Mathematics

Practice Test Paper 4

(Chapter 9: Some Applications of Trigonometry)

Class X | 2026–27

Time Allowed: 45 Minutes | Maximum Marks: 25

General Instructions

1. All 13 questions are compulsory. The paper has four sections: A, B, C and D.
2. Section A - 5 marks; Section B - 8 marks; Section C - 9 marks; Section D - 3 marks.
3. Choose one correct option in Section A. Show the necessary steps and reasoning in Sections B, C and D.
4. Give exact answers unless stated otherwise. Use of calculators is not allowed.

SECTION A

(5 questions × 1 mark = 5 marks)

1. A tower's height equals the horizontal distance from its foot to an observer's eye. If the eye is above ground level but below the tower top, the elevation of the top is:

(A) exactly 45° (B) greater than 45°

(C) less than 45° (D) always 60°

2. A taut wire is inclined at 60° to level ground. Its vertical projection is $9\sqrt{3}$ m. The wire length is:

(A) 9 m (B) 18 m

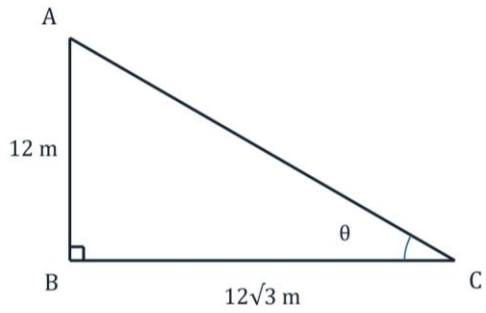
(C) 27 m (D) $18\sqrt{3}$ m

3. For the same pole on level ground, the shadow length at Sun elevation 30° is how many times the length at 60°?

(A) $\sqrt{3}$ (B) 2

(C) 1/3 (D) 3

4. AB is a vertical pole and BC is its shadow on level ground. With the lengths shown, the Sun's elevation θ is:



(A) 30° (B) 45°

(C) 60° (D) 90°

5. The elevation of the top of a vertical mast from a ground point is 60°. The angle between the mast and the line of sight at its top is:

(A) 60° (B) 30°

(C) 45° (D) 90°

SECTION B

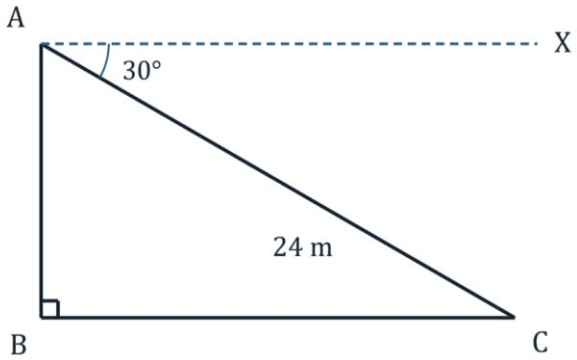
(4 questions × 2 marks = 8 marks)

6. A ladder reaches a wall at a height of $8\sqrt{3}$ m and is inclined at 60° to level ground. Find its length and the distance of its foot from the wall.

7. From a ground point 9 m from a building, the elevation of a window is 45°. The roof is 4 m above the window. Find the building height.

8. A 100 m tower casts a shadow when the Sun's elevation is 30°. Find the shadow length and the straight-line distance from the tower top to the shadow tip.

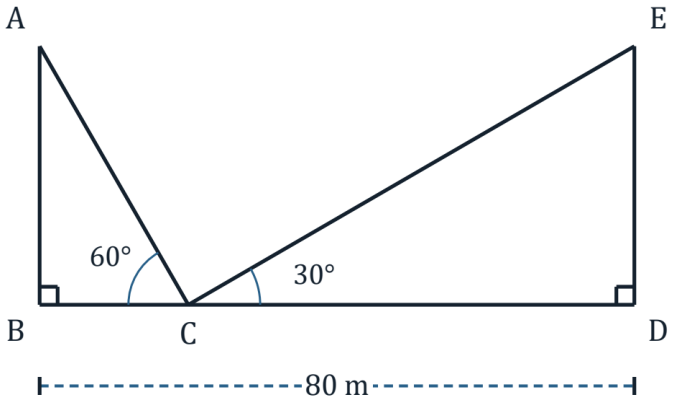
9. From A, the depression of ground point C is 30° from horizontal AX. If AC = 24 m, find the height AB and ground distance BC.



SECTION C

(3 questions × 3 marks = 9 marks)

10. Two equal poles AB and ED stand on opposite sides of an 80 m road BD. From C between them, their top elevations are 60° and 30°. Find their height and distances BC and CD.



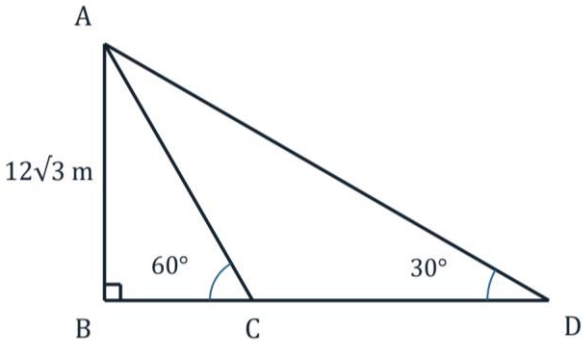
11. A flagstaff stands on a 10 m building. From a point on level ground, the elevations of its bottom and top are 30° and 45°. Find the flagstaff length and the distance to the building.

12. From a ship's deck 10 m above water, the elevation of a hilltop is 60° and the depression of the hill's foot at water level is 30°. Find the horizontal distance to the foot and the hill's height.

SECTION D

(Application Based Question - 3 marks)

13. A survey group observes a tower AB of height $12\sqrt{3}$ m from two ground points C and D on the same side, with B, C, D collinear. The elevations are marked.



(i) Find BC.

(ii) Find BD.

(iii) Find the distance between the observation points.