2.6.18

AI25BTECH11010 - Dhanush Kumar

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

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

TABLE 0: Variables Used

The area of a triangle ABC is given by :

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

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

$$\mathbf{A} - \mathbf{C} = \begin{pmatrix} -1 \\ 0 \end{pmatrix} - \begin{pmatrix} 3 \\ 2 \end{pmatrix} = \begin{pmatrix} -4 \\ -2 \end{pmatrix} \tag{2}$$

$$\frac{1}{2} \|(\mathbf{A} - \mathbf{B}) \times (\mathbf{A} - \mathbf{C})\| = 4 \tag{3}$$

The area of the triangle ABC is 4

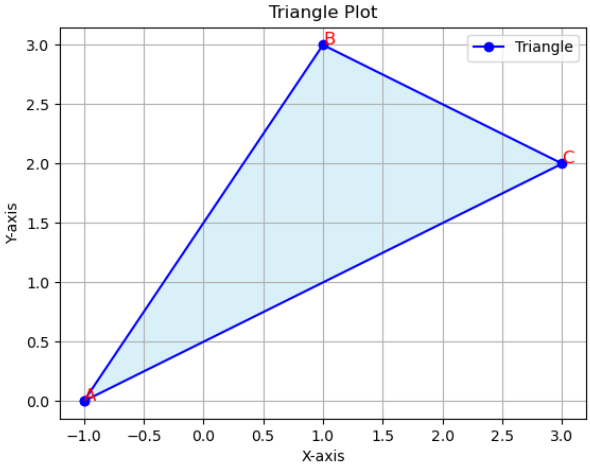
Triangle Plot
Triangle
A
B
C
X-axis
Y-axis
−1.0
−0.5
0.0
0.5
1.0
1.5
2.0
2.5
3.0
0.0
0.5
1.0
1.5
2.0
2.5
3.0

Fig. 0