WORKSHEET 1

CHAPTER 11 – SOME APPLICATIONS OF TRIGONOMETRY

1. When a point is observed, the angle formed by the line of sight with the horizontal level where the point being viewed is above the horizontal plane is known as
   (*a*) angle of triangle (*b*) angle of depression
   (*c*) angles of elevation (*d*) none of these

2. When we raise our hand to look at the object, the angle formed by the line of sight with horizontal is known as
   (*a*) obtuse angle (*b*) angle of elevation
   (*c*) angle of depression (*d*) acute angle

3. When we lower our hand to look at the object, the angle formed by the line of sight with horizontal is known as
   (*a*) obtuse angle (*b*) angle of elevation
   (*c*) angle of depression (*d*) acute angle

4. When the length of the shadow of a pillar is equal to its height, the elevation at source of the sight is
   (*a*) 60° (*b*) 45° (*c*) 30° (*d*) 90°

5. A pole 10 m high casts a shadow 10 m long on the ground, then the sun's elevation is
   (*a*) 30° (*b*) 45° (*c*) 60° (*d*) 90°

6. The angle of depression from the top of a tower 12 m high, at a point on the ground is 30°. The distance of the point from the top of the tower is
   (*a*) 18 m (*b*) $4\sqrt{3}$ m (*c*) $12\sqrt{3}$ m (*d*) 12 m

7. A ladder is 10 m long. It touches a wall at height of 5 m. The angle θ made by it with the horizontal is
   (*a*) 90° (*b*) 60° (*c*) 45° (*d*) 30°

8. If the angle of depression of an object from a 75 m high tower is 30°, then the distance of the object from the base of tower is
   (*a*) $25\sqrt{3}$ m (*b*) $40\sqrt{3}$ m (*c*) $75\sqrt{3}$ m (*d*) 150 m

9. The ratio of the length of rod and its shadow is $1 : \sqrt{3}$. The altitude of the sun is
   (*a*) 30° (*b*) 45° (*c*) 60° (*d*) 90°

10. The tops of two poles of height 10 m and 18 m are connected with wire. If wire makes an angle of 30° with horizontal, then length of wire is
    (*a*) 10 m (*b*) 12 m (*c*) 16 m (*d*) 18 m

11. A tower is 50 m high. Its shadow is x metres shorter when the sun's altitude is 45° then when it is 30°. Find the value of x.

12. An observer is 1.6 m tall, is 45 metres away from a tower. The angle of elevation from his eye to the top of tower is 30°. Determine the height of the tower.

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

14. The angles of elevation of the top of a tower from two points at a distance of 4 m and 9 m from the base of the tower and in the same straight line with it, are complementary. Prove that the height of the tower is 6 m.

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15. A bridge across a river makes an angle of 45° with the river bank. If the length of bridge across the river is 150 m, find the width of the river.

16. A tower subtends an angle α at a point A in the plane of its base and the angle of depression of the foot of the tower at a point b metres just above A is β. Prove that the height of the tower is $b \tan \alpha \cot \beta$.

17. As observed from the top of a lighthouse, 100 m above sea level the angle of depression of a ship, sailing directly towards it changes from 30° and 60°. Determine the distance travelled by the ship during the period of observation.

18. A man on the top of the vertical observation tower observes a car moving at a uniform speed, coming directly towards it. If it takes 12 minutes for the angle of depression to change from 30° to 45°, how soon after this will the car reach the observation tower?

19. From the top of a building 96 m high the angles of depression of two vehicles on a road at the same level and in the same line with the foot of the building and on the same side of it are $x°$ and $y°$ where $\tan x° = \frac{3}{4}$ and $\tan y° = \frac{1}{3}$. Calculate the distance between the vehicles.

20. A man in a boat rowing away from a chiff 150 m high takes 2 minutes to change the angle of elevation of the top of cliff from 60° to 45°. Find the speed of the boat.

ANSWERS

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1. (*b*) angle of depression
2. (*b*) angle of elevation
3. (*c*) angle of depression
4. (*b*) 45°
5. (*b*) 45°
6. (*b*) $4\sqrt{3}$ m
7. (*d*) 30°
8. (*c*) $75\sqrt{3}$ m
9. (*a*) 30°
10. (*c*) 16 m
11. 36.6 m
12. 27.58 m
13. $10\sqrt{3}$ m
15. $75\sqrt{2}$ m
17. 115.46 m
18. 16.39 minutes (approx.)
19. 160 m
20. 0.53 m/s (approx.)