Mathematics

Practice Test Paper 5

(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 telescope is 2 m above level ground. It measures a vertical rise of 13 m to a tower top. The tower height is:

(A) 11 m

(B) 26 m

(C) 13 m

(D) 15 m

2. A pole of height h has a shadow of length $h\sqrt{3}$ on level ground. The Sun's elevation is:

(A) 30° (B) 45°

(C) 60° (D) 90°

3. A taut rope makes 30° with level ground. The ratio of its vertical rise to its horizontal run is:

(A) $\sqrt{3} : 1$ (B) $1 : \sqrt{3}$

(C) 1 : 2 (D) 2 : 1

4. A 14 m pole has a shadow of length 14 m. If the Sun's elevation increases while the ground remains level, its shadow becomes:

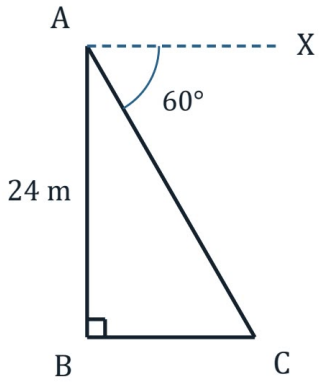
(A) longer

(B) unchanged

(C) shorter

(D) vertical

5. From the top A of a 24 m tower, point C is seen at depression angle 60°. AX is horizontal. The ground distance BC is:



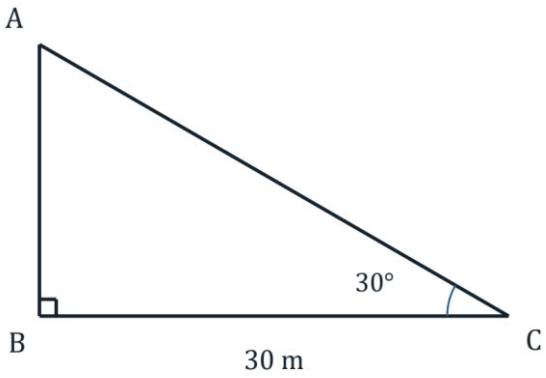
(A) $24\sqrt{3}$ m (B) 12 m

(C) $8\sqrt{3}$ m (D) 24 m

SECTION B

(4 questions × 2 marks = 8 marks)

6. A is the top of a vertical tower AB. Point C is 30 m from its foot on level ground, and ∠ACB = 30°. Find the height and the line-of-sight distance.



7. A 12 m wire is attached from level ground to a vertical mast at 45°. Find the attachment height and the ground distance from the mast.

8. A student writes h = 18 sin 60° for a tower seen at 60° from a ground point 18 m from its foot. Explain the error and find the correct height.

9. A balloon is 18 m above level ground. A viewer's eyes are 1.5 m high, and the balloon's elevation is 45°. Find the horizontal distance to the point directly beneath the balloon.

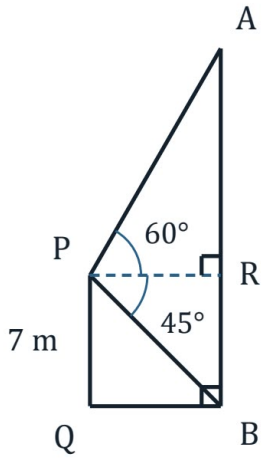
SECTION C

(3 questions × 3 marks = 9 marks)

10. A 50 m tower and a building stand on level ground. From the tower's foot, the building top has elevation 30°; from the building's foot, the tower top has elevation 60°. Find the building height.

11. A boy's eyes are 1.5 m above ground. He walks straight towards a 30 m building until the elevation of its top changes from 30° to 60°. Find the distance he walks.

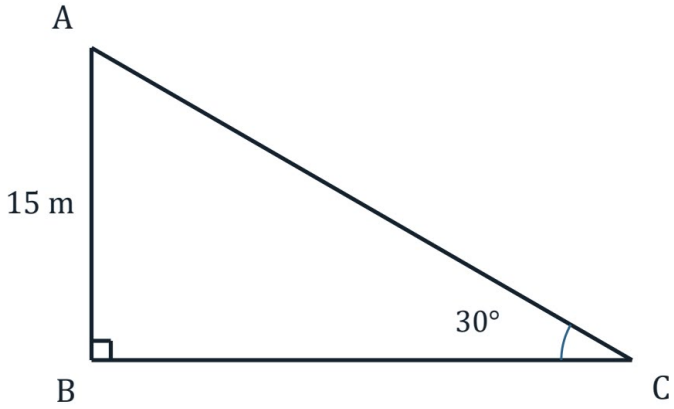
12. P is the top of a 7 m building PQ. From P, a cable tower's top A has elevation 60° and its foot B has depression 45°. PR is horizontal and QB is level. Find QB and AB.



SECTION D

(Application Based Question - 3 marks)

13. A drone A is hovering 15 m above B on level ground. A straight signal path AC makes 30° with BC at a ground receiver C.



(i) Find the horizontal range BC.

(ii) Find the signal-path length AC.

(iii) Find the depression angle from the drone to the receiver.