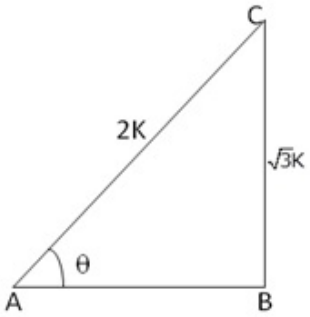
Exercise 5

Question 1:

Given: $sin\theta = \frac{\sqrt{3}}{2}$

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



Then, $\sin\theta = \frac{BC}{AC} = \frac{\sqrt{3}}{2}$

Let BC = $\sqrt{3}k$

and AC = 2k,

where k is positive

By pythagoras theorem, we have

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

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

$AB^2 = \left[(2k)^2 - \left(\sqrt{3}k\right)^2\right]$

$= \left(4k^2 - 3k^2\right)$

$\Rightarrow AB = \sqrt{k^2} = k$

$\therefore \sin\theta = \frac{BC}{AC} = \frac{\sqrt{3}k}{2k} = \frac{\sqrt{3}}{2}$,

$\cos\theta = \frac{AB}{AC} = \frac{k}{2k} = \frac{1}{2}$

$\tan\theta = \frac{\sin\theta}{\cos\theta} = \left(\frac{\sqrt{3}}{2} \times \frac{2}{1}\right) = \sqrt{3}$;

$\text{cosec}\,\theta = \frac{1}{\sin\theta} = \frac{2}{\sqrt{3}}$,

$\sec\theta = \frac{1}{\cos\theta} = \frac{2}{1} = 2$ and

$\cot\theta = \frac{1}{\tan\theta} = \frac{1}{\sqrt{3}}$

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