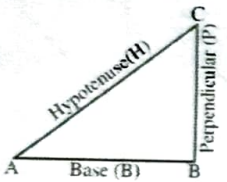
Introduction to Trigonometry and Trigonometric Identities

Trigonometry

Study of relationships between the sides & angles of a right triangle

Trigonometry Ratio



Sine of $\angle A$ *i.e.* $\sin A = \frac{BC}{AC}$

Cosine of $\angle A$ *i.e.* $\cos A = \frac{AB}{AC}$

Tangent of $\angle A$ *i.e.* $\tan A = \frac{BC}{AB}$

Cosecant of $\angle A$ *i.e.* $\text{cosec } A = \frac{AC}{BC}$

Secant of $\angle A$ *i.e.* $\sec A = \frac{AC}{AB}$

Cotangent of $\angle A$ *i.e.* $\cot A = \frac{AB}{BC}$

Reciprocal Relations :

(*i*) $\text{cosec } A = \frac{1}{\sin A}$

(*ii*) $\sec A = \frac{1}{\cos A}$

(*iii*) $\cot A = \frac{1}{\tan A}$

Quotient Relations :

(*i*) $\tan A = \frac{\sin A}{\cos A}$

(*ii*) $\cot A = \frac{\cos A}{\sin A}$

Trigonometric Identities

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

$1 + \tan^2 A = \sec^2 A \; ; \; 0 \le A \le 90°$

$\cot^2 A + 1 = \text{cosec}^2 A \; ; \; 0 \le A \le 90°$

Values

$\angle A$	0°	30°	45°	60°	90°
sin A	0	$\frac{1}{2}$	$\frac{1}{\sqrt{2}}$	$\frac{\sqrt{3}}{2}$	1
cos A	1	$\frac{\sqrt{3}}{2}$	$\frac{1}{\sqrt{2}}$	$\frac{1}{2}$	0
tan A	0	$\frac{1}{\sqrt{3}}$	1	$\sqrt{3}$	Not defined (∞)
cosec A	Not defined (∞)	2	$\sqrt{2}$	$\frac{2}{\sqrt{3}}$	1
sec A	1	$\frac{2}{\sqrt{3}}$	$\sqrt{2}$	2	Not defined (∞)
cot A	Not defined (∞)	$\sqrt{3}$	1	$\frac{1}{\sqrt{3}}$	0