$\theta \leqslant 180^\circ$	**0°**	**1°**	**2°**	**3°**	**4°**	**5°**	**6°**	**7°**	**8°**	**9°**	
0′	0,00	.*4*7615	.*3*3046	.*3*6852	.*2*1218	.*2*1903	.*2*2739	.*2*3727	.*2*4866	.*2*6156	**60′**
2′	.*5*0085	.*4*8131	.*3*3148	.*3*7005	.*2*1238	.*2*1928	.*2*2770	.*2*3762	.*2*4907	.*2*6201	58′
4′	.*5*0338	.*4*8664	.*3*3252	.*3*7160	.*2*1259	.*2*1954	.*2*2800	.*2*3798	.*2*4947	.*2*6247	56′
6′	.*5*0762	.*4*9214	.*3*3358	.*3*7317	.*2*1280	.*2*1979	.*2*2831	.*2*3834	.*2*4988	.*2*6293	54′
8′	.*5*1354	.*4*9781	.*3*3465	.*3*7475	.*2*1300	.*2*2005	.*2*2862	.*2*3870	.*2*5029	.*2*6339	52′
10′	**.*5*2115**	**.*3*1037**	**.*3*3575**	**.*3*7635**	**.*2*1322**	**.*2*2032**	**.*2*2893**	**.*2*3906**	**.*2*5070**	**.*2*6385**	**50′**
12′	.*5*3046	.*3*1097	.*3*3685	.*3*7796	.*2*1343	.*2*2058	.*2*2925	.*2*3943	.*2*5112	.*2*6432	48′
14′	.*5*4146	.*3*1158	.*3*3798	.*3*7959	.*2*1364	.*2*2084	.*2*2956	.*2*3979	.*2*5153	.*2*6478	46′
16′	.*5*5415	.*3*1222	.*3*3912	.*3*8124	.*2*1386	.*2*2111	.*2*2988	.*2*4016	.*2*5195	.*2*6525	44′
18′	.*5*6854	.*3*1287	.*3*4028	.*3*8291	.*2*1407	.*2*2138	.*2*3020	.*2*4053	.*2*5237	.*2*6572	42′
20′	**.*5*8462**	**.*3*1354**	**.*3*4146**	**.*3*8459**	**.*2*1429**	**.*2*2165**	**.*2*3052**	**.*2*4090**	**.*2*5279**	**.*2*6619**	**40′**
22′	.*4*1024	.*3*1422	.*3*4265	.*3*8629	.*2*1451	.*2*2192	.*2*3084	.*2*4127	.*2*5321	.*2*6666	38′
24′	.*4*1218	.*3*1493	.*3*4386	.*3*8801	.*2*1474	.*2*2219	.*2*3116	.*2*4164	.*2*5364	.*2*6714	36′
26′	.*4*1430	.*3*1564	.*3*4509	.*3*8974	.*2*1496	.*2*2246	.*2*3149	.*2*4202	.*2*5406	.*2*6762	34′
28′	.*4*1658	.*3*1638	.*3*4633	.*3*9149	.*2*1519	.*2*2274	.*2*3181	.*2*4240	.*2*5449	.*2*6809	32′
30′	**.*4*1904**	**.*3*1713**	**.*3*4759**	**.*3*9326**	**.*2*1541**	**.*2*2302**	**.*2*3214**	**.*2*4278**	**.*2*5492**	**.*2*6857**	**30′**
32′	.*4*2166	.*3*1790	.*3*4887	.*3*9504	.*2*1564	.*2*2330	.*2*3247	.*2*4316	.*2*5535	.*2*6905	28′
34′	.*4*2445	.*3*1869	.*3*5016	.*3*9685	.*2*1587	.*2*2358	.*2*3280	.*2*4354	.*2*5578	.*2*6954	26′
36′	.*4*2742	.*3*1949	.*3*5147	.*3*9866	.*2*1611	.*2*2386	.*2*3314	.*2*4392	.*2*5622	.*2*7002	24′
38′	.*4*3055	.*3*2031	.*3*5280	.*2*1005	.*2*1634	.*2*2415	.*2*3347	.*2*4431	.*2*5665	.*2*7051	22′
40′	**.*4*3385**	**.*3*2115**	**.*3*5414**	**.*2*1024**	**.*2*1658**	**.*2*2443**	**.*2*3381**	**.*2*4470**	**.*2*5709**	**.*2*7099**	**20′**
42′	.*4*3732	.*3*2201	.*3*5551	.*2*1042	.*2*1681	.*2*2472	.*2*3415	.*2*4508	.*2*5753	.*2*7148	18′
44′	.*4*4095	.*3*2288	.*3*5688	.*2*1061	.*2*1705	.*2*2501	.*2*3449	.*2*4547	.*2*5797	.*2*7197	16′
46′	.*4*4476	.*3*2377	.*3*5828	.*2*1080	.*2*1729	.*2*2530	.*2*3483	.*2*4587	.*2*5841	.*2*7247	14′
48′	.*4*4874	.*3*2467	.*3*5969	.*2*1099	.*2*1754	.*2*2560	.*2*3517	.*2*4626	.*2*5886	.*2*7296	12′
50′	**.*4*5288**	**.*3*2559**	**.*3*6112**	**.*2*1119**	**.*2*1778**	**.*2*2589**	**.*2*3552**	**.*2*4666**	**.*2*5930**	**.*2*7346**	**10′**
52′	.*4*5720	.*3*2653	.*3*6257	.*2*1138	.*2*1803	.*2*2619	.*2*3586	.*2*4705	.*2*5975	.*2*7395	8′
54′	.*4*6168	.*3*2749	.*3*6403	.*2*1158	.*2*1827	.*2*2649	.*2*3621	.*2*4745	.*2*6020	.*2*7445	6′
56′	.*4*6634	.*3*2846	.*3*6551	.*2*1178	.*2*1852	.*2*2679	.*2*3656	.*2*4785	.*2*6065	.*2*7495	4′
58′	.*4*7116	.*3*2945	.*3*6701	.*2*1198	.*2*1877	.*2*2709	.*2*3692	.*2*4826	.*2*6110	.*2*7546	2′
60′	.*4*7615	.*3*3046	.*3*6852	.*2*1218	.*2*1903	.*2*2739	.*2*3727	.*2*4866	.*2*6156	.*2*7596	**0′**
	359°	**358°**	**357°**	**356°**	**355°**	**354°**	**353°**	**352°**	**351°**	**350°**	$180^\circ \leqslant \theta$

Usage: $hav(358^\circ 42') = hav(1^\circ 18') = 0.0001287$ denoted as .*3*1287

$\theta \leqslant 180^\circ$	**10°**	**11°**	**12°**	**13°**	**14°**	**15°**	**16°**	**17°**	**18°**	**19°**	
0′	.***2***7596	.***2***9186	.***1***1093	.***1***1281	.***1***1485	.***1***1704	.***1***1937	.***1***2185	.***1***2447	.***1***2724	**60′**
2′	.***2***7647	.***2***9242	.***1***1099	.***1***1288	.***1***1492	.***1***1711	.***1***1945	.***1***2193	.***1***2456	.***1***2734	58′
4′	.***2***7697	.***2***9298	.***1***1105	.***1***1295	.***1***1499	.***1***1719	.***1***1953	.***1***2202	.***1***2465	.***1***2743	56′
6′	.***2***7748	.***2***9354	.***1***1111	.***1***1301	.***1***1506	.***1***1726	.***1***1961	.***1***2210	.***1***2474	.***1***2753	54′
8′	.***2***7800	.***2***9410	.***1***1117	.***1***1308	.***1***1513	.***1***1734	.***1***1969	.***1***2219	.***1***2483	.***1***2762	52′
10′	**.*2*7851**	**.*2*9466**	**.*1*1123**	**.*1*1314**	**.*1*1521**	**.*1*1742**	**.*1*1977**	**.*1*2227**	**.*1*2492**	**.*1*2772**	**50′**
12′	.***2***7902	.***2***9522	.***1***1129	.***1***1321	.***1***1528	.***1***1749	.***1***1985	.***1***2236	.***1***2501	.***1***2781	48′
14′	.***2***7954	.***2***9579	.***1***1135	.***1***1328	.***1***1535	.***1***1757	.***1***1993	.***1***2245	.***1***2510	.***1***2791	46′
16′	.***2***8006	.***2***9636	.***1***1142	.***1***1334	.***1***1542	.***1***1764	.***1***2002	.***1***2253	.***1***2520	.***1***2800	44′
18′	.***2***8057	.***2***9693	.***1***1148	.***1***1341	.***1***1549	.***1***1772	.***1***2010	.***1***2262	.***1***2529	.***1***2810	42′
20′	**.*2*8110**	**.*2*9750**	**.*1*1154**	**.*1*1348**	**.*1*1556**	**.*1*1780**	**.*1*2018**	**.*1*2271**	**.*1*2538**	**.*1*2820**	**40′**
22′	.***2***8162	.***2***9807	.***1***1160	.***1***1354	.***1***1564	.***1***1788	.***1***2026	.***1***2279	.***1***2547	.***1***2829	38′
24′	.***2***8214	.***2***9864	.***1***1166	.***1***1361	.***1***1571	.***1***1795	.***1***2034	.***1***2288	.***1***2556	.***1***2839	36′
26′	.***2***8267	.***2***9922	.***1***1173	.***1***1368	.***1***1578	.***1***1803	.***1***2043	.***1***2297	.***1***2565	.***1***2849	34′
28′	.***2***8320	.***2***9980	.***1***1179	.***1***1375	.***1***1585	.***1***1811	.***1***2051	.***1***2305	.***1***2575	.***1***2858	32′
30′	**.*2*8373**	**.*1*1004**	**.*1*1185**	**.*1*1382**	**.*1*1593**	**.*1*1818**	**.*1*2059**	**.*1*2314**	**.*1*2584**	**.*1*2868**	**30′**
32′	.***2***8426	.***1***1010	.***1***1192	.***1***1388	.***1***1600	.***1***1826	.***1***2067	.***1***2323	.***1***2593	.***1***2878	28′
34′	.***2***8479	.***1***1015	.***1***1198	.***1***1395	.***1***1607	.***1***1834	.***1***2076	.***1***2332	.***1***2602	.***1***2887	26′
36′	.***2***8532	.***1***1021	.***1***1204	.***1***1402	.***1***1615	.***1***1842	.***1***2084	.***1***2340	.***1***2612	.***1***2897	24′
38′	.***2***8586	.***1***1027	.***1***1211	.***1***1409	.***1***1622	.***1***1850	.***1***2092	.***1***2349	.***1***2621	.***1***2907	22′
40′	**.*2*8640**	**.*1*1033**	**.*1*1217**	**.*1*1416**	**.*1*1629**	**.*1*1858**	**.*1*2101**	**.*1*2358**	**.*1*2630**	**.*1*2917**	**20′**
42′	.***2***8694	.***1***1039	.***1***1223	.***1***1423	.***1***1637	.***1***1865	.***1***2109	.***1***2367	.***1***2639	.***1***2926	18′
44′	.***2***8748	.***1***1045	.***1***1230	.***1***1429	.***1***1644	.***1***1873	.***1***2117	.***1***2376	.***1***2649	.***1***2936	16′
46′	.***2***8802	.***1***1051	.***1***1236	.***1***1436	.***1***1651	.***1***1881	.***1***2126	.***1***2385	.***1***2658	.***1***2946	14′
48′	.***2***8856	.***1***1057	.***1***1243	.***1***1443	.***1***1659	.***1***1889	.***1***2134	.***1***2394	.***1***2668	.***1***2956	12′
50′	**.*2*8911**	**.*1*1063**	**.*1*1249**	**.*1*1450**	**.*1*1666**	**.*1*1897**	**.*1*2142**	**.*1*2402**	**.*1*2677**	**.*1*2966**	**10′**
52′	.***2***8966	.***1***1069	.***1***1255	.***1***1457	.***1***1674	.***1***1905	.***1***2151	.***1***2411	.***1***2686	.***1***2976	8′
54′	.***2***9021	.***1***1075	.***1***1262	.***1***1464	.***1***1681	.***1***1913	.***1***2159	.***1***2420	.***1***2696	.***1***2986	6′
56′	.***2***9076	.***1***1081	.***1***1268	.***1***1471	.***1***1689	.***1***1921	.***1***2168	.***1***2429	.***1***2705	.***1***2996	4′
58′	.***2***9131	.***1***1087	.***1***1275	.***1***1478	.***1***1696	.***1***1929	.***1***2176	.***1***2438	.***1***2715	.***1***3005	2′
60′	.***2***9186	.***1***1093	.***1***1281	.***1***1485	.***1***1704	.***1***1937	.***1***2185	.***1***2447	.***1***2724	.***1***3015	**0′**
	349°	**348°**	**347°**	**346°**	**345°**	**344°**	**343°**	**342°**	**341°**	**340°**	$180^\circ \leqslant \theta$

Usage: $hav(343^\circ 12') = hav(16^\circ 48') = 0.02134$ denoted as .***1***,2134

$\theta \leqslant 180^\circ$	**20°**	**21°**	**22°**	**23°**	**24°**	**25°**	**26°**	**27°**	**28°**	**29°**	
0′	.***1***3015	.***1***3321	.***1***3641	.***1***3975	.***1***4323	.***1***4685	.***1***5060	.***1***5450	.***1***5853	.***1***6269	**60′**
2′	.***1***3025	.***1***3331	.***1***3652	.***1***3986	.***1***4335	.***1***4697	.***1***5073	.***1***5463	.***1***5866	.***1***6283	58′
4′	.***1***3035	.***1***3342	.***1***3663	.***1***3998	.***1***4346	.***1***4709	.***1***5086	.***1***5476	.***1***5880	.***1***6297	56′
6′	.***1***3045	.***1***3352	.***1***3674	.***1***4009	.***1***4358	.***1***4722	.***1***5099	.***1***5489	.***1***5894	.***1***6311	54′
8′	.***1***3055	.***1***3363	.***1***3685	.***1***4020	.***1***4370	.***1***4734	.***1***5111	.***1***5503	.***1***5907	.***1***6326	52′
10′	**.*1*3065**	**.*1*3373**	**.*1*3695**	**.*1*4032**	**.*1*4382**	**.*1*4746**	**.*1*5124**	**.*1*5516**	**.*1*5921**	**.*1*6340**	**50′**
12′	.***1***3075	.***1***3384	.***1***3706	.***1***4043	.***1***4394	.***1***4759	.***1***5137	.***1***5529	.***1***5935	.***1***6354	48′
14′	.***1***3085	.***1***3394	.***1***3717	.***1***4055	.***1***4406	.***1***4771	.***1***5150	.***1***5542	.***1***5949	.***1***6368	46′
16′	.***1***3095	.***1***3405	.***1***3728	.***1***4066	.***1***4418	.***1***4783	.***1***5163	.***1***5556	.***1***5962	.***1***6382	44′
18′	.***1***3106	.***1***3415	.***1***3740	.***1***4078	.***1***4430	.***1***4796	.***1***5176	.***1***5569	.***1***5976	.***1***6397	42′
20′	**.*1*3116**	**.*1*3426**	**.*1*3751**	**.*1*4089**	**.*1*4442**	**.*1*4808**	**.*1*5189**	**.*1*5582**	**.*1*5990**	**.*1*6411**	**40′**
22′	.***1***3126	.***1***3437	.***1***3762	.***1***4101	.***1***4454	.***1***4821	.***1***5201	.***1***5596	.***1***6004	.***1***6425	38′
24′	.***1***3136	.***1***3447	.***1***3773	.***1***4112	.***1***4466	.***1***4833	.***1***5214	.***1***5609	.***1***6018	.***1***6439	36′
26′	.***1***3146	.***1***3458	.***1***3784	.***1***4124	.***1***4478	.***1***4846	.***1***5227	.***1***5623	.***1***6031	.***1***6454	34′
28′	.***1***3156	.***1***3468	.***1***3795	.***1***4135	.***1***4490	.***1***4858	.***1***5240	.***1***5636	.***1***6045	.***1***6468	32′
30′	**.*1*3166**	**.*1*3479**	**.*1*3806**	**.*1*4147**	**.*1*4502**	**.*1*4871**	**.*1*5253**	**.*1*5649**	**.*1*6059**	**.*1*6482**	**30′**
32′	.***1***3177	.***1***3490	.***1***3817	.***1***4159	.***1***4514	.***1***4883	.***1***5266	.***1***5663	.***1***6073	.***1***6497	28′
34′	.***1***3187	.***1***3500	.***1***3828	.***1***4170	.***1***4526	.***1***4896	.***1***5279	.***1***5676	.***1***6087	.***1***6511	26′
36′	.***1***3197	.***1***3511	.***1***3839	.***1***4182	.***1***4538	.***1***4908	.***1***5292	.***1***5690	.***1***6101	.***1***6525	24′
38′	.***1***3207	.***1***3522	.***1***3851	.***1***4194	.***1***4550	.***1***4921	.***1***5305	.***1***5703	.***1***6115	.***1***6540	22′
40′	**.*1*3218**	**.*1*3533**	**.*1*3862**	**.*1*4205**	**.*1*4562**	**.*1*4934**	**.*1*5318**	**.*1*5717**	**.*1*6129**	**.*1*6554**	**20′**
42′	.***1***3228	.***1***3543	.***1***3873	.***1***4217	.***1***4575	.***1***4946	.***1***5331	.***1***5730	.***1***6143	.***1***6568	18′
44′	.***1***3238	.***1***3554	.***1***3884	.***1***4229	.***1***4587	.***1***4959	.***1***5345	.***1***5744	.***1***6157	.***1***6583	16′
46′	.***1***3248	.***1***3565	.***1***3896	.***1***4240	.***1***4599	.***1***4971	.***1***5358	.***1***5757	.***1***6171	.***1***6597	14′
48′	.***1***3259	.***1***3576	.***1***3907	.***1***4252	.***1***4611	.***1***4984	.***1***5371	.***1***5771	.***1***6185	.***1***6612	12′
50′	**.*1*3269**	**.*1*3587**	**.*1*3918**	**.*1*4264**	**.*1*4623**	**.*1*4997**	**.*1*5384**	**.*1*5785**	**.*1*6199**	**.*1*6626**	**10′**
52′	.***1***3279	.***1***3597	.***1***3929	.***1***4276	.***1***4636	.***1***5009	.***1***5397	.***1***5798	.***1***6213	.***1***6641	8′
54′	.***1***3290	.***1***3608	.***1***3941	.***1***4287	.***1***4648	.***1***5022	.***1***5410	.***1***5812	.***1***6227	.***1***6655	6′
56′	.***1***3300	.***1***3619	.***1***3952	.***1***4299	.***1***4660	.***1***5035	.***1***5423	.***1***5825	.***1***6241	.***1***6670	4′
58′	.***1***3311	.***1***3630	.***1***3963	.***1***4311	.***1***4672	.***1***5048	.***1***5436	.***1***5839	.***1***6255	.***1***6684	2′
60′	.***1***3321	.***1***3641	.***1***3975	.***1***4323	.***1***4685	.***1***5060	.***1***5450	.***1***5853	.***1***6269	.***1***6699	**0′**
	339°	**338°**	**337°**	**336°**	**335°**	**334°**	**333°**	**332°**	**331°**	**330°**	$180^\circ \leqslant \theta$

Usage: $hav(330^\circ 56') = hav(29^\circ 04') = 0.06283$ denoted as .***1***,6283

$\theta \leqslant 180°$	**30°**	**31°**	**32°**	**33°**	**34°**	**35°**	**36°**	**37°**	**38°**	**39°**	
0′	.***1***6699	.***1***7142	.***1***7598	.***1***8066	.***1***8548	.***1***9042	.***1***9549	,10068	,10599	,11143	**60′**
2′	.***1***6713	.***1***7157	.***1***7613	.***1***8082	.***1***8564	.***1***9059	.***1***9566	,10086	,10617	,11161	58′
4′	.***1***6728	.***1***7172	.***1***7628	.***1***8098	.***1***8581	.***1***9076	.***1***9583	,10103	,10635	,11179	56′
6′	.***1***6742	.***1***7187	.***1***7644	.***1***8114	.***1***8597	.***1***9093	.***1***9601	,10121	,10653	,11198	54′
8′	.***1***6757	.***1***7202	.***1***7659	.***1***8130	.***1***8613	.***1***9109	.***1***9618	,10138	,10671	,11216	52′
10′	**.*1*6772**	**.*1*7217**	**.*1*7675**	**.*1*8146**	**.*1*8630**	**.*1*9126**	**.*1*9635**	**,10156**	**,10689**	**,11234**	**50′**
12′	.***1***6786	.***1***7232	.***1***7690	.***1***8162	.***1***8646	.***1***9143	.***1***9652	,10174	,10707	,11253	48′
14′	.***1***6801	.***1***7247	.***1***7706	.***1***8178	.***1***8662	.***1***9160	.***1***9669	,10191	,10725	,11271	46′
16′	.***1***6816	.***1***7262	.***1***7721	.***1***8194	.***1***8679	.***1***9176	.***1***9686	,10209	,10743	,11290	44′
18′	.***1***6830	.***1***7277	.***1***7737	.***1***8210	.***1***8695	.***1***9193	.***1***9704	,10226	,10761	,11308	42′
20′	**.*1*6845**	**.*1*7292**	**.*1*7752**	**.*1*8226**	**.*1*8711**	**.*1*9210**	**.*1*9721**	**,10244**	**,10779**	**,11326**	**40′**
22′	.***1***6860	.***1***7307	.***1***7768	.***1***8242	.***1***8728	.***1***9227	.***1***9738	,10262	,10797	,11345	38′
24′	.***1***6874	.***1***7322	.***1***7784	.***1***8258	.***1***8744	.***1***9244	.***1***9755	,10279	,10815	,11363	36′
26′	.***1***6889	.***1***7338	.***1***7799	.***1***8274	.***1***8761	.***1***9260	.***1***9773	,10297	,10833	,11382	34′
28′	.***1***6904	.***1***7353	.***1***7815	.***1***8290	.***1***8777	.***1***9277	.***1***9790	,10315	,10851	,11400	32′
30′	**.*1*6919**	**.*1*7368**	**.*1*7830**	**.*1*8306**	**.*1*8794**	**.*1*9294**	**.*1*9807**	**,10332**	**,10870**	**,11419**	**30′**
32′	.***1***6933	.***1***7383	.***1***7846	.***1***8322	.***1***8810	.***1***9311	.***1***9824	,10350	,10888	,11437	28′
34′	.***1***6948	.***1***7398	.***1***7862	.***1***8338	.***1***8827	.***1***9328	.***1***9842	,10368	,10906	,11456	26′
36′	.***1***6963	.***1***7414	.***1***7877	.***1***8354	.***1***8843	.***1***9345	.***1***9859	,10386	,10924	,11474	24′
38′	.***1***6978	.***1***7429	.***1***7893	.***1***8370	.***1***8860	.***1***9362	.***1***9876	,10403	,10942	,11493	22′
40′	**.*1*6993**	**.*1*7444**	**.*1*7909**	**.*1*8386**	**.*1*8876**	**.*1*9379**	**.*1*9894**	**,10421**	**,10960**	**,11511**	**20′**
42′	.***1***7007	.***1***7459	.***1***7924	.***1***8402	.***1***8893	.***1***9396	.***1***9911	,10439	,10978	,11530	18′
44′	.***1***7022	.***1***7475	.***1***7940	.***1***8418	.***1***8909	.***1***9413	.***1***9929	,10457	,10997	,11549	16′
46′	.***1***7037	.***1***7490	.***1***7956	.***1***8435	.***1***8926	.***1***9430	.***1***9946	,10474	,11015	,11567	14′
48′	.***1***7052	.***1***7505	.***1***7972	.***1***8451	.***1***8943	.***1***9447	.***1***9963	,10492	,11033	,11586	12′
50′	**.*1*7067**	**.*1*7521**	**.*1*7987**	**.*1*8467**	**.*1*8959**	**.*1*9464**	**.*1*9981**	**,10510**	**,11051**	**,11604**	**10′**
52′	.***1***7082	.***1***7536	.***1***8003	.***1***8483	.***1***8976	.***1***9481	.***1***9998	,10528	,11070	,11623	8′
54′	.***1***7097	.***1***7551	.***1***8019	.***1***8499	.***1***8992	.***1***9498	,10016	,10546	,11088	,11642	6′
56′	.***1***7112	.***1***7567	.***1***8035	.***1***8516	.***1***9009	.***1***9515	,10033	,10564	,11106	,11660	4′
58′	.***1***7127	.***1***7582	.***1***8051	.***1***8532	.***1***9026	.***1***9532	,10051	,10582	,11124	,11679	2′
60′	.***1***7142	.***1***7598	.***1***8066	.***1***8548	.***1***9042	.***1***9549	,10068	,10599	,11143	,11698	**0′**
	329°	**328°**	**327°**	**326°**	**325°**	**324°**	**323°**	**322°**	**321°**	**320°**	$180° \leqslant \theta$

Usage: $hav(326°32′) = hav(33°28′) = 0.0829$ denoted as .***1***8290
$hav(323°06′) = hav(36°54′) = 0.10016$ denoted as 0,10016

$\theta \leqslant 180^\circ$	**40°**	**41°**	**42°**	**43°**	**44°**	**45°**	**46°**	**47°**	**48°**	**49°**	
0′	0,11698	0,12265	0,12843	0,13432	,14033	,14645	,15267	,15900	,16543	,17197	**60′**
2′	,11716	,12284	,12862	,13452	,14053	,14665	,15288	,15921	,16565	,17219	58′
4′	,11735	,12303	,12882	,13472	,14073	,14686	,15309	,15943	,16587	,17241	56′
6′	,11754	,12322	,12901	,13492	,14094	,14706	,15330	,15964	,16608	,17263	54′
8′	,11773	,12341	,12921	,13512	,14114	,14727	,15351	,15985	,16630	,17285	52′
10′	**,11791**	**,12360**	**,12940**	**,13532**	**,14134**	**,14748**	**,15372**	**,16007**	**,16652**	**,17307**	**50′**
12′	,11810	,12379	,12960	,13552	,14154	,14768	,15393	,16028	,16673	,17329	48′
14′	,11829	,12398	,12979	,13571	,14175	,14789	,15414	,16049	,16695	,17351	46′
16′	,11848	,12418	,12999	,13591	,14195	,14810	,15435	,16071	,16717	,17373	44′
18′	,11867	,12437	,13018	,13611	,14215	,14830	,15456	,16092	,16738	,17395	42′
20′	**,11885**	**,12456**	**,13038**	**,13631**	**,14236**	**,14851**	**,15477**	**,16113**	**,16760**	**,17417**	**40′**
22′	,11904	,12475	,13058	,13651	,14256	,14872	,15498	,16135	,16782	,17439	38′
24′	,11923	,12494	,13077	,13671	,14276	,14892	,15519	,16156	,16804	,17461	36′
26′	,11942	,12514	,13097	,13691	,14297	,14913	,15540	,16178	,16825	,17483	34′
28′	,11961	,12533	,13116	,13711	,14317	,14934	,15561	,16199	,16847	,17505	32′
30′	**,11980**	**,12552**	**,13136**	**,13731**	**,14337**	**,14955**	**,15582**	**,16220**	**,16869**	**,17528**	**30′**
32′	,11999	,12571	,13156	,13751	,14358	,14975	,15603	,16242	,16891	,17550	28′
34′	,12018	,12591	,13175	,13771	,14378	,14996	,15624	,16263	,16913	,17572	26′
36′	,12036	,12610	,13195	,13791	,14399	,15017	,15646	,16285	,16934	,17594	24′
38′	,12055	,12629	,13215	,13811	,14419	,15038	,15667	,16306	,16956	,17616	22′
40′	**,12074**	**,12649**	**,13235**	**,13832**	**,14440**	**,15058**	**,15688**	**,16328**	**,16978**	**,17638**	**20′**
42′	,12093	,12668	,13254	,13852	,14460	,15079	,15709	,16349	,17000	,17661	18′
44′	,12112	,12687	,13274	,13872	,14480	,15100	,15730	,16371	,17022	,17683	16′
46′	,12131	,12707	,13294	,13892	,14501	,15121	,15751	,16392	,17044	,17705	14′
48′	,12150	,12726	,13314	,13912	,14521	,15142	,15773	,16414	,17066	,17727	12′
50′	**,12169**	**,12746**	**,13333**	**,13932**	**,14542**	**,15163**	**,15794**	**,16436**	**,17087**	**,17749**	**10′**
52′	,12188	,12765	,13353	,13952	,14562	,15183	,15815	,16457	,17109	,17772	8′
54′	,12207	,12784	,13373	,13972	,14583	,15204	,15836	,16479	,17131	,17794	6′
56′	,12226	,12804	,13393	,13993	,14604	,15225	,15858	,16500	,17153	,17816	4′
58′	,12245	,12823	,13412	,14013	,14624	,15246	,15879	,16522	,17175	,17838	2′
60′	,12265	,12843	,13432	,14033	,14645	,15267	,15900	,16543	,17197	,17861	**0′**
	319°	**318°**	**317°**	**316°**	**315°**	**314°**	**313°**	**312°**	**311°**	**310°**	$180^\circ \leqslant \theta$

Usage: $hav(315^\circ 02') = hav(44^\circ 58') = 0.14624$ denoted as ,14624

$\theta \leqslant 180°$	**50°**	**51°**	**52°**	**53°**	**54°**	**55°**	**56°**	**57°**	**58°**	**59°**	
0′	,17861	,18534	,19217	,19909	,20611	,21321	,22040	,22768	,23504	,24248	**60′**
2′	,17883	,18557	,19240	,19932	,20634	,21345	,22064	,22792	,23529	,24273	58′
4′	,17905	,18579	,19263	,19956	,20658	,21369	,22089	,22817	,23553	,24298	56′
6′	,17928	,18602	,19286	,19979	,20681	,21393	,22113	,22841	,23578	,24323	54′
8′	,17950	,18624	,19309	,20002	,20705	,21417	,22137	,22866	,23603	,24348	52′
10′	**,17972**	**,18647**	**,19332**	**,20026**	**,20729**	**,21440**	**,22161**	**,22890**	**,23627**	**,24373**	**50′**
12′	,17995	,18670	,19355	,20049	,20752	,21464	,22185	,22915	,23652	,24398	48′
14′	,18017	,18692	,19378	,20072	,20776	,21488	,22209	,22939	,23677	,24423	46′
16′	,18039	,18715	,19401	,20095	,20799	,21512	,22234	,22964	,23702	,24448	44′
18′	,18062	,18738	,19424	,20119	,20823	,21536	,22258	,22988	,23726	,24473	42′
20′	**,18084**	**,18761**	**,19447**	**,20142**	**,20847**	**,21560**	**,22282**	**,23012**	**,23751**	**,24498**	**40′**
22′	,18106	,18783	,19470	,20165	,20870	,21584	,22306	,23037	,23776	,24523	38′
24′	,18129	,18806	,19493	,20189	,20894	,21608	,22330	,23061	,23801	,24548	36′
26′	,18151	,18829	,19516	,20212	,20918	,21632	,22355	,23086	,23825	,24573	34′
28′	,18174	,18852	,19539	,20235	,20941	,21656	,22379	,23110	,23850	,24598	32′
30′	**,18196**	**,18874**	**,19562**	**,20259**	**,20965**	**,21680**	**,22403**	**,23135**	**,23875**	**,24623**	**30′**
32′	,18219	,18897	,19585	,20282	,20989	,21704	,22427	,23160	,23900	,24648	28′
34′	,18241	,18920	,19608	,20306	,21012	,21728	,22452	,23184	,23925	,24673	26′
36′	,18263	,18943	,19631	,20329	,21036	,21752	,22476	,23209	,23950	,24698	24′
38′	,18286	,18965	,19654	,20352	,21060	,21776	,22500	,23233	,23974	,24723	22′
40′	**,18308**	**,18988**	**,19677**	**,20376**	**,21083**	**,21800**	**,22525**	**,23258**	**,23999**	**,24749**	**20′**
42′	,18331	,19011	,19701	,20399	,21107	,21824	,22549	,23282	,24024	,24774	18′
44′	,18353	,19034	,19724	,20423	,21131	,21848	,22573	,23307	,24049	,24799	16′
46′	,18376	,19057	,19747	,20446	,21155	,21872	,22598	,23332	,24074	,24824	14′
48′	,18399	,19080	,19770	,20470	,21178	,21896	,22622	,23356	,24099	,24849	12′
50′	**,18421**	**,19102**	**,19793**	**,20493**	**,21202**	**,21920**	**,22646**	**,23381**	**,24124**	**,24874**	**10′**
52′	,18444	,19125	,19816	,20517	,21226	,21944	,22671	,23405	,24148	,24899	8′
54′	,18466	,19148	,19840	,20540	,21250	,21968	,22695	,23430	,24173	,24924	6′
56′	,18489	,19171	,19863	,20564	,21274	,21992	,22719	,23455	,24198	,24950	4′
58′	,18511	,19194	,19886	,20587	,21297	,22016	,22744	,23479	,24223	,24975	2′
60′	,18534	,19217	,19909	,20611	,21321	,22040	,22768	,23504	,24248	,25000	**0′**
	309°	**308°**	**307°**	**306°**	**305°**	**304°**	**303°**	**302°**	**301°**	**300°**	$180° \leqslant \theta$

Usage: $hav(309°26') = hav(50°34') = 0.18241$ denoted as ,18241

$\theta \leqslant 180^\circ$	**60°**	**61°**	**62°**	**63°**	**64°**	**65°**	**66°**	**67°**	**68°**	**69°**	
0′	,25000	,25760	,26526	,27300	,28081	,28869	,29663	,30463	,31270	,32082	**60′**
2′	,25025	,25785	,26552	,27326	,28108	,28895	,29690	,30490	,31297	,32109	58′
4′	,25050	,25810	,26578	,27352	,28134	,28922	,29716	,30517	,31324	,32136	56′
6′	,25076	,25836	,26604	,27378	,28160	,28948	,29743	,30544	,31351	,32163	54′
8′	,25101	,25861	,26629	,27404	,28186	,28975	,29770	,30571	,31378	,32190	52′
10′	**,25126**	**,25887**	**,26655**	**,27430**	**,28212**	**,29001**	**,29796**	**,30597**	**,31405**	**,32217**	**50′**
12′	,25151	,25912	,26681	,27456	,28238	,29027	,29823	,30624	,31432	,32245	48′
14′	,25177	,25938	,26706	,27482	,28265	,29054	,29849	,30651	,31459	,32272	46′
16′	,25202	,25963	,26732	,27508	,28291	,29080	,29876	,30678	,31486	,32299	44′
18′	,25227	,25989	,26758	,27534	,28317	,29107	,29903	,30705	,31513	,32326	42′
20′	**,25252**	**,26014**	**,26784**	**,27560**	**,28343**	**,29133**	**,29929**	**,30732**	**,31540**	**,32353**	**40′**
22′	,25278	,26040	,26809	,27586	,28369	,29160	,29956	,30758	,31567	,32381	38′
24′	,25303	,26065	,26835	,27612	,28396	,29186	,29983	,30785	,31594	,32408	36′
26′	,25328	,26091	,26861	,27638	,28422	,29212	,30009	,30812	,31621	,32435	34′
28′	,25354	,26117	,26887	,27664	,28448	,29239	,30036	,30839	,31648	,32462	32′
30′	**,25379**	**,26142**	**,26913**	**,27690**	**,28474**	**,29265**	**,30063**	**,30866**	**,31675**	**,32490**	**30′**
32′	,25404	,26168	,26938	,27716	,28501	,29292	,30089	,30893	,31702	,32517	28′
34′	,25429	,26193	,26964	,27742	,28527	,29318	,30116	,30920	,31729	,32544	26′
36′	,25455	,26219	,26990	,27768	,28553	,29345	,30143	,30946	,31756	,32571	24′
38′	,25480	,26244	,27016	,27794	,28580	,29371	,30169	,30973	,31783	,32599	22′
40′	**,25506**	**,26270**	**,27042**	**,27820**	**,28606**	**,29398**	**,30196**	**,31000**	**,31810**	**,32626**	**20′**
42′	,25531	,26296	,27068	,27846	,28632	,29424	,30223	,31027	,31837	,32653	18′
44′	,25556	,26321	,27093	,27873	,28658	,29451	,30249	,31054	,31865	,32681	16′
46′	,25582	,26347	,27119	,27899	,28685	,29477	,30276	,31081	,31892	,32708	14′
48′	,25607	,26372	,27145	,27925	,28711	,29504	,30303	,31108	,31919	,32735	12′
50′	**,25632**	**,26398**	**,27171**	**,27951**	**,28737**	**,29530**	**,30330**	**,31135**	**,31946**	**,32762**	**10′**
52′	,25658	,26424	,27197	,27977	,28764	,29557	,30356	,31162	,31973	,32790	8′
54′	,25683	,26449	,27223	,28003	,28790	,29583	,30383	,31189	,32000	,32817	6′
56′	,25709	,26475	,27249	,28029	,28816	,29610	,30410	,31216	,32027	,32844	4′
58′	,25734	,26501	,27275	,28055	,28843	,29637	,30437	,31243	,32054	,32872	2′
60′	,25760	,26526	,27300	,28081	,28869	,29663	,30463	,31270	,32082	,32899	**0′**
	299°	**298°**	**297°**	**296°**	**295°**	**294°**	**293°**	**292°**	**291°**	**290°**	$180^\circ \leqslant \theta$

Usage: $hav(290^\circ 50') = hav(69^\circ 10') = 0.32217$ denoted as ,32217

$\theta \leqslant 180^\circ$	**70°**	**71°**	**72°**	**73°**	**74°**	**75°**	**76°**	**77°**	**78°**	**79°**	
0′	,32899	,33722	,34549	,35381	,36218	,37059	,37904	,38752	,39604	,40460	**60′**
2′	,32926	,33749	,34577	,35409	,36246	,37087	,37932	,38781	,39633	,40488	58′
4′	,32954	,33777	,34604	,35437	,36274	,37115	,37960	,38809	,39661	,40517	56′
6′	,32981	,33804	,34632	,35465	,36302	,37143	,37989	,38837	,39690	,40545	54′
8′	,33008	,33832	,34660	,35493	,36330	,37171	,38017	,38866	,39718	,40574	52′
10′	**,33036**	**,33859**	**,34688**	**,35521**	**,36358**	**,37200**	**,38045**	**,38894**	**,39747**	**,40602**	**50′**
12′	,33063	,33887	,34715	,35548	,36386	,37228	,38073	,38923	,39775	,40631	48′
14′	,33090	,33914	,34743	,35576	,36414	,37256	,38102	,38951	,39804	,40660	46′
16′	,33118	,33942	,34771	,35604	,36442	,37284	,38130	,38979	,39832	,40688	44′
18′	,33145	,33969	,34798	,35632	,36470	,37312	,38158	,39008	,39861	,40717	42′
20′	**,33173**	**,33997**	**,34826**	**,35660**	**,36498**	**,37340**	**,38186**	**,39036**	**,39889**	**,40745**	**40′**
22′	,33200	,34024	,34854	,35688	,36526	,37368	,38215	,39064	,39918	,40774	38′
24′	,33227	,34052	,34882	,35716	,36554	,37397	,38243	,39093	,39946	,40802	36′
26′	,33255	,34080	,34909	,35743	,36582	,37425	,38271	,39121	,39975	,40831	34′
28′	,33282	,34107	,34937	,35771	,36610	,37453	,38299	,39150	,40003	,40860	32′
30′	**,33310**	**,34135**	**,34965**	**,35799**	**,36638**	**,37481**	**,38328**	**,39178**	**,40032**	**,40888**	**30′**
32′	,33337	,34162	,34992	,35827	,36666	,37509	,38356	,39206	,40060	,40917	28′
34′	,33365	,34190	,35020	,35855	,36694	,37537	,38384	,39235	,40089	,40945	26′
36′	,33392	,34218	,35048	,35883	,36722	,37566	,38413	,39263	,40117	,40974	24′
38′	,33419	,34245	,35076	,35911	,36750	,37594	,38441	,39292	,40146	,41003	22′
40′	**,33447**	**,34273**	**,35103**	**,35939**	**,36778**	**,37622**	**,38469**	**,39320**	**,40174**	**,41031**	**20′**
42′	,33474	,34300	,35131	,35967	,36806	,37650	,38498	,39348	,40203	,41060	18′
44′	,33502	,34328	,35159	,35995	,36834	,37678	,38526	,39377	,40231	,41089	16′
46′	,33529	,34356	,35187	,36023	,36862	,37706	,38554	,39405	,40260	,41117	14′
48′	,33557	,34383	,35215	,36050	,36891	,37735	,38582	,39434	,40288	,41146	12′
50′	**,33584**	**,34411**	**,35242**	**,36078**	**,36919**	**,37763**	**,38611**	**,39462**	**,40317**	**,41174**	**10′**
52′	,33612	,34439	,35270	,36106	,36947	,37791	,38639	,39491	,40345	,41203	8′
54′	,33639	,34466	,35298	,36134	,36975	,37819	,38667	,39519	,40374	,41232	6′
56′	,33667	,34494	,35326	,36162	,37003	,37847	,38696	,39548	,40402	,41260	4′
58′	,33694	,34521	,35354	,36190	,37031	,37876	,38724	,39576	,40431	,41289	2′
60′	,33722	,34549	,35381	,36218	,37059	,37904	,38752	,39604	,40460	,41318	**0′**
	289°	**288°**	**287°**	**286°**	**285°**	**284°**	**283°**	**282°**	**281°**	**280°**	$180^\circ \leqslant \theta$

Usage: $hav(289^\circ 10') = hav(70^\circ 50') = 0.33584$ denoted as ,33584

$\theta \leqslant 180°$	**80°**	**81°**	**82°**	**83°**	**84°**	**85°**	**86°**	**87°**	**88°**	**89°**	
0′	,41318	,42178	,43041	,43907	,44774	,45642	,46512	,47383	,48255	,49127	**60′**
2′	,41346	,42207	,43070	,43935	,44803	,45671	,46541	,47412	,48284	,49156	58′
4′	,41375	,42236	,43099	,43964	,44831	,45700	,46570	,47441	,48313	,49186	56′
6′	,41404	,42264	,43128	,43993	,44860	,45729	,46599	,47470	,48342	,49215	54′
8′	,41432	,42293	,43157	,44022	,44889	,45758	,46628	,47499	,48371	,49244	52′
10′	**,41461**	**,42322**	**,43185**	**,44051**	**,44918**	**,45787**	**,46657**	**,47528**	**,48400**	**,49273**	**50′**
12′	,41490	,42351	,43214	,44080	,44947	,45816	,46686	,47558	,48429	,49302	48′
14′	,41518	,42379	,43243	,44109	,44976	,45845	,46715	,47587	,48459	,49331	46′
16′	,41547	,42408	,43272	,44138	,45005	,45874	,46744	,47616	,48488	,49360	44′
18′	,41576	,42437	,43301	,44166	,45034	,45903	,46773	,47645	,48517	,49389	42′
20′	**,41604**	**,42466**	**,43330**	**,44195**	**,45063**	**,45932**	**,46802**	**,47674**	**,48546**	**,49418**	**40′**
22′	,41633	,42494	,43358	,44224	,45092	,45961	,46831	,47703	,48575	,49447	38′
24′	,41662	,42523	,43387	,44253	,45121	,45990	,46860	,47732	,48604	,49476	36′
26′	,41690	,42552	,43416	,44282	,45150	,46019	,46890	,47761	,48633	,49505	34′
28′	,41719	,42581	,43445	,44311	,45179	,46048	,46919	,47790	,48662	,49535	32′
30′	**,41748**	**,42610**	**,43474**	**,44340**	**,45208**	**,46077**	**,46948**	**,47819**	**,48691**	**,49564**	**30′**
32′	,41776	,42638	,43503	,44369	,45237	,46106	,46977	,47848	,48720	,49593	28′
34′	,41805	,42667	,43531	,44398	,45266	,46135	,47006	,47877	,48749	,49622	26′
36′	,41834	,42696	,43560	,44427	,45295	,46164	,47035	,47906	,48778	,49651	24′
38′	,41862	,42725	,43589	,44455	,45324	,46193	,47064	,47935	,48807	,49680	22′
40′	**,41891**	**,42753**	**,43618**	**,44484**	**,45353**	**,46222**	**,47093**	**,47964**	**,48837**	**,49709**	**20′**
42′	,41920	,42782	,43647	,44513	,45381	,46251	,47122	,47993	,48866	,49738	18′
44′	,41949	,42811	,43676	,44542	,45410	,46280	,47151	,48022	,48895	,49767	16′
46′	,41977	,42840	,43704	,44571	,45439	,46309	,47180	,48052	,48924	,49796	14′
48′	,42006	,42869	,43733	,44600	,45468	,46338	,47209	,48081	,48953	,49825	12′
50′	**,42035**	**,42897**	**,43762**	**,44629**	**,45497**	**,46367**	**,47238**	**,48110**	**,48982**	**,49855**	**10′**
52′	,42063	,42926	,43791	,44658	,45526	,46396	,47267	,48139	,49011	,49884	8′
54′	,42092	,42955	,43820	,44687	,45555	,46425	,47296	,48168	,49040	,49913	6′
56′	,42121	,42984	,43849	,44716	,45584	,46454	,47325	,48197	,49069	,49942	4′
58′	,42150	,43013	,43878	,44745	,45613	,46483	,47354	,48226	,49098	,49971	2′
60′	,42178	,43041	,43907	,44774	,45642	,46512	,47383	,48255	,49127	,50000	**0′**
	279°	**278°**	**277°**	**276°**	**275°**	**274°**	**273°**	**272°**	**271°**	**270°**	$180° \leqslant \theta$

Usage: $hav(273°44') = hav(86°16') = 0.46744$ denoted as ,46744

$\theta \leqslant 180^\circ$	**90°**	**91°**	**92°**	**93°**	**94°**	**95°**	**96°**	**97°**	**98°**	**99°**	
0′	,50000	,50873	,51745	,52617	,53488	,54358	,55226	,56093	,56959	,57822	**60′**
2′	,50029	,50902	,51774	,52646	,53517	,54387	,55255	,56122	,56987	,57850	58′
4′	,50058	,50931	,51803	,52675	,53546	,54416	,55284	,56151	,57016	,57879	56′
6′	,50087	,50960	,51832	,52704	,53575	,54445	,55313	,56180	,57045	,57908	54′
8′	,50116	,50989	,51861	,52733	,53604	,54474	,55342	,56209	,57074	,57937	52′
10′	**,50145**	**,51018**	**,51890**	**,52762**	**,53633**	**,54503**	**,55371**	**,56238**	**,57103**	**,57965**	**50′**
12′	,50175	,51047	,51919	,52791	,53662	,54532	,55400	,56267	,57131	,57994	48′
14′	,50204	,51076	,51948	,52820	,53691	,54561	,55429	,56296	,57160	,58023	46′
16′	,50233	,51105	,51978	,52849	,53720	,54590	,55458	,56324	,57189	,58051	44′
18′	,50262	,51134	,52007	,52878	,53749	,54619	,55487	,56353	,57218	,58080	42′
20′	**,50291**	**,51163**	**,52036**	**,52907**	**,53778**	**,54647**	**,55516**	**,56382**	**,57247**	**,58109**	**40′**
22′	,50320	,51193	,52065	,52936	,53807	,54676	,55545	,56411	,57275	,58138	38′
24′	,50349	,51222	,52094	,52965	,53836	,54705	,55573	,56440	,57304	,58166	36′
26′	,50378	,51251	,52123	,52994	,53865	,54734	,55602	,56469	,57333	,58195	34′
28′	,50407	,51280	,52152	,53023	,53894	,54763	,55631	,56497	,57362	,58224	32′
30′	**,50436**	**,51309**	**,52181**	**,53052**	**,53923**	**,54792**	**,55660**	**,56526**	**,57390**	**,58252**	**30′**
32′	,50465	,51338	,52210	,53081	,53952	,54821	,55689	,56555	,57419	,58281	28′
34′	,50495	,51367	,52239	,53110	,53981	,54850	,55718	,56584	,57448	,58310	26′
36′	,50524	,51396	,52268	,53140	,54010	,54879	,55747	,56613	,57477	,58338	24′
38′	,50553	,51425	,52297	,53169	,54039	,54908	,55776	,56642	,57506	,58367	22′
40′	**,50582**	**,51454**	**,52326**	**,53198**	**,54068**	**,54937**	**,55805**	**,56670**	**,57534**	**,58396**	**20′**
42′	,50611	,51483	,52355	,53227	,54097	,54966	,55834	,56699	,57563	,58424	18′
44′	,50640	,51512	,52384	,53256	,54126	,54995	,55862	,56728	,57592	,58453	16′
46′	,50669	,51541	,52413	,53285	,54155	,55024	,55891	,56757	,57621	,58482	14′
48′	,50698	,51571	,52442	,53314	,54184	,55053	,55920	,56786	,57649	,58510	12′
50′	**,50727**	**,51600**	**,52472**	**,53343**	**,54213**	**,55082**	**,55949**	**,56815**	**,57678**	**,58539**	**10′**
52′	,50756	,51629	,52501	,53372	,54242	,55111	,55978	,56843	,57707	,58568	8′
54′	,50785	,51658	,52530	,53401	,54271	,55140	,56007	,56872	,57736	,58596	6′
56′	,50814	,51687	,52559	,53430	,54300	,55169	,56036	,56901	,57764	,58625	4′
58′	,50844	,51716	,52588	,53459	,54329	,55197	,56065	,56930	,57793	,58654	2′
60′	,50873	,51745	,52617	,53488	,54358	,55226	,56093	,56959	,57822	,58682	**0′**
	269°	**268°**	**267°**	**266°**	**265°**	**264°**	**263°**	**262°**	**261°**	**260°**	$180^\circ \leqslant \theta$

Usage: $hav(263^\circ 02') = hav(96^\circ 58') = 0.56065$ denoted as ,56065

$\theta \leqslant 180°$	**100°**	**101°**	**102°**	**103°**	**104°**	**105°**	**106°**	**107°**	**108°**	**109°**	
0′	,58682	,59540	,60396	,61248	,62096	,62941	,63782	,64619	,65451	,66278	**60′**
2′	,58711	,59569	,60424	,61276	,62124	,62969	,63810	,64646	,65479	,66306	58′
4′	,58740	,59598	,60452	,61304	,62153	,62997	,63838	,64674	,65506	,66333	56′
6′	,58768	,59626	,60481	,61333	,62181	,63025	,63866	,64702	,65534	,66361	54′
8′	,58797	,59655	,60509	,61361	,62209	,63053	,63894	,64730	,65561	,66388	52′
10′	**,58826**	**,59683**	**,60538**	**,61389**	**,62237**	**,63081**	**,63922**	**,64758**	**,65589**	**,66416**	**50′**
12′	,58854	,59712	,60566	,61418	,62265	,63109	,63950	,64785	,65617	,66443	48′
14′	,58883	,59740	,60595	,61446	,62294	,63138	,63977	,64813	,65644	,66471	46′
16′	,58911	,59769	,60623	,61474	,62322	,63166	,64005	,64841	,65672	,66498	44′
18′	,58940	,59797	,60652	,61502	,62350	,63194	,64033	,64869	,65700	,66526	42′
20′	**,58969**	**,59826**	**,60680**	**,61531**	**,62378**	**,63222**	**,64061**	**,64897**	**,65727**	**,66553**	**40′**
22′	,58997	,59854	,60708	,61559	,62406	,63250	,64089	,64924	,65755	,66581	38′
24′	,59026	,59883	,60737	,61587	,62434	,63278	,64117	,64952	,65782	,66608	36′
26′	,59055	,59911	,60765	,61616	,62463	,63306	,64145	,64980	,65810	,66635	34′
28′	,59083	,59940	,60794	,61644	,62491	,63334	,64173	,65008	,65838	,66663	32′
30′	**,59112**	**,59968**	**,60822**	**,61672**	**,62519**	**,63362**	**,64201**	**,65035**	**,65865**	**,66690**	**30′**
32′	,59140	,59997	,60850	,61701	,62547	,63390	,64229	,65063	,65893	,66718	28′
34′	,59169	,60025	,60879	,61729	,62575	,63418	,64257	,65091	,65920	,66745	26′
36′	,59198	,60054	,60907	,61757	,62603	,63446	,64284	,65118	,65948	,66773	24′
38′	,59226	,60082	,60936	,61785	,62632	,63474	,64312	,65146	,65976	,66800	22′
40′	**,59255**	**,60111**	**,60964**	**,61814**	**,62660**	**,63502**	**,64340**	**,65174**	**,66003**	**,66827**	**20′**
42′	,59283	,60139	,60992	,61842	,62688	,63530	,64368	,65202	,66031	,66855	18′
44′	,59312	,60168	,61021	,61870	,62716	,63558	,64396	,65229	,66058	,66882	16′
46′	,59340	,60196	,61049	,61898	,62744	,63586	,64424	,65257	,66086	,66910	14′
48′	,59369	,60225	,61077	,61927	,62772	,63614	,64452	,65285	,66113	,66937	12′
50′	**,59398**	**,60253**	**,61106**	**,61955**	**,62800**	**,63642**	**,64479**	**,65312**	**,66141**	**,66964**	**10′**
52′	,59426	,60282	,61134	,61983	,62829	,63670	,64507	,65340	,66168	,66992	8′
54′	,59455	,60310	,61163	,62011	,62857	,63698	,64535	,65368	,66196	,67019	6′
56′	,59483	,60339	,61191	,62040	,62885	,63726	,64563	,65396	,66223	,67046	4′
58′	,59512	,60367	,61219	,62068	,62913	,63754	,64591	,65423	,66251	,67074	2′
60′	,59540	,60396	,61248	,62096	,62941	,63782	,64619	,65451	,66278	,67101	**0′**
	259°	**258°**	**257°**	**256°**	**255°**	**254°**	**253°**	**252°**	**251°**	**250°**	$180° \leqslant \theta$

Usage: $hav(255°40') = hav(104°20') = 0.62378$ denoted as ,62378

$\theta \leqslant 180°$	**110°**	**111°**	**112°**	**113°**	**114°**	**115°**	**116°**	**117°**	**118°**	**119°**	
0′	,67101	,67918	,68730	,69537	,70337	,71131	,71919	,72700	,73474	,74240	**60′**
2′	,67128	,67946	,68757	,69563	,70363	,71157	,71945	,72725	,73499	,74266	58′
4′	,67156	,67973	,68784	,69590	,70390	,71184	,71971	,72751	,73525	,74291	56′
6′	,67183	,68000	,68811	,69617	,70417	,71210	,71997	,72777	,73551	,74317	54′
8′	,67210	,68027	,68838	,69644	,70443	,71236	,72023	,72803	,73576	,74342	52′
10′	**,67238**	**,68054**	**,68865**	**,69670**	**,70470**	**,71263**	**,72049**	**,72829**	**,73602**	**,74368**	**50′**
12′	,67265	,68081	,68892	,69697	,70496	,71289	,72075	,72855	,73628	,74393	48′
14′	,67292	,68108	,68919	,69724	,70523	,71315	,72101	,72881	,73653	,74418	46′
16′	,67319	,68135	,68946	,69751	,70549	,71342	,72127	,72907	,73679	,74444	44′
18′	,67347	,68163	,68973	,69777	,70576	,71368	,72154	,72932	,73704	,74469	42′
20′	**,67374**	**,68190**	**,69000**	**,69804**	**,70602**	**,71394**	**,72180**	**,72958**	**,73730**	**,74494**	**40′**
22′	,67401	,68217	,69027	,69831	,70629	,71420	,72206	,72984	,73756	,74520	38′
24′	,67429	,68244	,69054	,69857	,70655	,71447	,72232	,73010	,73781	,74545	36′
26′	,67456	,68271	,69080	,69884	,70682	,71473	,72258	,73036	,73807	,74571	34′
28′	,67483	,68298	,69107	,69911	,70708	,71499	,72284	,73062	,73832	,74596	32′
30′	**,67510**	**,68325**	**,69134**	**,69937**	**,70735**	**,71526**	**,72310**	**,73087**	**,73858**	**,74621**	**30′**
32′	,67538	,68352	,69161	,69964	,70761	,71552	,72336	,73113	,73883	,74646	28′
34′	,67565	,68379	,69188	,69991	,70788	,71578	,72362	,73139	,73909	,74672	26′
36′	,67592	,68406	,69215	,70017	,70814	,71604	,72388	,73165	,73935	,74697	24′
38′	,67619	,68433	,69242	,70044	,70840	,71631	,72414	,73191	,73960	,74722	22′
40′	**,67647**	**,68460**	**,69268**	**,70071**	**,70867**	**,71657**	**,72440**	**,73216**	**,73986**	**,74748**	**20′**
42′	,67674	,68487	,69295	,70097	,70893	,71683	,72466	,73242	,74011	,74773	18′
44′	,67701	,68514	,69322	,70124	,70920	,71709	,72492	,73268	,74037	,74798	16′
46′	,67728	,68541	,69349	,70151	,70946	,71735	,72518	,73294	,74062	,74823	14′
48′	,67755	,68568	,69376	,70177	,70973	,71762	,72544	,73319	,74088	,74849	12′
50′	**,67783**	**,68595**	**,69403**	**,70204**	**,70999**	**,71788**	**,72570**	**,73345**	**,74113**	**,74874**	**10′**
52′	,67810	,68622	,69429	,70230	,71025	,71814	,72596	,73371	,74139	,74899	8′
54′	,67837	,68649	,69456	,70257	,71052	,71840	,72622	,73396	,74164	,74924	6′
56′	,67864	,68676	,69483	,70284	,71078	,71866	,72648	,73422	,74190	,74950	4′
58′	,67891	,68703	,69510	,70310	,71105	,71892	,72674	,73448	,74215	,74975	2′
60′	,67918	,68730	,69537	,70337	,71131	,71919	,72700	,73474	,74240	,75000	**0′**
	249°	**248°**	**247°**	**246°**	**245°**	**244°**	**243°**	**242°**	**241°**	**240°**	$180° \leqslant \theta$

Usage: $hav(244°20') = hav(115°40') = 0.71657$ denoted as ,71657

$\theta \leqslant 180°$	**120°**	**121°**	**122°**	**123°**	**124°**	**125°**	**126°**	**127°**	**128°**	**129°**	
0′	,75000	,75752	,76496	,77232	,77960	,78679	,79389	,80091	,80783	,81466	**60′**
2′	,75025	,75777	,76521	,77256	,77984	,78703	,79413	,80114	,80806	,81489	58′
4′	,75050	,75802	,76545	,77281	,78008	,78726	,79436	,80137	,80829	,81511	56′
6′	,75076	,75827	,76570	,77305	,78032	,78750	,79460	,80160	,80852	,81534	54′
8′	,75101	,75852	,76595	,77329	,78056	,78774	,79483	,80184	,80875	,81556	52′
10′	**,75126**	**,75876**	**,76619**	**,77354**	**,78080**	**,78798**	**,79507**	**,80207**	**,80898**	**,81579**	**50′**
12′	,75151	,75901	,76644	,77378	,78104	,78822	,79530	,80230	,80920	,81601	48′
14′	,75176	,75926	,76668	,77402	,78128	,78845	,79554	,80253	,80943	,81624	46′
16′	,75201	,75951	,76693	,77427	,78152	,78869	,79577	,80276	,80966	,81647	44′
18′	,75226	,75976	,76718	,77451	,78176	,78893	,79601	,80299	,80989	,81669	42′
20′	**,75251**	**,76001**	**,76742**	**,77475**	**,78200**	**,78917**	**,79624**	**,80323**	**,81012**	**,81692**	**40′**
22′	,75277	,76026	,76767	,77500	,78224	,78940	,79648	,80346	,81035	,81714	38′
24′	,75302	,76050	,76791	,77524	,78248	,78964	,79671	,80369	,81057	,81737	36′
26′	,75327	,76075	,76816	,77548	,78272	,78988	,79694	,80392	,81080	,81759	34′
28′	,75352	,76100	,76840	,77573	,78296	,79011	,79718	,80415	,81103	,81781	32′
30′	**,75377**	**,76125**	**,76865**	**,77597**	**,78320**	**,79035**	**,79741**	**,80438**	**,81126**	**,81804**	**30′**
32′	,75402	,76150	,76890	,77621	,78344	,79059	,79765	,80461	,81148	,81826	28′
34′	,75427	,76175	,76914	,77645	,78368	,79082	,79788	,80484	,81171	,81849	26′
36′	,75452	,76199	,76939	,77670	,78392	,79106	,79811	,80507	,81194	,81871	24′
38′	,75477	,76224	,76963	,77694	,78416	,79130	,79835	,80530	,81217	,81894	22′
40′	**,75502**	**,76249**	**,76988**	**,77718**	**,78440**	**,79153**	**,79858**	**,80553**	**,81239**	**,81916**	**20′**
42′	,75527	,76274	,77012	,77742	,78464	,79177	,79881	,80576	,81262	,81938	18′
44′	,75552	,76298	,77036	,77766	,78488	,79201	,79905	,80599	,81285	,81961	16′
46′	,75577	,76323	,77061	,77791	,78512	,79224	,79928	,80622	,81308	,81983	14′
48′	,75602	,76348	,77085	,77815	,78536	,79248	,79951	,80645	,81330	,82005	12′
50′	**,75627**	**,76373**	**,77110**	**,77839**	**,78560**	**,79271**	**,79974**	**,80668**	**,81353**	**,82028**	**10′**
52′	,75652	,76397	,77134	,77863	,78583	,79295	,79998	,80691	,81376	,82050	8′
54′	,75677	,76422	,77159	,77887	,78607	,79319	,80021	,80714	,81398	,82072	6′
56′	,75702	,76447	,77183	,77911	,78631	,79342	,80044	,80737	,81421	,82095	4′
58′	,75727	,76471	,77208	,77936	,78655	,79366	,80068	,80760	,81443	,82117	2′
60′	,75752	,76496	,77232	,77960	,78679	,79389	,80091	,80783	,81466	,82139	**0′**
	239°	**238°**	**237°**	**236°**	**235°**	**234°**	**233°**	**232°**	**231°**	**230°**	$180° \leqslant \theta$

Usage: $hav(237°52') = hav(122°08') = 0.76595$ denoted as ,76595

$\theta \leqslant 180°$	**130°**	**131°**	**132°**	**133°**	**134°**	**135°**	**136°**	**137°**	**138°**	**139°**	
0′	,82139	,82803	,83457	,84100	,84733	,85355	,85967	,86568	,87157	,87735	**60′**
2′	,82162	,82825	,83478	,84121	,84754	,85376	,85987	,86588	,87177	,87755	58′
4′	,82184	,82847	,83500	,84142	,84775	,85396	,86007	,86607	,87196	,87774	56′
6′	,82206	,82869	,83521	,84164	,84796	,85417	,86028	,86627	,87216	,87793	54′
8′	,82228	,82891	,83543	,84185	,84817	,85438	,86048	,86647	,87235	,87812	52′
10′	**,82251**	**,82913**	**,83564**	**,84206**	**,84837**	**,85458**	**,86068**	**,86667**	**,87254**	**,87831**	**50′**
12′	,82273	,82934	,83586	,84227	,84858	,85479	,86088	,86686	,87274	,87850	48′
14′	,82295	,82956	,83608	,84249	,84879	,85499	,86108	,86706	,87293	,87869	46′
16′	,82317	,82978	,83629	,84270	,84900	,85520	,86128	,86726	,87313	,87888	44′
18′	,82339	,83000	,83651	,84291	,84921	,85540	,86148	,86746	,87332	,87907	42′
20′	**,82362**	**,83022**	**,83672**	**,84312**	**,84942**	**,85560**	**,86168**	**,86765**	**,87351**	**,87926**	**40′**
22′	,82384	,83044	,83694	,84333	,84962	,85581	,86189	,86785	,87371	,87945	38′
24′	,82406	,83066	,83715	,84354	,84983	,85601	,86209	,86805	,87390	,87964	36′
26′	,82428	,83087	,83737	,84376	,85004	,85622	,86229	,86825	,87409	,87982	34′
28′	,82450	,83109	,83758	,84397	,85025	,85642	,86249	,86844	,87429	,88001	32′
30′	**,82472**	**,83131**	**,83780**	**,84418**	**,85045**	**,85663**	**,86269**	**,86864**	**,87448**	**,88020**	**30′**
32′	,82495	,83153	,83801	,84439	,85066	,85683	,86289	,86884	,87467	,88039	28′
34′	,82517	,83175	,83822	,84460	,85087	,85703	,86309	,86903	,87486	,88058	26′
36′	,82539	,83196	,83844	,84481	,85108	,85724	,86329	,86923	,87506	,88077	24′
38′	,82561	,83218	,83865	,84502	,85128	,85744	,86349	,86942	,87525	,88096	22′
40′	**,82583**	**,83240**	**,83887**	**,84523**	**,85149**	**,85764**	**,86369**	**,86962**	**,87544**	**,88115**	**20′**
42′	,82605	,83262	,83908	,84544	,85170	,85785	,86389	,86982	,87563	,88133	18′
44′	,82627	,83283	,83929	,84565	,85190	,85805	,86409	,87001	,87582	,88152	16′
46′	,82649	,83305	,83951	,84586	,85211	,85825	,86429	,87021	,87602	,88171	14′
48′	,82671	,83327	,83972	,84607	,85232	,85846	,86448	,87040	,87621	,88190	12′
50′	**,82693**	**,83348**	**,83993**	**,84628**	**,85252**	**,85866**	**,86468**	**,87060**	**,87640**	**,88209**	**10′**
52′	,82715	,83370	,84015	,84649	,85273	,85886	,86488	,87079	,87659	,88227	8′
54′	,82737	,83392	,84036	,84670	,85294	,85906	,86508	,87099	,87678	,88246	6′
56′	,82759	,83413	,84057	,84691	,85314	,85927	,86528	,87118	,87697	,88265	4′
58′	,82781	,83435	,84079	,84712	,85335	,85947	,86548	,87138	,87716	,88284	2′
60′	,82803	,83457	,84100	,84733	,85355	,85967	,86568	,87157	,87735	,88302	**0′**
	229°	**228°**	**227°**	**226°**	**225°**	**224°**	**223°**	**222°**	**221°**	**220°**	$180° \leqslant \theta$

Usage: $hav(223°18') = hav(136°42') = 0.86389$ denoted as ,86389

$\theta \leqslant 180^\circ$	**140°**	**141°**	**142°**	**143°**	**144°**	**145°**	**146°**	**147°**	**148°**	**149°**	
0′	,88302	,88857	,89401	,89932	$.\overline{1}0451$	$.\overline{1}0958$	$.\overline{1}1452$	$.\overline{1}1934$	$.\overline{1}2402$	$.\overline{1}2858$	**60′**
2′	,88321	,88876	,89418	,89949	$.\overline{1}0468$	$.\overline{1}0974$	$.\overline{1}1468$	$.\overline{1}1949$	$.\overline{1}2418$	$.\overline{1}2873$	58′
4′	,88340	,88894	,89436	,89967	$.\overline{1}0485$	$.\overline{1}0991$	$.\overline{1}1484$	$.\overline{1}1965$	$.\overline{1}2433$	$.\overline{1}2888$	56′
6′	,88358	,88912	,89454	,89984	$.\overline{1}0502$	$.\overline{1}1008$	$.\overline{1}1501$	$.\overline{1}1981$	$.\overline{1}2449$	$.\overline{1}2903$	54′
8′	,88377	,88930	,89472	$.\overline{1}0002$	$.\overline{1}0519$	$.\overline{1}1024$	$.\overline{1}1517$	$.\overline{1}1997$	$.\overline{1}2464$	$.\overline{1}2918$	52′
10′	**,88396**	**,88949**	**,89490**	$\mathbf{.\overline{1}0019}$	$\mathbf{.\overline{1}0536}$	$\mathbf{.\overline{1}1041}$	$\mathbf{.\overline{1}1533}$	$\mathbf{.\overline{1}2013}$	$\mathbf{.\overline{1}2479}$	$\mathbf{.\overline{1}2933}$	**50′**
12′	,88414	,88967	,89508	$.\overline{1}0037$	$.\overline{1}0553$	$.\overline{1}1057$	$.\overline{1}1549$	$.\overline{1}2028$	$.\overline{1}2495$	$.\overline{1}2948$	48′
14′	,88433	,88985	,89526	$.\overline{1}0054$	$.\overline{1}0570$	$.\overline{1}1074$	$.\overline{1}1565$	$.\overline{1}2044$	$.\overline{1}2510$	$.\overline{1}2963$	46′
16′	,88451	,89003	,89543	$.\overline{1}0071$	$.\overline{1}0587$	$.\overline{1}1091$	$.\overline{1}1582$	$.\overline{1}2060$	$.\overline{1}2525$	$.\overline{1}2978$	44′
18′	,88470	,89022	,89561	$.\overline{1}0089$	$.\overline{1}0604$	$.\overline{1}1107$	$.\overline{1}1598$	$.\overline{1}2076$	$.\overline{1}2541$	$.\overline{1}2993$	42′
20′	**,88489**	**,89040**	**,89579**	$\mathbf{.\overline{1}0106}$	$\mathbf{.\overline{1}0621}$	$\mathbf{.\overline{1}1124}$	$\mathbf{.\overline{1}1614}$	$\mathbf{.\overline{1}2091}$	$\mathbf{.\overline{1}2556}$	$\mathbf{.\overline{1}3007}$	**40′**
22′	,88507	,89058	,89597	$.\overline{1}0124$	$.\overline{1}0638$	$.\overline{1}1140$	$.\overline{1}1630$	$.\overline{1}2107$	$.\overline{1}2571$	$.\overline{1}3022$	38′
24′	,88526	,89076	,89614	$.\overline{1}0141$	$.\overline{1}0655$	$.\overline{1}1157$	$.\overline{1}1646$	$.\overline{1}2123$	$.\overline{1}2586$	$.\overline{1}3037$	36′
26′	,88544	,89094	,89632	$.\overline{1}0158$	$.\overline{1}0672$	$.\overline{1}1173$	$.\overline{1}1662$	$.\overline{1}2138$	$.\overline{1}2602$	$.\overline{1}3052$	34′
28′	,88563	,89112	,89650	$.\overline{1}0176$	$.\overline{1}0689$	$.\overline{1}1190$	$.\overline{1}1678$	$.\overline{1}2154$	$.\overline{1}2617$	$.\overline{1}3067$	32′
30′	**,88581**	**,89130**	**,89668**	$\mathbf{.\overline{1}0193}$	$\mathbf{.\overline{1}0706}$	$\mathbf{.\overline{1}1206}$	$\mathbf{.\overline{1}1694}$	$\mathbf{.\overline{1}2170}$	$\mathbf{.\overline{1}2632}$	$\mathbf{.\overline{1}3081}$	**30′**
32′	,88600	,89149	,89685	$.\overline{1}0210$	$.\overline{1}0723$	$.\overline{1}1223$	$.\overline{1}1710$	$.\overline{1}2185$	$.\overline{1}2647$	$.\overline{1}3096$	28′
34′	,88618	,89167	,89703	$.\overline{1}0227$	$.\overline{1}0740$	$.\overline{1}1239$	$.\overline{1}1726$	$.\overline{1}2201$	$.\overline{1}2662$	$.\overline{1}3111$	26′
36′	,88637	,89185	,89721	$.\overline{1}0245$	$.\overline{1}0756$	$.\overline{1}1256$	$.\overline{1}1742$	$.\overline{1}2216$	$.\overline{1}2678$	$.\overline{1}3126$	24′
38′	,88655	,89203	,89738	$.\overline{1}0262$	$.\overline{1}0773$	$.\overline{1}1272$	$.\overline{1}1758$	$.\overline{1}2232$	$.\overline{1}2693$	$.\overline{1}3140$	22′
40′	**,88674**	**,89221**	**,89756**	$\mathbf{.\overline{1}0279}$	$\mathbf{.\overline{1}0790}$	$\mathbf{.\overline{1}1289}$	$\mathbf{.\overline{1}1774}$	$\mathbf{.\overline{1}2248}$	$\mathbf{.\overline{1}2708}$	$\mathbf{.\overline{1}3155}$	**20′**
42′	,88692	,89239	,89774	$.\overline{1}0296$	$.\overline{1}0807$	$.\overline{1}1305$	$.\overline{1}1790$	$.\overline{1}2263$	$.\overline{1}2723$	$.\overline{1}3170$	18′
44′	,88710	,89257	,89791	$.\overline{1}0314$	$.\overline{1}0824$	$.\overline{1}1321$	$.\overline{1}1806$	$.\overline{1}2279$	$.\overline{1}2738$	$.\overline{1}3184$	16′
46′	,88729	,89275	,89809	$.\overline{1}0331$	$.\overline{1}0840$	$.\overline{1}1338$	$.\overline{1}1822$	$.\overline{1}2294$	$.\overline{1}2753$	$.\overline{1}3199$	14′
48′	,88747	,89293	,89826	$.\overline{1}0348$	$.\overline{1}0857$	$.\overline{1}1354$	$.\overline{1}1838$	$.\overline{1}2310$	$.\overline{1}2768$	$.\overline{1}3214$	12′
50′	**,88766**	**,89311**	**,89844**	$\mathbf{.\overline{1}0365}$	$\mathbf{.\overline{1}0874}$	$\mathbf{.\overline{1}1370}$	$\mathbf{.\overline{1}1854}$	$\mathbf{.\overline{1}2325}$	$\mathbf{.\overline{1}2783}$	$\mathbf{.\overline{1}3228}$	**10′**
52′	,88784	,89329	,89862	$.\overline{1}0382$	$.\overline{1}0891$	$.\overline{1}1387$	$.\overline{1}1870$	$.\overline{1}2341$	$.\overline{1}2798$	$.\overline{1}3243$	8′
54′	,88802	,89347	,89879	$.\overline{1}0399$	$.\overline{1}0907$	$.\overline{1}1403$	$.\overline{1}1886$	$.\overline{1}2356$	$.\overline{1}2813$	$.\overline{1}3258$	6′
56′	,88821	,89365	,89897	$.\overline{1}0417$	$.\overline{1}0924$	$.\overline{1}1419$	$.\overline{1}1902$	$.\overline{1}2372$	$.\overline{1}2828$	$.\overline{1}3272$	4′
58′	,88839	,89383	,89914	$.\overline{1}0434$	$.\overline{1}0941$	$.\overline{1}1436$	$.\overline{1}1918$	$.\overline{1}2387$	$.\overline{1}2843$	$.\overline{1}3287$	2′
60′	,88857	,89401	,89932	$.\overline{1}0451$	$.\overline{1}0958$	$.\overline{1}1452$	$.\overline{1}1934$	$.\overline{1}2402$	$.\overline{1}2858$	$.\overline{1}3301$	**0′**
	219°	**218°**	**217°**	**216°**	**215°**	**214°**	**213°**	**212°**	**211°**	**210°**	$180^\circ \leqslant \theta$

Usage: $hav(216^\circ 52') = hav(143^\circ 08') = 0.90002$ denoted as $.\overline{1}0002$
$hav(216^\circ 54') = hav(143^\circ 06') = 0.89984$ denoted as ,89984

$\theta \leqslant 180^\circ$	**150°**	**151°**	**152°**	**153°**	**154°**	**155°**	**156°**	**157°**	**158°**	**159°**	
0′	.$\overline{1}$3301	.$\overline{1}$3731	.$\overline{1}$4147	.$\overline{1}$4550	.$\overline{1}$4940	.$\overline{1}$5315	.$\overline{1}$5677	.$\overline{1}$6025	.$\overline{1}$6359	.$\overline{1}$6679	**60′**
2′	.$\overline{1}$3316	.$\overline{1}$3745	.$\overline{1}$4161	.$\overline{1}$4564	.$\overline{1}$4952	.$\overline{1}$5328	.$\overline{1}$5689	.$\overline{1}$6037	.$\overline{1}$6370	.$\overline{1}$6689	58′
4′	.$\overline{1}$3330	.$\overline{1}$3759	.$\overline{1}$4175	.$\overline{1}$4577	.$\overline{1}$4965	.$\overline{1}$5340	.$\overline{1}$5701	.$\overline{1}$6048	.$\overline{1}$6381	.$\overline{1}$6700	56′
6′	.$\overline{1}$3345	.$\overline{1}$3773	.$\overline{1}$4188	.$\overline{1}$4590	.$\overline{1}$4978	.$\overline{1}$5352	.$\overline{1}$5713	.$\overline{1}$6059	.$\overline{1}$6392	.$\overline{1}$6710	54′
8′	.$\overline{1}$3359	.$\overline{1}$3787	.$\overline{1}$4202	.$\overline{1}$4603	.$\overline{1}$4991	.$\overline{1}$5364	.$\overline{1}$5724	.$\overline{1}$6071	.$\overline{1}$6403	.$\overline{1}$6721	52′
10′	**.$\overline{1}$3374**	**.$\overline{1}$3801**	**.$\overline{1}$4215**	**.$\overline{1}$4616**	**.$\overline{1}$5003**	**.$\overline{1}$5377**	**.$\overline{1}$5736**	**.$\overline{1}$6082**	**.$\overline{1}$6413**	**.$\overline{1}$6731**	**50′**
12′	.$\overline{1}$3388	.$\overline{1}$3815	.$\overline{1}$4229	.$\overline{1}$4629	.$\overline{1}$5016	.$\overline{1}$5389	.$\overline{1}$5748	.$\overline{1}$6093	.$\overline{1}$6424	.$\overline{1}$6741	48′
14′	.$\overline{1}$3403	.$\overline{1}$3829	.$\overline{1}$4243	.$\overline{1}$4642	.$\overline{1}$5029	.$\overline{1}$5401	.$\overline{1}$5760	.$\overline{1}$6104	.$\overline{1}$6435	.$\overline{1}$6752	46′
16′	.$\overline{1}$3417	.$\overline{1}$3843	.$\overline{1}$4256	.$\overline{1}$4655	.$\overline{1}$5041	.$\overline{1}$5413	.$\overline{1}$5771	.$\overline{1}$6116	.$\overline{1}$6446	.$\overline{1}$6762	44′
18′	.$\overline{1}$3432	.$\overline{1}$3857	.$\overline{1}$4270	.$\overline{1}$4669	.$\overline{1}$5054	.$\overline{1}$5425	.$\overline{1}$5783	.$\overline{1}$6127	.$\overline{1}$6457	.$\overline{1}$6772	42′
20′	**.$\overline{1}$3446**	**.$\overline{1}$3871**	**.$\overline{1}$4283**	**.$\overline{1}$4682**	**.$\overline{1}$5066**	**.$\overline{1}$5438**	**.$\overline{1}$5795**	**.$\overline{1}$6138**	**.$\overline{1}$6467**	**.$\overline{1}$6782**	**40′**
22′	.$\overline{1}$3460	.$\overline{1}$3885	.$\overline{1}$4297	.$\overline{1}$4695	.$\overline{1}$5079	.$\overline{1}$5450	.$\overline{1}$5806	.$\overline{1}$6149	.$\overline{1}$6478	.$\overline{1}$6793	38′
24′	.$\overline{1}$3475	.$\overline{1}$3899	.$\overline{1}$4310	.$\overline{1}$4708	.$\overline{1}$5092	.$\overline{1}$5462	.$\overline{1}$5818	.$\overline{1}$6161	.$\overline{1}$6489	.$\overline{1}$6803	36′
26′	.$\overline{1}$3489	.$\overline{1}$3913	.$\overline{1}$4324	.$\overline{1}$4721	.$\overline{1}$5104	.$\overline{1}$5474	.$\overline{1}$5830	.$\overline{1}$6172	.$\overline{1}$6500	.$\overline{1}$6813	34′
28′	.$\overline{1}$3503	.$\overline{1}$3927	.$\overline{1}$4337	.$\overline{1}$4734	.$\overline{1}$5117	.$\overline{1}$5486	.$\overline{1}$5841	.$\overline{1}$6183	.$\overline{1}$6510	.$\overline{1}$6823	32′
30′	**.$\overline{1}$3518**	**.$\overline{1}$3941**	**.$\overline{1}$4351**	**.$\overline{1}$4747**	**.$\overline{1}$5129**	**.$\overline{1}$5498**	**.$\overline{1}$5853**	**.$\overline{1}$6194**	**.$\overline{1}$6521**	**.$\overline{1}$6834**	**30′**
32′	.$\overline{1}$3532	.$\overline{1}$3955	.$\overline{1}$4364	.$\overline{1}$4760	.$\overline{1}$5142	.$\overline{1}$5510	.$\overline{1}$5865	.$\overline{1}$6205	.$\overline{1}$6532	.$\overline{1}$6844	28′
34′	.$\overline{1}$3546	.$\overline{1}$3969	.$\overline{1}$4377	.$\overline{1}$4773	.$\overline{1}$5154	.$\overline{1}$5522	.$\overline{1}$5876	.$\overline{1}$6216	.$\overline{1}$6542	.$\overline{1}$6854	26′
36′	.$\overline{1}$3561	.$\overline{1}$3982	.$\overline{1}$4391	.$\overline{1}$4786	.$\overline{1}$5167	.$\overline{1}$5534	.$\overline{1}$5888	.$\overline{1}$6227	.$\overline{1}$6553	.$\overline{1}$6864	24′
38′	.$\overline{1}$3575	.$\overline{1}$3996	.$\overline{1}$4404	.$\overline{1}$4799	.$\overline{1}$5179	.$\overline{1}$5546	.$\overline{1}$5899	.$\overline{1}$6238	.$\overline{1}$6563	.$\overline{1}$6874	22′
40′	**.$\overline{1}$3589**	**.$\overline{1}$4010**	**.$\overline{1}$4418**	**.$\overline{1}$4811**	**.$\overline{1}$5192**	**.$\overline{1}$5558**	**.$\overline{1}$5911**	**.$\overline{1}$6249**	**.$\overline{1}$6574**	**.$\overline{1}$6884**	**20′**
42′	.$\overline{1}$3603	.$\overline{1}$4024	.$\overline{1}$4431	.$\overline{1}$4824	.$\overline{1}$5204	.$\overline{1}$5570	.$\overline{1}$5922	.$\overline{1}$6260	.$\overline{1}$6585	.$\overline{1}$6894	18′
44′	.$\overline{1}$3618	.$\overline{1}$4038	.$\overline{1}$4444	.$\overline{1}$4837	.$\overline{1}$5217	.$\overline{1}$5582	.$\overline{1}$5934	.$\overline{1}$6272	.$\overline{1}$6595	.$\overline{1}$6905	16′
46′	.$\overline{1}$3632	.$\overline{1}$4051	.$\overline{1}$4458	.$\overline{1}$4850	.$\overline{1}$5229	.$\overline{1}$5594	.$\overline{1}$5945	.$\overline{1}$6283	.$\overline{1}$6606	.$\overline{1}$6915	14′
48′	.$\overline{1}$3646	.$\overline{1}$4065	.$\overline{1}$4471	.$\overline{1}$4863	.$\overline{1}$5241	.$\overline{1}$5606	.$\overline{1}$5957	.$\overline{1}$6294	.$\overline{1}$6616	.$\overline{1}$6925	12′
50′	**.$\overline{1}$3660**	**.$\overline{1}$4079**	**.$\overline{1}$4484**	**.$\overline{1}$4876**	**.$\overline{1}$5254**	**.$\overline{1}$5618**	**.$\overline{1}$5968**	**.$\overline{1}$6305**	**.$\overline{1}$6627**	**.$\overline{1}$6935**	**10′**
52′	.$\overline{1}$3674	.$\overline{1}$4093	.$\overline{1}$4497	.$\overline{1}$4889	.$\overline{1}$5266	.$\overline{1}$5630	.$\overline{1}$5980	.$\overline{1}$6315	.$\overline{1}$6637	.$\overline{1}$6945	8′
54′	.$\overline{1}$3689	.$\overline{1}$4106	.$\overline{1}$4511	.$\overline{1}$4901	.$\overline{1}$5278	.$\overline{1}$5642	.$\overline{1}$5991	.$\overline{1}$6326	.$\overline{1}$6648	.$\overline{1}$6955	6′
56′	.$\overline{1}$3703	.$\overline{1}$4120	.$\overline{1}$4524	.$\overline{1}$4914	.$\overline{1}$5291	.$\overline{1}$5654	.$\overline{1}$6002	.$\overline{1}$6337	.$\overline{1}$6658	.$\overline{1}$6965	4′
58′	.$\overline{1}$3717	.$\overline{1}$4134	.$\overline{1}$4537	.$\overline{1}$4927	.$\overline{1}$5303	.$\overline{1}$5665	.$\overline{1}$6014	.$\overline{1}$6348	.$\overline{1}$6669	.$\overline{1}$6975	2′
60′	.$\overline{1}$3731	.$\overline{1}$4147	.$\overline{1}$4550	.$\overline{1}$4940	.$\overline{1}$5315	.$\overline{1}$5677	.$\overline{1}$6025	.$\overline{1}$6359	.$\overline{1}$6679	.$\overline{1}$6985	**0′**
	209°	**208°**	**207°**	**206°**	**205°**	**204°**	**203°**	**202°**	**201°**	**200°**	$180^\circ \leqslant \theta$

Usage: $hav(200^\circ 02') = hav(159^\circ 58') = 0.96975$ denoted as .$\overline{1}$,6975

$\theta \leqslant 180^\circ$	**160°**	**161°**	**162°**	**163°**	**164°**	**165°**	**166°**	**167°**	**168°**	**169°**	
0′	.$\overline{1}$6985	.$\overline{1}$7276	.$\overline{1}$7553	.$\overline{1}$7815	.$\overline{1}$8063	.$\overline{1}$8296	.$\overline{1}$8515	.$\overline{1}$8719	.$\overline{1}$8907	.$\overline{2}$0814	**60′**
2′	.$\overline{1}$6995	.$\overline{1}$7285	.$\overline{1}$7562	.$\overline{1}$7824	.$\overline{1}$8071	.$\overline{1}$8304	.$\overline{1}$8522	.$\overline{1}$8725	.$\overline{1}$8913	.$\overline{2}$0869	58′
4′	.$\overline{1}$7004	.$\overline{1}$7295	.$\overline{1}$7571	.$\overline{1}$7832	.$\overline{1}$8079	.$\overline{1}$8311	.$\overline{1}$8529	.$\overline{1}$8732	.$\overline{1}$8919	.$\overline{2}$0924	56′
6′	.$\overline{1}$7014	.$\overline{1}$7304	.$\overline{1}$7580	.$\overline{1}$7841	.$\overline{1}$8087	.$\overline{1}$8319	.$\overline{1}$8536	.$\overline{1}$8738	.$\overline{1}$8925	.$\overline{2}$0979	54′
8′	.$\overline{1}$7024	.$\overline{1}$7314	.$\overline{1}$7589	.$\overline{1}$7849	.$\overline{1}$8095	.$\overline{1}$8326	.$\overline{1}$8543	.$\overline{1}$8745	.$\overline{1}$8931	.$\overline{2}$1034	52′
10′	**.$\overline{1}$7034**	**.$\overline{1}$7323**	**.$\overline{1}$7598**	**.$\overline{1}$7858**	**.$\overline{1}$8103**	**.$\overline{1}$8334**	**.$\overline{1}$8550**	**.$\overline{1}$8751**	**.$\overline{1}$8937**	**.$\overline{2}$1089**	**50′**
12′	.$\overline{1}$7044	.$\overline{1}$7332	.$\overline{1}$7606	.$\overline{1}$7866	.$\overline{1}$8111	.$\overline{1}$8341	.$\overline{1}$8557	.$\overline{1}$8757	.$\overline{1}$8943	.$\overline{2}$1144	48′
14′	.$\overline{1}$7054	.$\overline{1}$7342	.$\overline{1}$7615	.$\overline{1}$7874	.$\overline{1}$8119	.$\overline{1}$8349	.$\overline{1}$8564	.$\overline{1}$8764	.$\overline{1}$8949	.$\overline{2}$1198	46′
16′	.$\overline{1}$7064	.$\overline{1}$7351	.$\overline{1}$7624	.$\overline{1}$7883	.$\overline{1}$8127	.$\overline{1}$8356	.$\overline{1}$8571	.$\overline{1}$8770	.$\overline{1}$8955	.$\overline{2}$1252	44′
18′	.$\overline{1}$7074	.$\overline{1}$7361	.$\overline{1}$7633	.$\overline{1}$7891	.$\overline{1}$8135	.$\overline{1}$8363	.$\overline{1}$8577	.$\overline{1}$8777	.$\overline{1}$8961	.$\overline{2}$1306	42′
20′	**.$\overline{1}$7083**	**.$\overline{1}$7370**	**.$\overline{1}$7642**	**.$\overline{1}$7899**	**.$\overline{1}$8142**	**.$\overline{1}$8371**	**.$\overline{1}$8584**	**.$\overline{1}$8783**	**.$\overline{1}$8967**	**.$\overline{2}$1360**	**40′**
22′	.$\overline{1}$7093	.$\overline{1}$7379	.$\overline{1}$7651	.$\overline{1}$7908	.$\overline{1}$8150	.$\overline{1}$8378	.$\overline{1}$8591	.$\overline{1}$8789	.$\overline{1}$8973	.$\overline{2}$1414	38′
24′	.$\overline{1}$7103	.$\overline{1}$7388	.$\overline{1}$7660	.$\overline{1}$7916	.$\overline{1}$8158	.$\overline{1}$8385	.$\overline{1}$8598	.$\overline{1}$8796	.$\overline{1}$8979	.$\overline{2}$1468	36′
26′	.$\overline{1}$7113	.$\overline{1}$7398	.$\overline{1}$7668	.$\overline{1}$7924	.$\overline{1}$8166	.$\overline{1}$8393	.$\overline{1}$8605	.$\overline{1}$8802	.$\overline{1}$8985	.$\overline{2}$1521	34′
28′	.$\overline{1}$7122	.$\overline{1}$7407	.$\overline{1}$7677	.$\overline{1}$7933	.$\overline{1}$8174	.$\overline{1}$8400	.$\overline{1}$8612	.$\overline{1}$8808	.$\overline{1}$8990	.$\overline{2}$1574	32′
30′	**.$\overline{1}$7132**	**.$\overline{1}$7416**	**.$\overline{1}$7686**	**.$\overline{1}$7941**	**.$\overline{1}$8182**	**.$\overline{1}$8407**	**.$\overline{1}$8618**	**.$\overline{1}$8815**	**.$\overline{1}$8996**	**.$\overline{2}$1627**	**30′**
32′	.$\overline{1}$7142	.$\overline{1}$7425	.$\overline{1}$7695	.$\overline{1}$7949	.$\overline{1}$8189	.$\overline{1}$8415	.$\overline{1}$8625	.$\overline{1}$8821	.$\overline{2}$0020	.$\overline{2}$1680	28′
34′	.$\overline{1}$7151	.$\overline{1}$7435	.$\overline{1}$7703	.$\overline{1}$7957	.$\overline{1}$8197	.$\overline{1}$8422	.$\overline{1}$8632	.$\overline{1}$8827	.$\overline{2}$0078	.$\overline{2}$1733	26′
36′	.$\overline{1}$7161	.$\overline{1}$7444	.$\overline{1}$7712	.$\overline{1}$7966	.$\overline{1}$8205	.$\overline{1}$8429	.$\overline{1}$8639	.$\overline{1}$8834	.$\overline{2}$0136	.$\overline{2}$1786	24′
38′	.$\overline{1}$7171	.$\overline{1}$7453	.$\overline{1}$7721	.$\overline{1}$7974	.$\overline{1}$8212	.$\overline{1}$8436	.$\overline{1}$8646	.$\overline{1}$8840	.$\overline{2}$0193	.$\overline{2}$1838	22′
40′	**.$\overline{1}$7180**	**.$\overline{1}$7462**	**.$\overline{1}$7729**	**.$\overline{1}$7982**	**.$\overline{1}$8220**	**.$\overline{1}$8444**	**.$\overline{1}$8652**	**.$\overline{1}$8846**	**.$\overline{2}$0250**	**.$\overline{2}$1890**	**20′**
42′	.$\overline{1}$7190	.$\overline{1}$7471	.$\overline{1}$7738	.$\overline{1}$7990	.$\overline{1}$8228	.$\overline{1}$8451	.$\overline{1}$8659	.$\overline{1}$8852	.$\overline{2}$0307	.$\overline{2}$1943	18′
44′	.$\overline{1}$7200	.$\overline{1}$7480	.$\overline{1}$7747	.$\overline{1}$7998	.$\overline{1}$8236	.$\overline{1}$8458	.$\overline{1}$8666	.$\overline{1}$8858	.$\overline{2}$0364	.$\overline{2}$1994	16′
46′	.$\overline{1}$7209	.$\overline{1}$7490	.$\overline{1}$7755	.$\overline{1}$8007	.$\overline{1}$8243	.$\overline{1}$8465	.$\overline{1}$8672	.$\overline{1}$8865	.$\overline{2}$0421	.$\overline{2}$2046	14′
48′	.$\overline{1}$7219	.$\overline{1}$7499	.$\overline{1}$7764	.$\overline{1}$8015	.$\overline{1}$8251	.$\overline{1}$8472	.$\overline{1}$8679	.$\overline{1}$8871	.$\overline{2}$0478	.$\overline{2}$2098	12′
50′	**.$\overline{1}$7228**	**.$\overline{1}$7508**	**.$\overline{1}$7773**	**.$\overline{1}$8023**	**.$\overline{1}$8258**	**.$\overline{1}$8479**	**.$\overline{1}$8686**	**.$\overline{1}$8877**	**.$\overline{2}$0534**	**.$\overline{2}$2149**	**10′**
52′	.$\overline{1}$7238	.$\overline{1}$7517	.$\overline{1}$7781	.$\overline{1}$8031	.$\overline{1}$8266	.$\overline{1}$8487	.$\overline{1}$8692	.$\overline{1}$8883	.$\overline{2}$0590	.$\overline{2}$2200	8′
54′	.$\overline{1}$7247	.$\overline{1}$7526	.$\overline{1}$7790	.$\overline{1}$8039	.$\overline{1}$8274	.$\overline{1}$8494	.$\overline{1}$8699	.$\overline{1}$8889	.$\overline{2}$0646	.$\overline{2}$2252	6′
56′	.$\overline{1}$7257	.$\overline{1}$7535	.$\overline{1}$7798	.$\overline{1}$8047	.$\overline{1}$8281	.$\overline{1}$8501	.$\overline{1}$8705	.$\overline{1}$8895	.$\overline{2}$0702	.$\overline{2}$2303	4′
58′	.$\overline{1}$7266	.$\overline{1}$7544	.$\overline{1}$7807	.$\overline{1}$8055	.$\overline{1}$8289	.$\overline{1}$8508	.$\overline{1}$8712	.$\overline{1}$8901	.$\overline{2}$0758	.$\overline{2}$2353	2′
60′	.$\overline{1}$7276	.$\overline{1}$7553	.$\overline{1}$7815	.$\overline{1}$8063	.$\overline{1}$8296	.$\overline{1}$8515	.$\overline{1}$8719	.$\overline{1}$8907	.$\overline{2}$0814	.$\overline{2}$2404	**0′**
	199°	**198°**	**197°**	**196°**	**195°**	**194°**	**193°**	**192°**	**191°**	**190°**	$180^\circ \leqslant \theta$

Usage: $hav(191^\circ 26') = hav(168^\circ 34') = 0.990078$ denoted as .$\overline{2}$,0078

$\theta \leqslant 180^\circ$	**170°**	**171°**	**172°**	**173°**	**174°**	**175°**	**176°**	**177°**	**178°**	**179°**	
0′	.$\overline{2}$2404	.$\overline{2}$3844	.$\overline{2}$5134	.$\overline{2}$6273	.$\overline{2}$7261	.$\overline{2}$8097	.$\overline{2}$8782	.$\overline{3}$3148	.$\overline{3}$6954	.$\overline{4}$2385	**60′**
2′	.$\overline{2}$2454	.$\overline{2}$3890	.$\overline{2}$5174	.$\overline{2}$6308	.$\overline{2}$7291	.$\overline{2}$8123	.$\overline{2}$8802	.$\overline{3}$3299	.$\overline{3}$7055	.$\overline{4}$2884	58′
4′	.$\overline{2}$2505	.$\overline{2}$3935	.$\overline{2}$5215	.$\overline{2}$6344	.$\overline{2}$7321	.$\overline{2}$8148	.$\overline{2}$8822	.$\overline{3}$3449	.$\overline{3}$7154	.$\overline{4}$3366	56′
6′	.$\overline{2}$2555	.$\overline{2}$3980	.$\overline{2}$5255	.$\overline{2}$6379	.$\overline{2}$7351	.$\overline{2}$8173	.$\overline{2}$8842	.$\overline{3}$3597	.$\overline{3}$7251	.$\overline{4}$3832	54′
8′	.$\overline{2}$2605	.$\overline{2}$4025	.$\overline{2}$5295	.$\overline{2}$6414	.$\overline{2}$7381	.$\overline{2}$8197	.$\overline{2}$8862	.$\overline{3}$3743	.$\overline{3}$7347	.$\overline{4}$4280	52′
10′	**.$\overline{2}$2654**	**.$\overline{2}$4070**	**.$\overline{2}$5334**	**.$\overline{2}$6448**	**.$\overline{2}$7411**	**.$\overline{2}$8222**	**.$\overline{2}$8881**	**.$\overline{3}$3888**	**.$\overline{3}$7441**	**.$\overline{4}$4712**	**50′**
12′	.$\overline{2}$2704	.$\overline{2}$4114	.$\overline{2}$5374	.$\overline{2}$6483	.$\overline{2}$7440	.$\overline{2}$8246	.$\overline{2}$8901	.$\overline{3}$4031	.$\overline{3}$7533	.$\overline{4}$5126	48′
14′	.$\overline{2}$2753	.$\overline{2}$4159	.$\overline{2}$5413	.$\overline{2}$6517	.$\overline{2}$7470	.$\overline{2}$8271	.$\overline{2}$8920	.$\overline{3}$4172	.$\overline{3}$7623	.$\overline{4}$5524	46′
16′	.$\overline{2}$2803	.$\overline{2}$4203	.$\overline{2}$5453	.$\overline{2}$6551	.$\overline{2}$7499	.$\overline{2}$8295	.$\overline{2}$8939	.$\overline{3}$4312	.$\overline{3}$7712	.$\overline{4}$5905	44′
18′	.$\overline{2}$2852	.$\overline{2}$4247	.$\overline{2}$5492	.$\overline{2}$6585	.$\overline{2}$7528	.$\overline{2}$8319	.$\overline{2}$8958	.$\overline{3}$4449	.$\overline{3}$7799	.$\overline{4}$6268	42′
20′	**.$\overline{2}$2901**	**.$\overline{2}$4291**	**.$\overline{2}$5530**	**.$\overline{2}$6619**	**.$\overline{2}$7557**	**.$\overline{2}$8342**	**.$\overline{2}$8976**	**.$\overline{3}$4586**	**.$\overline{3}$7885**	**.$\overline{4}$6615**	**40′**
22′	.$\overline{2}$2949	.$\overline{2}$4335	.$\overline{2}$5569	.$\overline{2}$6653	.$\overline{2}$7585	.$\overline{2}$8366	.$\overline{2}$8995	.$\overline{3}$4720	.$\overline{3}$7969	.$\overline{4}$6945	38′
24′	.$\overline{2}$2998	.$\overline{2}$4378	.$\overline{2}$5608	.$\overline{2}$6686	.$\overline{2}$7614	.$\overline{2}$8389	.$\overline{3}$0134	.$\overline{3}$4853	.$\overline{3}$8051	.$\overline{4}$7258	36′
26′	.$\overline{2}$3046	.$\overline{2}$4422	.$\overline{2}$5646	.$\overline{2}$6720	.$\overline{2}$7642	.$\overline{2}$8413	.$\overline{3}$0315	.$\overline{3}$4984	.$\overline{3}$8131	.$\overline{4}$7555	34′
28′	.$\overline{2}$3095	.$\overline{2}$4465	.$\overline{2}$5684	.$\overline{2}$6753	.$\overline{2}$7670	.$\overline{2}$8436	.$\overline{3}$0496	.$\overline{3}$5113	.$\overline{3}$8210	.$\overline{4}$7834	32′
30′	**.$\overline{2}$3143**	**.$\overline{2}$4508**	**.$\overline{2}$5722**	**.$\overline{2}$6786**	**.$\overline{2}$7698**	**.$\overline{2}$8459**	**.$\overline{3}$0674**	**.$\overline{3}$5241**	**.$\overline{3}$8287**	**.$\overline{4}$8096**	**30′**
32′	.$\overline{2}$3191	.$\overline{2}$4551	.$\overline{2}$5760	.$\overline{2}$6819	.$\overline{2}$7726	.$\overline{2}$8481	.$\overline{3}$0851	.$\overline{3}$5367	.$\overline{3}$8362	.$\overline{4}$8342	28′
34′	.$\overline{2}$3238	.$\overline{2}$4594	.$\overline{2}$5798	.$\overline{2}$6851	.$\overline{2}$7754	.$\overline{2}$8504	.$\overline{3}$1026	.$\overline{3}$5491	.$\overline{3}$8436	.$\overline{4}$8570	26′
36′	.$\overline{2}$3286	.$\overline{2}$4636	.$\overline{2}$5836	.$\overline{2}$6884	.$\overline{2}$7781	.$\overline{2}$8526	.$\overline{3}$1199	.$\overline{3}$5614	.$\overline{3}$8507	.$\overline{4}$8782	24′
38′	.$\overline{2}$3334	.$\overline{2}$4679	.$\overline{2}$5873	.$\overline{2}$6916	.$\overline{2}$7808	.$\overline{2}$8549	.$\overline{3}$1371	.$\overline{3}$5735	.$\overline{3}$8578	.$\overline{4}$8976	22′
40′	**.$\overline{2}$3381**	**.$\overline{2}$4721**	**.$\overline{2}$5910**	**.$\overline{2}$6948**	**.$\overline{2}$7835**	**.$\overline{2}$8571**	**.$\overline{3}$1541**	**.$\overline{3}$5854**	**.$\overline{3}$8646**	**.$\overline{5}$1538**	**20′**
42′	.$\overline{2}$3428	.$\overline{2}$4763	.$\overline{2}$5947	.$\overline{2}$6980	.$\overline{2}$7862	.$\overline{2}$8593	.$\overline{3}$1709	.$\overline{3}$5972	.$\overline{3}$8713	.$\overline{5}$3146	18′
44′	.$\overline{2}$3475	.$\overline{2}$4805	.$\overline{2}$5984	.$\overline{2}$7012	.$\overline{2}$7889	.$\overline{2}$8614	.$\overline{3}$1876	.$\overline{3}$6088	.$\overline{3}$8778	.$\overline{5}$4585	16′
46′	.$\overline{2}$3522	.$\overline{2}$4847	.$\overline{2}$6021	.$\overline{2}$7044	.$\overline{2}$7916	.$\overline{2}$8636	.$\overline{3}$2041	.$\overline{3}$6202	.$\overline{3}$8842	.$\overline{5}$5854	14′
48′	.$\overline{2}$3568	.$\overline{2}$4888	.$\overline{2}$6057	.$\overline{2}$7075	.$\overline{2}$7942	.$\overline{2}$8657	.$\overline{3}$2204	.$\overline{3}$6315	.$\overline{3}$8903	.$\overline{5}$6954	12′
50′	**.$\overline{2}$3615**	**.$\overline{2}$4930**	**.$\overline{2}$6094**	**.$\overline{2}$7107**	**.$\overline{2}$7968**	**.$\overline{2}$8678**	**.$\overline{3}$2365**	**.$\overline{3}$6425**	**.$\overline{3}$8963**	**.$\overline{5}$7885**	**10′**
52′	.$\overline{2}$3661	.$\overline{2}$4971	.$\overline{2}$6130	.$\overline{2}$7138	.$\overline{2}$7995	.$\overline{2}$8700	.$\overline{3}$2525	.$\overline{3}$6535	.$\overline{4}$0219	.$\overline{5}$8646	8′
54′	.$\overline{2}$3707	.$\overline{2}$5012	.$\overline{2}$6166	.$\overline{2}$7169	.$\overline{2}$8021	.$\overline{2}$8720	.$\overline{3}$2683	.$\overline{3}$6642	.$\overline{4}$0786	.$\overline{5}$9238	6′
56′	.$\overline{2}$3753	.$\overline{2}$5053	.$\overline{2}$6202	.$\overline{2}$7200	.$\overline{2}$8046	.$\overline{2}$8741	.$\overline{3}$2840	.$\overline{3}$6748	.$\overline{4}$1336	.$\overline{5}$9662	4′
58′	.$\overline{2}$3799	.$\overline{2}$5093	.$\overline{2}$6238	.$\overline{2}$7230	.$\overline{2}$8072	.$\overline{2}$8762	.$\overline{3}$2995	.$\overline{3}$6852	.$\overline{4}$1869	.$\overline{5}$9915	2′
60′	.$\overline{2}$3844	.$\overline{2}$5134	.$\overline{2}$6273	.$\overline{2}$7261	.$\overline{2}$8097	.$\overline{2}$8782	.$\overline{3}$3148	.$\overline{3}$6954	.$\overline{4}$2385	1,00	**0′**
	189°	**188°**	**187°**	**186°**	**185°**	**184°**	**183°**	**182°**	**181°**	**180°**	$180^\circ \leqslant \theta$

Usage: $hav(180^\circ 02') = hav(179^\circ 58') = 0.999999915$ denoted as .$\overline{5}$,9915

$\theta \leqslant 180^\circ$	**0°**	**1°**	**2°**	**3°**	**4°**	**5°**	**6°**	**7°**	**8°**	**9°**	
0′	0.000	.0001	.0003	.0007	.0012	.0019	.0027	.0037	.0049	.0062	**60′**
2′	.0000	.0001	.0003	.0007	.0012	.0019	.0028	.0038	.0049	.0062	**58′**
4′	.0000	.0001	.0003	.0007	.0013	.0020	.0028	.0038	.0049	.0062	**56′**
6′	.0000	.0001	.0003	.0007	.0013	.0020	.0028	.0038	.0050	.0063	**54′**
8′	.0000	.0001	.0003	.0007	.0013	.0020	.0029	.0039	.0050	.0063	**52′**
10′	**.0000**	**.0001**	**.0004**	**.0008**	**.0013**	**.0020**	**.0029**	**.0039**	**.0051**	**.0064**	**50′**
12′	.0000	.0001	.0004	.0008	.0013	.0021	.0029	.0039	.0051	.0064	**48′**
14′	.0000	.0001	.0004	.0008	.0014	.0021	.0030	.0040	.0052	.0065	**46′**
16′	.0000	.0001	.0004	.0008	.0014	.0021	.0030	.0040	.0052	.0065	**44′**
18′	.0000	.0001	.0004	.0008	.0014	.0021	.0030	.0041	.0052	.0066	**42′**
20′	**.0000**	**.0001**	**.0004**	**.0008**	**.0014**	**.0022**	**.0031**	**.0041**	**.0053**	**.0066**	**40′**
22′	.0000	.0001	.0004	.0009	.0015	.0022	.0031	.0041	.0053	.0067	**38′**
24′	.0000	.0001	.0004	.0009	.0015	.0022	.0031	.0042	.0054	.0067	**36′**
26′	.0000	.0002	.0005	.0009	.0015	.0022	.0031	.0042	.0054	.0068	**34′**
28′	.0000	.0002	.0005	.0009	.0015	.0023	.0032	.0042	.0054	.0068	**32′**
30′	**.0000**	**.0002**	**.0005**	**.0009**	**.0015**	**.0023**	**.0032**	**.0043**	**.0055**	**.0069**	**30′**
32′	.0000	.0002	.0005	.0010	.0016	.0023	.0032	.0043	.0055	.0069	**28′**
34′	.0000	.0002	.0005	.0010	.0016	.0024	.0033	.0044	.0056	.0070	**26′**
36′	.0000	.0002	.0005	.0010	.0016	.0024	.0033	.0044	.0056	.0070	**24′**
38′	.0000	.0002	.0005	.0010	.0016	.0024	.0033	.0044	.0057	.0071	**22′**
40′	**.0000**	**.0002**	**.0005**	**.0010**	**.0017**	**.0024**	**.0034**	**.0045**	**.0057**	**.0071**	**20′**
42′	.0000	.0002	.0006	.0010	.0017	.0025	.0034	.0045	.0058	.0071	**18′**
44′	.0000	.0002	.0006	.0011	.0017	.0025	.0034	.0045	.0058	.0072	**16′**
46′	.0000	.0002	.0006	.0011	.0017	.0025	.0035	.0046	.0058	.0072	**14′**
48′	.0000	.0002	.0006	.0011	.0018	.0026	.0035	.0046	.0059	.0073	**12′**
50′	**.0001**	**.0003**	**.0006**	**.0011**	**.0018**	**.0026**	**.0036**	**.0047**	**.0059**	**.0073**	**10′**
52′	.0001	.0003	.0006	.0011	.0018	.0026	.0036	.0047	.0060	.0074	**8′**
54′	.0001	.0003	.0006	.0012	.0018	.0026	.0036	.0047	.0060	.0074	**6′**
56′	.0001	.0003	.0007	.0012	.0019	.0027	.0037	.0048	.0061	.0075	**4′**
58′	.0001	.0003	.0007	.0012	.0019	.0027	.0037	.0048	.0061	.0075	**2′**
60′	.0001	.0003	.0007	.0012	.0019	.0027	.0037	.0049	.0062	.0076	**0′**
	359°	**358°**	**357°**	**356°**	**355°**	**354°**	**353°**	**352°**	**351°**	**350°**	$180^\circ \leqslant \theta$
	89°	*88°*	*87°*	*86°*	*85°*	*84°*	*83°*	*82°*	*81°*	*80°*	*Hc*

Usage: $hav(355^\circ 40') = hav(4^\circ 20') = 0.0014$. Hc = 90°− ZD.

$\theta \leqslant 180^\circ$	**10°**	**11°**	**12°**	**13°**	**14°**	**15°**	**16°**	**17°**	**18°**	**19°**	
0′	.0076	.0092	.0109	.0128	.0149	.0170	.0194	.0218	.0245	.0272	**60′**
2′	.0076	.0092	.0110	.0129	.0149	.0171	.0194	.0219	.0246	.0273	**58′**
4′	.0077	.0093	.0110	.0129	.0150	.0172	.0195	.0220	.0247	.0274	**56′**
6′	.0077	.0094	.0111	.0130	.0151	.0173	.0196	.0221	.0247	.0275	**54′**
8′	.0078	.0094	.0112	.0131	.0151	.0173	.0197	.0222	.0248	.0276	**52′**
10′	**.0079**	**.0095**	**.0112**	**.0131**	**.0152**	**.0174**	**.0198**	**.0223**	**.0249**	**.0277**	**50′**
12′	.0079	.0095	.0113	.0132	.0153	.0175	.0199	.0224	.0250	.0278	**48′**
14′	.0080	.0096	.0114	.0133	.0153	.0176	.0199	.0224	.0251	.0279	**46′**
16′	.0080	.0096	.0114	.0133	.0154	.0176	.0200	.0225	.0252	.0280	**44′**
18′	.0081	.0097	.0115	.0134	.0155	.0177	.0201	.0226	.0253	.0281	**42′**
20′	**.0081**	**.0097**	**.0115**	**.0135**	**.0156**	**.0178**	**.0202**	**.0227**	**.0254**	**.0282**	**40′**
22′	.0082	.0098	.0116	.0135	.0156	.0179	.0203	.0228	.0255	.0283	**38′**
24′	.0082	.0099	.0117	.0136	.0157	.0180	.0203	.0229	.0256	.0284	**36′**
26′	.0083	.0099	.0117	.0137	.0158	.0180	.0204	.0230	.0257	.0285	**34′**
28′	.0083	.0100	.0118	.0137	.0159	.0181	.0205	.0231	.0257	.0286	**32′**
30′	**.0084**	**.0100**	**.0119**	**.0138**	**.0159**	**.0182**	**.0206**	**.0231**	**.0258**	**.0287**	**30′**
32′	.0084	.0101	.0119	.0139	.0160	.0183	.0207	.0232	.0259	.0288	**28′**
34′	.0085	.0102	.0120	.0140	.0161	.0183	.0208	.0233	.0260	.0289	**26′**
36′	.0085	.0102	.0120	.0140	.0161	.0184	.0208	.0234	.0261	.0290	**24′**
38′	.0086	.0103	.0121	.0141	.0162	.0185	.0209	.0235	.0262	.0291	**22′**
40′	**.0086**	**.0103**	**.0122**	**.0142**	**.0163**	**.0186**	**.0210**	**.0236**	**.0263**	**.0292**	**20′**
42′	.0087	.0104	.0122	.0142	.0164	.0187	.0211	.0237	.0264	.0293	**18′**
44′	.0087	.0104	.0123	.0143	.0164	.0187	.0212	.0238	.0265	.0294	**16′**
46′	.0088	.0105	.0124	.0144	.0165	.0188	.0213	.0238	.0266	.0295	**14′**
48′	.0089	.0106	.0124	.0144	.0166	.0189	.0213	.0239	.0267	.0296	**12′**
50′	**.0089**	**.0106**	**.0125**	**.0145**	**.0167**	**.0190**	**.0214**	**.0240**	**.0268**	**.0297**	**10′**
52′	.0090	.0107	.0126	.0146	.0167	.0190	.0215	.0241	.0269	.0298	**8′**
54′	.0090	.0107	.0126	.0146	.0168	.0191	.0216	.0242	.0270	.0299	**6′**
56′	.0091	.0108	.0127	.0147	.0169	.0192	.0217	.0243	.0271	.0300	**4′**
58′	.0091	.0109	.0127	.0148	.0170	.0193	.0218	.0244	.0271	.0301	**2′**
60′	.0092	.0109	.0128	.0149	.0170	.0194	.0218	.0245	.0272	.0302	**0′**
	349°	**348°**	**347°**	**346°**	**345°**	**344°**	**343°**	**342°**	**341°**	**340°**	$180^\circ \leqslant \theta$
	79°	*78°*	*77°*	*76°*	*75°*	*74°*	*73°*	*72°*	*71°*	*70°*	*Hc*

Usage: $hav(340^\circ 18') = hav(19^\circ 42') = 0.0293$. Hc = 90°− ZD.

$\theta \leqslant 180^\circ$	**20°**	**21°**	**22°**	**23°**	**24°**	**25°**	**26°**	**27°**	**28°**	**29°**	
0′	.0302	.0332	.0364	.0397	.0432	.0468	.0506	.0545	.0585	.0627	**60′**
2′	.0303	.0333	.0365	.0399	.0433	.0470	.0507	.0546	.0587	.0628	**58′**
4′	.0304	.0334	.0366	.0400	.0435	.0471	.0509	.0548	.0588	.0630	**56′**
6′	.0305	.0335	.0367	.0401	.0436	.0472	.0510	.0549	.0589	.0631	**54′**
8′	.0306	.0336	.0368	.0402	.0437	.0473	.0511	.0550	.0591	.0633	**52′**
10′	**.0307**	**.0337**	**.0370**	**.0403**	**.0438**	**.0475**	**.0512**	**.0552**	**.0592**	**.0634**	**50′**
12′	.0308	.0338	.0371	.0404	.0439	.0476	.0514	.0553	.0593	.0635	**48′**
14′	.0309	.0339	.0372	.0405	.0441	.0477	.0515	.0554	.0595	.0637	**46′**
16′	.0310	.0340	.0373	.0407	.0442	.0478	.0516	.0556	.0596	.0638	**44′**
18′	.0311	.0342	.0374	.0408	.0443	.0480	.0518	.0557	.0598	.0640	**42′**
20′	**.0312**	**.0343**	**.0375**	**.0409**	**.0444**	**.0481**	**.0519**	**.0558**	**.0599**	**.0641**	**40′**
22′	.0313	.0344	.0376	.0410	.0445	.0482	.0520	.0560	.0600	.0643	**38′**
24′	.0314	.0345	.0377	.0411	.0447	.0483	.0521	.0561	.0602	.0644	**36′**
26′	.0315	.0346	.0378	.0412	.0448	.0485	.0523	.0562	.0603	.0645	**34′**
28′	.0316	.0347	.0379	.0414	.0449	.0486	.0524	.0564	.0605	.0647	**32′**
30′	**.0317**	**.0348**	**.0381**	**.0415**	**.0450**	**.0487**	**.0525**	**.0565**	**.0606**	**.0648**	**30′**
32′	.0318	.0349	.0382	.0416	.0451	.0488	.0527	.0566	.0607	.0650	**28′**
34′	.0319	.0350	.0383	.0417	.0453	.0490	.0528	.0568	.0609	.0651	**26′**
36′	.0320	.0351	.0384	.0418	.0454	.0491	.0529	.0569	.0610	.0653	**24′**
38′	.0321	.0352	.0385	.0419	.0455	.0492	.0531	.0570	.0611	.0654	**22′**
40′	**.0322**	**.0353**	**.0386**	**.0421**	**.0456**	**.0493**	**.0532**	**.0572**	**.0613**	**.0655**	**20′**
42′	.0323	.0354	.0387	.0422	.0457	.0495	.0533	.0573	.0614	.0657	**18′**
44′	.0324	.0355	.0388	.0423	.0459	.0496	.0534	.0574	.0616	.0658	**16′**
46′	.0325	.0356	.0390	.0424	.0460	.0497	.0536	.0576	.0617	.0660	**14′**
48′	.0326	.0358	.0391	.0425	.0461	.0498	.0537	.0577	.0618	.0661	**12′**
50′	**.0327**	**.0359**	**.0392**	**.0426**	**.0462**	**.0500**	**.0538**	**.0578**	**.0620**	**.0663**	**10′**
52′	.0328	.0360	.0393	.0428	.0464	.0501	.0540	.0580	.0621	.0664	**8′**
54′	.0329	.0361	.0394	.0429	.0465	.0502	.0541	.0581	.0623	.0666	**6′**
56′	.0330	.0362	.0395	.0430	.0466	.0503	.0542	.0583	.0624	.0667	**4′**
58′	.0331	.0363	.0396	.0431	.0467	.0505	.0544	.0584	.0625	.0668	**2′**
60′	.0332	.0364	.0397	.0432	.0468	.0506	.0545	.0585	.0627	.0670	**0′**
	339°	**338°**	**337°**	**336°**	**335°**	**334°**	**333°**	**332°**	**331°**	**330°**	$180^\circ \leqslant \theta$
	69°	*68°*	*67°*	*66°*	*65°*	*64°*	*63°*	*62°*	*61°*	*60°*	*Hc*

Usage: $hav(333^\circ 56') = hav(26^\circ 04') = 0.0509$. Hc = 90°− ZD.

$\theta \leqslant 180^\circ$	**30°**	**31°**	**32°**	**33°**	**34°**	**35°**	**36°**	**37°**	**38°**	**39°**	
0′	.0670	.0714	.0760	.0807	.0855	.0904	.0955	.1007	.1060	.1114	**60′**
2′	.0671	.0716	.0761	.0808	.0856	.0906	.0957	.1009	.1062	.1116	**58′**
4′	.0673	.0717	.0763	.0810	.0858	.0908	.0958	.1010	.1064	.1118	**56′**
6′	.0674	.0719	.0764	.0811	.0860	.0909	.0960	.1012	.1065	.1120	**54′**
8′	.0676	.0720	.0766	.0813	.0861	.0911	.0962	.1014	.1067	.1122	**52′**
10′	**.0677**	**.0722**	**.0767**	**.0815**	**.0863**	**.0913**	**.0963**	**.1016**	**.1069**	**.1123**	**50′**
12′	.0679	.0723	.0769	.0816	.0865	.0914	.0965	.1017	.1071	.1125	**48′**
14′	.0680	.0725	.0771	.0818	.0866	.0916	.0967	.1019	.1073	.1127	**46′**
16′	.0682	.0726	.0772	.0819	.0868	.0918	.0969	.1021	.1074	.1129	**44′**
18′	.0683	.0728	.0774	.0821	.0870	.0919	.0970	.1023	.1076	.1131	**42′**
20′	**.0684**	**.0729**	**.0775**	**.0823**	**.0871**	**.0921**	**.0972**	**.1024**	**.1078**	**.1133**	**40′**
22′	.0686	.0731	.0777	.0824	.0873	.0923	.0974	.1026	.1080	.1134	**38′**
24′	.0687	.0732	.0778	.0826	.0874	.0924	.0976	.1028	.1082	.1136	**36′**
26′	.0689	.0734	.0780	.0827	.0876	.0926	.0977	.1030	.1083	.1138	**34′**
28′	.0690	.0735	.0781	.0829	.0878	.0928	.0979	.1031	.1085	.1140	**32′**
30′	**.0692**	**.0737**	**.0783**	**.0831**	**.0879**	**.0929**	**.0981**	**.1033**	**.1087**	**.1142**	**30′**
32′	.0693	.0738	.0785	.0832	.0881	.0931	.0982	.1035	.1089	.1144	**28′**
34′	.0695	.0740	.0786	.0834	.0883	.0933	.0984	.1037	.1091	.1146	**26′**
36′	.0696	.0741	.0788	.0835	.0884	.0934	.0986	.1039	.1092	.1147	**24′**
38′	.0698	.0743	.0789	.0837	.0886	.0936	.0988	.1040	.1094	.1149	**22′**
40′	**.0699**	**.0744**	**.0791**	**.0839**	**.0888**	**.0938**	**.0989**	**.1042**	**.1096**	**.1151**	**20′**
42′	.0701	.0746	.0792	.0840	.0889	.0940	.0991	.1044	.1098	.1153	**18′**
44′	.0702	.0747	.0794	.0842	.0891	.0941	.0993	.1046	.1100	.1155	**16′**
46′	.0704	.0749	.0796	.0843	.0893	.0943	.0995	.1047	.1101	.1157	**14′**
48′	.0705	.0751	.0797	.0845	.0894	.0945	.0996	.1049	.1103	.1159	**12′**
50′	**.0707**	**.0752**	**.0799**	**.0847**	**.0896**	**.0946**	**.0998**	**.1051**	**.1105**	**.1160**	**10′**
52′	.0708	.0754	.0800	.0848	.0898	.0948	.1000	.1053	.1107	.1162	**8′**
54′	.0710	.0755	.0802	.0850	.0899	.0950	.1002	.1055	.1109	.1164	**6′**
56′	.0711	.0757	.0803	.0852	.0901	.0951	.1003	.1056	.1111	.1166	**4′**
58′	.0713	.0758	.0805	.0853	.0903	.0953	.1005	.1058	.1112	.1168	**2′**
60′	.0714	.0760	.0807	.0855	.0904	.0955	.1007	.1060	.1114	.1170	**0′**
	329°	**328°**	**327°**	**326°**	**325°**	**324°**	**323°**	**322°**	**321°**	**320°**	$180^\circ \leqslant \theta$
	59°	*58°*	*57°*	*56°*	*55°*	*54°*	*53°*	*52°*	*51°*	*50°*	*Hc*

Usage: $hav(329^\circ 38') = hav(30^\circ 22') = 0.0686$. Hc = 90°− ZD.

$\theta \leqslant 180^\circ$	**40°**	**41°**	**42°**	**43°**	**44°**	**45°**	**46°**	**47°**	**48°**	**49°**	
0′	.1170	.1226	.1284	.1343	.1403	.1464	.1527	.1590	.1654	.1720	**60′**
2′	.1172	.1228	.1286	.1345	.1405	.1467	.1529	.1592	.1657	.1722	**58′**
4′	.1174	.1230	.1288	.1347	.1407	.1469	.1531	.1594	.1659	.1724	**56′**
6′	.1175	.1232	.1290	.1349	.1409	.1471	.1533	.1596	.1661	.1726	**54′**
8′	.1177	.1234	.1292	.1351	.1411	.1473	.1535	.1599	.1663	.1728	**52′**
10′	**.1179**	**.1236**	**.1294**	**.1353**	**.1413**	**.1475**	**.1537**	**.1601**	**.1665**	**.1731**	**50′**
12′	.1181	.1238	.1296	.1355	.1415	.1477	.1539	.1603	.1667	.1733	**48′**
14′	.1183	.1240	.1298	.1357	.1417	.1479	.1541	.1605	.1670	.1735	**46′**
16′	.1185	.1242	.1300	.1359	.1420	.1481	.1543	.1607	.1672	.1737	**44′**
18′	.1187	.1244	.1302	.1361	.1422	.1483	.1546	.1609	.1674	.1740	**42′**
20′	**.1189**	**.1246**	**.1304**	**.1363**	**.1424**	**.1485**	**.1548**	**.1611**	**.1676**	**.1742**	**40′**
22′	.1190	.1248	.1306	.1365	.1426	.1487	.1550	.1613	.1678	.1744	**38′**
24′	.1192	.1249	.1308	.1367	.1428	.1489	.1552	.1616	.1680	.1746	**36′**
26′	.1194	.1251	.1310	.1369	.1430	.1491	.1554	.1618	.1683	.1748	**34′**
28′	.1196	.1253	.1312	.1371	.1432	.1493	.1556	.1620	.1685	.1751	**32′**
30′	**.1198**	**.1255**	**.1314**	**.1373**	**.1434**	**.1495**	**.1558**	**.1622**	**.1687**	**.1753**	**30′**
32′	.1200	.1257	.1316	.1375	.1436	.1498	.1560	.1624	.1689	.1755	**28′**
34′	.1202	.1259	.1318	.1377	.1438	.1500	.1562	.1626	.1691	.1757	**26′**
36′	.1204	.1261	.1320	.1379	.1440	.1502	.1565	.1628	.1693	.1759	**24′**
38′	.1206	.1263	.1321	.1381	.1442	.1504	.1567	.1631	.1696	.1762	**22′**
40′	**.1207**	**.1265**	**.1323**	**.1383**	**.1444**	**.1506**	**.1569**	**.1633**	**.1698**	**.1764**	**20′**
42′	.1209	.1267	.1325	.1385	.1446	.1508	.1571	.1635	.1700	.1766	**18′**
44′	.1211	.1269	.1327	.1387	.1448	.1510	.1573	.1637	.1702	.1768	**16′**
46′	.1213	.1271	.1329	.1389	.1450	.1512	.1575	.1639	.1704	.1770	**14′**
48′	.1215	.1273	.1331	.1391	.1452	.1514	.1577	.1641	.1707	.1773	**12′**
50′	**.1217**	**.1275**	**.1333**	**.1393**	**.1454**	**.1516**	**.1579**	**.1644**	**.1709**	**.1775**	**10′**
52′	.1219	.1277	.1335	.1395	.1456	.1518	.1582	.1646	.1711	.1777	**8′**
54′	.1221	.1278	.1337	.1397	.1458	.1520	.1584	.1648	.1713	.1779	**6′**
56′	.1223	.1280	.1339	.1399	.1460	.1523	.1586	.1650	.1715	.1782	**4′**
58′	.1225	.1282	.1341	.1401	.1462	.1525	.1588	.1652	.1718	.1784	**2′**
60′	.1226	.1284	.1343	.1403	.1464	.1527	.1590	.1654	.1720	.1786	**0′**
	319°	**318°**	**317°**	**316°**	**315°**	**314°**	**313°**	**312°**	**311°**	**310°**	$180^\circ \leqslant \theta$
	49°	*48°*	*47°*	*46°*	*45°*	*44°*	*43°*	*42°*	*41°*	*40°*	*Hc*

Usage: $hav(316^\circ 44') = hav(43^\circ 16') = 0.1359$. Hc = 90°− ZD.

$\theta \leqslant 180^\circ$	**50°**	**51°**	**52°**	**53°**	**54°**	**55°**	**56°**	**57°**	**58°**	**59°**	
0′	.1786	.1853	.1922	.1991	.2061	.2132	.2204	.2277	.2350	.2425	**60′**
2′	.1788	.1856	.1924	.1993	.2063	.2135	.2206	.2279	.2353	.2427	**58′**
4′	.1791	.1858	.1926	.1996	.2066	.2137	.2209	.2282	.2355	.2430	**56′**
6′	.1793	.1860	.1929	.1998	.2068	.2139	.2211	.2284	.2358	.2432	**54′**
8′	.1795	.1862	.1931	.2000	.2070	.2142	.2214	.2287	.2360	.2435	**52′**
10′	**.1797**	**.1865**	**.1933**	**.2003**	**.2073**	**.2144**	**.2216**	**.2289**	**.2363**	**.2437**	**50′**
12′	.1799	.1867	.1935	.2005	.2075	.2146	.2219	.2291	.2365	.2440	**48′**
14′	.1802	.1869	.1938	.2007	.2078	.2149	.2221	.2294	.2368	.2442	**46′**
16′	.1804	.1872	.1940	.2010	.2080	.2151	.2223	.2296	.2370	.2445	**44′**
18′	.1806	.1874	.1942	.2012	.2082	.2154	.2226	.2299	.2373	.2447	**42′**
20′	**.1808**	**.1876**	**.1945**	**.2014**	**.2085**	**.2156**	**.2228**	**.2301**	**.2375**	**.2450**	**40′**
22′	.1811	.1878	.1947	.2017	.2087	.2158	.2231	.2304	.2378	.2452	**38′**
24′	.1813	.1881	.1949	.2019	.2089	.2161	.2233	.2306	.2380	.2455	**36′**
26′	.1815	.1883	.1952	.2021	.2092	.2163	.2235	.2309	.2383	.2457	**34′**
28′	.1817	.1885	.1954	.2024	.2094	.2166	.2238	.2311	.2385	.2460	**32′**
30′	**.1820**	**.1887**	**.1956**	**.2026**	**.2096**	**.2168**	**.2240**	**.2314**	**.2388**	**.2462**	**30′**
32′	.1822	.1890	.1959	.2028	.2099	.2170	.2243	.2316	.2390	.2465	**28′**
34′	.1824	.1892	.1961	.2031	.2101	.2173	.2245	.2318	.2392	.2467	**26′**
36′	.1826	.1894	.1963	.2033	.2104	.2175	.2248	.2321	.2395	.2470	**24′**
38′	.1829	.1897	.1965	.2035	.2106	.2178	.2250	.2323	.2397	.2472	**22′**
40′	**.1831**	**.1899**	**.1968**	**.2038**	**.2108**	**.2180**	**.2252**	**.2326**	**.2400**	**.2475**	**20′**
42′	.1833	.1901	.1970	.2040	.2111	.2182	.2255	.2328	.2402	.2477	**18′**
44′	.1835	.1903	.1972	.2042	.2113	.2185	.2257	.2331	.2405	.2480	**16′**
46′	.1838	.1906	.1975	.2045	.2115	.2187	.2260	.2333	.2407	.2482	**14′**
48′	.1840	.1908	.1977	.2047	.2118	.2190	.2262	.2336	.2410	.2485	**12′**
50′	**.1842**	**.1910**	**.1979**	**.2049**	**.2120**	**.2192**	**.2265**	**.2338**	**.2412**	**.2487**	**10′**
52′	.1844	.1913	.1982	.2052	.2123	.2194	.2267	.2341	.2415	.2490	**8′**
54′	.1847	.1915	.1984	.2054	.2125	.2197	.2269	.2343	.2417	.2492	**6′**
56′	.1849	.1917	.1986	.2056	.2127	.2199	.2272	.2345	.2420	.2495	**4′**
58′	.1851	.1919	.1989	.2059	.2130	.2202	.2274	.2348	.2422	.2497	**2′**
60′	.1853	.1922	.1991	.2061	.2132	.2204	.2277	.2350	.2425	.2500	**0′**
	309°	**308°**	**307°**	**306°**	**305°**	**304°**	**303°**	**302°**	**301°**	**300°**	$180^\circ \leqslant \theta$
	39°	*38°*	*37°*	*36°*	*35°*	*34°*	*33°*	*32°*	*31°*	*30°*	*Hc*

Usage: $hav(302^\circ 36') = hav(57^\circ 24') = 0.2306$. Hc = 90°− ZD.

$\theta \leqslant 180^\circ$	**60°**	**61°**	**62°**	**63°**	**64°**	**65°**	**66°**	**67°**	**68°**	**69°**	
0′	.2500	.2576	.2653	.2730	.2808	.2887	.2966	.3046	.3127	.3208	**60′**
2′	.2503	.2578	.2655	.2733	.2811	.2890	.2969	.3049	.3130	.3211	**58′**
4′	.2505	.2581	.2658	.2735	.2813	.2892	.2972	.3052	.3132	.3214	**56′**
6′	.2508	.2584	.2660	.2738	.2816	.2895	.2974	.3054	.3135	.3216	**54′**
8′	.2510	.2586	.2663	.2740	.2819	.2897	.2977	.3057	.3138	.3219	**52′**
10′	**.2513**	**.2589**	**.2665**	**.2743**	**.2821**	**.2900**	**.2980**	**.3060**	**.3140**	**.3222**	**50′**
12′	.2515	.2591	.2668	.2746	.2824	.2903	.2982	.3062	.3143	.3224	**48′**
14′	.2518	.2594	.2671	.2748	.2826	.2905	.2985	.3065	.3146	.3227	**46′**
16′	.2520	.2596	.2673	.2751	.2829	.2908	.2988	.3068	.3149	.3230	**44′**
18′	.2523	.2599	.2676	.2753	.2832	.2911	.2990	.3070	.3151	.3233	**42′**
20′	**.2525**	**.2601**	**.2678**	**.2756**	**.2834**	**.2913**	**.2993**	**.3073**	**.3154**	**.3235**	**40′**
22′	.2528	.2604	.2681	.2759	.2837	.2916	.2996	.3076	.3157	.3238	**38′**
24′	.2530	.2607	.2684	.2761	.2840	.2919	.2998	.3079	.3159	.3241	**36′**
26′	.2533	.2609	.2686	.2764	.2842	.2921	.3001	.3081	.3162	.3244	**34′**
28′	.2535	.2612	.2689	.2766	.2845	.2924	.3004	.3084	.3165	.3246	**32′**
30′	**.2538**	**.2614**	**.2691**	**.2769**	**.2847**	**.2927**	**.3006**	**.3087**	**.3167**	**.3249**	**30′**
32′	.2540	.2617	.2694	.2772	.2850	.2929	.3009	.3089	.3170	.3252	**28′**
34′	.2543	.2619	.2696	.2774	.2853	.2932	.3012	.3092	.3173	.3254	**26′**
36′	.2545	.2622	.2699	.2777	.2855	.2934	.3014	.3095	.3176	.3257	**24′**
38′	.2548	.2624	.2702	.2779	.2858	.2937	.3017	.3097	.3178	.3260	**22′**
40′	**.2551**	**.2627**	**.2704**	**.2782**	**.2861**	**.2940**	**.3020**	**.3100**	**.3181**	**.3263**	**20′**
42′	.2553	.2630	.2707	.2785	.2863	.2942	.3022	.3103	.3184	.3265	**18′**
44′	.2556	.2632	.2709	.2787	.2866	.2945	.3025	.3105	.3186	.3268	**16′**
46′	.2558	.2635	.2712	.2790	.2868	.2948	.3028	.3108	.3189	.3271	**14′**
48′	.2561	.2637	.2715	.2792	.2871	.2950	.3030	.3111	.3192	.3274	**12′**
50′	**.2563**	**.2640**	**.2717**	**.2795**	**.2874**	**.2953**	**.3033**	**.3113**	**.3195**	**.3276**	**10′**
52′	.2566	.2642	.2720	.2798	.2876	.2956	.3036	.3116	.3197	.3279	**8′**
54′	.2568	.2645	.2722	.2800	.2879	.2958	.3038	.3119	.3200	.3282	**6′**
56′	.2571	.2648	.2725	.2803	.2882	.2961	.3041	.3122	.3203	.3284	**4′**
58′	.2573	.2650	.2727	.2806	.2884	.2964	.3044	.3124	.3205	.3287	**2′**
60′	.2576	.2653	.2730	.2808	.2887	.2966	.3046	.3127	.3208	.3290	**0′**
	299°	**298°**	**297°**	**296°**	**295°**	**294°**	**293°**	**292°**	**291°**	**290°**	$180^\circ \leqslant \theta$
	29°	*28°*	*27°*	*26°*	*25°*	*24°*	*23°*	*22°*	*21°*	*20°*	*Hc*

Usage: $hav(295^\circ 02') = hav(64^\circ 58') = 0.2884$. Hc = 90°− ZD.

$\theta \leqslant 180^\circ$	**70°**	**71°**	**72°**	**73°**	**74°**	**75°**	**76°**	**77°**	**78°**	**79°**	
0′	.3290	.3372	.3455	.3538	.3622	.3706	.3790	.3875	.3960	.4046	**60′**
2′	.3293	.3375	.3458	.3541	.3625	.3709	.3793	.3878	.3963	.4049	**58′**
4′	.3295	.3378	.3460	.3544	.3627	.3712	.3796	.3881	.3966	.4052	**56′**
6′	.3298	.3380	.3463	.3546	.3630	.3714	.3799	.3884	.3969	.4055	**54′**
8′	.3301	.3383	.3466	.3549	.3633	.3717	.3802	.3887	.3972	.4057	**52′**
10′	**.3304**	**.3386**	**.3469**	**.3552**	**.3636**	**.3720**	**.3805**	**.3889**	**.3975**	**.4060**	**50′**
12′	.3306	.3389	.3472	.3555	.3639	.3723	.3807	.3892	.3978	.4063	**48′**
14′	.3309	.3391	.3474	.3558	.3641	.3726	.3810	.3895	.3980	.4066	**46′**
16′	.3312	.3394	.3477	.3560	.3644	.3728	.3813	.3898	.3983	.4069	**44′**
18′	.3315	.3397	.3480	.3563	.3647	.3731	.3816	.3901	.3986	.4072	**42′**
20′	**.3317**	**.3400**	**.3483**	**.3566**	**.3650**	**.3734**	**.3819**	**.3904**	**.3989**	**.4075**	**40′**
22′	.3320	.3402	.3485	.3569	.3653	.3737	.3821	.3906	.3992	.4077	**38′**
24′	.3323	.3405	.3488	.3572	.3655	.3740	.3824	.3909	.3995	.4080	**36′**
26′	.3325	.3408	.3491	.3574	.3658	.3742	.3827	.3912	.3997	.4083	**34′**
28′	.3328	.3411	.3494	.3577	.3661	.3745	.3830	.3915	.4000	.4086	**32′**
30′	**.3331**	**.3413**	**.3496**	**.3580**	**.3664**	**.3748**	**.3833**	**.3918**	**.4003**	**.4089**	**30′**
32′	.3334	.3416	.3499	.3583	.3667	.3751	.3836	.3921	.4006	.4092	**28′**
34′	.3336	.3419	.3502	.3586	.3669	.3754	.3838	.3923	.4009	.4095	**26′**
36′	.3339	.3422	.3505	.3588	.3672	.3757	.3841	.3926	.4012	.4097	**24′**
38′	.3342	.3425	.3508	.3591	.3675	.3759	.3844	.3929	.4015	.4100	**22′**
40′	**.3345**	**.3427**	**.3510**	**.3594**	**.3678**	**.3762**	**.3847**	**.3932**	**.4017**	**.4103**	**20′**
42′	.3347	.3430	.3513	.3597	.3681	.3765	.3850	.3935	.4020	.4106	**18′**
44′	.3350	.3433	.3516	.3599	.3683	.3768	.3853	.3938	.4023	.4109	**16′**
46′	.3353	.3436	.3519	.3602	.3686	.3771	.3855	.3941	.4026	.4112	**14′**
48′	.3356	.3438	.3521	.3605	.3689	.3773	.3858	.3943	.4029	.4115	**12′**
50′	**.3358**	**.3441**	**.3524**	**.3608**	**.3692**	**.3776**	**.3861**	**.3946**	**.4032**	**.4117**	**10′**
52′	.3361	.3444	.3527	.3611	.3695	.3779	.3864	.3949	.4035	.4120	**8′**
54′	.3364	.3447	.3530	.3613	.3697	.3782	.3867	.3952	.4037	.4123	**6′**
56′	.3367	.3449	.3533	.3616	.3700	.3785	.3870	.3955	.4040	.4126	**4′**
58′	.3369	.3452	.3535	.3619	.3703	.3788	.3872	.3958	.4043	.4129	**2′**
60′	.3372	.3455	.3538	.3622	.3706	.3790	.3875	.3960	.4046	.4132	**0′**
	289°	**288°**	**287°**	**286°**	**285°**	**284°**	**283°**	**282°**	**281°**	**280°**	$180^\circ \leqslant \theta$
	19°	*18°*	*17°*	*16°*	*15°*	*14°*	*13°*	*12°*	*11°*	*10°*	*Hc*

Usage: $hav(281^\circ 40') = hav(78^\circ 20') = 0.3989$. Hc = 90°− ZD.

$\theta \leqslant 180^\circ$	**80°**	**81°**	**82°**	**83°**	**84°**	**85°**	**86°**	**87°**	**88°**	**89°**	
0′	.4132	.4218	.4304	.4391	.4477	.4564	.4651	.4738	.4826	.4913	**60′**
2′	.4135	.4221	.4307	.4394	.4480	.4567	.4654	.4741	.4828	.4916	**58′**
4′	.4137	.4224	.4310	.4396	.4483	.4570	.4657	.4744	.4831	.4919	**56′**
6′	.4140	.4226	.4313	.4399	.4486	.4573	.4660	.4747	.4834	.4921	**54′**
8′	.4143	.4229	.4316	.4402	.4489	.4576	.4663	.4750	.4837	.4924	**52′**
10′	**.4146**	**.4232**	**.4319**	**.4405**	**.4492**	**.4579**	**.4666**	**.4753**	**.4840**	**.4927**	**50′**
12′	.4149	.4235	.4321	.4408	.4495	.4582	.4669	.4756	.4843	.4930	**48′**
14′	.4152	.4238	.4324	.4411	.4498	.4585	.4672	.4759	.4846	.4933	**46′**
16′	.4155	.4241	.4327	.4414	.4501	.4587	.4674	.4762	.4849	.4936	**44′**
18′	.4158	.4244	.4330	.4417	.4503	.4590	.4677	.4764	.4852	.4939	**42′**
20′	**.4160**	**.4247**	**.4333**	**.4420**	**.4506**	**.4593**	**.4680**	**.4767**	**.4855**	**.4942**	**40′**
22′	.4163	.4249	.4336	.4422	.4509	.4596	.4683	.4770	.4857	.4945	**38′**
24′	.4166	.4252	.4339	.4425	.4512	.4599	.4686	.4773	.4860	.4948	**36′**
26′	.4169	.4255	.4342	.4428	.4515	.4602	.4689	.4776	.4863	.4951	**34′**
28′	.4172	.4258	.4344	.4431	.4518	.4605	.4692	.4779	.4866	.4953	**32′**
30′	**.4175**	**.4261**	**.4347**	**.4434**	**.4521**	**.4608**	**.4695**	**.4782**	**.4869**	**.4956**	**30′**
32′	.4178	.4264	.4350	.4437	.4524	.4611	.4698	.4785	.4872	.4959	**28′**
34′	.4181	.4267	.4353	.4440	.4527	.4614	.4701	.4788	.4875	.4962	**26′**
36′	.4183	.4270	.4356	.4443	.4529	.4616	.4703	.4791	.4878	.4965	**24′**
38′	.4186	.4272	.4359	.4446	.4532	.4619	.4706	.4794	.4881	.4968	**22′**
40′	**.4189**	**.4275**	**.4362**	**.4448**	**.4535**	**.4622**	**.4709**	**.4796**	**.4884**	**.4971**	**20′**
42′	.4192	.4278	.4365	.4451	.4538	.4625	.4712	.4799	.4887	.4974	**18′**
44′	.4195	.4281	.4368	.4454	.4541	.4628	.4715	.4802	.4889	.4977	**16′**
46′	.4198	.4284	.4370	.4457	.4544	.4631	.4718	.4805	.4892	.4980	**14′**
48′	.4201	.4287	.4373	.4460	.4547	.4634	.4721	.4808	.4895	.4983	**12′**
50′	**.4203**	**.4290**	**.4376**	**.4463**	**.4550**	**.4637**	**.4724**	**.4811**	**.4898**	**.4985**	**10′**
52′	.4206	.4293	.4379	.4466	.4553	.4640	.4727	.4814	.4901	.4988	**8′**
54′	.4209	.4295	.4382	.4469	.4556	.4643	.4730	.4817	.4904	.4991	**6′**
56′	.4212	.4298	.4385	.4472	.4558	.4645	.4733	.4820	.4907	.4994	**4′**
58′	.4215	.4301	.4388	.4474	.4561	.4648	.4735	.4823	.4910	.4997	**2′**
60′	.4218	.4304	.4391	.4477	.4564	.4651	.4738	.4826	.4913	.5000	**0′**
	279°	**278°**	**277°**	**276°**	**275°**	**274°**	**273°**	**272°**	**271°**	**270°**	$180^\circ \leqslant \theta$
	9°	*8°*	*7°*	*6°*	*5°*	*4°*	*3°*	*2°*	*1°*	*0°*	*Hc*

Usage: $hav(277^\circ 10') = hav(82^\circ 50') = 0.4376$. Hc = 90°− ZD.

Hc	*0°*	*-1°*	*-2°*	*-3°*	*-4°*	*-5°*	*-6°*	*-7°*	*-8°*	*-9°*	
$\theta \leqslant 180°$	**90°**	**91°**	**92°**	**93°**	**94°**	**95°**	**96°**	**97°**	**98°**	**99°**	
0′	.5000	.5087	.5174	.5262	.5349	.5436	.5523	.5609	.5696	.5782	**60′**
2′	.5003	.5090	.5177	.5265	.5352	.5439	.5526	.5612	.5699	.5785	**58′**
4′	.5006	.5093	.5180	.5267	.5355	.5442	.5528	.5615	.5702	.5788	**56′**
6′	.5009	.5096	.5183	.5270	.5357	.5444	.5531	.5618	.5705	.5791	**54′**
8′	.5012	.5099	.5186	.5273	.5360	.5447	.5534	.5621	.5707	.5794	**52′**
10′	**.5015**	**.5102**	**.5189**	**.5276**	**.5363**	**.5450**	**.5537**	**.5624**	**.5710**	**.5797**	**50′**
12′	.5017	.5105	.5192	.5279	.5366	.5453	.5540	.5627	.5713	.5799	**48′**
14′	.5020	.5108	.5195	.5282	.5369	.5456	.5543	.5630	.5716	.5802	**46′**
16′	.5023	.5111	.5198	.5285	.5372	.5459	.5546	.5632	.5719	.5805	**44′**
18′	.5026	.5113	.5201	.5288	.5375	.5462	.5549	.5635	.5722	.5808	**42′**
20′	**.5029**	**.5116**	**.5204**	**.5291**	**.5378**	**.5465**	**.5552**	**.5638**	**.5725**	**.5811**	**40′**
22′	.5032	.5119	.5206	.5294	.5381	.5468	.5554	.5641	.5728	.5814	**38′**
24′	.5035	.5122	.5209	.5297	.5384	.5471	.5557	.5644	.5730	.5817	**36′**
26′	.5038	.5125	.5212	.5299	.5386	.5473	.5560	.5647	.5733	.5819	**34′**
28′	.5041	.5128	.5215	.5302	.5389	.5476	.5563	.5650	.5736	.5822	**32′**
30′	**.5044**	**.5131**	**.5218**	**.5305**	**.5392**	**.5479**	**.5566**	**.5653**	**.5739**	**.5825**	**30′**
32′	.5047	.5134	.5221	.5308	.5395	.5482	.5569	.5656	.5742	.5828	**28′**
34′	.5049	.5137	.5224	.5311	.5398	.5485	.5572	.5658	.5745	.5831	**26′**
36′	.5052	.5140	.5227	.5314	.5401	.5488	.5575	.5661	.5748	.5834	**24′**
38′	.5055	.5143	.5230	.5317	.5404	.5491	.5578	.5664	.5751	.5837	**22′**
40′	**.5058**	**.5145**	**.5233**	**.5320**	**.5407**	**.5494**	**.5580**	**.5667**	**.5753**	**.5840**	**20′**
42′	.5061	.5148	.5236	.5323	.5410	.5497	.5583	.5670	.5756	.5842	**18′**
44′	.5064	.5151	.5238	.5326	.5413	.5499	.5586	.5673	.5759	.5845	**16′**
46′	.5067	.5154	.5241	.5328	.5415	.5502	.5589	.5676	.5762	.5848	**14′**
48′	.5070	.5157	.5244	.5331	.5418	.5505	.5592	.5679	.5765	.5851	**12′**
50′	**.5073**	**.5160**	**.5247**	**.5334**	**.5421**	**.5508**	**.5595**	**.5681**	**.5768**	**.5854**	**10′**
52′	.5076	.5163	.5250	.5337	.5424	.5511	.5598	.5684	.5771	.5857	**8′**
54′	.5079	.5166	.5253	.5340	.5427	.5514	.5601	.5687	.5774	.5860	**6′**
56′	.5081	.5169	.5256	.5343	.5430	.5517	.5604	.5690	.5776	.5863	**4′**
58′	.5084	.5172	.5259	.5346	.5433	.5520	.5606	.5693	.5779	.5865	**2′**
60′	.5087	.5174	.5262	.5349	.5436	.5523	.5609	.5696	.5782	.5868	**0′**
	269°	**268°**	**267°**	**266°**	**265°**	**264°**	**263°**	**262°**	**261°**	**260°**	$180° \leqslant \theta$

Usage: $hav(263°34') = hav(96°26') = 0.556$. Hc = 90°− ZD.

$\theta \leqslant 180^\circ$	**100°**	**101°**	**102°**	**103°**	**104°**	**105°**	**106°**	**107°**	**108°**	**109°**	
0′	.5868	.5954	.6040	.6125	.6210	.6294	.6378	.6462	.6545	.6628	**60′**
2′	.5871	.5957	.6042	.6128	.6212	.6297	.6381	.6465	.6548	.6631	**58′**
4′	.5874	.5960	.6045	.6130	.6215	.6300	.6384	.6467	.6551	.6633	**56′**
6′	.5877	.5963	.6048	.6133	.6218	.6303	.6387	.6470	.6553	.6636	**54′**
8′	.5880	.5965	.6051	.6136	.6221	.6305	.6389	.6473	.6556	.6639	**52′**
10′	**.5883**	**.5968**	**.6054**	**.6139**	**.6224**	**.6308**	**.6392**	**.6476**	**.6559**	**.6642**	**50′**
12′	.5885	.5971	.6057	.6142	.6227	.6311	.6395	.6479	.6562	.6644	**48′**
14′	.5888	.5974	.6059	.6145	.6229	.6314	.6398	.6481	.6564	.6647	**46′**
16′	.5891	.5977	.6062	.6147	.6232	.6317	.6401	.6484	.6567	.6650	**44′**
18′	.5894	.5980	.6065	.6150	.6235	.6319	.6403	.6487	.6570	.6653	**42′**
20′	**.5897**	**.5983**	**.6068**	**.6153**	**.6238**	**.6322**	**.6406**	**.6490**	**.6573**	**.6655**	**40′**
22′	.5900	.5985	.6071	.6156	.6241	.6325	.6409	.6492	.6575	.6658	**38′**
24′	.5903	.5988	.6074	.6159	.6243	.6328	.6412	.6495	.6578	.6661	**36′**
26′	.5905	.5991	.6077	.6162	.6246	.6331	.6414	.6498	.6581	.6664	**34′**
28′	.5908	.5994	.6079	.6164	.6249	.6333	.6417	.6501	.6584	.6666	**32′**
30′	**.5911**	**.5997**	**.6082**	**.6167**	**.6252**	**.6336**	**.6420**	**.6504**	**.6587**	**.6669**	**30′**
32′	.5914	.6000	.6085	.6170	.6255	.6339	.6423	.6506	.6589	.6672	**28′**
34′	.5917	.6003	.6088	.6173	.6258	.6342	.6426	.6509	.6592	.6675	**26′**
36′	.5920	.6005	.6091	.6176	.6260	.6345	.6428	.6512	.6595	.6677	**24′**
38′	.5923	.6008	.6094	.6179	.6263	.6347	.6431	.6515	.6598	.6680	**22′**
40′	**.5925**	**.6011**	**.6096**	**.6181**	**.6266**	**.6350**	**.6434**	**.6517**	**.6600**	**.6683**	**20′**
42′	.5928	.6014	.6099	.6184	.6269	.6353	.6437	.6520	.6603	.6685	**18′**
44′	.5931	.6017	.6102	.6187	.6272	.6356	.6440	.6523	.6606	.6688	**16′**
46′	.5934	.6020	.6105	.6190	.6274	.6359	.6442	.6526	.6609	.6691	**14′**
48′	.5937	.6022	.6108	.6193	.6277	.6361	.6445	.6528	.6611	.6694	**12′**
50′	**.5940**	**.6025**	**.6111**	**.6195**	**.6280**	**.6364**	**.6448**	**.6531**	**.6614**	**.6696**	**10′**
52′	.5943	.6028	.6113	.6198	.6283	.6367	.6451	.6534	.6617	.6699	**8′**
54′	.5945	.6031	.6116	.6201	.6286	.6370	.6454	.6537	.6620	.6702	**6′**
56′	.5948	.6034	.6119	.6204	.6288	.6373	.6456	.6540	.6622	.6705	**4′**
58′	.5951	.6037	.6122	.6207	.6291	.6375	.6459	.6542	.6625	.6707	**2′**
60′	.5954	.6040	.6125	.6210	.6294	.6378	.6462	.6545	.6628	.6710	**0′**
	259°	**258°**	**257°**	**256°**	**255°**	**254°**	**253°**	**252°**	**251°**	**250°**	$180^\circ \leqslant \theta$

Usage: $hav(255^\circ 54') = hav(104^\circ 06') = 0.6218$.

$\theta \leqslant 180^\circ$	**110°**	**111°**	**112°**	**113°**	**114°**	**115°**	**116°**	**117°**	**118°**	**119°**	
0′	.6710	.6792	.6873	.6954	.7034	.7113	.7192	.7270	.7347	.7424	**60′**
2′	.6713	.6795	.6876	.6956	.7036	.7116	.7194	.7273	.7350	.7427	**58′**
4′	.6716	.6797	.6878	.6959	.7039	.7118	.7197	.7275	.7352	.7429	**56′**
6′	.6718	.6800	.6881	.6962	.7042	.7121	.7200	.7278	.7355	.7432	**54′**
8′	.6721	.6803	.6884	.6964	.7044	.7124	.7202	.7280	.7358	.7434	**52′**
10′	**.6724**	**.6805**	**.6887**	**.6967**	**.7047**	**.7126**	**.7205**	**.7283**	**.7360**	**.7437**	**50′**
12′	.6726	.6808	.6889	.6970	.7050	.7129	.7208	.7285	.7363	.7439	**48′**
14′	.6729	.6811	.6892	.6972	.7052	.7132	.7210	.7288	.7365	.7442	**46′**
16′	.6732	.6814	.6895	.6975	.7055	.7134	.7213	.7291	.7368	.7444	**44′**
18′	.6735	.6816	.6897	.6978	.7058	.7137	.7215	.7293	.7370	.7447	**42′**
20′	**.6737**	**.6819**	**.6900**	**.6980**	**.7060**	**.7139**	**.7218**	**.7296**	**.7373**	**.7449**	**40′**
22′	.6740	.6822	.6903	.6983	.7063	.7142	.7221	.7298	.7376	.7452	**38′**
24′	.6743	.6824	.6905	.6986	.7066	.7145	.7223	.7301	.7378	.7455	**36′**
26′	.6746	.6827	.6908	.6988	.7068	.7147	.7226	.7304	.7381	.7457	**34′**
28′	.6748	.6830	.6911	.6991	.7071	.7150	.7228	.7306	.7383	.7460	**32′**
30′	**.6751**	**.6833**	**.6913**	**.6994**	**.7073**	**.7153**	**.7231**	**.7309**	**.7386**	**.7462**	**30′**
32′	.6754	.6835	.6916	.6996	.7076	.7155	.7234	.7311	.7388	.7465	**28′**
34′	.6756	.6838	.6919	.6999	.7079	.7158	.7236	.7314	.7391	.7467	**26′**
36′	.6759	.6841	.6921	.7002	.7081	.7160	.7239	.7316	.7393	.7470	**24′**
38′	.6762	.6843	.6924	.7004	.7084	.7163	.7241	.7319	.7396	.7472	**22′**
40′	**.6765**	**.6846**	**.6927**	**.7007**	**.7087**	**.7166**	**.7244**	**.7322**	**.7399**	**.7475**	**20′**
42′	.6767	.6849	.6930	.7010	.7089	.7168	.7247	.7324	.7401	.7477	**18′**
44′	.6770	.6851	.6932	.7012	.7092	.7171	.7249	.7327	.7404	.7480	**16′**
46′	.6773	.6854	.6935	.7015	.7095	.7174	.7252	.7329	.7406	.7482	**14′**
48′	.6776	.6857	.6938	.7018	.7097	.7176	.7254	.7332	.7409	.7485	**12′**
50′	**.6778**	**.6860**	**.6940**	**.7020**	**.7100**	**.7179**	**.7257**	**.7335**	**.7411**	**.7487**	**10′**
52′	.6781	.6862	.6943	.7023	.7103	.7181	.7260	.7337	.7414	.7490	**8′**
54′	.6784	.6865	.6946	.7026	.7105	.7184	.7262	.7340	.7416	.7492	**6′**
56′	.6786	.6868	.6948	.7028	.7108	.7187	.7265	.7342	.7419	.7495	**4′**
58′	.6789	.6870	.6951	.7031	.7110	.7189	.7267	.7345	.7422	.7497	**2′**
60′	.6792	.6873	.6954	.7034	.7113	.7192	.7270	.7347	.7424	.7500	**0′**
	249°	**248°**	**247°**	**246°**	**245°**	**244°**	**243°**	**242°**	**241°**	**240°**	$180^\circ \leqslant \theta$

Usage: $hav(240^\circ 10') = hav(119^\circ 50') = 0.7487$.

$\theta \leqslant 180^\circ$	**120°**	**121°**	**122°**	**123°**	**124°**	**125°**	**126°**	**127°**	**128°**	**129°**	
0′	.7500	.7575	.7650	.7723	.7796	.7868	.7939	.8009	.8078	.8147	**60′**
2′	.7503	.7578	.7652	.7726	.7798	.7870	.7941	.8011	.8081	.8149	**58′**
4′	.7505	.7580	.7655	.7728	.7801	.7873	.7944	.8014	.8083	.8151	**56′**
6′	.7508	.7583	.7657	.7731	.7803	.7875	.7946	.8016	.8085	.8153	**54′**
8′	.7510	.7585	.7659	.7733	.7806	.7877	.7948	.8018	.8087	.8156	**52′**
10′	**.7513**	**.7588**	**.7662**	**.7735**	**.7808**	**.7880**	**.7951**	**.8021**	**.8090**	**.8158**	**50′**
12′	.7515	.7590	.7664	.7738	.7810	.7882	.7953	.8023	.8092	.8160	**48′**
14′	.7518	.7593	.7667	.7740	.7813	.7885	.7955	.8025	.8094	.8162	**46′**
16′	.7520	.7595	.7669	.7743	.7815	.7887	.7958	.8028	.8097	.8165	**44′**
18′	.7523	.7598	.7672	.7745	.7818	.7889	.7960	.8030	.8099	.8167	**42′**
20′	**.7525**	**.7600**	**.7674**	**.7748**	**.7820**	**.7892**	**.7962**	**.8032**	**.8101**	**.8169**	**40′**
22′	.7528	.7603	.7677	.7750	.7822	.7894	.7965	.8035	.8103	.8171	**38′**
24′	.7530	.7605	.7679	.7752	.7825	.7896	.7967	.8037	.8106	.8174	**36′**
26′	.7533	.7608	.7682	.7755	.7827	.7899	.7969	.8039	.8108	.8176	**34′**
28′	.7535	.7610	.7684	.7757	.7830	.7901	.7972	.8041	.8110	.8178	**32′**
30′	**.7538**	**.7612**	**.7686**	**.7760**	**.7832**	**.7904**	**.7974**	**.8044**	**.8113**	**.8180**	**30′**
32′	.7540	.7615	.7689	.7762	.7834	.7906	.7976	.8046	.8115	.8183	**28′**
34′	.7543	.7617	.7691	.7765	.7837	.7908	.7979	.8048	.8117	.8185	**26′**
36′	.7545	.7620	.7694	.7767	.7839	.7911	.7981	.8051	.8119	.8187	**24′**
38′	.7548	.7622	.7696	.7769	.7842	.7913	.7983	.8053	.8122	.8189	**22′**
40′	**.7550**	**.7625**	**.7699**	**.7772**	**.7844**	**.7915**	**.7986**	**.8055**	**.8124**	**.8192**	**20′**
42′	.7553	.7627	.7701	.7774	.7846	.7918	.7988	.8058	.8126	.8194	**18′**
44′	.7555	.7630	.7704	.7777	.7849	.7920	.7990	.8060	.8128	.8196	**16′**
46′	.7558	.7632	.7706	.7779	.7851	.7922	.7993	.8062	.8131	.8198	**14′**
48′	.7560	.7635	.7709	.7781	.7854	.7925	.7995	.8065	.8133	.8201	**12′**
50′	**.7563**	**.7637**	**.7711**	**.7784**	**.7856**	**.7927**	**.7997**	**.8067**	**.8135**	**.8203**	**10′**
52′	.7565	.7640	.7713	.7786	.7858	.7930	.8000	.8069	.8138	.8205	**8′**
54′	.7568	.7642	.7716	.7789	.7861	.7932	.8002	.8071	.8140	.8207	**6′**
56′	.7570	.7645	.7718	.7791	.7863	.7934	.8004	.8074	.8142	.8209	**4′**
58′	.7573	.7647	.7721	.7794	.7865	.7937	.8007	.8076	.8144	.8212	**2′**
60′	.7575	.7650	.7723	.7796	.7868	.7939	.8009	.8078	.8147	.8214	**0′**
	239°	**238°**	**237°**	**236°**	**235°**	**234°**	**233°**	**232°**	**231°**	**230°**	$180^\circ \leqslant \theta$

Usage: $hav(236^\circ 40') = hav(123^\circ 20') = 0.7748$.

$\theta \leqslant 180°$	**130°**	**131°**	**132°**	**133°**	**134°**	**135°**	**136°**	**137°**	**138°**	**139°**	
0′	.8214	.8280	.8346	.8410	.8473	.8536	.8597	.8657	.8716	.8774	**60′**
2′	.8216	.8282	.8348	.8412	.8475	.8538	.8599	.8659	.8718	.8775	**58′**
4′	.8218	.8285	.8350	.8414	.8477	.8540	.8601	.8661	.8720	.8777	**56′**
6′	.8221	.8287	.8352	.8416	.8480	.8542	.8603	.8663	.8722	.8779	**54′**
8′	.8223	.8289	.8354	.8418	.8482	.8544	.8605	.8665	.8723	.8781	**52′**
10′	**.8225**	**.8291**	**.8356**	**.8421**	**.8484**	**.8546**	**.8607**	**.8667**	**.8725**	**.8783**	**50′**
12′	.8227	.8293	.8359	.8423	.8486	.8548	.8609	.8669	.8727	.8785	**48′**
14′	.8230	.8296	.8361	.8425	.8488	.8550	.8611	.8671	.8729	.8787	**46′**
16′	.8232	.8298	.8363	.8427	.8490	.8552	.8613	.8673	.8731	.8789	**44′**
18′	.8234	.8300	.8365	.8429	.8492	.8554	.8615	.8675	.8733	.8791	**42′**
20′	**.8236**	**.8302**	**.8367**	**.8431**	**.8494**	**.8556**	**.8617**	**.8677**	**.8735**	**.8793**	**40′**
22′	.8238	.8304	.8369	.8433	.8496	.8558	.8619	.8679	.8737	.8794	**38′**
24′	.8241	.8307	.8372	.8435	.8498	.8560	.8621	.8680	.8739	.8796	**36′**
26′	.8243	.8309	.8374	.8438	.8500	.8562	.8623	.8682	.8741	.8798	**34′**
28′	.8245	.8311	.8376	.8440	.8502	.8564	.8625	.8684	.8743	.8800	**32′**
30′	**.8247**	**.8313**	**.8378**	**.8442**	**.8505**	**.8566**	**.8627**	**.8686**	**.8745**	**.8802**	**30′**
32′	.8249	.8315	.8380	.8444	.8507	.8568	.8629	.8688	.8747	.8804	**28′**
34′	.8252	.8317	.8382	.8446	.8509	.8570	.8631	.8690	.8749	.8806	**26′**
36′	.8254	.8320	.8384	.8448	.8511	.8572	.8633	.8692	.8751	.8808	**24′**
38′	.8256	.8322	.8387	.8450	.8513	.8574	.8635	.8694	.8752	.8810	**22′**
40′	**.8258**	**.8324**	**.8389**	**.8452**	**.8515**	**.8576**	**.8637**	**.8696**	**.8754**	**.8811**	**20′**
42′	.8260	.8326	.8391	.8454	.8517	.8578	.8639	.8698	.8756	.8813	**18′**
44′	.8263	.8328	.8393	.8457	.8519	.8580	.8641	.8700	.8758	.8815	**16′**
46′	.8265	.8330	.8395	.8459	.8521	.8583	.8643	.8702	.8760	.8817	**14′**
48′	.8267	.8333	.8397	.8461	.8523	.8585	.8645	.8704	.8762	.8819	**12′**
50′	**.8269**	**.8335**	**.8399**	**.8463**	**.8525**	**.8587**	**.8647**	**.8706**	**.8764**	**.8821**	**10′**
52′	.8272	.8337	.8401	.8465	.8527	.8589	.8649	.8708	.8766	.8823	**8′**
54′	.8274	.8339	.8404	.8467	.8529	.8591	.8651	.8710	.8768	.8825	**6′**
56′	.8276	.8341	.8406	.8469	.8531	.8593	.8653	.8712	.8770	.8826	**4′**
58′	.8278	.8343	.8408	.8471	.8533	.8595	.8655	.8714	.8772	.8828	**2′**
60′	.8280	.8346	.8410	.8473	.8536	.8597	.8657	.8716	.8774	.8830	**0′**
	229°	**228°**	**227°**	**226°**	**225°**	**224°**	**223°**	**222°**	**221°**	**220°**	$180° \leqslant \theta$

Usage: $hav(224°22') = hav(135°38') = 0.8574$.

$\theta \leqslant 180^\circ$	**140°**	**141°**	**142°**	**143°**	**144°**	**145°**	**146°**	**147°**	**148°**	**149°**	
0′	.8830	.8886	.8940	.8993	.9045	.9096	.9145	.9193	.9240	.9286	**60′**
2′	.8832	.8888	.8942	.8995	.9047	.9097	.9147	.9195	.9242	.9287	**58′**
4′	.8834	.8889	.8944	.8997	.9049	.9099	.9148	.9197	.9243	.9289	**56′**
6′	.8836	.8891	.8945	.8998	.9050	.9101	.9150	.9198	.9245	.9290	**54′**
8′	.8838	.8893	.8947	.9000	.9052	.9102	.9152	.9200	.9246	.9292	**52′**
10′	**.8840**	**.8895**	**.8949**	**.9002**	**.9054**	**.9104**	**.9153**	**.9201**	**.9248**	**.9293**	**50′**
12′	.8841	.8897	.8951	.9004	.9055	.9106	.9155	.9203	.9249	.9295	**48′**
14′	.8843	.8899	.8953	.9005	.9057	.9107	.9157	.9204	.9251	.9296	**46′**
16′	.8845	.8900	.8954	.9007	.9059	.9109	.9158	.9206	.9253	.9298	**44′**
18′	.8847	.8902	.8956	.9009	.9060	.9111	.9160	.9208	.9254	.9299	**42′**
20′	**.8849**	**.8904**	**.8958**	**.9011**	**.9062**	**.9112**	**.9161**	**.9209**	**.9256**	**.9301**	**40′**
22′	.8851	.8906	.8960	.9012	.9064	.9114	.9163	.9211	.9257	.9302	**38′**
24′	.8853	.8908	.8961	.9014	.9066	.9116	.9165	.9212	.9259	.9304	**36′**
26′	.8854	.8909	.8963	.9016	.9067	.9117	.9166	.9214	.9260	.9305	**34′**
28′	.8856	.8911	.8965	.9018	.9069	.9119	.9168	.9215	.9262	.9307	**32′**
30′	**.8858**	**.8913**	**.8967**	**.9019**	**.9071**	**.9121**	**.9169**	**.9217**	**.9263**	**.9308**	**30′**
32′	.8860	.8915	.8969	.9021	.9072	.9122	.9171	.9219	.9265	.9310	**28′**
34′	.8862	.8917	.8970	.9023	.9074	.9124	.9173	.9220	.9266	.9311	**26′**
36′	.8864	.8918	.8972	.9024	.9076	.9126	.9174	.9222	.9268	.9313	**24′**
38′	.8866	.8920	.8974	.9026	.9077	.9127	.9176	.9223	.9269	.9314	**22′**
40′	**.8867**	**.8922**	**.8976**	**.9028**	**.9079**	**.9129**	**.9177**	**.9225**	**.9271**	**.9316**	**20′**
42′	.8869	.8924	.8977	.9030	.9081	.9130	.9179	.9226	.9272	.9317	**18′**
44′	.8871	.8926	.8979	.9031	.9082	.9132	.9181	.9228	.9274	.9318	**16′**
46′	.8873	.8927	.8981	.9033	.9084	.9134	.9182	.9229	.9275	.9320	**14′**
48′	.8875	.8929	.8983	.9035	.9086	.9135	.9184	.9231	.9277	.9321	**12′**
50′	**.8877**	**.8931**	**.8984**	**.9037**	**.9087**	**.9137**	**.9185**	**.9233**	**.9278**	**.9323**	**10′**
52′	.8878	.8933	.8986	.9038	.9089	.9139	.9187	.9234	.9280	.9324	**8′**
54′	.8880	.8935	.8988	.9040	.9091	.9140	.9189	.9236	.9281	.9326	**6′**
56′	.8882	.8936	.8990	.9042	.9092	.9142	.9190	.9237	.9283	.9327	**4′**
58′	.8884	.8938	.8991	.9043	.9094	.9144	.9192	.9239	.9284	.9329	**2′**
60′	.8886	.8940	.8993	.9045	.9096	.9145	.9193	.9240	.9286	.9330	**0′**
	219°	**218°**	**217°**	**216°**	**215°**	**214°**	**213°**	**212°**	**211°**	**210°**	$180^\circ \leqslant \theta$

Usage: $hav(218^\circ 02') = hav(141^\circ 58') = 0.8938$.

$\theta \leqslant 180^\circ$	**150°**	**151°**	**152°**	**153°**	**154°**	**155°**	**156°**	**157°**	**158°**	**159°**	
0′	.9330	.9373	.9415	.9455	.9494	.9532	.9568	.9603	.9636	.9668	**60′**
2′	.9332	.9375	.9416	.9456	.9495	.9533	.9569	.9604	.9637	.9669	**58′**
4′	.9333	.9376	.9417	.9458	.9497	.9534	.9570	.9605	.9638	.9670	**56′**
6′	.9334	.9377	.9419	.9459	.9498	.9535	.9571	.9606	.9639	.9671	**54′**
8′	.9336	.9379	.9420	.9460	.9499	.9536	.9572	.9607	.9640	.9672	**52′**
10′	**.9337**	**.9380**	**.9422**	**.9462**	**.9500**	**.9538**	**.9574**	**.9608**	**.9641**	**.9673**	**50′**
12′	.9339	.9382	.9423	.9463	.9502	.9539	.9575	.9609	.9642	.9674	**48′**
14′	.9340	.9383	.9424	.9464	.9503	.9540	.9576	.9610	.9644	.9675	**46′**
16′	.9342	.9384	.9426	.9466	.9504	.9541	.9577	.9612	.9645	.9676	**44′**
18′	.9343	.9386	.9427	.9467	.9505	.9543	.9578	.9613	.9646	.9677	**42′**
20′	**.9345**	**.9387**	**.9428**	**.9468**	**.9507**	**.9544**	**.9579**	**.9614**	**.9647**	**.9678**	**40′**
22′	.9346	.9389	.9430	.9469	.9508	.9545	.9581	.9615	.9648	.9679	**38′**
24′	.9347	.9390	.9431	.9471	.9509	.9546	.9582	.9616	.9649	.9680	**36′**
26′	.9349	.9391	.9432	.9472	.9510	.9547	.9583	.9617	.9650	.9681	**34′**
28′	.9350	.9393	.9434	.9473	.9512	.9549	.9584	.9618	.9651	.9682	**32′**
30′	**.9352**	**.9394**	**.9435**	**.9475**	**.9513**	**.9550**	**.9585**	**.9619**	**.9652**	**.9683**	**30′**
32′	.9353	.9395	.9436	.9476	.9514	.9551	.9586	.9621	.9653	.9684	**28′**
34′	.9355	.9397	.9438	.9477	.9515	.9552	.9588	.9622	.9654	.9685	**26′**
36′	.9356	.9398	.9439	.9479	.9517	.9553	.9589	.9623	.9655	.9686	**24′**
38′	.9357	.9400	.9440	.9480	.9518	.9555	.9590	.9624	.9656	.9687	**22′**
40′	**.9359**	**.9401**	**.9442**	**.9481**	**.9519**	**.9556**	**.9591**	**.9625**	**.9657**	**.9688**	**20′**
42′	.9360	.9402	.9443	.9482	.9520	.9557	.9592	.9626	.9658	.9689	**18′**
44′	.9362	.9404	.9444	.9484	.9522	.9558	.9593	.9627	.9660	.9690	**16′**
46′	.9363	.9405	.9446	.9485	.9523	.9559	.9595	.9628	.9661	.9691	**14′**
48′	.9365	.9407	.9447	.9486	.9524	.9561	.9596	.9629	.9662	.9692	**12′**
50′	**.9366**	**.9408**	**.9448**	**.9488**	**.9525**	**.9562**	**.9597**	**.9630**	**.9663**	**.9693**	**10′**
52′	.9367	.9409	.9450	.9489	.9527	.9563	.9598	.9632	.9664	.9694	**8′**
54′	.9369	.9411	.9451	.9490	.9528	.9564	.9599	.9633	.9665	.9695	**6′**
56′	.9370	.9412	.9452	.9491	.9529	.9565	.9600	.9634	.9666	.9696	**4′**
58′	.9372	.9413	.9454	.9493	.9530	.9567	.9601	.9635	.9667	.9697	**2′**
60′	.9373	.9415	.9455	.9494	.9532	.9568	.9603	.9636	.9668	.9698	**0′**
	209°	**208°**	**207°**	**206°**	**205°**	**204°**	**203°**	**202°**	**201°**	**200°**	$180^\circ \leqslant \theta$

Usage: $hav(205^\circ 56') = hav(154^\circ 04') = 0.9497$.

$\theta \leqslant 180^\circ$	**160°**	**161°**	**162°**	**163°**	**164°**	**165°**	**166°**	**167°**	**168°**	**169°**	
0′	.9698	.9728	.9755	.9782	.9806	.9830	.9851	.9872	.9891	.9908	**60′**
2′	.9699	.9729	.9756	.9782	.9807	.9830	.9852	.9873	.9891	.9909	**58′**
4′	.9700	.9729	.9757	.9783	.9808	.9831	.9853	.9873	.9892	.9909	**56′**
6′	.9701	.9730	.9758	.9784	.9809	.9832	.9854	.9874	.9893	.9910	**54′**
8′	.9702	.9731	.9759	.9785	.9810	.9833	.9854	.9874	.9893	.9910	**52′**
10′	**.9703**	**.9732**	**.9760**	**.9786**	**.9810**	**.9833**	**.9855**	**.9875**	**.9894**	**.9911**	**50′**
12′	.9704	.9733	.9761	.9787	.9811	.9834	.9856	.9876	.9894	.9911	**48′**
14′	.9705	.9734	.9762	.9787	.9812	.9835	.9856	.9876	.9895	.9912	**46′**
16′	.9706	.9735	.9762	.9788	.9813	.9836	.9857	.9877	.9896	.9913	**44′**
18′	.9707	.9736	.9763	.9789	.9813	.9836	.9858	.9878	.9896	.9913	**42′**
20′	**.9708**	**.9737**	**.9764**	**.9790**	**.9814**	**.9837**	**.9858**	**.9878**	**.9897**	**.9914**	**40′**
22′	.9709	.9738	.9765	.9791	.9815	.9838	.9859	.9879	.9897	.9914	**38′**
24′	.9710	.9739	.9766	.9792	.9816	.9839	.9860	.9880	.9898	.9915	**36′**
26′	.9711	.9740	.9767	.9792	.9817	.9839	.9860	.9880	.9898	.9915	**34′**
28′	.9712	.9741	.9768	.9793	.9817	.9840	.9861	.9881	.9899	.9916	**32′**
30′	**.9713**	**.9742**	**.9769**	**.9794**	**.9818**	**.9841**	**.9862**	**.9881**	**.9900**	**.9916**	**30′**
32′	.9714	.9743	.9769	.9795	.9819	.9841	.9863	.9882	.9900	.9917	**28′**
34′	.9715	.9743	.9770	.9796	.9820	.9842	.9863	.9883	.9901	.9917	**26′**
36′	.9716	.9744	.9771	.9797	.9820	.9843	.9864	.9883	.9901	.9918	**24′**
38′	.9717	.9745	.9772	.9797	.9821	.9844	.9865	.9884	.9902	.9918	**22′**
40′	**.9718**	**.9746**	**.9773**	**.9798**	**.9822**	**.9844**	**.9865**	**.9885**	**.9903**	**.9919**	**20′**
42′	.9719	.9747	.9774	.9799	.9823	.9845	.9866	.9885	.9903	.9919	**18′**
44′	.9720	.9748	.9775	.9800	.9824	.9846	.9867	.9886	.9904	.9920	**16′**
46′	.9721	.9749	.9776	.9801	.9824	.9847	.9867	.9886	.9904	.9920	**14′**
48′	.9722	.9750	.9776	.9801	.9825	.9847	.9868	.9887	.9905	.9921	**12′**
50′	**.9723**	**.9751**	**.9777**	**.9802**	**.9826**	**.9848**	**.9869**	**.9888**	**.9905**	**.9921**	**10′**
52′	.9724	.9752	.9778	.9803	.9827	.9849	.9869	.9888	.9906	.9922	**8′**
54′	.9725	.9753	.9779	.9804	.9827	.9849	.9870	.9889	.9906	.9923	**6′**
56′	.9726	.9753	.9780	.9805	.9828	.9850	.9871	.9890	.9907	.9923	**4′**
58′	.9727	.9754	.9781	.9806	.9829	.9851	.9871	.9890	.9908	.9924	**2′**
60′	.9728	.9755	.9782	.9806	.9830	.9851	.9872	.9891	.9908	.9924	**0′**
	199°	**198°**	**197°**	**196°**	**195°**	**194°**	**193°**	**192°**	**191°**	**190°**	$180^\circ \leqslant \theta$

Usage: $hav(192^\circ 10') = hav(167^\circ 50') = 0.9888$.

$\theta \leqslant 180^\circ$	**170°**	**171°**	**172°**	**173°**	**174°**	**175°**	**176°**	**177°**	**178°**	**179°**	
0′	.9924	.9938	.9951	.9963	.9973	.9981	.9988	.9993	.9997	.9999	**60′**
2′	.9925	.9939	.9952	.9963	.9973	.9981	.9988	.9993	.9997	.9999	**58′**
4′	.9925	.9939	.9952	.9963	.9973	.9981	.9988	.9993	.9997	.9999	**56′**
6′	.9926	.9940	.9953	.9964	.9974	.9982	.9988	.9994	.9997	.9999	**54′**
8′	.9926	.9940	.9953	.9964	.9974	.9982	.9989	.9994	.9997	.9999	**52′**
10′	**.9927**	**.9941**	**.9953**	**.9964**	**.9974**	**.9982**	**.9989**	**.9994**	**.9997**	**.9999**	**50′**
12′	.9927	.9941	.9954	.9965	.9974	.9982	.9989	.9994	.9998	1.000	**48′**
14′	.9928	.9942	.9954	.9965	.9975	.9983	.9989	.9994	.9998	1.000	**46′**
16′	.9928	.9942	.9955	.9966	.9975	.9983	.9989	.9994	.9998	1.000	**44′**
18′	.9929	.9942	.9955	.9966	.9975	.9983	.9990	.9994	.9998	1.000	**42′**
20′	**.9929**	**.9943**	**.9955**	**.9966**	**.9976**	**.9983**	**.9990**	**.9995**	**.9998**	**1.000**	**40′**
22′	.9929	.9943	.9956	.9967	.9976	.9984	.9990	.9995	.9998	1.000	**38′**
24′	.9930	.9944	.9956	.9967	.9976	.9984	.9990	.9995	.9998	1.000	**36′**
26′	.9930	.9944	.9956	.9967	.9976	.9984	.9990	.9995	.9998	1.000	**34′**
28′	.9931	.9945	.9957	.9968	.9977	.9984	.9990	.9995	.9998	1.000	**32′**
30′	**.9931**	**.9945**	**.9957**	**.9968**	**.9977**	**.9985**	**.9991**	**.9995**	**.9998**	**1.000**	**30′**
32′	.9932	.9946	.9958	.9968	.9977	.9985	.9991	.9995	.9998	1.000	**28′**
34′	.9932	.9946	.9958	.9969	.9978	.9985	.9991	.9995	.9998	1.000	**26′**
36′	.9933	.9946	.9958	.9969	.9978	.9985	.9991	.9996	.9999	1.000	**24′**
38′	.9933	.9947	.9959	.9969	.9978	.9985	.9991	.9996	.9999	1.000	**22′**
40′	**.9934**	**.9947**	**.9959**	**.9969**	**.9978**	**.9986**	**.9992**	**.9996**	**.9999**	**1.000**	**20′**
42′	.9934	.9948	.9959	.9970	.9979	.9986	.9992	.9996	.9999	1.000	**18′**
44′	.9935	.9948	.9960	.9970	.9979	.9986	.9992	.9996	.9999	1.000	**16′**
46′	.9935	.9948	.9960	.9970	.9979	.9986	.9992	.9996	.9999	1.000	**14′**
48′	.9936	.9949	.9961	.9971	.9979	.9987	.9992	.9996	.9999	1.000	**12′**
50′	**.9936**	**.9949**	**.9961**	**.9971**	**.9980**	**.9987**	**.9992**	**.9996**	**.9999**	**1.000**	**10′**
52′	.9937	.9950	.9961	.9971	.9980	.9987	.9993	.9997	.9999	1.000	**8′**
54′	.9937	.9950	.9962	.9972	.9980	.9987	.9993	.9997	.9999	1.000	**6′**
56′	.9938	.9951	.9962	.9972	.9980	.9987	.9993	.9997	.9999	1.000	**4′**
58′	.9938	.9951	.9962	.9972	.9981	.9988	.9993	.9997	.9999	1.000	**2′**
60′	.9938	.9951	.9963	.9973	.9981	.9988	.9993	.9997	.9999	1.000	**0′**
	189°	**188°**	**187°**	**186°**	**185°**	**184°**	**183°**	**182°**	**181°**	**180°**	$180^\circ \leqslant \theta$

Usage: $hav(188^\circ 50') = hav(171^\circ 10') = 0.9941$.