



### Trigonometric Ratios Ex 5.1 Q1

**Answer :**

(i) Given:  $\sin A = \frac{2}{3}$  .....(1)

By definition,

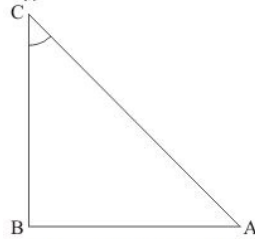
$$\sin A = \frac{\text{Perpendicular}}{\text{Hypotenuse}} \text{ ..... (2)}$$

By Comparing (1) and (2)

We get,

Perpendicular side = 2 and

Hypotenuse = 3



Therefore, by Pythagoras theorem,

$$AC^2 = AB^2 + BC^2$$

Now we substitute the value of perpendicular side (BC) and hypotenuse (AC) and get the base side (AB)

Therefore,

$$3^2 = AB^2 + 2^2$$

$$AB^2 = 3^2 - 2^2$$

$$AB^2 = 9 - 4$$

$$AB^2 = 5$$

$$AB = \sqrt{5}$$

$$\text{Hence, Base} = \sqrt{5}$$

$$\text{Now, } \cos A = \frac{\text{Base}}{\text{Hypotenuse}}$$

$$\cos A = \frac{\sqrt{5}}{3}$$

3

$$\text{Now, } \operatorname{cosec} A = \frac{1}{\sin A}$$

Therefore,

$$\operatorname{cosec} A = \frac{\text{Hypotenuse}}{\text{Perpendicular}}$$

$$\operatorname{cosec} A = \frac{3}{2}$$

$$\text{Now, } \sec A = \frac{\text{Hypotenuse}}{\text{Base}}$$

Therefore,

$$\sec A = \frac{3}{\sqrt{5}}$$

$$\text{Now, } \tan A = \frac{\text{Perpendicular}}{\text{Base}}$$

Therefore,

$$\tan A = \frac{2}{\sqrt{5}}$$

$$\text{Now, } \cot A = \frac{\text{Base}}{\text{Perpendicular}}$$

Therefore,

$$\cot A = \frac{\sqrt{5}}{2}$$

$$\text{(ii) Given: } \cos A = \frac{4}{5} \dots\dots (1)$$

By definition,

$$\cos A = \frac{\text{Base}}{\text{Hypotenuse}} \dots\dots (2)$$

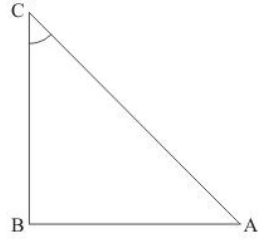
By Comparing (1) and (2)

We get,

Base = 4 and

Hypotenuse = 5

Hypotenuse = 5



Therefore,

By Pythagoras theorem,

$$AC^2 = AB^2 + BC^2$$

Now we substitute the value of base side (AB) and hypotenuse (AC) and get the perpendicular side (BC)

$$5^2 = 4^2 + BC^2$$

$$BC^2 = 5^2 - 4^2$$

$$BC^2 = 25 - 16$$

$$BC^2 = 9$$

$$BC = 3$$

Hence, Perpendicular side = 3

$$\text{Now, } \sin A = \frac{\text{Perpendicular}}{\text{Hypotenuse}}$$

Therefore,

$$\sin A = \frac{3}{5}$$

$$\text{Now, cosec} A = \frac{1}{\sin A}$$

Therefore,

$$\therefore \text{cosec} A = \frac{\text{Hypotenuse}}{\text{Perpendicular}}$$

$$\text{cosec} A = \frac{5}{3}$$

$$\text{Now, sec} A = \frac{1}{\cos A}$$

Therefore,

$$\text{sec} A = \frac{\text{Hypotenuse}}{\text{Base}}$$

$$\text{sec} A = \frac{5}{4}$$

$$\text{Now, tan} A = \frac{\text{Perpendicular}}{\text{Base}}$$

Therefore,

$$\tan A = \frac{3}{4}$$

\*\*\*\*\* END \*\*\*\*\*