2.6.18

AI25BTECH11009 - Dasu Harshith Kumar

Question:
ind the area of region bounded by the triangle whose vertices are (1, 0), (2, 2) and (3, 1). **Solution:**

Variable	Formula
A	$A = \begin{pmatrix} 1 \\ 0 \end{pmatrix}$
B	$B = \begin{pmatrix} 2 \\ 2 \end{pmatrix}$
C	$C = \begin{pmatrix} 3 \\ 1 \end{pmatrix}$

TABLE 0: Variables Used

The area of a triangle ABC is given by :

$$\frac{1}{2} \| (\mathbf{A} - \mathbf{B}) \times (\mathbf{A} - \mathbf{C}) \|$$

$$\mathbf{A} - \mathbf{B} = \begin{pmatrix} 1 \\ 0 \end{pmatrix} - \begin{pmatrix} 2 \\ 2 \end{pmatrix} = \begin{pmatrix} -1 \\ -2 \end{pmatrix} \tag{1}$$

$$\mathbf{A} - \mathbf{C} = \begin{pmatrix} 1 \\ 0 \end{pmatrix} - \begin{pmatrix} 3 \\ 1 \end{pmatrix} = \begin{pmatrix} -2 \\ -1 \end{pmatrix} \tag{2}$$

$$\frac{1}{2} \| (\mathbf{A} - \mathbf{B}) \times (\mathbf{A} - \mathbf{C}) \| = 1.5 \tag{3}$$
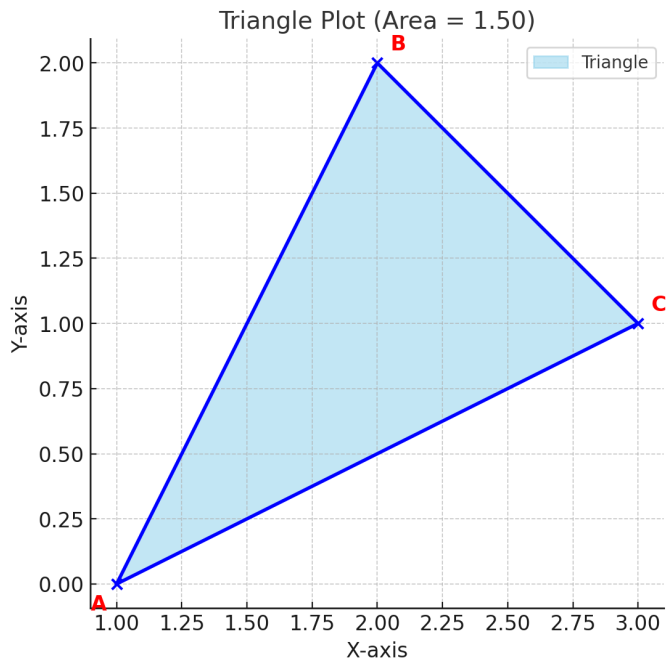
The area of the triangle ABC is 1.5

Fig. 0