SmartKalike

CBSE Class 10 · Maths

Some Applications of Trigonometry

10 most probable questions for Boards 2027

Q1. 1 mark · Multiple choice

An observer looks down at an object below their horizontal level. The angle between the line of sight and the horizontal is called the:
(A) angle of elevation
(B) angle of depression
(C) right angle
(D) angle of incidence

Answer

(B) angle of depression — it is formed by the line of sight with the horizontal when the point viewed is below the horizontal level.

Q2. 2 marks · Short answer

State two kinds of heights or distances that can be determined using trigonometric ratios.

Answer

Trigonometric ratios help determine the height or length of an object, such as a tower, and the distance between two distant objects. These measurements can be found without directly measuring the object or distance.

Q3. 3 marks · Medium answer

Define the angle of elevation of a point on an object viewed by an observer. Specify how the position of the point viewed relates to the observer's horizontal level.

Answer

1. The angle of elevation of a point viewed is the angle formed by the line of sight with the horizontal when the point is above the horizontal level.
2. The observer looks upward and raises their head to view the point; therefore, the point lies higher than the observer's horizontal level.

Q4. 4 marks · Long answer

A student observes the top of a minar from a point on the ground. Explain what is meant by the line of sight in this situation and identify its endpoints.

Answer

The line of sight is the straight line drawn from an observer's eye to the point in an object that the observer views.
1. The first endpoint is the student's eye, from which the student looks towards the minar.
2. The second endpoint is the point on the minar being viewed; when the student observes its top, the endpoint is the top of the minar.

3. The straight line joining the student's eye to the top of the minar represents the line of sight in this situation.
4. As the top of the minar is above the student's horizontal level, the angle formed by this line of sight with the horizontal is the angle of elevation.
The line of sight therefore connects the observer's eye with the precise point being viewed.

Q5. 5 marks · Long answer

An observer's eye is 1.6 m above the ground. From a point 12 m horizontally from a vertical pole, the angle of elevation of its top from the observer's eye is 45°. Find the total height of the pole above the ground.

Answer

Given: The observer's eye is 1.6 m above the ground. The horizontal distance from the pole is 12 m, and the angle of elevation to the top is 45°.
Let h be the vertical distance from eye level to the pole's top, and let H be the pole's total height above ground.
Formula: In the right triangle, tan θ = opposite side/adjacent side.
Here, the opposite side is h and the adjacent side is 12 m.
Substitution: tan 45° = h/12.
Since tan 45° = 1, 1 = h/12.
Multiplying both sides by 12 gives h = 12 m.
The pole's total height includes the 1.6 m from the ground to the observer's eye.
Therefore, H = h + 1.6 m.
H = 12 m + 1.6 m = 13.6 m.
Answer: The total height of the pole is 13.6 m.

Q6. 7 marks · Very long answer

A tower stands vertically on level ground, and an observer views its top from a point on the ground. Describe how to model the situation with a right triangle and explain how to select a trigonometric ratio when the horizontal distance and angle of elevation are known but the tower's height is not. Use variables rather than numerical values.

Full answer on SmartKalike: https://smartkalike.com/cbse/class-10/maths/some-applications-of-trigonometry

Q7. 2 marks · Short answer

When an observer's eye is above the ground, what must be done with the height measured from eye level to the top of an object to obtain the object's total height?

Full answer on SmartKalike: https://smartkalike.com/cbse/class-10/maths/some-applications-of-trigonometry

Q8. 4 marks · Long answer

Explain how a right-triangle model and a suitable trigonometric ratio can be used to find an inaccessible height or the distance between two distant objects. Describe how the known angle and side determine which ratio to use.

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Q9. 2 marks · Short answer

Two parallel horizontal lines are crossed by a line of sight. The angle of depression from the upper horizontal is 38°. Find the angle of elevation from the lower horizontal.

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