1.8.11

AI25BTECH11035 - SUJAL RAJANI

Question:
AOBC is a rectangle whose three vertices are vertices $\mathbf{A}(0,3), \mathbf{O}(0,0), \mathbf{B}(5,0)$. The length of diagonal is _____. **Solution:**
From the given information,

$$\mathbf{A} = \begin{pmatrix} 0 \\ 3 \end{pmatrix}, \mathbf{O} = \begin{pmatrix} 0 \\ 0 \end{pmatrix}, \mathbf{B} = \begin{pmatrix} 5 \\ 0 \end{pmatrix} \tag{1}$$

Then the direction vector of the diagonal AB is :

$$\mathbf{A} - \mathbf{B} = \begin{pmatrix} 0 \\ 3 \end{pmatrix} - \begin{pmatrix} 5 \\ 0 \end{pmatrix} = \begin{pmatrix} -5 \\ 3 \end{pmatrix}, \tag{2}$$

the length of the diagonal is :

$$(\mathbf{A} - \mathbf{B})^T (\mathbf{A} - \mathbf{B}) = 34 \Rightarrow AB = \|\mathbf{A} - \mathbf{B}\| = \sqrt{34} > \tag{3}$$