

CHAPTER-7
COORDINATE GEOMETRY

Excercise 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 are given as

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

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

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

$$\mathbf{R} = \frac{\begin{pmatrix} 4 \\ -3 \end{pmatrix} + \begin{pmatrix} -5 \\ 7 \end{pmatrix}}{1 + \frac{3}{2}} \quad (4)$$

$$\mathbf{R} = \frac{\begin{pmatrix} 4 \\ -3 \end{pmatrix} + \frac{1}{2} \begin{pmatrix} -3 \\ 21 \end{pmatrix}}{1 + \frac{3}{2}} \quad (5)$$

$$\mathbf{R} = \frac{\frac{1}{2} \begin{pmatrix} 5 \\ 15 \end{pmatrix}}{\frac{5}{2}} \quad (6)$$

$$\mathbf{R} = \frac{1}{2} \cdot \frac{2}{5} \begin{pmatrix} 5 \\ 15 \end{pmatrix} \quad (7)$$

$$\mathbf{R} = \frac{1}{5} \begin{pmatrix} 5 \\ 15 \end{pmatrix} \quad (8)$$

$$\mathbf{R} = \begin{pmatrix} 1 \\ 3 \end{pmatrix} \quad (9)$$

Hence, the coordinates of the point which divides the join is $R(1, 3)$ also shown in Figure:1

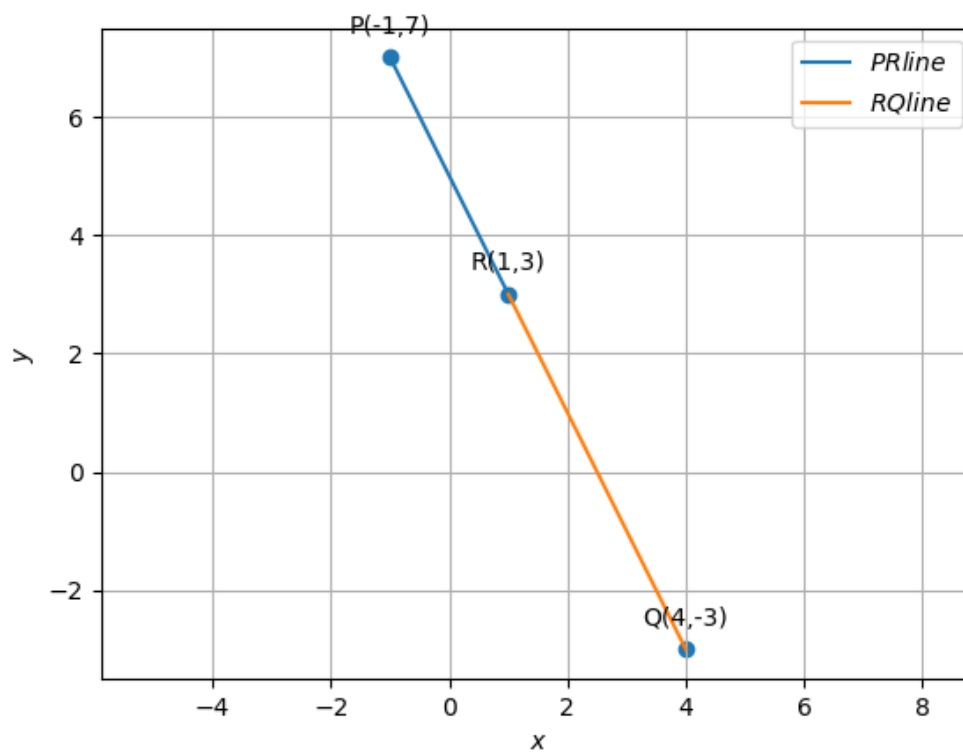


Figure 1: