

# ASSIGNMENT-1

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Question 1.1.2 : Find the length of side BC.

**Solution:** Given,

$$\mathbf{A} = \begin{pmatrix} 1 \\ -1 \end{pmatrix}, \mathbf{B} = \begin{pmatrix} -4 \\ 6 \end{pmatrix}, \mathbf{C} = \begin{pmatrix} -3 \\ -5 \end{pmatrix} \quad (1)$$

$$\|\mathbf{B} - \mathbf{C}\| = \sqrt{(\mathbf{B} - \mathbf{C})^\top (\mathbf{B} - \mathbf{C})} \quad (2)$$

$$\mathbf{B} - \mathbf{C} = \begin{pmatrix} -4 \\ 6 \end{pmatrix} - \begin{pmatrix} -3 \\ -5 \end{pmatrix} \quad (3)$$

$$\mathbf{B} - \mathbf{C} = \begin{pmatrix} -1 \\ 11 \end{pmatrix} \quad (4)$$

$$(\mathbf{B} - \mathbf{C})^\top = \begin{pmatrix} -1 \\ 11 \end{pmatrix}^\top = (-1 \ 11) \quad (5)$$

$$(\mathbf{B} - \mathbf{C})^\top (\mathbf{B} - \mathbf{C}) = \begin{pmatrix} -1 \\ 11 \end{pmatrix}^\top (-1 \ 11) \quad (6)$$

$$= 1 + 121 \quad (7)$$

$$= 122 \quad (8)$$

$$\sqrt{(\mathbf{B} - \mathbf{C})^\top (\mathbf{B} - \mathbf{C})} = \sqrt{122} \quad (9)$$

$$\Rightarrow \|\mathbf{B} - \mathbf{C}\| = \sqrt{122} \quad (10)$$