(2) The points $(-5,2)$ and $(2,-5)$ lie in the ——

(1) same quadrant (2) II and III quadrant respectively

(3) II and IV quadrant respectively

(4) IV and II quadrant respectively.

⇒ (3) II and IV quadrant respectively.

(3) On plotting the points $O(0,0)$, $A(3,-4)$, $B(3,4)$ and $C(0,4)$. and joining OA, AB, BC and CO, which of the following figure is obtained?

(1) square (2) Rectangle (3) Trapezium (4) Rhombus.

⇒ ~~Now, mid-point of OB~~

$= \left(\frac{0+3}{2}, \frac{0+4}{2}\right)$

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

~~and mid-point of AC~~

$= \left(\frac{3+0}{2}, \frac{-4+4}{2}\right)$

⇒ $OA = \sqrt{(3-0)^2+(-4-0)^2}$

$= \sqrt{9+16}$

$= \sqrt{25} = 5$

$BC = \sqrt{(0-3)^2+(4-4)^2}$

$= \sqrt{9+0}$

$= 3$

$AB = \sqrt{(3-3)^2+(4+4)^2}$

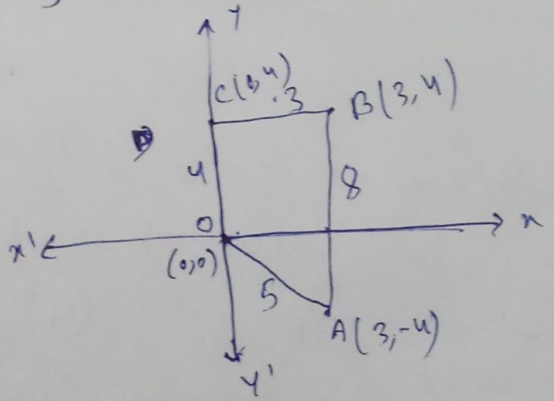
$= \sqrt{0+64}$

$= 8$

$CO = \sqrt{(0-0)^2+(0-4)^2}$

$= \sqrt{0+16}$

$= 4$



Thus This figure is trapezium.

(3)

(4) If P(-1,1), Q(3,-4), R(1,-1), S(-2,-3) and T(-4,4) are plotted on a graph paper, then the points in the fourth quadrant are ——

(1) P and T (2) Q and R (3) only S (4) P and Q.

⇒ we know that 4th quadrant ~~are~~ be

x-axis ~~negative~~ positive.

and y-axis negative.

∴ ~~(3) only S.~~ (2) Q and R.

(5) The point whose ordinate is 4 and which lies on the y-axis is ——

(1) (4,0) (2) (0,4) (3) (1,4) (4) (4,2).

⇒ (2) (0,4).

(6) The distance between the two points (2,3) and (1,4) is ——

(1) 2 (2) $\sqrt{56}$ (3) $\sqrt{10}$ (4) $\sqrt{2}$

⇒ required distance $= \sqrt{(1-2)^2+(4-3)^2}$

$= \sqrt{1+1}$

$= \sqrt{2}$ (4)

(7) If the points A(2,0), B(-6,0), C(3,a-3) lie on the x-axis then the value of a is.

(1) 0 (2) 2 (3) 3 (4) -6.

⇒ Given all points line on x-axis.

then, C(3,a-3) = (3,0)

$a-3=0$

$a = 3$ (3)

(8) If $(x+2, 4) = (5, y-2)$, then the coordinates (x, y) are ——

(1) $(7, 12)$ (2) $(5, 3)$ (3) $(3, 6)$ (4) $(2, 1)$.

$\Rightarrow (x+2, 4) = (5, y-2)$

$x+2 = 5$ | $4 = y-2$

$x = 5-2$ | $y = 4+2$

$x = 3$ | $y = 6$.

$\therefore$ required coordinates $(x, y) = (3, 6)$ (3)

(9) If Q_1, Q_2, Q_3, Q_4 are the quadrants in a cartesian plane then $Q_2 \cap Q_3$ is ——

(1) $Q_1 \cup Q_2$ (2) $Q_2 \cup Q_3$ (3) null set (4) Negative x-axis.

$\Rightarrow Q_2 \cap Q_3 = \phi$ = null set (3)

(10) The distance between the point $(5, -1)$ and the origin is ——

(1) $\sqrt{24}$ (3) $\sqrt{37}$ (3) $\sqrt{26}$ (4) $\sqrt{17}$

$\Rightarrow$ distance $= \sqrt{(0-5)^2 + (0+1)^2}$

$= \sqrt{25+1} = \sqrt{26}$ (3)

(11) The coordinates of the point e dividing the line segment joining the points $P(2, 4)$ and $Q(5, 7)$ internally in the ratio $2:1$ is

$\Rightarrow$ (1) $\left(\frac{7}{2}, \frac{4}{2}\right)$ (2) $(3, 5)$ (3) $(4, 4)$ (4) $(4, 6)$.

$\Rightarrow e(x, y) = \left(\frac{2\times5+1\times2}{2+1}, \frac{2\times7+1\times4}{2+1}\right)$

$= \left(\frac{10+2}{3}, \frac{14+4}{3}\right) = \left(\frac{12}{3}, \frac{18}{3}\right)$

$= (4, 6)$ (4)

(12) If $P\left(\frac{a}{3}, \frac{b}{2}\right)$ is the mid-point of the line segment joining $A(-4, 3)$ and $B(-2, 4)$ then (a, b) is

(1) $(-9, 7)$ (2) $\left(-3, \frac{7}{2}\right)$ (3) $(9, -7)$ (4) $\left(3, -\frac{7}{2}\right)$

⇒ Now,

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

$$\left(\frac{-6}{2}, \frac{7}{2}\right) = \left(\frac{a}{3}, \frac{b}{2}\right)$$

$$-3 = \frac{a}{3} \quad \Big| \quad \frac{7}{2} = \frac{b}{2}$$

$$a = -9 \quad \Big| \quad b = 7$$

Thus, $(a, b) = (-9, 7)$ (1)

(13) In what ratio does the point $(1, 6)$ divide the line segment joining the points $P(2, 7)$ and $R(-2, 3)$

(1) 1:2 (2) 2:1 (3) 1:3 (4) 3:1

⇒ Let the ratio $m:n$

then $\left(\frac{-2m+2n}{m+n}, \frac{3m+7n}{m+n}\right) = (1, 6)$

$$\frac{-2m+2n}{m+n} = 1$$

$$-2m+2n = m+n$$

$$-3m = -n$$

$$3m = n$$

$$\frac{m}{n} = \frac{1}{3}$$

$$m:n = 1:3 \quad (3)$$

(14) If the coordinates of one end of a diameter of a circle is (3,4) and the coordinates of its centre is (-3,2), then the coordinates of the other end of the diameter is

(1) (0,-3) (2) (1,9) (3) (3,0) (4) (-9,0).

⇒ Now, Let other end = (x, y)

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

$\frac{3+x}{2} = -3$ | $\frac{4+y}{2} = 2$

$3+x = -6$ | $4+y = 4$

$x = -9$ | $y = 0$

Thus the other end = (-9,0) (4)

(15) The ratio in which the x-axis divides the line segment joining the points A(a_1, b_1) and B(a_2, b_2) is

(1) $b_1 : b_2$ (2) $-b_1 : b_2$ (3) $a_1 : a_2$ (4) $-a_1 : a_2$

⇒ Now, Let the ratio = m : n

then, $\left(\frac{ma_2 + na_1}{m+n}, \frac{mb_2 + nb_1}{m+n}\right) = (a_3, 0)$

$mb_2 + nb_1 = 0(m+n)$

$mb_2 + nb_1 = 0$

$mb_2 = -nb_1$

$\frac{m}{n} = \frac{-b_1}{b_2}$

$m : n = -b_1 : b_2$ (2)

(16) The ratio in which the x-axis divides the line segment joining the points (6,4) and (1,-7) is

(1) 2:3 (2) 3:4 (3) 4:7 (4) 4:3

⇒ Now, Let the ratio = m:n

then, $\left(\frac{m\times 1+n\times 6}{m+n}, \frac{m\times -7+m\times 4}{m+n}\right) = (x, 0)$

$\frac{-7m+4n}{m+n} = 0$

$-7m+4n = 0$

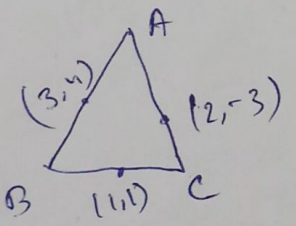
$7m = 4n$

$\frac{m}{n} = \frac{4}{7}$ $\quad m:n = 4:7$ (3)

(17) If the coordinates of the mid-points of the sides AB, BC and CA of a triangle are (3,4), (1,1) and (2,-3) respectively, then the vertices A and B of the triangle are

(1) (3,2), (2,4) (2) (4,0) (2,-4) (3) (3,4) (2,0) (4) (4,3) (2,4).

⇒



Let $A = (x_1, y_1)$, $B = (x_2, y_2)$

$C = (x_3, y_3)$.

Now, $\left(\frac{x_1+x_2}{2}, \frac{y_1+y_2}{2}\right) = (3,4)$

$x_1+x_2 = 6$ --(i) $\quad y_1+y_2 = 8$ --(ii)

$\left(\frac{x_2+x_3}{2}, \frac{y_2+y_3}{2}\right) = (1,1)$

$x_2+x_3 = 2$ --(iii) $\quad y_2+y_3 = 2$ --(iv)

$\left(\frac{x_3+x_1}{2}, \frac{y_3+y_1}{2}\right) = (2,-3)$

$x_3+x_1 = 4$ --(v)

$y_3+y_1 = -6$ --(vi)

Now, (i) + (iii) + (v). we get and (ii) + (iv) + (vi), we get

$2(x_1 + x_2 + x_3) = 6 + 2 + 4$ $\quad 2(y_1 + y_2 + y_3) = 8 + 2 - 6$

$(x_1 + x_2 + x_3) = 6 \cdots$ (vii) $\quad y_1 + y_2 + y_3 = 2 \cdots$ (viii)

Now, (vii) − (iii), we get (vii) − (v), we get

$x_1 = 6 - 2 = 4$ $\quad x_2 = 6 - 4 = 2$

Now, (viii) − (iv), we get (viii) − (vi), we get

$y_1 = 2 - 2 = 0$ $\quad y_2 = 2 - 6 = -4$

Thus vertices $A = (4, 0)$ and $B(2, -4)$ (2)

(18) The mid-point of the line joining $(-a, 2b)$ and $(-3a, -4b)$ is —

(1) $(2a, 3b)$ (2) $(-2a, -b)$ (3) $(2a, b)$ (4) $(-2a, -3b)$.

⇒ mid-point $= \left(\frac{-a-3a}{2}, \frac{2b-4b}{2}\right) = \left(\frac{-4a}{2}, \frac{-2b}{2}\right)$

$= (-2a, -b)$ (2)

(19) In what ratio does the y-axis divides the line joining the points $(-5, 1)$ and $(2, 3)$ internally —

(1) 1 : 3 (2) 2 : 5 (3) 3 : 1 (4) 5 : 2

⇒ Let the ratio $= m : n$

then, $\left(\frac{2m - 5n}{m+n}, \frac{3m+n}{m+n}\right) = (0, y)$

$2m - 5n = 0$

$2m = 5n$

$\frac{m}{n} = \frac{5}{2}$ $\Rightarrow$ $m : n = 5 : 2$ (4)

(20) If $(1, -2)$, $(3, 6)$, $(x, 10)$ and $(3, 2)$ are the vertices of the parallelogram taken in order, then the value of x is —

(1) 6 (2) 5 (3) 4 (4) 3

⇒ mid points of $(1, -2)$ and $(x, 10)$ = mid-points of $(3, 6)$ & $(3, 2)$

$\left(\frac{1+x}{2}, \frac{-2+10}{2}\right) = \left(\frac{3+3}{2}, \frac{6+2}{2}\right)$

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

$1 + x = 6$

$x = 6 - 1 = 5$ (2).