

2.6.10

AI25BTECH11004-B.JASWANTH

Question

Find the area of the triangle whose vertices are $(-8,4)$, $(-6,6)$ and $(-3,9)$.

Solution:

Name	Point
A	$\begin{pmatrix} -8 \\ 4 \end{pmatrix}$
B	$\begin{pmatrix} -6 \\ 6 \end{pmatrix}$
C	$\begin{pmatrix} -3 \\ 9 \end{pmatrix}$

TABLE 0: variables used

$$A - B = \begin{pmatrix} -8 \\ 4 \end{pmatrix} - \begin{pmatrix} -6 \\ 6 \end{pmatrix} = \begin{pmatrix} -2 \\ -2 \end{pmatrix}, \quad (0.1)$$

$$A - C = \begin{pmatrix} -8 \\ 4 \end{pmatrix} - \begin{pmatrix} -3 \\ 9 \end{pmatrix} \quad (0.2)$$

Now, the area of the triangle is

$$\text{ar}(\triangle ABC) = \frac{1}{2} |(A - B) \times (A - C)| \quad (0.3)$$

$$\text{ar}(\triangle ABC) = \frac{1}{2} \left| \begin{pmatrix} -2 \\ -2 \end{pmatrix} \times \begin{pmatrix} -5 \\ -5 \end{pmatrix} \right| \quad (0.4)$$

$$\therefore \text{ar}(\triangle ABC) = \frac{1}{2}(0) = 0 \quad (0.5)$$

Thus, the three points are collinear, and the triangle has area=0.

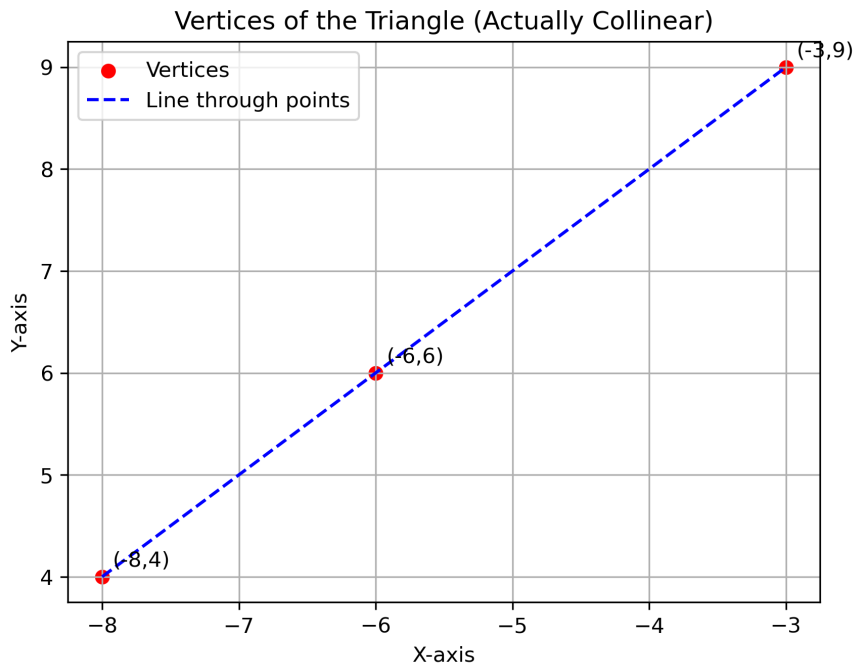


Fig. 0: Caption