MATHEMATICS

BYJU'S

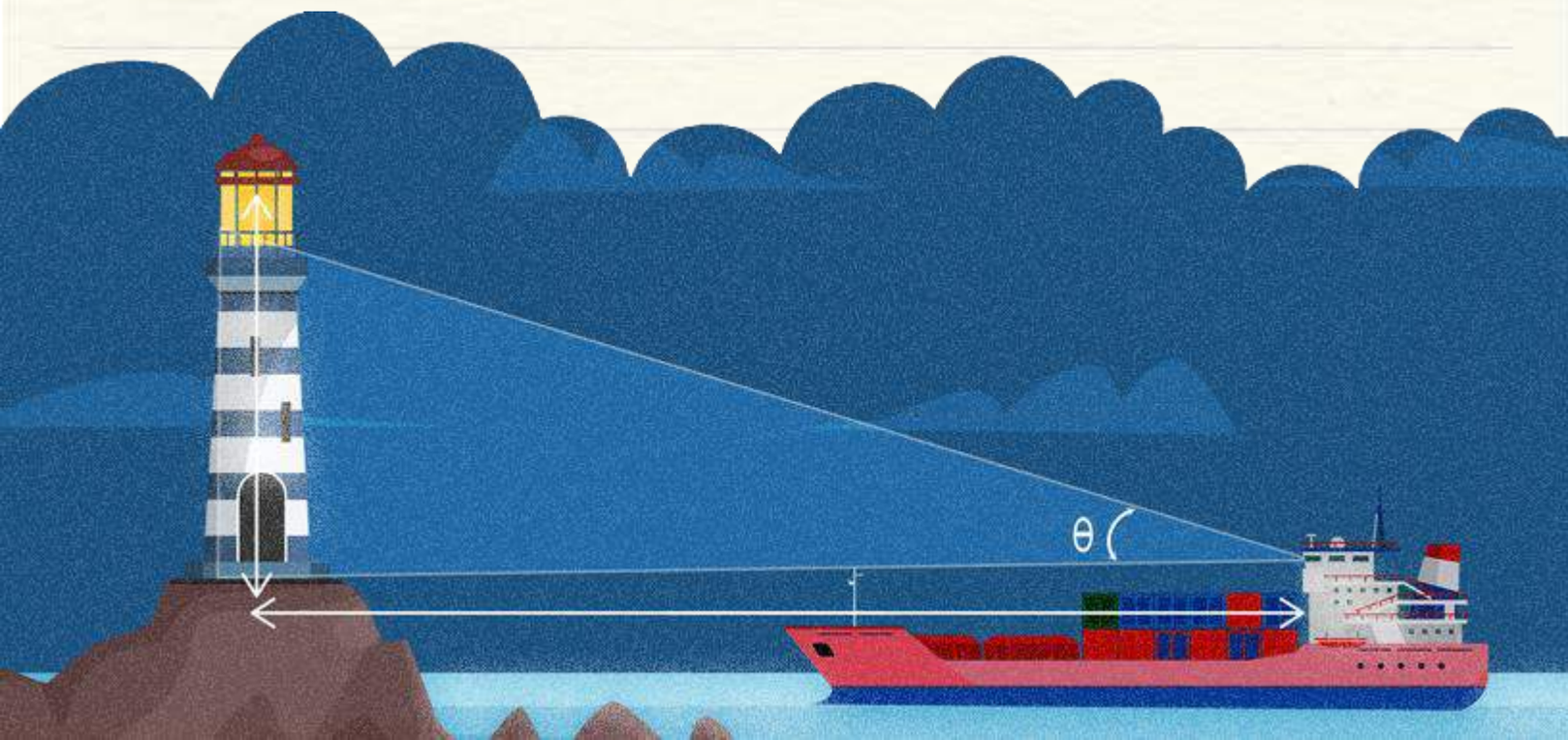
POST CLASS NOTES

Some Applications of Trigonometry

B

Topics

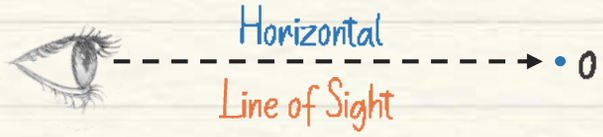
1. Basic Terminologies
2. Assumptions made while solving
3. Trigonometric Ratios of Some Common Angles
4. Method of Solving Questions



1. Basic Terminologies

Line of Sight

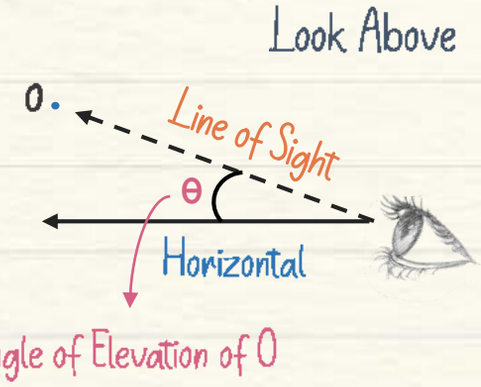
The line drawn from the eyes of an observer to a point on the object viewed.



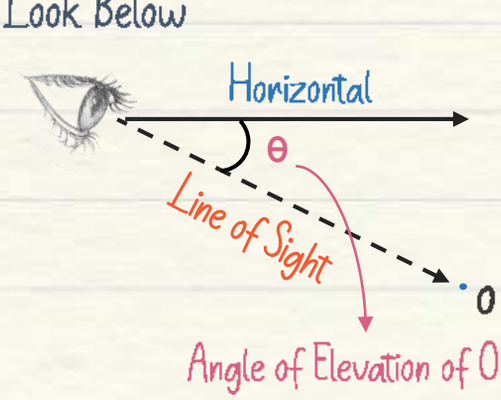
If the object to be viewed is straight ahead, then the line of sight is the same as the horizontal level.

Angle of Elevation

The angle formed by the line of sight with the horizontal when the point being viewed is above the horizontal level.



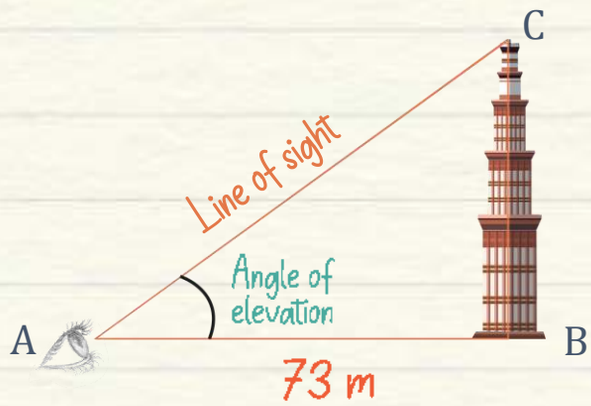
Angle of Depression



The angle formed by the line of sight with the horizontal when the point being viewed is below the horizontal level.

2. Assumptions Made While Solving

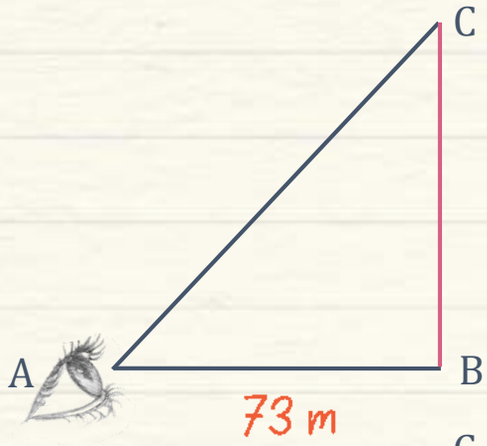
The angle of elevation of the top of the Qutub Minar, 73 m away from its base is 45°.



Steps to Draw the figure:

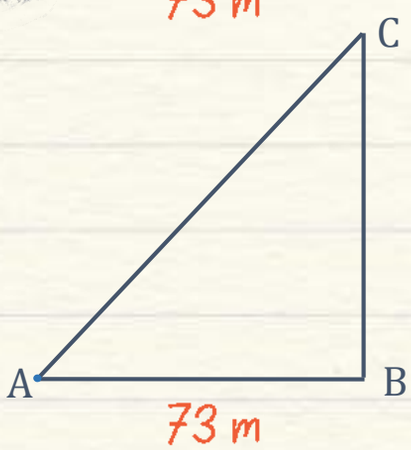
Step 1

Represent the 3D object by a vertical line.



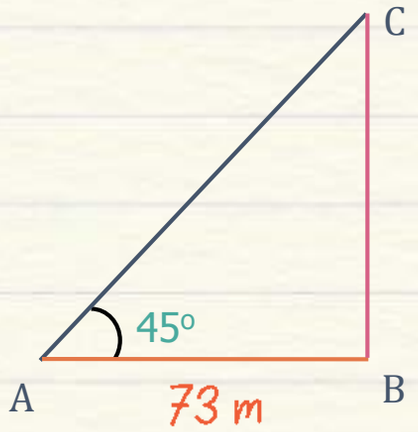
Step 2

Represent the observer as a point object.



Step 3

Label the angle, height, and distance.

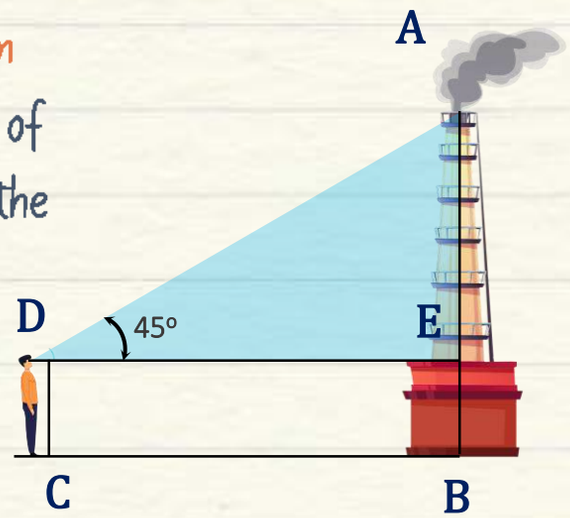


3. Trigonometric Ratios of Some Common Angles

Angles / Ratios	Logic	0°	30°	45°	60°	90°
$\sin\theta$	$\sin\theta$	0	$\frac{1}{2}$	$\frac{1}{\sqrt{2}}$	$\frac{\sqrt{3}}{2}$	1
$\cos\theta$	Reverse $\sin\theta$	1	$\frac{\sqrt{3}}{2}$	$\frac{1}{\sqrt{2}}$	$\frac{1}{2}$	0
$\tan\theta$	$\frac{\sin\theta}{\cos\theta}$	0	$\frac{1}{\sqrt{3}}$	1	$\sqrt{3}$	Not defined
$\operatorname{cosec}\theta$	$\frac{1}{\sin\theta}$	Not defined	2	$\sqrt{2}$	$\frac{2}{\sqrt{3}}$	1
$\sec\theta$	$\frac{1}{\cos\theta}$	1	$\frac{2}{\sqrt{3}}$	$\sqrt{2}$	2	Not defined
$\cot\theta$	$\frac{1}{\tan\theta}$	Not defined	$\sqrt{3}$	1	$\frac{1}{\sqrt{3}}$	0

4. Method of Solving Questions

An observer 1.5 m tall is 28.5 m away from a chimney. The angle of elevation of the top of the chimney from her eyes is 45°. What is the height of the chimney?



Steps to Draw the figure:

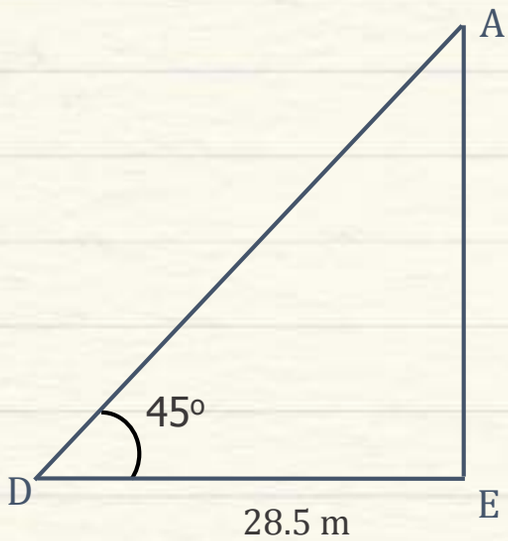
Step 1

Draw the figure correctly.

Step 2

Identify the unknown length.

AB = ?



Step 3

Use the relevant trigonometric ratios to find these lengths.

$$\tan 45^\circ = \frac{AE}{DE}$$

$$1 = \frac{AE}{28.5}$$

$$AE = 28.5 \text{ m}$$

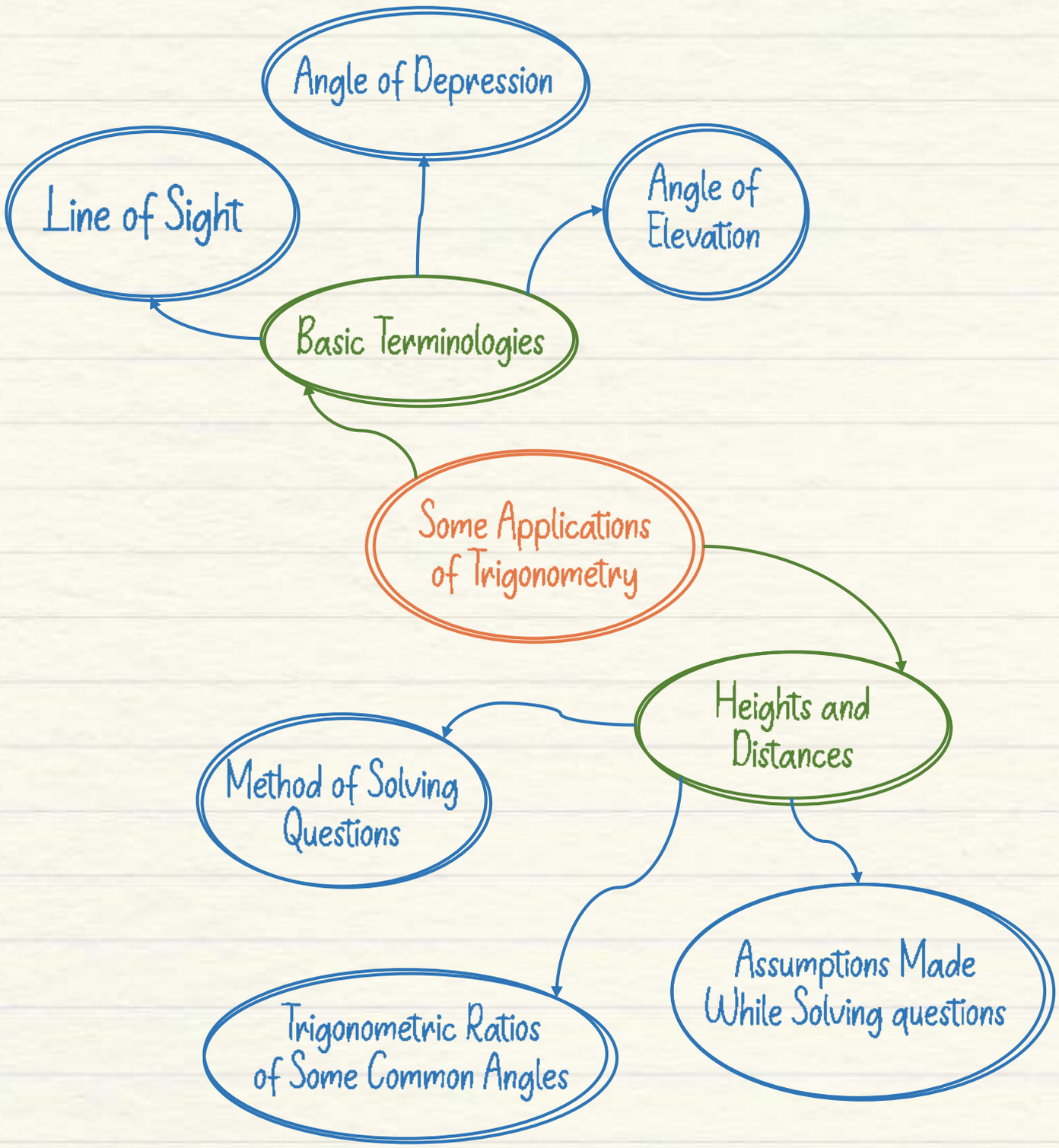
Step 4

Solve to find the unknown length

So, the height of the chimney

$$AB = (28.5 + 1.5) \text{ m} = 30 \text{ m}.$$

Mind Map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Line of Sight
Angle of Elevation
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Some Applications of Trigonometry
Heights and Distances
Method of Solving Questions
Assumptions Made While Solving questions
Trigonometric Ratios of Some Common Angles