

## Trigonometric Ratios Ex 5.1 Q6

## Answer:

Given:

 $\Delta PQR$  is right angled at vertex Q.

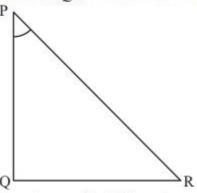
PQ = 4 cm

RQ = 3 cm

To find:

 $\sin P$ ,  $\sin R$ ,  $\sec P$ ,  $\sec R$ 

Given  $\Delta PQR$  is as shown below



Hypotenuse side PR is unknown.

Therefore, we find side PR of  $\Delta PQR$  by Pythagoras theorem By applying Pythagoras theorem to  $\Delta PQR$  We get,

 $PR^2 = PQ^2 + RQ^2$ 

Substituting values of sides from the above figure

$$PR^2 = 4^2 + 3^2$$

$$PR^2 = 16 + 9$$

$$PR^{2} = 25$$

$$PR = \sqrt{25}$$

$$PR = 5$$

Hence, Hypotenuse = 5

Now by definition,

$$\sin P = \frac{\text{Perpendicular side opposite to} \angle P}{\text{Hypotenuse}}$$

$$\sin P = \frac{RQ}{PR}$$

Substituting values of sides from the above figure

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

Now by definition,

$$\sin R = \frac{\text{Perpendicular side opposite to} \angle R}{\text{Hypotenuse}}$$

$$\sin R = \frac{PQ}{PR}$$

Substituting values of sides from the above figure

$$\sin R = \frac{4}{5}$$

By definition,

$$\sec P = \frac{1}{\cos P}$$

$$\sec P = \frac{1}{\frac{\text{Base side adjacent to } \angle P}{\text{Hypotenuse}}}$$

$$\sec P = \frac{\text{Hypotenuse}}{\text{Base side adjacent to } \angle P}.$$

Substituting values of sides from the above figure

$$\sec P = \frac{PR}{PQ}$$
$$\sec P = \frac{5}{4}$$

By definition,

$$\sec R = \frac{1}{\cos R}$$

$$\sec R = \frac{1}{\frac{\text{Base side adjacent to } \angle R}{\text{Hypotenuse}}}$$

$$\sec R = \frac{\text{Hypotenuse}}{\text{Base side adjacent to } \angle R}.$$

Substituting values of sides from the above figure

$$\sec R = \frac{PR}{RQ}$$
$$\sec R = \frac{5}{3}$$

Answer: 
$$\sin P = \frac{3}{5}$$
,  $\sin R = \frac{4}{5}$ ,  $\sec P = \frac{5}{4}$  and  $\sec R = \frac{5}{3}$ 

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