

minutes

sec.	0	1	2	3	4	5	6	7	8	9
0	0°0,0'	0°15,0'	0°30,0'	0°45,0'	1°0,0'	1°15,0'	1°30,0'	1°45,0'	2°0,0'	2°15,0'
1	0°0,3'	0°15,3'	0°30,3'	0°45,3'	1°0,2'	1°15,3'	1°30,3'	1°45,3'	2°0,3'	2°15,3'
2	0°0,5'	0°15,5'	0°30,5'	0°45,5'	1°0,5'	1°15,5'	1°30,5'	1°45,5'	2°0,5'	2°15,5'
3	0°0,8'	0°15,8'	0°30,8'	0°45,8'	1°0,8'	1°15,8'	1°30,8'	1°45,8'	2°0,7'	2°15,8'
4	0°1,0'	0°16,0'	0°31,0'	0°46,0'	1°1,0'	1°16,0'	1°31,0'	1°46,0'	2°1,0'	2°16,0'
5	0°1,3'	0°16,3'	0°31,3'	0°46,3'	1°1,3'	1°16,3'	1°31,3'	1°46,3'	2°1,2'	2°16,3'
6	0°1,5'	0°16,5'	0°31,5'	0°46,5'	1°1,5'	1°16,5'	1°31,5'	1°46,5'	2°1,5'	2°16,5'
7	0°1,8'	0°16,8'	0°31,8'	0°46,8'	1°1,7'	1°16,8'	1°31,8'	1°46,8'	2°1,8'	2°16,8'
8	0°2,0'	0°17,0'	0°32,0'	0°47,0'	1°2,0'	1°17,0'	1°32,0'	1°47,0'	2°2,0'	2°17,0'
9	0°2,3'	0°17,3'	0°32,3'	0°47,3'	1°2,3'	1°17,3'	1°32,3'	1°47,3'	2°2,3'	2°17,3'
10	0°2,5'	0°17,5'	0°32,5'	0°47,5'	1°2,5'	1°17,5'	1°32,5'	1°47,5'	2°2,5'	2°17,5'
11	0°2,8'	0°17,8'	0°32,8'	0°47,8'	1°2,8'	1°17,8'	1°32,8'	1°47,8'	2°2,8'	2°17,8'
12	0°3,0'	0°18,0'	0°33,0'	0°48,0'	1°3,0'	1°18,0'	1°33,0'	1°48,0'	2°3,0'	2°18,0'
13	0°3,3'	0°18,3'	0°33,3'	0°48,3'	1°3,3'	1°18,3'	1°33,3'	1°48,3'	2°3,3'	2°18,3'
14	0°3,5'	0°18,5'	0°33,5'	0°48,5'	1°3,5'	1°18,5'	1°33,5'	1°48,5'	2°3,5'	2°18,5'
15	0°3,8'	0°18,8'	0°33,8'	0°48,8'	1°3,8'	1°18,8'	1°33,8'	1°48,8'	2°3,8'	2°18,8'
16	0°4,0'	0°19,0'	0°34,0'	0°49,0'	1°4,0'	1°19,0'	1°34,0'	1°49,0'	2°4,0'	2°19,0'
17	0°4,3'	0°19,3'	0°34,3'	0°49,3'	1°4,3'	1°19,3'	1°34,3'	1°49,3'	2°4,3'	2°19,3'
18	0°4,5'	0°19,5'	0°34,5'	0°49,5'	1°4,5'	1°19,5'	1°34,5'	1°49,5'	2°4,5'	2°19,5'
19	0°4,8'	0°19,8'	0°34,8'	0°49,8'	1°4,8'	1°19,8'	1°34,8'	1°49,8'	2°4,8'	2°19,8'
20	0°5,0'	0°20,0'	0°35,0'	0°50,0'	1°5,0'	1°20,0'	1°35,0'	1°50,0'	2°5,0'	2°20,0'
21	0°5,3'	0°20,3'	0°35,3'	0°50,3'	1°5,2'	1°20,3'	1°35,3'	1°50,3'	2°5,2'	2°20,3'
22	0°5,5'	0°20,5'	0°35,5'	0°50,5'	1°5,5'	1°20,5'	1°35,5'	1°50,5'	2°5,5'	2°20,5'
23	0°5,8'	0°20,8'	0°35,8'	0°50,8'	1°5,7'	1°20,8'	1°35,8'	1°50,8'	2°5,7'	2°20,8'
24	0°6,0'	0°21,0'	0°36,0'	0°51,0'	1°6,0'	1°21,0'	1°36,0'	1°51,0'	2°6,0'	2°21,0'
25	0°6,3'	0°21,3'	0°36,3'	0°51,3'	1°6,3'	1°21,3'	1°36,3'	1°51,3'	2°6,2'	2°21,3'
26	0°6,5'	0°21,5'	0°36,5'	0°51,5'	1°6,5'	1°21,5'	1°36,5'	1°51,5'	2°6,5'	2°21,5'
27	0°6,8'	0°21,8'	0°36,8'	0°51,8'	1°6,8'	1°21,8'	1°36,8'	1°51,8'	2°6,8'	2°21,8'
28	0°7,0'	0°22,0'	0°37,0'	0°52,0'	1°7,0'	1°22,0'	1°37,0'	1°52,0'	2°7,0'	2°22,0'
29	0°7,3'	0°22,3'	0°37,3'	0°52,3'	1°7,3'	1°22,3'	1°37,3'	1°52,3'	2°7,3'	2°22,3'
30	0°7,5'	0°22,5'	0°37,5'	0°52,5'	1°7,5'	1°22,5'	1°37,5'	1°52,5'	2°7,5'	2°22,5'
31	0°7,8'	0°22,8'	0°37,8'	0°52,8'	1°7,8'	1°22,8'	1°37,8'	1°52,8'	2°7,8'	2°22,8'
32	0°8,0'	0°23,0'	0°38,0'	0°53,0'	1°8,0'	1°23,0'	1°38,0'	1°53,0'	2°8,0'	2°23,0'
33	0°8,3'	0°23,3'	0°38,3'	0°53,3'	1°8,3'	1°23,3'	1°38,3'	1°53,3'	2°8,2'	2°23,3'
34	0°8,5'	0°23,5'	0°38,5'	0°53,5'	1°8,5'	1°23,5'	1°38,5'	1°53,5'	2°8,5'	2°23,5'
35	0°8,8'	0°23,8'	0°38,8'	0°53,8'	1°8,8'	1°23,8'	1°38,8'	1°53,8'	2°8,7'	2°23,8'
36	0°9,0'	0°24,0'	0°39,0'	0°54,0'	1°9,0'	1°24,0'	1°39,0'	1°54,0'	2°9,0'	2°24,0'
37	0°9,3'	0°24,3'	0°39,3'	0°54,3'	1°9,2'	1°24,3'	1°39,3'	1°54,3'	2°9,3'	2°24,3'
38	0°9,5'	0°24,5'	0°39,5'	0°54,5'	1°9,5'	1°24,5'	1°39,5'	1°54,5'	2°9,5'	2°24,5'
39	0°9,8'	0°24,8'	0°39,8'	0°54,8'	1°9,8'	1°24,8'	1°39,8'	1°54,8'	2°9,8'	2°24,8'
40	0°10,0'	0°25,0'	0°40,0'	0°55,0'	1°10,0'	1°25,0'	1°40,0'	1°55,0'	2°10,0'	2°25,0'
41	0°10,3'	0°25,3'	0°40,3'	0°55,3'	1°10,3'	1°25,3'	1°40,3'	1°55,3'	2°10,3'	2°25,3'
42	0°10,5'	0°25,5'	0°40,5'	0°55,5'	1°10,5'	1°25,5'	1°40,5'	1°55,5'	2°10,5'	2°25,5'
43	0°10,8'	0°25,8'	0°40,8'	0°55,8'	1°10,8'	1°25,8'	1°40,8'	1°55,8'	2°10,8'	2°25,8'
44	0°11,0'	0°26,0'	0°41,0'	0°56,0'	1°11,0'	1°26,0'	1°41,0'	1°56,0'	2°11,0'	2°26,0'
45	0°11,3'	0°26,3'	0°41,3'	0°56,3'	1°11,3'	1°26,3'	1°41,3'	1°56,3'	2°11,3'	2°26,3'
46	0°11,5'	0°26,5'	0°41,5'	0°56,5'	1°11,5'	1°26,5'	1°41,5'	1°56,5'	2°11,5'	2°26,5'
47	0°11,8'	0°26,8'	0°41,8'	0°56,8'	1°11,8'	1°26,8'	1°41,8'	1°56,8'	2°11,8'	2°26,8'
48	0°12,0'	0°27,0'	0°42,0'	0°57,0'	1°12,0'	1°27,0'	1°42,0'	1°57,0'	2°12,0'	2°27,0'
49	0°12,3'	0°27,3'	0°42,3'	0°57,3'	1°12,3'	1°27,3'	1°42,3'	1°57,3'	2°12,3'	2°27,3'
50	0°12,5'	0°27,5'	0°42,5'	0°57,5'	1°12,5'	1°27,5'	1°42,5'	1°57,5'	2°12,5'	2°27,5'
51	0°12,8'	0°27,8'	0°42,8'	0°57,8'	1°12,8'	1°27,8'	1°42,8'	1°57,8'	2°12,8'	2°27,8'
52	0°13,0'	0°28,0'	0°43,0'	0°58,0'	1°13,0'	1°28,0'	1°43,0'	1°58,0'	2°13,0'	2°28,0'
53	0°13,3'	0°28,3'	0°43,3'	0°58,3'	1°13,3'	1°28,3'	1°43,3'	1°58,3'	2°13,3'	2°28,3'
54	0°13,5'	0°28,5'	0°43,5'	0°58,5'	1°13,5'	1°28,5'	1°43,5'	1°58,5'	2°13,5'	2°28,5'
55	0°13,8'	0°28,8'	0°43,8'	0°58,8'	1°13,8'	1°28,8'	1°43,8'	1°58,8'	2°13,8'	2°28,8'
56	0°14,0'	0°29,0'	0°44,0'	0°59,0'	1°14,0'	1°29,0'	1°44,0'	1°59,0'	2°14,0'	2°29,0'
57	0°14,3'	0°29,3'	0°44,3'	0°59,3'	1°14,3'	1°29,3'	1°44,3'	1°59,3'	2°14,3'	2°29,3'
58	0°14,5'	0°29,5'	0°44,5'	0°59,5'	1°14,5'	1°29,5'	1°44,5'	1°59,5'	2°14,5'	2°29,5'
59	0°14,8'	0°29,8'	0°44,8'	0°59,8'	1°14,8'	1°29,8'	1°44,8'	1°59,8'	2°14,8'	2°29,8'

	4	5	6	7	8	9	10	11
15	60°	75°	90°	105°	120°	135°	150°	165°

sec.	10	11	12	13	14	15	16	17	18	19
0	2°30,0'	2°45,0'	3°0,0'	3°15,0'	3°30,0'	3°45,0'	4°0,0'	4°15,0'	4°30,0'	4°45,0'
1	2°30,3'	2°45,3'	3°0,2'	3°15,3'	3°30,3'	3°45,3'	4°0,2'	4°15,3'	4°30,3'	4°45,3'
2	2°30,5'	2°45,5'	3°0,5'	3°15,5'	3°30,5'	3°45,5'	4°0,5'	4°15,5'	4°30,5'	4°45,5'
3	2°30,8'	2°45,8'	3°0,8'	3°15,8'	3°30,8'	3°45,8'	4°0,8'	4°15,8'	4°30,8'	4°45,8'
4	2°31,0'	2°46,0'	3°1,0'	3°16,0'	3°31,0'	3°46,0'	4°1,0'	4°16,0'	4°31,0'	4°46,0'
5	2°31,3'	2°46,3'	3°1,3'	3°16,3'	3°31,3'	3°46,3'	4°1,2'	4°16,3'	4°31,3'	4°46,3'
6	2°31,5'	2°46,5'	3°1,5'	3°16,5'	3°31,5'	3°46,5'	4°1,5'	4°16,5'	4°31,5'	4°46,5'
7	2°31,8'	2°46,8'	3°1,8'	3°16,8'	3°31,8'	3°46,8'	4°1,8'	4°16,8'	4°31,8'	4°46,8'
8	2°32,0'	2°47,0'	3°2,0'	3°17,0'	3°32,0'	3°47,0'	4°2,0'	4°17,0'	4°32,0'	4°47,0'
9	2°32,3'	2°47,3'	3°2,3'	3°17,3'	3°32,3'	3°47,3'	4°2,2'	4°17,3'	4°32,3'	4°47,3'
10	2°32,5'	2°47,5'	3°2,5'	3°17,5'	3°32,5'	3°47,5'	4°2,5'	4°17,5'	4°32,5'	4°47,5'
11	2°32,8'	2°47,8'	3°2,8'	3°17,8'	3°32,8'	3°47,8'	4°2,7'	4°17,8'	4°32,8'	4°47,8'
12	2°33,0'	2°48,0'	3°3,0'	3°18,0'	3°33,0'	3°48,0'	4°3,0'	4°18,0'	4°33,0'	4°48,0'
13	2°33,3'	2°48,3'	3°3,3'	3°18,3'	3°33,3'	3°48,3'	4°3,3'	4°18,3'	4°33,3'	4°48,3'
14	2°33,5'	2°48,5'	3°3,5'	3°18,5'	3°33,5'	3°48,5'	4°3,5'	4°18,5'	4°33,5'	4°48,5'
15	2°33,8'	2°48,8'	3°3,8'	3°18,8'	3°33,8'	3°48,8'	4°3,8'	4°18,8'	4°33,8'	4°48,8'
16	2°34,0'	2°49,0'	3°4,0'	3°19,0'	3°34,0'	3°49,0'	4°4,0'	4°19,0'	4°34,0'	4°49,0'
17	2°34,3'	2°49,3'	3°4,3'	3°19,3'	3°34,3'	3°49,3'	4°4,3'	4°19,3'	4°34,3'	4°49,3'
18	2°34,5'	2°49,5'	3°4,5'	3°19,5'	3°34,5'	3°49,5'	4°4,5'	4°19,5'	4°34,5'	4°49,5'
19	2°34,8'	2°49,8'	3°4,8'	3°19,8'	3°34,8'	3°49,8'	4°4,8'	4°19,8'	4°34,8'	4°49,8'
20	2°35,0'	2°50,0'	3°5,0'	3°20,0'	3°35,0'	3°50,0'	4°5,0'	4°20,0'	4°35,0'	4°50,0'
21	2°35,3'	2°50,3'	3°5,2'	3°20,3'	3°35,3'	3°50,3'	4°5,3'	4°20,3'	4°35,3'	4°50,3'
22	2°35,5'	2°50,5'	3°5,5'	3°20,5'	3°35,5'	3°50,5'	4°5,5'	4°20,5'	4°35,5'	4°50,5'
23	2°35,8'	2°50,8'	3°5,8'	3°20,8'	3°35,8'	3°50,8'	4°5,7'	4°20,8'	4°35,8'	4°50,8'
24	2°36,0'	2°51,0'	3°6,0'	3°21,0'	3°36,0'	3°51,0'	4°6,0'	4°21,0'	4°36,0'	4°51,0'
25	2°36,3'	2°51,3'	3°6,2'	3°21,3'	3°36,3'	3°51,3'	4°6,3'	4°21,3'	4°36,3'	4°51,3'
26	2°36,5'	2°51,5'	3°6,5'	3°21,5'	3°36,5'	3°51,5'	4°6,5'	4°21,5'	4°36,5'	4°51,5'
27	2°36,8'	2°51,8'	3°6,7'	3°21,8'	3°36,8'	3°51,8'	4°6,7'	4°21,8'	4°36,8'	4°51,8'
28	2°37,0'	2°52,0'	3°7,0'	3°22,0'	3°37,0'	3°52,0'	4°7,0'	4°22,0'	4°37,0'	4°52,0'
29	2°37,3'	2°52,3'	3°7,2'	3°22,3'	3°37,3'	3°52,3'	4°7,2'	4°22,3'	4°37,3'	4°52,3'
30	2°37,5'	2°52,5'	3°7,5'	3°22,5'	3°37,5'	3°52,5'	4°7,5'	4°22,5'	4°37,5'	4°52,5'
31	2°37,8'	2°52,8'	3°7,7'	3°22,8'	3°37,8'	3°52,8'	4°7,7'	4°22,8'	4°37,8'	4°52,8'
32	2°38,0'	2°53,0'	3°8,0'	3°23,0'	3°38,0'	3°53,0'	4°8,0'	4°23,0'	4°38,0'	4°53,0'
33	2°38,3'	2°53,3'	3°8,3'	3°23,3'	3°38,3'	3°53,3'	4°8,3'	4°23,3'	4°38,3'	4°53,3'
34	2°38,5'	2°53,5'	3°8,5'	3°23,5'	3°38,5'	3°53,5'	4°8,5'	4°23,5'	4°38,5'	4°53,5'
35	2°38,8'	2°53,8'	3°8,8'	3°23,8'	3°38,8'	3°53,8'	4°8,8'	4°23,8'	4°38,8'	4°53,8'
36	2°39,0'	2°54,0'	3°9,0'	3°24,0'	3°39,0'	3°54,0'	4°9,0'	4°24,0'	4°39,0'	4°54,0'
37	2°39,3'	2°54,3'	3°9,3'	3°24,3'	3°39,3'	3°54,3'	4°9,3'	4°24,3'	4°39,3'	4°54,3'
38	2°39,5'	2°54,5'	3°9,5'	3°24,5'	3°39,5'	3°54,5'	4°9,5'	4°24,5'	4°39,5'	4°54,5'
39	2°39,8'	2°54,8'	3°9,8'	3°24,8'	3°39,8'	3°54,8'	4°9,8'	4°24,8'	4°39,8'	4°54,8'
40	2°40,0'	2°55,0'	3°10,0'	3°25,0'	3°40,0'	3°55,0'	4°10,0'	4°25,0'	4°40,0'	4°55,0'
41	2°40,3'	2°55,3'	3°10,3'	3°25,3'	3°40,3'	3°55,3'	4°10,3'	4°25,3'	4°40,3'	4°55,3'
42	2°40,5'	2°55,5'	3°10,5'	3°25,5'	3°40,5'	3°55,5'	4°10,5'	4°25,5'	4°40,5'	4°55,5'
43	2°40,8'	2°55,8'	3°10,8'	3°25,8'	3°40,8'	3°55,8'	4°10,8'	4°25,8'	4°40,8'	4°55,8'
44	2°41,0'	2°56,0'	3°11,0'	3°26,0'	3°41,0'	3°56,0'	4°11,0'	4°26,0'	4°41,0'	4°56,0'
45	2°41,3'	2°56,3'	3°11,3'	3°26,3'	3°41,3'	3°56,3'	4°11,3'	4°26,3'	4°41,3'	4°56,3'
46	2°41,5'	2°56,5'	3°11,5'	3°26,5'	3°41,5'	3°56,5'	4°11,5'	4°26,5'	4°41,5'	4°56,5'
47	2°41,8'	2°56,8'	3°11,8'	3°26,8'	3°41,8'	3°56,8'	4°11,8'	4°26,8'	4°41,8'	4°56,8'
48	2°42,0'	2°57,0'	3°12,0'	3°27,0'	3°42,0'	3°57,0'	4°12,0'	4°27,0'	4°42,0'	4°57,0'
49	2°42,3'	2°57,3'	3°12,3'	3°27,3'	3°42,3'	3°57,3'	4°12,3'	4°27,3'	4°42,3'	4°57,3'
50	2°42,5'	2°57,5'	3°12,5'	3°27,5'	3°42,5'	3°57,5'	4°12,5'	4°27,5'	4°42,5'	4°57,5'
51	2°42,8'	2°57,8'	3°12,8'	3°27,8'	3°42,8'	3°57,8'	4°12,8'	4°27,8'	4°42,8'	4°57,8'
52	2°43,0'	2°58,0'	3°13,0'	3°28,0'	3°43,0'	3°58,0'	4°13,0'	4°28,0'	4°43,0'	4°58,0'
53	2°43,3'	2°58,3'	3°13,3'	3°28,3'	3°43,3'	3°58,3'	4°13,3'	4°28,3'	4°43,3'	4°58,3'
54	2°43,5'	2°58,5'	3°13,5'	3°28,5'	3°43,5'	3°58,5'	4°13,5'	4°28,5'	4°43,5'	4°58,5'
55	2°43,8'	2°58,8'	3°13,8'	3°28,8'	3°43,8'	3°58,8'	4°13,8'	4°28,8'	4°43,8'	4°58,8'
56	2°44,0'	2°59,0'	3°14,0'	3°29,0'	3°44,0'	3°59,0'	4°14,0'	4°29,0'	4°44,0'	4°59,0'
57	2°44,3'	2°59,3'	3°14,3'	3°29,3'	3°44,3'	3°59,3'	4°14,3'	4°29,3'	4°44,3'	4°59,3'
58	2°44,5'	2°59,5'	3°14,5'	3°29,5'	3°44,5'	3°59,5'	4°14,5'	4°29,5'	4°44,5'	4°59,5'
59	2°44,8'	2°59,8'	3°14,8'	3°29,8'	3°44,8'	3°59,8'	4°14,8'	4°29,8'	4°44,8'	4°59,8'

	12	13	14	15	16	17	18	19
	180°	195°	210°	225°	240°	255°	270°	285°

sec.	20	21	22	23	24	25	26	27	28	29
0	5°0,0'	5°15,0'	5°30,0'	5°45,0'	6°0,0'	6°15,0'	6°30,0'	6°45,0'	7°0,0'	7°15,0'
1	5°0,3'	5°15,3'	5°30,3'	5°45,3'	6°0,2'	6°15,3'	6°30,3'	6°45,3'	7°0,2'	7°15,3'
2	5°0,5'	5°15,5'	5°30,5'	5°45,5'	6°0,5'	6°15,5'	6°30,5'	6°45,5'	7°0,5'	7°15,5'
3	5°0,8'	5°15,8'	5°30,8'	5°45,8'	6°0,8'	6°15,8'	6°30,8'	6°45,8'	7°0,8'	7°15,8'
4	5°1,0'	5°16,0'	5°31,0'	5°46,0'	6°1,0'	6°16,0'	6°31,0'	6°46,0'	7°1,0'	7°16,0'
5	5°1,2'	5°16,3'	5°31,3'	5°46,3'	6°1,3'	6°16,3'	6°31,3'	6°46,3'	7°1,2'	7°16,3'
6	5°1,5'	5°16,5'	5°31,5'	5°46,5'	6°1,5'	6°16,5'	6°31,5'	6°46,5'	7°1,5'	7°16,5'
7	5°1,8'	5°16,8'	5°31,8'	5°46,8'	6°1,8'	6°16,8'	6°31,8'	6°46,8'	7°1,8'	7°16,8'
8	5°2,0'	5°17,0'	5°32,0'	5°47,0'	6°2,0'	6°17,0'	6°32,0'	6°47,0'	7°2,0'	7°17,0'
9	5°2,2'	5°17,3'	5°32,3'	5°47,3'	6°2,3'	6°17,3'	6°32,3'	6°47,3'	7°2,3'	7°17,3'
10	5°2,5'	5°17,5'	5°32,5'	5°47,5'	6°2,5'	6°17,5'	6°32,5'	6°47,5'	7°2,5'	7°17,5'
11	5°2,8'	5°17,8'	5°32,8'	5°47,8'	6°2,8'	6°17,8'	6°32,8'	6°47,8'	7°2,8'	7°17,8'
12	5°3,0'	5°18,0'	5°33,0'	5°48,0'	6°3,0'	6°18,0'	6°33,0'	6°48,0'	7°3,0'	7°18,0'
13	5°3,2'	5°18,3'	5°33,3'	5°48,3'	6°3,2'	6°18,3'	6°33,3'	6°48,3'	7°3,3'	7°18,3'
14	5°3,5'	5°18,5'	5°33,5'	5°48,5'	6°3,5'	6°18,5'	6°33,5'	6°48,5'	7°3,5'	7°18,5'
15	5°3,8'	5°18,8'	5°33,8'	5°48,8'	6°3,8'	6°18,8'	6°33,8'	6°48,8'	7°3,8'	7°18,8'
16	5°4,0'	5°19,0'	5°34,0'	5°49,0'	6°4,0'	6°19,0'	6°34,0'	6°49,0'	7°4,0'	7°19,0'
17	5°4,2'	5°19,3'	5°34,3'	5°49,3'	6°4,2'	6°19,3'	6°34,3'	6°49,3'	7°4,3'	7°19,3'
18	5°4,5'	5°19,5'	5°34,5'	5°49,5'	6°4,5'	6°19,5'	6°34,5'	6°49,5'	7°4,5'	7°19,5'
19	5°4,8'	5°19,8'	5°34,8'	5°49,8'	6°4,8'	6°19,8'	6°34,8'	6°49,8'	7°4,8'	7°19,8'
20	5°5,0'	5°20,0'	5°35,0'	5°50,0'	6°5,0'	6°20,0'	6°35,0'	6°50,0'	7°5,0'	7°20,0'
21	5°5,3'	5°20,3'	5°35,3'	5°50,3'	6°5,2'	6°20,3'	6°35,3'	6°50,3'	7°5,2'	7°20,3'
22	5°5,5'	5°20,5'	5°35,5'	5°50,5'	6°5,5'	6°20,5'	6°35,5'	6°50,5'	7°5,5'	7°20,5'
23	5°5,7'	5°20,8'	5°35,8'	5°50,8'	6°5,7'	6°20,8'	6°35,8'	6°50,8'	7°5,7'	7°20,8'
24	5°6,0'	5°21,0'	5°36,0'	5°51,0'	6°6,0'	6°21,0'	6°36,0'	6°51,0'	7°6,0'	7°21,0'
25	5°6,3'	5°21,3'	5°36,3'	5°51,3'	6°6,3'	6°21,3'	6°36,3'	6°51,3'	7°6,2'	7°21,3'
26	5°6,5'	5°21,5'	5°36,5'	5°51,5'	6°6,5'	6°21,5'	6°36,5'	6°51,5'	7°6,5'	7°21,5'
27	5°6,7'	5°21,8'	5°36,8'	5°51,8'	6°6,7'	6°21,8'	6°36,8'	6°51,8'	7°6,7'	7°21,8'
28	5°7,0'	5°22,0'	5°37,0'	5°52,0'	6°7,0'	6°22,0'	6°37,0'	6°52,0'	7°7,0'	7°22,0'
29	5°7,3'	5°22,3'	5°37,3'	5°52,3'	6°7,3'	6°22,3'	6°37,3'	6°52,3'	7°7,3'	7°22,3'
30	5°7,5'	5°22,5'	5°37,5'	5°52,5'	6°7,5'	6°22,5'	6°37,5'	6°52,5'	7°7,5'	7°22,5'
31	5°7,7'	5°22,8'	5°37,8'	5°52,8'	6°7,7'	6°22,8'	6°37,8'	6°52,8'	7°7,8'	7°22,8'
32	5°8,0'	5°23,0'	5°38,0'	5°53,0'	6°8,0'	6°23,0'	6°38,0'	6°53,0'	7°8,0'	7°23,0'
33	5°8,3'	5°23,3'	5°38,3'	5°53,3'	6°8,3'	6°23,3'	6°38,3'	6°53,3'	7°8,3'	7°23,3'
34	5°8,5'	5°23,5'	5°38,5'	5°53,5'	6°8,5'	6°23,5'	6°38,5'	6°53,5'	7°8,5'	7°23,5'
35	5°8,7'	5°23,8'	5°38,8'	5°53,8'	6°8,7'	6°23,8'	6°38,8'	6°53,8'	7°8,7'	7°23,8'
36	5°9,0'	5°24,0'	5°39,0'	5°54,0'	6°9,0'	6°24,0'	6°39,0'	6°54,0'	7°9,0'	7°24,0'
37	5°9,3'	5°24,3'	5°39,3'	5°54,3'	6°9,3'	6°24,3'	6°39,3'	6°54,3'	7°9,3'	7°24,3'
38	5°9,5'	5°24,5'	5°39,5'	5°54,5'	6°9,5'	6°24,5'	6°39,5'	6°54,5'	7°9,5'	7°24,5'
39	5°9,8'	5°24,8'	5°39,8'	5°54,8'	6°9,7'	6°24,8'	6°39,8'	6°54,8'	7°9,7'	7°24,8'
40	5°10,0'	5°25,0'	5°40,0'	5°55,0'	6°10,0'	6°25,0'	6°40,0'	6°55,0'	7°10,0'	7°25,0'
41	5°10,3'	5°25,3'	5°40,3'	5°55,3'	6°10,3'	6°25,3'	6°40,3'	6°55,3'	7°10,3'	7°25,3'
42	5°10,5'	5°25,5'	5°40,5'	5°55,5'	6°10,5'	6°25,5'	6°40,5'	6°55,5'	7°10,5'	7°25,5'
43	5°10,8'	5°25,8'	5°40,8'	5°55,8'	6°10,8'	6°25,8'	6°40,8'	6°55,8'	7°10,8'	7°25,8'
44	5°11,0'	5°26,0'	5°41,0'	5°56,0'	6°11,0'	6°26,0'	6°41,0'	6°56,0'	7°11,0'	7°26,0'
45	5°11,3'	5°26,3'	5°41,3'	5°56,3'	6°11,3'	6°26,3'	6°41,3'	6°56,3'	7°11,3'	7°26,3'
46	5°11,5'	5°26,5'	5°41,5'	5°56,5'	6°11,5'	6°26,5'	6°41,5'	6°56,5'	7°11,5'	7°26,5'
47	5°11,8'	5°26,8'	5°41,8'	5°56,8'	6°11,8'	6°26,8'	6°41,8'	6°56,8'	7°11,8'	7°26,8'
48	5°12,0'	5°27,0'	5°42,0'	5°57,0'	6°12,0'	6°27,0'	6°42,0'	6°57,0'	7°12,0'	7°27,0'
49	5°12,3'	5°27,3'	5°42,3'	5°57,3'	6°12,3'	6°27,3'	6°42,3'	6°57,3'	7°12,3'	7°27,3'
50	5°12,5'	5°27,5'	5°42,5'	5°57,5'	6°12,5'	6°27,5'	6°42,5'	6°57,5'	7°12,5'	7°27,5'
51	5°12,8'	5°27,8'	5°42,8'	5°57,8'	6°12,8'	6°27,8'	6°42,8'	6°57,8'	7°12,8'	7°27,8'
52	5°13,0'	5°28,0'	5°43,0'	5°58,0'	6°13,0'	6°28,0'	6°43,0'	6°58,0'	7°13,0'	7°28,0'
53	5°13,3'	5°28,3'	5°43,3'	5°58,3'	6°13,3'	6°28,3'	6°43,3'	6°58,3'	7°13,3'	7°28,3'
54	5°13,5'	5°28,5'	5°43,5'	5°58,5'	6°13,5'	6°28,5'	6°43,5'	6°58,5'	7°13,5'	7°28,5'
55	5°13,8'	5°28,8'	5°43,8'	5°58,8'	6°13,8'	6°28,8'	6°43,8'	6°58,8'	7°13,8'	7°28,8'
56	5°14,0'	5°29,0'	5°44,0'	5°59,0'	6°14,0'	6°29,0'	6°44,0'	6°59,0'	7°14,0'	7°29,0'
57	5°14,3'	5°29,3'	5°44,3'	5°59,3'	6°14,3'	6°29,3'	6°44,3'	6°59,3'	7°14,3'	7°29,3'
58	5°14,5'	5°29,5'	5°44,5'	5°59,5'	6°14,5'	6°29,5'	6°44,5'	6°59,5'	7°14,5'	7°29,5'
59	5°14,8'	5°29,8'	5°44,8'	5°59,8'	6°14,8'	6°29,8'	6°44,8'	6°59,8'	7°14,8'	7°29,8'

sec.	30	31	32	33	34	35	36	37	38	39
0	7°30,0'	7°45,0'	8°0,0'	8°15,0'	8°30,0'	8°45,0'	9°0,0'	9°15,0'	9°30,0'	9°45,0'
1	7°30,3'	7°45,3'	8°0,2'	8°15,3'	8°30,3'	8°45,3'	9°0,2'	9°15,3'	9°30,3'	9°45,3'
2	7°30,5'	7°45,5'	8°0,5'	8°15,5'	8°30,5'	8°45,5'	9°0,5'	9°15,5'	9°30,5'	9°45,5'
3	7°30,8'	7°45,8'	8°0,7'	8°15,8'	8°30,8'	8°45,8'	9°0,7'	9°15,8'	9°30,8'	9°45,8'
4	7°31,0'	7°46,0'	8°1,0'	8°16,0'	8°31,0'	8°46,0'	9°1,0'	9°16,0'	9°31,0'	9°46,0'
5	7°31,3'	7°46,3'	8°1,3'	8°16,3'	8°31,2'	8°46,3'	9°1,2'	9°16,3'	9°31,2'	9°46,3'
6	7°31,5'	7°46,5'	8°1,5'	8°16,5'	8°31,5'	8°46,5'	9°1,5'	9°16,5'	9°31,5'	9°46,5'
7	7°31,8'	7°46,8'	8°1,8'	8°16,8'	8°31,8'	8°46,8'	9°1,7'	9°16,8'	9°31,8'	9°46,8'
8	7°32,0'	7°47,0'	8°2,0'	8°17,0'	8°32,0'	8°47,0'	9°2,0'	9°17,0'	9°32,0'	9°47,0'
9	7°32,3'	7°47,3'	8°2,3'	8°17,3'	8°32,3'	8°47,3'	9°2,3'	9°17,3'	9°32,3'	9°47,3'
10	7°32,5'	7°47,5'	8°2,5'	8°17,5'	8°32,5'	8°47,5'	9°2,5'	9°17,5'	9°32,5'	9°47,5'
11	7°32,8'	7°47,8'	8°2,8'	8°17,8'	8°32,8'	8°47,8'	9°2,8'	9°17,8'	9°32,8'	9°47,8'
12	7°33,0'	7°48,0'	8°3,0'	8°18,0'	8°33,0'	8°48,0'	9°3,0'	9°18,0'	9°33,0'	9°48,0'
13	7°33,3'	7°48,3'	8°3,3'	8°18,3'	8°33,3'	8°48,3'	9°3,3'	9°18,3'	9°33,3'	9°48,3'
14	7°33,5'	7°48,5'	8°3,5'	8°18,5'	8°33,5'	8°48,5'	9°3,5'	9°18,5'	9°33,5'	9°48,5'
15	7°33,8'	7°48,8'	8°3,8'	8°18,8'	8°33,8'	8°48,8'	9°3,8'	9°18,8'	9°33,8'	9°48,8'
16	7°34,0'	7°49,0'	8°4,0'	8°19,0'	8°34,0'	8°49,0'	9°4,0'	9°19,0'	9°34,0'	9°49,0'
17	7°34,3'	7°49,3'	8°4,2'	8°19,3'	8°34,3'	8°49,3'	9°4,3'	9°19,3'	9°34,3'	9°49,3'
18	7°34,5'	7°49,5'	8°4,5'	8°19,5'	8°34,5'	8°49,5'	9°4,5'	9°19,5'	9°34,5'	9°49,5'
19	7°34,8'	7°49,8'	8°4,8'	8°19,7'	8°34,8'	8°49,7'	9°4,8'	9°19,7'	9°34,8'	9°49,7'
20	7°35,0'	7°50,0'	8°5,0'	8°20,0'	8°35,0'	8°50,0'	9°5,0'	9°20,0'	9°35,0'	9°50,0'
21	7°35,3'	7°50,3'	8°5,3'	8°20,2'	8°35,3'	8°50,2'	9°5,3'	9°20,3'	9°35,3'	9°50,3'
22	7°35,5'	7°50,5'	8°5,5'	8°20,5'	8°35,5'	8°50,5'	9°5,5'	9°20,5'	9°35,5'	9°50,5'
23	7°35,8'	7°50,8'	8°5,7'	8°20,8'	8°35,8'	8°50,8'	9°5,7'	9°20,8'	9°35,8'	9°50,8'
24	7°36,0'	7°51,0'	8°6,0'	8°21,0'	8°36,0'	8°51,0'	9°6,0'	9°21,0'	9°36,0'	9°51,0'
25	7°36,3'	7°51,3'	8°6,2'	8°21,3'	8°36,3'	8°51,3'	9°6,2'	9°21,3'	9°36,3'	9°51,3'
26	7°36,5'	7°51,5'	8°6,5'	8°21,5'	8°36,5'	8°51,5'	9°6,5'	9°21,5'	9°36,5'	9°51,5'
27	7°36,7'	7°51,8'	8°6,8'	8°21,8'	8°36,8'	8°51,8'	9°6,8'	9°21,7'	9°36,8'	9°51,7'
28	7°37,0'	7°52,0'	8°7,0'	8°22,0'	8°37,0'	8°52,0'	9°7,0'	9°22,0'	9°37,0'	9°52,0'
29	7°37,3'	7°52,3'	8°7,3'	8°22,3'	8°37,3'	8°52,3'	9°7,3'	9°22,3'	9°37,3'	9°52,2'
30	7°37,5'	7°52,5'	8°7,5'	8°22,5'	8°37,5'	8°52,5'	9°7,5'	9°22,5'	9°37,5'	9°52,5'
31	7°37,8'	7°52,8'	8°7,7'	8°22,8'	8°37,8'	8°52,8'	9°7,7'	9°22,8'	9°37,8'	9°52,8'
32	7°38,0'	7°53,0'	8°8,0'	8°23,0'	8°38,0'	8°53,0'	9°8,0'	9°23,0'	9°38,0'	9°53,0'
33	7°38,3'	7°53,3'	8°8,2'	8°23,3'	8°38,3'	8°53,3'	9°8,2'	9°23,3'	9°38,3'	9°53,3'
34	7°38,5'	7°53,5'	8°8,5'	8°23,5'	8°38,5'	8°53,5'	9°8,5'	9°23,5'	9°38,5'	9°53,5'
35	7°38,8'	7°53,8'	8°8,7'	8°23,8'	8°38,7'	8°53,8'	9°8,8'	9°23,8'	9°38,8'	9°53,8'
36	7°39,0'	7°54,0'	8°9,0'	8°24,0'	8°39,0'	8°54,0'	9°9,0'	9°24,0'	9°39,0'	9°54,0'
37	7°39,3'	7°54,3'	8°9,3'	8°24,3'	8°39,3'	8°54,3'	9°9,3'	9°24,3'	9°39,3'	9°54,3'
38	7°39,5'	7°54,5'	8°9,5'	8°24,5'	8°39,5'	8°54,5'	9°9,5'	9°24,5'	9°39,5'	9°54,5'
39	7°39,8'	7°54,8'	8°9,7'	8°24,8'	8°39,8'	8°54,8'	9°9,7'	9°24,8'	9°39,8'	9°54,8'
40	7°40,0'	7°55,0'	8°10,0'	8°25,0'	8°40,0'	8°55,0'	9°10,0'	9°25,0'	9°40,0'	9°55,0'
41	7°40,3'	7°55,3'	8°10,3'	8°25,3'	8°40,3'	8°55,3'	9°10,3'	9°25,3'	9°40,3'	9°55,3'
42	7°40,5'	7°55,5'	8°10,5'	8°25,5'	8°40,5'	8°55,5'	9°10,5'	9°25,5'	9°40,5'	9°55,5'
43	7°40,8'	7°55,8'	8°10,8'	8°25,8'	8°40,7'	8°55,8'	9°10,7'	9°25,8'	9°40,7'	9°55,8'
44	7°41,0'	7°56,0'	8°11,0'	8°26,0'	8°41,0'	8°56,0'	9°11,0'	9°26,0'	9°41,0'	9°56,0'
45	7°41,2'	7°56,3'	8°11,3'	8°26,3'	8°41,3'	8°56,3'	9°11,3'	9°26,3'	9°41,3'	9°56,3'
46	7°41,5'	7°56,5'	8°11,5'	8°26,5'	8°41,5'	8°56,5'	9°11,5'	9°26,5'	9°41,5'	9°56,5'
47	7°41,8'	7°56,8'	8°11,8'	8°26,8'	8°41,8'	8°56,8'	9°11,8'	9°26,8'	9°41,8'	9°56,8'
48	7°42,0'	7°57,0'	8°12,0'	8°27,0'	8°42,0'	8°57,0'	9°12,0'	9°27,0'	9°42,0'	9°57,0'
49	7°42,3'	7°57,2'	8°12,3'	8°27,2'	8°42,3'	8°57,3'	9°12,2'	9°27,3'	9°42,2'	9°57,3'
50	7°42,5'	7°57,5'	8°12,5'	8°27,5'	8°42,5'	8°57,5'	9°12,5'	9°27,5'	9°42,5'	9°57,5'
51	7°42,8'	7°57,8'	8°12,8'	8°27,8'	8°42,8'	8°57,8'	9°12,8'	9°27,8'	9°42,7'	9°57,8'
52	7°43,0'	7°58,0'	8°13,0'	8°28,0'	8°43,0'	8°58,0'	9°13,0'	9°28,0'	9°43,0'	9°58,0'
53	7°43,3'	7°58,3'	8°13,3'	8°28,3'	8°43,3'	8°58,3'	9°13,3'	9°28,3'	9°43,3'	9°58,3'
54	7°43,5'	7°58,5'	8°13,5'	8°28,5'	8°43,5'	8°58,5'	9°13,5'	9°28,5'	9°43,5'	9°58,5'
55	7°43,8'	7°58,8'	8°13,8'	8°28,8'	8°43,8'	8°58,8'	9°13,8'	9°28,8'	9°43,8'	9°58,8'
56	7°44,0'	7°59,0'	8°14,0'	8°29,0'	8°44,0'	8°59,0'	9°14,0'	9°29,0'	9°44,0'	9°59,0'
57	7°44,3'	7°59,3'	8°14,3'	8°29,2'	8°44,3'	8°59,2'	9°14,3'	9°29,2'	9°44,3'	9°59,3'
58	7°44,5'	7°59,5'	8°14,5'	8°29,5'	8°44,5'	8°59,5'	9°14,5'	9°29,5'	9°44,5'	9°59,5'
59	7°44,8'	7°59,8'	8°14,8'	8°29,8'	8°44,8'	8°59,8'	9°14,8'	9°29,8'	9°44,8'	9°59,8'

sec.	40	41	42	43	44	45	46	47	48	49
0	10°0,0'	10°15,0'	10°30,0'	10°45,0'	11°0,0'	11°15,0'	11°30,0'	11°45,0'	12°0,0'	12°15,0'
1	10°0,2'	10°15,3'	10°30,3'	10°45,3'	11°0,2'	11°15,3'	11°30,3'	11°45,3'	12°0,2'	12°15,3'
2	10°0,5'	10°15,5'	10°30,5'	10°45,5'	11°0,5'	11°15,5'	11°30,5'	11°45,5'	12°0,5'	12°15,5'
3	10°0,7'	10°15,8'	10°30,8'	10°45,8'	11°0,7'	11°15,8'	11°30,8'	11°45,8'	12°0,7'	12°15,8'
4	10°1,0'	10°16,0'	10°31,0'	10°46,0'	11°1,0'	11°16,0'	11°31,0'	11°46,0'	12°1,0'	12°16,0'
5	10°1,2'	10°16,3'	10°31,2'	10°46,3'	11°1,3'	11°16,3'	11°31,3'	11°46,3'	12°1,3'	12°16,2'
6	10°1,5'	10°16,5'	10°31,5'	10°46,5'	11°1,5'	11°16,5'	11°31,5'	11°46,5'	12°1,5'	12°16,5'
7	10°1,8'	10°16,8'	10°31,8'	10°46,8'	11°1,8'	11°16,8'	11°31,8'	11°46,8'	12°1,8'	12°16,8'
8	10°2,0'	10°17,0'	10°32,0'	10°47,0'	11°2,0'	11°17,0'	11°32,0'	11°47,0'	12°2,0'	12°17,0'
9	10°2,2'	10°17,3'	10°32,3'	10°47,3'	11°2,2'	11°17,3'	11°32,3'	11°47,3'	12°2,2'	12°17,3'
10	10°2,5'	10°17,5'	10°32,5'	10°47,5'	11°2,5'	11°17,5'	11°32,5'	11°47,5'	12°2,5'	12°17,5'
11	10°2,7'	10°17,8'	10°32,8'	10°47,8'	11°2,7'	11°17,8'	11°32,8'	11°47,8'	12°2,7'	12°17,8'
12	10°3,0'	10°18,0'	10°33,0'	10°48,0'	11°3,0'	11°18,0'	11°33,0'	11°48,0'	12°3,0'	12°18,0'
13	10°3,3'	10°18,3'	10°33,2'	10°48,3'	11°3,2'	11°18,3'	11°33,2'	11°48,3'	12°3,3'	12°18,3'
14	10°3,5'	10°18,5'	10°33,5'	10°48,5'	11°3,5'	11°18,5'	11°33,5'	11°48,5'	12°3,5'	12°18,5'
15	10°3,8'	10°18,8'	10°33,8'	10°48,8'	11°3,8'	11°18,8'	11°33,8'	11°48,8'	12°3,8'	12°18,8'
16	10°4,0'	10°19,0'	10°34,0'	10°49,0'	11°4,0'	11°19,0'	11°34,0'	11°49,0'	12°4,0'	12°19,0'
17	10°4,3'	10°19,3'	10°34,3'	10°49,3'	11°4,2'	11°19,3'	11°34,3'	11°49,3'	12°4,2'	12°19,3'
18	10°4,5'	10°19,5'	10°34,5'	10°49,5'	11°4,5'	11°19,5'	11°34,5'	11°49,5'	12°4,5'	12°19,5'
19	10°4,8'	10°19,7'	10°34,8'	10°49,8'	11°4,7'	11°19,8'	11°34,7'	11°49,8'	12°4,7'	12°19,8'
20	10°5,0'	10°20,0'	10°35,0'	10°50,0'	11°5,0'	11°20,0'	11°35,0'	11°50,0'	12°5,0'	12°20,0'
21	10°5,3'	10°20,3'	10°35,3'	10°50,3'	11°5,3'	11°20,3'	11°35,2'	11°50,3'	12°5,2'	12°20,3'
22	10°5,5'	10°20,5'	10°35,5'	10°50,5'	11°5,5'	11°20,5'	11°35,5'	11°50,5'	12°5,5'	12°20,5'
23	10°5,7'	10°20,8'	10°35,8'	10°50,8'	11°5,7'	11°20,8'	11°35,8'	11°50,8'	12°5,7'	12°20,8'
24	10°6,0'	10°21,0'	10°36,0'	10°51,0'	11°6,0'	11°21,0'	11°36,0'	11°51,0'	12°6,0'	12°21,0'
25	10°6,3'	10°21,3'	10°36,3'	10°51,3'	11°6,3'	11°21,3'	11°36,3'	11°51,3'	12°6,3'	12°21,3'
26	10°6,5'	10°21,5'	10°36,5'	10°51,5'	11°6,5'	11°21,5'	11°36,5'	11°51,5'	12°6,5'	12°21,5'
27	10°6,8'	10°21,7'	10°36,8'	10°51,7'	11°6,8'	11°21,7'	11°36,8'	11°51,8'	12°6,8'	12°21,8'
28	10°7,0'	10°22,0'	10°37,0'	10°52,0'	11°7,0'	11°22,0'	11°37,0'	11°52,0'	12°7,0'	12°22,0'
29	10°7,3'	10°22,3'	10°37,3'	10°52,3'	11°7,3'	11°22,3'	11°37,3'	11°52,3'	12°7,3'	12°22,3'
30	10°7,5'	10°22,5'	10°37,5'	10°52,5'	11°7,5'	11°22,5'	11°37,5'	11°52,5'	12°7,5'	12°22,5'
31	10°7,7'	10°22,8'	10°37,8'	10°52,8'	11°7,7'	11°22,8'	11°37,8'	11°52,8'	12°7,7'	12°22,8'
32	10°8,0'	10°23,0'	10°38,0'	10°53,0'	11°8,0'	11°23,0'	11°38,0'	11°53,0'	12°8,0'	12°23,0'
33	10°8,2'	10°23,3'	10°38,3'	10°53,3'	11°8,3'	11°23,3'	11°38,3'	11°53,3'	12°8,3'	12°23,3'
34	10°8,5'	10°23,5'	10°38,5'	10°53,5'	11°8,5'	11°23,5'	11°38,5'	11°53,5'	12°8,5'	12°23,5'
35	10°8,8'	10°23,7'	10°38,8'	10°53,7'	11°8,8'	11°23,7'	11°38,8'	11°53,7'	12°8,8'	12°23,7'
36	10°9,0'	10°24,0'	10°39,0'	10°54,0'	11°9,0'	11°24,0'	11°39,0'	11°54,0'	12°9,0'	12°24,0'
37	10°9,3'	10°24,3'	10°39,3'	10°54,2'	11°9,3'	11°24,3'	11°39,3'	11°54,3'	12°9,3'	12°24,3'
38	10°9,5'	10°24,5'	10°39,5'	10°54,5'	11°9,5'	11°24,5'	11°39,5'	11°54,5'	12°9,5'	12°24,5'
39	10°9,7'	10°24,8'	10°39,8'	10°54,8'	11°9,7'	11°24,8'	11°39,8'	11°54,8'	12°9,7'	12°24,8'
40	10°10,0'	10°25,0'	10°40,0'	10°55,0'	11°10,0'	11°25,0'	11°40,0'	11°55,0'	12°10,0'	12°25,0'
41	10°10,3'	10°25,3'	10°40,3'	10°55,3'	11°10,3'	11°25,3'	11°40,3'	11°55,3'	12°10,3'	12°25,3'
42	10°10,5'	10°25,5'	10°40,5'	10°55,5'	11°10,5'	11°25,5'	11°40,5'	11°55,5'	12°10,5'	12°25,5'
43	10°10,8'	10°25,8'	10°40,8'	10°55,8'	11°10,8'	11°25,8'	11°40,8'	11°55,8'	12°10,8'	12°25,7'
44	10°11,0'	10°26,0'	10°41,0'	10°56,0'	11°11,0'	11°26,0'	11°41,0'	11°56,0'	12°11,0'	12°26,0'
45	10°11,3'	10°26,3'	10°41,3'	10°56,3'	11°11,3'	11°26,3'	11°41,3'	11°56,3'	12°11,3'	12°26,3'
46	10°11,5'	10°26,5'	10°41,5'	10°56,5'	11°11,5'	11°26,5'	11°41,5'	11°56,5'	12°11,5'	12°26,5'
47	10°11,8'	10°26,8'	10°41,8'	10°56,8'	11°11,8'	11°26,8'	11°41,8'	11°56,8'	12°11,8'	12°26,8'
48	10°12,0'	10°27,0'	10°42,0'	10°57,0'	11°12,0'	11°27,0'	11°42,0'	11°57,0'	12°12,0'	12°27,0'
49	10°12,2'	10°27,3'	10°42,2'	10°57,3'	11°12,2'	11°27,3'	11°42,2'	11°57,3'	12°12,2'	12°27,3'
50	10°12,5'	10°27,5'	10°42,5'	10°57,5'	11°12,5'	11°27,5'	11°42,5'	11°57,5'	12°12,5'	12°27,5'
51	10°12,7'	10°27,8'	10°42,7'	10°57,8'	11°12,8'	11°27,8'	11°42,8'	11°57,8'	12°12,8'	12°27,8'
52	10°13,0'	10°28,0'	10°43,0'	10°58,0'	11°13,0'	11°28,0'	11°43,0'	11°58,0'	12°13,0'	12°28,0'
53	10°13,3'	10°28,3'	10°43,3'	10°58,3'	11°13,3'	11°28,3'	11°43,3'	11°58,3'	12°13,3'	12°28,3'
54	10°13,5'	10°28,5'	10°43,5'	10°58,5'	11°13,5'	11°28,5'	11°43,5'	11°58,5'	12°13,5'	12°28,5'
55	10°13,8'	10°28,8'	10°43,8'	10°58,8'	11°13,8'	11°28,8'	11°43,8'	11°58,8'	12°13,8'	12°28,8'
56	10°14,0'	10°29,0'	10°44,0'	10°59,0'	11°14,0'	11°29,0'	11°44,0'	11°59,0'	12°14,0'	12°29,0'
57	10°14,3'	10°29,3'	10°44,3'	10°59,3'	11°14,2'	11°29,3'	11°44,2'	11°59,3'	12°14,2'	12°29,3'
58	10°14,5'	10°29,5'	10°44,5'	10°59,5'	11°14,5'	11°29,5'	11°44,5'	11°59,5'	12°14,5'	12°29,5'
59	10°14,8'	10°29,8'	10°44,8'	10°59,8'	11°14,8'	11°29,8'	11°44,7'	11°59,8'	12°14,8'	12°29,8'

sec.	50	51	52	53	54	55	56	57	58	59
0	12°30,0'	12°45,0'	13°0,0'	13°15,0'	13°30,0'	13°45,0'	14°0,0'	14°15,0'	14°30,0'	14°45,0'
1	12°30,3'	12°45,3'	13°0,2'	13°15,3'	13°30,3'	13°45,3'	14°0,2'	14°15,3'	14°30,3'	14°45,3'
2	12°30,5'	12°45,5'	13°0,5'	13°15,5'	13°30,5'	13°45,5'	14°0,5'	14°15,5'	14°30,5'	14°45,5'
3	12°30,8'	12°45,8'	13°0,8'	13°15,8'	13°30,8'	13°45,8'	14°0,8'	14°15,8'	14°30,8'	14°45,8'
4	12°31,0'	12°46,0'	13°1,0'	13°16,0'	13°31,0'	13°46,0'	14°1,0'	14°16,0'	14°31,0'	14°46,0'
5	12°31,3'	12°46,2'	13°1,3'	13°16,2'	13°31,3'	13°46,2'	14°1,3'	14°16,2'	14°31,3'	14°46,3'
6	12°31,5'	12°46,5'	13°1,5'	13°16,5'	13°31,5'	13°46,5'	14°1,5'	14°16,5'	14°31,5'	14°46,5'
7	12°31,8'	12°46,7'	13°1,8'	13°16,8'	13°31,8'	13°46,8'	14°1,8'	14°16,8'	14°31,8'	14°46,8'
8	12°32,0'	12°47,0'	13°2,0'	13°17,0'	13°32,0'	13°47,0'	14°2,0'	14°17,0'	14°32,0'	14°47,0'
9	12°32,3'	12°47,3'	13°2,2'	13°17,3'	13°32,3'	13°47,3'	14°2,2'	14°17,3'	14°32,3'	14°47,3'
10	12°32,5'	12°47,5'	13°2,5'	13°17,5'	13°32,5'	13°47,5'	14°2,5'	14°17,5'	14°32,5'	14°47,5'
11	12°32,8'	12°47,8'	13°2,7'	13°17,8'	13°32,8'	13°47,8'	14°2,8'	14°17,8'	14°32,8'	14°47,8'
12	12°33,0'	12°48,0'	13°3,0'	13°18,0'	13°33,0'	13°48,0'	14°3,0'	14°18,0'	14°33,0'	14°48,0'
13	12°33,3'	12°48,3'	13°3,3'	13°18,3'	13°33,3'	13°48,3'	14°3,3'	14°18,2'	14°33,3'	14°48,2'
14	12°33,5'	12°48,5'	13°3,5'	13°18,5'	13°33,5'	13°48,5'	14°3,5'	14°18,5'	14°33,5'	14°48,5'
15	12°33,8'	12°48,8'	13°3,8'	13°18,8'	13°33,8'	13°48,8'	14°3,8'	14°18,8'	14°33,8'	14°48,8'
16	12°34,0'	12°49,0'	13°4,0'	13°19,0'	13°34,0'	13°49,0'	14°4,0'	14°19,0'	14°34,0'	14°49,0'
17	12°34,3'	12°49,3'	13°4,2'	13°19,3'	13°34,3'	13°49,3'	14°4,2'	14°19,3'	14°34,3'	14°49,3'
18	12°34,5'	12°49,5'	13°4,5'	13°19,5'	13°34,5'	13°49,5'	14°4,5'	14°19,5'	14°34,5'	14°49,5'
19	12°34,7'	12°49,8'	13°4,7'	13°19,8'	13°34,7'	13°49,8'	14°4,7'	14°19,8'	14°34,8'	14°49,7'
20	12°35,0'	12°50,0'	13°5,0'	13°20,0'	13°35,0'	13°50,0'	14°5,0'	14°20,0'	14°35,0'	14°50,0'
21	12°35,2'	12°50,3'	13°5,3'	13°20,3'	13°35,3'	13°50,3'	14°5,3'	14°20,3'	14°35,3'	14°50,3'
22	12°35,5'	12°50,5'	13°5,5'	13°20,5'	13°35,5'	13°50,5'	14°5,5'	14°20,5'	14°35,5'	14°50,5'
23	12°35,8'	12°50,8'	13°5,7'	13°20,8'	13°35,8'	13°50,8'	14°5,7'	14°20,8'	14°35,8'	14°50,8'
24	12°36,0'	12°51,0'	13°6,0'	13°21,0'	13°36,0'	13°51,0'	14°6,0'	14°21,0'	14°36,0'	14°51,0'
25	12°36,3'	12°51,3'	13°6,2'	13°21,3'	13°36,3'	13°51,3'	14°6,2'	14°21,3'	14°36,3'	14°51,3'
26	12°36,5'	12°51,5'	13°6,5'	13°21,5'	13°36,5'	13°51,5'	14°6,5'	14°21,5'	14°36,5'	14°51,5'
27	12°36,8'	12°51,8'	13°6,7'	13°21,8'	13°36,7'	13°51,8'	14°6,7'	14°21,8'	14°36,7'	14°51,8'
28	12°37,0'	12°52,0'	13°7,0'	13°22,0'	13°37,0'	13°52,0'	14°7,0'	14°22,0'	14°37,0'	14°52,0'
29	12°37,3'	12°52,3'	13°7,3'	13°22,3'	13°37,2'	13°52,3'	14°7,3'	14°22,3'	14°37,3'	14°52,3'
30	12°37,5'	12°52,5'	13°7,5'	13°22,5'	13°37,5'	13°52,5'	14°7,5'	14°22,5'	14°37,5'	14°52,5'
31	12°37,8'	12°52,8'	13°7,7'	13°22,8'	13°37,8'	13°52,8'	14°7,7'	14°22,8'	14°37,8'	14°52,8'
32	12°38,0'	12°53,0'	13°8,0'	13°23,0'	13°38,0'	13°53,0'	14°8,0'	14°23,0'	14°38,0'	14°53,0'
33	12°38,3'	12°53,3'	13°8,3'	13°23,3'	13°38,3'	13°53,3'	14°8,2'	14°23,3'	14°38,3'	14°53,3'
34	12°38,5'	12°53,5'	13°8,5'	13°23,5'	13°38,5'	13°53,5'	14°8,5'	14°23,5'	14°38,5'	14°53,5'
35	12°38,8'	12°53,8'	13°8,8'	13°23,8'	13°38,8'	13°53,8'	14°8,7'	14°23,8'	14°38,7'	14°53,8'
36	12°39,0'	12°54,0'	13°9,0'	13°24,0'	13°39,0'	13°54,0'	14°9,0'	14°24,0'	14°39,0'	14°54,0'
37	12°39,3'	12°54,3'	13°9,3'	13°24,3'	13°39,3'	13°54,3'	14°9,3'	14°24,3'	14°39,2'	14°54,3'
38	12°39,5'	12°54,5'	13°9,5'	13°24,5'	13°39,5'	13°54,5'	14°9,5'	14°24,5'	14°39,5'	14°54,5'
39	12°39,8'	12°54,8'	13°9,7'	13°24,8'	13°39,8'	13°54,8'	14°9,8'	14°24,8'	14°39,8'	14°54,8'
40	12°40,0'	12°55,0'	13°10,0'	13°25,0'	13°40,0'	13°55,0'	14°10,0'	14°25,0'	14°40,0'	14°55,0'
41	12°40,3'	12°55,3'	13°10,3'	13°25,3'	13°40,3'	13°55,3'	14°10,3'	14°25,3'	14°40,3'	14°55,3'
42	12°40,5'	12°55,5'	13°10,5'	13°25,5'	13°40,5'	13°55,5'	14°10,5'	14°25,5'	14°40,5'	14°55,5'
43	12°40,8'	12°55,7'	13°10,8'	13°25,7'	13°40,8'	13°55,8'	14°10,8'	14°25,8'	14°40,8'	14°55,8'
44	12°41,0'	12°56,0'	13°11,0'	13°26,0'	13°41,0'	13°56,0'	14°11,0'	14°26,0'	14°41,0'	14°56,0'
45	12°41,3'	12°56,3'	13°11,3'	13°26,3'	13°41,3'	13°56,3'	14°11,3'	14°26,3'	14°41,3'	14°56,3'
46	12°41,5'	12°56,5'	13°11,5'	13°26,5'	13°41,5'	13°56,5'	14°11,5'	14°26,5'	14°41,5'	14°56,5'
47	12°41,8'	12°56,8'	13°11,8'	13°26,8'	13°41,8'	13°56,8'	14°11,8'	14°26,8'	14°41,8'	14°56,8'
48	12°42,0'	12°57,0'	13°12,0'	13°27,0'	13°42,0'	13°57,0'	14°12,0'	14°27,0'	14°42,0'	14°57,0'
49	12°42,3'	12°57,2'	13°12,3'	13°27,2'	13°42,3'	13°57,2'	14°12,3'	14°27,2'	14°42,3'	14°57,2'
50	12°42,5'	12°57,5'	13°12,5'	13°27,5'	13°42,5'	13°57,5'	14°12,5'	14°27,5'	14°42,5'	14°57,5'
51	12°42,8'	12°57,8'	13°12,8'	13°27,7'	13°42,8'	13°57,7'	14°12,8'	14°27,7'	14°42,8'	14°57,8'
52	12°43,0'	12°58,0'	13°13,0'	13°28,0'	13°43,0'	13°58,0'	14°13,0'	14°28,0'	14°43,0'	14°58,0'
53	12°43,3'	12°58,3'	13°13,3'	13°28,3'	13°43,3'	13°58,3'	14°13,3'	14°28,3'	14°43,3'	14°58,3'
54	12°43,5'	12°58,5'	13°13,5'	13°28,5'	13°43,5'	13°58,5'	14°13,5'	14°28,5'	14°43,5'	14°58,5'
55	12°43,8'	12°58,8'	13°13,8'	13°28,8'	13°43,8'	13°58,8'	14°13,8'	14°28,8'	14°43,8'	14°58,8'
56	12°44,0'	12°59,0'	13°14,0'	13°29,0'	13°44,0'	13°59,0'	14°14,0'	14°29,0'	14°44,0'	14°59,0'
57	12°44,2'	12°59,3'	13°14,2'	13°29,3'	13°44,3'	13°59,3'	14°14,3'	14°29,3'	14°44,3'	14°59,2'
58	12°44,5'	12°59,5'	13°14,5'	13°29,5'	13°44,5'	13°59,5'	14°14,5'	14°29,5'	14°44,5'	14°59,5'
59	12°44,8'	12°59,8'	13°14,8'	13°29,8'	13°44,8'	13°59,8'	14°14,8'	14°29,8'	14°44,8'	14°59,8'