1.5.34

EE24BTECH11037 - Manognya Kundarapu

Question:
The point **P** which divides the line segment joining the points $\mathbf{A}\,(2,-5)$ and $\mathbf{B}\,(5,2)$ in the ratio $2:3$ lies in which quadrant?
Solution:

Variable	Description
P	Point dividing A and B in the given ratio
A	point whose coordinates are $(2,-5)$
B	point whose coordinates are $(5,2)$

TABLE 0: Variables Used

$$\mathbf{P} = \frac{A + kB}{k+1}, k = \frac{2}{3} \tag{0.1}$$

$$= \frac{1}{k+1}(A) + \frac{k}{k+1}(B) \tag{0.2}$$

$$= \begin{pmatrix} A & B \end{pmatrix} \begin{pmatrix} \frac{1}{k+1} \\ \frac{k}{k+1} \end{pmatrix} \tag{0.3}$$

$$= \begin{pmatrix} 2 & 5 \\ -5 & 2 \end{pmatrix} \begin{pmatrix} \frac{3}{5} \\ \frac{2}{5} \end{pmatrix} = \begin{pmatrix} \frac{16}{5} \\ \frac{-11}{5} \end{pmatrix} \tag{0.4}$$

$\therefore$ $\mathbf{P}\,(3.2,-2.2)$.
P is in **fourth quadrant**.

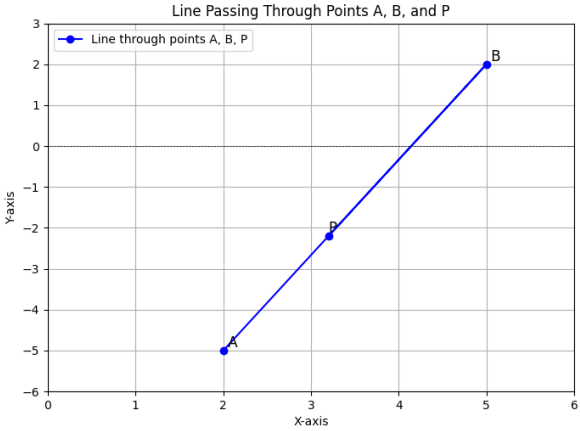

Fig. 0.1: Stem Plot of y(n)