

CHAPTER-7
COORDINATE GEOMETRY

Exercise 7.2

1. Find the coordinates of the point which divides the join $(-1, 7)$ and $(4, -3)$ in the ratio 2:3 :

Solution:

The coordinates and ratio are given as

$$\mathbf{P} = \begin{pmatrix} -1 \\ 7 \end{pmatrix}, \mathbf{Q} = \begin{pmatrix} 4 \\ -3 \end{pmatrix}, n = \frac{3}{2} \quad (1)$$

$$\mathbf{R} = \frac{\mathbf{Q} + n\mathbf{P}}{1 + n} \quad (2)$$

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

$$\mathbf{R} = \frac{1}{1 + \frac{3}{2}} \left(\begin{pmatrix} 4 \\ -3 \end{pmatrix} + \begin{pmatrix} \frac{-3}{2} \\ \frac{21}{2} \end{pmatrix} \right) \quad (4)$$

$$\mathbf{R} = \frac{1}{\frac{5}{2}} \begin{pmatrix} \frac{5}{2} \\ \frac{15}{2} \end{pmatrix} \quad (5)$$

$$\mathbf{R} = \frac{2}{5} \begin{pmatrix} \frac{5}{2} \\ \frac{15}{2} \end{pmatrix} \quad (6)$$

$$\mathbf{R} = \begin{pmatrix} 1 \\ \frac{15}{5} \end{pmatrix} \quad (7)$$

$$\mathbf{R} = \begin{pmatrix} 1 \\ 3 \end{pmatrix} \quad (8)$$

Hence, the coordinates of the point which divides the join is $\mathbf{R} = \begin{pmatrix} 1 \\ 3 \end{pmatrix}$ also shown in Figure:1

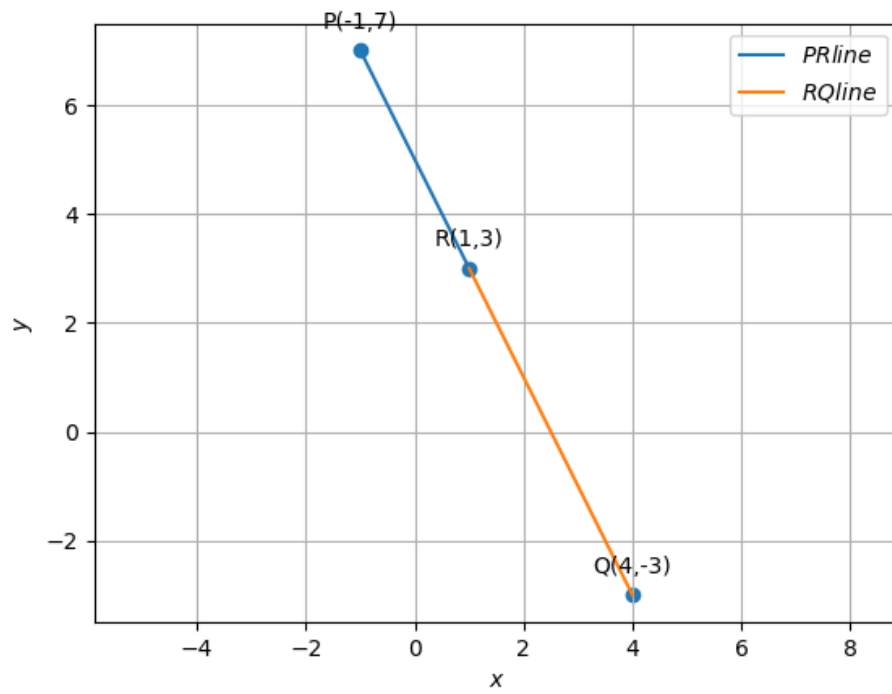


Figure 1: