VECTORS

1 10th Maths - EXERCISE-7.2

1. Find the coordinates of the points of trisection of the line segment joining (4,-1) and (-2,-3)

2 SOLUTION

Given points are

$$\mathbf{Q} = \begin{pmatrix} 4 \\ -1 \end{pmatrix}, \mathbf{P} = \begin{pmatrix} -2 \\ -3 \end{pmatrix} \tag{1}$$

The equation of the formula is

$$\mathbf{R} = \frac{\mathbf{Q} + n\mathbf{P}}{1 + n} \tag{2}$$

Ratio 2:1 has taken

$$n = \frac{1}{2} \tag{3}$$

$$\mathbf{R} = \frac{1}{1 + \frac{1}{2}} \left(\begin{pmatrix} 4 \\ -1 \end{pmatrix} + \frac{1}{2} \begin{pmatrix} -2 \\ -3 \end{pmatrix} \right) \tag{4}$$

$$=\frac{1}{\frac{3}{2}}\left(\begin{pmatrix}4\\-1\end{pmatrix}+\begin{pmatrix}-1\\\frac{-3}{2}\end{pmatrix}\right)\tag{5}$$

$$=\frac{1}{\frac{3}{2}}\left(\begin{pmatrix}3\\\frac{-5}{3}\end{pmatrix}\right)\tag{6}$$

$$\mathbf{R} = \begin{pmatrix} 2\\ \frac{-5}{3} \end{pmatrix} \tag{7}$$

(8)

Ratio 1:2 has taken

$$n = \frac{2}{1} \tag{9}$$

$$\mathbf{S} = \frac{1}{1 + \frac{2}{1}} \left(\begin{pmatrix} 4 \\ -1 \end{pmatrix} + \frac{2}{1} \begin{pmatrix} -2 \\ -3 \end{pmatrix} \right) \tag{10}$$

$$=\frac{1}{3}\left(\begin{pmatrix} 4\\-1 \end{pmatrix} + \begin{pmatrix} -4\\-6 \end{pmatrix}\right) \tag{11}$$

$$=\frac{1}{3}\left(\begin{pmatrix}0\\-7\end{pmatrix}\right)\tag{12}$$

$$\mathbf{S} = \begin{pmatrix} 0\\ \frac{-7}{3} \end{pmatrix} \tag{13}$$

3 Figure

 $https://\,github.com/\,prasaddeva 287/FWC/\,tree/main/VECTORS/\,7.2/\,codes$

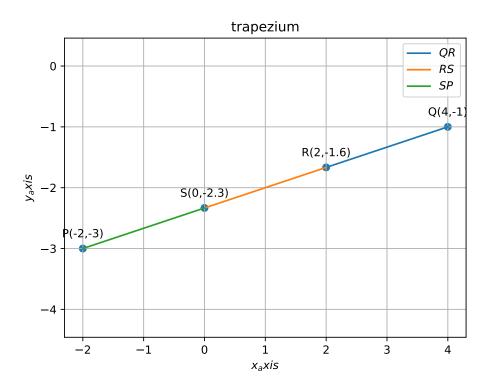


Figure 1: trisecton