

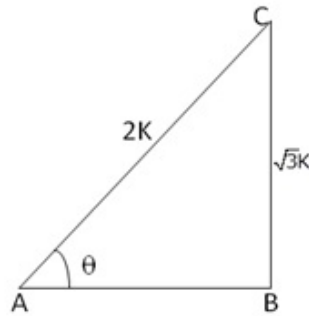


Exercise 5

Question 1:

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

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



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

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

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

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

$$= (4k^2 - 3k^2)$$

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

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

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

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

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

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

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

***** END *****

