EduSahara™ Assignment

Name : Heights and Distances using Tables - 2

Chapter : Heights and Distances

Grade : ICSE Grade X

1. From a point 150 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 47°25' and 20°24' 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'
20	0.3640	0.3659	0.3679	0.3699	0.3719	0.3739	0.3759	0.3779	0.3799	0.3819	3	7	10	13	17

From Table of Natural Tangents

x°	0'	6'	12'	18'	24'	30'	36'	42'	48'	54'	1'	2'	3'	4'	5'
47	1.0724	1.0761	1.0799	1.0837	1.0875	1.0913	1.0951	1.0990	1.1028	1.1067	6	13	19	25	32

(i) 58.78 m (ii) 50.78 m (iii) 52.78 m (iv) 60.78 m (v) 55.78 m

2. From a point 190 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 46°18' and 23°50' 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'
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'
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) 121.87 m (ii) 90.87 m (iii) 128.87 m (iv) 102.87 m (v) 114.87 m

3. The angles of depression of two boats from the top of a cliff 60 m high are 49° and 29° 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'
41	0.8693	0.8724	0.8754	0.8785	0.8816	0.8847	0.8878	0.8910	0.8941	0.8972	5	10	16	21	26

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) 51.08 m (ii) 61.08 m (iii) 53.08 m (iv) 56.08 m (v) 59.08 m

4. The angles of depression of two boats from the top of a cliff 140 m high are 49° and 41° 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'
41	0.8693	0.8724	0.8754	0.8785	0.8816	0.8847	0.8878	0.8910	0.8941	0.8972	5	10	16	21	26

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

(i) 280.76 m (ii) 282.76 m (iii) 296.76 m (iv) 267.76 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 18 min for the angle of depression to change from 21° to 35°, 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'
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

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

(i) 24 min 53 sec (ii) 22 min 52 sec (iii) 20 min 50 sec (iv) 21 min 51 sec (v) 19 min 48 sec

6. From a point 70 m above a lake, the angle of elevation of a cloud is 34° and the angle of depression of its reflection in the lake is 63°. 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'
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 Tangents

x°	0'	6'	12'	18'	24'	30'	36'	42'	48'	54'	1'	2'	3'	4'	5'
63	1.9626	1.9711	1.9797	1.9883	1.9970	2.0057	2.0145	2.0233	2.0323	2.0413	15	29	44	58	73

(i) 157.31 m (ii) 170.31 m (iii) 121.31 m (iv) 130.31 m (v) 143.31 m

7. At the foot of a mountain, the elevation of its summit is 48°. After ascending 800 m towards the mountain up an incline of 29°, the elevation changes to 60°. 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'
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

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

From Table of Natural Cosines

x°	0'	6'	12'	18'	24'	30'	36'	42'	48'	54'	1'	2'	3'	4'	5'
29	0.8746	0.8738	0.8729	0.8721	0.8712	0.8704	0.8695	0.8686	0.8678	0.8669	1	3	4	6	7

From Table of Natural Sines

x°	0'	6'	12'	18'	24'	30'	36'	42'	48'	54'	1'	2'	3'	4'	5'
29	0.4848	0.4863	0.4879	0.4894	0.4909	0.4924	0.4939	0.4955	0.4970	0.4985	3	5	8	10	13

(i) 1752.66 m (ii) 1532.66 m (iii) 1342.66 m (iv) 1472.66 m

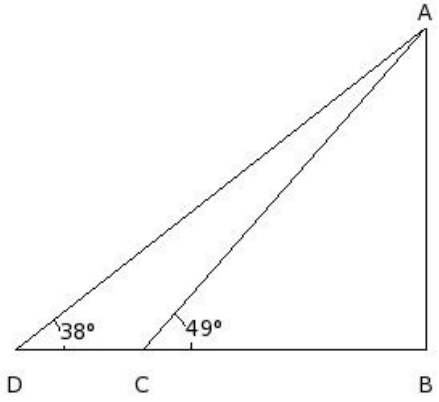
8. The shadow of a vertical tower BA on a level ground is increased by 50 m, when the altitude of the sun changes from 49° to 38°. Find the height of the tower .

From Table of Natural Tangents

x°	0'	6'	12'	18'	24'	30'	36'	42'	48'	54'	1'	2'	3'	4'	5'
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'
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) 98.76 m (ii) 121.76 m (iii) 137.76 m (iv) 118.76 m (v) 139.76 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 27° and 26° and the distance between them is 215 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'
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'
26	0.4877	0.4899	0.4921	0.4942	0.4964	0.4986	0.5008	0.5029	0.5051	0.5073	4	7	11	15	18

(i) 48.57 m (ii) 53.57 m (iii) 58.57 m (iv) 50.57 m (v) 56.57 m

10. A man in a boat rowing away from a lighthouse 25 m high, takes 0.5 min to change the angle of elevation of the top of the lighthouse from 37° to 32°. 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'
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'
37	0.7536	0.7563	0.7590	0.7618	0.7646	0.7673	0.7701	0.7729	0.7757	0.7785	5	9	14	19	23

(i) 1.23 m/sec (ii) 7.23 m/sec (iii) 8.23 m/sec (iv) 0.23 m/sec (v) 2.23 m/sec

11. Two vertical poles are on either side of a road. A 40 m long ladder is placed between the two poles. When the ladder rests against one pole, it makes an angle of 50°48' with the pole and when it is turned to rest against another pole, it makes an angle of 44°34' 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'
50	0.6428	0.6414	0.6401	0.6388	0.6374	0.6361	0.6347	0.6334	0.6320	0.6307	2	5	7	9	12

From Table of Natural Cosines															
x°	0'	6'	12'	18'	24'	30'	36'	42'	48'	54'	1'	2'	3'	4'	5'
44	0.7193	0.7181	0.7169	0.7157	0.7145	0.7133	0.7120	0.7108	0.7096	0.7083	2	4	6	8	10

(i) 53.78 m (ii) 48.78 m (iii) 58.78 m (iv) 50.78 m (v) 56.78 m

Assignment Key

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