

1.1.5.26

EE24BTECH11030 - J.KEDARANANDA

Question:

Let **P** and **Q** be the points of trisection of the line segment joining the points **A** (2, -2) and **B** (-7, 4) such that **P** is nearer to **A**. Find the coordinates of **P** and **Q**

(10, 2016)

Solution:

Variable	Description	Formula
$\begin{pmatrix} x_1 \\ y_1 \end{pmatrix}$	x,y coordinate of P respectively	$\frac{k(\mathbf{B})+(\mathbf{A})}{k+1}$
$\begin{pmatrix} x_2 \\ y_2 \end{pmatrix}$	x,y coordinate of Q respectively	$\frac{k(\mathbf{B})+(\mathbf{A})}{k+1}$
$\begin{pmatrix} 2 \\ -2 \end{pmatrix}$	x,y coordinate of A respectively	
$\begin{pmatrix} -7 \\ 4 \end{pmatrix}$	x,y coordinate of B respectively	

TABLE 0: Variables Used

Here according to problem value of k is 0.5 for **P** and 2 for **Q** respectively.

$$\mathbf{P} = \frac{1\mathbf{B} + 2\mathbf{A}}{3} = \frac{1\begin{pmatrix} -7 \\ 4 \end{pmatrix} + 2\begin{pmatrix} 2 \\ -2 \end{pmatrix}}{3} = \frac{\begin{pmatrix} -3 \\ 0 \end{pmatrix}}{3} \quad (0.1)$$

$$\mathbf{P} = \begin{pmatrix} -1 \\ 0 \end{pmatrix} \quad (0.2)$$

$$\mathbf{Q} = \frac{2\mathbf{B} + 1\mathbf{A}}{3} = \frac{2\begin{pmatrix} -7 \\ 4 \end{pmatrix} + 1\begin{pmatrix} 2 \\ -2 \end{pmatrix}}{3} = \frac{\begin{pmatrix} -12 \\ 6 \end{pmatrix}}{3} \quad (0.3)$$

$$\mathbf{Q} = \begin{pmatrix} -4 \\ 2 \end{pmatrix} \quad (0.4)$$

Hence the coordinates of **P** are (-1, 0) and of **Q** are (-4, 2)

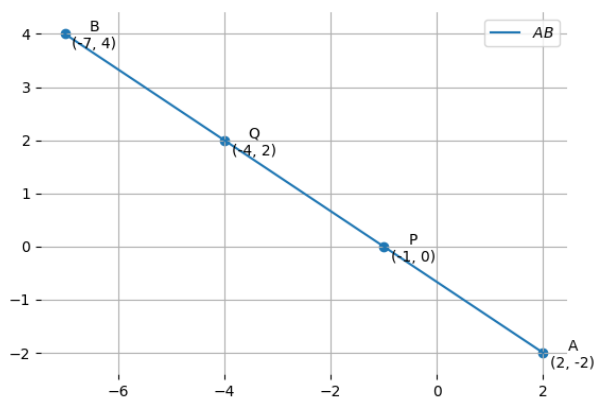


Fig. 0.1: Stem Plot of $y(n)$