7'	
3	165°56.4'	222°10.1'	S 19°49.0'	183°48.5'	S 9°01.1'	243°27.3'	S 22°53.0'	230°10.5'	S 21°17.9'	274°42.5'	S 22°10.9'	
4	180°58.8'	237°09.9'	S 19°48.4'	198°48.1'	S 8°59.8'	258°29.2'	S 22°53.0'	245°12.6'	S 21°17.9'	289°43.1'	S 22°11.2'	
5	196°01.3'	252°09.8'	S 19°47.9'	213°47.8'	S 8°58.6'	273°31.0'	S 22°52.9'	260°14.8'	S 21°17.8'	304°43.8'	S 22°11.4'	
6	211°03.8'	267°09.6'	S 19°47.3'	228°47.5'	S 8°57.4'	288°32.9'	S 22°52.9'	275°16.9'	S 21°17.8'	319°44.4'	S 22°11.7'	
7	226°06.2'	282°09.4'	S 19°46.7'	243°47.2'	S 8°56.1'	303°34.8'	S 22°52.9'	290°19.1'	S 21°17.7'	334°45.1'	S 22°11.9'	
8	241°08.7'	297°09.2'	S 19°46.2'	258°46.9'	S 8°54.9'	318°36.6'	S 22°52.8'	305°21.2'	S 21°17.7'	349°45.7'	S 22°12.1'	
9	256°11.2'	312°09.1'	S 19°45.6'	273°46.6'	S 8°53.7'	333°38.5'	S 22°52.8'	320°23.4'	S 21°17.6'	4°46.4'	S 22°12.4'	
10	271°13.6'	327°08.9'	S 19°45.0'	288°46.2'	S 8°52.4'	348°40.3'	S 22°52.7'	335°25.6'	S 21°17.6'	19°47.0'	S 22°12.6'	
11	286°16.1'	342°08.7'	S 19°44.5'	303°45.9'	S 8°51.2'	3°42.2'	S 22°52.7'	350°27.7'	S 21°17.5'	34°47.7'	S 22°12.9'	
12	301°18.6'	357°08.6'	S 19°43.9'	318°45.6'	S 8°50.0'	18°44.0'	S 22°52.6'	5°29.9'	S 21°17.5'	49°48.3'	S 22°13.1'	
13	316°21.0'	12°08.4'	S 19°43.3'	333°45.3'	S 8°48.7'	33°45.9'	S 22°52.6'	20°32.0'	S 21°17.4'	64°48.9'	S 22°13.4'	
14	331°23.5'	27°08.2'	S 19°42.8'	348°45.0'	S 8°47.5'	48°47.8'	S 22°52.5'	35°34.2'	S 21°17.4'	79°49.6'	S 22°13.6'	
15	346°25.9'	42°08.0'	S 19°42.2'	3°44.7'	S 8°46.3'	63°49.6'	S 22°52.5'	50°36.3'	S 21°17.3'	94°50.2'	S 22°13.9'	
16	1°28.4'	57°07.9'	S 19°41.6'	18°44.4'	S 8°45.0'	78°51.5'	S 22°52.5'	65°38.5'	S 21°17.3'	109°50.9'	S 22°14.1'	
17	16°30.9'	72°07.7'	S 19°41.0'	33°44.0'	S 8°43.8'	93°53.3'	S 22°52.4'	80°40.6'	S 21°17.2'	124°51.5'	S 22°14.3'	
18	31°33.3'	87°07.5'	S 19°40.5'	48°43.7'	S 8°42.5'	108°55.2'	S 22°52.4'	95°42.8'	S 21°17.2'	139°52.2'	S 22°14.6'	
19	46°35.8'	102°07.4'	S 19°39.9'	63°43.4'	S 8°41.3'	123°57.1'	S 22°52.3'	110°44.9'	S 21°17.1'	154°52.8'	S 22°14.8'	
20	61°38.3'	117°07.2'	S 19°39.3'	78°43.1'	S 8°40.1'	138°58.9'	S 22°52.3'	125°47.1'	S 21°17.1'	169°53.5'	S 22°15.1'	
21	76°40.7'	132°07.0'	S 19°38.7'	93°42.8'	S 8°38.8'	154°00.8'	S 22°52.2'	140°49.2'	S 21°17.1'	184°54.1'	S 22°15.3'	
22	91°43.2'	147°06.9'	S 19°38.2'	108°42.5'	S 8°37.6'	169°02.6'	S 22°52.2'	155°51.4'	S 21°17.0'	199°54.8'	S 22°15.6'	
23	106°45.7'	162°06.7'	S 19°37.6'	123°42.2'	S 8°36.4'	184°04.5'	S 22°52.1'	170°53.5'	S 21°17.0'	214°55.4'	S 22°15.8'	
		SD 16.2' d 0.6'		v -0.3' d 1.2'		v 1.9' d 0.0'		v 2.2' d 0.0'		v 0.6' d -0.2'		
Mer. pass.		12 h 11 m 26 s		14 h 45 m		10 h 45 m		11 h 38 m		8 h 41 m		

h	Moon					Lunar distance							
	GHA	dec	v	d	HP	-Altair	-Jupiter	+Mars	+Antares	+Rigil Kent	+Hadar	+Spica	+Arcturus
0	213°45.2'	S 22°23.8'	8.2'	-3.5'	56.8'	43°32.3'	14°12.4'	14°43.7'	18°07.0'			63°13.9'	66°16.9'
1	228°12.4'	S 22°27.4'	8.2'	-3.4'	56.8'	43°10.8'	13°40.2'	15°14.4'	18°37.2'			63°46.3'	66°45.7'
2	242°39.6'	S 22°30.8'	8.2'	-3.3'	56.8'	42°49.6'	13°08.0'	15°45.2'	19°07.5'			64°18.7'	67°14.6'
3	257°06.8'	S 22°34.1'	8.2'	-3.2'	56.7'	42°28.6'	12°35.9'	16°15.9'	19°37.9'			64°51.2'	67°43.5'
4	271°34.0'	S 22°37.2'	8.2'	-3.0'	56.7'	42°07.8'	12°03.7'	16°46.6'	20°08.4'			65°23.5'	68°12.4'
5	286°01.3'	S 22°40.2'	8.2'	-2.9'	56.7'	41°47.2'	11°31.6'	17°17.3'	20°39.0'			65°55.9'	68°41.4'
6	300°28.5'	S 22°43.1'	8.2'	-2.8'	56.7'	41°26.9'	10°59.5'	17°48.0'	21°09.7'			66°28.3'	69°10.3'
7	314°55.7'	S 22°45.9'	8.2'	-2.6'	56.7'	41°06.8'	10°27.5'	18°18.7'	21°40.4'			67°00.6'	69°39.2'
8	329°22.9'	S 22°48.5'	8.2'	-2.5'	56.6'	40°46.9'	9°55.4'	18°49.4'	22°11.2'			67°32.9'	70°08.1'
9	343°50.1'	S 22°51.0'	8.2'	-2.4'	56.6'	40°27.2'	9°23.4'	19°20.1'	22°42.1'			68°05.2'	70°37.1'
10	358°17.3'	S 22°53.4'	8.2'	-2.2'	56.6'	40°07.8'	8°51.4'	19°50.8'	23°13.0'		56°20.6'	68°37.5'	71°06.0'
11	12°44.5'	S 22°55.6'	8.3'	-2.1'	56.6'	39°48.6'	8°19.5'	20°21.4'	23°44.0'		56°35.7'	69°09.8'	71°35.0'
12	27°11.7'	S 22°57.7'	8.2'	-2.0'	56.6'	39°29.7'	7°47.5'	20°52.1'	24°15.0'		56°50.9'	69°42.0'	72°03.9'
13	41°38.9'	S 22°59.7'	8.2'	-1.8'	56.5'	39°11.1'	7°15.6'	21°22.7'	24°46.0'		57°06.2'	70°14.3'	72°32.9'
14	56°06.1'	S 23°01.5'	8.2'	-1.7'	56.5'	38°52.7'	6°43.7'	21°53.4'	25°17.1'		57°21.7'	70°46.5'	73°01.8'
15	70°33.4'	S 23°03.2'	8.2'	-1.6'	56.5'	38°34.6'	6°11.9'	22°24.0'	25°48.3'		57°37.3'	71°18.7'	73°30.8'
16	85°00.6'	S 23°04.8'	8.2'	-1.4'	56.5'	38°16.8'	5°40.0'	22°54.6'	26°19.4'		57°53.1'	71°50.8'	73°59.8'
17	99°27.8'	S 23°06.2'	8.3'	-1.3'	56.5'	37°59.3'	5°08.2'	23°25.1'	26°50.6'		54°00.4'	58°09.0'	74°28.7'
18	113°55.1'	S 23°07.6'	8.3'	-1.2'	56.4'	37°42.0'	4°36.5'	23°55.7'	27°21.8'		54°15.6'	58°25.0'	72°55.1'
19	128°22.4'	S 23°08.7'	8.3'	-1.1'	56.4'	37°25.1'	4°04.8'	24°26.3'	27°53.0'		54°30.9'	58°41.2'	73°27.2'
20	142°49.7'	S 23°09.8'	8.3'	-0.9'	56.4'	37°08.4'	3°33.1'	24°56.8'	28°24.3'		54°46.4'	58°57.5'	73°59.3'
21	157°17.0'	S 23°10.7'	8.3'	-0.8'	56.4'	36°52.1'	3°01.5'	25°27.3'	28°55.6'		55°02.1'	59°13.9'	74°31.4'
22	171°44.3'	S 23°11.5'	8.3'	-0.7'	56.4'	36°36.0'	2°30.0'	25°57.8'	29°26.8'		55°17.9'	59°30.4'	75°03.5'
23	186°11.6'	S 23°12.2'	8.3'	-0.5'	56.3'	36°20.3'	1°58.7'	26°28.3'	29°58.1'		55°33.8'	59°47.1'	75°35.5'
Mer. pass.		10 h 7 m SD 15.5'	phase 9%										

Star	mag	SHA	dec	Star	mag	SHA	dec	Star	mag	SHA	dec
Fomalhaut	+1.2	15°19.2'	S 29°31.2'	Spica	+1.0	158°26.4'	S 11°15.8'	Betelgeuse	+0.5	270°56.1'	N 7°24.5'
Deneb	+1.2	49°28.9'	N 45°21.1'	Acrux	+0.8	173°04.0'	S 63°12.2'	Capella	+0.1	280°27.4'	N 46°01.0'
Altair	+0.8	62°04.1'	N 8°55.3'	Regulus	+1.4	207°38.4'	N 11°52.1'	Rigel	+0.2	281°07.4'	S 8°10.9'
Vega	+0.0	80°36.3'	N 38°48.1'	Pollux	+1.2	243°21.8'	N 27°58.5'	Aldebaran	+0.9	290°43.9'	N 16°32.8'
Antares	+1.1	112°20.9'	S 26°28.4'	Procyon	+0.4	244°54.7'	N 5°10.3'	Polaris	+2.0	315°39.4'	N 89°21.1'
Rigil Kent	-0.0	139°45.7'	S 60°54.7'	Adhara	+1.5	255°08.6'	S 29°00.1'	Achernar	+0.5	335°23.4'	S 57°08.6'
Arcturus	-0.1	145°51.6'	N 19°04.6'	Sirius	-1.4	258°29.4'	S 16°44.8'				
Hadar	+0.6	148°41.5'	S 60°27.8'	Canopus	-0.6	263°53.6'	S 52°42.6'				

h	Aries			Sun			Venus		Jupiter		Saturn		Mars	
	GHA	GHA	dec	GHA	dec	GHA	dec	GHA	dec	GHA	dec	GHA	dec	
0	121°48.1'	177°06.5'	S 19°37.0'	138°41.9'	S 8°35.1'	199°06.4'	S 22°52.1'	185°55.7'	S 21°16.9'	229°56.1'	S 22°16.0'			
1	136°50.6'	192°06.4'	S 19°36.4'	153°41.6'	S 8°33.9'	214°08.2'	S 22°52.1'	200°57.8'	S 21°16.9'	244°56.7'	S 22°16.3'			
2	151°53.1'	207°06.2'	S 19°35.9'	168°41.2'	S 8°32.6'	229°10.1'	S 22°52.0'	215°60.0'	S 21°16.8'	259°57.3'	S 22°16.5'			
3	166°55.5'	222°06.0'	S 19°35.3'	183°40.9'	S 8°31.4'	244°11.9'	S 22°52.0'	231°02.1'	S 21°16.8'	274°58.0'	S 22°16.8'			
4	181°58.0'	237°05.9'	S 19°34.7'	198°40.6'	S 8°30.2'	259°13.8'	S 22°51.9'	246°04.3'	S 21°16.7'	289°58.6'	S 22°17.0'			
5	197°00.4'	252°05.7'	S 19°34.1'	213°40.3'	S 8°28.9'	274°15.7'	S 22°51.9'	261°06.4'	S 21°16.7'	304°59.3'	S 22°17.2'			
6	212°02.9'	267°05.5'	S 19°33.6'	228°40.0'	S 8°27.7'	289°17.5'	S 22°51.8'	276°08.6'	S 21°16.6'	319°59.9'	S 22°17.5'			
7	227°05.4'	282°05.4'	S 19°33.0'	243°39.7'	S 8°26.4'	304°19.4'	S 22°51.8'	291°10.8'	S 21°16.6'	335°00.6'	S 22°17.7'			
8	242°07.8'	297°05.2'	S 19°32.4'	258°39.4'	S 8°25.2'	319°21.2'	S 22°51.7'	306°12.9'	S 21°16.5'	350°01.2'	S 22°17.9'			
9	257°10.3'	312°05.0'	S 19°31.8'	273°39.1'	S 8°24.0'	334°23.1'	S 22°51.7'	321°15.1'	S 21°16.5'	5°01.9'	S 22°18.2'			
10	272°12.8'	327°04.9'	S 19°31.2'	288°38.8'	S 8°22.7'	349°25.0'	S 22°51.6'	336°17.2'	S 21°16.4'	20°02.5'	S 22°18.4'			
11	287°15.2'	342°04.7'	S 19°30.7'	303°38.5'	S 8°21.5'	4°26.8'	S 22°51.6'	351°19.4'	S 21°16.4'	35°03.1'	S 22°18.7'			
12	302°17.7'	357°04.5'	S 19°30.1'	318°38.2'	S 8°20.2'	19°28.7'	S 22°51.6'	6°21.5'	S 21°16.3'	50°03.8'	S 22°18.9'			
13	317°20.2'	12°04.4'	S 19°29.5'	333°37.9'	S 8°19.0'	34°30.5'	S 22°51.5'	21°23.7'	S 21°16.3'	65°04.4'	S 22°19.1'			
14	332°22.6'	27°04.2'	S 19°28.9'	348°37.6'	S 8°17.7'	49°32.4'	S 22°51.5'	36°25.8'	S 21°16.2'	80°05.1'	S 22°19.4'			
15	347°25.1'	42°04.1'	S 19°28.3'	3°37.3'	S 8°16.5'	64°34.3'	S 22°51.4'	51°28.0'	S 21°16.2'	95°05.7'	S 22°19.6'			
16	2°27.5'	57°03.9'	S 19°27.7'	18°37.0'	S 8°15.3'	79°36.1'	S 22°51.4'	66°30.1'	S 21°16.1'	110°06.4'	S 22°19.8'			
17	17°30.0'	72°03.7'	S 19°27.1'	33°36.7'	S 8°14.0'	94°38.0'	S 22°51.3'	81°32.3'	S 21°16.1'	125°07.0'	S 22°20.1'			
18	32°32.5'	87°03.6'	S 19°26.6'	48°36.4'	S 8°12.8'	109°39.8'	S 22°51.3'	96°34.4'	S 21°16.0'	140°07.6'	S 22°20.3'			
19	47°34.9'	102°03.4'	S 19°26.0'	63°36.1'	S 8°11.5'	124°41.7'	S 22°51.2'	111°36.6'	S 21°16.0'	155°08.3'	S 22°20.5'			
20	62°37.4'	117°03.2'	S 19°25.4'	78°35.8'	S 8°10.3'	139°43.6'	S 22°51.2'	126°38.7'	S 21°15.9'	170°08.9'	S 22°20.8'			
21	77°39.9'	132°03.1'	S 19°24.8'	93°35.5'	S 8°09.0'	154°45.4'	S 22°51.1'	141°40.9'	S 21°15.9'	185°09.6'	S 22°21.0'			
22	92°42.3'	147°02.9'	S 19°24.2'	108°35.2'	S 8°07.8'	169°47.3'	S 22°51.1'	156°43.0'	S 21°15.8'	200°10.2'	S 22°21.2'			
23	107°44.8'	162°02.8'	S 19°23.6'	123°34.9'	S 8°06.5'	184°49.1'	S 22°51.1'	171°45.2'	S 21°15.8'	215°10.9'	S 22°21.5'			
		SD 16.2' d 0.6'		v -0.3' d 1.2'		v 1.9' d 0.0'		v 2.2' d 0.0'		v 0.6' d -0.2'				
Mer. pass.		12 h 11 m 42 s		14 h 46 m		10 h 42 m		11 h 35 m		8 h 40 m				

h	Moon					Lunar distance							
	GHA	dec	v	d	HP	-Altair	-Jupiter	+Mars	+Antares	+Rigil Kent	+Hadar	+Acrux	+Spica
0	200°39.0'	S 23°12.7'	8.4'	-0.4'	56.3'	36°05.0'		26°58.8'	30°29.4'	55°49.9'	60°03.9'		76°07.5'
1	215°06.3'	S 23°13.1'	8.4'	-0.3'	56.3'			27°29.2'	31°00.8'	56°06.2'	60°20.7'	71°30.4'	76°39.5'
2	229°33.7'	S 23°13.4'	8.4'	-0.1'	56.3'			27°59.7'	31°32.1'	56°22.5'	60°37.8'	71°45.4'	77°11.5'
3	244°01.1'	S 23°13.5'	8.4'	-0.0'	56.3'			28°30.1'	32°03.4'	56°39.1'	60°54.9'	72°00.5'	77°43.4'
4	258°28.5'	S 23°13.5'	8.5'	0.1'	56.2'			29°00.5'	32°34.8'	56°55.7'	61°12.1'	72°15.6'	78°15.4'
5	272°56.0'	S 23°13.4'	8.5'	0.2'	56.2'			29°30.9'	33°06.1'	57°12.5'	61°29.4'	72°30.8'	78°47.3'
6	287°23.5'	S 23°13.1'	8.5'	0.4'	56.2'		1°47.1'	30°01.3'	33°37.4'	57°29.4'	61°46.9'	72°46.1'	79°19.2'
7	301°51.0'	S 23°12.8'	8.5'	0.5'	56.2'		2°18.2'	30°31.6'	34°08.8'	57°46.5'	62°04.4'	73°01.4'	79°51.1'
8	316°18.5'	S 23°12.3'	8.6'	0.6'	56.1'		2°49.4'	31°01.9'	34°40.1'	58°03.6'	62°22.1'	73°16.8'	80°22.9'
9	330°46.1'	S 23°11.6'	8.6'	0.8'	56.1'		3°20.7'	31°32.2'	35°11.5'	58°20.9'	62°39.8'	73°32.3'	80°54.7'
10	345°13.7'	S 23°10.9'	8.6'	0.9'	56.1'		3°52.1'	32°02.5'	35°42.8'	58°38.3'	62°57.6'	73°47.8'	81°26.6'
11	359°41.3'	S 23°10.0'	8.7'	1.0'	56.1'		4°23.4'	32°32.8'	36°14.2'	58°55.8'	63°15.6'	74°03.4'	81°58.4'
12	14°08.9'	S 23°09.0'	8.7'	1.1'	56.1'		4°54.8'	33°03.0'	36°45.5'	59°13.5'	63°33.6'	74°19.0'	82°30.1'
13	28°36.6'	S 23°07.8'	8.7'	1.3'	56.0'		5°26.2'	33°33.3'	37°16.8'	59°31.2'	63°51.7'	74°34.7'	83°01.9'
14	43°04.3'	S 23°06.5'	8.8'	1.4'	56.0'		5°57.5'	34°03.5'	37°48.1'	59°49.1'	64°09.9'	74°50.4'	83°33.6'
15	57°32.1'	S 23°05.1'	8.8'	1.5'	56.0'		6°28.9'	34°33.7'	38°19.5'	60°07.1'	64°28.2'	75°06.2'	84°05.3'
16	71°59.9'	S 23°03.6'	8.8'	1.6'	56.0'		7°00.2'	35°03.9'	38°50.8'	60°25.1'	64°46.5'	75°22.1'	84°37.0'
17	86°27.7'	S 23°02.0'	8.9'	1.8'	56.0'		7°31.6'	35°34.0'	39°22.1'	60°43.3'	65°05.0'	75°37.9'	85°08.7'
18	100°55.6'	S 23°00.2'	8.9'	1.9'	55.9'		8°02.9'	36°04.1'	39°53.4'	61°01.6'	65°23.5'	75°53.9'	85°40.3'
19	115°23.5'	S 22°58.3'	8.9'	2.0'	55.9'		8°34.2'	36°34.3'	40°24.7'	61°20.0'	65°42.1'	76°09.8'	86°12.0'
20	129°51.4'	S 22°56.3'	9.0'	2.1'	55.9'		9°05.4'	37°04.4'	40°56.0'	61°38.4'	66°00.8'	76°25.9'	86°43.6'
21	144°19.4'	S 22°54.1'	9.0'	2.3'	55.9'		9°36.7'	37°34.4'	41°27.2'	61°57.0'	66°19.5'	76°41.9'	87°15.2'
22	158°47.4'	S 22°51.9'	9.1'	2.4'	55.9'		10°07.9'	38°04.5'	41°58.5'	62°15.6'	66°38.4'	76°58.0'	87°46.7'
23	173°15.5'	S 22°49.5'	9.1'	2.5'	55.9'		10°39.1'	38°34.5'	42°29.8'	62°34.4'	66°57.3'	77°14.2'	88°18.3'
Mer. pass.		11 h 1 m SD 15.4'		phase 4%									

Star	mag	SHA	dec	Star	mag	SHA	dec	Star	mag	SHA	dec
Fomalhaut	+1.2	15°19.2'	S 29°31.2'	Spica	+1.0	158°26.4'	S 11°15.8'	Betelgeuse	+0.5	270°56.1'	N 7°24.5'
Deneb	+1.2	49°28.9'	N 45°21.1'	Acrux	+0.8	173°04.0'	S 63°12.3'	Capella	+0.1	280°27.4'	N 46°01.0'
Altair	+0.8	62°04.1'	N 8°55.3'	Regulus	+1.4	207°38.4'	N 11°52.1'	Rigel	+0.2	281°07.4'	S 8°10.9'
Vega	+0.0	80°36.3'	N 38°48.1'	Pollux	+1.2	243°21.8'	N 27°58.5'	Aldebaran	+0.9	290°43.9'	N 16°32.8'
Antares	+1.1	112°20.9'	S 26°28.4'	Procyon	+0.4	244°54.7'	N 5°10.3'	Polaris	+2.0	315°39.8'	N 89°21.1'
Rigil Kent	-0.0	139°45.7'	S 60°54.7'	Adhara	+1.5	255°08.6'	S 29°00.1'	Achernar	+0.5	335°23.4'	S 57°08.6'
Arcturus	-0.1	145°51.6'	N 19°04.6'	Sirius	-1.4	258°29.4'	S 16°44.8'				
Hadar	+0.6	148°41.5'	S 60°27.8'	Canopus	-0.6	263°53.6'	S 52°42.6'				

Friday 24 January 2020 UT1

h	Aries		Sun		Venus		Jupiter		Saturn		Mars	
	GHA	dec	GHA	dec	GHA	dec	GHA	dec	GHA	dec	GHA	dec
0	122°47.3'	S 19°23.0'	177°02.6'	S 19°23.0'	138°34.6'	S 8°05.3'	199°51.0'	S 22°51.0'	186°47.3'	S 21°15.7'	230°11.5'	S 22°21.7'
1	137°49.7'	S 19°22.4'	192°02.4'	S 19°22.4'	153°34.3'	S 8°04.0'	214°52.9'	S 22°51.0'	201°49.5'	S 21°15.7'	245°12.1'	S 22°21.9'
2	152°52.2'	S 19°21.8'	207°02.3'	S 19°21.8'	168°34.0'	S 8°02.8'	229°54.7'	S 22°50.9'	216°51.7'	S 21°15.7'	260°12.8'	S 22°22.2'
3	167°54.7'	S 19°21.2'	222°02.1'	S 19°21.2'	183°33.7'	S 8°01.5'	244°56.6'	S 22°50.9'	231°53.8'	S 21°15.6'	275°13.4'	S 22°22.4'
4	182°57.1'	S 19°20.7'	237°02.0'	S 19°20.7'	198°33.4'	S 8°00.3'	259°58.5'	S 22°50.8'	246°56.0'	S 21°15.6'	290°14.1'	S 22°22.6'
5	197°59.6'	S 19°20.1'	252°01.8'	S 19°20.1'	213°33.1'	S 7°59.1'	275°00.3'	S 22°50.8'	261°58.1'	S 21°15.5'	305°14.7'	S 22°22.9'
6	213°02.0'	S 19°19.5'	267°01.7'	S 19°19.5'	228°32.8'	S 7°57.8'	290°02.2'	S 22°50.7'	277°00.3'	S 21°15.5'	320°15.3'	S 22°23.1'
7	228°04.5'	S 19°18.9'	282°01.5'	S 19°18.9'	243°32.5'	S 7°56.6'	305°04.0'	S 22°50.7'	292°02.4'	S 21°15.4'	335°16.0'	S 22°23.3'
8	243°07.0'	S 19°18.3'	297°01.3'	S 19°18.3'	258°32.2'	S 7°55.3'	320°05.9'	S 22°50.6'	307°04.6'	S 21°15.4'	350°16.6'	S 22°23.6'
9	258°09.4'	S 19°17.7'	312°01.2'	S 19°17.7'	273°31.9'	S 7°54.1'	335°07.8'	S 22°50.6'	322°06.7'	S 21°15.3'	5°17.3'	S 22°23.8'
10	273°11.9'	S 19°17.1'	327°01.0'	S 19°17.1'	288°31.6'	S 7°52.8'	350°09.6'	S 22°50.5'	337°08.9'	S 21°15.3'	20°17.9'	S 22°24.0'
11	288°14.4'	S 19°16.5'	342°00.9'	S 19°16.5'	303°31.3'	S 7°51.6'	5°11.5'	S 22°50.5'	352°11.0'	S 21°15.2'	35°18.5'	S 22°24.2'
12	303°16.8'	S 19°15.9'	357°00.7'	S 19°15.9'	318°31.0'	S 7°50.3'	20°13.3'	S 22°50.5'	7°13.2'	S 21°15.2'	50°19.2'	S 22°24.5'
13	318°19.3'	S 19°15.3'	12°00.6'	S 19°15.3'	333°30.7'	S 7°49.0'	35°15.2'	S 22°50.4'	22°15.3'	S 21°15.1'	65°19.8'	S 22°24.7'
14	333°21.8'	S 19°14.7'	27°00.4'	S 19°14.7'	348°30.5'	S 7°47.8'	50°17.1'	S 22°50.4'	37°17.5'	S 21°15.1'	80°20.5'	S 22°24.9'
15	348°24.2'	S 19°14.1'	42°00.3'	S 19°14.1'	3°30.2'	S 7°46.5'	65°18.9'	S 22°50.3'	52°19.6'	S 21°15.0'	95°21.1'	S 22°25.2'
16	3°26.7'	S 19°13.5'	57°00.1'	S 19°13.5'	18°29.9'	S 7°45.3'	80°20.8'	S 22°50.3'	67°21.8'	S 21°15.0'	110°21.7'	S 22°25.4'
17	18°29.2'	S 19°12.9'	71°60.0'	S 19°12.9'	33°29.6'	S 7°44.0'	95°22.7'	S 22°50.2'	82°24.0'	S 21°14.9'	125°22.4'	S 22°25.6'
18	33°31.6'	S 19°12.3'	86°59.8'	S 19°12.3'	48°29.3'	S 7°42.8'	110°24.5'	S 22°50.2'	97°26.1'	S 21°14.9'	140°23.0'	S 22°25.8'
19	48°34.1'	S 19°11.7'	101°59.6'	S 19°11.7'	63°29.0'	S 7°41.5'	125°26.4'	S 22°50.1'	112°28.3'	S 21°14.8'	155°23.7'	S 22°26.1'
20	63°36.5'	S 19°11.1'	116°59.5'	S 19°11.1'	78°28.7'	S 7°40.3'	140°28.2'	S 22°50.1'	127°30.4'	S 21°14.8'	170°24.3'	S 22°26.3'
21	78°39.0'	S 19°10.5'	131°59.3'	S 19°10.5'	93°28.4'	S 7°39.0'	155°30.1'	S 22°50.0'	142°32.6'	S 21°14.7'	185°24.9'	S 22°26.5'
22	93°41.5'	S 19°09.9'	146°59.2'	S 19°09.9'	108°28.1'	S 7°37.8'	170°32.0'	S 22°50.0'	157°34.7'	S 21°14.7'	200°25.6'	S 22°26.7'
23	108°43.9'	S 19°09.3'	161°59.0'	S 19°09.3'	123°27.8'	S 7°36.5'	185°33.8'	S 22°49.9'	172°36.9'	S 21°14.6'	215°26.2'	S 22°27.0'
		SD 16.2' d 0.6'		v -0.3' d 1.3'		v 1.9' d 0.0'		v 2.2' d 0.0'		v 0.6' d -0.2'		
Mer. pass.		12 h 11 m 57 s		14 h 46 m		10 h 39 m		11 h 31 m		8 h 39 m		

h	Moon				Lunar distance								
	GHA	dec	v	d	HP	+Jupiter	+Mars	+Antares	+Rigil Kent	+Hadar	+Acrux	+Spica	+Arcturus
0	187°43.6'	S 22°47.0'	9.2'	2.6'	55.8'	11°10.3'	39°04.5'	43°01.0'	62°53.2'	67°16.2'	77°30.3'	88°49.8'	89°22.4'
1	202°11.7'	S 22°44.4'	9.2'	2.7'	55.8'	11°41.5'	39°34.5'	43°32.3'	63°12.1'	67°35.3'	77°46.6'	89°21.3'	89°51.0'
2	216°40.0'	S 22°41.6'	9.2'	2.9'	55.8'								
3	231°08.2'	S 22°38.7'	9.3'	3.0'	55.8'								
4	245°36.5'	S 22°35.7'	9.3'	3.1'	55.8'								
5	260°04.8'	S 22°32.6'	9.4'	3.2'	55.7'								
6	274°33.2'	S 22°29.4'	9.4'	3.3'	55.7'								
7	289°01.7'	S 22°26.1'	9.5'	3.5'	55.7'								
8	303°30.2'	S 22°22.6'	9.5'	3.6'	55.7'								
9	317°58.7'	S 22°19.0'	9.6'	3.7'	55.7'								
10	332°27.3'	S 22°15.4'	9.7'	3.8'	55.6'								
11	346°56.0'	S 22°11.5'	9.7'	3.9'	55.6'								
12	1°24.7'	S 22°07.6'	9.8'	4.0'	55.6'								
13	15°53.4'	S 22°03.6'	9.8'	4.1'	55.6'								
14	30°22.2'	S 21°59.5'	9.9'	4.3'	55.6'								
15	44°51.1'	S 21°55.2'	9.9'	4.4'	55.5'								
16	59°20.0'	S 21°50.8'	10.0'	4.5'	55.5'								
17	73°49.0'	S 21°46.4'	10.0'	4.6'	55.5'								
18	88°18.1'	S 21°41.8'	10.1'	4.7'	55.5'								
19	102°47.2'	S 21°37.1'	10.2'	4.8'	55.5'								
20	117°16.3'	S 21°32.3'	10.2'	4.9'	55.4'								
21	131°45.6'	S 21°27.4'	10.3'	5.0'	55.4'								
22	146°14.8'	S 21°22.4'	10.3'	5.1'	55.4'								
23	160°44.2'	S 21°17.2'	10.4'	5.2'	55.4'								
Mer. pass.		11 h 54 m SD 15.2'		phase 1%									

Star	mag	SHA	dec	Star	mag	SHA	dec	Star	mag	SHA	dec
Fomalhaut	+1.2	15°19.2'	S 29°31.2'	Spica	+1.0	158°26.4'	S 11°15.8'	Betelgeuse	+0.5	270°56.1'	N 7°24.5'
Deneb	+1.2	49°28.9'	N 45°21.1'	Acrux	+0.8	173°04.0'	S 63°12.3'	Capella	+0.1	280°27.4'	N 46°01.0'
Altair	+0.8	62°04.1'	N 8°55.2'	Regulus	+1.4	207°38.4'	N 11°52.1'	Rigel	+0.2	281°07.4'	S 8°10.9'
Vega	+0.0	80°36.3'	N 38°48.1'	Pollux	+1.2	243°21.8'	N 27°58.5'	Aldebaran	+0.9	290°43.9'	N 16°32.8'
Antares	+1.1	112°20.9'	S 26°28.4'	Procyon	+0.4	244°54.6'	N 5°10.3'	Polaris	+2.0	315°40.3'	N 89°21.1'
Rigil Kent	-0.0	139°45.7'	S 60°54.7'	Adhara	+1.5	255°08.6'	S 29°00.1'	Achernar	+0.5	335°23.4'	S 57°08.6'
Arcturus	-0.1	145°51.6'	N 19°04.6'	Sirius	-1.4	258°29.4'	S 16°44.8'				
Hadar	+0.6	148°41.5'	S 60°27.8'	Canopus	-0.6	263°53.6'	S 52°42.6'				



h	Aries		Sun		Venus		Jupiter		Saturn		Mars	
	GHA		GHA	dec	GHA	dec	GHA	dec	GHA	dec	GHA	dec
0	123°46.4'		176°58.9'	S 19°08.7'	138°27.6'	S 7°35.3'	200°35.7'	S 22°49.9'	187°39.0'	S 21°14.6'	230°26.9'	S 22°27.2'
1	138°48.9'		191°58.7'	S 19°08.1'	153°27.3'	S 7°34.0'	215°37.6'	S 22°49.9'	202°41.2'	S 21°14.5'	245°27.5'	S 22°27.4'
2	153°51.3'		206°58.6'	S 19°07.4'	168°27.0'	S 7°32.8'	230°39.4'	S 22°49.8'	217°43.3'	S 21°14.5'	260°28.1'	S 22°27.6'
3	168°53.8'		221°58.4'	S 19°06.8'	183°26.7'	S 7°31.5'	245°41.3'	S 22°49.8'	232°45.5'	S 21°14.4'	275°28.8'	S 22°27.9'
4	183°56.3'		236°58.3'	S 19°06.2'	198°26.4'	S 7°30.2'	260°43.2'	S 22°49.7'	247°47.6'	S 21°14.4'	290°29.4'	S 22°28.1'
5	198°58.7'		251°58.1'	S 19°05.6'	213°26.1'	S 7°29.0'	275°45.0'	S 22°49.7'	262°49.8'	S 21°14.3'	305°30.0'	S 22°28.3'
6	214°01.2'		266°58.0'	S 19°05.0'	228°25.8'	S 7°27.7'	290°46.9'	S 22°49.6'	277°52.0'	S 21°14.3'	320°30.7'	S 22°28.5'
7	229°03.7'		281°57.8'	S 19°04.4'	243°25.6'	S 7°26.5'	305°48.7'	S 22°49.6'	292°54.1'	S 21°14.2'	335°31.3'	S 22°28.8'
8	244°06.1'		296°57.7'	S 19°03.8'	258°25.3'	S 7°25.2'	320°50.6'	S 22°49.5'	307°56.3'	S 21°14.2'	350°32.0'	S 22°29.0'
9	259°08.6'		311°57.5'	S 19°03.2'	273°25.0'	S 7°24.0'	335°52.5'	S 22°49.5'	322°58.4'	S 21°14.2'	5°32.6'	S 22°29.2'
10	274°11.0'		326°57.4'	S 19°02.6'	288°24.7'	S 7°22.7'	350°54.3'	S 22°49.4'	338°00.6'	S 21°14.1'	20°33.2'	S 22°29.4'
11	289°13.5'		341°57.2'	S 19°02.0'	303°24.4'	S 7°21.4'	5°56.2'	S 22°49.4'	353°02.7'	S 21°14.1'	35°33.9'	S 22°29.6'
12	304°16.0'		356°57.1'	S 19°01.3'	318°24.1'	S 7°20.2'	20°58.1'	S 22°49.3'	8°04.9'	S 21°14.0'	50°34.5'	S 22°29.9'
13	319°18.4'		11°57.0'	S 19°00.7'	333°23.9'	S 7°18.9'	35°59.9'	S 22°49.3'	23°07.0'	S 21°14.0'	65°35.1'	S 22°30.1'
14	334°20.9'		26°56.8'	S 19°00.1'	348°23.6'	S 7°17.7'	51°01.8'	S 22°49.2'	38°09.2'	S 21°13.9'	80°35.8'	S 22°30.3'
15	349°23.4'		41°56.7'	S 18°59.5'	3°23.3'	S 7°16.4'	66°03.7'	S 22°49.2'	53°11.3'	S 21°13.9'	95°36.4'	S 22°30.5'
16	4°25.8'		56°56.5'	S 18°58.9'	18°23.0'	S 7°15.1'	81°05.5'	S 22°49.2'	68°13.5'	S 21°13.8'	110°37.1'	S 22°30.7'
17	19°28.3'		71°56.4'	S 18°58.3'	33°22.7'	S 7°13.9'	96°07.4'	S 22°49.1'	83°15.6'	S 21°13.8'	125°37.7'	S 22°31.0'
18	34°30.8'		86°56.2'	S 18°57.7'	48°22.5'	S 7°12.6'	111°09.2'	S 22°49.1'	98°17.8'	S 21°13.7'	140°38.3'	S 22°31.2'
19	49°33.2'		101°56.1'	S 18°57.0'	63°22.2'	S 7°11.4'	126°11.1'	S 22°49.0'	113°20.0'	S 21°13.7'	155°39.0'	S 22°31.4'
20	64°35.7'		116°55.9'	S 18°56.4'	78°21.9'	S 7°10.1'	141°13.0'	S 22°49.0'	128°22.1'	S 21°13.6'	170°39.6'	S 22°31.6'
21	79°38.1'		131°55.8'	S 18°55.8'	93°21.6'	S 7°08.8'	156°14.8'	S 22°48.9'	143°24.3'	S 21°13.6'	185°40.2'	S 22°31.8'
22	94°40.6'		146°55.6'	S 18°55.2'	108°21.3'	S 7°07.6'	171°16.7'	S 22°48.9'	158°26.4'	S 21°13.5'	200°40.9'	S 22°32.0'
23	109°43.1'		161°55.5'	S 18°54.6'	123°21.1'	S 7°06.3'	186°18.6'	S 22°48.8'	173°28.6'	S 21°13.5'	215°41.5'	S 22°32.3'
			SD 16.2'	d 0.6'	v -0.3'	d 1.3'	v 1.9'	d 0.0'	v 2.2'	d 0.0'	v 0.6'	d -0.2'
Mer. pass.			12 h 12 m 12 s		14 h 46 m		10 h 36 m		11 h 28 m		8 h 38 m	

h	Moon					Lunar distance			
	GHA	dec	v	d	HP	-Aldebaran	-Rigel	-Venus	-Fomalhaut
0	175°13.6'	S 21°12.0'	10.5'	5.3'	55.4'				
1	189°43.1'	S 21°06.7'	10.5'	5.4'	55.3'				
2	204°12.6'	S 21°01.3'	10.6'	5.5'	55.3'				
3	218°42.2'	S 20°55.7'	10.7'	5.6'	55.3'				
4	233°11.8'	S 20°50.1'	10.7'	5.7'	55.3'				
5	247°41.5'	S 20°44.4'	10.8'	5.8'	55.3'				
6	262°11.3'	S 20°38.5'	10.8'	5.9'	55.3'				
7	276°41.2'	S 20°32.6'	10.9'	6.0'	55.2'				
8	291°11.1'	S 20°26.6'	11.0'	6.1'	55.2'				
9	305°41.1'	S 20°20.4'	11.0'	6.2'	55.2'				
10	320°11.1'	S 20°14.2'	11.1'	6.3'	55.2'				
11	334°41.2'	S 20°07.9'	11.2'	6.4'	55.2'				
12	349°11.4'	S 20°01.5'	11.2'	6.5'	55.1'				
13	3°41.6'	S 19°55.0'	11.3'	6.6'	55.1'				
14	18°11.9'	S 19°48.4'	11.4'	6.7'	55.1'				
15	32°42.3'	S 19°41.7'	11.4'	6.8'	55.1'				
16	47°12.7'	S 19°34.9'	11.5'	6.9'	55.1'				
17	61°43.2'	S 19°28.1'	11.6'	7.0'	55.1'				
18	76°13.8'	S 19°21.1'	11.6'	7.0'	55.0'	114°43.5'	115°21.0'	29°38.3'	26°00.8'
19	90°44.4'	S 19°14.1'	11.7'	7.1'	55.0'	114°12.7'	114°55.0'	29°10.7'	25°37.7'
20	105°15.1'	S 19°06.9'	11.8'	7.2'	55.0'	113°41.9'	114°28.9'	28°43.1'	25°14.9'
21	119°45.9'	S 18°59.7'	11.8'	7.3'	55.0'	113°11.2'	114°02.9'	28°15.5'	24°52.4'
22	134°16.7'	S 18°52.4'	11.9'	7.4'	55.0'	112°40.4'	113°36.8'	27°48.0'	24°30.1'
23	148°47.6'	S 18°45.0'	12.0'	7.5'	55.0'	112°09.7'	113°10.7'	27°20.5'	24°08.2'
Mer. pass.	12 h 45 m	SD 15.1'	phase 0%						

Star	mag	SHA	dec	Star	mag	SHA	dec	Star	mag	SHA	dec
Fomalhaut	+1.2	15°19.2'	S 29°31.2'	Spica	+1.0	158°26.4'	S 11°15.8'	Betelgeuse	+0.5	270°56.1'	N 7°24.5'
Deneb	+1.2	49°28.9'	N 45°21.1'	Acrux	+0.8	173°04.0'	S 63°12.3'	Capella	+0.1	280°27.4'	N 46°01.0'
Altair	+0.8	62°04.1'	N 8°55.2'	Regulus	+1.4	207°38.4'	N 11°52.1'	Rigel	+0.2	281°07.4'	S 8°10.9'
Vega	+0.0	80°36.3'	N 38°48.1'	Pollux	+1.2	243°21.8'	N 27°58.5'	Aldebaran	+0.9	290°43.9'	N 16°32.8'
Antares	+1.1	112°20.9'	S 26°28.4'	Procyon	+0.4	244°54.6'	N 5°10.3'	Polaris	+2.0	315°40.8'	N 89°21.1'
Rigil Kent	-0.0	139°45.6'	S 60°54.7'	Adhara	+1.5	255°08.6'	S 29°00.1'	Achernar	+0.5	335°23.4'	S 57°08.5'
Arcturus	-0.1	145°51.6'	N 19°04.6'	Sirius	-1.4	258°29.4'	S 16°44.8'				
Hadar	+0.6	148°41.4'	S 60°27.8'	Canopus	-0.6	263°53.6'	S 52°42.6'				

h	Aries			Sun			Venus			Jupiter			Saturn			Mars		
	GHA	GHA	dec	GHA	dec		GHA	dec		GHA	dec		GHA	dec		GHA	dec	
0	124°45.5'	176°55.4'	S 18°53.9'	138°20.8'	S 7°05.1'		201°20.4'	S 22°48.8'		188°30.7'	S 21°13.4'		230°42.1'	S 22°32.5'				
1	139°48.0'	191°55.2'	S 18°53.3'	153°20.5'	S 7°03.8'		216°22.3'	S 22°48.7'		203°32.9'	S 21°13.4'		245°42.8'	S 22°32.7'				
2	154°50.5'	206°55.1'	S 18°52.7'	168°20.2'	S 7°02.5'		231°24.2'	S 22°48.7'		218°35.0'	S 21°13.3'		260°43.4'	S 22°32.9'				
3	169°52.9'	221°54.9'	S 18°52.1'	183°20.0'	S 7°01.3'		246°26.0'	S 22°48.6'		233°37.2'	S 21°13.3'		275°44.1'	S 22°33.1'				
4	184°55.4'	236°54.8'	S 18°51.5'	198°19.7'	S 7°00.0'		261°27.9'	S 22°48.6'		248°39.3'	S 21°13.2'		290°44.7'	S 22°33.3'				
5	199°57.9'	251°54.7'	S 18°50.8'	213°19.4'	S 6°58.7'		276°29.8'	S 22°48.5'		263°41.5'	S 21°13.2'		305°45.3'	S 22°33.6'				
6	215°00.3'	266°54.5'	S 18°50.2'	228°19.1'	S 6°57.5'		291°31.6'	S 22°48.5'		278°43.7'	S 21°13.1'		320°46.0'	S 22°33.8'				
7	230°02.8'	281°54.4'	S 18°49.6'	243°18.9'	S 6°56.2'		306°33.5'	S 22°48.4'		293°45.8'	S 21°13.1'		335°46.6'	S 22°34.0'				
8	245°05.3'	296°54.2'	S 18°49.0'	258°18.6'	S 6°54.9'		321°35.4'	S 22°48.4'		308°48.0'	S 21°13.0'		350°47.2'	S 22°34.2'				
9	260°07.7'	311°54.1'	S 18°48.3'	273°18.3'	S 6°53.7'		336°37.2'	S 22°48.3'		323°50.1'	S 21°13.0'		5°47.9'	S 22°34.4'				
10	275°10.2'	326°54.0'	S 18°47.7'	288°18.0'	S 6°52.4'		351°39.1'	S 22°48.3'		338°52.3'	S 21°12.9'		20°48.5'	S 22°34.6'				
11	290°12.6'	341°53.8'	S 18°47.1'	303°17.8'	S 6°51.2'		6°41.0'	S 22°48.3'		353°54.4'	S 21°12.9'		35°49.1'	S 22°34.8'				
12	305°15.1'	356°53.7'	S 18°46.5'	318°17.5'	S 6°49.9'		21°42.8'	S 22°48.2'		8°56.6'	S 21°12.8'		50°49.8'	S 22°35.1'				
13	320°17.6'	11°53.5'	S 18°45.8'	333°17.2'	S 6°48.6'		36°44.7'	S 22°48.2'		23°58.7'	S 21°12.8'		65°50.4'	S 22°35.3'				
14	335°20.0'	26°53.4'	S 18°45.2'	348°16.9'	S 6°47.4'		51°46.6'	S 22°48.1'		39°00.9'	S 21°12.7'		80°51.0'	S 22°35.5'				
15	350°22.5'	41°53.3'	S 18°44.6'	3°16.7'	S 6°46.1'		66°48.4'	S 22°48.1'		54°03.0'	S 21°12.7'		95°51.7'	S 22°35.7'				
16	5°25.0'	56°53.1'	S 18°43.9'	18°16.4'	S 6°44.8'		81°50.3'	S 22°48.0'		69°05.2'	S 21°12.6'		110°52.3'	S 22°35.9'				
17	20°27.4'	71°53.0'	S 18°43.3'	33°16.1'	S 6°43.6'		96°52.2'	S 22°48.0'		84°07.4'	S 21°12.6'		125°52.9'	S 22°36.1'				
18	35°29.9'	86°52.8'	S 18°42.7'	48°15.9'	S 6°42.3'		111°54.0'	S 22°47.9'		99°09.5'	S 21°12.6'		140°53.6'	S 22°36.3'				
19	50°32.4'	101°52.7'	S 18°42.0'	63°15.6'	S 6°41.0'		126°55.9'	S 22°47.9'		114°11.7'	S 21°12.5'		155°54.2'	S 22°36.5'				
20	65°34.8'	116°52.6'	S 18°41.4'	78°15.3'	S 6°39.8'		141°57.7'	S 22°47.8'		129°13.8'	S 21°12.5'		170°54.8'	S 22°36.7'				
21	80°37.3'	131°52.4'	S 18°40.8'	93°15.1'	S 6°38.5'		156°59.6'	S 22°47.8'		144°16.0'	S 21°12.4'		185°55.5'	S 22°37.0'				
22	95°39.8'	146°52.3'	S 18°40.2'	108°14.8'	S 6°37.2'		172°01.5'	S 22°47.7'		159°18.1'	S 21°12.4'		200°56.1'	S 22°37.2'				
23	110°42.2'	161°52.2'	S 18°39.5'	123°14.5'	S 6°35.9'		187°03.3'	S 22°47.7'		174°20.3'	S 21°12.3'		215°56.7'	S 22°37.4'				
		SD 16.2' d 0.6'		v -0.3' d 1.3'			v 1.9' d 0.0'			v 2.2' d 0.0'			v 0.6' d -0.2'					
Mer. pass.		12 h 12 m 26 s		14 h 47 m			10 h 33 m			11 h 24 m			8 h 37 m					

h	Moon					Lunar distance						
	GHA	dec	v	d	HP	-Betelgeuse	-Sirius	-Capella	-Rigel	-Aldebaran	-Venus	-Fomalhaut
0	163°18.6'	S 18°37.6'	12.0'	7.6'	54.9'				112°44.6'	111°39.0'	26°53.0'	23°46.6'
1	177°49.7'	S 18°30.0'	12.1'	7.6'	54.9'				112°18.5'	111°08.3'	26°25.6'	23°25.3'
2	192°20.8'	S 18°22.4'	12.2'	7.7'	54.9'				111°52.3'	110°37.6'	25°58.2'	23°04.4'
3	206°51.9'	S 18°14.6'	12.2'	7.8'	54.9'				111°26.2'	110°07.0'	25°30.8'	22°43.9'
4	221°23.2'	S 18°06.9'	12.3'	7.9'	54.9'				111°00.0'	109°36.4'	25°03.5'	22°23.7'
5	235°54.5'	S 17°59.0'	12.4'	8.0'	54.9'				110°33.8'	109°05.8'	24°36.2'	22°03.9'
6	250°25.8'	S 17°51.0'	12.4'	8.0'	54.8'			119°58.4'	110°07.6'	108°35.2'	24°08.9'	21°44.5'
7	264°57.3'	S 17°43.0'	12.5'	8.1'	54.8'			119°31.4'	109°41.5'	108°04.6'	23°41.6'	21°25.6'
8	279°28.8'	S 17°34.9'	12.6'	8.2'	54.8'			119°04.4'	109°15.3'	107°34.1'	23°14.4'	21°07.1'
9	294°00.4'	S 17°26.7'	12.6'	8.3'	54.8'			118°37.4'	108°49.0'	107°03.5'	22°47.2'	20°49.1'
10	308°32.0'	S 17°18.5'	12.7'	8.3'	54.8'			118°10.4'	108°22.8'	106°33.0'	22°20.1'	20°31.5'
11	323°03.7'	S 17°10.1'	12.8'	8.4'	54.8'			117°43.3'	107°56.6'	106°02.5'	21°53.0'	20°14.5'
12	337°35.5'	S 17°01.7'	12.8'	8.5'	54.7'			117°16.3'	107°30.4'	105°32.0'	21°25.9'	19°58.0'
13	352°07.3'	S 16°53.3'	12.9'	8.5'	54.7'			116°49.2'	107°04.1'	105°01.6'	20°58.9'	19°42.0'
14	6°39.2'	S 16°44.7'	13.0'	8.6'	54.7'			116°22.1'	106°37.9'	104°31.2'	20°31.9'	
15	21°11.2'	S 16°36.1'	13.0'	8.7'	54.7'			115°55.0'	106°11.6'	104°00.7'	20°04.9'	
16	35°43.2'	S 16°27.4'	13.1'	8.7'	54.7'			115°27.9'	105°45.4'	103°30.3'	19°38.0'	
17	50°15.3'	S 16°18.7'	13.2'	8.8'	54.7'			115°00.8'	105°19.1'	102°60.0'	19°11.1'	
18	64°47.4'	S 16°09.9'	13.2'	8.9'	54.6'	119°42.7'		114°33.7'	104°52.9'	102°29.6'	18°44.3'	
19	79°19.6'	S 16°01.0'	13.3'	8.9'	54.6'	118°44.7'		114°06.5'	104°26.6'	101°59.3'	18°17.5'	
20	93°51.9'	S 15°52.0'	13.3'	9.0'	54.6'	118°15.7'		113°39.4'	104°00.3'	101°28.9'	17°50.8'	
21	108°24.3'	S 15°43.0'	13.4'	9.1'	54.6'	117°46.7'		113°12.2'	103°34.1'	100°58.6'	17°24.1'	
22	122°56.7'	S 15°34.0'	13.5'	9.1'	54.6'	117°17.7'		112°45.1'	103°07.8'	100°28.3'	16°57.4'	
23	137°29.2'	S 15°24.8'	13.5'	9.2'	54.6'	116°48.7'	119°42.0'	112°17.9'	102°41.5'	99°58.1'	16°30.9'	
Mer. pass.		13 h 33 m SD 15.0'		phase 1%								

Star	mag	SHA	dec	Star	mag	SHA	dec	Star	mag	SHA	dec
Fomalhaut	+1.2	15°19.2'	S 29°31.2'	Spica	+1.0	158°26.4'	S 11°15.8'	Betelgeuse	+0.5	270°56.1'	N 7°24.5'
Deneb	+1.2	49°28.9'	N 45°21.1'	Acrux	+0.8	173°04.0'	S 63°12.3'	Capella	+0.1	280°27.4'	N 46°01.0'
Altair	+0.8	62°04.1'	N 8°55.2'	Regulus	+1.4	207°38.4'	N 11°52.1'	Rigel	+0.2	281°07.4'	S 8°10.9'
Vega	+0.0	80°36.3'	N 38°48.1'	Pollux	+1.2	243°21.8'	N 27°58.5'	Aldebaran	+0.9	290°43.9'	N 16°32.8'
Antares	+1.1	112°20.9'	S 26°28.4'	Procyon	+0.4	244°54.6'	N 5°10.3'	Polaris	+2.0	315°41.3'	N 89°21.1'
Rigel Kent	-0.0	139°45.6'	S 60°54.7'	Adhara	+1.5	255°08.6'	S 29°00.1'	Achernar	+0.5	335°23.4'	S 57°08.5'
Arcturus	-0.1	145°51.6'	N 19°04.6'	Sirius	-1.4	258°29.4'	S 16°44.8'				
Hadar	+0.6	148°41.4'	S 60°27.8'	Canopus	-0.6	263°53.6'	S 52°42.6'				

h	Aries		Sun		Venus		Jupiter		Saturn		Mars	
	GHA	GHA dec	GHA	dec	GHA	dec	GHA	dec	GHA	dec	GHA	dec
0	125°44.7'	176°52.0'	S 18°38.9'	138°14.3'	S 6°34.7'	202°05.2'	S 22°47.6'	189°22.4'	S 21°12.3'	230°57.4'	S 22°37.6'	
1	140°47.1'	191°51.9'	S 18°38.2'	153°14.0'	S 6°33.4'	217°07.1'	S 22°47.6'	204°24.6'	S 21°12.2'	245°58.0'	S 22°37.8'	
2	155°49.6'	206°51.8'	S 18°37.6'	168°13.7'	S 6°32.1'	232°09.0'	S 22°47.5'	219°26.7'	S 21°12.2'	260°58.6'	S 22°38.0'	
3	170°52.1'	221°51.6'	S 18°37.0'	183°13.5'	S 6°30.9'	247°10.8'	S 22°47.5'	234°28.9'	S 21°12.1'	275°59.3'	S 22°38.2'	
4	185°54.5'	236°51.5'	S 18°36.3'	198°13.2'	S 6°29.6'	262°12.7'	S 22°47.4'	249°31.1'	S 21°12.1'	290°59.9'	S 22°38.4'	
5	200°57.0'	251°51.4'	S 18°35.7'	213°12.9'	S 6°28.3'	277°14.6'	S 22°47.4'	264°33.2'	S 21°12.0'	306°00.5'	S 22°38.6'	
6	215°59.5'	266°51.2'	S 18°35.1'	228°12.7'	S 6°27.1'	292°16.4'	S 22°47.3'	279°35.4'	S 21°12.0'	321°01.2'	S 22°38.8'	
7	231°01.9'	281°51.1'	S 18°34.4'	243°12.4'	S 6°25.8'	307°18.3'	S 22°47.3'	294°37.5'	S 21°11.9'	336°01.8'	S 22°39.0'	
8	246°04.4'	296°51.0'	S 18°33.8'	258°12.1'	S 6°24.5'	322°20.2'	S 22°47.2'	309°39.7'	S 21°11.9'	351°02.4'	S 22°39.2'	
9	261°06.9'	311°50.8'	S 18°33.1'	273°11.9'	S 6°23.2'	337°22.0'	S 22°47.2'	324°41.8'	S 21°11.8'	6°03.0'	S 22°39.4'	
10	276°09.3'	326°50.7'	S 18°32.5'	288°11.6'	S 6°22.0'	352°23.9'	S 22°47.2'	339°44.0'	S 21°11.8'	21°03.7'	S 22°39.6'	
11	291°11.8'	341°50.6'	S 18°31.9'	303°11.3'	S 6°20.7'	7°25.8'	S 22°47.1'	354°46.1'	S 21°11.7'	36°04.3'	S 22°39.9'	
12	306°14.2'	356°50.4'	S 18°31.2'	318°11.1'	S 6°19.4'	22°27.6'	S 22°47.1'	9°48.3'	S 21°11.7'	51°04.9'	S 22°40.1'	
13	321°16.7'	11°50.3'	S 18°30.6'	333°10.8'	S 6°18.2'	37°29.5'	S 22°47.0'	24°50.5'	S 21°11.6'	66°05.6'	S 22°40.3'	
14	336°19.2'	26°50.2'	S 18°29.9'	348°10.6'	S 6°16.9'	52°31.4'	S 22°47.0'	39°52.6'	S 21°11.6'	81°06.2'	S 22°40.5'	
15	351°21.6'	41°50.1'	S 18°29.3'	3°10.3'	S 6°15.6'	67°33.2'	S 22°46.9'	54°54.8'	S 21°11.5'	96°06.8'	S 22°40.7'	
16	6°24.1'	56°49.9'	S 18°28.7'	18°10.0'	S 6°14.3'	82°35.1'	S 22°46.9'	69°56.9'	S 21°11.5'	111°07.5'	S 22°40.9'	
17	21°26.6'	71°49.8'	S 18°28.0'	33°09.8'	S 6°13.1'	97°37.0'	S 22°46.8'	84°59.1'	S 21°11.4'	126°08.1'	S 22°41.1'	
18	36°29.0'	86°49.7'	S 18°27.4'	48°09.5'	S 6°11.8'	112°38.8'	S 22°46.8'	100°01.2'	S 21°11.4'	141°08.7'	S 22°41.3'	
19	51°31.5'	101°49.5'	S 18°26.7'	63°09.3'	S 6°10.5'	127°40.7'	S 22°46.7'	115°03.4'	S 21°11.3'	156°09.4'	S 22°41.5'	
20	66°34.0'	116°49.4'	S 18°26.1'	78°09.0'	S 6°09.2'	142°42.6'	S 22°46.7'	130°05.5'	S 21°11.3'	171°10.0'	S 22°41.7'	
21	81°36.4'	131°49.3'	S 18°25.4'	93°08.7'	S 6°08.0'	157°44.4'	S 22°46.6'	145°07.7'	S 21°11.2'	186°10.6'	S 22°41.9'	
22	96°38.9'	146°49.2'	S 18°24.8'	108°08.5'	S 6°06.7'	172°46.3'	S 22°46.6'	160°09.9'	S 21°11.2'	201°11.2'	S 22°42.1'	
23	111°41.4'	161°49.0'	S 18°24.1'	123°08.2'	S 6°05.4'	187°48.2'	S 22°46.5'	175°12.0'	S 21°11.1'	216°11.9'	S 22°42.3'	
		SD 16.2' d 0.6'		v -0.3' d 1.3'		v 1.9' d 0.0'		v 2.2' d 0.0'		v 0.6' d -0.2'		
Mer. pass.		12 h 12 m 39 s		14 h 47 m		10 h 30 m		11 h 21 m		8 h 36 m		

h	Moon				Lunar distance							
	GHA	dec	v	d	HP	-Sirius	-Betelgeuse	-Adhara	-Capella	-Rigel	-Aldebaran	-Venus
0	152°01.7'	S 15°15.6'	13.6'	9.3'	54.6'	119°21.6'	116°19.7'	111°50.8'	102°15.3'	99°27.8'	16°04.3'	
1	166°34.3'	S 15°06.4'	13.7'	9.3'	54.5'	119°01.1'	115°50.7'	111°23.6'	101°49.0'	98°57.6'	15°37.9'	
2	181°06.9'	S 14°57.0'	13.7'	9.4'	54.5'	118°40.5'	115°21.8'	110°56.4'	101°22.8'	98°27.4'	15°11.5'	
3	195°39.6'	S 14°47.7'	13.8'	9.4'	54.5'	118°19.9'	114°52.8'	110°29.2'	100°56.5'	97°57.1'	14°45.1'	
4	210°12.4'	S 14°38.2'	13.8'	9.5'	54.5'	117°59.2'	114°23.9'	114°19.1'	110°02.0'	97°27.0'	14°18.9'	
5	224°45.3'	S 14°28.7'	13.9'	9.6'	54.5'	117°38.4'	113°54.9'	114°04.0'	109°34.8'	96°56.8'	13°52.7'	
6	239°18.1'	S 14°19.2'	14.0'	9.6'	54.5'	117°17.6'	113°26.0'	113°48.8'	109°07.6'	99°37.7'	13°26.6'	
7	253°51.1'	S 14°09.6'	14.0'	9.7'	54.5'	116°56.7'	112°57.0'	113°33.6'	108°40.5'	99°11.5'	13°00.6'	
8	268°24.1'	S 13°59.9'	14.1'	9.7'	54.5'	116°35.8'	112°28.1'	113°18.3'	108°13.3'	98°45.3'	12°34.7'	
9	282°57.2'	S 13°50.2'	14.1'	9.8'	54.4'	116°14.8'	111°59.2'	113°02.9'	107°46.1'	98°19.0'	12°08.9'	
10	297°30.3'	S 13°40.4'	14.2'	9.8'	54.4'	115°53.7'	111°30.3'	112°47.4'	107°18.9'	97°52.8'	11°43.2'	
11	312°03.5'	S 13°30.6'	14.2'	9.9'	54.4'	115°32.6'	111°01.4'	112°31.9'	106°51.7'	97°26.6'	11°17.6'	
12	326°36.7'	S 13°20.7'	14.3'	9.9'	54.4'	115°11.5'	110°32.5'	112°16.3'	106°24.5'	97°00.3'	10°52.2'	
13	341°10.0'	S 13°10.8'	14.3'	10.0'	54.4'	114°50.3'	110°03.6'	112°00.6'	105°57.3'	96°34.1'	10°26.9'	
14	355°43.4'	S 13°00.8'	14.4'	10.0'	54.4'	114°29.0'	109°34.7'	111°44.9'	105°30.1'	96°07.9'	10°01.8'	
15	10°16.8'	S 12°50.8'	14.5'	10.1'	54.4'	114°07.7'	109°05.8'	111°29.1'	105°02.9'	95°41.7'	9°36.9'	
16	24°50.2'	S 12°40.7'	14.5'	10.1'	54.4'	113°46.3'	108°37.0'	111°13.2'	104°35.7'	95°15.5'	9°12.2'	
17	39°23.7'	S 12°30.6'	14.6'	10.2'	54.3'	113°24.9'	108°08.1'	110°57.3'	104°08.5'	94°49.3'	8°47.8'	
18	53°57.3'	S 12°20.5'	14.6'	10.2'	54.3'	113°03.5'	107°39.3'	110°41.2'	103°41.3'	94°23.2'	8°23.6'	
19	68°30.9'	S 12°10.2'	14.7'	10.3'	54.3'	112°42.0'	107°10.4'	110°25.2'	103°14.1'	93°57.0'	7°59.7'	
20	83°04.6'	S 11°60.0'	14.7'	10.3'	54.3'	112°20.5'	106°41.6'	110°09.0'	102°46.9'	93°30.8'	7°36.2'	
21	97°38.3'	S 11°49.7'	14.8'	10.3'	54.3'	111°58.9'	106°12.8'	109°52.9'	102°19.7'	93°04.7'	7°13.1'	
22	112°12.0'	S 11°39.3'	14.8'	10.4'	54.3'	111°37.3'	105°44.0'	109°36.6'	101°52.5'	92°38.5'	6°50.5'	
23	126°45.9'	S 11°29.0'	14.9'	10.4'	54.3'	111°15.6'	105°15.2'	109°20.3'	101°25.4'	92°12.4'	6°28.5'	
Mer. pass.		14 h 18 m SD 14.9'		phase 4%								

Star	mag	SHA	dec	Star	mag	SHA	dec	Star	mag	SHA	dec
Fomalhaut	+1.2	15°19.2'	S 29°31.2'	Spica	+1.0	158°26.4'	S 11°15.8'	Betelgeuse	+0.5	270°56.1'	N 7°24.5'
Deneb	+1.2	49°28.9'	N 45°21.1'	Acrux	+0.8	173°03.9'	S 63°12.3'	Capella	+0.1	280°27.4'	N 46°01.1'
Altair	+0.8	62°04.1'	N 8°55.2'	Regulus	+1.4	207°38.4'	N 11°52.1'	Rigel	+0.2	281°07.4'	N 8°10.9'
Vega	+0.0	80°36.3'	N 38°48.1'	Pollux	+1.2	243°21.8'	N 27°58.5'	Aldebaran	+0.9	290°43.9'	N 16°32.8'
Antares	+1.1	112°20.9'	S 26°28.4'	Procyon	+0.4	244°54.6'	N 5°10.3'	Polaris	+2.0	315°41.8'	N 89°21.1'
Rigel Kent	-0.0	139°45.6'	S 60°54.7'	Adhara	+1.5	255°08.6'	S 29°00.1'	Achernar	+0.5	335°23.4'	S 57°08.5'
Arcturus	-0.1	145°51.6'	N 19°04.6'	Sirius	-1.4	258°29.4'	S 16°44.8'				
Hadar	+0.6	148°41.4'	S 60°27.8'	Canopus	-0.6	263°53.6'	S 52°42.6'				

h	Aries			Sun			Venus		Jupiter		Saturn		Mars	
	GHA	GHA	dec	GHA	dec	GHA	dec	GHA	dec	GHA	dec	GHA	dec	
0	126°43.8'	176°48.9'	S 18°23.5'	138°08.0'	S 6°04.1'	202°50.0'	S 22°46.5'	190°14.2'	S 21°11.1'	231°12.5'	S 22°42.5'			
1	141°46.3'	191°48.8'	S 18°22.8'	153°07.7'	S 6°02.9'	217°51.9'	S 22°46.4'	205°16.3'	S 21°11.0'	246°13.1'	S 22°42.7'			
2	156°48.7'	206°48.7'	S 18°22.2'	168°07.4'	S 6°01.6'	232°53.8'	S 22°46.4'	220°18.5'	S 21°11.0'	261°13.8'	S 22°42.9'			
3	171°51.2'	221°48.5'	S 18°21.5'	183°07.2'	S 6°00.3'	247°55.7'	S 22°46.3'	235°20.6'	S 21°10.9'	276°14.4'	S 22°43.1'			
4	186°53.7'	236°48.4'	S 18°20.9'	198°06.9'	S 5°59.0'	262°57.5'	S 22°46.3'	250°22.8'	S 21°10.9'	291°15.0'	S 22°43.3'			
5	201°56.1'	251°48.3'	S 18°20.2'	213°06.7'	S 5°57.8'	277°59.4'	S 22°46.2'	265°24.9'	S 21°10.8'	306°15.7'	S 22°43.5'			
6	216°58.6'	266°48.2'	S 18°19.6'	228°06.4'	S 5°56.5'	293°01.3'	S 22°46.2'	280°27.1'	S 21°10.8'	321°16.3'	S 22°43.7'			
7	232°01.1'	281°48.0'	S 18°18.9'	243°06.2'	S 5°55.2'	308°03.1'	S 22°46.1'	295°29.3'	S 21°10.7'	336°16.9'	S 22°43.9'			
8	247°03.5'	296°47.9'	S 18°18.3'	258°05.9'	S 5°53.9'	323°05.0'	S 22°46.1'	310°31.4'	S 21°10.7'	351°17.5'	S 22°44.1'			
9	262°06.0'	311°47.8'	S 18°17.6'	273°05.7'	S 5°52.7'	338°06.9'	S 22°46.0'	325°33.6'	S 21°10.7'	6°18.2'	S 22°44.3'			
10	277°08.5'	326°47.7'	S 18°17.0'	288°05.4'	S 5°51.4'	353°08.7'	S 22°46.0'	340°35.7'	S 21°10.6'	21°18.8'	S 22°44.5'			
11	292°10.9'	341°47.6'	S 18°16.3'	303°05.2'	S 5°50.1'	8°10.6'	S 22°45.9'	355°37.9'	S 21°10.6'	36°19.4'	S 22°44.7'			
12	307°13.4'	356°47.4'	S 18°15.7'	318°04.9'	S 5°48.8'	23°12.5'	S 22°45.9'	10°40.0'	S 21°10.5'	51°20.1'	S 22°44.9'			
13	322°15.9'	11°47.3'	S 18°15.0'	333°04.7'	S 5°47.5'	38°14.3'	S 22°45.8'	25°42.2'	S 21°10.5'	66°20.7'	S 22°45.1'			
14	337°18.3'	26°47.2'	S 18°14.3'	348°04.4'	S 5°46.3'	53°16.2'	S 22°45.8'	40°44.4'	S 21°10.4'	81°21.3'	S 22°45.3'			
15	352°20.8'	41°47.1'	S 18°13.7'	3°04.1'	S 5°45.0'	68°18.1'	S 22°45.7'	55°46.5'	S 21°10.4'	96°21.9'	S 22°45.5'			
16	7°23.2'	56°46.9'	S 18°13.0'	18°03.9'	S 5°43.7'	83°20.0'	S 22°45.7'	70°48.7'	S 21°10.3'	111°22.6'	S 22°45.7'			
17	22°25.7'	71°46.8'	S 18°12.4'	33°03.6'	S 5°42.4'	98°21.8'	S 22°45.6'	85°50.8'	S 21°10.3'	126°23.2'	S 22°45.8'			
18	37°28.2'	86°46.7'	S 18°11.7'	48°03.4'	S 5°41.1'	113°23.7'	S 22°45.6'	100°53.0'	S 21°10.2'	141°23.8'	S 22°46.0'			
19	52°30.6'	101°46.6'	S 18°11.1'	63°03.1'	S 5°39.9'	128°25.6'	S 22°45.5'	115°55.1'	S 21°10.2'	156°24.4'	S 22°46.2'			
20	67°33.1'	116°46.5'	S 18°10.4'	78°02.9'	S 5°38.6'	143°27.4'	S 22°45.5'	130°57.3'	S 21°10.1'	171°25.1'	S 22°46.4'			
21	82°35.6'	131°46.4'	S 18°09.7'	93°02.6'	S 5°37.3'	158°29.3'	S 22°45.4'	145°59.4'	S 21°10.1'	186°25.7'	S 22°46.6'			
22	97°38.0'	146°46.2'	S 18°09.1'	108°02.4'	S 5°36.0'	173°31.2'	S 22°45.4'	161°01.6'	S 21°10.0'	201°26.3'	S 22°46.8'			
23	112°40.5'	161°46.1'	S 18°08.4'	123°02.1'	S 5°34.7'	188°33.1'	S 22°45.3'	176°03.8'	S 21°10.0'	216°27.0'	S 22°47.0'			
		SD 16.2'	d 0.7'	v -0.3'	d 1.3'	v 1.9'	d 0.0'	v 2.2'	d 0.0'	v 0.6'	d -0.2'			
Mer. pass.		12 h 12 m 51 s		14 h 48 m		10 h 27 m		11 h 17 m		8 h 35 m				

h	Moon				Lunar distance								
	GHA	dec	v	d	HP	-Procyon	-Sirius	-Capella	-Rigel	-Aldebaran	-Venus	+Fomalhaut	+Sun
0	141°19.7'	S 11°18.5'	14.9'	10.5'	54.3'		110°53.9'	100°58.2'	91°46.3'	87°26.7'	6°07.1'		
1	155°53.6'	S 11°08.1'	15.0'	10.5'	54.3'		110°32.2'	100°31.0'	91°20.2'	86°56.8'			
2	170°27.6'	S 10°57.6'	15.0'	10.5'	54.2'		110°10.4'	100°03.8'	90°54.1'	86°26.9'			
3	185°01.6'	S 10°47.0'	15.1'	10.6'	54.2'		109°48.6'	99°36.7'	90°28.0'	85°57.1'			
4	199°35.6'	S 10°36.4'	15.1'	10.6'	54.2'		109°26.8'	99°09.5'	90°01.9'	85°27.3'			
5	214°09.7'	S 10°25.8'	15.1'	10.7'	54.2'		109°05.0'	98°42.4'	89°35.8'	84°57.5'			
6	228°43.9'	S 10°15.1'	15.2'	10.7'	54.2'		108°43.1'	98°15.2'	89°09.8'	84°27.7'		19°33.2'	
7	243°18.1'	S 10°04.4'	15.2'	10.7'	54.2'		108°21.1'	97°48.1'	88°43.7'	83°57.9'		19°48.5'	
8	257°52.3'	S 9°53.7'	15.3'	10.8'	54.2'		107°59.2'	97°20.9'	88°17.7'	83°28.2'		20°04.3'	
9	272°26.6'	S 9°42.9'	15.3'	10.8'	54.2'		107°37.2'	96°53.8'	87°51.7'	82°58.4'		20°20.7'	
10	287°00.9'	S 9°32.1'	15.4'	10.8'	54.2'		107°15.2'	96°26.7'	87°25.7'	82°28.7'		20°37.5'	
11	301°35.2'	S 9°21.3'	15.4'	10.9'	54.2'		106°53.1'	95°59.5'	86°59.7'	81°58.9'		20°54.7'	
12	316°09.6'	S 9°10.4'	15.4'	10.9'	54.2'		106°31.1'	95°32.4'	86°33.7'	81°29.2'		21°12.4'	40°24.5'
13	330°44.1'	S 8°59.5'	15.5'	10.9'	54.2'		106°09.0'	95°05.3'	86°07.7'	80°59.5'		21°30.5'	40°51.6'
14	345°18.5'	S 8°48.6'	15.5'	11.0'	54.1'		105°46.8'	94°38.2'	85°41.8'	80°29.8'		21°49.0'	41°18.8'
15	359°53.0'	S 8°37.6'	15.5'	11.0'	54.1'		105°24.7'	94°11.1'	85°15.8'	80°00.1'		22°07.9'	41°45.9'
16	14°27.6'	S 8°26.6'	15.6'	11.0'	54.1'		105°02.5'	93°44.0'	84°49.9'	79°30.4'		22°27.1'	42°13.1'
17	29°02.2'	S 8°15.6'	15.6'	11.1'	54.1'		104°40.4'	93°16.9'	84°24.0'	79°00.8'		22°46.7'	42°40.2'
18	43°36.8'	S 8°04.6'	15.7'	11.1'	54.1'		104°18.1'	92°49.8'	83°58.1'	78°31.1'		23°06.7'	43°07.3'
19	58°11.4'	S 7°53.5'	15.7'	11.1'	54.1'		103°55.9'	92°22.8'	83°32.2'	78°01.5'		23°26.9'	43°34.4'
20	72°46.1'	S 7°42.4'	15.7'	11.1'	54.1'		103°33.7'	91°55.7'	83°06.4'	77°31.8'		23°47.5'	44°01.5'
21	87°20.8'	S 7°31.2'	15.8'	11.2'	54.1'		103°11.4'	91°28.6'	82°40.5'	77°02.2'		24°08.3'	44°28.6'
22	101°55.6'	S 7°20.1'	15.8'	11.2'	54.1'	119°44.7'	102°49.1'	91°01.6'	82°14.7'	76°32.6'	6°19.0'	24°29.4'	44°55.6'
23	116°30.4'	S 7°08.9'	15.8'	11.2'	54.1'	119°16.9'	102°26.8'	90°34.5'	81°48.9'	76°03.0'	6°40.6'	24°50.8'	45°22.7'
Mer. pass.		15 h 0 m SD 14.8'		phase 9%									

Star	mag	SHA	dec	Star	mag	SHA	dec	Star	mag	SHA	dec
Fomalhaut	+1.2	15°19.2'	S 29°31.2'	Spica	+1.0	158°26.4'	S 11°15.8'	Betelgeuse	+0.5	270°56.1'	N 7°24.5'
Deneb	+1.2	49°28.9'	N 45°21.1'	Acrux	+0.8	173°03.9'	S 63°12.3'	Capella	+0.1	280°27.4'	N 46°01.1'
Altair	+0.8	62°04.1'	N 8°55.2'	Regulus	+1.4	207°38.4'	N 11°52.1'	Rigel	+0.2	281°07.4'	S 8°10.9'
Vega	+0.0	80°36.3'	N 38°48.0'	Pollux	+1.2	243°21.8'	N 27°58.5'	Aldebaran	+0.9	290°43.9'	N 16°32.8'
Antares	+1.1	112°20.9'	S 26°28.4'	Procyon	+0.4	244°54.6'	N 5°10.3'	Polaris	+2.0	315°42.3'	N 89°21.1'
Rigel Kent	-0.0	139°45.6'	S 60°54.7'	Adhara	+1.5	255°08.6'	S 29°00.2'	Achernar	+0.5	335°23.4'	S 57°08.5'
Arcturus	-0.1	145°51.6'	N 19°04.6'	Sirius	-1.4	258°29.4'	S 16°44.8'				
Hadar	+0.6	148°41.4'	S 60°27.8'	Canopus	-0.6	263°53.6'	S 52°42.6'				

h	Aries		Sun		Venus		Jupiter		Saturn		Mars	
	GHA	dec	GHA	dec	GHA	dec	GHA	dec	GHA	dec	GHA	dec
0	127°43.0'	S 18°07.8'	176°46.0'	S 18°07.8'	138°01.9'	S 5°33.5'	203°34.9'	S 22°45.3'	191°05.9'	S 21°09.9'	231°27.6'	S 22°47.2'
1	142°45.4'	S 18°07.1'	191°45.9'	S 18°07.1'	153°01.7'	S 5°32.2'	218°36.8'	S 22°45.2'	206°08.1'	S 21°09.9'	246°28.2'	S 22°47.4'
2	157°47.9'	S 18°06.4'	206°45.8'	S 18°06.4'	168°01.4'	S 5°30.9'	233°38.7'	S 22°45.2'	221°10.2'	S 21°09.8'	261°28.8'	S 22°47.6'
3	172°50.3'	S 18°05.8'	221°45.6'	S 18°05.8'	183°01.2'	S 5°29.6'	248°40.5'	S 22°45.1'	236°12.4'	S 21°09.8'	276°29.5'	S 22°47.8'
4	187°52.8'	S 18°05.1'	236°45.5'	S 18°05.1'	198°00.9'	S 5°28.3'	263°42.4'	S 22°45.1'	251°14.5'	S 21°09.7'	291°30.1'	S 22°48.0'
5	202°55.3'	S 18°04.4'	251°45.4'	S 18°04.4'	213°00.7'	S 5°27.1'	278°44.3'	S 22°45.0'	266°16.7'	S 21°09.7'	306°30.7'	S 22°48.2'
6	217°57.7'	S 18°03.8'	266°45.3'	S 18°03.8'	228°00.4'	S 5°25.8'	293°46.2'	S 22°45.0'	281°18.9'	S 21°09.6'	321°31.3'	S 22°48.4'
7	233°00.2'	S 18°03.1'	281°45.2'	S 18°03.1'	243°00.2'	S 5°24.5'	308°48.0'	S 22°44.9'	296°21.0'	S 21°09.6'	336°32.0'	S 22°48.5'
8	248°02.7'	S 18°02.4'	296°45.1'	S 18°02.4'	257°59.9'	S 5°23.2'	323°49.9'	S 22°44.9'	311°23.2'	S 21°09.5'	351°32.6'	S 22°48.7'
9	263°05.1'	S 18°01.8'	311°45.0'	S 18°01.8'	272°59.7'	S 5°21.9'	338°51.8'	S 22°44.8'	326°25.3'	S 21°09.5'	6°33.2'	S 22°48.9'
10	278°07.6'	S 18°01.1'	326°44.8'	S 18°01.1'	287°59.4'	S 5°20.6'	353°53.6'	S 22°44.8'	341°27.5'	S 21°09.4'	21°33.8'	S 22°49.1'
11	293°10.1'	S 18°00.4'	341°44.7'	S 18°00.4'	302°59.2'	S 5°19.4'	8°55.5'	S 22°44.7'	356°29.6'	S 21°09.4'	36°34.5'	S 22°49.3'
12	308°12.5'	S 17°59.8'	356°44.6'	S 17°59.8'	317°59.0'	S 5°18.1'	23°57.4'	S 22°44.7'	11°31.8'	S 21°09.3'	51°35.1'	S 22°49.5'
13	323°15.0'	S 17°59.1'	11°44.5'	S 17°59.1'	332°58.7'	S 5°16.8'	38°59.3'	S 22°44.6'	26°34.0'	S 21°09.3'	66°35.7'	S 22°49.7'
14	338°17.5'	S 17°58.4'	26°44.4'	S 17°58.4'	347°58.5'	S 5°15.5'	54°01.1'	S 22°44.6'	41°36.1'	S 21°09.2'	81°36.3'	S 22°49.9'
15	353°19.9'	S 17°57.8'	41°44.3'	S 17°57.8'	2°58.2'	S 5°14.2'	69°03.0'	S 22°44.5'	56°38.3'	S 21°09.2'	96°37.0'	S 22°50.1'
16	8°22.4'	S 17°57.1'	56°44.2'	S 17°57.1'	17°58.0'	S 5°12.9'	84°04.9'	S 22°44.5'	71°40.4'	S 21°09.1'	111°37.6'	S 22°50.2'
17	23°24.8'	S 17°56.4'	71°44.1'	S 17°56.4'	32°57.7'	S 5°11.7'	99°06.7'	S 22°44.5'	86°42.6'	S 21°09.1'	126°38.2'	S 22°50.4'
18	38°27.3'	S 17°55.7'	86°43.9'	S 17°55.7'	47°57.5'	S 5°10.4'	114°08.6'	S 22°44.4'	101°44.7'	S 21°09.0'	141°38.8'	S 22°50.6'
19	53°29.8'	S 17°55.1'	101°43.8'	S 17°55.1'	62°57.3'	S 5°09.1'	129°10.5'	S 22°44.4'	116°46.9'	S 21°09.0'	156°39.5'	S 22°50.8'
20	68°32.2'	S 17°54.4'	116°43.7'	S 17°54.4'	77°57.0'	S 5°07.8'	144°12.4'	S 22°44.3'	131°49.1'	S 21°08.9'	171°40.1'	S 22°51.0'
21	83°34.7'	S 17°53.7'	131°43.6'	S 17°53.7'	92°56.8'	S 5°06.5'	159°14.2'	S 22°44.3'	146°51.2'	S 21°08.9'	186°40.7'	S 22°51.2'
22	98°37.2'	S 17°53.0'	146°43.5'	S 17°53.0'	107°56.5'	S 5°05.2'	174°16.1'	S 22°44.2'	161°53.4'	S 21°08.8'	201°41.3'	S 22°51.4'
23	113°39.6'	S 17°52.4'	161°43.4'	S 17°52.4'	122°56.3'	S 5°03.9'	189°18.0'	S 22°44.2'	176°55.5'	S 21°08.8'	216°42.0'	S 22°51.5'
		SD 16.2' d 0.7'		v -0.2' d 1.3'		v 1.9' d 0.0'		v 2.2' d 0.0'		v 0.6' d -0.2'		
Mer. pass.		12 h 13 m 2 s		14 h 48 m		10 h 24 m		11 h 14 m		8 h 34 m		

h	Moon				Lunar distance								
	GHA	dec	v	d	HP	-Pollux	-Betelgeuse	-Capella	-Rigel	-Aldebaran	+Venus	+Fomalhaut	+Sun
0	131°05.2'	S 6°57.7'	15.8'	11.2'	54.1'	119°41.3'	93°17.6'	90°07.5'	81°23.1'	75°33.4'	7°02.7'	25°12.5'	45°49.8'
1	145°40.0'	S 6°46.5'	15.9'	11.3'	54.1'	119°11.8'	92°49.0'	89°40.5'	80°57.3'	75°03.8'	7°25.3'	25°34.4'	46°16.8'
2	160°14.9'	S 6°35.2'	15.9'	11.3'	54.1'	118°42.3'	92°20.5'	89°13.5'	80°31.5'	74°34.2'	7°48.3'	25°56.5'	46°43.8'
3	174°49.8'	S 6°23.9'	15.9'	11.3'	54.1'	118°12.9'	91°51.9'	88°46.4'	80°05.8'	74°04.7'	8°11.7'	26°18.8'	47°10.9'
4	189°24.7'	S 6°12.6'	16.0'	11.3'	54.1'	117°43.4'	91°23.3'	88°19.4'	79°40.1'	73°35.1'	8°35.4'	26°41.4'	47°37.9'
5	203°59.7'	S 6°01.3'	16.0'	11.3'	54.1'	117°14.0'	90°54.7'	87°52.4'	79°14.3'	73°05.6'	8°59.3'	27°04.1'	48°04.9'
6	218°34.7'	S 5°50.0'	16.0'	11.4'	54.1'	116°44.6'	90°26.2'	87°25.4'	78°48.6'	72°36.0'	9°23.5'	27°27.1'	48°31.9'
7	233°09.7'	S 5°38.6'	16.0'	11.4'	54.0'	116°15.1'	89°57.6'	86°58.5'	78°23.0'	72°06.5'	9°47.9'	27°50.3'	48°58.9'
8	247°44.7'	S 5°27.2'	16.1'	11.4'	54.0'	115°45.7'	89°29.1'	86°31.5'	77°57.3'	71°36.9'	10°12.5'	28°13.6'	49°25.9'
9	262°19.8'	S 5°15.8'	16.1'	11.4'	54.0'	115°16.3'	89°00.5'	86°04.5'	77°31.7'	71°07.4'	10°37.2'	28°37.1'	49°52.9'
10	276°54.9'	S 5°04.4'	16.1'	11.4'	54.0'	114°46.9'	88°32.0'	85°37.6'	77°06.1'	70°37.9'	11°02.0'	29°00.7'	50°19.9'
11	291°30.0'	S 4°53.0'	16.1'	11.4'	54.0'	114°17.5'	88°03.4'	85°10.6'	76°40.5'	70°08.4'	11°27.0'	29°24.6'	50°46.9'
12	306°05.1'	S 4°41.5'	16.1'	11.5'	54.0'	113°48.1'	87°34.9'	84°43.7'	76°14.9'	69°38.9'	11°52.1'	29°48.5'	51°13.9'
13	320°40.2'	S 4°30.1'	16.2'	11.5'	54.0'	113°18.7'	87°06.4'	84°16.8'	75°49.3'	69°09.4'	12°17.3'	30°12.7'	51°40.9'
14	335°15.4'	S 4°18.6'	16.2'	11.5'	54.0'	112°49.3'	86°37.9'	83°49.8'	75°23.8'	68°39.9'	12°42.5'	30°36.9'	52°07.8'
15	349°50.6'	S 4°07.1'	16.2'	11.5'	54.0'	112°19.9'	86°09.4'	83°22.9'	74°58.3'	68°10.4'	13°07.9'	31°01.3'	52°34.8'
16	4°25.8'	S 3°55.6'	16.2'	11.5'	54.0'	111°50.5'	85°40.9'	82°56.0'	74°32.8'	67°40.9'	13°33.3'	31°25.8'	53°01.8'
17	19°01.0'	S 3°44.1'	16.2'	11.5'	54.0'	111°21.1'	85°12.4'	82°29.1'	74°07.3'	67°11.4'	13°58.8'	31°50.5'	53°28.7'
18	33°36.2'	S 3°32.5'	16.2'	11.5'	54.0'	110°51.7'	84°43.9'	82°02.2'	73°41.9'	66°41.9'	14°24.3'	32°15.2'	53°55.7'
19	48°11.4'	S 3°21.0'	16.3'	11.6'	54.0'	110°22.3'	84°15.4'	81°35.4'	73°16.4'	66°12.4'	14°49.9'	32°40.1'	54°22.6'
20	62°46.7'	S 3°09.4'	16.3'	11.6'	54.0'	109°52.9'	83°46.9'	81°08.5'	72°51.0'	65°43.0'	15°15.6'	33°05.1'	54°49.6'
21	77°22.0'	S 2°57.9'	16.3'	11.6'	54.0'	109°23.6'	83°18.4'	80°41.6'	72°25.6'	65°13.5'	15°41.3'	33°30.2'	55°16.5'
22	91°57.2'	S 2°46.3'	16.3'	11.6'	54.0'	108°54.2'	82°50.0'	80°14.8'	72°00.3'	64°44.0'	16°07.0'	33°55.4'	55°43.4'
23	106°32.5'	S 2°34.7'	16.3'	11.6'	54.0'	108°24.8'	82°21.5'	79°48.0'	71°35.0'	64°14.6'	16°32.8'	34°20.7'	56°10.4'
Mer. pass.		15 h 42 m SD 14.7'		phase 15%									

Star	mag	SHA	dec	Star	mag	SHA	dec	Star	mag	SHA	dec
Fomalhaut	+1.2	15°19.2'	S 29°31.2'	Spica	+1.0	158°26.4'	S 11°15.8'	Betelgeuse	+0.5	270°56.1'	N 7°24.5'
Deneb	+1.2	49°28.9'	N 45°21.1'	Acrux	+0.8	173°03.9'	S 63°12.3'	Capella	+0.1	280°27.4'	N 46°01.1'
Altair	+0.8	62°04.1'	N 8°55.2'	Regulus	+1.4	207°38.4'	N 11°52.1'	Rigel	+0.2	281°07.4'	S 8°10.9'
Vega	+0.0	80°36.3'	N 38°48.0'	Pollux	+1.2	243°21.8'	N 27°58.5'	Aldebaran	+0.9	290°44.0'	N 16°32.8'
Antares	+1.1	112°20.9'	S 26°28.4'	Procyon	+0.4	244°54.6'	N 5°10.3'	Polaris	+2.0	315°42.9'	N 89°21.1'
Rigel Kent	-0.0	139°45.6'	S 60°54.7'	Adhara	+1.5	255°08.6'	S 29°00.2'	Achernar	+0.5	335°23.4'	S 57°08.5'
Arcturus	-0.1	145°51.6'	N 19°04.6'	Sirius	-1.4	258°29.4'	S 16°44.8'				
Hadar	+0.6	148°41.4'	S 60°27.8'	Canopus	-0.6	263°53.7'	S 52°42.6'				

h	Aries		Sun		Venus		Jupiter		Saturn		Mars	
	GHA		GHA	dec	GHA	dec	GHA	dec	GHA	dec	GHA	dec
0	128°42.1'		176°43.3'	S 17°51.7'	137°56.1'	S 5°02.7'	204°19.9'	S 22°44.1'	191°57.7'	S 21°08.7'	231°42.6'	S 22°51.7'
1	143°44.6'		191°43.2'	S 17°51.0'	152°55.8'	S 5°01.4'	219°21.7'	S 22°44.0'	206°59.8'	S 21°08.7'	246°43.2'	S 22°51.9'
2	158°47.0'		206°43.1'	S 17°50.3'	167°55.6'	S 5°00.1'	234°23.6'	S 22°44.0'	222°02.0'	S 21°08.6'	261°43.8'	S 22°52.1'
3	173°49.5'		221°43.0'	S 17°49.7'	182°55.3'	S 4°58.8'	249°25.5'	S 22°43.9'	237°04.2'	S 21°08.6'	276°44.5'	S 22°52.3'
4	188°51.9'		236°42.9'	S 17°49.0'	197°55.1'	S 4°57.5'	264°27.3'	S 22°43.9'	252°06.3'	S 21°08.6'	291°45.1'	S 22°52.5'
5	203°54.4'		251°42.7'	S 17°48.3'	212°54.9'	S 4°56.2'	279°29.2'	S 22°43.8'	267°08.5'	S 21°08.5'	306°45.7'	S 22°52.6'
6	218°56.9'		266°42.6'	S 17°47.6'	227°54.6'	S 4°54.9'	294°31.1'	S 22°43.8'	282°10.6'	S 21°08.5'	321°46.3'	S 22°52.8'
7	233°59.3'		281°42.5'	S 17°47.0'	242°54.4'	S 4°53.6'	309°33.0'	S 22°43.7'	297°12.8'	S 21°08.4'	336°47.0'	S 22°53.0'
8	249°01.8'		296°42.4'	S 17°46.3'	257°54.2'	S 4°52.4'	324°34.8'	S 22°43.7'	312°15.0'	S 21°08.4'	351°47.6'	S 22°53.2'
9	264°04.3'		311°42.3'	S 17°45.6'	272°53.9'	S 4°51.1'	339°36.7'	S 22°43.6'	327°17.1'	S 21°08.3'	6°48.2'	S 22°53.4'
10	279°06.7'		326°42.2'	S 17°44.9'	287°53.7'	S 4°49.8'	354°38.6'	S 22°43.6'	342°19.3'	S 21°08.3'	21°48.8'	S 22°53.5'
11	294°09.2'		341°42.1'	S 17°44.2'	302°53.5'	S 4°48.5'	9°40.5'	S 22°43.5'	357°21.4'	S 21°08.2'	36°49.4'	S 22°53.7'
12	309°11.7'		356°42.0'	S 17°43.5'	317°53.2'	S 4°47.2'	24°42.3'	S 22°43.5'	12°23.6'	S 21°08.2'	51°50.1'	S 22°53.9'
13	324°14.1'		11°41.9'	S 17°42.9'	332°53.0'	S 4°45.9'	39°44.2'	S 22°43.4'	27°25.7'	S 21°08.1'	66°50.7'	S 22°54.1'
14	339°16.6'		26°41.8'	S 17°42.2'	347°52.8'	S 4°44.6'	54°46.1'	S 22°43.4'	42°27.9'	S 21°08.1'	81°51.3'	S 22°54.3'
15	354°19.1'		41°41.7'	S 17°41.5'	2°52.5'	S 4°43.3'	69°48.0'	S 22°43.3'	57°30.1'	S 21°08.0'	96°51.9'	S 22°54.4'
16	9°21.5'		56°41.6'	S 17°40.8'	17°52.3'	S 4°42.0'	84°49.8'	S 22°43.3'	72°32.2'	S 21°08.0'	111°52.6'	S 22°54.6'
17	24°24.0'		71°41.5'	S 17°40.1'	32°52.1'	S 4°40.8'	99°51.7'	S 22°43.2'	87°34.4'	S 21°07.9'	126°53.2'	S 22°54.8'
18	39°26.4'		86°41.4'	S 17°39.4'	47°51.8'	S 4°39.5'	114°53.6'	S 22°43.2'	102°36.5'	S 21°07.9'	141°53.8'	S 22°55.0'
19	54°28.9'		101°41.3'	S 17°38.8'	62°51.6'	S 4°38.2'	129°55.5'	S 22°43.1'	117°38.7'	S 21°07.8'	156°54.4'	S 22°55.2'
20	69°31.4'		116°41.2'	S 17°38.1'	77°51.4'	S 4°36.9'	144°57.3'	S 22°43.1'	132°40.8'	S 21°07.8'	171°55.0'	S 22°55.3'
21	84°33.8'		131°41.1'	S 17°37.4'	92°51.1'	S 4°35.6'	159°59.2'	S 22°43.0'	147°43.0'	S 21°07.7'	186°55.7'	S 22°55.5'
22	99°36.3'		146°41.0'	S 17°36.7'	107°50.9'	S 4°34.3'	175°01.1'	S 22°43.0'	162°45.2'	S 21°07.7'	201°56.3'	S 22°55.7'
23	114°38.8'		161°40.9'	S 17°36.0'	122°50.7'	S 4°33.0'	190°03.0'	S 22°42.9'	177°47.3'	S 21°07.6'	216°56.9'	S 22°55.9'
			SD 16.2'	d 0.7'	v -0.2'	d 1.3'	v 1.9'	d 0.1'	v 2.2'	d 0.0'	v 0.6'	d -0.2'
Mer. pass.			12 h 13 m 12 s		14 h 49 m		10 h 21 m		11 h 11 m		8 h 33 m	

h	Moon				HP	Lunar distance							
	GHA	dec	v	d		-Pollux	-Betelgeuse	-Capella	-Rigel	-Aldebaran	+Venus	+Fomalhaut	+Sun
0	121°07.8'	S 2°23.1'	16.3'	11.6'	54.0'	107°55.4'	81°53.0'	79°21.1'	71°09.6'	63°45.1'	16°58.6'	34°46.1'	56°37.3'
1	135°43.1'	S 2°11.5'	16.3'	11.6'	54.0'	107°26.1'	81°24.6'	78°54.3'	70°44.4'	63°15.7'	17°24.4'	35°11.6'	57°04.3'
2	150°18.5'	S 1°59.9'	16.3'	11.6'	54.0'	106°56.7'	80°56.1'	78°27.5'	70°19.1'	62°46.2'	17°50.3'	35°37.2'	57°31.2'
3	164°53.8'	S 1°48.3'	16.3'	11.6'	54.0'	106°27.3'	80°27.7'	78°00.7'	69°53.9'	62°16.7'	18°16.2'	36°02.8'	57°58.1'
4	179°29.1'	S 1°36.7'	16.3'	11.6'	54.0'	105°58.0'	79°59.2'	77°33.9'	69°28.6'	61°47.3'	18°42.1'	36°28.6'	58°25.1'
5	194°04.5'	S 1°25.0'	16.3'	11.6'	54.0'	105°28.6'	79°30.8'	77°07.1'	69°03.5'	61°17.8'	19°08.1'	36°54.4'	58°52.0'
6	208°39.8'	S 1°13.4'	16.3'	11.6'	54.0'	104°59.2'	79°02.3'	76°40.4'	68°38.3'	60°48.4'	19°34.0'	37°20.3'	59°18.9'
7	223°15.2'	S 1°01.7'	16.4'	11.6'	54.0'	104°29.9'	78°33.9'	76°13.6'	68°13.2'	60°18.9'	20°00.0'	37°46.3'	59°45.9'
8	237°50.5'	S 0°50.1'	16.4'	11.6'	54.0'	104°00.5'	78°05.5'	75°46.9'	67°48.1'	59°49.5'	20°26.1'	38°12.3'	60°12.8'
9	252°25.9'	S 0°38.4'	16.4'	11.7'	54.0'	103°31.1'	77°37.0'	75°20.1'	67°23.0'	59°20.0'	20°52.1'	38°38.5'	60°39.7'
10	267°01.2'	S 0°26.8'	16.4'	11.7'	54.0'	103°01.7'	77°08.6'	74°53.4'	66°57.9'	58°50.6'	21°18.2'	39°04.7'	61°06.7'
11	281°36.6'	S 0°15.1'	16.4'	11.7'	54.0'	102°32.4'	76°40.2'	74°26.7'	66°32.9'	58°21.1'	21°44.2'	39°30.9'	61°33.6'
12	296°11.9'	S 0°03.5'	16.4'	11.7'	54.0'	102°03.0'	76°11.8'	73°60.0'	66°07.9'	57°51.7'	22°10.3'	39°57.2'	62°00.5'
13	310°47.3'	N 0°08.2'	16.4'	11.7'	54.1'	101°33.6'	75°43.3'	73°33.3'	65°43.0'	57°22.2'	22°36.5'	40°23.6'	62°27.5'
14	325°22.6'	N 0°19.8'	16.3'	11.7'	54.1'	101°04.2'	75°14.9'	73°06.6'	65°18.1'	56°52.8'	23°02.6'	40°50.1'	62°54.4'
15	339°58.0'	N 0°31.5'	16.3'	11.7'	54.1'	100°34.8'	74°46.5'	72°39.9'	64°53.2'	56°23.3'	23°28.7'	41°16.6'	63°21.4'
16	354°33.3'	N 0°43.1'	16.3'	11.7'	54.1'	100°05.4'	74°18.1'	72°13.3'	64°28.3'	55°53.9'	23°54.9'	41°43.1'	63°48.3'
17	9°08.7'	N 0°54.8'	16.3'	11.7'	54.1'	99°36.0'	73°49.7'	71°46.7'	64°03.5'	55°24.4'	24°21.1'	42°09.8'	64°15.3'
18	23°44.0'	N 1°06.5'	16.3'	11.7'	54.1'	99°06.6'	73°21.3'	71°20.0'	63°38.7'	54°54.9'	24°47.3'	42°36.4'	64°42.2'
19	38°19.3'	N 1°18.1'	16.3'	11.6'	54.1'	98°37.2'	72°52.9'	70°53.4'	63°13.9'	54°25.5'	25°13.5'	43°03.2'	65°09.2'
20	52°54.6'	N 1°29.8'	16.3'	11.6'	54.1'	98°07.8'	72°24.5'	70°26.8'	62°49.2'	53°56.0'	25°39.7'	43°30.0'	65°36.1'
21	67°29.9'	N 1°41.4'	16.3'	11.6'	54.1'	97°38.4'	71°56.1'	70°00.2'	62°24.5'	53°26.5'	26°06.0'	43°56.8'	66°03.1'
22	82°05.2'	N 1°53.0'	16.3'	11.6'	54.1'	97°09.0'	71°27.7'	69°33.6'	61°59.8'	52°57.0'	26°32.2'	44°23.7'	66°30.1'
23	96°40.5'	N 2°04.7'	16.3'	11.6'	54.1'	96°39.6'	70°59.3'	69°07.1'	61°35.2'	52°27.6'	26°58.5'	44°50.6'	66°57.1'
Mer. pass.			16 h 22 m SD 14.7'		phase 22%								

Star	mag	SHA	dec	Star	mag	SHA	dec	Star	mag	SHA	dec
Fomalhaut	+1.2	15°19.2'	S 29°31.2'	Spica	+1.0	158°26.4'	S 11°15.9'	Betelgeuse	+0.5	270°56.1'	N 7°24.5'
Deneb	+1.2	49°28.9'	N 45°21.1'	Acrux	+0.8	173°03.9'	S 63°12.3'	Capella	+0.1	280°27.4'	N 46°01.1'
Altair	+0.8	62°04.1'	N 8°55.2'	Regulus	+1.4	207°38.4'	N 11°52.1'	Rigel	+0.2	281°07.4'	S 8°10.9'
Vega	+0.0	80°36.3'	N 38°48.0'	Pollux	+1.2	243°21.8'	N 27°58.5'	Aldebaran	+0.9	290°44.0'	N 16°32.8'
Antares	+1.1	112°20.8'	S 26°28.4'	Procyon	+0.4	244°54.6'	N 5°10.3'	Polaris	+2.0	315°43.4'	N 89°21.1'
Rigel Kent	-0.0	139°45.6'	S 60°54.7'	Adhara	+1.5	255°08.6'	S 29°00.2'	Achernar	+0.5	335°23.4'	S 57°08.5'
Arcturus	-0.1	145°51.5'	N 19°04.6'	Sirius	-1.4	258°29.4'	S 16°44.8'				
Hadar	+0.6	148°41.4'	S 60°27.8'	Canopus	-0.6	263°53.7'	S 52°42.6'				

h	Aries		Sun		Venus		Jupiter		Saturn		Mars	
	GHA	dec	GHA	dec	GHA	dec	GHA	dec	GHA	dec	GHA	dec
0	129°41.2'	S 17°35.3'	176°40.8'	S 17°35.3'	137°50.4'	S 4°31.7'	205°04.8'	S 22°42.9'	192°49.5'	S 21°07.6'	231°57.5'	S 22°56.0'
1	144°43.7'	S 17°34.6'	191°40.7'	S 17°34.6'	152°50.2'	S 4°30.4'	220°06.7'	S 22°42.8'	207°51.6'	S 21°07.5'	246°58.2'	S 22°56.2'
2	159°46.2'	S 17°33.9'	206°40.6'	S 17°33.9'	167°50.0'	S 4°29.1'	235°08.6'	S 22°42.8'	222°53.8'	S 21°07.5'	261°58.8'	S 22°56.4'
3	174°48.6'	S 17°33.2'	221°40.5'	S 17°33.2'	182°49.8'	S 4°27.9'	250°10.5'	S 22°42.7'	237°56.0'	S 21°07.4'	276°59.4'	S 22°56.6'
4	189°51.1'	S 17°32.6'	236°40.4'	S 17°32.6'	197°49.5'	S 4°26.6'	265°12.3'	S 22°42.7'	252°58.1'	S 21°07.4'	292°00.0'	S 22°56.7'
5	204°53.6'	S 17°31.9'	251°40.3'	S 17°31.9'	212°49.3'	S 4°25.3'	280°14.2'	S 22°42.6'	268°00.3'	S 21°07.3'	307°00.6'	S 22°56.9'
6	219°56.0'	S 17°31.2'	266°40.2'	S 17°31.2'	227°49.1'	S 4°24.0'	295°16.1'	S 22°42.6'	283°02.4'	S 21°07.3'	322°01.3'	S 22°57.1'
7	234°58.5'	S 17°30.5'	281°40.1'	S 17°30.5'	242°48.8'	S 4°22.7'	310°18.0'	S 22°42.5'	298°04.6'	S 21°07.2'	337°01.9'	S 22°57.3'
8	250°00.9'	S 17°29.8'	296°40.0'	S 17°29.8'	257°48.6'	S 4°21.4'	325°19.8'	S 22°42.5'	313°06.8'	S 21°07.2'	352°02.5'	S 22°57.4'
9	265°03.4'	S 17°29.1'	311°39.9'	S 17°29.1'	272°48.4'	S 4°20.1'	340°21.7'	S 22°42.4'	328°08.9'	S 21°07.1'	7°03.1'	S 22°57.6'
10	280°05.9'	S 17°28.4'	326°39.8'	S 17°28.4'	287°48.2'	S 4°18.8'	355°23.6'	S 22°42.4'	343°11.1'	S 21°07.1'	22°03.7'	S 22°57.8'
11	295°08.3'	S 17°27.7'	341°39.7'	S 17°27.7'	302°47.9'	S 4°17.5'	10°25.5'	S 22°42.3'	358°13.2'	S 21°07.0'	37°04.4'	S 22°58.0'
12	310°10.8'	S 17°27.0'	356°39.6'	S 17°27.0'	317°47.7'	S 4°16.2'	25°27.3'	S 22°42.3'	13°15.4'	S 21°07.0'	52°05.0'	S 22°58.1'
13	325°13.3'	S 17°26.3'	11°39.5'	S 17°26.3'	332°47.5'	S 4°14.9'	40°29.2'	S 22°42.2'	28°17.5'	S 21°06.9'	67°05.6'	S 22°58.3'
14	340°15.7'	S 17°25.6'	26°39.4'	S 17°25.6'	347°47.3'	S 4°13.6'	55°31.1'	S 22°42.2'	43°19.7'	S 21°06.9'	82°06.2'	S 22°58.5'
15	355°18.2'	S 17°24.9'	41°39.3'	S 17°24.9'	2°47.0'	S 4°12.3'	70°33.0'	S 22°42.1'	58°21.9'	S 21°06.8'	97°06.8'	S 22°58.6'
16	10°20.7'	S 17°24.2'	56°39.2'	S 17°24.2'	17°46.8'	S 4°11.0'	85°34.9'	S 22°42.1'	73°24.0'	S 21°06.8'	112°07.5'	S 22°58.8'
17	25°23.1'	S 17°23.5'	71°39.1'	S 17°23.5'	32°46.6'	S 4°09.8'	100°36.7'	S 22°42.0'	88°26.2'	S 21°06.7'	127°08.1'	S 22°59.0'
18	40°25.6'	S 17°22.8'	86°39.0'	S 17°22.8'	47°46.4'	S 4°08.5'	115°38.6'	S 22°42.0'	103°28.3'	S 21°06.7'	142°08.7'	S 22°59.2'
19	55°28.0'	S 17°22.1'	101°39.0'	S 17°22.1'	62°46.1'	S 4°07.2'	130°40.5'	S 22°41.9'	118°30.5'	S 21°06.6'	157°09.3'	S 22°59.3'
20	70°30.5'	S 17°21.4'	116°38.9'	S 17°21.4'	77°45.9'	S 4°05.9'	145°42.4'	S 22°41.9'	133°32.7'	S 21°06.6'	172°09.9'	S 22°59.5'
21	85°33.0'	S 17°20.7'	131°38.8'	S 17°20.7'	92°45.7'	S 4°04.6'	160°44.2'	S 22°41.8'	148°34.8'	S 21°06.5'	187°10.6'	S 22°59.7'
22	100°35.4'	S 17°20.0'	146°38.7'	S 17°20.0'	107°45.5'	S 4°03.3'	175°46.1'	S 22°41.8'	163°37.0'	S 21°06.5'	202°11.2'	S 22°59.8'
23	115°37.9'	S 17°19.3'	161°38.6'	S 17°19.3'	122°45.2'	S 4°02.0'	190°48.0'	S 22°41.7'	178°39.1'	S 21°06.4'	217°11.8'	S 23°00.0'
		SD 16.2' d 0.7'		v -0.2' d 1.3'		v 1.9' d 0.1'		v 2.2' d 0.0'		v 0.6' d -0.2'		
Mer. pass.		12 h 13 m 22 s		14 h 49 m		10 h 18 m		11 h 7 m		8 h 32 m		

h	Moon					Lunar distance							
	GHA	dec	v	d	HP	-Procyon	-Betelgeuse	-Capella	-Rigel	-Aldebaran	+Venus	+Fomalhaut	+Sun
0	111°15.8'	N 2°16.3'	16.3'	11.6'	54.1'	96°25.6'	70°30.9'	68°40.5'	61°10.6'	51°58.1'	27°24.8'	45°17.6'	67°24.0'
1	125°51.1'	N 2°27.9'	16.2'	11.6'	54.1'	95°57.5'	70°02.5'	68°14.0'	60°46.1'	51°28.6'	27°51.1'	45°44.6'	67°51.0'
2	140°26.3'	N 2°39.5'	16.2'	11.6'	54.1'	95°29.3'	69°34.1'	67°47.4'	60°21.6'	50°59.1'	28°17.4'	46°11.7'	68°18.0'
3	155°01.5'	N 2°51.2'	16.2'	11.6'	54.1'	95°01.1'	69°05.7'	67°20.9'	59°57.1'	50°29.6'	28°43.7'	46°38.8'	68°45.0'
4	169°36.8'	N 3°02.8'	16.2'	11.6'	54.1'	94°32.9'	68°37.3'	66°54.4'	59°32.7'	50°00.1'	29°10.1'	47°06.0'	69°12.1'
5	184°12.0'	N 3°14.4'	16.2'	11.6'	54.2'	94°04.7'	68°08.9'	66°27.9'	59°08.3'	49°30.5'	29°36.4'	47°33.2'	69°39.1'
6	198°47.2'	N 3°25.9'	16.2'	11.6'	54.2'	93°36.5'	67°40.5'	66°01.5'	58°44.0'	49°01.0'	30°02.8'	48°00.4'	70°06.1'
7	213°22.3'	N 3°37.5'	16.1'	11.6'	54.2'	93°08.3'	67°12.1'	65°35.0'	58°19.7'	48°31.5'	30°29.2'	48°27.7'	70°33.1'
8	227°57.5'	N 3°49.1'	16.1'	11.6'	54.2'	92°40.1'	66°43.7'	65°08.6'	57°55.4'	48°02.0'	30°55.6'	48°55.1'	71°00.2'
9	242°32.6'	N 4°00.6'	16.1'	11.5'	54.2'	92°11.8'	66°15.3'	64°42.2'	57°31.2'	47°32.4'	31°22.0'	49°22.5'	71°27.2'
10	257°07.7'	N 4°12.2'	16.1'	11.5'	54.2'	91°43.6'	65°46.9'	64°15.8'	57°07.0'	47°02.9'	31°48.4'	49°49.9'	71°54.3'
11	271°42.8'	N 4°23.7'	16.1'	11.5'	54.2'	91°15.3'	65°18.6'	63°49.4'	56°42.9'	46°33.3'	32°14.9'	50°17.3'	72°21.4'
12	286°17.8'	N 4°35.2'	16.0'	11.5'	54.2'	90°47.1'	64°50.2'	63°23.0'	56°18.9'	46°03.7'	32°41.3'	50°44.8'	72°48.4'
13	300°52.9'	N 4°46.7'	16.0'	11.5'	54.2'	90°18.8'	64°21.8'	62°56.7'	55°54.9'	45°34.1'	33°07.8'	51°12.4'	73°15.5'
14	315°27.9'	N 4°58.2'	16.0'	11.5'	54.2'	89°50.5'	63°53.4'	62°30.3'	55°30.9'	45°04.6'	33°34.3'	51°39.9'	73°42.6'
15	330°02.9'	N 5°09.7'	16.0'	11.5'	54.3'	89°22.2'	63°25.0'	62°04.0'	55°07.0'	44°35.0'	34°00.8'	52°07.5'	74°09.8'
16	344°37.8'	N 5°21.2'	15.9'	11.4'	54.3'	88°53.9'	62°56.6'	61°37.7'	54°43.1'	44°05.3'	34°27.3'	52°35.2'	74°36.9'
17	359°12.7'	N 5°32.6'	15.9'	11.4'	54.3'	88°25.6'	62°28.2'	61°11.4'	54°19.3'	43°35.7'	34°53.9'	53°02.9'	75°04.0'
18	13°47.6'	N 5°44.0'	15.9'	11.4'	54.3'	87°57.3'	61°59.8'	60°45.2'	53°55.6'	43°06.1'	35°20.4'	53°30.6'	75°31.2'
19	28°22.5'	N 5°55.4'	15.8'	11.4'	54.3'	87°28.9'	61°31.4'	60°18.9'	53°31.9'	42°36.5'	35°47.0'	53°58.3'	75°58.3'
20	42°57.3'	N 6°06.8'	15.8'	11.4'	54.3'	87°00.6'	61°03.1'	59°52.7'	53°08.3'	42°06.8'	36°13.6'	54°26.1'	76°25.5'
21	57°32.2'	N 6°18.2'	15.8'	11.4'	54.3'	86°32.2'	60°34.7'	59°26.5'	52°44.7'	41°37.1'	36°40.2'	54°54.0'	76°52.7'
22	72°06.9'	N 6°29.6'	15.7'	11.3'	54.3'	86°03.9'	60°06.3'	59°00.4'	52°21.2'	41°07.5'	37°06.8'	55°21.8'	77°19.9'
23	86°41.7'	N 6°40.9'	15.7'	11.3'	54.4'	85°35.5'	59°37.9'	58°34.2'	51°57.8'	40°37.8'	37°33.4'	55°49.7'	77°47.1'
Mer. pass.		17 h 3 m SD 14.8'		phase 31%									

Star	mag	SHA	dec	Star	mag	SHA	dec	Star	mag	SHA	dec
Fomalhaut	+1.2	15°19.2'	S 29°31.2'	Spica	+1.0	158°26.3'	S 11°15.9'	Betelgeuse	+0.5	270°56.1'	N 7°24.5'
Deneb	+1.2	49°28.9'	N 45°21.1'	Acrux	+0.8	173°03.9'	S 63°12.3'	Capella	+0.1	280°27.4'	N 46°01.1'
Altair	+0.8	62°04.1'	N 8°55.2'	Regulus	+1.4	207°38.4'	N 11°52.1'	Rigel	+0.2	281°07.4'	S 8°11.0'
Vega	+0.0	80°36.2'	N 38°48.0'	Pollux	+1.2	243°21.8'	N 27°58.6'	Aldebaran	+0.9	290°44.0'	N 16°32.8'
Antares	+1.1	112°20.8'	S 26°28.4'	Procyon	+0.4	244°54.6'	N 5°10.3'	Polaris	+2.0	315°43.9'	N 89°21.1'
Rigil Kent	-0.0	139°45.6'	S 60°54.7'	Adhara	+1.5	255°08.6'	S 29°00.2'	Achernar	+0.5	335°23.5'	S 57°08.5'
Arcturus	-0.1	145°51.5'	N 19°04.6'	Sirius	-1.4	258°29.4'	S 16°44.8'				
Hadar	+0.6	148°41.4'	S 60°27.8'	Canopus	-0.6	263°53.7'	S 52°42.6'				