1.8.11

AI25BTECH11035 - SUJAL RAJANI

Question:
AOBC is a rectangle whose three vertices are vertices A(0,3),O(0,0),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 length of the diagonal AB is :

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

$$\tag{3}$$

$$(\mathbf{A} - \mathbf{B})^T (\mathbf{A} - \mathbf{B}) = 34 \tag{4}$$

Thus the desired distance is

$$\implies AB = \|\mathbf{A} - \mathbf{B}\| = \sqrt{34} \tag{5}$$