1-1.4-2

AI24BTECH11011 - Gourishetty Himani

1) Find the coordinates of the point $\mathbf{R}$ on the line segment joining the points $\mathbf{P}\,(-1,3)$ and $\mathbf{Q}\,(2,5)$ such that $\frac{PR}{PQ}$.

Solution: The coordinate and the ratio of $\frac{PR}{PQ}$ is given by,

$\mathbf{P} = \begin{pmatrix} -1 \\ 3 \end{pmatrix} \mathbf{Q} = \begin{pmatrix} 2 \\ 5 \end{pmatrix} \frac{PR}{PQ} = \frac{3}{5}$

$\mathbf{R}$ lies on the line joining the points $\mathbf{P}$ AND $\mathbf{Q}$ so,

$PR + RQ = PQ$

then , $\frac{PR}{PR+PQ} = \frac{3}{5}$

$5PR = 3PR + 3RQ$

$\frac{PR}{PQ} = \frac{3}{2}$, n$=\frac{3}{2}$

By section formula ,

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

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

$\mathbf{R} = \begin{pmatrix} \frac{4}{5} \\ \frac{21}{5} \end{pmatrix}$

Therefore the coordinates of point $\mathbf{R}$ is $\left(\frac{4}{5}, \frac{21}{5}\right)$