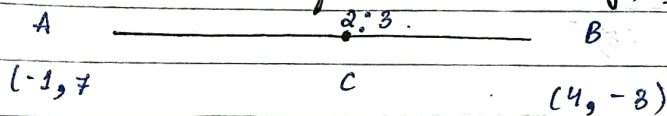


## Exercise - 7.2.

51.

Q1. Let the coordinate of point 'C' be  $(x, y)$ .



$$x \text{ coordinate of } C = \frac{mx_2 + nx_1}{m+n}$$

$$= \frac{2 \times 4 + 3 \times (-1)}{2+3} = \frac{8-3}{5} = 1$$

$$y \text{-coordinate of } C = \frac{-6 + 21}{5} = 3$$

hence, the coordinates of C are  $(1, 3)$ .

Q2. Let points P & Q trisect the line joining points.

$$\therefore AP = PQ = QB$$

$$P(x \text{-coordinate}) = \frac{1 \times (-2) + 2 \times 4}{1+2} = \frac{-2+8}{3} = \frac{6}{3} = 2$$

$$P(y \text{-coordinate}) = \frac{1 \times (-3) + 2 \times (-1)}{1+2} = \frac{-3-2}{3} = \frac{-5}{3}$$

The coordinates of P are  $(2, -\frac{5}{3})$

$$Q(x \text{-coordinate}) = \frac{2 \times (-2) + 1 \times 4}{2+1} = \frac{-4+4}{3} = 0$$

$$Q(y \text{-coordinate}) = \frac{2 \times (-3) + 1 \times (-1)}{2+1} = \frac{-6-1}{3} = \frac{-7}{3}$$

Coordinates of Q are  $(0, -\frac{7}{3})$ .

Q3. The green flag is at  $\frac{1}{4}$ th of the total dist.

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

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

Q3. Similarly coordinates of red flag (8, 20)

Dist between 2 flags,

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

$$= \sqrt{(6)^2 + (-5)^2} = \sqrt{36 + 25} = \sqrt{61} \text{ m.}$$

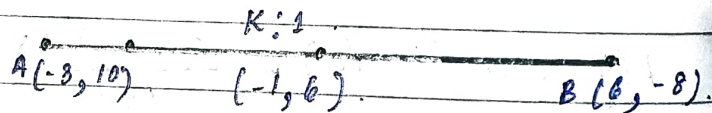
now, blue flag is posted at the midpoint of dist. between 2 flags.

$$\therefore \text{Coordinates of blue flag} = \left( \frac{2+8}{2}, \frac{25+20}{2} \right)$$

$$= (8, 22.5)$$

$\therefore$  Hence the blue flag will be posted in 5th line at distance of 22.5m.

Q4.



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

$$-1 = \frac{k \times 1 + 6 \times (-3)}{k + 1}$$

$$-k - 1 = 6k - 3 \Rightarrow 7k = 2 \Rightarrow k = \frac{2}{7}$$

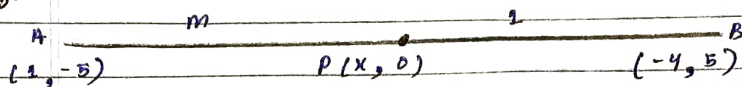
$$y = \frac{m_1 y_2 + m_2 y_1}{m_1 + m_2}$$

$$6 = \frac{k \times (-8) + 1 \times (10)}{k + 1}$$

$$6k + 6 = -8k + 10 \Rightarrow 14k = 4 \Rightarrow k = \frac{4}{14} = \frac{2}{7}$$

$\therefore$  2:7

Q5.



$$(x, 0) = \left( \frac{m \times (-4) + 1 \times (-1)}{m+1}, \frac{m \times 5 + 1 \times (-5)}{m+1} \right)$$

$$\rightarrow 0 = \frac{m \times 5 + 1 \times (-5)}{m+1}$$

$$\rightarrow 5m - 5 = 0 \quad m = 1$$

$$\rightarrow m : 1 = 1 : 1$$

$\therefore 1 : 1$ , so the mid point.

$$\therefore x = \frac{-1 - 4}{2} = -\frac{5}{2}$$

hence,  $(-\frac{5}{2}, 0)$ .

Q6. Mid point of AC = Mid-point of BD.

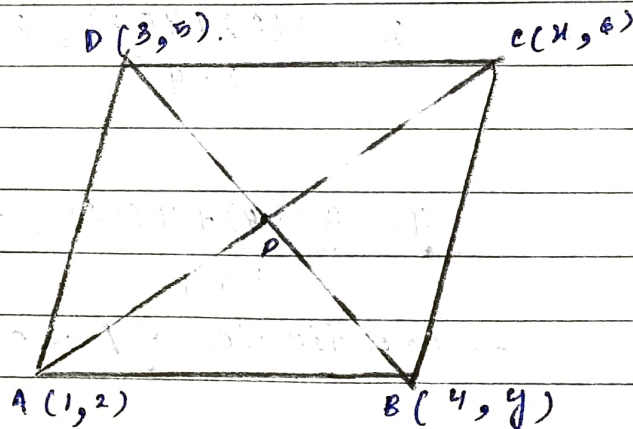
$$\rightarrow \frac{x+1}{2}, \frac{6+2}{2} = \frac{4+3}{2}, \frac{y+5}{2}$$

$$\rightarrow \frac{x+1}{2} = \frac{7}{2} \text{ \& } \frac{6+2}{2} = \frac{y+5}{2}$$

$$\rightarrow x+1 = 7 \text{ \& } 8 = y+5$$

$$\rightarrow x = 7 - 1 \text{ \& } y = 8 - 5 = 3$$

$$\rightarrow x = 6 \text{ \& } y = 3$$



Q7. Let the coordinates of point A be  $(x, y)$ .

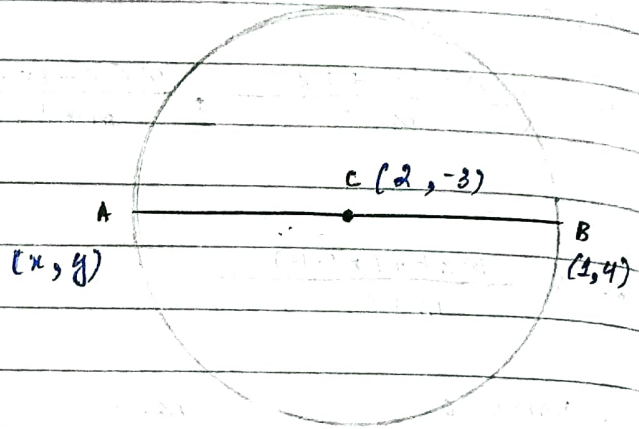
$C(2, -3)$  is the mid point of dia. AB.

$$\therefore \text{Coordinates of } C = \left( \frac{x+1}{2}, \frac{y+4}{2} \right)$$

Q7.  $\Rightarrow 2 = \frac{x+1}{2} \Rightarrow x=3$

$-3 = \frac{y+4}{2} \Rightarrow y = -10$

$\therefore$  A are  $(3, -10)$



Q8.  $AP = \frac{3}{7} AB$

$BP = AB - AP$

$= \frac{AB}{1} - \frac{3}{7} AB = \frac{7AB - 3AB}{7} = \frac{4AB}{7}$

$\frac{AP}{BP} = \frac{\frac{3}{7} AB}{\frac{4}{7} AB} = 3:4$

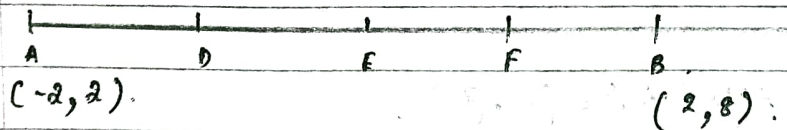


$x = \frac{3(2) + 4(-2)}{3+4} = \frac{6-8}{7} = -\frac{2}{7}$

$y = \frac{3(-4) + 4(-2)}{3+4} = \frac{-12-8}{7} = -\frac{20}{7}$

$\therefore$  coordinates of P are  $(-\frac{2}{7}, -\frac{20}{7})$

Q9.



$\therefore$  coordinates of D =  $(\frac{-2+0}{2}, \frac{2+5}{2})$

$= (-1, \frac{7}{2})$

Q9.  $\therefore$  Coordinates of E =  $(\frac{-2+2}{2}, \frac{2+8}{2}) = (0, 5)$ .

D is the mid-point of AE.

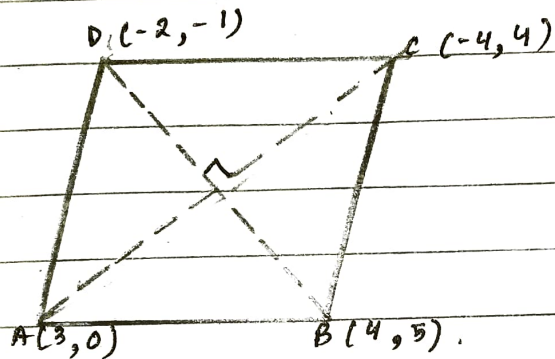
F is the mid-point of EB.

$\therefore$  Coordinates of F =

$$(\frac{0+2}{2}, \frac{5+8}{2}) = (1, \frac{13}{2})$$

$\therefore (-1, \frac{7}{2}), (0, 5)$  &  $(1, \frac{13}{2})$ .

Q10.



A(3, 0).

B(4, 5)

C(-1, 4).

D(-2, -1).

$$AC = \sqrt{(-1-3)^2 + (4-0)^2} = \sqrt{16+16} = \sqrt{32} = 4\sqrt{2}$$

$$BD = \sqrt{(4+2)^2 + (5+1)^2} = \sqrt{36+36} = 6\sqrt{2}$$

Area of a rhombus =

$$= \frac{1}{2} \times AC \times BD$$

$$= \frac{1}{2} \times 4\sqrt{2} \times 6\sqrt{2}$$

$$= \frac{1}{2} \times 4 \times 6 \times 2 = 24 \text{ sq. units.}$$