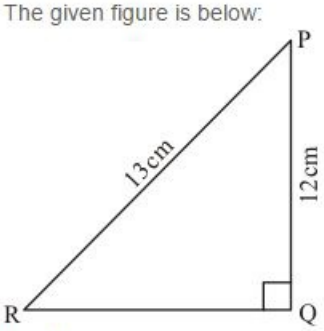
Trigonometric Ratios Ex 5.1 Q3

Answer :

The given figure is below:



To Find:

$\tan P, \cot R$

In the given right angled ΔPQR, length of side QR is unknown.

Therefore, to find length of side QR we use Pythagoras Theorem

Hence, by applying Pythagoras theorem in ΔPQR,

We get,

$PR^2 = PQ^2 + QR^2$

Now, we substitute the length of given side PR and PQ in the above equation

$13^2 = 12^2 + QR^2$

$QR^2 = 13^2 - 12^2$

$QR^2 = 169 - 144$

$QR^2 = 25$

$QR = \sqrt{25}$

$QR = 5$

By definition, we know that

$$\tan P = \frac{\text{Perpendicular side opposite to} \angle P}{\text{Base side adjacent to} \angle P}$$

$$\tan P = \frac{QR}{PQ}$$

$$\tan P = \frac{5}{12} \quad \ldots (1)$$

Also, by definition, we know that

$$\cot R = \frac{\text{Base side adjacent to} \angle R}{\text{Perpendicular side opposite to} \angle R}$$

$$\cot R = \frac{QR}{PQ}$$

$$\cot R = \frac{5}{12} \quad \ldots (2)$$

Comparing equation (1) and (2) , we come to know that R.H.S of both the equation are equal

Therefore, L.H.S of both the equation are also equal

$\tan P = \cot R$

Answer:

$$\text{Yes, } \tan P = \cot R = \frac{5}{12}$$

Trigonometric Ratios Ex 5.1 Q4

Answer :

Given: $\sin A = \frac{9}{41}$ .....(1)

To Find: $\cos A, \tan A$

By definition,

$\sin A = \frac{\text{Perpendicular side opposite to} \angle A}{\text{Hypotenuse}}$ ..... (2)

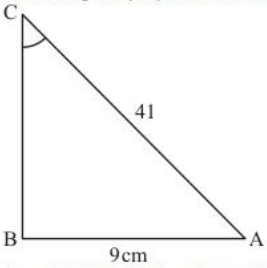
By Comparing (1) and (2)

We get,

Perpendicular side = 9 and

Hypotenuse = 41

Now using the perpendicular side and hypotenuse we can construct ΔABC as shown below



Length of side AB is unknown in right angled ΔABC,

To find length of side AB, we use Pythagoras theorem.

Therefore, by applying Pythagoras theorem in ΔABC,

We get,

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

$$41^2 = AB^2 + 9^2$$

$$AB^2 = 41^2 - 9^2$$

$$AB^2 = 1681 - 81$$

$$AB^2 = 1600$$

$$AB = \sqrt{1600}$$

$$AB = 40$$

Hence, length of side AB = 40

Now,

By definition,

$$\cos A = \frac{\text{Base side adjacent to} \angle A}{\text{Hypotenuse}}$$

$$\cos A = \frac{AB}{AC}$$

$$\cos A = \frac{40}{41}$$

Now,

By definition,

$$\tan A = \frac{\text{Perpendicular side opposite to} \angle A}{\text{Base side adjacent to} \angle A}$$

$$\tan A = \frac{BC}{AB}$$

$$\tan A = \frac{9}{40}$$

Answer: $\cos A = \frac{40}{41}$ and $\tan A = \frac{9}{40}$

********** END **********