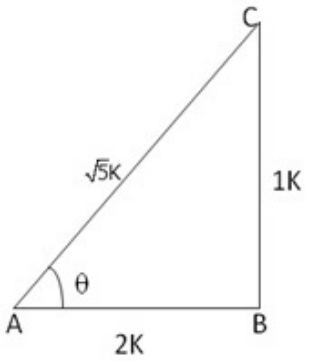
Question 4

Given: $cot\theta = \frac{AB}{BC} = \frac{2}{1}$

Let AB = 2k and AC = 1k,

Where k is positive

Let us draw a ΔABC in which ∠B = 90^0 and ∠BAC = θ



By Pythagoras theorem, we have

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

$$(AC)^2 = (AB)^2 + (BC)^2 = \left[(2k)^2 + (1k)^2\right]$$

$$= \left(4k^2 + 1k^2\right) = 5k^2$$

$$\therefore AC = \sqrt{5k^2} = \sqrt{5}k$$

$$\therefore \sin\theta = \frac{BC}{AC} = \frac{1k}{\sqrt{5}k} = \frac{1}{\sqrt{5}}$$

$$\cos\theta = \frac{AB}{AC} = \frac{2k}{\sqrt{5}k} = \frac{2}{\sqrt{5}}$$

$$\tan\theta = \frac{1}{\cot\theta} = \frac{1}{2}; \cot\theta = 2 \text{ (given)}$$

$$\operatorname{cosec}\theta = \frac{1}{\sin\theta} = \sqrt{5}$$

$$\sec\theta = \frac{1}{\cos\theta} = \frac{\sqrt{5}}{2}$$

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