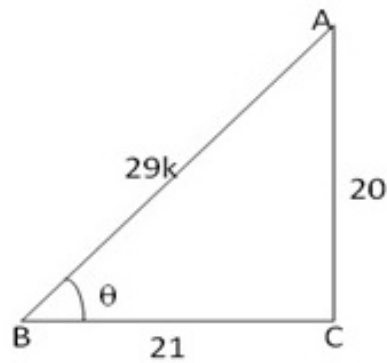




### Question 19

Given:  $\triangle ABC$  in which  $\angle B = 90^\circ$  and  $\angle A = \theta$ ,  $BC = 21$  cm units and  $AB = 29$  units



By Pythagoras theorem, we have

$$\Rightarrow (AC)^2 = (AB)^2 - (BC)^2$$

$$\Rightarrow (AC)^2 = [(29)^2 - (21)^2]$$

$$\Rightarrow (AC)^2 = 841 - 441$$

$$\Rightarrow (AC)^2 = 400$$

$$\Rightarrow AC = \sqrt{400} = 20$$

$$\therefore AC = 20 \text{ units}$$

$$\cos \theta = \frac{BC}{AB} = \frac{21}{29}$$

$$\sin \theta = \frac{AC}{AB} = \frac{20}{29}$$

$$\begin{aligned} \text{(i)} \quad (\cos^2 \theta + \sin^2 \theta) &= \left(\frac{21}{29}\right)^2 + \left(\frac{20}{29}\right)^2 \\ &= \frac{441}{841} + \frac{400}{841} \\ &= \frac{841}{841} \\ &= 1 \end{aligned}$$

$$\therefore \text{R.H.S.} = \text{L.H.S.}$$

$$\begin{aligned} \text{(ii)} \quad (\cos^2 \theta - \sin^2 \theta) &= \left(\frac{21}{29}\right)^2 - \left(\frac{20}{29}\right)^2 \\ &= \frac{441}{841} - \frac{400}{841} = \frac{41}{841} \end{aligned}$$

$$\text{Hence, } (\cos^2 \theta - \sin^2 \theta) = \frac{41}{841}$$

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