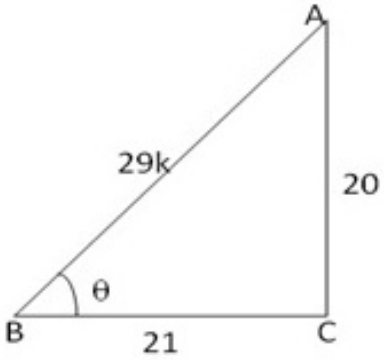
Question 19

Given: ΔABC in which ∠B = 900 and ∠A = θ, BC = 21cm units and AB = 29 units



By Pythagoras theorem, we have

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

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

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

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

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

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

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

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

$$\text{(i)} \left(\cos^2\theta + \sin^2\theta\right) = \left(\frac{21}{29}\right)^2 + \left(\frac{20}{29}\right)^2$$

$$= \frac{441}{841} + \frac{400}{841}$$

$$= \frac{841}{841}$$

$$= 1$$

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

$$\text{(ii)} \quad \left(\cos^2\theta - \sin^2\theta\right) = \left(\frac{21}{29}\right)^2 - \left(\frac{20}{29}\right)^2$$

$$= \frac{441}{841} - \frac{400}{841} = \frac{41}{841}$$

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

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