

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:

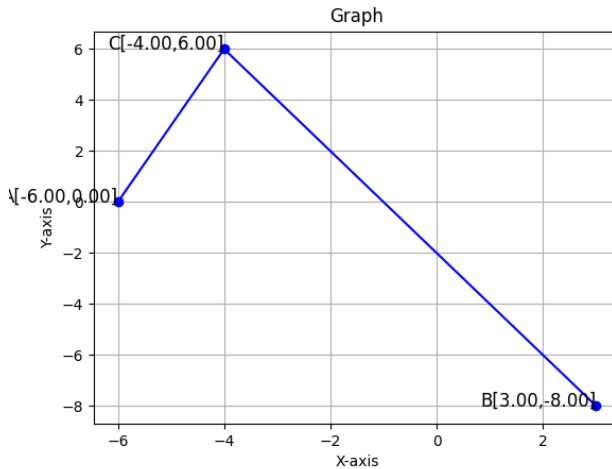


Fig. 0.1: Stem Plot of $y(n)$

Fig. ?? we can see that the given point doesn't lie on the line segment joining A and B. Distance between vectors A and C is:

$$d_1 = \|(A - C)\| \Rightarrow \left\| \begin{pmatrix} -2 \\ -6 \end{pmatrix} \right\| \quad (0.1)$$

$$d_1 = \begin{pmatrix} -2 & -6 \end{pmatrix} \begin{pmatrix} -2 \\ -6 \end{pmatrix} \quad (0.2)$$

$$d_1 = \sqrt{2^2 + 6^2} = \sqrt{40} \quad (0.3)$$

$$(0.4)$$

Distance between vectors B and C is:

$$d_2 = \|(B - C)\| \Rightarrow \left\| \begin{pmatrix} 7 \\ -14 \end{pmatrix} \right\| \quad (0.5)$$

$$d_2 = (7 \quad -14) \begin{pmatrix} 7 \\ -14 \end{pmatrix} \quad (0.6)$$

$$d_2 = \sqrt{7^2 + 14^2} = 7\sqrt{5} \quad (0.7)$$

$$\therefore \frac{d_1}{d_2} = \frac{\sqrt{40}}{7\sqrt{5}} \quad (0.8)$$

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	Distance between vectors A and C
d_2	Distance between vectors B and C

TABLE 0