



Exercise 16B

Question 14:

Let $P(-6, a)$ divides the join of $A(-3, -1)$ and $B(-8, 9)$ in the ratio $k : 1$

Then the coordinates of P are given by

$$\left(\frac{-8k - 3}{k + 1}, \frac{9k - 1}{k + 1} \right)$$

But, we are given P is $(-6, a)$

$$\therefore \frac{-8k - 3}{k + 1} = -6 \quad \text{and} \quad \frac{9k - 1}{k + 1} = a$$

$$\text{Now, } \frac{-8k - 3}{k + 1} = -6 \Rightarrow 8k + 3 = 6k + 6$$

$$\Rightarrow 2k = 3 \quad \therefore k = \frac{3}{2}$$

Putting $k = \frac{3}{2}$ in $\frac{9k - 1}{k + 1} = a$, we get

$$a = \frac{\left(9 \times \frac{3}{2} - 1 \right)}{\left(\frac{3}{2} + 1 \right)} = \frac{\left(\frac{27 - 2}{2} \right)}{\left(\frac{3 + 2}{2} \right)} = \frac{25}{5} = 5$$

Hence, required ratio is $3 : 2$ and $a = 5$

Question 15:

Let P divided the join of line segment $A(-4, 3)$ and $B(2, 8)$ in the ratio $k : 1$

\therefore the point P is

$$\left(\frac{k \times 2 + 1 \times (-4)}{k+1}, \frac{k \times 8 + 1 \times 3}{k+1} \right) = \left(\frac{2k-4}{k+1}, \frac{8k+3}{k+1} \right)$$

$$\Rightarrow \frac{2k-4}{k+1} = m \quad \text{----- (1)}$$

$$\text{and } \frac{8k+3}{k+1} = 6$$

$$\text{or } 8k+3 = 6k+6 \quad \text{or } 2k = 3 \quad \therefore k = \frac{3}{2}$$

Putting value of k in (1)

$$\frac{2 \times \frac{3}{2} - 4}{\frac{3}{2} + 1} = m$$

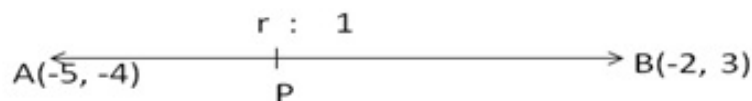
$$m = \frac{3-4}{\frac{5}{2}}$$

$$m = -\frac{2}{5}$$

$$\text{Hence, } m = -\frac{2}{5}, k = \frac{3}{2}$$

Question 16:

Let P is dividing the given segment joining A(-5, -4) and B(-2, 3) in the ratio r : 1



Coordinates of point P

$$\left(\frac{-2r+1 \cdot (-5)}{r+1}, \frac{r \cdot 3 + 1 \cdot (-4)}{r+1} \right) \text{ i.e. } \left(\frac{-2r-5}{r+1}, \frac{3r-4}{r+1} \right)$$

Also, the coordinates of point P are (-3, k)

$$\therefore \frac{-2r-5}{r+1} = -3 \Rightarrow -2r-5 = -3r-3, r = 2$$

$$\text{and } k = \frac{3r-4}{r+1} = \frac{3 \times 2 - 4}{2+1} = \frac{2}{3}$$

\therefore P is dividing AB in the ratio 2 : 1 and $k = \frac{2}{3}$

***** END *****