

BHARATH COACHING CENTRE

10th CBSE

Some Applications of Trigonometry

Total: 50

Maths

Time: 1.30 hrs

Section – A

$1 \times 5 = 5$

1. If the angles of elevation of a tower from two points distant a and b ($a > b$) from its foot and in the same straight line from it are 30° and 60° , then the height of the tower is
2. From a light house the angles of depression of two ships on opposite sides of the light house are observed to be 30° and 45° . If the height of the light house is h metres, the distance between the ships is
3. The angle of elevation of the top of a tower standing on a horizontal plane from a point A is α . After walking a distance d towards the foot of the tower the angle of elevation is found to be β . The height of the tower is
4. Two persons are a metres apart and the height of one is double that of the other. If from the middle point of the line joining their feet, an observer finds the angular elevation of their tops to be complementary, then the height of the shorter post is
5. Two poles are ' a ' metres apart and the height of one is double of the other. If from the middle point of the line joining their feet an observer finds the angular elevations of their tops to be complementary, then the height of the smaller is

Section – B

$5 \times 2 = 10$

6. The angle of elevation of the top of a building from the foot of the top of a building from the foot of the tower is 30° and the angle of elevation of the top of the tower from the foot of the building is 45° . If the tower is 30 m high, find the height of the building.
7. If the shadow of a tower is 30 m long, when the Sun's elevation is 30° . What is the length of the shadow, when Sun's elevation is 60° ?
8. A man is standing on the top of a multi-storey building, which is 30 m high, observes the angles of elevation of the top of a tower as 60° and the angle of depression of the base of the tower as 30° . Find the horizontal distance between the building and the tower. Also find the height of the tower.
9. An aeroplane, when 3000 m high, passes vertically above another plane at an instant when the angles of elevation of the two aeroplanes from the same point on the ground are 60° and 45° respectively. Find the vertical distance between the two aeroplanes.
10. The shadow of a tower standing on a level ground is found to be 40 m longer when the Sun's altitude is 30° , then when it is 60° . Find the height of the tower.

Section – C

$5 \times 3 = 15$

11. The angles of elevation of the top of a tower from two points at a distance of a and b from the base and in the same straight line with it are complementary. Prove that the height of tower is \sqrt{ab} .
12. An aeroplane, when flying at a height of 4000 m from the ground passes vertically above another aeroplane at an instant when the angles of elevation of the two planes from the same point on the ground are 60° and 45° respectively. Find the vertical distance between the aeroplanes at that instant. (Take $\sqrt{3} = 1.73$)

13. A man standing on the deck of a ship which is 10 m above water level observes the angles of elevation of the top of a hill as 60° and the angle of depression of the base of hill as 30° . Find the distance of the hill from the ship and the height of the hill.
14. From the top of a tower of height 50 m, the angles of depression of the top and bottom of a pole are 30° and 45° respectively. Find
- How far the pole is from the bottom of a tower.
 - the height of the pole (Use $\sqrt{3} = 1.732$)
15. A person observed the angles of elevation of the top of a tower as 30° . He walked 50 m towards the foot of the tower along level ground and found the angle of elevation of the top of the tower as 60° . Find the height of the tower.

Section – D

$5 \times 4 = 20$

16. If the angle of elevation of a cloud from a point h metres above a lake is α and the angle of depression of its reflection in the lake be β , prove that the distance of the cloud from the point of observation is $\frac{2h \sec \alpha}{\tan \beta - \tan \alpha}$
17. A ladder rests against a wall at an angle to the horizontal. Its foot is pulled away from the wall through a distance a, so that it slides a distance b down the wall making an angle with the horizontal. Show that $\frac{a}{b} = \frac{\cos \alpha - \cos \beta}{\sin \beta - \sin \alpha}$
18. The angle of elevation of the top of a building from the foot of the tower is 30° and the angle of elevation of the top of the tower from the foot of the building is 60° . If the tower is 60 m high, find the height of the building.
19. The angle of elevation of a cloud from a point 120 m above a lake is 30° and the angle of depression of its reflection in the lake is 60° . Find the height of the cloud.
20. A man on a cliff observes a boat at an angle of depression of 30° which is approaching the shore to the point is immediately beneath the observer with a uniform speed. Six minutes later, the angle of depression of the boat is found to be 60° .
- Find the time taken by the boat to reach the shore
 - Which mathematical concept is used in the above problem?
 - What is its value?