

1-1.4-9c

EE24BTECH11009 - Mokshith Kumar Reddy

Question:

In what ratio does the point $(-4, 6)$ divide the line segment joining the points $A(-6, 0)$ and $B(3, -8)$?

Solution:

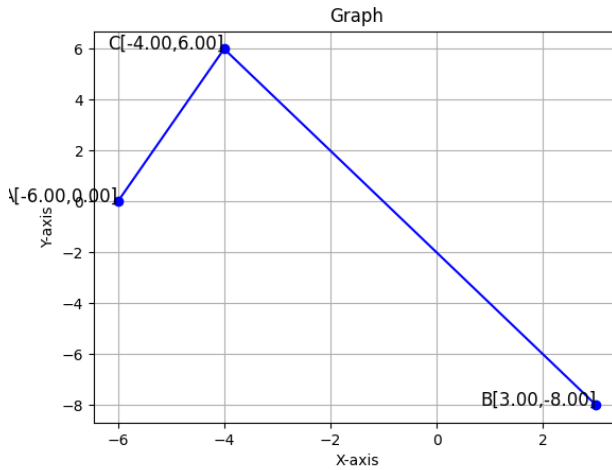


Fig. 0.1

Fig. 0.1 we can see that the given point doesn't lie on the line segment joining A and B.

$$d_1 = \|(A - C)\| \quad (0.1)$$

$$\Rightarrow d_1^2 = (A - C)(A - C)^T \quad (0.2)$$

$$\Rightarrow = \begin{pmatrix} -2 & -6 \end{pmatrix} \begin{pmatrix} -2 \\ -6 \end{pmatrix} \quad (0.3)$$

$$\Rightarrow d_1 = \sqrt{40} \quad (0.4)$$

$$(0.5)$$

$$d_2 = \|(B - C)\| \quad (0.6)$$

$$\Rightarrow d_2^2 = (B - C)(B - C)^T \quad (0.7)$$

$$\Rightarrow = \begin{pmatrix} 7 & -14 \end{pmatrix} \begin{pmatrix} 7 \\ -14 \end{pmatrix} \quad (0.8)$$

$$\Rightarrow d_2 = 7\sqrt{5} \quad (0.9)$$

$$\therefore \frac{d_1}{d_2} = \frac{\sqrt{40}}{7\sqrt{5}} \quad (0.10)$$

Parameter	Description
A	$\begin{pmatrix} -6 \\ 0 \end{pmatrix}$
B	$\begin{pmatrix} 3 \\ -8 \end{pmatrix}$
C	$\begin{pmatrix} -4 \\ 6 \end{pmatrix}$
d_1	$\ (A - C)\ $
d_2	$\ (B - C)\ $

TABLE 0