

1-1.4-9j

EE24BTECH11006 - Arnav Mahishi

Q) Point $P(5, -3)$ is one of the points of trisection of line segment joining the points $A(7, -2)$ and $B(1, -5)$

Soln: $\overline{AQ} = \overline{QR} = \overline{RB} = \frac{1}{3}\overline{AB}$

Point	X	Y
P	5	-3
A	7	-2
B	1	-5
R	3	-4

TABLE 0: Input Parameters

$$\overline{MN} \text{ to be split into ratio } 1:n \quad O = \frac{1}{1 + \frac{1}{n}} \left(M + \frac{1}{2}N \right) \quad (0.1)$$

$$Q = \frac{1}{1 + \frac{1}{2}} \left(A + \frac{1}{2}B \right) = \frac{2}{3} \left(\begin{pmatrix} 7 \\ -2 \end{pmatrix} + \frac{1}{2} \begin{pmatrix} 1 \\ -5 \end{pmatrix} \right) = \begin{pmatrix} 5 \\ -3 \end{pmatrix} \quad (0.2)$$

$$R = \frac{1}{1 + \frac{1}{2}} \left(B + \frac{1}{2}A \right) = \frac{2}{3} \left(\begin{pmatrix} 1 \\ -5 \end{pmatrix} + \frac{1}{2} \begin{pmatrix} 7 \\ -2 \end{pmatrix} \right) = \begin{pmatrix} 3 \\ -4 \end{pmatrix} \quad (0.3)$$

$Q = P(5, -3)$ so $\overline{AP} = \overline{PR} = \overline{RB} = \frac{1}{3}\overline{AB}$

$\therefore P$ is one of the two points that trisects the line segment \overline{AB}

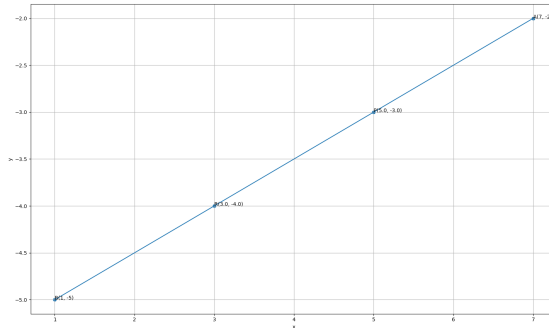


Fig. 0.1: Plot of trisection