2.6.9

AI25BTECH11003 - Bhavesh Gaikwad

Question: The area of a triangle with vertices A(3,0), B(7,0) and C(8,4) is

Solution:

Given: $A(3,0),\ B(7,0),\ C(8,4)$.

$$\mathbf{B}-\mathbf{A}=\begin{pmatrix}7-3\\0-0\end{pmatrix}=\begin{pmatrix}4\\0\end{pmatrix},\qquad \mathbf{C}-\mathbf{A}=\begin{pmatrix}8-3\\4-0\end{pmatrix}=\begin{pmatrix}5\\4\end{pmatrix}.$$

$$\text{Area}=\frac{1}{2}\|(B-A)\times(C-A)\|=\frac{1}{2}\left|\begin{pmatrix}4\\0\end{pmatrix}\times\begin{pmatrix}5\\4\end{pmatrix}\right|=8$$

$$\boxed{Area\ of\ Triangle\ ABC\ =\ 8\ sq.units} \tag{0.1}$$

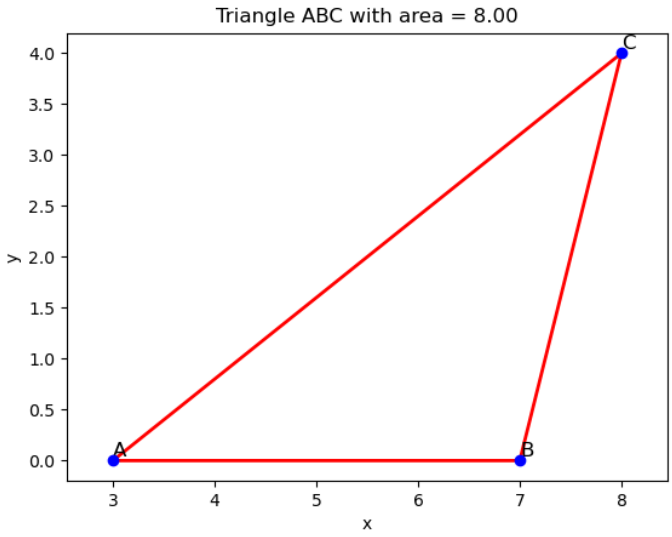

Fig. 0.1: Vector Representation