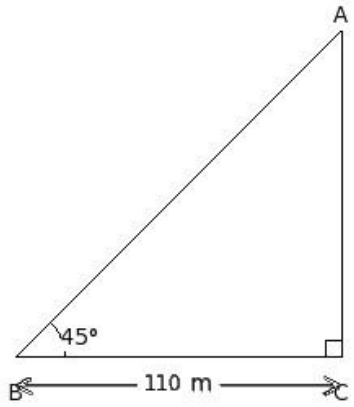
EduSahara™ Worksheet

Name : Chapter Based Worksheet

Chapter : Some Applications of Trigonometry

Grade : CBSE Grade X

1. 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 $45°$. If the distance between the point and the foot of the building is 110 m, find the distance between the observation point and the top of the building.



(i) $220\sqrt{3}$ m (ii) $110\sqrt{2}$ m (iii) $55\sqrt{12}$ m (iv) 220 m (v) 110 m

2. A tower stands vertically on the ground.

The height of the tower is $70\sqrt{3}$ m.

The distance between the observation point and its foot is 70 m.

Find the angle of elevation.

(i) $90°$ (ii) $60°$ (iii) $105°$ (iv) $45°$ (v) $30°$

3. Two poles of equal height are standing opposite to each other on either side of a road which is 15 m wide. From a point between them on the road, the angles of elevation of the top of the poles are $60°$ and $30°$ respectively. Find the height of each pole and the distances of the point from the two poles .

(i) height $= 4.5$ m, distances away $= 9.25$ m, 1.75 m (ii) height $= 6.5$ m, distances away $= 11.25$ m, 3.75 m

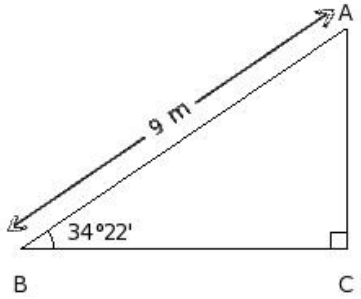
(iii) height $= 7.5$ m, distances away $= 12.25$ m, 4.75 m (iv) height $= 8.5$ m, distances away $= 13.25$ m, 5.75 m

(v) height $= 5.5$ m, distances away $= 10.25$ m, 2.75 m

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 34°22'. If the distance between the observation point and the top of the chimney is 9 m, find the height of the chimney.

From Table of Natural Sines															
x°	0'	6'	12'	18'	24'	30'	36'	42'	48'	54'	1'	2'	3'	4'	5'
34	0.5592	0.5606	0.5621	0.5635	0.5650	0.5664	0.5678	0.5693	0.5707	0.5721	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'
34	0.8290	0.8281	0.8271	0.8261	0.8251	0.8241	0.8231	0.8221	0.8211	0.8202	2	3	5	7	8



(i) 6.08 m (ii) 4.08 m (iii) 5.08 m (iv) 7.08 m (v) 3.08 m

5. From the top of a light house which is 95 m high from the sea level, the angles of depression of two ships are 60° and 30°. If one ship is exactly behind the other on the same side of the light house , find the distance between the two ships.

(i) 117.68 m (ii) 109.68 m (iii) 125.68 m (iv) 96.68 m (v) 94.68 m

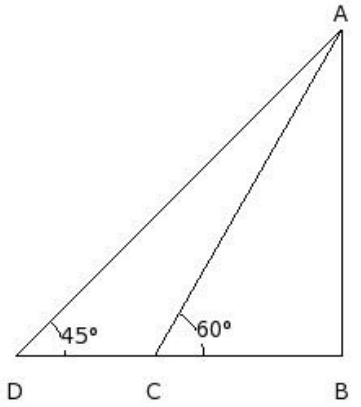
6. From the top of a 17 m high building , the angle of elevation of the top of a cable tower is 45°12' and the angle of depression of its foot is 28°27'. Find the height of the cable tower.

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

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

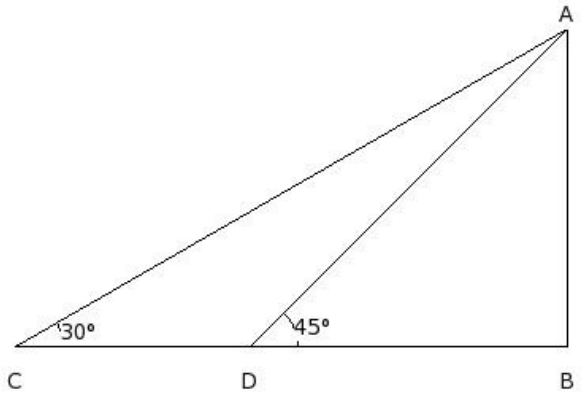
(i) 53.60 m (ii) 51.60 m (iii) 45.60 m (iv) 43.60 m (v) 48.60 m

7. The shadow of a vertical tower BA on a level ground is increased by 10 m, when the altitude of the sun changes from 60° to 45°. Find the height of the tower .



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

8. A person, walking 5 m from a point toward a flagpost , observes that its angle of elevation changes from 30° to 45°. Find the height of the flagpost .



(i) $(\frac{5}{2}\sqrt{18}+\frac{5}{2}\sqrt{6})$m (ii) $\frac{25}{2}$ m (iii) $(\frac{5}{2}\sqrt{3}+\frac{5}{2})$m (iv) $(2+\sqrt{3})$m (v) $(\frac{15}{4}\sqrt{2}+\frac{5}{4}\sqrt{6})$m

9. 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 30° to 60°, how soon after this, will the car reach the observation tower?

(i) 7 min 7 sec (ii) 5 min 0 sec (iii) 6 min 6 sec (iv) 4 min 4 sec (v) 3 min 3 sec

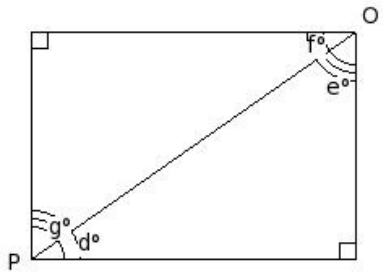
10. A tower stands vertically on the ground. From a point on the ground, the angle of elevation of the top of the tower is found to be $\sin^{(-1)}(\frac{1}{5})$. If the distance between the point and the top of the tower is 10 m, find the height of the tower.

(i) 0.00 m (ii) 4.00 m (iii) 2.00 m (iv) 3.00 m (v) 1.00 m

11. From the top of a 14 m high building , the angle of elevation of the top of a cable tower is 60° and the angle of depression of its foot is 45°. Find the height of the cable tower.

(i) 41.25 m (ii) 33.25 m (iii) 43.25 m (iv) 35.25 m (v) 38.25 m

12. If P is the point of observation and the observed object is at point O, which of the following angles represent the angle of elevation ?

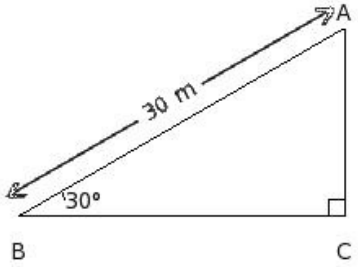


(i) ∠d (ii) ∠e (iii) ∠g (iv) ∠f

13. 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 $\cos^{(-1)}(\frac{1}{2})$. If the distance between the point and the top of the tower is 150 m, find the distance between the observation point and the foot of the tower.

(i) 72.00 m (ii) 80.00 m (iii) 78.00 m (iv) 70.00 m (v) 75.00 m

14. 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 30°. If the distance between the point and the top of the building is 30 m, find the height of the building.



(i) 15 m (ii) 12 m (iii) 16 m (iv) 17 m (v) 14 m

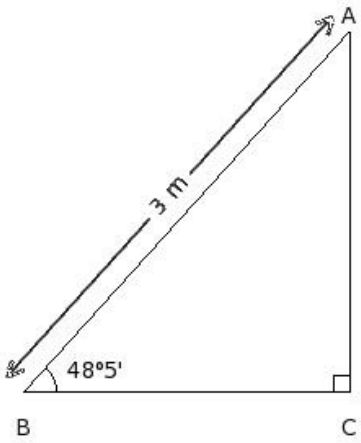
15. A pole stands vertically on the ground. From a point on the ground, the angle of elevation of the top of the pole is found to be 48°5'. If the distance between the observation point and the top of the pole is 3 m, find the distance between the observation point and the foot of the pole.

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) 3.00 m (ii) 0.00 m (iii) 1.00 m (iv) 2.00 m (v) 4.00 m

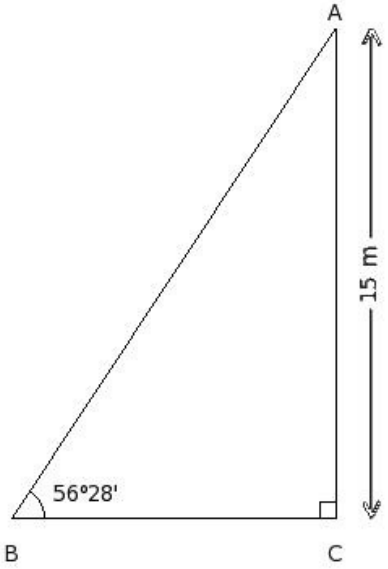
16. The upper part of a tree is broken into two parts without being detatched. It makes an angle of 45° with the ground. The top of the tree touches the ground at a distance of 70 m from the foot of the tree . Find the height of the tree before it was broken.

(i) 169.00 m (ii) 195.00 m (iii) 154.00 m (iv) 151.00 m (v) 176.00 m

17. 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 56°28'. If the height of the pole is 15 m, find the distance between the observation point and the top of the pole.

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 Sines															
x°	0'	6'	12'	18'	24'	30'	36'	42'	48'	54'	1'	2'	3'	4'	5'
56	0.8290	0.8300	0.8310	0.8320	0.8329	0.8339	0.8348	0.8358	0.8369	0.8377	2	3	5	7	8



(i) 12.99 m (ii) 17.99 m (iii) 14.99 m (iv) 20.99 m (v) 22.99 m

18. 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 60° and the angle of elevation of the top of the building is 30°. If the height of the building is 16 m, find the height of the flag staff .

(i) 29.00 m (ii) 27.00 m (iii) 37.00 m (iv) 32.00 m (v) 35.00 m

19. There are two temples one on each bank of a river, just opposite to each other. One of the temples is 10 m high. As observed from the top of this temple, the angles of depression of the top and foot of the other temple are 42°46' and 62°40' 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'
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

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) 3.17 m (ii) 5.17 m (iii) 4.17 m (iv) 7.17 m (v) 6.17 m

20. 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 45° and 30° and the distance between them is 140 m , find the height of the cliff.

(i) 48.25 m (ii) 51.25 m (iii) 46.25 m (iv) 54.25 m (v) 56.25 m

21. 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 $\cot^{(-1)}(\frac{5}{7})$. If the height of the tower is 60 m, find the distance between the observation point and the foot of the tower.

(i) 45.86 m (ii) 47.86 m (iii) 42.86 m (iv) 39.86 m (v) 37.86 m

22. Two poles of equal height are standing opposite to each other on either side of a road which is 40 m wide. From a point between them on the road, the angles of elevation of the top of the poles are 35°44' and 31°17' 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'
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'
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

(i) height = 13.18 m, distances away = 21.69 m, 18.31 m

(ii) height = 15.18 m, distances away = 23.69 m, 20.31 m

(iii) height = 11.18 m, distances away = 19.69 m, 16.31 m

(iv) height = 12.18 m, distances away = 20.69 m, 17.31 m

(v) height = 14.18 m, distances away = 22.69 m, 19.31 m

23. From the top of a light house which is 35 m high from the sea level, the angles of depression of two ships are 49°24' and 45°12'. 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'
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'
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) 6.76 m (ii) 4.76 m (iii) 2.76 m (iv) 5.76 m (v) 3.76 m

24. 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 49°10' and 62°29' 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'
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'
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) 66.50 m (ii) 68.50 m (iii) 71.50 m (iv) 74.50 m (v) 76.50 m

25. The angles of depression of two boats from the top of a cliff 170 m high are 60° and 30° respectively. Find the distance between the boats, if the boats are on the same side of the cliff .

(i) 196.30 m (ii) 209.30 m (iii) 178.30 m (iv) 210.30 m (v) 181.30 m

Assignment Key

1) (ii)	2) (ii)	3) (ii)	4) (iii)	5) (ii)	6) (v)
7) (i)	8) (iii)	9) (ii)	10) (iii)	11) (v)	12) (i)
13) (v)	14) (i)	15) (iv)	16) (i)	17) (ii)	18) (iv)
19) (ii)	20) (ii)	21) (iii)	22) (i)	23) (ii)	24) (iii)
25) (i)					