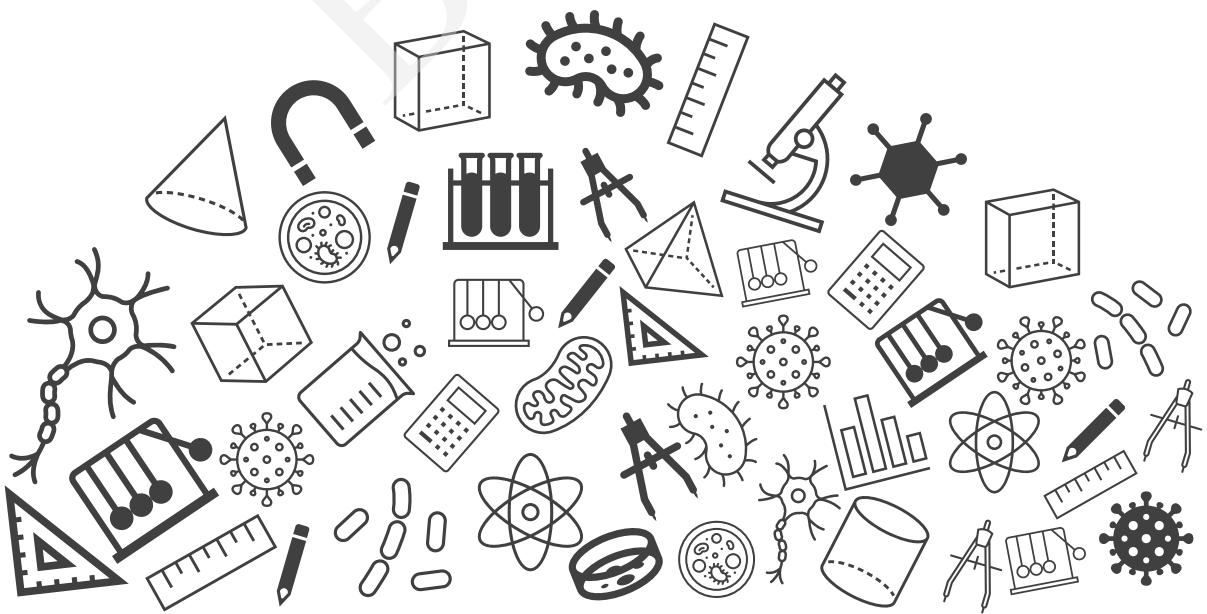




Grade 10

Mathematics Chapter Notes



M A T H E M A T I C S



Some Applications of Trigonometry

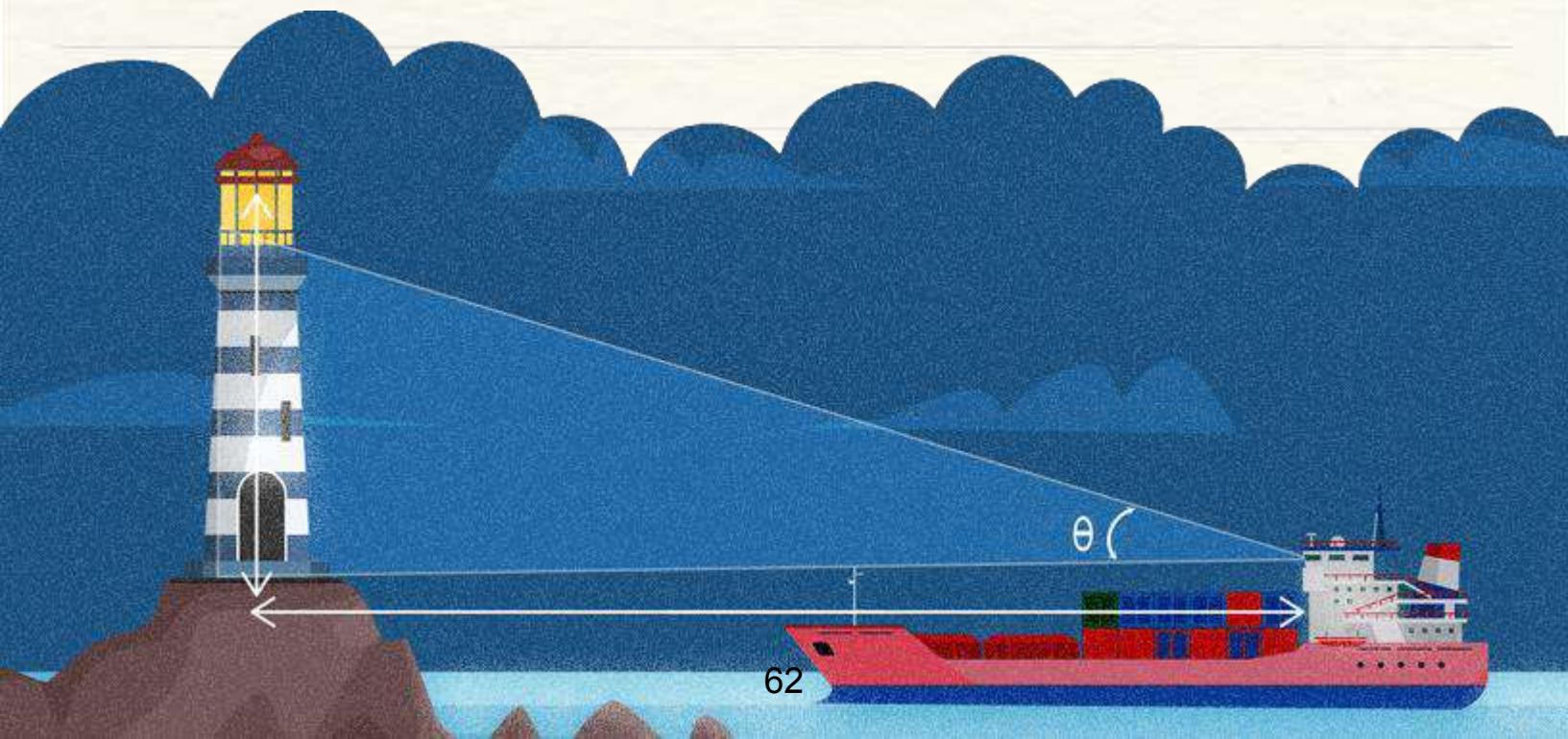




Topics



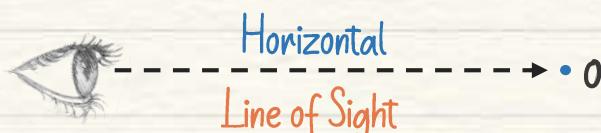
- 1. Basic Terminologies
- 2. Assumptions made while solving
- 3. Trigonometric Ratios of Some Common Angles
- 4. Method of Solving Questions



1. Basic Terminologies

Line of Sight

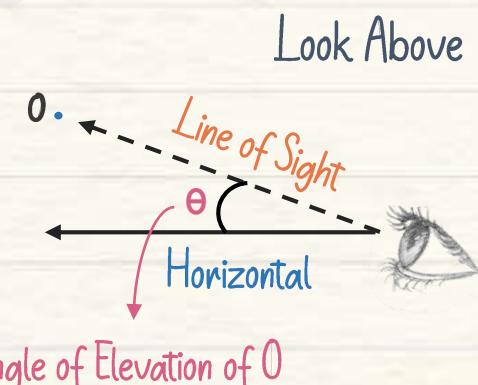
The line drawn from the eyes of an observer to a point on the object viewed.



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

Angle of Elevation

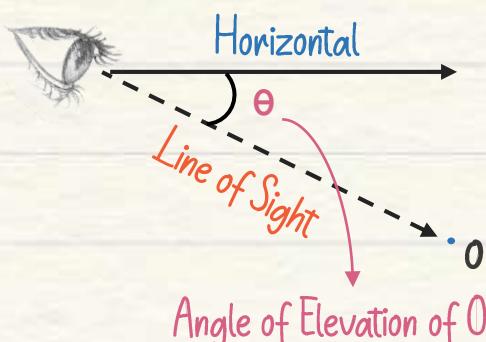
The angle formed by the line of sight with the horizontal when the **point** being viewed is above the **horizontal level**.



Angle of Elevation of θ

Angle of Depression

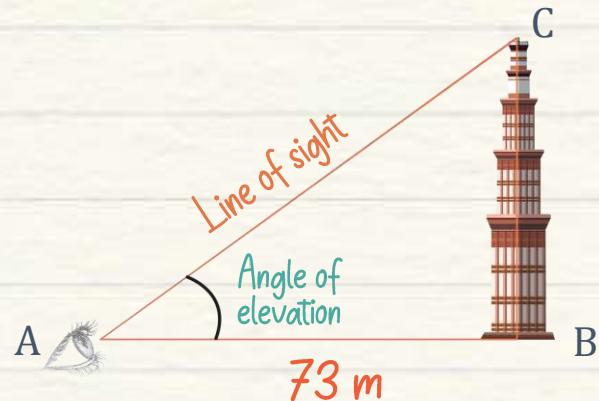
Look Below



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

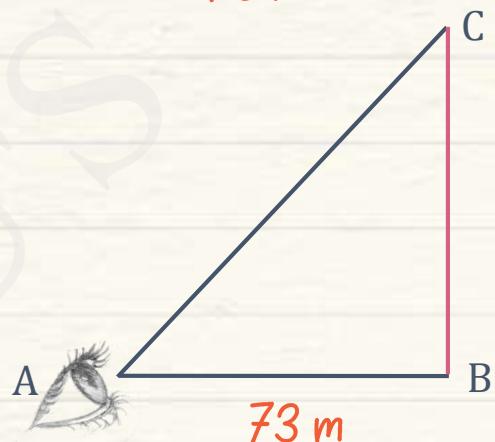
The angle of elevation of the top of the Qutub Minar, 73 m away from its base is 45° .



Steps to Draw the figure:

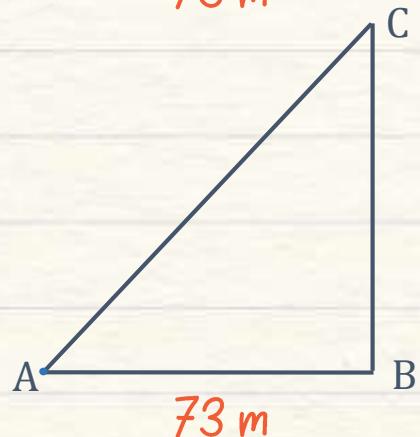
Step 1

Represent the 3D object by a vertical line.



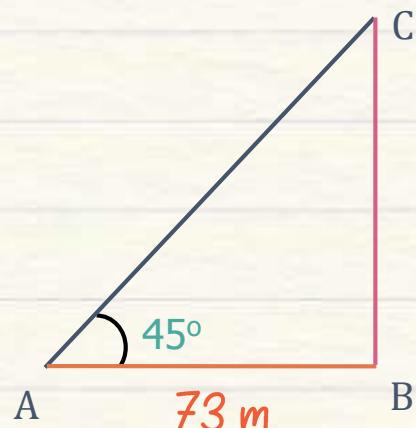
Step 2

Represent the observer as a point object.



Step 3

Label the angle, height, and distance.



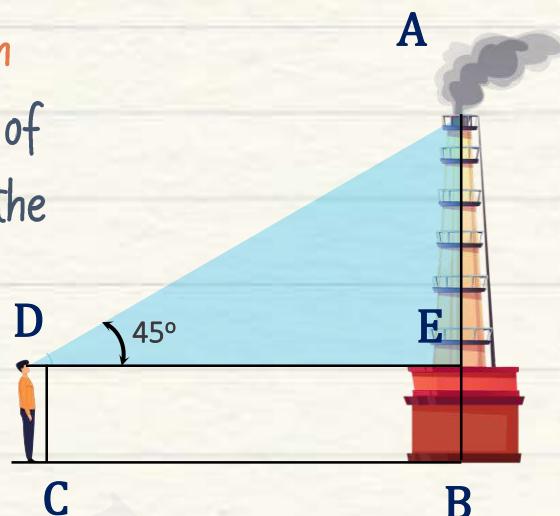


3. Trigonometric Ratios of Some Common Angles

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
cosec θ	$\frac{1}{\sin\theta}$	Not defined	2	$\sqrt{2}$	$\frac{2}{\sqrt{3}}$	1
sec θ	$\frac{1}{\cos\theta}$	1	$\frac{2}{\sqrt{3}}$	$\sqrt{2}$	2	Not defined
cot θ	$\frac{1}{\tan\theta}$	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.

$$AB = ?$$

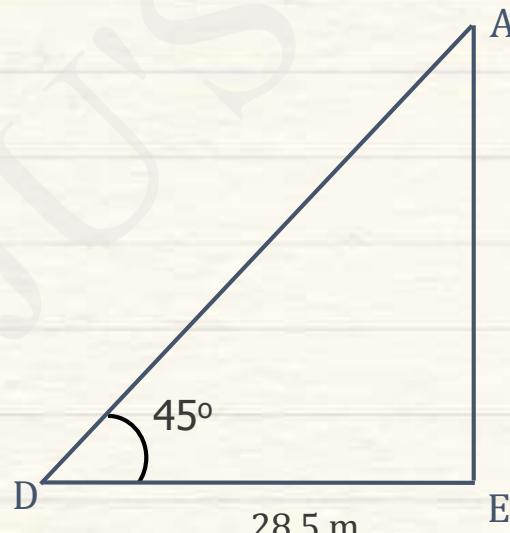
Step 3

Use the relevant trigonometric ratios to find these lengths.

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

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

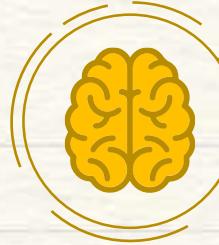
$$AE = 28.5 \text{ m}$$



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

