1.8.11

AI25BTECH11035 - SUJAL RAJANI

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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,

$$\mathbf{A} = \begin{pmatrix} 0 \\ 3 \end{pmatrix}, \mathbf{O} = \begin{pmatrix} 0 \\ 0 \end{pmatrix}, \mathbf{B} = \begin{pmatrix} 5 \\ 0 \end{pmatrix} \tag{0.1}$$

Then the length of the diagonal AB is :

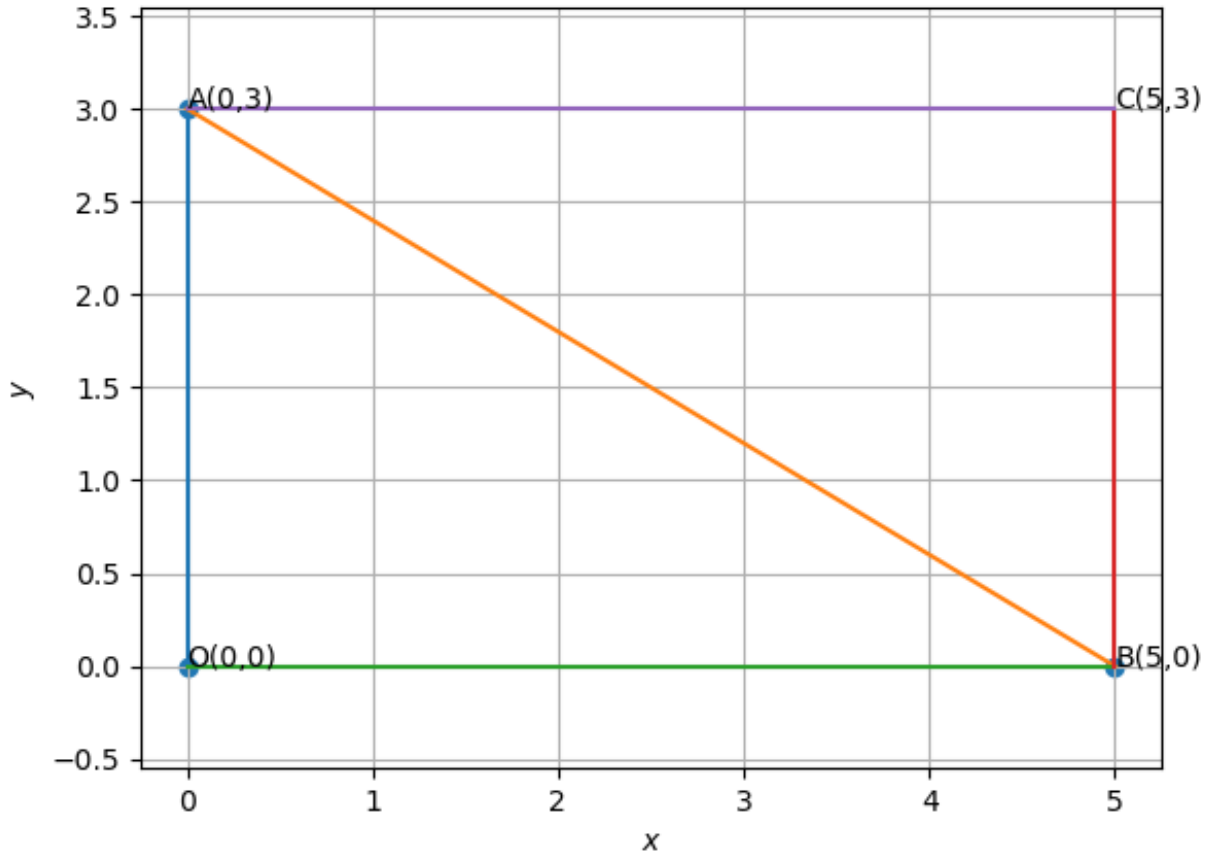
$$\mathbf{A\text{-}B} = \begin{pmatrix} 0 \\ 3 \end{pmatrix} - \begin{pmatrix} 5 \\ 0 \end{pmatrix} = \begin{pmatrix} -5 \\ 3 \end{pmatrix}, \tag{0.2}$$

$$\tag{0.3}$$

$$\mathbf{(A\text{-}B)}^T\mathbf{(A\text{-}B)} = 34 \tag{0.4}$$

Thus the desired distance is

$$\Rightarrow AB = \text{——}\mathbf{A\text{-}B}\text{——} = \sqrt{34} \tag{0.5}$$


A(0,3)
C(5,3)
O(0,0)
B(5,0)
3.5
3.0
2.5
2.0
1.5
1.0
0.5
0.0
−0.5
0
1
2
3
4
5
y
x