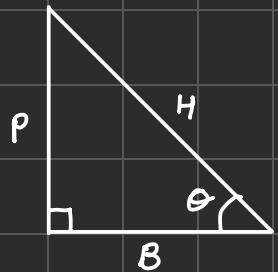


# Chapter - 8 : Introduction to Trigonometry

\* Notes



$$\sin \theta = \frac{P}{H}$$

$$\operatorname{cosec} \theta = \frac{H}{P}$$

$$\cos \theta = \frac{B}{H}$$

$$\sec \theta = \frac{H}{B}$$

$$\tan \theta = \frac{P}{B}$$

$$\cot \theta = \frac{B}{P}$$

0°    30°    45°    60°    90°

$\sin$	0	$\frac{1}{2}$	$\frac{1}{\sqrt{2}}$	$\frac{\sqrt{3}}{2}$	1
$\cos$	1	$\frac{\sqrt{3}}{2}$	$\frac{1}{\sqrt{2}}$	$\frac{1}{2}$	0
$\tan$	0	$\frac{1}{\sqrt{3}}$	1	$\sqrt{3}$	N.d.
$\operatorname{cosec}$	N.d.	2	$\sqrt{2}$	$\frac{2}{\sqrt{3}}$	1

\* Reciprocal Identities

$$\sin = \frac{1}{\operatorname{cosec}}, \quad \operatorname{cosec} = \frac{1}{\sin}$$

$$\cos = \frac{1}{\sec}, \quad \sec = \frac{1}{\cos}$$

$$\tan = \frac{1}{\cot}, \quad \cot = \frac{1}{\tan}$$

\* Identities

$$\frac{\sin}{\cos} = \tan, \quad \frac{\cos}{\sin} = \cot$$

$$\sin^2 \theta + \cos^2 \theta = 1$$

$$\tan^2 \theta + 1 = \sec^2 \theta$$

$$\cot^2 \theta + 1 = \operatorname{cosec}^2 \theta$$

sec	1	$\frac{2}{\sqrt{3}}$	$\sqrt{2}$	2	N.d.
cot	N.d.	$\sqrt{3}$	1	$\frac{1}{\sqrt{3}}$	0

\* How to Prove Questions.

- ① Apply identities
- ② Convert into "sin" or "cos".
- ③ Take common values
- ④ Take LCM
- ⑤ Rationalize
- ⑥ Apply polynomial identity:

$$a^2 + b^2 = (a+b)^2 - 2ab$$

$$(a+b)^2 = a^2 + b^2 + 2ab$$

$$a^3 - b^3 = (a-b)(a^2 + b^2 + ab)$$

$$a^3 + b^3 = (a+b)(a^2 + b^2 - ab)$$

$$(a+b)^3 = a^3 + b^3 + 3ab(a-b)$$

$$(a-b)^3 = a^3 - b^3 - 3ab(a+b)$$

- ⑦ Simplify