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

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

$$A - C = \begin{pmatrix}-8\\4\end{pmatrix} - \begin{pmatrix}-3\\9\end{pmatrix} = \begin{pmatrix}-5\\-5\end{pmatrix} \tag{0.2}$$

Now, the area of the triangle is

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

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

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

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

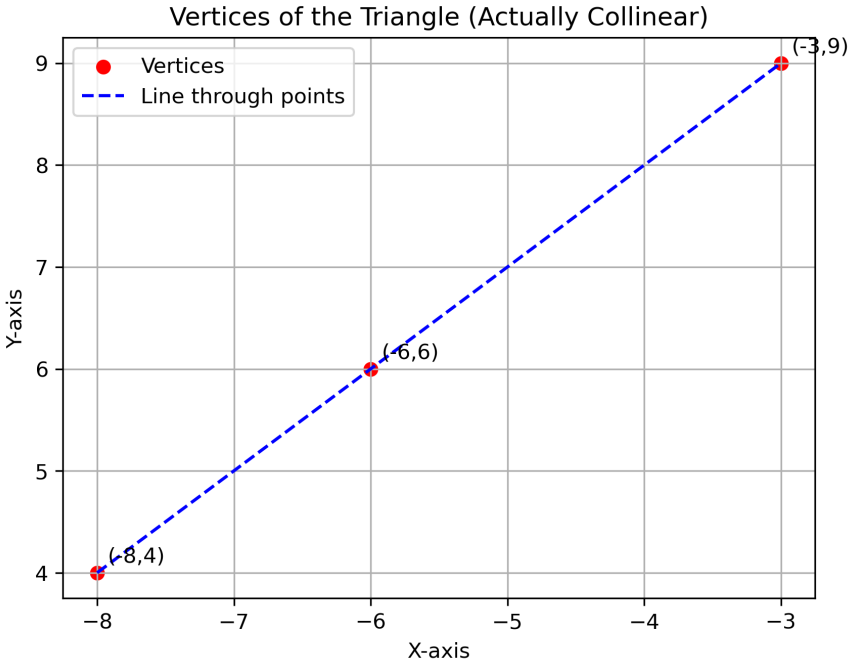

Fig. 0: Caption