EduSahara™ Assignment

Name : Heights and Distances using Tables - 2

Chapter : Heights and Distances

Grade : ICSE Grade X

1. From a point 200 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 38°19' and 36°41' 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'
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

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) 149.00 m (ii) 151.00 m (iii) 167.00 m (iv) 135.00 m (v) 122.00 m

2. From a point 160 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°40' and 22°59' 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'
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

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) 51.26 m (ii) 46.26 m (iii) 48.26 m (iv) 54.26 m (v) 56.26 m

3. The angles of depression of two boats from the top of a cliff 80 m high are 25° and 35° 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'
65	2.1445	2.1543	2.1642	2.1742	2.1842	2.1943	2.2045	2.2148	2.2251	2.2355	17	34	51	68	85

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) 62.31 m (ii) 60.31 m (iii) 52.31 m (iv) 57.31 m (v) 54.31 m

4. The angles of depression of two boats from the top of a cliff 100 m high are 31° and 27° 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'
59	1.6643	1.6709	1.6775	1.6842	1.6909	1.6977	1.7045	1.7113	1.7182	1.7251	11	23	34	45	56

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) 385.69 m (ii) 376.69 m (iii) 334.69 m (iv) 345.69 m (v) 362.69 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 10 min for the angle of depression to change from 21° to 27°, 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'
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

(i) 31 min 35 sec (ii) 27 min 31 sec (iii) 29 min 33 sec (iv) 33 min 36 sec (v) 30 min 34 sec

6. From a point 200 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 65°. 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'
65	2.1445	2.1543	2.1642	2.1742	2.1842	2.1943	2.2045	2.2148	2.2251	2.2355	17	34	51	68	85

(i) 391.54 m (ii) 359.54 m (iii) 383.54 m (iv) 380.54 m (v) 398.54 m

7. At the foot of a mountain, the elevation of its summit is 50°. After ascending 600 m towards the mountain up an incline of 21°, the elevation changes to 70°. 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'
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

From Table of Natural Tangents

x°	0'	6'	12'	18'	24'	30'	36'	42'	48'	54'	1'	2'	3'	4'	5'
70	2.7475	2.7625	2.7776	2.7929	2.8083	2.8239	2.8397	2.8556	2.8716	2.8878	26	52	78	104	133

From Table of Natural Cosines

x°	0'	6'	12'	18'	24'	30'	36'	42'	48'	54'	1'	2'	3'	4'	5'
21	0.9336	0.9330	0.9323	0.9317	0.9311	0.9304	0.9298	0.9291	0.9285	0.9278	1	2	3	4	5

From Table of Natural Sines

x°	0'	6'	12'	18'	24'	30'	36'	42'	48'	54'	1'	2'	3'	4'	5'
21	0.3584	0.3600	0.3616	0.3633	0.3649	0.3665	0.3681	0.3697	0.3714	0.3730	3	5	8	11	13

(i) 1194.23 m (ii) 1014.23 m (iii) 1254.23 m (iv) 864.23 m (v) 884.23 m

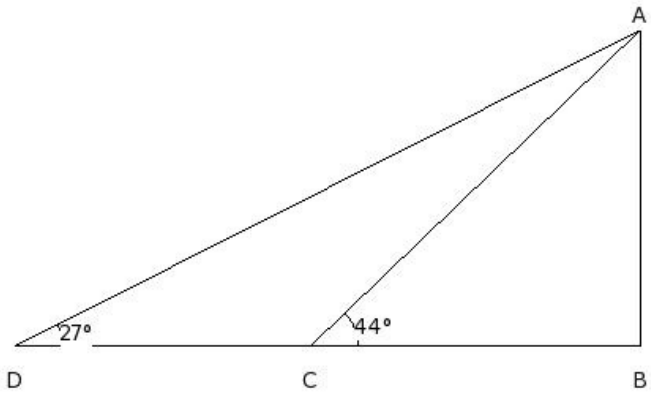
8. The shadow of a vertical tower BA on a level ground is increased by 45 m, when the altitude of the sun changes from 44° to 27°. Find the height of the tower .

From Table of Natural Tangents

x°	0'	6'	12'	18'	24'	30'	36'	42'	48'	54'	1'	2'	3'	4'	5'
44	0.9657	0.9691	0.9725	0.9759	0.9793	0.9827	0.9861	0.9896	0.9930	0.9965	6	11	17	23	28

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



(i) 48.53 m (ii) 45.53 m (iii) 43.53 m (iv) 53.53 m (v) 51.53 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 30° and 20° and the distance between them is 145 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'
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 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

(i) 27.37 m (ii) 37.37 m (iii) 35.37 m (iv) 32.37 m (v) 29.37 m

10. A man in a boat rowing away from a lighthouse 90 m high, takes 1.5 min to change the angle of elevation of the top of the lighthouse from 37° to 24°. 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'
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'
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) 7.92 m/sec (ii) 8.92 m/sec (iii) 1.92 m/sec (iv) 0.92 m/sec (v) 2.92 m/sec

11. Two vertical poles are on either side of a road. A 37 m long ladder is placed between the two poles. When the ladder rests against one pole, it makes an angle of 22°57' with the pole and when it is turned to rest against another pole, it makes an angle of 28°49' 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'
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 Cosines															
x°	0'	6'	12'	18'	24'	30'	36'	42'	48'	54'	1'	2'	3'	4'	5'
28	0.8829	0.8821	0.8813	0.8805	0.8796	0.8788	0.8780	0.8771	0.8763	0.8755	1	3	4	5	7

(i) 61.49 m (ii) 69.49 m (iii) 71.49 m (iv) 63.49 m (v) 66.49 m

Assignment Key

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