

CLASS 10 MATHS – CHAPTER 8

INTRODUCTION TO TRIGONOMETRY – ALL FORMULAE

Basic Idea

- Deals with angles & sides
- Right-angled triangle based
- Tri = 3, Gon = sides, Metron = measure
- Used in height & distance

Triangle Terms

- Opposite → opposite side of angle
- Adjacent → side just next to angle
- Hypotenuse → longest side
- Right angle = 90°
- Depends on reference angle
- Basis of all ratios

Trigonometric Ratios

- $\sin A = \text{Opp/Hyp}$
- $\cos A = \text{Adj/Hyp}$
- $\tan A = \text{Opp/Adj}$
- $\text{cosec } A = 1/\sin A$
- $\sec A = 1/\cos A$
- $\cot A = 1/\tan A$

Standard Values

- Angles: $0^\circ, 30^\circ, 45^\circ, 60^\circ, 90^\circ$
- $\sin \uparrow$ from 0 to 1
- $\cos \downarrow$ from 1 to 0
- $\tan \uparrow$ from 0 to ∞
- 0° & $90^\circ \rightarrow$ special cases
- ND \rightarrow not defined
- Must learn table

Identities

- $\sin^2 A + \cos^2 A = 1$
- $1 + \tan^2 A = \sec^2 A$
- $1 + \cot^2 A = \operatorname{cosec}^2 A$
- $\tan A = \sin A / \cos A$
- Used to simplify expressions
- True for all angles

Complementary Angles

- Sum = 90°
- $\sin(90-A) = \cos A$
- $\cos(90-A) = \sin A$
- $\tan(90-A) = \cot A$
- $\sec(90-A) = \operatorname{cosec} A$