EduSahara™ Assignment

Name : Heights and Distances using Tables

Chapter : Heights and Distances

Grade : ICSE Grade X

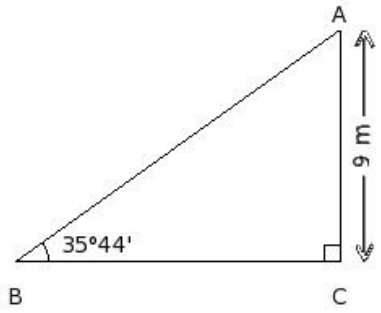
1. A building stands vertically on the ground. From a point on the ground, the angle of elevation of the top of the building is found to be 35°44'. If the height of the building is 9 m, find the distance between the observation point and the top of the building.

From Table of Natural Tangents

x°	0'	6'	12'	18'	24'	30'	36'	42'	48'	54'	1'	2'	3'	4'	5'
35	0.7002	0.7028	0.7054	0.7080	0.7107	0.7133	0.7159	0.7186	0.7212	0.7239	4	9	13	17	22

From Table of Natural Sines

x°	0'	6'	12'	18'	24'	30'	36'	42'	48'	54'	1'	2'	3'	4'	5'
35	0.5736	0.5750	0.5764	0.5779	0.5793	0.5807	0.5821	0.5835	0.5850	0.5864	2	5	7	9	12



(i) 18.41 m (ii) 10.41 m (iii) 20.41 m (iv) 12.41 m (v) 15.41 m

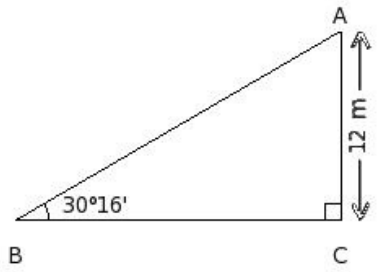
2. A pole stands vertically on the ground. From a point on the ground, the angle of elevation of the top of the pole is found to be 30°16'. If the height of the pole is 12 m, find the distance between the observation point and the foot of the pole.

From Table of Natural Tangents

x°	0'	6'	12'	18'	24'	30'	36'	42'	48'	54'	1'	2'	3'	4'	5'
30	0.5774	0.5797	0.5820	0.5844	0.5867	0.5890	0.5914	0.5938	0.5961	0.5985	4	8	12	16	20

From Table of Natural Sines

x°	0'	6'	12'	18'	24'	30'	36'	42'	48'	54'	1'	2'	3'	4'	5'
30	0.5000	0.5015	0.5030	0.5045	0.5060	0.5075	0.5090	0.5105	0.5120	0.5135	3	5	8	10	13



(i) 25.56 m (ii) 15.56 m (iii) 20.56 m (iv) 17.56 m (v) 23.56 m

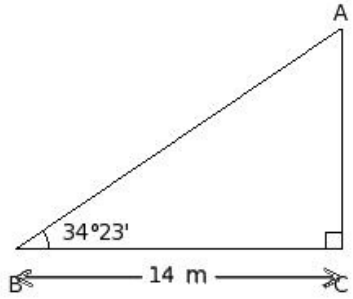
3. A building stands vertically on the ground. From a point on the ground, the angle of elevation of the top of the building is found to be 34°23'. If the distance between the observation point and the foot of the building is 14 m, find the distance between the observation point and the top of the building.

From Table of Natural Tangents

x°	0'	6'	12'	18'	24'	30'	36'	42'	48'	54'	1'	2'	3'	4'	5'
34	0.6745	0.6771	0.6796	0.6822	0.6847	0.6873	0.6899	0.6924	0.6930	0.6976	4	9	13	17	22

From Table of Natural Cosines

x°	0'	6'	12'	18'	24'	30'	36'	42'	48'	54'	1'	2'	3'	4'	5'
34	0.8290	0.8281	0.8271	0.8261	0.8251	0.8241	0.8231	0.8221	0.8211	0.8202	2	3	5	7	8



(i) 16.96 m (ii) 19.96 m (iii) 11.96 m (iv) 13.96 m (v) 21.96 m

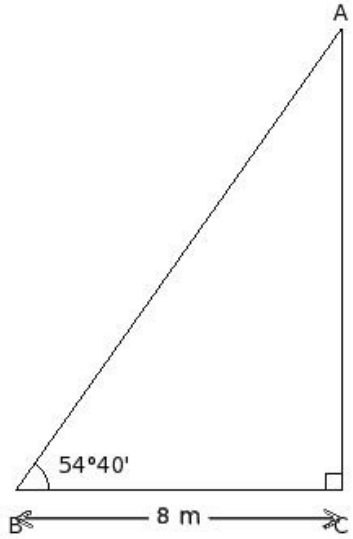
4. A building stands vertically on the ground. From a point on the ground, the angle of elevation of the top of the building is found to be 54°40'. If the distance between the observation point and the foot of the building is 8 m, find the height of the building.

From Table of Natural Tangents

x°	0'	6'	12'	18'	24'	30'	36'	42'	48'	54'	1'	2'	3'	4'	5'
54	1.3764	1.3814	1.3865	1.3916	1.3968	1.4019	1.4071	1.4124	1.4176	1.4229	9	17	26	34	43

From Table of Natural Cosines

x°	0'	6'	12'	18'	24'	30'	36'	42'	48'	54'	1'	2'	3'	4'	5'
54	0.5878	0.5864	0.5850	0.5835	0.5821	0.5807	0.5793	0.5779	0.5764	0.5750	2	5	7	9	12



(i) 6.28 m (ii) 16.28 m (iii) 8.28 m (iv) 14.28 m (v) 11.28 m

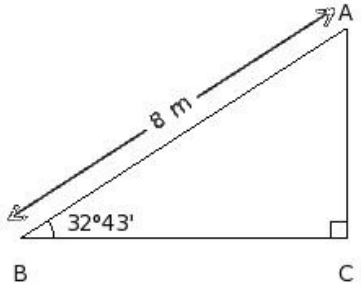
5. A pole stands vertically on the ground. From a point on the ground, the angle of elevation of the top of the pole is found to be 32°43'. If the distance between the observation point and the top of the pole is 8 m, find the height of the pole.

From Table of Natural Sines

x°	0'	6'	12'	18'	24'	30'	36'	42'	48'	54'	1'	2'	3'	4'	5'
32	0.5299	0.5314	0.5329	0.5344	0.5358	0.5373	0.5388	0.5402	0.5417	0.5432	2	5	7	10	12

From Table of Natural Cosines

x°	0'	6'	12'	18'	24'	30'	36'	42'	48'	54'	1'	2'	3'	4'	5'
32	0.8480	0.8471	0.8462	0.8453	0.8443	0.8434	0.8425	0.8415	0.8406	0.8393	2	3	5	6	8



(i) 2.32 m (ii) 4.32 m (iii) 5.32 m (iv) 3.32 m (v) 6.32 m

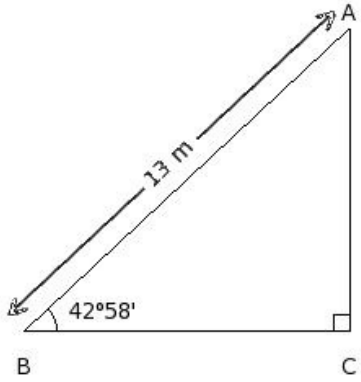
6. A tower stands vertically on the ground. From a point on the ground, the angle of elevation of the top of the tower is found to be 42°58'. If the distance between the observation point and the top of the tower is 13 m, find the distance between the observation point and the foot of the tower.

From Table of Natural Sines

x°	0'	6'	12'	18'	24'	30'	36'	42'	48'	54'	1'	2'	3'	4'	5'
42	0.6691	0.6704	0.6717	0.6730	0.6743	0.6756	0.6769	0.6782	0.6794	0.6807	2	4	6	9	11

From Table of Natural Cosines

x°	0'	6'	12'	18'	24'	30'	36'	42'	48'	54'	1'	2'	3'	4'	5'
42	0.7431	0.7420	0.7408	0.7396	0.7385	0.7373	0.7361	0.7349	0.7337	0.7325	2	4	6	8	10



(i) 8.51 m (ii) 9.51 m (iii) 11.51 m (iv) 10.51 m (v) 7.51 m

7. The upper part of a tree is broken into two parts without being detatched. It makes an angle of 51°59' with the ground. The top of the tree touches the ground at a distance of 20 m from the foot of the tree . Find the height of the tree before it was broken.

From Table of Natural Tangents

x°	0'	6'	12'	18'	24'	30'	36'	42'	48'	54'	1'	2'	3'	4'	5'
51	1.2349	1.2393	1.2437	1.2484	1.2527	1.2572	1.2617	1.2662	1.2708	1.2753	8	15	23	30	38

From Table of Natural Cosines

x°	0'	6'	12'	18'	24'	30'	36'	42'	48'	54'	1'	2'	3'	4'	5'
51	0.6293	0.6280	0.6266	0.6252	0.6239	0.6225	0.6211	0.6198	0.6184	0.9170	2	5	7	9	12

(i) 42.42 m (ii) 44.42 m (iii) 50.42 m (iv) 47.42 m (v) 52.42 m

8. There are two temples one on each bank of a river, just opposite to each other. One of the temples is 110 m high. As observed from the top of this temple, the angles of depression of the top and foot of the other temple are 42°6' and 50°11' respectively. Find the width of the river .

From Table of Natural Tangents															
x°	0'	6'	12'	18'	24'	30'	36'	42'	48'	54'	1'	2'	3'	4'	5'
42	0.9004	0.9036	0.9067	0.9099	0.9131	0.9163	0.9195	0.9228	0.9260	0.9293	5	11	16	21	27

From Table of Natural Tangents															
x°	0'	6'	12'	18'	24'	30'	36'	42'	48'	54'	1'	2'	3'	4'	5'
50	1.1918	1.1960	1.2002	1.2045	1.2088	1.2131	1.2174	1.2218	1.2261	1.2305	7	14	22	29	36

(i) 94.70 m (ii) 91.70 m (iii) 96.70 m (iv) 86.70 m (v) 88.70 m

9. There are two temples one on each bank of a river, just opposite to each other. One of the temples is 80 m high. As observed from the top of this temple, the angles of depression of the top and foot of the other temple are 40°44' and 51°21' respectively. Find the height of the other temple.

From Table of Natural Tangents															
x°	0'	6'	12'	18'	24'	30'	36'	42'	48'	54'	1'	2'	3'	4'	5'
40	0.8391	0.8421	0.8451	0.8481	0.8511	0.8541	0.8571	0.8601	0.8632	0.8662	5	10	15	20	25

From Table of Natural Tangents															
x°	0'	6'	12'	18'	24'	30'	36'	42'	48'	54'	1'	2'	3'	4'	5'
51	1.2349	1.2393	1.2437	1.2484	1.2527	1.2572	1.2617	1.2662	1.2708	1.2753	8	15	23	30	38

(i) 21.92 m (ii) 27.92 m (iii) 19.92 m (iv) 24.92 m (v) 29.92 m

10. An observer 1.9 m tall, is 40 m away from a tower . The angle of elevation of the top of the tower from her eyes is 55°44'. Find the height of the tower .

From Table of Natural Tangents															
x°	0'	6'	12'	18'	24'	30'	36'	42'	48'	54'	1'	2'	3'	4'	5'
55	1.4281	1.4335	1.4388	1.4442	1.4496	1.4550	1.4605	1.4659	1.4715	1.4770	9	18	27	36	45

(i) 57.61 m (ii) 60.61 m (iii) 63.61 m (iv) 55.61 m (v) 65.61 m

11. An aeroplane is flying horizontally 1700 m above the ground. From a point of observation, which lies exactly below the path of the aeroplane, the angle of elevation at a certain instant is 52°. After 40 sec , its elevation from the same point changes to 23°. Find the uniform speed of the aeroplane .

From Table of Natural Tangents															
x°	0'	6'	12'	18'	24'	30'	36'	42'	48'	54'	1'	2'	3'	4'	5'
23	0.4245	0.4265	0.4286	0.4307	0.4327	0.4348	0.4369	0.4390	0.4411	0.4431	3	7	10	14	17

From Table of Natural Tangents															
x°	0'	6'	12'	18'	24'	30'	36'	42'	48'	54'	1'	2'	3'	4'	5'
52	1.2799	1.2846	1.2892	1.2938	1.2985	1.3032	1.3079	1.3127	1.3175	1.3222	8	16	24	31	39

(i) 253.88 kmph (ii) 222.88 kmph (iii) 216.88 kmph (iv) 240.88 kmph

12. Two poles of equal height are standing opposite to each other on either side of a road which is 20 m wide. From a point between them on the road, the angles of elevation of the top of the poles are 27°40' and 31°33' respectively. Find the height of each pole and the distances of the point from the two poles .

From Table of Natural Tangents															
x°	0'	6'	12'	18'	24'	30'	36'	42'	48'	54'	1'	2'	3'	4'	5'
27	0.5095	0.5117	0.5139	0.5161	0.5184	0.5206	0.5228	0.5250	0.5272	0.5295	4	7	11	15	18

From Table of Natural Tangents															
x°	0'	6'	12'	18'	24'	30'	36'	42'	48'	54'	1'	2'	3'	4'	5'
31	0.6009	0.6032	0.6056	0.6080	0.6104	0.6128	0.6152	0.6176	0.6200	0.6224	4	8	12	16	20

(i) height $= 4.66$ m, distances away $= 8.21$ m, 9.79 m (ii) height $= 3.66$ m, distances away $= 7.21$ m, 8.79 m

(iii) height $= 7.66$ m, distances away $= 11.21$ m, 12.79 m

(iv) height $= 6.66$ m, distances away $= 10.21$ m, 11.79 m

(v) height $= 5.66$ m, distances away $= 9.21$ m, 10.79 m

13. From the top of a light house which is 45 m high from the sea level, the angles of depression of two ships are 42°59' and 33°53'. If one ship is exactly behind the other on the same side of the light house , find the distance between the two ships.

From Table of Natural Tangents															
x°	0'	6'	12'	18'	24'	30'	36'	42'	48'	54'	1'	2'	3'	4'	5'
42	0.9004	0.9036	0.9067	0.9099	0.9131	0.9163	0.9195	0.9228	0.9260	0.9293	5	11	16	21	27

From Table of Natural Tangents															
x°	0'	6'	12'	18'	24'	30'	36'	42'	48'	54'	1'	2'	3'	4'	5'
33	0.6494	0.6519	0.6544	0.6569	0.6594	0.6619	0.6644	0.6669	0.6694	0.6720	4	8	13	17	21

(i) 23.73 m (ii) 18.73 m (iii) 15.73 m (iv) 13.73 m (v) 21.73 m

14. From the top of a 15 m high building , the angle of elevation of the top of a cable tower is 46°3' and the angle of depression of its foot is 43°24'. Find the height of the cable tower.

From Table of Natural Tangents															
x°	0'	6'	12'	18'	24'	30'	36'	42'	48'	54'	1'	2'	3'	4'	5'
46	1.0355	1.0392	1.0428	1.0464	1.0501	1.0538	1.0575	1.0612	1.0649	1.0686	6	12	18	25	31

From Table of Natural Tangents															
x°	0'	6'	12'	18'	24'	30'	36'	42'	48'	54'	1'	2'	3'	4'	5'
43	0.9325	0.9358	0.9391	0.9424	0.9457	0.9490	0.9523	0.9556	0.9590	0.9623	6	11	17	22	28

(i) 28.45 m (ii) 36.45 m (iii) 26.45 m (iv) 34.45 m (v) 31.45 m

15. The angle of elevation of the top of a building from the foot of a tower is 23°52'. The angle of elevation of the top of the tower from the foot of the building is 21°6'. If the height of the tower is 30 m, find the height of the building .

From Table of Natural Tangents															
x°	0'	6'	12'	18'	24'	30'	36'	42'	48'	54'	1'	2'	3'	4'	5'
23	0.4245	0.4265	0.4286	0.4307	0.4327	0.4348	0.4369	0.4390	0.4411	0.4431	3	7	10	14	17

From Table of Natural Tangents															
x°	0'	6'	12'	18'	24'	30'	36'	42'	48'	54'	1'	2'	3'	4'	5'
21	0.3839	0.3859	0.3879	0.3899	0.3919	0.3939	0.3959	0.3979	0.4000	0.4020	3	7	10	13	17

(i) 34.40 m (ii) 31.40 m (iii) 29.40 m (iv) 37.40 m (v) 39.40 m

16. A flag is hoisted at the top of a building . From a point on the ground, the angle of elevation of the top of the flag staff is 45°31' and the angle of elevation of the top of the building is 27°45'. If the height of the building is 7 m, find the height of the flag staff .

From Table of Natural Tangents															
x°	0'	6'	12'	18'	24'	30'	36'	42'	48'	54'	1'	2'	3'	4'	5'
27	0.5095	0.5117	0.5139	0.5161	0.5184	0.5206	0.5228	0.5250	0.5272	0.5295	4	7	11	15	18

From Table of Natural Tangents															
x°	0'	6'	12'	18'	24'	30'	36'	42'	48'	54'	1'	2'	3'	4'	5'
45	1.0000	1.0035	1.0070	1.0105	1.0141	1.0176	1.0212	1.0247	1.0283	1.0319	6	12	18	24	30

(i) 4.55 m (ii) 8.55 m (iii) 6.55 m (iv) 5.55 m (v) 7.55 m

17. A flag is hoisted at the top of a building . From a point on the ground, the angle of elevation of the top of the flag staff is 38°4' and the angle of elevation of the top of the building is 28°12'. If the height of the flag staff is 8 m, find the height of the building .

From Table of Natural Tangents															
x°	0'	6'	12'	18'	24'	30'	36'	42'	48'	54'	1'	2'	3'	4'	5'
28	0.5317	0.5340	0.5362	0.5384	0.5407	0.5430	0.5452	0.5475	0.5498	0.5520	4	8	11	15	19

From Table of Natural Tangents															
x°	0'	6'	12'	18'	24'	30'	36'	42'	48'	54'	1'	2'	3'	4'	5'
38	0.7813	0.7841	0.7869	0.7898	0.7926	0.7954	0.7983	0.8012	0.8040	0.8069	5	9	14	19	23

(i) 20.37 m (ii) 17.37 m (iii) 14.37 m (iv) 12.37 m (v) 22.37 m

Assignment Key

1) (v)	2) (iii)	3) (i)	4) (v)	5) (ii)	6) (ii)
7) (iv)	8) (ii)	9) (iv)	10) (ii)	11) (iv)	12) (v)
13) (ii)	14) (v)	15) (i)	16) (iii)	17) (ii)	