EduSahara™ Assignment

Name : Heights and Distances using Tables - 2

Chapter : Heights and Distances

Grade : ICSE Grade X

1. 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 26°12' and 23°5' 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'
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'
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) 85.98 m (ii) 75.98 m (iii) 83.98 m (iv) 80.98 m (v) 77.98 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 36°59' and 24°26' 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'
24	0.4452	0.4473	0.4494	0.4515	0.4536	0.4557	0.4578	0.4599	0.4621	0.4642	4	7	11	14	18

From Table of Natural Tangents

x°	0'	6'	12'	18'	24'	30'	36'	42'	48'	54'	1'	2'	3'	4'	5'
36	0.7265	0.7292	0.7319	0.7346	0.7373	0.7400	0.7427	0.7454	0.7481	0.7508	5	9	14	18	23

(i) 51.77 m (ii) 53.77 m (iii) 56.77 m (iv) 61.77 m (v) 59.77 m

3. The angles of depression of two boats from the top of a cliff 140 m high are 29° and 27° 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'
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

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) 17.20 m (ii) 25.20 m (iii) 27.20 m (iv) 22.20 m (v) 19.20 m

4. The angles of depression of two boats from the top of a cliff 80 m high are 28° and 35° 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'
62	1.8807	1.8887	1.8967	1.9047	1.9128	1.9210	1.9292	1.9375	1.9458	1.9542	14	27	41	55	68

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) 289.70 m (ii) 238.70 m (iii) 247.70 m (iv) 264.70 m (v) 271.70 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 9 min for the angle of depression to change from 20° to 29°, 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'
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'
29	0.5543	0.5566	0.5589	0.5612	0.5635	0.5658	0.5681	0.5704	0.5727	0.5750	4	8	12	15	19

(i) 16 min 12 sec (ii) 18 min 14 sec (iii) 15 min 11 sec (iv) 17 min 13 sec (v) 19 min 15 sec

6. From a point 80 m above a lake, the angle of elevation of a cloud is 32° and the angle of depression of its reflection in the lake is 62°. 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'
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'
62	1.8807	1.8887	1.8967	1.9047	1.9128	1.9210	1.9292	1.9375	1.9458	1.9542	14	27	41	55	68

(i) 163.62 m (ii) 156.62 m (iii) 147.62 m (iv) 177.62 m (v) 159.62 m

7. At the foot of a mountain, the elevation of its summit is 49°. After ascending 600 m towards the mountain up an incline of 22°, the elevation changes to 61°. 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'
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

From Table of Natural Cosines

x°	0'	6'	12'	18'	24'	30'	36'	42'	48'	54'	1'	2'	3'	4'	5'
22	0.9272	0.9263	0.9259	0.9252	0.9245	0.9239	0.9232	0.9225	0.9219	0.9212	1	2	3	5	6

From Table of Natural Sines

x°	0'	6'	12'	18'	24'	30'	36'	42'	48'	54'	1'	2'	3'	4'	5'
22	0.3746	0.3762	0.3778	0.2795	0.3811	0.3827	0.3843	0.3859	0.3875	0.3891	3	5	8	11	13

(i) 1450.68 m (ii) 1330.68 m (iii) 1500.68 m (iv) 1370.68 m (v) 1090.68 m

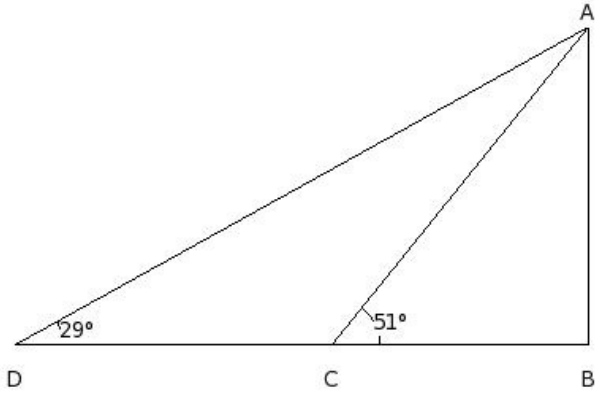
8. The shadow of a vertical tower BA on a level ground is increased by 20 m, when the altitude of the sun changes from 51° to 29°. Find the height of the tower .

From Table of Natural Tangents

x°	0'	6'	12'	18'	24'	30'	36'	42'	48'	54'	1'	2'	3'	4'	5'
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'
29	0.5543	0.5566	0.5589	0.5612	0.5635	0.5658	0.5681	0.5704	0.5727	0.5750	4	8	12	15	19



(i) 17.11 m (ii) 15.11 m (iii) 25.11 m (iv) 20.11 m (v) 23.11 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 41° and 22° and the distance between them is 135 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'
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'
22	0.4040	0.4061	0.4081	0.4101	0.4122	0.4142	0.4163	0.4183	0.4202	0.4224	3	7	10	13	17

(i) 40.24 m (ii) 42.24 m (iii) 37.24 m (iv) 32.24 m (v) 34.24 m

10. A man in a boat rowing away from a lighthouse 45 m high, takes 3 min to change the angle of elevation of the top of the lighthouse from 29° to 21°. 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'
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'
29	0.5543	0.5566	0.5589	0.5612	0.5635	0.5658	0.5681	0.5704	0.5727	0.5750	4	8	12	15	19

(i) 0.20 m/sec (ii) 8.20 m/sec (iii) 7.20 m/sec (iv) 1.20 m/sec (v) 2.20 m/sec

11. Two vertical poles are on either side of a road. A 27 m long ladder is placed between the two poles. When the ladder rests against one pole, it makes an angle of 43°45' with the pole and when it is turned to rest against another pole, it makes an angle of 39°6' 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'
43	0.7314	0.7302	0.7290	0.7278	0.7266	0.7254	0.7242	0.7230	0.7218	0.7206	2	4	6	8	10

From Table of Natural Cosines															
x°	0'	6'	12'	18'	24'	30'	36'	42'	48'	54'	1'	2'	3'	4'	5'
39	0.7771	0.7760	0.7749	0.7738	0.7727	0.7216	0.7705	0.7694	0.7683	0.7672	2	4	6	7	9

(i) 37.46 m (ii) 43.46 m (iii) 45.46 m (iv) 40.46 m (v) 35.46 m

Assignment Key

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