

# 1-1.4-2

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

**Solution:** Given,

Variable	Description
point <b>P</b>	$\begin{pmatrix} -1 \\ 3 \end{pmatrix}$
point <b>Q</b>	$\begin{pmatrix} 2 \\ 5 \end{pmatrix}$
Ratio of $\frac{PR}{PQ}$	$\frac{3}{5}$

**R** lies on the line joining the points **P** and **Q** so,

$$PR + RQ = PQ \quad (1)$$

$$\frac{PR}{PR + PQ} = \frac{3}{5} \quad (2)$$

$$5PR = 3PR + 3RQ \quad (3)$$

$$\frac{PR}{PQ} = \frac{3}{2} \quad (4)$$

$$n = \frac{3}{2} \quad (5)$$

$$(6)$$

By section formula ,

$$\mathbf{R} = \frac{n\mathbf{Q} + \mathbf{P}}{1 + n} \quad (7)$$

$$\mathbf{R} = \frac{1}{1 + \frac{3}{2}} \left( \begin{pmatrix} 2 \\ 5 \end{pmatrix} + \frac{3}{2} \begin{pmatrix} -1 \\ 3 \end{pmatrix} \right) \quad (8)$$

$$\mathbf{R} = \begin{pmatrix} \frac{4}{5} \\ \frac{21}{5} \end{pmatrix} \quad (9)$$

$$(10)$$

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

