

Assignment 1

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AI20MTECH14004

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Solution: Given,

$$\mathbf{P} = \begin{pmatrix} 7 \\ 6 \end{pmatrix} \quad \mathbf{Q} = \begin{pmatrix} 3 \\ 4 \end{pmatrix} \quad (1)$$

A vector on the X-axis \mathbf{X} is equidistant to both \mathbf{P} and \mathbf{Q} .

$$\text{i.e. } \mathbf{X} = \frac{\mathbf{P} + \mathbf{Q}}{2} \quad (2)$$

Need to find k. Let $\mathbf{X} = k \begin{pmatrix} 1 \\ 0 \end{pmatrix}$ be the vector on the X-axis.

$$\implies (1 \ 0) \mathbf{X} = k \quad (3)$$

$$\implies \mathbf{X} = \frac{\begin{pmatrix} 7 \\ 6 \end{pmatrix} + \begin{pmatrix} 3 \\ 4 \end{pmatrix}}{2} \quad (4)$$

$$\implies \mathbf{X} = \begin{pmatrix} 5 \\ 5 \end{pmatrix} \quad (5)$$

$$\implies (1 \ 0) \mathbf{X} = (1 \ 0) \begin{pmatrix} 5 \\ 5 \end{pmatrix} \quad (6)$$

$$(7)$$

Therefore, $k = 5$ i.e. $\mathbf{X} = \begin{pmatrix} 5 \\ 0 \end{pmatrix}$

Plot

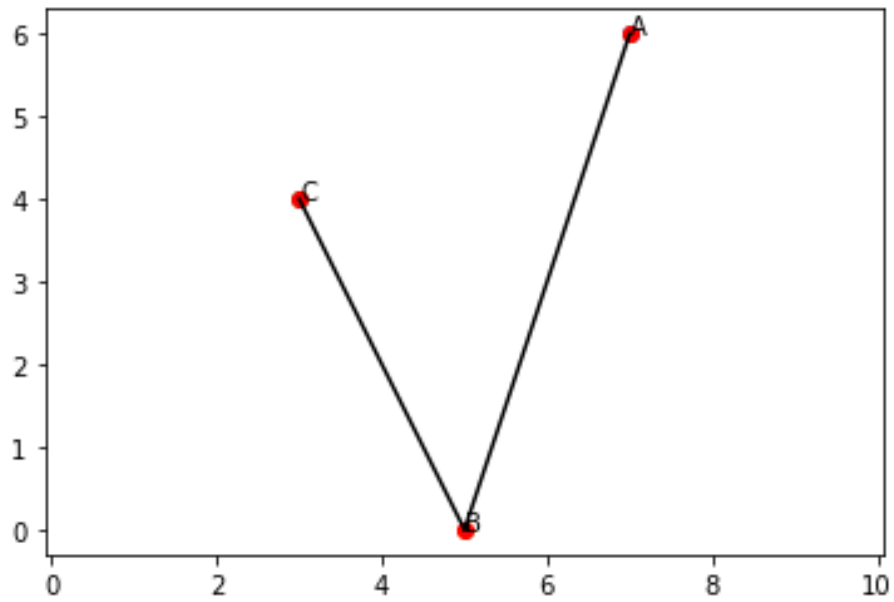


Figure 1: Plot representing the Points