

# Solution to problem 1.1.1

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Consider a triangle with vertices

$$\mathbf{A} = \begin{pmatrix} 1 \\ -1 \end{pmatrix} \quad (1)$$

$$\mathbf{B} = \begin{pmatrix} -4 \\ 6 \end{pmatrix} \quad (2)$$

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

## Question 1.1.1

The Direction Vector of AB is defined as

$$\mathbf{B} - \mathbf{A} \quad (4)$$

Find the Direction Vectors of AB,BC,CA.

## Solution:

The Direction Vector of

$$AB = \mathbf{B} - \mathbf{A} \quad (5)$$

$$= \begin{pmatrix} -4 - (1) \\ 6 - (-1) \end{pmatrix} = \begin{pmatrix} -5 \\ 7 \end{pmatrix} \quad (6)$$

$$BC = \mathbf{C} - \mathbf{B} \quad (7)$$

$$= \begin{pmatrix} -3 - (-4) \\ -5 - (6) \end{pmatrix} = \begin{pmatrix} 1 \\ -11 \end{pmatrix} \quad (8)$$

$$CA = \mathbf{A} - \mathbf{C} \quad (9)$$

$$= \begin{pmatrix} 1 - (-3) \\ -1 - (-5) \end{pmatrix} = \begin{pmatrix} 4 \\ 4 \end{pmatrix} \quad (10)$$

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