2.9.17

AI25BTECH11001 - ABHISEK MOHAPATRA

October 1, 2025

Question: If $\|\mathbf{A}\|$ =2, $\|\mathbf{B}\| = 7$,and $\mathbf{A} \times \mathbf{B} = \begin{pmatrix} 3 \\ 2 \\ 6 \end{pmatrix}$, find the angle between $\mathbf{A}$ and $\mathbf{B}$.

Solution: Given

$$\|\mathbf{A}\| = 2, \|\mathbf{B}\| = 7, \mathbf{A} \times \mathbf{B} = \begin{pmatrix} 3 \\ 2 \\ 6 \end{pmatrix} \tag{0.1}$$

We have to find the angle between $\mathbf{A}$ and $\mathbf{B}$.So,we can use the following equation

$$\|\mathbf{A} \times \mathbf{B}\| = \|\mathbf{A}\| \times \|\mathbf{B}\| \sin(\theta) \tag{0.2}$$

where θ is the angle. so,

$$\sqrt{3^2 + 2^2 + 6^2} = 2 \times 7 \times \sin(\theta) \tag{0.3}$$

$$\sin(\theta) = \frac{1}{2} \Rightarrow \theta = 30^\circ \tag{0.4}$$

So, thde angle is 30°.