EduSahara™ Assignment

Name : Heights and Distances using Tables - 2

Chapter : Heights and Distances

Grade : ICSE Grade X

1. From a point 70 m away from a vertical cliff, the angles of elevation of the top and the foot of a vertical pillar at the top of the cliff are 31°25' and 28°46' respectively. Find the height of the cliff.

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'
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) 35.43 m (ii) 33.43 m (iii) 38.43 m (iv) 43.43 m (v) 41.43 m

2. From a point 50 m away from a vertical cliff, the angles of elevation of the top and the foot of a vertical pillar at the top of the cliff are 48°30' and 35°8' respectively. Find the height of the pillar.

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 Tangents															
x°	0'	6'	12'	18'	24'	30'	36'	42'	48'	54'	1'	2'	3'	4'	5'
48	1.1106	1.1145	1.1184	1.1224	1.1263	1.1303	1.1343	1.1383	1.1423	1.1463	7	13	20	27	33

(i) 18.33 m (ii) 26.33 m (iii) 24.33 m (iv) 16.33 m (v) 21.33 m

3. The angles of depression of two boats from the top of a cliff 150 m high are 39° and 30° respectively. Find the distance between the boats, if the boats are on the same side of the cliff .

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 Tangents															
x°	0'	6'	12'	18'	24'	30'	36'	42'	48'	54'	1'	2'	3'	4'	5'
60	1.7321	1.7391	1.7461	1.7532	1.7603	1.7675	1.7747	1.7820	1.7893	1.7966	12	24	36	48	60

(i) 77.58 m (ii) 71.58 m (iii) 74.58 m (iv) 79.58 m (v) 69.58 m

4. The angles of depression of two boats from the top of a cliff 80 m high are 23° and 26° respectively. Find the distance between the boats, if the boats are on the opposite sides of the cliff .

From Table of Natural Tangents															
x°	0'	6'	12'	18'	24'	30'	36'	42'	48'	54'	1'	2'	3'	4'	5'
67	2.3559	2.3673	2.3789	2.3906	2.4023	2.4142	2.4262	2.4383	2.4504	2.4627	20	40	60	79	99

From Table of Natural Tangents															
x°	0'	6'	12'	18'	24'	30'	36'	42'	48'	54'	1'	2'	3'	4'	5'
64	2.0503	2.0594	2.0686	2.0778	2.0872	2.0965	2.1060	2.1155	2.1251	2.1348	16	31	47	63	78

(i) 352.50 m (ii) 345.50 m (iii) 368.50 m (iv) 364.50 m (v) 324.50 m

5. A man on the top of a vertical observation tower observes a car moving at a uniform speed coming directly towards him. If it takes 14 min for the angle of depression to change from 31° to 46°, how soon after this, will the car reach the observation tower?

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

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

(i) 16 min 20 sec (ii) 18 min 21 sec (iii) 19 min 22 sec (iv) 21 min 25 sec (v) 20 min 23 sec

6. From a point 100 m above a lake, the angle of elevation of a cloud is 33° and the angle of depression of its reflection in the lake is 61°. Find the height of the cloud from the lake.

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

From Table of Natural Tangents

x°	0'	6'	12'	18'	24'	30'	36'	42'	48'	54'	1'	2'	3'	4'	5'
61	1.8040	1.8115	1.8190	1.8265	1.8341	1.8418	1.8495	1.8572	1.8650	1.8728	13	26	38	51	64

(i) 228.49 m (ii) 212.49 m (iii) 190.49 m (iv) 207.49 m (v) 236.49 m

7. At the foot of a mountain, the elevation of its summit is 49°. After ascending 700 m towards the mountain up an incline of 24°, the elevation changes to 69°. Find the height of the mountain.

From Table of Natural Tangents

x°	0'	6'	12'	18'	24'	30'	36'	42'	48'	54'	1'	2'	3'	4'	5'
49	1.1504	1.1544	1.1585	1.1626	1.1667	1.1708	1.1750	1.1792	1.1833	1.1875	7	14	21	27	34

From Table of Natural Tangents

x°	0'	6'	12'	18'	24'	30'	36'	42'	48'	54'	1'	2'	3'	4'	5'
69	2.6051	2.6187	2.6325	2.6464	2.6605	2.6746	2.6889	2.7034	2.7179	2.7326	24	47	71	95	119

From Table of Natural Cosines

x°	0'	6'	12'	18'	24'	30'	36'	42'	48'	54'	1'	2'	3'	4'	5'
24	0.9135	0.9128	0.9121	0.9114	0.9107	0.9100	0.9092	0.9085	0.9078	0.9070	1	2	4	5	6

From Table of Natural Sines

x°	0'	6'	12'	18'	24'	30'	36'	42'	48'	54'	1'	2'	3'	4'	5'
24	0.4067	0.4083	0.4099	0.4115	0.4131	0.4147	0.4163	0.4179	0.4195	0.4210	3	5	8	11	13

(i) 1132.14 m (ii) 1212.14 m (iii) 862.14 m (iv) 1032.14 m (v) 1092.14 m

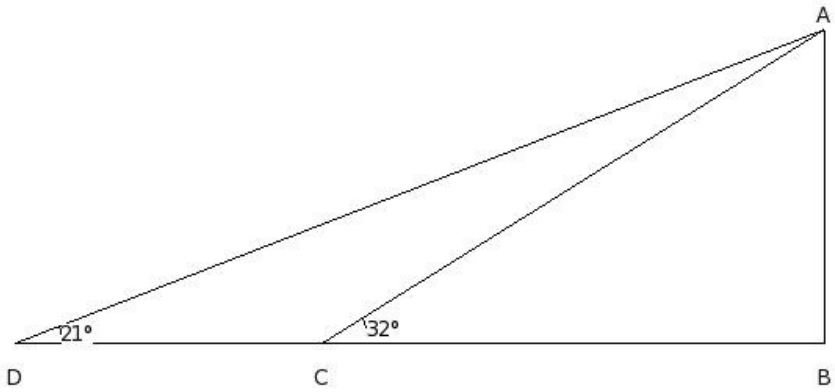
8. The shadow of a vertical tower BA on a level ground is increased by 25 m, when the altitude of the sun changes from 32° to 21°. Find the height of the tower .

From Table of Natural Tangents

x°	0'	6'	12'	18'	24'	30'	36'	42'	48'	54'	1'	2'	3'	4'	5'
32	0.6249	0.6273	0.6297	0.6322	0.6346	0.6371	0.6395	0.6420	0.6445	0.6469	4	8	12	17	21

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) 19.89 m (ii) 21.89 m (iii) 27.89 m (iv) 24.89 m (v) 29.89 m

9. A boy standing on a vertical cliff in a jungle observes two rest houses in line with him on opposite sides deep in the jungle below. If their angles of depression are 49° and 23° and the distance between them is 130 m , find the height of the cliff.

From Table of Natural Tangents

x°	0'	6'	12'	18'	24'	30'	36'	42'	48'	54'	1'	2'	3'	4'	5'
49	1.1504	1.1544	1.1585	1.1626	1.1667	1.1708	1.1750	1.1792	1.1833	1.1875	7	14	21	27	34

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

(i) 45.31 m (ii) 35.31 m (iii) 37.31 m (iv) 43.31 m (v) 40.31 m

10. A man in a boat rowing away from a lighthouse 25 m high, takes 1 min to change the angle of elevation of the top of the lighthouse from 48° to 27°. Find the speed of the boat.

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'
48	1.1106	1.1145	1.1184	1.1224	1.1263	1.1303	1.1343	1.1383	1.1423	1.1463	7	13	20	27	33

(i) 7.44 m/sec (ii) 0.44 m/sec (iii) 2.44 m/sec (iv) 1.44 m/sec (v) 8.44 m/sec

11. Two vertical poles are on either side of a road. A 32 m long ladder is placed between the two poles. When the ladder rests against one pole, it makes an angle of 35°54' with the pole and when it is turned to rest against another pole, it makes an angle of 24°22' with the road. Find the width of the road.

From Table of Natural Cosines															
x°	0'	6'	12'	18'	24'	30'	36'	42'	48'	54'	1'	2'	3'	4'	5'
35	0.8192	0.8181	0.8171	0.8161	0.8151	0.8141	0.8131	0.8121	0.8111	0.8100	2	3	5	7	8

From Table of Natural Cosines															
x°	0'	6'	12'	18'	24'	30'	36'	42'	48'	54'	1'	2'	3'	4'	5'
24	0.9135	0.9128	0.9121	0.9114	0.9107	0.9100	0.9092	0.9085	0.9078	0.9070	1	2	4	5	6

(i) 60.07 m (ii) 50.07 m (iii) 58.07 m (iv) 52.07 m (v) 55.07 m

Assignment Key

1) (iii)	2) (v)	3) (iii)	4) (i)	5) (iii)	6) (ii)
7) (v)	8) (iv)	9) (v)	10) (ii)	11) (v)	