

# VECTORS

## 1 12<sup>th</sup> Maths - EXERCISE-10.3

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

**Solution:** Given points are

$$\|\mathbf{a}^\top \mathbf{a}\| = \sqrt{3} \quad (1)$$

$$\|\mathbf{b}^\top \mathbf{b}\| = 2 \quad (2)$$

$$\mathbf{a}^\top \mathbf{b} = \sqrt{6} \quad (3)$$

$$\mathbf{a}^\top \mathbf{b} = \sqrt{\mathbf{a}^\top \mathbf{a}} \sqrt{\mathbf{b}^\top \mathbf{b}} \cos \theta \quad (4)$$

$$\sqrt{6} = \sqrt{3} \times 2 \times \cos \theta \quad (5)$$

$$\cos \theta = \frac{\sqrt{6}}{\sqrt{3} \times 2} \quad (6)$$

$$= \frac{1}{\sqrt{2}} \quad (7)$$

$$\theta = 45^\circ \quad (8)$$