

Some Applications of Trigonometry

CBSE Class 10 Maths · Knowledge organiser

KEY DEFINITIONS

Line of sight

The line from the observer's eye to the object being looked at.

Angle of elevation

The angle above the horizontal to an object higher than the eye.

Angle of depression

The angle below the horizontal to an object lower than the eye.

KEY FORMULAS

Height and distance $\tan \theta = \frac{\text{height}}{\text{horizontal distance}}$

Angle of elevation (looking up) = angle of depression (looking down) between the same two points; use 30° , 45° , 60°

WORKED EXAMPLE

A 12 m ladder leans against a wall and makes 60° with the ground. How high up the wall does it reach?

$$\sin 60^\circ = \frac{h}{12} \Rightarrow h = 12 \cdot \frac{\sqrt{3}}{2} = 6\sqrt{3} \text{ m.}$$

YOU SHOULD BE ABLE TO...

- Draw the right triangle for a height-and-distance problem and use $\tan$, $\sin$ or $\cos$ with 30° , 45° and 60° .
- Solve angle-of-depression problems and the standard two-triangle problems where the observer moves.
- Write full-marks 5-mark answers with a labelled figure, two equations and a final answer with units.
- Handle mixed elevation-and-depression problems, moving objects and speed, and the unusual two-triangle set-ups.

COMMON MISTAKES

- ✗ Measuring the angle of depression from the vertical instead of the horizontal.
- ✗ Forgetting the observer's eye height when a person's height is given.
- ✗ Using $\sin$ when the hypotenuse is not involved. Pick the ratio from the two sides you actually have.
- ✗ Rounding $\sqrt{3}$ too early. Keep surds until the last line.