Ch-8 Introduction to Trigonometry

1. The certain ratios involving the sides of a right angled triangle are called Trigonometric ratios. Here, 'b' is the base, 'h' is the hypotenuse, and 'p' is the perpendicular.
   $\sin A = \frac{\text{Perpendicular}}{\text{Hypotenuse}} = \frac{p}{h}$,
   $\cos A = \frac{\text{Base}}{\text{Hypotenuse}} = \frac{b}{h}$, and
   $\tan A = \frac{\text{Perpendicular}}{\text{Base}} = \frac{p}{b}$.
2. Reciprocals of the ratios are –
   $\text{cosec } A = \frac{1}{\sin A} = \frac{h}{p}$,
   $\sec A = \frac{1}{\cos A} = \frac{h}{b}$, and
   $\cot A = \frac{1}{\tan A} = \frac{b}{p}$.
3. Sin θ is a single symbol and sin cannot be detached from 'θ'. And sin θ ≠ sin x θ. This remark is true for other ratios as well.
4. **Trigonometric Ratios of some specific angles –**

Specific Angle **t-ratio**	**0º**	**30º**	**45º**	**60º**	**90º**
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

5. The value of sin A increases from 0 to 1, as A increases from 0º to 90º.
   The value of cos A decreases from 1 to 0, as A increases from 0º to 90º.
   The value of tan A increases from 0 to infinity, as A increases 0º to 90º.
   [$\sqrt{2}$ = 1.414 and $\sqrt{3}$ = 1.732].
6. **Trigonometric identities**
   a. $\text{Cos}^2 A + \sin^2 A = 1$,
   b. $1 + \tan^2 A = \sec^2 A$, and
   c. $\text{Cot}^2 A + 1 = \text{cosec}^2 A$.