

Some Applications of Trigonometry

<1M>

1. The angle of elevation of the top of building from the foot of tower is 45° and the angle of elevation of the top of the tower from the foot of the building is 60° . If the tower is 50 m high find the height of building ?

- (A) 40 m
- (B) 50m
- (C) 60m
- (D) $\frac{50\sqrt{3}}{3}$ m

2. A tower stands vertically on the ground from a point on the ground which is 15 m away from the foot of tower if the height of tower is $15\sqrt{3}$ meters find the angle of elevation.

- (A) 60°
- (B) 30°
- (C) 90°
- (D) 120°

3. A kite is flying in sky if the string attached is of length $40\sqrt{3}$ m and is tied to ground making 60° . Then what is the height?

- (A) 50 metre
- (B) 40 metre
- (C) 60 metre
- (D) 120 metre

4. A kite is flying at a height of 60m above the ground. The string attached to kite is tied to a point. The inclination of string with the ground is 30° . Find length of the string. Assuming there is no slack in the string.

- (A) 30 metre
- (B) 60 metre
- (C) 90 metre
- (D) 120 metre

5. A person is climbing a 20 m long ladder which is inclined at 30° from ground and touches top of minar. Find the height of minar.

- (A) $10\sqrt{3}$ m
- (B) $20\sqrt{3}$ m
- (C) 10 m
- (D) 15 m

6. The angle of elevation of the top of a tower from a point on the ground which is 60 m away from the foot of tower is 30° . Find the height of tower.

- (A) $60\sqrt{3}$ m
- (B) 30 m
- (C) $30\sqrt{3}$ m
- (D) $20\sqrt{3}$ m

7. A line drawn from the eye of an observer to the point in the object viewed by the observer is called:

- (A) Line of inclination
- (B) Horizontal line
- (C) Line of sight
- (D) Vertical line

8. The angles of elevation of the top of the tower from two points at a distance 4m and 1 m from the base of the tower and in the same straight line with it are complementary then the height of the tower is:

- (A) 8 m
- (B) 10 m
- (C) 6 m
- (D) 12 m

9. A 1.5 m tall boy is standing at some distance from a 31.5 m tall building. The angle of elevation from his eyes to the top of building increase from 45° to 60° as he walked towards the building. Find distance as he walked towards the building.

10.

In figure 1 the angle θ is called

- (A) Angle of inclination
- (B) Angle of depression
- (C) Acute angle
- (D) None of these

11. From a point on the ground the angles of elevation of the bottom and the top of a transmission tower fixed at the top of a 30m high building are 45° and 60° . Then the height of tower is _____,

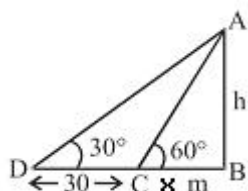
(take $(\sqrt{3}) = 1.73$)

- (A) 30 m
- (B) 28.9 m
- (C) 21.9 m
- (D) None of these

12. The angle formed by the line of sight with the horizontal when the point being viewed above the horizontal level is called.

- (A) Angle inclination
- (B) Angle of declination
- (C) Angle of depression
- (D) None of these

13. In the given figure h is equal to _____



- (A) 20 m
- (B) 30 m
- (C) 40 m
- (D) $15\sqrt{3}$ m

14. From the top of a 10 m height building the angle of elevation of the top of a cable tower is 60° and angle of depression of its foot is 45° , determine the height of the towers.

- (A) 10 m
- (B) 15 m
- (C) 27.3 m
- (D) 20 m

15. The shadow of a tower standing on a level ground is found to be $40\sqrt{3}$ m. If the height of tower is 40 m. What is altitude of the sun?

- (A) 30°
- (B) 60°
- (C) 45°
- (D) 90°

16. The angles of depression of top and Bottom of an 16 m tall building from the top of a multistoried building are 30° and 60° therefore the height of multistory building is:

- (A) 12 m
- (B) 24 m
- (C) 36 m
- (D) 48 m

17. The shadow of the tower standing on a level ground is found to be 40 m longer when the sun's altitude is 30° than when it is 60° . Then the height of tower is:

- (A) 20 m
- (B) $20\sqrt{3}$ m
- (C) 40 m
- (D) 60 m

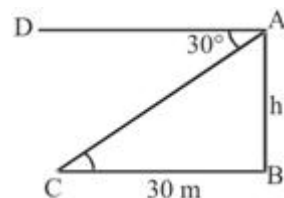
18. Two poles of equal height are standing opposite each other on either side of the road which is 60m wide. From a point between them on the road, the angles of elevation of the top of poles are 60° and 30° respectively. Find the height of the poles.

- (A) 40 m
- (B) 60m
- (C) 80 m
- (D) $15\sqrt{3}$ m

19. The altitude of the sun at any instant is 60° . The height of the vertical pole that will cast a shadow of 30 m is .

- (A) $30\sqrt{3}$
- (B) 15
- (C) 25m
- (D) $25\sqrt{3}$ m

20. In the given figure find the value of h.



- (A) $10\sqrt{3}$
- (B) $20\sqrt{3}$
- (C) $30\sqrt{3}$
- (D) None of these

21. The shadow of a tower standing on a level ground is found to be 30 m longer when the sun's altitude is 30° than when it is 60° . Find the height of tower.

- (A) 20°
- (B) $20\sqrt{3}$
- (C) $15\sqrt{3}$
- (D) $30\sqrt{3}$

22. The angle of elevation of the top of tower from a point on the ground which is 40 m away from the foot of tower is 45° , then what is the height of tower ?

- (A) 40 m
- (B) 60m
- (C) 80 m
- (D) 20 m

23. An electric pole stands vertically on the ground from a point on the ground which is 10 m away from foot of pole, the Angle of elevation is 60° from top of the tower find the height ?

- (A) 5m
- (B) $\frac{5\sqrt{3}}{10}$ m
- (C) $\frac{10}{53}$ m
- (D) $10\sqrt{3}$ m

24. The angle of elevation of a tower from a distance 100m from its foot is 30° . Height of the tower is

- (A) $100\sqrt{3}$
- (B) $\frac{100}{\sqrt{3}}$
- (C) $50\sqrt{3}$
- (D) $\frac{200}{\sqrt{3}}$

25. If the elevation of the sun changed from 30° to 60° , then the difference between the length of shadows of a pole 15m high, made at these two position is ?

- (A) 7.5m
- (B) 15m
- (C) $10\sqrt{3}$
- (D) $\frac{15}{\sqrt{3}}$ m

26. If the angle 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 .

- (A) $\frac{\sqrt{a+b}}{\sqrt{ab}}$
- (B) $\frac{\sqrt{ab}}{\sqrt{a-b}}$
- (C) $\frac{\sqrt{a-b}}{\sqrt{a+b}}$
- (D) $\frac{\sqrt{a+b}}{\sqrt{a-b}}$

27. The ratio of the length of a rod and its shadow is $1 : \sqrt{3}$. The angle of elevation of the sun is :

- (A) 30°
- (B) 45°
- (C) 60°
- (D) 90°

28. In the given triangle find the value of sin A:

- (A) $\frac{12}{13}$

- (B) $\frac{5}{13}$
 (C) $\frac{12}{13}$
 (D) $\frac{2}{12}$

<3M>

29. A circus artist is climbing a 20 m long rope, which is tightly stretched and tied from the top of a vertical pole to the ground. Find the height of the pole if the angle made by the rope with the ground level is 30° .

30. An observer 1.5 m tall is 28.5 m away from a chimney. The angle of elevation of the top of the chimney from her eyes is 45° . What is the height of the chimney?

31. A tower stands vertically above from the ground. From a point on the ground which is 15 m away from the foot of the tower, the angle of elevation of the top of the tower is found to be 60° . Find the height of the tower.

32. A bridge across a river makes an angle of 45° with the river bank. If the length of the bridge across the river is 50m, what is the width of the river?

<6M>

33. Two pillars of equal height are on either side of a road, which is 100 m wide. The angles of elevation of the top of the pillars are 60° and 30° at a point on the road between the pillars. Find the position of the point between the pillars and the height of each pillar.

34. A round balloon of radius r subtends an angle α at the eye of the observer while the angle of elevation of its centre is β . Prove that the height of the centre of the balloon is $\frac{r \sin \beta \operatorname{cosec} \alpha}{2}$.

35. Two ships are sailing in the sea on either side of a lighthouse. The angles of depression of the two ships are observed as 60° and 45° respectively. If the distance between the two ships is 100 m, find the height of the lighthouse.

36. The shadow of a tower standing on a level ground is found to be 40 m longer when the sun altitude is 30° than when it is 60° . Find the height of the tower.

37. From a point on a bridge across a river, the angles of depression of the banks on opposite sides of the river are 30° and 45° , respectively. If the bridge is at a height of 3 m from the banks, find the width of the river.

38. From a point on the ground 40m away from the foot of a tower, the angle of elevation of the top of the tower is 30° . The angle of elevation of the top of a water tank (on the top of the tower) is 45° . Find the height of the tower and depth of the tank.

39. The angles of elevation of the top of a tower from two points at distances a and b metres from the base and in the same straight line with it are complementary, prove that the height of the tower is \sqrt{ab} metres.

40. From the top of the hill, the angles of depression of two consecutive kilometer stones due east are found to be 30° and 45° . Find the height of the hill.