Class 10 Mathematics · Chapter 9: Some Applications of Trigonometry

Worksheet · 20 marks · about 40 minutes · based on NCERT

Name _____ Class and section _____ Date _____

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1. In a heights problem, the horizontal distance d from the foot of a tower and the angle of elevation θ of its top are known, and the height h is wanted. The ratio to use is [1]

(a) $\sin\theta = \frac{h}{d}$ (b) $\tan\theta = \frac{h}{d}$

(c) $\cos\theta = \frac{h}{d}$ (d) $\sec\theta = \frac{h}{d}$

2. The angle of elevation of the top of a mobile tower, seen by an observer, is the angle between [1]

(a) the line of sight and the horizontal through the observer's eye (b) the line of sight and the tower

(c) the tower and the ground (d) the line of sight and the vertical through the observer's eye

3. An escalator in a metro station is 14 m long and makes an angle of 30° with the horizontal. The vertical height it lifts a passenger through is [1]

(a) $7\sqrt{3}$ m (b) $14\sqrt{3}$ m

(c) 7 m (d) $\frac{14}{\sqrt{3}}$ m

4. A vertical pole casts a shadow on level ground equal to its own height. The angle of elevation of the Sun is [1]

(a) 30° (b) 60°

(c) 90° (d) 45°

5. Meena, standing on her balcony, looks down at a scooter parked on the road. The angle between her line of sight and the horizontal through her eye is called the [1]

(a) angle of elevation (b) angle of depression

(c) line of sight (d) right angle

6. A guy-rope runs from the top of a vertical tent pole to a peg on level ground 6 m from the foot of the pole, and makes an angle of 30° with the ground. Find the height of the pole and the length of the rope. (Use $\sqrt{3} \approx 1.73$.) [2]

7. A straight loading plank 2.8 m long rests from the ground to the floor of a truck and makes an angle of 30° with the ground. Find the height of the truck's floor above the ground and the horizontal distance from the foot of the plank to the truck. (Use $\sqrt{3} \approx 1.73$.) [2]

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8. In a heights problem, a distance comes out as $\frac{24}{\sqrt{3}-1}$ m. Write it in the form $a(\sqrt{3}+1)$ m and find its value. (Use $\sqrt{3} \approx 1.73$.) [2]

9. AB is a building 12 m tall and CD a tower, both standing on level ground 20 m apart (B and D the feet). From the top A of the building, the angle of elevation of the top C of the tower is 45°. Let AE be the horizontal through A, meeting CD at E. (i) Explain why AE = 20 m and ED = 12 m. (ii) Find the height of the tower. [3]

10. From the top of a watch-tower in a forest, two deer on opposite sides of the tower, in a straight line with its foot, are seen at angles of depression of 60° and 45°. The deer are 60 m apart. Find the height of the watch-tower. (Use $\sqrt{3} \approx 1.73$.) [3]

11. A cyclist rides along a straight level road towards a tower. At one point the angle of elevation of its top is 30°; after he rides 60 m further, it is 45°. Find the height of the tower. (Use $\sqrt{3} \approx 1.73$.) [3]