



A radio tower stands vertically on the ground. From a point on the ground, the angle of elevation of the top of the radio tower is found to be $51^\circ 27'$. If the height of the radio tower is 19 m, find the distance between the observation point and the top of the radio tower.

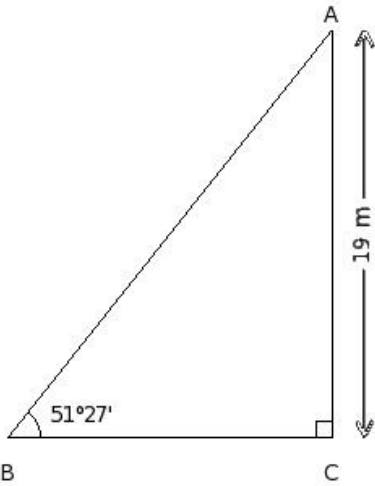
1.

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 Sines

x°	0'	6'	12'	18'	24'	30'	36'	42'	48'	54'	1'	2'	3'	4'	5'
51	0.7771	0.7782	0.7793	0.7804	0.7815	0.7826	0.7837	0.7848	0.7859	0.7869	2	4	5	7	9



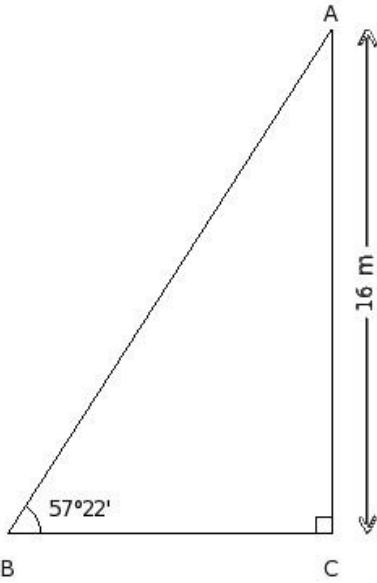
- (i) 21.30 m (ii) 29.30 m (iii) 27.30 m (iv) 24.30 m (v) 19.30 m

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 $57^{\circ}22'$. If the height of the building is 16 m, find the distance between the observation point and the foot of the building.

2.

From Table of Natural Tangents															
x°	0'	6'	12'	18'	24'	30'	36'	42'	48'	54'	1'	2'	3'	4'	5'
57	1.5399	1.5458	1.5517	1.5577	1.5637	1.5697	1.5757	1.5818	1.5880	1.5941	10	20	30	40	50

From Table of Natural Sines															
x°	0'	6'	12'	18'	24'	30'	36'	42'	48'	54'	1'	2'	3'	4'	5'
57	0.8387	0.8396	0.8406	0.8415	0.8425	0.8434	0.8443	0.8453	0.8462	0.8471	2	3	5	6	8



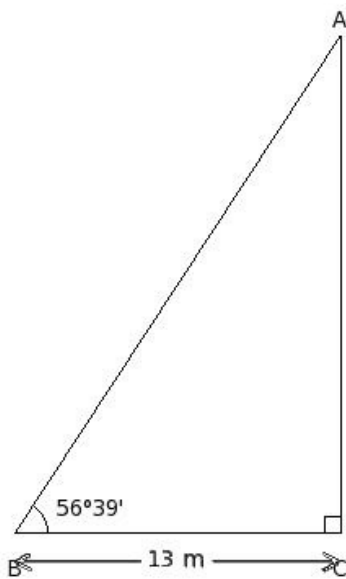
- (i) 10.25 m (ii) 13.25 m (iii) 5.25 m (iv) 15.25 m (v) 7.25 m

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 $56^{\circ}39'$. If the distance between the observation point and the foot of the building is 13 m, find the distance between the observation point and the top of the building.

3.

From Table of Natural Tangents															
x°	0'	6'	12'	18'	24'	30'	36'	42'	48'	54'	1'	2'	3'	4'	5'
56	1.4826	1.4882	1.4938	1.4994	1.5051	1.5108	1.5166	1.5224	1.5282	1.5340	10	19	29	38	48

From Table of Natural Cosines															
x°	0'	6'	12'	18'	24'	30'	36'	42'	48'	54'	1'	2'	3'	4'	5'
56	0.5592	0.5577	0.5563	0.5548	0.5534	0.5519	0.5505	0.5490	0.5476	0.5461	2	5	7	10	12



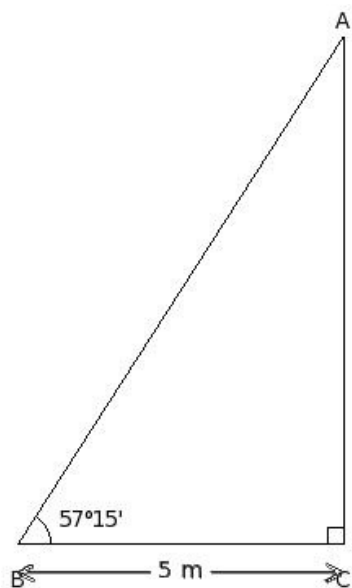
- (i) 28.64 m (ii) 20.64 m (iii) 18.64 m (iv) 26.64 m (v) 23.64 m

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 $57^{\circ}15'$. If the distance between the observation point and the foot of the building is 5 m, find the height of the building.

4.

From Table of Natural Tangents															
x°	0'	6'	12'	18'	24'	30'	36'	42'	48'	54'	1'	2'	3'	4'	5'
57	1.5399	1.5458	1.5517	1.5577	1.5637	1.5697	1.5757	1.5818	1.5880	1.5941	10	20	30	40	50

From Table of Natural Cosines															
x°	0'	6'	12'	18'	24'	30'	36'	42'	48'	54'	1'	2'	3'	4'	5'
57	0.5446	0.5432	0.5417	0.5402	0.5388	0.5373	0.5358	0.5344	0.5329	0.5314	2	5	7	10	12



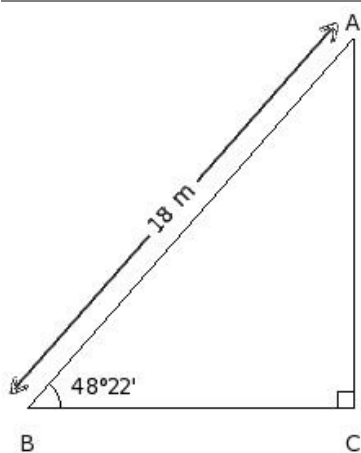
- (i) 7.77 m (ii) 9.77 m (iii) 5.77 m (iv) 8.77 m (v) 6.77 m

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 $48^{\circ}22'$. If the distance between the observation point and the top of the pole is 18 m, find the height of the pole.

5.

From Table of Natural Sines															
x°	0'	6'	12'	18'	24'	30'	36'	42'	48'	54'	1'	2'	3'	4'	5'
48	0.7431	0.7443	0.7455	0.7466	0.7478	0.7490	0.7501	0.7513	0.7524	0.7536	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'
48	0.6691	0.6678	0.6665	0.6652	0.6639	0.6626	0.6613	0.6600	0.6587	0.6574	2	4	7	9	11



- (i) 10.45 m (ii) 16.45 m (iii) 8.45 m (iv) 13.45 m (v) 18.45 m

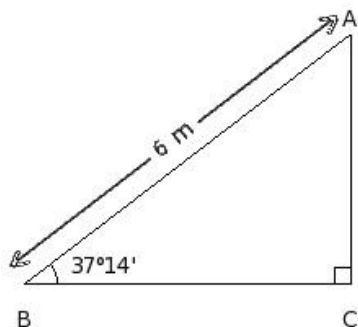
A tower stands vertically on the ground. From a point on the ground, the angle of elevation of the top of the tower is found to be $37^{\circ}14'$. If the distance between the observation point and the top of the tower is 6 m, find the distance between the observation point and the foot of the tower.

From Table of Natural Sines

x°	0'	6'	12'	18'	24'	30'	36'	42'	48'	54'	1'	2'	3'	4'	5'
37	0.6018	0.6032	0.6046	0.6060	0.6074	0.6088	0.6101	0.6115	0.6129	0.6143	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'
37	0.7986	0.7976	0.7963	0.7955	0.7944	0.7934	0.7923	0.7912	0.7902	0.7891	2	4	5	7	9



- (i) 3.78 m (ii) 2.78 m (iii) 5.78 m (iv) 6.78 m (v) 4.78 m

The upper part of a tree is broken into two parts without being detached. It makes an angle of $41^{\circ}12'$ with the ground. The top of the tree touches the ground at a distance of 140 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'
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 Cosines

x°	0'	6'	12'	18'	24'	30'	36'	42'	48'	54'	1'	2'	3'	4'	5'
41	0.7547	0.7536	0.7524	0.7513	0.7501	0.7490	0.7478	0.7466	0.7455	0.7443	2	4	6	8	10

- (i) 291.63 m (ii) 296.63 m (iii) 322.63 m (iv) 326.63 m (v) 308.63 m

There are two temples one on each bank of a river, just opposite to each other. One of the temples is 180 m high. As observed from the top of this temple, the angles of depression of the top and foot of the other temple are $43^{\circ}30'$ and $53^{\circ}44'$ 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'
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

From Table of Natural Tangents

x°	0'	6'	12'	18'	24'	30'	36'	42'	48'	54'	1'	2'	3'	4'	5'
53	1.3270	1.3319	1.3367	1.3416	1.3465	1.3514	1.3564	1.3613	1.3663	1.3713	8	16	25	33	41

- (i) 140.07 m (ii) 129.07 m (iii) 132.07 m (iv) 147.07 m (v) 115.07 m

There are two temples one on each bank of a river, just opposite to each other. One of the temples is 50 m high. As observed from the top of this temple, the angles of depression of the top and foot of the other temple are $30^{\circ}8'$ and $47^{\circ}3'$ 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'
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'
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) 17.98 m (ii) 25.98 m (iii) 27.98 m (iv) 19.98 m (v) 22.98 m

An observer 1.6 m tall, is 80 m away from a tower . The angle of elevation of the top of the tower from her eyes is $45^{\circ}56'$. Find the height of the tower .

10.

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) 79.25 m (ii) 84.25 m (iii) 89.25 m (iv) 81.25 m (v) 87.25 m

An aeroplane is flying horizontally 900 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 40° . After 10 sec , its elevation from the same point changes to 21° . Find the uniform speed of the aeroplane .

11.

From Table of Natural Tangents															
x°	0'	6'	12'	18'	24'	30'	36'	42'	48'	54'	1'	2'	3'	4'	5'
41	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'
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

- (i) 472.84 kmph (ii) 443.84 kmph (iii) 459.84 kmph (iv) 457.84 kmph (v) 440.84 kmph

Two poles of equal height are standing opposite to each other on either side of a road which is 10 m wide. From a point between them on the road, the angles of elevation of the top of the poles are $44^{\circ}54'$ and $41^{\circ}22'$ respectively. Find the height of each pole and the distances of the point from the two poles .

12.

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'
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

- (i) height = 3.67 m, distances away = 4.31 m, 3.69 m (ii) height = 2.67 m, distances away = 3.31 m, 2.69 m
 (iii) height = 4.67 m, distances away = 5.31 m, 4.69 m (iv) height = 5.67 m, distances away = 6.31 m, 5.69 m
 (v) height = 6.67 m, distances away = 7.31 m, 6.69 m

From the top of a light house which is 100 m high from the sea level, the angles of depression of two ships are $28^{\circ}35'$ and $21^{\circ}54'$. If one ship is exactly behind the other on the same side of the light house , find the distance between the two ships.

13.

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'
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) 62.24 m (ii) 60.24 m (iii) 70.24 m (iv) 65.24 m (v) 68.24 m

From the top of a 17 m high building , the angle of elevation of the top of a cable tower is $44^{\circ}4'$ and the angle of depression of its foot is $23^{\circ}57'$. Find the height of the cable tower.

14.

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'
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) 54.05 m (ii) 49.05 m (iii) 57.05 m (iv) 51.05 m (v) 59.05 m

The angle of elevation of the top of a building from the foot of a tower is $47^{\circ}46'$. The angle of elevation of the top of the tower from the foot of the building is $49^{\circ}20'$. If the height of the tower is 25 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'
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

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) 20.66 m (ii) 18.66 m (iii) 28.66 m (iv) 23.66 m (v) 26.66 m

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 $42^{\circ}56'$ and the angle of elevation of the top of the building is $20^{\circ}46'$. If the height of the building is 13 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'
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'
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

- (i) 21.90 m (ii) 18.90 m (iii) 23.90 m (iv) 13.90 m (v) 15.90 m

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 $43^{\circ}32'$ and the angle of elevation of the top of the building is $24^{\circ}26'$. If the height of the flag staff is 12 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'
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'
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) 16.00 m (ii) 11.00 m (iii) 14.00 m (iv) 6.00 m (v) 8.00 m

Assignment Key

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