2.6.25

AI25BTECH11016-Varun

Question:

Find the area of a triangle formed by the points $A(5,2)$, $B(4,7)$ and $C(7,-4)$.

Solution:

$$\mathbf{B}-\mathbf{A}=\begin{pmatrix}-1\\5\end{pmatrix} \tag{1}$$

$$\mathbf{C}-\mathbf{A}=\begin{pmatrix}2\\-6\end{pmatrix} \tag{2}$$

$$\begin{aligned}\text{Area of the triangle ABC} &= \tfrac{1}{2}\left\|(\mathbf{B}-\mathbf{A})\times(\mathbf{C}-\mathbf{A})\right\| \\ &= \tfrac{1}{2}\left\|\begin{pmatrix}-1\\5\end{pmatrix}\times\begin{pmatrix}2\\-6\end{pmatrix}\right\| \\ &= 2\end{aligned} \tag{3}$$

Therefore,

The area of triangle ABC is 2

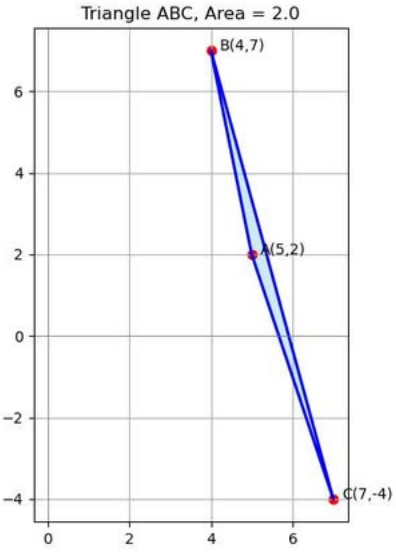

Fig. 0.1