1-1.4-9c

EE24BTECH11009 - Mokshith Kumar Reddy

Question:
In what ratio does the point $(-4, 6)$ divide the line segment joining the points $\mathbf{A}(-6, 0)$ and $\mathbf{B}(3, -8)$?
Solution:

Vectors	Description
A	$\begin{pmatrix} -6 \\ 0 \end{pmatrix}$
B	$\begin{pmatrix} 3 \\ -8 \end{pmatrix}$
C	$\begin{pmatrix} -4 \\ 6 \end{pmatrix}$

TABLE 0: Vectors Used

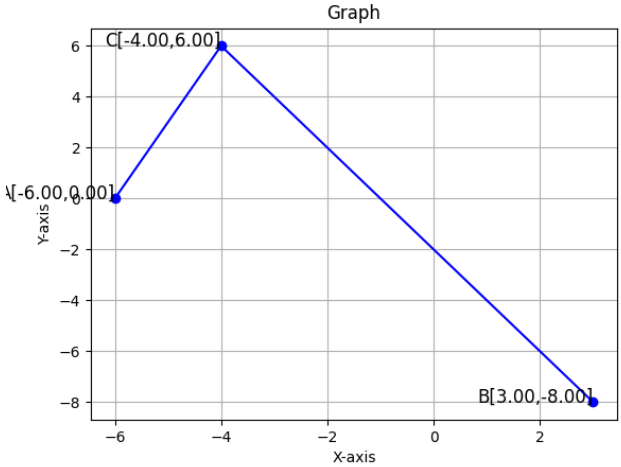

Fig. 0.1: Stem Plot of y(n)

from Fig. 0.1 we can see that the give point doesn't lie on the line segment joining A and B.
using section formulae:
Distance between vectors A and C is:

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

$d_1 = \sqrt{2^2 + 6^2} = \sqrt{40}$

Distance between vectors B and C is:

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

$d_2 = \sqrt{7^2 + 14^2} = 7\sqrt{5}$

The ratio is equal to:

$\frac{d_1}{d_2} = \frac{\sqrt{40}}{7\sqrt{5}}$