

Exercise 7.2

1. A (-1, 7) B (4, -3) ratio 2:3

$m_1 = 2 \quad m_2 = 3$

Ans.  $\left( \frac{m_1 x_2 + m_2 x_1}{m_1 + m_2}, \frac{m_1 y_2 + m_2 y_1}{m_1 + m_2} \right)$

$\left( \frac{2(4) + 3(-1)}{2+3}, \frac{2(-3) + 3(7)}{2+3} \right)$

$= \left( \frac{8 + (-3)}{5}, \frac{-6 + 21}{5} \right)$

$= \left( \frac{5}{5}, \frac{15}{5} \right)$

$= (1, 3)$

2. A (4, -1) B (-2, -3)  $\left[ \begin{array}{c|c} A & B \\ \hline A & B \end{array} \right]$

for

Ans.  $\left( \frac{m_1 x_2 + m_2 x_1}{m_1 + m_2}, \frac{m_1 y_2 + m_2 y_1}{m_1 + m_2} \right)$

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

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

$$= \frac{62}{3}, \quad -\frac{5}{3}$$

$$, \quad 2, \quad -\frac{5}{3}$$

$$A(4, -1) \quad B(-2, -3)$$

For Ratio = 2:1

$$= \left( \frac{m_1 x_2 + m_2 x_1}{m_1 + m_2}, \quad \frac{m_1 y_2 + m_2 y_1}{m_1 + m_2} \right)$$

$$= \frac{2(-2) + (1)(4)}{2+1}$$

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

$$= \left( \frac{-4 + 4}{3}, \quad \frac{(-6) + (-1)}{3} \right)$$

$$= (0, \quad -\frac{7}{3})$$

3. The green flag is at  $\frac{1}{4}$ th of the total distance

$$= \frac{1}{4} \times 100 = 25 \text{ m on 2nd line.}$$

$\therefore$  The coordinates of green flag are (2, 25)

Similarly, coordinates of red flag are (8, 20)

$$D = \sqrt{(8-2)^2 + (20-25)^2}$$

$$= \sqrt{(6)^2 + (-5)^2}$$

$$= \sqrt{36 + 25}$$

$$= \sqrt{61} \text{ m}$$

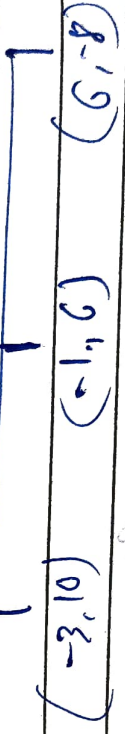
$\therefore$  Coordinate of blue flag  $(\frac{2+8}{2}, \frac{25+20}{2})$

Hence, the blue flag will be posted on 5m line at a distance of 22.5m

Q1. A(-3, 10) B = (6, -8)

Let the ratio be k:1

k:1



$$k(G) + 1(-3), k(-8) + 1(10)$$

$$k+1 \quad k+1$$

$$= \frac{6k - 3}{k+1}, \frac{-8k + 10}{k+1}$$

5.

Let the ratio of the join be  $(k, -5)$   
and  $B(-4, 5)$  on the ratio  $k:1$

$$(1, -5) \text{ and } (k, -5)$$

$$\frac{kx_2 + y_1}{k+1} = \frac{kx_1 + y_2}{k+1}$$

$$\frac{k \times (-4) + 1}{k+1} = \frac{k \times (-5)}{k+1}$$

$x$  coordinate of any point on  $AC$  is  
 $z \rightarrow 0$ .

$$\Rightarrow \frac{k \times 5k - 5}{k+1} = 0$$

$$\Rightarrow 5k = 5$$

$$\Rightarrow 5k = 5$$

$$\Rightarrow k = \frac{5}{5}$$

$$\Rightarrow k = 1$$

$$1:1$$

Required ratio is  $1:1$

$$\frac{-4k+1}{k+1}$$

$$= \frac{-4(1)+1}{1+1}$$

$$= \frac{-3}{2}$$

$$\frac{5k-5}{k+1}$$

$$= \frac{5(1)-5}{1+1}$$

$$= \frac{0}{2}$$

$$= 0$$

Hence  $(-\frac{3}{2}, 0)$

6.  $O$  is the mid-point of  $AC$  and  $BD$ .  
 $AC$  and  $BD$  bisect each other at  $O$ .

$$AC \text{ coordinates of } O = \frac{1+x}{2}, \frac{2+y}{2}$$

$$BD \text{ coordinates of } O = \frac{3+y}{2}, \frac{5+y}{2}$$

$$\frac{1+x}{2} = \frac{3+y}{2}, \frac{2+y}{2} = \frac{5+y}{2}$$

$$\frac{1+x}{2} = \frac{7}{2}$$

$$x = 6$$

$$2+y = 5+y$$

$$3 = y$$

7.  $A(x, y)$   
 $B(p, q)$   
 $O = (2, -3)$   
 $(2, -3)$

$$\frac{x+1}{2}, \frac{y+4}{2}$$

$\frac{-4k+1}{k+1}$	$= \frac{5k-5}{k+1}$
$= \frac{-4(1)+1}{1+1}$	$= \frac{5(1)-5}{1+1}$
$= \frac{-3}{2}$	$= \frac{0}{2}$
	$= 0$

Here  $(-\frac{3}{2}, 0)$

6. O is the mid-point of AC and BD  
AC and BD bisect each other at O.

AC coordinates of O =  $\frac{1+x}{2}, \frac{2+y}{2}$

BD coordinates of O =  $\frac{3+y}{2}, \frac{5+y}{2}$

$$\frac{1+x}{2} = \frac{3+y}{2}, \quad \frac{2+y}{2} = \frac{5+y}{2}$$

$$\frac{1+x}{2} = \frac{7}{2}$$

$$x = 6$$

$$2 + 5 = y$$

$$7 = y$$

7. A(x, y)  
B(4, 4)  
O = (2, -3)  
(2, -3)

$$\frac{x+4}{2}, \frac{y+4}{2}$$

$$\frac{1+2}{2} \quad \therefore \quad \frac{y+y}{2} = -3$$

$$x+1 = 4$$

$$y+y = -6$$

$$x = 3$$

$$y = -3$$

Coordinates of  $x = (-3, 10)$

8

$$\frac{m_1 x_2 + m_2 x_1}{m_1 + m_2}$$

$$\frac{3(2) + 4(-2)}{3+4}$$

$$= \frac{6 + (-8)}{3+4}$$

$$= \frac{-2}{7}$$

$$\frac{(3)(-4) + (4)(2)}{3+4}$$

$$= \frac{-12 + 8}{7}$$

$$= \frac{-4}{7}$$

6

$$\frac{x_1 + x_2}{2}$$

$$y = \frac{-2+2}{2}, \quad \frac{-2+8}{2}$$

$$\frac{0}{2}, \quad \frac{+6}{2}$$

$$y = (0, 5)$$

$$x_2 = \frac{-2+0}{2}, \quad \frac{2+8}{2}$$

$$, \quad \frac{-2}{-2}, \quad \frac{+0}{2}$$

$$= -1, 5$$

$$z = \frac{2+0}{2}, \quad \frac{8+5}{2}$$

$$= \frac{2}{2}, \quad \frac{13}{2}$$

$$= (1, \frac{13}{2})$$