

Class 10 Some Applications of Trigonometry (Heights and Distances)

- Q1. From a point on the ground, 30 meters away from the foot of a vertical tower, the angle of elevation of the top of the tower is found to be 30° . Find the height of the tower. (Leave your answer in radical form).
- Q2. An airplane flying horizontally at a height of 2500 meters above the ground is observed at an angle of elevation of 60° from a point on the ground. After a flight of 15 seconds, the angle of elevation changes to 30° . Find the speed of the airplane in meters per second.
- Q3. A 1.5-meter-tall boy is standing at some distance from a 31.5-meter-tall building. The angle of elevation from his eyes to the top of the building increases from 30° to 60° as he walks towards the building. Find the distance he walked towards the building.
- Q4. A vertical pole stands on the level ground. From a point on the ground, which is 25 meters away from the foot of the pole, the angle of elevation of the top of the pole is 45° . Find the height of the pole.
- Q5. From the top of a 7-meter-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° . Determine the height of the tower.
- Q6. A kite is flying at a height of 75 meters above the ground. The string attached to the kite is temporarily tied to a point on the ground. The inclination of the string with the ground is 60° . Find the length of the string, assuming that there is no slack in the string.
- Q7. As observed from the top of a 100-meter-high lighthouse from the sea-level, the angles of depression of two ships are 30° and 45° . If one ship is exactly behind the other on the same side of the lighthouse, find the distance between the two ships. (Take $\sqrt{3} = 1.732$)
- Q8. The shadow of a vertical tower standing on a level ground is found to be 40 meters longer when the Sun's altitude is 30° than when it is 60° . Find the height of the tower.
- Q9. Two poles of equal heights are standing opposite each other on either side of a 100-meter-wide road. 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 the poles.
- Q10. A straight highway leads to the foot of a tower. A man standing at the top of the tower observes a car at an angle of depression of 30° , which is approaching the foot of the tower with a uniform speed. Six seconds later, the angle of depression of the car is found to be 60° . Find the further time taken by the car to reach the foot of the tower from this point.

Ans 1: $10\sqrt{3}$ meters Ans 2: $(5000\sqrt{3} / 9)$ m/s [or Approx 962.25 m/s] Ans 3: $20\sqrt{3}$ meters Ans 4:

25 meters Ans 5: $7(\sqrt{3} + 1)$ meters Ans 6: $50\sqrt{3}$ meters Ans 7: 73.2 meters Ans 8: $20\sqrt{3}$ meters Ans 9:

$25\sqrt{3}$ meters Ans 10: 3 seconds