

ТАБЛИЦА ДЛЯ ОПРЕДЕЛЕНИЯ УГЛОВ ПАДЕНИЯ ПЛАСТОВ В КОСЫХ СЕЧЕНИЯХ

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Для определения угла падения пласта в косом сечении можно воспользоваться формулой

$$\operatorname{tg} \alpha_k = \operatorname{tg} \alpha_n \cdot \cos \varphi, \quad (1)$$

где α_n — угол падения пласта в прямом сечении и φ — разность азимутов падения пласта и заданного профиля. Вывод этой формулы в свое время приводили В. Н. Вебер [3], а также И. Я. Фурман [5]. Для решения задач по ней разные авторы рекомендуют различные средства. Например, И. Я. Фурман [5] рекомендует диаграмму профессора Т. Смита и сетку В. И. Баумана, В. Н. Вебер [3, стр. 151].— собственную номограмму и другие методы, однако в связи с тем, что работа с применением данных средств требует больших затрат труда, они не получили широкого распространения. В последнее время для данной цели стали пользоваться специальными таблицами. Такого рода таблицы приводят И. О. Брод и Е. Ф. Фролов [1, стр. 658—659], Н. И. Буялов [2, стр. 372], А. Л. Вычегжанин [4, стр. 157—159] и другие авторы. Однако таблицы эти составлены недостаточно подробно, что затрудняет их использование. В связи с этим предлагается настоящая таблица, подробность которой вполне удовлетворит геологов при построении профилей. Углы падения в ней (α_n) берутся через 1° , а разности азимутов (φ) — через 2° , искомые величины определены с точностью до одной минуты (приложение 1).

Приложение

$\alpha_n \backslash \varphi$	0°	2°	4°	6°	8°	10°	12°	14°
1°	1°00'	1°00'	1°00'	1°00'	0°59'	0°59'	0°59'	0°58'
2°	2°00'	2°00'	2°00'	1°59'	1°59'	1°58'	1°57'	1°56'
3°	3°00'	3°00'	3°00'	2°59'	2°58'	2°57'	2°56'	2°55'
4°	4°00'	4°00'	3°59'	3°59'	3°58'	3°56'	3°55'	3°53'
5°	5°00'	5°00'	4°59'	4°58'	4°57'	4°55'	4°53'	4°51'
6°	6°00'	6°00'	5°59'	5°58'	5°57'	5°55'	5°52'	5°49'
7°	7°00'	7°00'	6°59'	6°58'	6°56'	6°54'	6°51'	6°48'
8°	8°00'	8°00'	7°59'	7°58'	7°56'	7°53'	7°50'	7°46'
9°	9°00'	9°00'	8°59'	8°57'	8°55'	8°52'	8°48'	8°44'
10°	10°00'	10°00'	9°59'	9°57'	9°54'	9°51'	9°47'	9°43'
11°	11°00'	11°00'	10°58'	10°56'	10°54'	10°50'	10°46'	10°41'
12°	12°00'	12°00'	11°58'	11°56'	11°53'	11°49'	11°45'	11°39'
13°	13°00'	13°00'	12°58'	12°56'	12°53'	12°49'	12°44'	12°38'
14°	14°00'	14°00'	13°58'	13°56'	13°52'	13°47'	13°42'	13°36'
15°	15°00'	14°59'	14°58'	14°55'	14°52'	14°47'	14°41'	14°34'
16°	16°00'	15°59'	15°58'	15°55'	15°51'	15°46'	15°40'	15°33'
17°	17°00'	16°59'	16°58'	16°55'	16°51'	16°45'	16°39'	16°31'
18°	18°00'	17°59'	17°58'	17°54'	17°50'	17°45'	17°38'	17°30'
19°	19°00'	18°59'	18°57'	18°54'	18°50'	18°44'	18°37'	18°28'
20°	20°00'	19°59'	19°57'	19°54'	19°49'	19°43'	19°36'	19°27'
21°	21°00'	20°59'	20°57'	20°54'	20°49'	20°42'	20°35'	20°26'
22°	22°00'	21°59'	21°57'	21°53'	21°48'	21°42'	21°34'	21°24'
23°	23°00'	22°59'	22°57'	22°53'	22°48'	22°41'	22°33'	22°23'
24°	24°00'	23°59'	23°57'	23°53'	23°48'	23°41'	23°32'	23°22'
25°	25°00'	24°59'	24°57'	24°53'	24°47'	24°40'	24°31'	24°21'
26°	26°00'	25°59'	25°57'	25°53'	25°47'	25°39'	25°30'	25°20'
27°	27°00'	26°59'	26°57'	26°52'	26°46'	26°39'	26°29'	26°18'
28°	28°00'	27°59'	27°57'	27°52'	27°46'	27°38'	27°29'	27°17'
29°	29°00'	28°59'	28°56'	28°52'	28°46'	28°38'	28°28'	28°16'
30°	30°00'	29°59'	29°56'	29°52'	29°45'	29°37'	29°27'	29°15'
31°	31°00'	30°59'	30°56'	30°52'	30°45'	30°37'	30°27'	30°15'
32°	32°00'	31°59'	31°56'	31°52'	31°45'	31°36'	31°26'	31°14'
33°	33°00'	32°59'	32°56'	32°51'	32°45'	32°36'	32°25'	32°13'
34°	34°00'	33°59'	33°56'	33°51'	33°44'	33°36'	33°25'	33°12'
35°	35°00'	34°59'	34°56'	34°51'	34°44'	34°35'	34°24'	34°12'
36°	36°00'	35°59'	35°56'	35°51'	35°44'	35°35'	35°24'	35°11'
37°	37°00'	36°59'	36°56'	36°51'	36°44'	36°35'	36°24'	36°10'
38°	38°00'	37°59'	37°56'	37°51'	37°44'	37°35'	37°23'	37°10'
39°	39°00'	38°59'	38°56'	38°51'	38°44'	38°34'	38°23'	38°09'
40°	40°00'	39°59'	39°56'	39°51'	39°43'	39°34'	39°23'	39°09'
41°	41°00'	40°59'	40°56'	40°51'	40°43'	40°34'	40°22'	40°09'
42°	42°00'	41°59'	41°56'	41°51'	41°43'	41°34'	41°22'	41°09'
43°	43°00'	42°59'	42°56'	42°51'	42°43'	42°34'	42°22'	42°08'
44°	44°00'	43°59'	43°56'	43°51'	43°43'	43°34'	43°22'	43°08'
45°	45°00'	44°59'	44°56'	44°51'	44°43'	44°34'	44°22'	44°08'

α_n	16°	18°	20°	22°	24°	26°	28°	30°
1°	0°58'	0°57'	0°56'	0°56'	0°55'	0°54'	0°53'	0°52'
2°	1°55'	1°54'	1°52'	1°51'	1°50'	1°48'	1°46'	1°44'
3°	2°53'	2°51'	2°49'	2°47'	2°44'	2°42'	2°39'	2°36'
4°	3°51'	3°48'	3°46'	3°43'	3°39'	3°36'	3°32'	3°28'
5°	4°48'	4°45'	4°42'	4°38'	4°34'	4°29'	4°25'	4°20'
6°	5°46'	5°42'	5°38'	5°34'	5°29'	5°23'	5°18'	5°12'
7°	6°44'	6°40'	6°35'	6°30'	6°24'	6°18'	6°11'	6°04'
8°	7°42'	7°37'	7°32'	7°26'	7°19'	7°13'	7°05'	6°56'
9°	8°39'	8°34'	8°28'	8°21'	8°14'	8°06'	7°58'	7°49'
10°	9°37'	9°31'	9°24'	9°17'	9°09'	9°00'	8°51'	8°41'
11°	10°35'	10°28'	10°21'	10°13'	10°04'	9°55'	9°44'	9°33'
12°	11°33'	11°26'	11°18'	11°09'	10°59'	10°49'	10°38'	10°26'
13°	12°31'	12°23'	12°14'	12°05'	11°55'	11°43'	11°31'	11°18'
14°	13°29'	13°20'	13°11'	13°01'	12°50'	12°38'	12°25'	12°11'
15°	14°27'	14°18'	14°08'	13°57'	13°45'	13°32'	13°19'	13°04'
16°	15°25'	15°15'	15°05'	14°53'	14°41'	14°27'	14°12'	13°57'
17°	16°23'	16°12'	16°02'	15°50'	15°36'	15°22'	15°06'	14°49'
18°	17°21'	17°10'	16°59'	16°46'	16°32'	16°17'	16°00'	15°43'
19°	18°19'	18°08'	17°56'	17°42'	17°28'	17°12'	16°55'	16°36'
20°	19°17'	19°06'	18°53'	18°39'	18°24'	18°07'	17°49'	17°30'
21°	20°15'	20°03'	19°50'	19°35'	19°19'	19°02'	18°43'	18°23'
22°	21°13'	21°01'	20°47'	20°32'	20°16'	19°57'	19°38'	19°17'
23°	22°12'	21°59'	21°45'	21°29'	21°12'	20°53'	20°33'	20°11'
24°	23°10'	22°57'	22°42'	22°26'	22°08'	21°49'	21°28'	21°05'
25°	24°09'	23°55'	23°40'	23°23'	23°04'	22°44'	22°23'	21°59'
26°	25°07'	24°53'	24°37'	24°20'	24°01'	23°40'	23°18'	22°54'
27°	26°06'	25°51'	25°35'	25°17'	24°58'	24°36'	24°13'	23°49'
28°	27°04'	26°50'	26°33'	26°15'	25°54'	25°33'	25°09'	24°42'
29°	28°03'	27°48'	27°31'	27°12'	26°51'	26°29'	26°05'	25°39'
30°	29°02'	28°46'	28°29'	28°10'	27°49'	27°26'	27°01'	26°34'
31°	30°01'	29°45'	29°27'	29°07'	28°46'	28°22'	27°57'	27°29'
32°	31°00'	30°43'	30°25'	30°05'	29°43'	29°19'	28°53'	28°25'
33°	31°58'	31°42'	31°24'	31°03'	30°41'	30°16'	29°50'	29°21'
34°	32°58'	32°41'	32°22'	32°01'	31°38'	31°14'	30°47'	30°17'
35°	33°57'	33°40'	33°21'	33°00'	32°36'	32°11'	31°44'	31°14'
36°	34°56'	34°39'	34°19'	33°58'	33°34'	33°09'	32°41'	32°11'
37°	35°55'	35°38'	35°18'	34°56'	34°33'	34°07'	33°38'	33°08'
38°	36°54'	36°37'	36°17'	35°55'	35°31'	35°05'	34°36'	34°05'
39°	37°54'	37°36'	37°16'	36°54'	36°30'	36°03'	35°34'	35°03'
40°	38°53'	38°35'	38°15'	37°53'	37°28'	37°01'	36°32'	36°00'
41°	39°53'	39°35'	39°15'	38°52'	38°27'	38°00'	37°30'	36°58'
42°	40°52'	40°34'	40°14'	39°51'	39°26'	38°59'	38°29'	37°57'
43°	41°52'	41°34'	41°14'	40°51'	40°26'	39°58'	39°28'	38°55'
44°	42°52'	42°34'	42°13'	41°50'	41°25'	40°57'	40°27'	39°54'
45°	43°52'	43°34'	43°13'	42°50'	42°25'	41°57'	41°27'	40°54'

zu \ φ	32°	34°	36°	38°	40°	42°	44°	46°
1°	0°51'	0°50'	0°49'	0°47'	0°46'	0°45'	0°43'	0°41'
2°	1°42'	1°39'	1°37'	1°35'	1°32'	1°29'	1°26'	1°23'
3°	2°33'	2°29'	2°26'	2°22'	2°18'	2°14'	2°10'	2°05'
4°	3°24'	3°19'	3°14'	3°09'	3°04'	2°58'	2°53'	2°47'
5°	4°15'	4°09'	4°03'	3°57'	3°50'	3°43'	3°36'	3°29'
6°	5°06'	4°59'	4°52'	4°42'	4°36'	4°28'	4°19'	4°11'
7°	5°57'	5°49'	5°40'	5°32'	5°22'	5°13'	5°03'	4°53'
8°	6°48'	6°39'	6°29'	6°19'	6°09'	5°58'	5°46'	5°35'
9°	7°39'	7°29'	7°18'	7°07'	6°55'	6°43'	6°30'	6°17'
10°	8°30'	8°19'	8°07'	7°58'	7°42'	7°28'	7°14'	6°59'
11°	9°22'	9°09'	8°56'	8°43'	8°28'	8°13'	7°58'	7°41'
12°	10°13'	10°00'	9°45'	9°31'	9°15'	8°59'	8°42'	8°24'
13°	11°05'	10°50'	10°35'	10°19'	10°02'	9°44'	9°26'	9°07'
14°	11°56'	11°41'	11°24'	11°10'	10°49'	10°30'	10°10'	9°50'
15°	12°48'	12°31'	12°17'	11°55'	11°36'	11°16'	10°55'	10°33'
16°	13°40'	13°22'	13°04'	12°44'	12°23'	12°02'	11°39'	11°16'
17°	14°32'	14°13'	13°54'	13°33'	13°14'	12°48'	12°24'	11°59'
18°	15°24'	15°05'	14°44'	14°22'	13°59'	13°34'	13°09'	12°43'
19°	16°17'	15°56'	15°34'	15°11'	14°47'	14°21'	13°55'	13°27'
20°	17°09'	16°47'	16°24'	16°00'	15°35'	15°08'	14°40'	14°11'
21°	18°02'	17°39'	17°15'	16°50'	16°23'	15°55'	15°26'	14°56'
22°	18°55'	18°31'	18°06'	17°40'	17°12'	16°43'	16°12'	15°41'
23°	19°48'	19°23'	18°57'	18°30'	18°01'	17°30'	16°59'	16°26'
24°	20°41'	20°16'	19°49'	19°20'	18°50'	18°18'	17°46'	17°11'
25°	21°35'	21°08'	20°40'	20°11'	19°39'	19°07'	18°33'	17°57'
26°	22°28'	22°01'	21°32'	21°01'	20°29'	19°55'	19°20'	18°43'
27°	23°22'	22°54'	22°24'	21°53'	21°19'	20°44'	20°08'	19°29'
28°	24°16'	23°47'	23°17'	22°44'	22°10'	21°34'	20°56'	20°16'
29°	25°10'	24°41'	24°09'	23°36'	23°00'	22°23'	21°44'	21°04'
30°	26°05'	25°35'	25°02'	24°28'	23°52'	23°13'	22°33'	21°51'
31°	27°00'	26°29'	25°55'	25°20'	24°43'	24°04'	23°23'	22°39'
32°	27°55'	27°23'	26°49'	26°13'	25°35'	24°55'	24°12'	23°28'
33°	28°51'	28°18'	27°43'	27°06'	26°27'	25°46'	25°02'	24°17'
34°	29°46'	29°13'	28°37'	27°59'	27°20'	26°37'	25°53'	25°06'
35°	30°42'	30°08'	29°32'	28°53'	28°13'	27°29'	26°44'	25°56'
36°	31°38'	31°04'	30°27'	29°48'	29°06'	28°22'	27°36'	26°47'
37°	32°35'	32°00'	31°22'	30°42'	30°00'	29°15'	28°28'	27°38'
38°	33°32'	32°56'	32°18'	31°37'	30°54'	30°08'	29°20'	28°29'
39°	34°29'	33°53'	33°14'	32°33'	31°49'	31°02'	30°13'	29°22'
40°	35°26'	34°49'	34°10'	33°28'	32°44'	31°57'	31°07'	30°14'
41°	36°24'	35°47'	35°07'	34°25'	33°40'	32°52'	32°01'	31°08'
42°	37°22'	36°44'	36°04'	35°21'	34°36'	33°47'	32°56'	32°01'
43°	38°20'	37°42'	37°02'	36°19'	35°32'	34°43'	33°51'	32°56'
44°	39°19'	38°41'	38°00'	37°16'	36°30'	35°40'	34°47'	33°51'
45°	40°18'	39°40'	38°58'	38°14'	37°27'	36°37'	35°44'	34°47'

$\alpha_n \backslash \varphi$	48°	50°	52°	54°	56°	58°	60°	62°
1°	0°40'	0°39'	0°37'	0°35'	0°34'	0°32'	0°30'	0°28'
2°	1°20'	1°17'	1°14'	1°11'	1°07'	1°04'	1°00'	0°56'
3°	2°01'	1°56'	1°51'	1°46'	1°41'	1°35'	1°30'	1°25'
4°	2°41'	2°34'	2°28'	2°21'	2°14'	2°07'	2°00'	1°53'
5°	3°21'	3°13'	3°05'	2°57'	2°48'	2°39'	2°30'	2°21'
6°	4°01'	3°52'	3°42'	3°32'	3°22'	3°11'	3°00'	2°49'
7°	4°42'	4°31'	4°19'	4°08'	3°56'	3°43'	3°31'	3°18'
8°	5°22'	5°10'	4°57'	4°43'	4°30'	4°15'	4°01'	3°47'
9°	6°03'	5°49'	5°34'	5°19'	5°04'	4°48'	4°32'	4°15'
10°	6°43'	6°28'	6°12'	5°55'	5°38'	5°20'	5°02'	4°44'
11°	7°25'	7°07'	6°49'	6°31'	6°12'	5°53'	5°33'	5°13'
12°	8°06'	7°47'	7°27'	7°07'	6°47'	6°26'	6°04'	5°42'
13°	8°47'	8°26'	8°05'	7°44'	7°21'	6°58'	6°35'	6°11'
14°	9°28'	9°06'	8°44'	8°20'	7°56'	7°32'	7°06'	6°41'
15°	10°10'	9°46'	9°22'	8°57'	8°31'	8°05'	7°38'	7°10'
16°	10°52'	10°26'	10°01'	9°34'	9°07'	8°38'	8°09'	7°40'
17°	11°34'	11°07'	10°40'	10°11'	9°42'	9°12'	8°41'	8°10'
18°	12°16'	11°48'	11°19'	10°49'	10°18'	9°46'	9°14'	8°40'
19°	12°58'	12°29'	11°58'	11°26'	10°54'	10°24'	9°46'	9°11'
20°	13°41'	13°10'	12°38'	12°08'	11°30'	10°55'	10°19'	9°42'
21°	14°24'	13°52'	13°18'	12°43'	12°07'	11°30'	10°52'	10°13'
22°	15°08'	14°33'	13°58'	13°22'	12°44'	12°05'	11°25'	10°44'
23°	15°51'	15°16'	14°39'	14°01'	13°21'	12°41'	11°59'	11°16'
24°	16°35'	15°58'	15°20'	14°40'	13°59'	13°17'	12°33'	11°48'
25°	17°20'	16°41'	16°01'	15°20'	14°37'	13°53'	13°07'	12°21'
26°	18°04'	17°24'	16°43'	16°00'	15°15'	14°29'	13°42'	12°54'
27°	18°50'	18°08'	17°25'	16°40'	15°54'	15°07'	14°18'	13°27'
28°	19°35'	18°52'	18°08'	17°21'	16°34'	15°44'	14°53'	14°01'
29°	20°21'	19°37'	18°51'	18°03'	17°13'	16°22'	15°29'	14°35'
30°	21°07'	20°22'	19°34'	18°45'	17°54'	17°04'	16°06'	15°10'
31°	21°54'	21°07'	20°18'	19°27'	18°34'	17°40'	16°43'	15°45'
32°	22°41'	21°53'	21°03'	20°10'	19°16'	18°19'	17°21'	16°21'
33°	23°29'	22°39'	21°48'	20°54'	19°57'	18°59'	17°59'	16°57'
34°	24°17'	23°26'	22°33'	21°38'	20°40'	19°40'	18°38'	17°34'
35°	25°06'	24°14'	23°19'	22°22'	21°23'	20°21'	19°18'	18°12'
36°	25°56'	25°02'	24°06'	23°07'	22°07'	21°03'	19°58'	18°50'
37°	26°46'	25°51'	24°53'	23°53'	22°51'	21°46'	20°39'	19°29'
38°	27°36'	26°40'	25°41'	24°40'	23°36'	22°29'	21°20'	20°09'
39°	28°27'	27°30'	26°30'	25°27'	24°22'	23°14'	22°03'	20°49'
40°	29°19'	28°20'	27°19'	26°15'	25°08'	23°58'	22°46'	21°30'
41°	30°11'	29°12'	28°09'	27°04'	25°55'	24°44'	23°30'	22°12'
42°	31°04'	30°04'	29°00'	27°53'	26°44'	25°30'	24°14'	22°55'
43°	31°58'	30°56'	29°52'	28°44'	27°32'	26°18'	25°00'	23°39'
44°	32°52'	31°50'	30°44'	29°35'	28°22'	27°06'	25°47'	24°23'
45°	33°47'	32°44'	31°37'	30°27'	29°13'	27°55'	26°34'	25°09'

α_n \ φ	64°	66°	68°	70°	72°	74°	76°	78°
1°	0°26'	0°24'	0°22'	0°21'	0°19'	0°17'	0°15'	0°12'
2°	0°53'	0°49'	0°45'	0°41'	0°37'	0°33'	0°29'	0°25'
3°	1°19'	1°13'	1°07'	1°02'	0°56'	0°50'	0°44'	0°37'
4°	1°45'	1°38'	1°30'	1°22'	1°14'	1°06'	0°58'	0°50'
5°	2°12'	2°02'	1°53'	1°43'	1°33'	1°23'	1°13'	1°03'
6°	2°38'	2°27'	2°16'	2°04'	1°52'	1°40'	1°31'	1°14'
7°	3°05'	2°52'	2°38'	2°24'	2°10'	1°56'	1°42'	1°28'
8°	3°32'	3°16'	3°01'	2°45'	2°29'	2°13'	1°57'	1°40'
9°	3°58'	3°41'	3°24'	3°06'	2°48'	2°30'	2°08'	1°53'
10°	4°25'	4°06'	3°47'	3°27'	3°07'	2°47'	2°27'	2°06'
11°	4°52'	4°31'	4°10'	3°48'	3°26'	3°04'	2°45'	2°19'
12°	5°19'	4°56'	4°33'	4°09'	3°45'	3°21'	2°57'	2°31'
13°	5°47'	5°22'	4°57'	4°31'	4°05'	3°38'	3°12'	2°45'
14°	6°14'	5°47'	5°20'	4°52'	4°24'	3°56'	3°27'	2°58'
15°	6°42'	6°13'	5°44'	5°14'	4°44'	4°13'	3°43'	3°11'
16°	7°10'	6°39'	6°08'	5°36'	5°04'	4°31'	3°58'	3°24'
17°	7°38'	7°05'	6°32'	5°58'	5°24'	4°49'	4°14'	3°38'
18°	8°06'	7°32'	6°56'	6°20'	5°44'	5°07'	4°30'	3°52'
19°	8°35'	7°58'	7°21'	6°43'	6°04'	5°25'	4°46'	4°06'
20°	9°04'	8°25'	7°46'	7°06'	6°25'	5°44'	5°02'	4°19'
21°	9°33'	8°52'	8°11'	7°29'	6°46'	6°02'	5°18'	4°34'
22°	10°03'	9°20'	8°36'	7°52'	7°07'	6°21'	5°35'	4°48'
23°	10°32'	9°48'	9°02'	8°16'	7°28'	6°40'	5°52'	5°03'
24°	11°03'	10°16'	9°28'	8°40'	7°50'	7°00'	6°09'	5°17'
25°	11°33'	10°44'	9°55'	9°04'	8°12'	7°19'	6°26'	5°32'
26°	12°04'	11°13'	10°21'	9°28'	8°34'	7°39'	6°44'	5°47'
27°	12°35'	11°43'	10°48'	9°53'	8°57'	8°00'	7°02'	6°03'
28°	13°07'	12°12'	11°16'	10°18'	9°20'	8°20'	7°20'	6°19'
29°	13°39'	12°42'	11°44'	10°44'	9°43'	8°41'	7°38'	6°34'
30°	14°12'	13°13'	12°12'	11°10'	10°07'	9°03'	7°57'	6°51'
31°	14°45'	13°44'	12°41'	11°37'	10°31'	9°24'	8°16'	7°07'
32°	15°19'	14°16'	13°10'	12°04'	10°56'	9°46'	8°36'	7°24'
33°	15°53'	14°48'	13°40'	12°31'	11°21'	10°09'	8°56'	7°41'
34°	16°28'	15°20'	14°11'	12°59'	11°46'	10°32'	9°16'	7°59'
35°	17°04'	15°54'	14°42'	13°28'	12°13'	10°55'	9°37'	8°17'
36°	17°40'	16°28'	15°14'	13°57'	12°39'	11°19'	9°58'	8°35'
37°	18°17'	17°02'	15°46'	14°27'	13°06'	11°44'	10°20'	8°54'
38°	18°54'	17°38'	16°19'	14°58'	13°34'	12°09'	10°42'	9°14'
39°	19°33'	18°14'	16°53'	15°29'	14°03'	12°35'	11°05'	9°33'
40°	20°12'	18°51'	17°27'	16°01'	14°32'	13°01'	11°28'	9°54'
41°	20°52'	19°25'	18°02'	16°33'	15°02'	13°28'	11°53'	10°15'
42°	21°32'	20°07'	18°38'	17°07'	15°33'	13°56'	12°17'	10°36'
43°	22°14'	20°46'	19°15'	17°41'	16°04'	14°25'	12°43'	10°58'
44°	22°57'	21°27'	19°53'	18°17'	16°37'	14°54'	13°09'	11°21'
45°	23°40'	22°08'	20°32'	18°53'	17°10'	15°25'	13°36'	11°45'

$\alpha_n \backslash \varphi$	80°	82°	84°	86°	88°	90°
1°	0°10'	0°08'	0°06'	0°04'	0°02'	0°00'
2°	0°21'	0°17'	0°13'	0°08'	0°04'	0°00'
3°	0°31'	0°25'	0°19'	0°13'	0°06'	0°00'
4°	0°42'	0°33'	0°25'	0°17'	0°08'	0°00'
5°	0°52'	0°42'	0°31'	0°21'	0°10'	0°00'
6°	1°03'	0°50'	0°38'	0°25'	0°13'	0°00'
7°	1°13'	0°59'	0°44'	0°29'	0°15'	0°00'
8°	1°24'	1°07'	0°51'	0°34'	0°17'	0°00'
9°	1°35'	1°16'	0°57'	0°38'	0°19'	0°00'
10°	1°46'	1°24'	1°03'	0°42'	0°21'	0°00'
11°	1°56'	1°33'	1°10'	0°47'	0°23'	0°00'
12°	2°07'	1°42'	1°16'	0°51'	0°26'	0°00'
13°	2°18'	1°50'	1°23'	0°55'	0°28'	0°00'
14°	2°29'	1°59'	1°30'	1°00'	0°30'	0°00'
15°	2°40'	2°08'	1°36'	1°05'	0°32'	0°00'
16°	2°51'	2°17'	1°43'	1°09'	0°34'	0°00'
17°	3°02'	2°26'	1°49'	1°13'	0°37'	0°00'
18°	3°14'	2°35'	1°57'	1°18'	0°39'	0°00'
19°	3°25'	2°45'	2°04'	1°23'	0°41'	0°00'
20°	3°37'	2°54'	2°11'	1°27'	0°44'	0°00'
21°	3°49'	3°03'	2°18'	1°32'	0°46'	0°00'
22°	4°01'	3°13'	2°25'	1°37'	0°48'	0°00'
23°	4°13'	3°23'	2°32'	1°42'	0°51'	0°00'
24°	4°25'	3°33'	2°40'	1°47'	0°53'	0°00'
25°	4°38'	3°43'	2°47'	1°52'	0°56'	0°00'
26°	4°50'	3°53'	2°55'	1°57'	0°59'	0°00'
27°	5°03'	4°03'	3°03'	2°02'	1°01'	0°00'
28°	5°17'	4°14'	3°11'	2°07'	1°04'	0°00'
29°	5°30'	4°25'	3°19'	2°13'	1°07'	0°00'
30°	5°44'	4°36'	3°27'	2°18'	1°09'	0°00'
31°	5°27'	4°47'	3°36'	2°24'	1°12'	0°00'
32°	6°12'	4°58'	3°44'	2°30'	1°15'	0°00'
33°	6°26'	5°10'	3°53'	2°36'	1°18'	0°00'
34°	6°41'	5°22'	4°02'	2°42'	1°21'	0°00'
35°	6°56'	5°34'	4°11'	2°48'	1°24'	0°00'
36°	7°11'	5°46'	4°21'	2°54'	1°27'	0°00'
37°	7°27'	5°59'	4°30'	3°01'	1°30'	0°00'
38°	7°44'	6°12'	4°40'	3°07'	1°34'	0°00'
39°	8°00'	6°26'	4°50'	3°14'	1°37'	0°00'
40°	8°17'	6°40'	5°01'	3°21'	1°41'	0°00'
41°	8°35'	6°54'	5°12'	3°28'	1°44'	0°00'
42°	8°53'	7°09'	5°23'	3°36'	1°48'	0°00'
43°	9°12'	7°24'	5°34'	3°43'	1°52'	0°00'
44°	9°31'	7°39'	5°46'	3°51'	1°56'	0°00'
45°	9°51'	7°55'	5°58'	3°59'	2°00'	0°00'

$\alpha_n \backslash \varphi$	0°	2°	4°	6°	8°	10°	12°	14°
45°	45°00'	44°59'	44°56'	44°51'	44°43'	44°34'	44°22'	44°08'
46°	46°00'	45°59'	45°56'	45°51'	45°43'	45°34'	45°22'	45°08'
47°	47°00'	46°59'	46°56'	46°51'	46°43'	46°34'	46°22'	46°08'
48°	48°00'	47°59'	47°56'	47°51'	47°43'	47°34'	47°22'	47°08'
49°	49°00'	48°59'	48°56'	48°51'	48°43'	48°34'	48°22'	48°09'
50°	50°00'	49°59'	49°56'	49°51'	49°43'	49°34'	49°23'	49°09'
51°	51°00'	50°59'	50°56'	50°51'	50°44'	50°34'	50°23'	50°09'
52°	52°00'	51°59'	51°56'	51°51'	51°44'	51°34'	51°23'	51°10'
53°	53°00'	52°59'	52°56'	52°51'	52°44'	52°35'	52°23'	52°10'
54°	54°00'	53°59'	53°56'	53°51'	53°44'	53°35'	53°24'	53°10'
55°	55°00'	54°59'	54°56'	54°51'	54°44'	54°35'	54°24'	54°11'
56°	56°00'	55°59'	55°56'	55°51'	55°44'	55°36'	55°25'	55°12'
57°	57°00'	56°59'	56°56'	56°51'	56°45'	56°36'	56°25'	56°12'
58°	58°00'	57°59'	57°56'	57°52'	57°45'	57°37'	57°26'	57°13'
59°	59°00'	58°59'	58°56'	58°52'	58°45'	58°37'	58°26'	58°14'
60°	60°00'	59°59'	59°56'	59°52'	59°45'	59°37'	59°27'	59°15'
61°	61°00'	60°59'	60°56'	60°52'	60°46'	60°38'	60°28'	60°16'
62°	62°00'	61°59'	61°57'	61°52'	61°46'	61°38'	61°28'	61°17'
63°	63°00'	62°59'	62°57'	62°52'	62°46'	62°39'	62°29'	62°18'
64°	64°00'	63°59'	63°57'	63°53'	63°47'	63°39'	63°30'	63°19'
65°	65°00'	64°59'	64°57'	64°53'	64°47'	64°40'	64°31'	64°20'
66°	66°00'	65°59'	65°57'	65°53'	65°47'	65°40'	65°32'	65°21'
67°	67°00'	66°59'	66°57'	66°53'	66°48'	66°41'	66°32'	66°22'
68°	68°00'	67°59'	67°57'	67°53'	67°48'	67°42'	67°33'	67°24'
69°	69°00'	68°59'	68°57'	68°54'	68°49'	68°42'	68°34'	68°25'
70°	70°00'	69°59'	69°57'	69°54'	69°49'	69°43'	69°35'	69°26'
71°	71°00'	70°59'	70°57'	70°54'	70°50'	70°44'	70°36'	70°28'
72°	72°00'	71°59'	71°58'	71°54'	71°50'	71°44'	71°37'	71°29'
73°	73°00'	72°59'	72°58'	72°55'	72°51'	72°45'	72°39'	72°31'
74°	74°00'	73°59'	73°58'	73°55'	73°51'	73°46'	73°40'	73°32'
75°	75°00'	74°59'	74°58'	74°55'	74°52'	74°47'	74°41'	74°34'
76°	76°00'	76°00'	75°58'	75°56'	75°52'	75°48'	75°42'	75°35'
77°	77°00'	77°00'	76°58'	76°56'	76°53'	76°48'	76°43'	76°37'
78°	78°00'	78°00'	77°58'	77°56'	77°53'	77°49'	77°44'	77°39'
79°	79°00'	79°00'	78°58'	78°56'	78°54'	78°50'	78°46'	78°40'
80°	80°00'	80°00'	79°58'	79°57'	79°55'	79°51'	79°47'	79°42'
81°	81°00'	81°00'	80°59'	80°57'	80°55'	80°52'	80°48'	80°44'
82°	82°00'	82°00'	81°59'	81°57'	81°55'	81°53'	81°49'	81°46'
83°	83°00'	83°00'	82°59'	82°58'	82°56'	82°54'	82°51'	82°47'
84°	84°00'	84°00'	83°59'	83°58'	83°56'	83°54'	83°52'	83°49'
85°	85°00'	85°00'	84°59'	84°58'	84°57'	84°55'	84°53'	84°51'
86°	86°00'	86°00'	85°59'	85°59'	85°58'	85°56'	85°55'	85°53'
87°	87°00'	87°00'	87°00'	86°59'	86°58'	86°57'	86°56'	86°55'
88°	88°00'	88°00'	88°00'	87°59'	87°59'	87°58'	87°57'	87°56'
89°	89°00'	89°00'	89°00'	89°00'	88°59'	88°59'	88°59'	88°58'
89°30'	89°30'	89°30'	89°30'	89°30'	89°30'	89°30'	89°29'	89°29'

$\alpha_n \backslash \varphi$	16°	18°	20°	22°	24°	26°	28°	30°
45°	43°52'	43°34'	43°13'	42°50'	42°25'	41°57'	41°27'	40°54'
46°	44°52'	44°34'	44°13'	43°50'	43°25'	42°57'	42°26'	41°53'
47°	45°52'	45°34'	45°13'	44°50'	44°25'	43°57'	43°26'	42°53'
48°	46°52'	46°34'	46°13'	45°50'	45°25'	44°57'	44°26'	43°53'
49°	47°53'	47°34'	47°14'	46°51'	46°25'	45°57'	45°27'	44°54'
50°	48°53'	48°35'	48°14'	47°51'	47°26'	46°58'	46°28'	45°54'
51°	49°53'	49°35'	49°15'	48°52'	48°27'	47°59'	47°28'	46°55'
52°	50°54'	50°36'	50°16'	49°53'	49°28'	49°00'	48°30'	47°57'
53°	51°54'	51°37'	51°16'	50°54'	50°29'	50°02'	49°31'	48°58'
54°	52°55'	52°37'	52°17'	51°55'	51°30'	51°03'	50°33'	50°00'
55°	53°56'	53°38'	53°19'	52°56'	52°32'	52°05'	51°35'	51°03'
56°	54°57'	54°39'	54°20'	53°58'	53°34'	53°07'	52°38'	52°05'
57°	55°57'	55°40'	55°21'	55°00'	54°36'	54°09'	53°40'	53°08'
58°	56°58'	56°42'	56°23'	56°01'	55°38'	55°12'	54°43'	54°11'
59°	57°59'	57°43'	57°24'	57°03'	56°40'	56°14'	55°46'	55°15'
60°	59°01'	58°44'	58°26'	58°05'	57°42'	57°17'	56°49'	56°19'
61°	60°02'	59°46'	59°28'	59°08'	58°45'	58°20'	57°53'	57°23'
62°	61°03'	60°47'	60°30'	60°10'	59°48'	59°24'	58°57'	58°27'
63°	62°04'	61°49'	61°32'	61°13'	60°51'	60°27'	60°01'	59°32'
64°	63°06'	62°51'	62°34'	62°15'	61°54'	61°31'	61°05'	60°37'
65°	64°07'	63°53'	63°36'	63°18'	62°58'	62°35'	62°10'	61°42'
66°	65°09'	64°55'	64°39'	64°21'	64°01'	63°39'	63°14'	62°48'
67°	66°10'	65°57'	65°41'	65°24'	65°05'	64°43'	64°19'	63°53'
68°	67°12'	66°59'	66°44'	66°27'	66°09'	65°48'	65°25'	64°59'
69°	68°14'	68°01'	67°47'	67°31'	67°12'	66°52'	66°30'	66°06'
70°	69°16'	69°03'	68°50'	68°34'	68°17'	67°57'	67°36'	67°12'
71°	70°18'	70°06'	69°53'	69°38'	69°21'	69°02'	68°42'	68°19'
72°	71°19'	71°08'	70°56'	70°41'	70°25'	70°07'	69°48'	69°26'
73°	72°21'	72°11'	71°59'	71°45'	71°30'	71°13'	70°54'	70°33'
74°	73°23'	73°13'	73°02'	72°49'	72°34'	72°18'	72°00'	71°41'
75°	74°25'	74°16'	74°05'	73°53'	73°39'	73°24'	73°07'	72°48'
76°	75°28'	75°19'	75°08'	74°57'	74°44'	74°30'	74°14'	73°56'
77°	76°30'	76°21'	76°12'	76°01'	75°49'	75°36'	75°21'	75°04'
78°	77°32'	77°24'	77°15'	77°05'	76°54'	76°42'	76°28'	76°13'
79°	78°34'	78°27'	78°19'	78°10'	77°59'	77°48'	77°35'	77°21'
80°	79°36'	79°30'	79°22'	79°14'	79°05'	78°54'	78°42'	78°29'
81°	80°39'	80°33'	80°26'	80°18'	80°10'	80°00'	79°50'	79°38'
82°	81°41'	81°36'	81°29'	81°23'	81°15'	81°07'	80°57'	80°47'
83°	82°43'	82°39'	82°33'	82°27'	82°21'	82°13'	82°05'	81°56'
84°	83°46'	83°42'	83°37'	83°32'	83°26'	83°20'	83°13'	83°05'
85°	84°48'	84°45'	84°41'	84°37'	84°32'	84°26'	84°20'	84°14'
86°	85°50'	85°48'	85°45'	85°41'	85°37'	85°33'	85°28'	85°23'
87°	86°53'	86°51'	86°48'	86°46'	86°43'	86°40'	86°36'	86°32'
88°	87°55'	87°54'	87°52'	87°51'	87°49'	87°47'	87°44'	87°41'
89°	88°58'	88°57'	88°56'	88°55'	88°54'	88°53'	88°52'	88°51'
89°30'	89°29'	89°28'	89°28'	89°28'	89°27'	89°27'	89°26'	89°25'

$\alpha_n \backslash -\epsilon$	32°	34°	36°	38°	40°	42°	44°	46°
45°	40°18'	39°40'	38°58'	38°14'	37°27'	36°37'	35°44'	34°47'
46°	41°17'	40°39'	39°57'	39°13'	38°25'	37°35'	36°41'	35°44'
47°	42°17'	41°38'	40°56'	40°12'	39°24'	38°33'	37°39'	36°41'
48°	43°17'	42°38'	41°56'	41°11'	40°23'	39°32'	38°37'	37°39'
49°	44°17'	43°39'	42°57'	42°12'	41°23'	40°32'	39°36'	38°38'
50°	45°18'	44°39'	43°57'	43°12'	42°24'	41°32'	40°36'	39°37'
51°	46°19'	45°40'	44°58'	44°13'	43°25'	42°33'	41°37'	40°37'
52°	47°21'	46°42'	46°00'	45°15'	44°26'	43°34'	42°38'	41°38'
53°	48°23'	47°44'	47°02'	46°17'	45°28'	44°36'	43°40'	42°40'
54°	49°25'	48°46'	48°04'	47°19'	46°31'	45°39'	44°43'	43°43'
55°	50°27'	49°49'	49°07'	48°23'	47°34'	46°42'	45°46'	44°46'
56°	51°30'	50°52'	50°11'	49°26'	48°38'	47°46'	46°51'	45°51'
57°	52°33'	51°56'	51°15'	50°30'	49°43'	48°51'	47°55'	46°56'
58°	53°37'	53°00'	52°19'	51°35'	50°48'	49°56'	49°01'	48°02'
59°	54°41'	54°04'	53°24'	52°40'	51°53'	51°03'	50°08'	49°08'
60°	55°45'	55°09'	54°29'	53°46'	53°00'	52°09'	51°15'	50°16'
61°	56°50'	56°14'	55°35'	54°53'	54°07'	53°17'	52°23'	51°25'
62°	57°55'	57°20'	56°41'	55°39'	55°14'	54°25'	53°32'	52°34'
63°	59°00'	58°26'	57°48'	57°07'	56°22'	55°34'	54°48'	53°44'
64°	60°06'	59°32'	58°55'	58°15'	57°31'	56°43'	55°52'	54°56'
65°	61°12'	60°39'	60°02'	59°23'	58°40'	57°54'	57°03'	56°08'
66°	62°18'	61°46'	61°10'	60°32'	59°50'	59°04'	58°15'	57°21'
67°	63°25'	62°53'	62°19'	61°41'	61°01'	60°16'	59°27'	58°34'
68°	64°32'	64°01'	63°28'	62°51'	62°12'	61°28'	60°41'	59°49'
69°	65°39'	65°09'	64°37'	64°02'	63°23'	62°41'	61°55'	61°05'
70°	66°46'	66°18'	65°47'	65°13'	64°35'	63°54'	63°10'	62°21'
71°	67°54'	67°27'	66°57'	66°24'	65°48'	65°08'	64°25'	63°38'
72°	69°02'	68°36'	68°07'	67°36'	67°01'	66°23'	65°42'	64°56'
73°	70°11'	69°45'	69°18'	68°50'	68°15'	67°38'	66°58'	66°15'
74°	71°19'	70°55'	70°33'	70°00'	69°29'	68°54'	68°16'	67°34'
75°	72°28'	72°05'	71°40'	71°13'	70°43'	70°10'	69°34'	68°54'
76°	73°37'	73°16'	72°52'	72°27'	71°55'	71°27'	70°53'	70°15'
77°	74°46'	74°24'	74°04'	73°38'	73°14'	72°45'	72°12'	71°37'
78°	75°56'	75°37'	75°17'	74°54'	74°30'	74°02'	73°32'	72°59'
79°	77°05'	76°48'	76°29'	76°09'	75°46'	75°21'	74°53'	74°22'
80°	78°15'	78°00'	77°42'	77°23'	77°02'	76°39'	76°14'	75°45'
81°	79°25'	79°11'	78°55'	78°38'	78°19'	77°58'	77°35'	77°09'
82°	80°35'	80°23'	80°09'	79°53'	79°36'	79°17'	78°57'	78°34'
83°	81°46'	81°35'	81°22'	81°09'	80°54'	80°37'	80°19'	79°59'
84°	82°56'	82°46'	82°36'	82°24'	82°11'	81°57'	81°41'	81°24'
85°	84°07'	83°59'	83°50'	83°40'	83°29'	83°17'	83°04'	82°49'
86°	85°17'	85°11'	85°03'	84°56'	84°47'	84°37'	84°27'	84°15'
87°	86°28'	86°23'	86°18'	86°12'	86°05'	85°58'	85°50'	85°41'
88°	87°39'	87°35'	87°32'	87°28'	87°23'	87°19'	87°13'	87°07'
89°	88°49'	88°48'	88°46'	88°44'	88°42'	88°39'	88°37'	88°34'
89°30'	89°25'	89°23'	89°23'	89°22'	89°21'	89°20'	89°18'	89°15'

$\alpha_n \backslash \varphi$	48°	50°	52°	54°	56°	58°	60°	62°
45°	33°47'	32°44'	31°37'	30°27'	29°13'	27°55'	26°34'	25°09'
46°	34°43'	33°39'	32°31'	31°20'	30°04'	28°45'	27°22'	25°56'
47°	35°40'	34°35'	33°26'	32°13'	30°57'	29°36'	28°12'	26°43'
48°	36°37'	35°31'	34°22'	33°08'	31°51'	30°29'	29°03'	27°32'
49°	37°35'	36°29'	35°18'	34°04'	32°45'	31°22'	29°54'	28°22'
50°	38°34'	37°27'	36°16'	35°00'	33°41'	32°16'	30°47'	29°14'
51°	39°34'	38°27'	37°15'	35°58'	34°38'	33°12'	31°42'	30°06'
52°	40°35'	39°27'	38°14'	36°57'	35°36'	34°09'	32°37'	31°00'
53°	41°36'	40°28'	39°15'	37°57'	36°35'	35°07'	33°34'	31°55'
54°	42°39'	41°30'	40°17'	38°58'	37°35'	36°06'	34°32'	32°52'
55°	43°42'	42°33'	41°19'	40°01'	38°37'	37°07'	35°32'	33°50'
56°	44°46'	43°37'	42°23'	41°04'	39°40'	38°09'	36°33'	34°50'
57°	45°51'	44°42'	43°28'	42°09'	40°44'	39°13'	37°35'	35°52'
58°	46°58'	45°49'	44°34'	43°15'	41°50'	40°18'	38°40'	36°55'
59°	48°05'	46°56'	45°42'	44°22'	42°57'	41°25'	39°46'	38°00'
60°	49°13'	48°04'	46°50'	45°31'	44°05'	42°33'	40°54'	39°07'
61°	50°22'	49°14'	48°00'	46°41'	45°15'	43°43'	42°03'	40°16'
62°	51°32'	50°24'	49°11'	47°52'	46°27'	44°54'	43°14'	41°27'
63°	52°43'	51°36'	50°23'	49°05'	47°40'	46°07'	44°28'	42°39'
64°	53°55'	52°49'	51°37'	50°19'	48°54'	47°22'	45°43'	43°54'
65°	55°08'	54°02'	52°52'	51°34'	50°11'	48°39'	47°00'	45°12'
66°	56°22'	55°17'	54°08'	52°51'	51°33'	49°58'	48°19'	46°31'
67°	57°37'	56°34'	55°25'	54°10'	52°48'	51°18'	49°40'	47°53'
68°	58°53'	57°51'	56°44'	55°30'	54°09'	52°41'	51°04'	49°17'
69°	60°09'	59°09'	58°03'	56°51'	55°32'	54°05'	52°29'	50°44'
70°	61°27'	60°29'	59°25'	58°14'	56°56'	55°31'	53°57'	52°13'
71°	62°46'	61°42'	60°47'	59°38'	58°23'	56°59'	55°27'	53°45'
72°	64°06'	63°11'	62°11'	61°04'	59°50'	58°29'	56°59'	55°19'
73°	65°27'	64°34'	63°35'	62°31'	61°20'	60°01'	58°33'	56°56'
74°	66°48'	65°58'	65°02'	64°00'	62°51'	61°35'	60°10'	58°35'
75°	68°11'	67°22'	66°29'	65°30'	64°24'	63°11'	61°49'	60°17'
76°	69°34'	68°48'	67°57'	67°01'	65°58'	64°48'	63°30'	62°02'
77°	70°58'	70°15'	69°27'	68°33'	67°34'	66°33'	65°13'	63°49'
78°	72°23'	71°42'	70°57'	70°07'	69°11'	68°09'	66°58'	65°38'
79°	73°48'	73°10'	72°29'	71°42'	70°51'	69°51'	68°45'	67°31'
80°	75°14'	74°40'	74°01'	73°18'	72°30'	71°36'	70°34'	69°25'
81°	76°41'	76°09'	75°34'	74°55'	74°11'	73°22'	72°25'	71°21'
82°	78°08'	77°40'	77°08'	76°33'	75°54'	75°09'	74°18'	73°20'
83°	79°36'	79°11'	78°43'	78°12'	77°37'	76°57'	76°12'	75°21'
84°	81°04'	80°43'	80°19'	79°52'	79°21'	78°47'	78°08'	77°23'
85°	82°33'	82°15'	81°55'	81°32'	81°06'	80°38'	80°05'	79°27'
86°	84°02'	83°47'	83°31'	83°13'	82°52'	82°29'	82°02'	81°32'
87°	85°31'	85°20'	85°08'	84°54'	84°39'	84°21'	84°01'	83°38'
88°	87°01'	86°53'	86°45'	86°36'	86°26'	86°14'	86°00'	85°45'
89°	88°30'	88°27'	88°23'	88°18'	88°13'	88°07'	88°00'	87°52'
89°30'	89°15'	89°13'	89°11'	89°09'	89°06'	89°03'	89°00'	88°56'

α_n	64°	66°	68°	70°	72°	74°	76°	78°
45°	23°40'	22°08'	20°32'	18°53'	17°10'	15°25'	13°36'	11°45'
46°	24°25'	22°50'	21°12'	19°30'	17°45'	15°56'	14°04'	12°09'
47°	25°11'	23°34'	21°53'	20°08'	18°20'	16°28'	14°33'	12°34'
48°	25°58'	24°19'	22°35'	20°48'	18°57'	17°01'	15°02'	13°00'
49°	26°46'	25°04'	23°19'	21°29'	19°34'	17°36'	15°33'	13°27'
50°	27°35'	25°52'	24°04'	22°11'	20°13'	18°11'	16°05'	13°55'
51°	28°26'	26°40'	24°50'	22°54'	20°53'	18°48'	16°38'	14°24'
52°	29°18'	27°30'	25°37'	23°39'	21°35'	19°26'	17°12'	14°54'
53°	30°11'	28°21'	26°26'	24°25'	22°18'	20°05'	17°48'	15°25'
54°	31°06'	29°14'	27°17'	25°13'	23°02'	20°47'	18°25'	15°58'
55°	32°03'	30°09'	28°09'	26°02'	23°49'	21°29'	19°04'	16°32'
56°	33°01'	31°05'	29°03'	26°54'	24°37'	22°14'	19°44'	17°08'
57°	34°01'	32°04'	29°59'	27°46'	25°27'	23°00'	20°26'	17°45'
58°	35°03'	33°04'	30°57'	28°42'	26°19'	23°48'	21°10'	18°24'
59°	36°07'	34°06'	31°56'	29°39'	27°13'	24°39'	21°56'	19°05'
60°	37°13'	35°10'	32°59'	30°39'	28°09'	25°31'	22°44'	19°48'
61°	38°20'	36°16'	34°03'	31°41'	29°08'	26°26'	23°35'	20°34'
62°	39°30'	37°25'	35°10'	32°45'	30°10'	27°24'	24°28'	21°21'
63°	40°42'	38°36'	36°20'	33°52'	31°14'	28°25'	25°24'	22°12'
64°	41°57'	39°50'	37°32'	35°02'	32°21'	29°28'	26°23'	23°05'
65°	43°14'	41°06'	38°47'	36°16'	33°32'	30°35'	27°25'	24°02'
66°	44°33'	42°25'	40°05'	37°32'	34°46'	31°46'	28°31'	25°02'
67°	45°55'	43°47'	41°26'	38°52'	36°03'	33°00'	29°41'	26°06'
68°	47°20'	45°11'	42°50'	40°15'	37°25'	34°18'	30°55'	27°14'
69°	48°48'	46°39'	44°18'	41°42'	38°50'	35°41'	32°13'	28°26'
70°	50°18'	48°11'	45°50'	43°13'	40°20'	37°08'	33°37'	29°44'
71°	51°51'	49°45'	47°25'	44°48'	41°54'	38°41'	35°05'	31°07'
72°	53°27'	51°23'	49°04'	46°28'	43°34'	40°19'	36°40'	32°37'
73°	55°06'	53°04'	50°47'	48°12'	45°18'	42°02'	38°21'	34°13'
74°	56°49'	54°49'	52°34'	50°01'	47°08'	43°52'	40°09'	35°57'
75°	58°34'	56°37'	54°25'	51°55'	49°04'	45°49'	42°05'	37°49'
76°	60°22'	58°30'	56°21'	53°55'	51°06'	47°52'	44°08'	39°49'
77°	62°14'	60°25'	58°21'	55°59'	53°14'	50°03'	46°20'	42°00'
78°	64°08'	62°25'	60°26'	58°08'	55°29'	52°22'	48°42'	44°22'
79°	66°05'	64°27'	62°35'	60°23'	57°50'	54°49'	51°13'	46°56'
80°	68°05'	66°34'	64°48'	62°44'	60°17'	57°24'	53°55'	49°42'
81°	70°08'	68°43'	67°05'	65°09'	62°52'	60°07'	56°47'	52°42'
82°	72°13'	70°56'	69°26'	67°40'	65°33'	62°59'	59°51'	55°57'
83°	74°21'	73°12'	71°51'	70°15'	68°20'	65°59'	63°05'	59°26'
84°	76°31'	75°31'	74°20'	72°55'	71°13'	69°08'	66°31'	63°11'
85°	78°43'	77°52'	76°51'	75°39'	74°12'	72°23'	70°07'	67°11'
86°	80°56'	80°15'	79°26'	78°27'	77°45'	75°46'	73°53'	71°25'
87°	83°11'	82°39'	82°02'	81°17'	80°22'	79°14'	77°47'	75°51'
88°	85°27'	85°06'	84°40'	84°10'	83°33'	82°47'	81°47'	80°28'
89°	87°43'	87°33'	87°20'	87°05'	86°46'	86°23'	85°52'	85°12'
89°30'	88°52'	88°46'	88°40'	88°32'	88°23'	88°11'	87°56'	87°36'

$\alpha_n \backslash \varphi$	80°	82°	84°	86°	88°	90°
45°	9°51'	7°55'	5°58'	3°59'	2°00'	0°00'
46°	10°12'	8°12'	6°11'	4°08'	2°04'	0°00'
47°	10°33'	8°29'	6°24'	4°17'	2°09'	0°00'
48°	10°55'	8°47'	6°37'	4°26'	2°13'	0°00'
49°	11°18'	9°06'	6°51'	4°35'	2°18'	0°00'
50°	11°42'	9°25'	7°06'	4°45'	2°23'	0°00'
51°	12°06'	9°45'	7°21'	4°55'	2°28'	0°00'
52°	12°32'	10°06'	7°37'	5°06'	2°33'	0°00'
53°	12°59'	10°28'	7°54'	5°17'	2°39'	0°00'
54°	13°27'	10°51'	8°11'	5°29'	2°45'	0°00'
55°	13°56'	11°14'	8°29'	5°41'	2°51'	0°00'
56°	14°26'	11°40'	8°49'	5°54'	2°58'	0°00'
57°	14°58'	12°06'	9°09'	6°08'	3°05'	0°00'
58°	15°32'	12°33'	9°30'	6°22'	3°12'	0°00'
59°	16°07'	13°02'	9°52'	6°37'	3°19'	0°00'
60°	16°44'	13°33'	10°16'	6°53'	3°28'	0°00'
61°	17°24'	14°06'	10°41'	7°10'	3°56'	0°00'
62°	18°05'	14°40'	11°07'	7°28'	3°45'	0°00'
63°	18°49'	15°17'	11°36'	7°48'	3°55'	0°00'
64°	19°36'	15°56'	12°06'	8°08'	4°06'	0°00'
65°	20°25'	16°37'	12°38'	8°30'	4°17'	0°00'
66°	21°18'	17°22'	13°13'	8°54'	4°29'	0°00'
67°	22°15'	18°09'	13°50'	9°20'	4°42'	0°00'
68°	23°15'	19°00'	14°30'	9°48'	4°56'	0°00'
69°	24°20'	19°56'	15°14'	10°18'	5°12'	0°00'
70°	25°30'	20°56'	16°01'	10°51'	5°29'	0°00'
71°	26°46'	22°00'	16°53'	11°27'	5°47'	0°00'
72°	28°07'	23°11'	17°50'	12°07'	6°08'	0°00'
73°	29°36'	24°29'	18°53'	12°51'	6°31'	0°00'
74°	31°12'	25°53'	20°02'	13°40'	6°56'	0°00'
75°	32°57'	27°27'	21°19'	14°36'	7°25'	0°00'
76°	34°51'	29°10'	22°45'	15°38'	7°58'	0°00'
77°	36°57'	31°05'	24°22'	16°49'	8°36'	0°00'
78°	39°15'	33°13'	26°11'	18°10'	9°19'	0°00'
79°	41°47'	35°36'	28°16'	19°45'	10°11'	0°00'
80°	44°34'	38°17'	30°40'	21°35'	11°12'	0°00'
81°	47°38'	41°18'	33°25'	23°46'	12°26'	0°00'
82°	51°01'	44°43'	36°38'	26°24'	13°57'	0°00'
83°	54°44'	48°35'	40°24'	29°36'	15°52'	0°00'
84°	58°49'	52°56'	44°51'	33°34'	18°18'	0°00'
85°	63°16'	57°51'	50°04'	38°34'	21°45'	0°00'
86°	68°04'	63°19'	56°13'	44°56'	26°31'	0°00'
87°	73°12'	69°22'	63°22'	53°05'	33°40'	0°00'
88°	78°38'	75°55'	71°32'	63°31'	44°59'	0°00'
89°	84°16'	82°51'	80°31'	75°57'	63°33'	0°00'
89°30'	87°07'	86°25'	85°04'	82°52'	75°58'	0°00'

ЛИТЕРАТУРА

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ЗАМЕЧЕННЫЕ ОПЕЧАТКИ

Страница	Строка	Напечатано	Должно быть
141	4 снизу	Deerwater	Deerwater
150	15 сверху	56°58'	56°58'
226	10 сверху	0,77	0,75