TABLES OF SINE, COSINE AND TANGENT

One can use tables to simplify questions on sine, cosine and tangent (e.g. $\sin 33.28^{o}$) instead of using a calculator.

Note that 33.47^{o} is all in degrees and is different from $33^{o}28'$ which has its first part in degrees and its second part in minutes. For converting to degree, there are 60 minutes in 1^{o}.

The table of sine, cosine, and tangent has three sections, as exemplified in the diagram below:

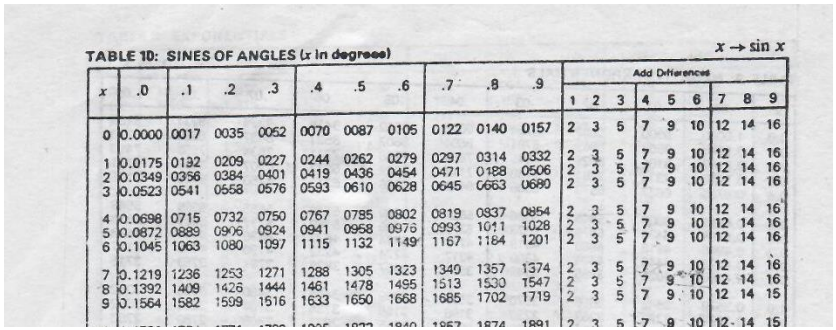


TABLE 10: SINES OF ANGLES (x in degrees) — $x \to \sin x$

x	.0	.1	.2	.3	.4	.5	.6	.7	.8	.9	Add Differences 1	2	3	4	5	6	7	8	9
0	0.0000	0017	0035	0052	0070	0087	0105	0122	0140	0157	2	3	5	7	9	10	12	14	16
1	0.0175	0192	0209	0227	0244	0262	0279	0297	0314	0332	2	3	5	7	9	10	12	14	16
2	0.0349	0366	0384	0401	0419	0436	0454	0471	0488	0506	2	3	5	7	9	10	12	14	16
3	0.0523	0541	0558	0576	0593	0610	0628	0645	0663	0680	2	3	5	7	9	10	12	14	16
4	0.0698	0715	0732	0750	0767	0785	0802	0819	0837	0854	2	3	5	7	9	10	12	14	16
5	0.0872	0889	0906	0924	0941	0958	0976	0993	1011	1028	2	3	5	7	9	10	12	14	16
6	0.1045	1063	1080	1097	1115	1132	1149	1167	1184	1201	2	3	5	7	9	10	12	14	16
7	0.1219	1236	1253	1271	1288	1305	1323	1340	1357	1374	2	3	5	7	9	10	12	14	16
8	0.1392	1409	1426	1444	1461	1478	1495	1513	1530	1547	2	3	5	7	9	10	12	14	16
9	0.1564	1582	1599	1616	1633	1650	1668	1685	1702	1719	2	3	5	7	9	10	12	14	15

Table for sine of angles

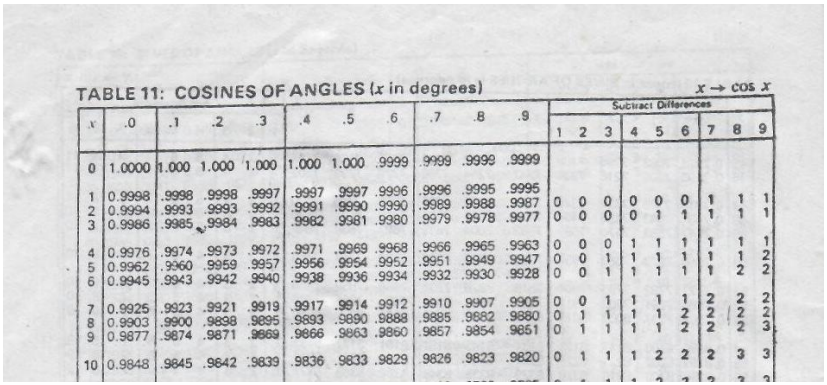


TABLE 11: COSINES OF ANGLES (x in degrees) — $x \to \cos x$

x	.0	.1	.2	.3	.4	.5	.6	.7	.8	.9	Subtract Differences 1	2	3	4	5	6	7	8	9
0	1.0000	1.000	1.000	1.000	1.000	1.000	.9999	.9999	.9999	.9999									
1	0.9998	.9998	.9998	.9997	.9997	.9997	.9996	.9996	.9995	.9995									
2	0.9994	.9993	.9993	.9992	.9991	.9990	.9990	.9989	.9988	.9987	0	0	0	0	0	0	1	1	1
3	0.9986	.9985	.9984	.9983	.9982	.9981	.9980	.9979	.9978	.9977	0	0	0	0	1	1	1	1	1
4	0.9976	.9974	.9973	.9972	.9971	.9969	.9968	.9966	.9965	.9963	0	0	0	1	1	1	1	1	1
5	0.9962	.9960	.9959	.9957	.9956	.9954	.9952	.9951	.9949	.9947	0	0	1	1	1	1	1	1	2
6	0.9945	.9943	.9942	.9940	.9938	.9936	.9934	.9932	.9930	.9928	0	0	1	1	1	1	1	2	2
7	0.9925	.9923	.9921	.9919	.9917	.9914	.9912	.9910	.9907	.9905	0	0	1	1	1	1	2	2	2
8	0.9903	.9900	.9898	.9895	.9893	.9890	.9888	.9885	.9882	.9880	0	1	1	1	1	2	2	2	2
9	0.9877	.9874	.9871	.9869	.9866	.9863	.9860	.9857	.9854	.9851	0	1	1	1	1	2	2	2	3
10	0.9848	.9845	.9842	.9839	.9836	.9833	.9829	.9826	.9823	.9820	0	1	1	1	2	2	2	3	3

Table for cosine of angles

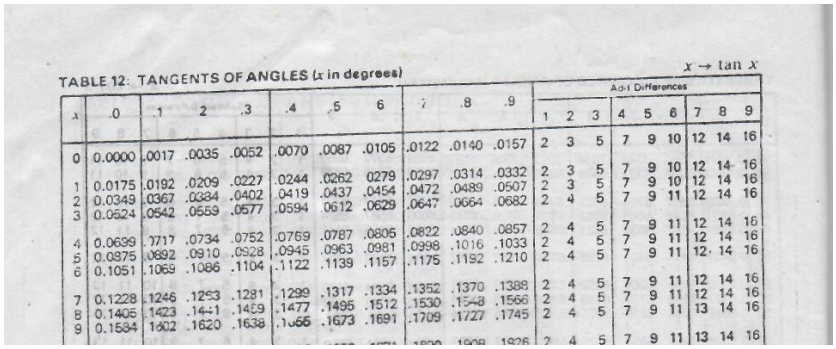


TABLE 12: TANGENTS OF ANGLES (x in degrees) — $x \to \tan x$

x	.0	.1	.2	.3	.4	.5	.6	.7	.8	.9	Add Differences 1	2	3	4	5	6	7	8	9
0	0.0000	.0017	.0035	.0052	.0070	.0087	.0105	.0122	.0140	.0157	2	3	5	7	9	10	12	14	16
1	0.0175	.0192	.0209	.0227	.0244	.0262	.0279	.0297	.0314	.0332	2	3	5	7	9	10	12	14	16
2	0.0349	.0367	.0384	.0402	.0419	.0437	.0454	.0472	.0489	.0507	2	3	5	7	9	10	12	14	16
3	0.0524	.0542	.0559	.0577	.0594	.0612	.0629	.0647	.0664	.0682	2	4	5	7	9	11	12	14	16
4	0.0699	.0717	.0734	.0752	.0769	.0787	.0805	.0822	.0840	.0857	2	4	5	7	9	11	12	14	16
5	0.0875	.0892	.0910	.0928	.0945	.0963	.0981	.0998	.1016	.1033	2	4	5	7	9	11	12	14	16
6	0.1051	.1069	.1086	.1104	.1122	.1139	.1157	.1175	.1192	.1210	2	4	5	7	9	11	12	14	16
7	0.1228	.1246	.1263	.1281	.1299	.1317	.1334	.1352	.1370	.1388	2	4	5	7	9	11	12	14	16
8	0.1405	.1423	.1441	.1459	.1477	.1495	.1512	.1530	.1548	.1566	2	4	5	7	9	11	12	14	16
9	0.1584	.1602	.1620	.1638	.1656	.1673	.1691	.1709	.1727	.1745	2	4	5	7	9	11	13	14	16

Table for tangents of angles

The first section has values from 0 to 89 which are the whole number parts. The second section contains values for 0.0 to 0.9 of the number to be simplified. The last section contains values for 0.01 to 0.09 of the number.

Examples

1. Simplify sin 47.02^{o} using tables.

   Solving

   47.0 in the table = 0.7314

   0.02 in the table = 0.0002

   sin 47.02 = 0.7314 + 0.0002 = <u>0.7316</u>

2. Simplify sin $33^{o}28'$ using tables.

   Solving

   $33^{o}28'$; Converting 28′ into degrees

   60′ makes 1^{o} ; 28′ would make x^{o}

$x = \frac{28}{60} \times 1 = 0.47^o$

thus $33^o28' = 33.47^o$

33.4 in tables = 0.5505

00.07 in tables = 0.0010

sin 33.47 = 0.5505 + 0.0010 = <u>0.5515</u>

$\therefore \sin 33^o28' = \mathbf{0.5515}$

3. Simplify $\cos 18.95^o$

Solving

18.9 in table = 0.9461

00.05 in table= 0.0003

cos 18.95 = 0.9461 – 0.0003 = <u>0.9458</u>

Notice that in cosine tables the difference are subtracted from the main part.

4. Simplify cos 45.75 using tables.

Solving

45.7 in table = 0.6984

0.05 in table = 0.0006

cos 45.75 = 0.6984 – 0.0006 = <u>0.6978</u>

5. Simplify tan 4.91 using tables.

Solving

4.9 in table = 0.0857

0.01 in table = 0.0002

tan 4.91 = 0.0857 + 0.0002 = <u>0.0859</u>