VECTORS

1 12^{th} Maths - EXERCISE-10.3

1. Find the angle between two vectors $\overrightarrow{a}$ and $\overrightarrow{b}$ with magnitudes $\sqrt{3}$ and 2 respectively having $\overrightarrow{a}.\overrightarrow{b} = \sqrt{6}$.

Solution: Given points are

$$\left\|\mathbf{a}^\top \mathbf{a}\right\| = \sqrt{3} \tag{1}$$
$$\left\|\mathbf{b}^\top \mathbf{b}\right\| = 2 \tag{2}$$
$$\mathbf{a}^\top.\mathbf{b} = \sqrt{6} \tag{3}$$

$$\mathbf{a}^\top.\mathbf{b} = \sqrt{\mathbf{a}^\top \mathbf{a}}\sqrt{\mathbf{b}\top\mathbf{b}}cos\theta \tag{4}$$
$$\sqrt{6} = \sqrt{3} \times 2 \times cos\theta \tag{5}$$
$$cos\theta = \frac{\sqrt{6}}{\sqrt{3} \times 2} \tag{6}$$
$$= \frac{1}{\sqrt{2}} \tag{7}$$
$$\theta = 45^\circ \tag{8}$$