1.
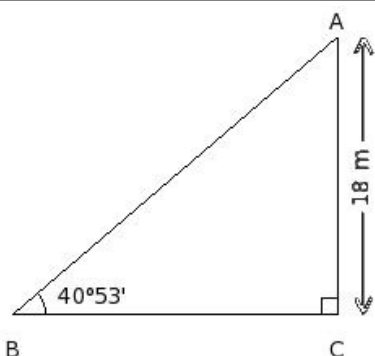
A chimney stands vertically on the ground. From a point on the ground, the angle of elevation of the top of the chimney is found to be 40°53'. If the height of the chimney is 18 m, find the distance between the observation point and the top of the chimney.

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

From Table of Natural Sines

x°	0'	6'	12'	18'	24'	30'	36'	42'	48'	54'	1'	2'	3'	4'	5'
40	0.6428	0.6441	0.6455	0.6468	0.6481	0.6494	0.6508	0.6521	0.6534	0.6547	2	4	7	9	11

(i) 22.50 m   (ii) 30.50 m   (iii) 32.50 m   (iv) 24.50 m   (v) 27.50 m

2.
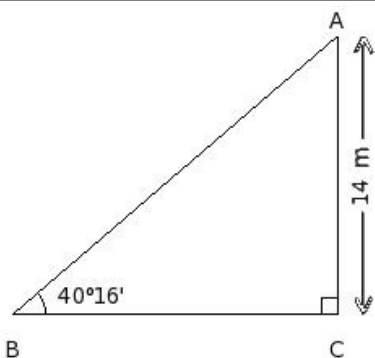
A radio tower stands vertically on the ground. From a point on the ground, the angle of elevation of the top of the radio tower is found to be 40°16'. If the height of the radio tower is 14 m, find the distance between the observation point and the foot of the radio tower.

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

From Table of Natural Sines

| x°	0'	6'	12'	18'	24'	30'	36'	42'	48'	54'	1'	2'	3'	4'	5'
40	0.6428	0.6441	0.6455	0.6468	0.6481	0.6494	0.6508	0.6521	0.6534	0.6547	2	4	7	9	11

(i) 21.53 m   (ii) 19.53 m   (iii) 11.53 m   (iv) 13.53 m   (v) 16.53 m

3. 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 31°11'. If the distance between the observation point and the foot of the radio tower is 14 m, find the distance between the observation point and the top of the radio 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 Cosines**										
x°	0'	6'	12'	18'	24'	30'	36'	42'	48'	54'	1'	2'	3'	4'	5'
31	0.8572	0.8563	0.8554	0.8545	0.8536	0.8526	0.8517	0.8508	0.8499	0.8490	2	3	5	6	8
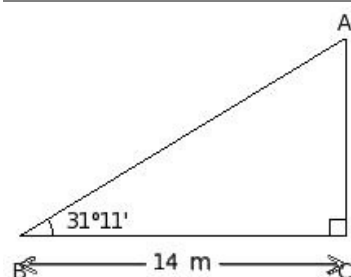
(i) 11.36 m   (ii) 13.36 m   (iii) 19.36 m   (iv) 16.36 m   (v) 21.36 m

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4. A chimney stands vertically on the ground. From a point on the ground, the angle of elevation of the top of the chimney is found to be 51°52'. If the distance between the observation point and the foot of the chimney is 14 m, find the height of the chimney.

					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 Cosines										
x°	0'	6'	12'	18'	24'	30'	36'	42'	48'	54'	1'	2'	3'	4'	5'
51	0.6293	0.6280	0.6266	0.6252	0.6239	0.6225	0.6211	0.6198	0.6184	0.9170	2	5	7	9	12
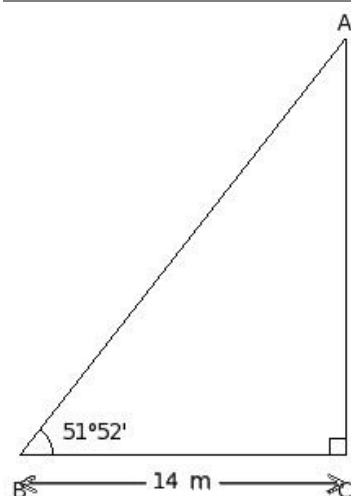
(i) 20.83 m   (ii) 22.83 m   (iii) 17.83 m   (iv) 12.83 m   (v) 14.83 m

5. 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 38°56'. If the distance between the observation point and the top of the radio tower is 7 m, find the height of the radio tower.

From Table of Natural Sines

x°	0'	6'	12'	18'	24'	30'	36'	42'	48'	54'	1'	2'	3'	4'	5'
38	0.6157	0.6170	0.6184	0.6195	0.6211	0.6225	0.6239	0.6252	0.6266	0.6280	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'
38	0.7880	0.7869	0.7859	0.7848	0.7837	0.7826	0.7815	0.7804	0.7793	0.7782	2	4	5	7	9

(i) 5.40 m (ii) 3.40 m (iii) 6.40 m (iv) 2.40 m (v) 4.40 m

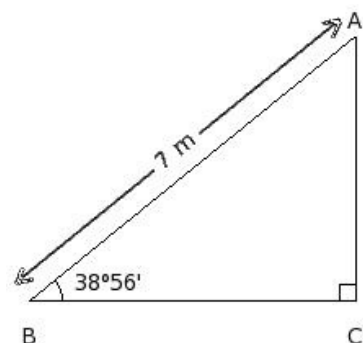6. A radio tower stands vertically on the ground. From a point on the ground, the angle of elevation of the top of the radio tower is found to be 40°13'. If the distance between the observation point and the top of the radio tower is 18 m, find the distance between the observation point and the foot of the radio tower.

From Table of Natural Sines

x°	0'	6'	12'	18'	24'	30'	36'	42'	48'	54'	1'	2'	3'	4'	5'
40	0.6428	0.6441	0.6455	0.6468	0.6481	0.6494	0.6508	0.6521	0.6534	0.6547	2	4	7	9	11

From Table of Natural Cosines

x°	0'	6'	12'	18'	24'	30'	36'	42'	48'	54'	1'	2'	3'	4'	5'
40	0.7660	0.7649	0.7638	0.7627	0.7615	0.7604	0.7593	0.7581	0.7570	0.7559	2	4	6	7	9
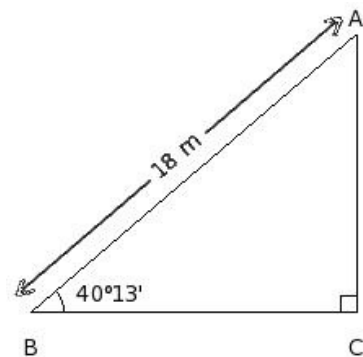
(i) 13.74 m (ii) 16.74 m (iii) 18.74 m (iv) 8.74 m (v) 10.74 m

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7. The upper part of a tree is broken into two parts without being detatched. It makes an angle of 43°28' with the ground. The top of the tree touches the ground at a distance of 110 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'
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 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

(i) 273.83 m (ii) 248.83 m (iii) 257.83 m (iv) 255.83 m (v) 240.83 m

8. There are two temples one on each bank of a river, just opposite to each other. One of the temples is 30 m high. As observed from the top of this temple, the angles of depression of the top and foot of the other temple are 34°24' and 39°38' 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'
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'
39	0.8098	0.8127	0.8156	0.8185	0.8214	0.8243	0.8273	0.8302	0.8332	0.8361	5	10	15	19	24

(i) 31.22 m (ii) 39.22 m (iii) 41.22 m (iv) 33.22 m (v) 36.22 m

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9. There are two temples one on each bank of a river, just opposite to each other. One of the temples is 160 m high. As observed from the top of this temple, the angles of depression of the top and foot of the other temple are 35°24' and 47°8' 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'
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'
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) 54.46 m (ii) 51.46 m (iii) 49.46 m (iv) 57.46 m (v) 59.46 m

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10. An observer 1.7 m tall, is 50 m away from a tower . The angle of elevation of the top of the tower from her eyes is 47°36'. 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'
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) 51.46 m (ii) 56.46 m (iii) 61.46 m (iv) 59.46 m (v) 53.46 m

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11. An aeroplane is flying horizontally 1100 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 60°. After 50 sec , its elevation from the same point changes to 31°. Find the uniform speed of the aeroplane .

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'
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) 86.08 kmph (ii) 91.08 kmph (iii) 89.08 kmph (iv) 81.08 kmph (v) 83.08 kmph

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12. 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 31°10' and 45°28' respectively. Find the height of each pole and the distances of the point from the two poles .

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'
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) height = 4.79 m, distances away = 4.73 m, 7.27 m (ii) height = 1.79 m, distances away = 1.73 m, 4.27 m

(iii) height = 2.79 m, distances away = 2.73 m, 5.27 m (iv) height = 3.79 m, distances away = 3.73 m, 6.27 m

(v) height = 5.79 m, distances away = 5.73 m, 8.27 m

13. From the top of a light house which is 25 m high from the sea level, the angles of depression of two ships are 41°24' and 37°22'. If one ship is exactly behind the other on the same side of the light house , find the distance between the two ships.

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'
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) 3.38 m   (ii) 6.38 m   (iii) 4.38 m   (iv) 2.38 m   (v) 5.38 m

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14. From the top of a 10 m high building , the angle of elevation of the top of a cable tower is 31°58' and the angle of depression of its foot is 21°9'. Find the height of the cable 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'
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) 31.13 m   (ii) 29.13 m   (iii) 23.13 m   (iv) 26.13 m   (v) 21.13 m

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15. The angle of elevation of the top of a building from the foot of a tower is 44°35'. The angle of elevation of the top of the tower from the foot of the building is 24°31'. If the height of the tower is 65 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'
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'
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

(i) 157.45 m   (ii) 138.45 m   (iii) 155.45 m   (iv) 124.45 m   (v) 140.45 m

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16. 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 49°55' and the angle of elevation of the top of the building is 32°45'. If the height of the building is 15 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'
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'
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) 7.71 m   (ii) 15.71 m   (iii) 17.71 m   (iv) 12.71 m   (v) 9.71 m

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17. 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 50°41' and the angle of elevation of the top of the building is 28°28'. If the height of the flag staff is 15 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'
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'
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

(i) 11.98 m   (ii) 14.98 m   (iii) 6.98 m   (iv) 16.98 m   (v) 8.98 m

Assignment Key

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