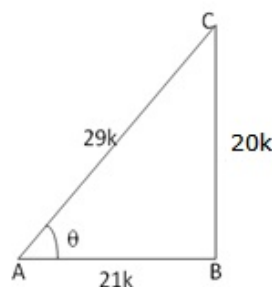




Question 16

Given: $\tan \theta = \frac{20}{21} = \frac{20k}{21k}$

Let us draw a ΔABC in which $\angle B = 90^\circ$ and $\angle A = \theta$



By Pythagoras theorem, we have

$$\begin{aligned} AC^2 &= AB^2 + BC^2 \\ &= (21k)^2 + (20k)^2 \\ &= 441k^2 + 400k^2 \\ &= 841k^2 \end{aligned}$$

$$\therefore AC = 29k$$

$$\sin \theta = \frac{BC}{AC} = \frac{20k}{29k} = \frac{20}{29}, \cos \theta = \frac{AB}{AC} = \frac{21k}{29k} = \frac{21}{29}$$

$$\begin{aligned} \text{L.H.S.} &= \frac{1 - \sin \theta + \cos \theta}{1 + \sin \theta + \cos \theta} = \frac{1 - \frac{20}{29} + \frac{21}{29}}{1 + \frac{20}{29} + \frac{21}{29}} = \frac{\frac{29 - 20 + 21}{29}}{\frac{29 + 20 + 21}{29}} \\ &= \frac{30}{70} = \frac{3}{7} = \text{R.H.S} \end{aligned}$$

***** END *****