

Question-1-1.9-9

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Question:

Find the distance between the points $\mathbf{A} \left(-\frac{7}{3}, 5 \right)$ and $\mathbf{B} \left(\frac{2}{3}, 5 \right)$.

Solution:

Variable	Description	Formula
A	A Point to be plotted	$A = \begin{pmatrix} -\frac{7}{3} \\ 5 \end{pmatrix}$
B	A Point to be plotted	$B = \begin{pmatrix} \frac{2}{3} \\ 5 \end{pmatrix}$

TABLE 0: variables used

$$\mathbf{A} - \mathbf{B} = \begin{pmatrix} -3 \\ 0 \end{pmatrix} \quad (0.1)$$

$$(\mathbf{A} - \mathbf{B})^T (\mathbf{A} - \mathbf{B}) = 9 \quad (0.2)$$

Thus, the desired distance is

$$d = \|\mathbf{A} - \mathbf{B}\| = \sqrt{9} \quad (0.3)$$

$$\implies d = 3 \quad (0.4)$$

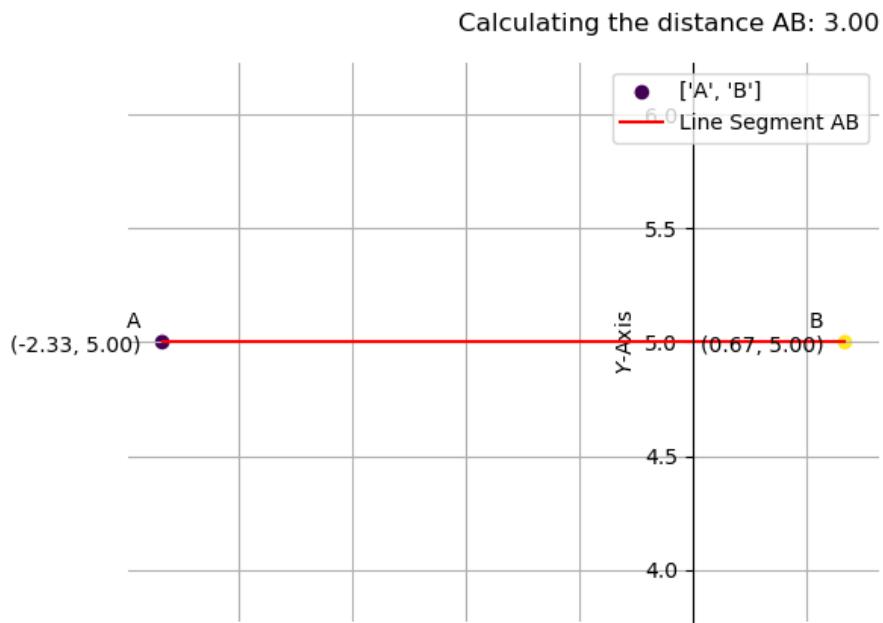


Fig. 0.1