Assignment

Chatrapati

1.1.6) Given in the question that,

$$\mathbf{A} = \begin{pmatrix} 1 \\ -1 \end{pmatrix}; \mathbf{B} = \begin{pmatrix} -4 \\ 6 \end{pmatrix}; \mathbf{C} = \begin{pmatrix} -3 \\ -5 \end{pmatrix}$$

Formula for area of $\Delta ABC = \frac{1}{2}||(A-B)\times(A-C)||$

$$\text{Value of } \mathbf{A}-\mathbf{B} = \begin{pmatrix} 1 \\ -1 \end{pmatrix} - \begin{pmatrix} -4 \\ 6 \end{pmatrix} = \begin{pmatrix} 5 \\ -7 \end{pmatrix} \quad (1)$$

$$\text{Value of } \mathbf{A}-\mathbf{C} = \begin{pmatrix} 1 \\ -1 \end{pmatrix} - \begin{pmatrix} -3 \\ -5 \end{pmatrix} = \begin{pmatrix} 4 \\ 4 \end{pmatrix} \quad (2)$$

$$\therefore (A-B)\times(A-C) = \begin{vmatrix} 5 & 4 \\ -7 & 4 \end{vmatrix} \quad (3)$$

The value of Determinant is

$$\begin{vmatrix} 5 & 4 \\ -7 & 4 \end{vmatrix} = 5\times 4 - 4\times(-7) = 20 + 28 = 48$$

$$\therefore ||\mathbf{A}-\mathbf{B}\times\mathbf{A}-\mathbf{C}|| = \sqrt{48^2} = 48$$

$$\text{So area of } \Delta ABC = \frac{1}{2}||(A-B)\times(A-C)|| = \frac{48}{2} = 24$$

$$\therefore \text{Area of } \Delta ABC = 24 square.units$$