

This is a table showing the altitude of the sun at various zmanim for a latitude of 42°. Hatzot is when the sun reaches 90° minute the latitude (in this case, 42°) plus the solar declination (adding negative degrees, i.e. subtracting, in wintertime)

Solar Declination	Morning Shema	Shaharit	Minḥa Gedola	Minḥa Ketana	Pelag HaMinḥa
23°	17°38'	21°37'	24°47'	15°9'	7°48'
-22°	18°18'	22°28'	25°46'	15°43'	8°5'
-21°	18°57'	23°18'	26°46'	16°16'	8°22'
-20°	19°37'	24°8'	27°45'	16°50'	8°39'
-19°	20°16'	24°58'	28°44'	17°23'	8°56'
-18°	20°54'	25°48'	29°44'	17°55'	9°12'
-17°	21°33'	26°37'	30°43'	18°27'	9°28'
-16°	22°11'	27°26'	31°42'	18°59'	9°43'
-15°	22°49'	28°15'	32°41'	19°30'	9°59'
-14°	23°26'	29°4'	33°41'	20°1'	10°14'
-13°	24°3'	29°52'	34°40'	20°32'	10°28'
-12°	24°39'	30°41'	35°39'	21°2'	10°43'
-11°	25°16'	31°29'	36°38'	21°32'	10°57'
-10°	25°51'	32°16'	37°37'	22°1'	11°11'
-9°	26°26'	33°4'	38°36'	22°30'	11°24'
-8°	27°1'	33°51'	39°36'	22°59'	11°38'
-7°	27°36'	34°37'	40°35'	23°27'	11°50'
-6°	28°9'	35°23'	41°34'	23°54'	12°3'
-5°	28°43'	36°9'	42°33'	24°21'	12°15'
-4°	29°16'	36°55'	43°31'	24°48'	12°27'
-3°	29°48'	37°40'	44°30'	25°14'	12°38'
-2°	30°20'	38°25'	45°29'	25°39'	12°49'
-1°	30°51'	39°9'	46°28'	26°4'	13°0'
0°	31°21'	39°53'	47°27'	26°28'	13°11'
1°	31°51'	40°36'	48°25'	26°51'	13°21'
2°	32°20'	41°19'	49°24'	27°14'	13°30'
3°	32°49'	42°1'	50°23'	27°37'	13°39'
4°	33°17'	42°42'	51°21'	27°59'	13°48'
5°	33°44'	43°23'	52°19'	28°20'	13°56'
6°	34°11'	44°4'	53°18'	28°40'	14°4'
7°	34°36'	44°43'	54°16'	28°60'	14°12'
8°	35°1'	45°22'	55°14'	29°19'	14°19'
9°	35°26'	46°1'	56°12'	29°37'	14°26'
10°	35°49'	46°38'	57°10'	29°54'	14°32'
11°	36°12'	47°15'	58°8'	30°11'	14°37'
12°	36°33'	47°50'	59°6'	30°27'	14°43'
13°	36°54'	48°25'	60°3'	30°42'	14°47'
14°	37°14'	48°59'	61°0'	30°56'	14°52'
15°	37°33'	49°32'	61°58'	31°10'	14°55'
16°	37°51'	50°4'	62°55'	31°22'	14°59'
17°	38°7'	50°35'	63°51'	31°34'	15°1'
18°	38°23'	51°4'	64°48'	31°44'	15°4'
19°	38°38'	51°33'	65°44'	31°54'	15°5'
20°	38°52'	52°0'	66°40'	32°3'	15°6'
21°	39°4'	52°26'	67°35'	32°10'	15°7'
22°	39°15'	52°51'	68°30'	32°17'	15°6'
23°	39°25'	53°14'	69°25'	32°23'	15°6'