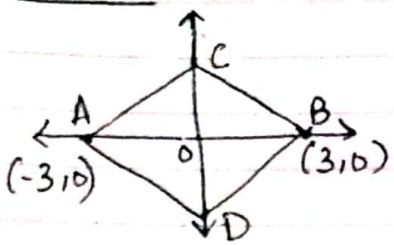
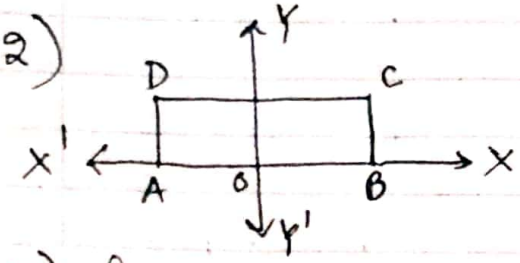
IX H.W-8

1) 

$\triangle ABC$ and $\triangle ABD$ are equilateral $\triangle$s
(i) Find the coordinates of point C and D
(ii) Which mathematical concept is used?

2) 

ABCD is a rectangle with length 6cm and breadth 3cm. O is the mid-point of AB. Find the coordinates of A, B, C and D.

(graph) 3) Draw the graph of the equation: $y = 3x - 2$

4) Find the coordinates of the vertices of a rectangle placed in III quadrant in the cartesian plane with length p units on x-axis and breadth q units on y-axis.

5) In which quadrant or on which axis do each of the points $(-2,4)$, $(3,-1)$, $(-1,0)$, $(-3,-5)$ and $(1,2)$ lie?

6) Calculate the area of $\triangle$ formed by joining the points $(4,0)$, $(0,0)$ and $(0,4)$.

7) If the coordinates of a point M are $(-2,9)$ which can also be expressed as $(1+x, y^2)$ and $y > 0$, then find in which quadrant do the following points lie:
$P(x,y)$, $Q(2,x)$, $R(x^2, y-1)$, $S(2x, -3y)$

8) The ratio of girls and boys in a class is 1:3. Set up an (graph) equation between the students of a class and boys and draw its graph. Also find the no. of boys in the class of 40 students from the graph.

9) At what point does the graph of the linear equation $2x + 3y = 9$ meet a line which is parallel to the y-axis, at a distance of 4 units from the origin and on the right of the y-axis?

10) The auto rikshaw fare in a city is charged ₹10 for first kilometer and Rs 4 per km for subsequent distance covered. Write a linear equation in two variables to express the above statement. Find four solutions also.

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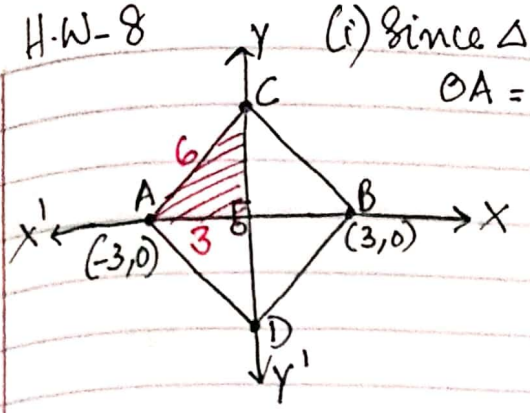
IX H.W-8

1) (i) Since $\triangle ABC$ is an equilateral $\triangle$, $AC = BC = AB = 6$ units.



$OA = AB/2 = 3$ units

Using Pythagoras Theorem in rt. $\triangle AOC$,

$OC^2 = AC^2 - OA^2$

$= 6^2 - 3^2$

$= 36 - 9 = 27$

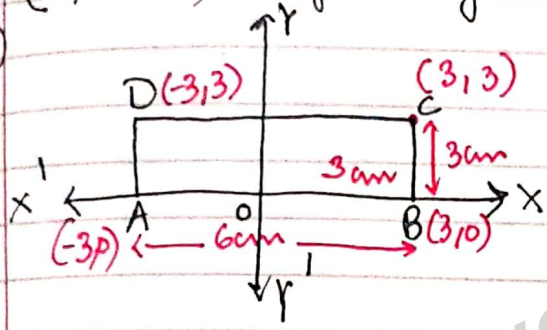
$\therefore OC = \sqrt{27} = 3\sqrt{3}$ units

3 | 27
3 | 9
3

Similarly we can get $OD = 3\sqrt{3}$ units.

Hence the coordinates of point C and D are $(0, 3\sqrt{3})$ and $(0, -3\sqrt{3})$ respectively. (ii) coordinate geometry

2)



$AB = CD$ } opposite sides of a
$BC = AD$ } rectangle.

Since O is the mid-point of AB, $OA = OB = 3$ cm.

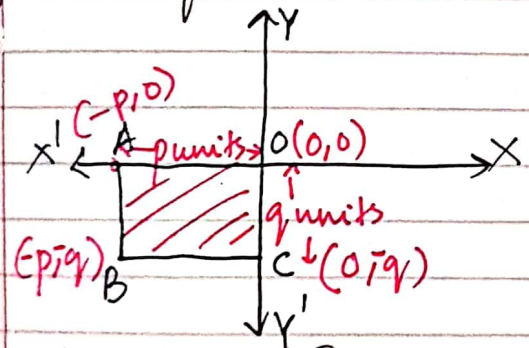
$\therefore$ The coordinates of A, B, C and D are A(-3,0), B(3,0), C(3,3) and D(-3,3) respectively.

3) $y = 3x - 2$

x	0	1	2
y	-2	1	4

(graph)

4) The required coordinates are O(0, 0)
A(-p, 0)
B(-p, -q) and
C(0, -q)



5) (-2, 4) → II quadrant
(3, -1) → IV quadrant
(-1, 0) → x-axis
(-3, -5) → III quadrant
(1, 2) → I quadrant

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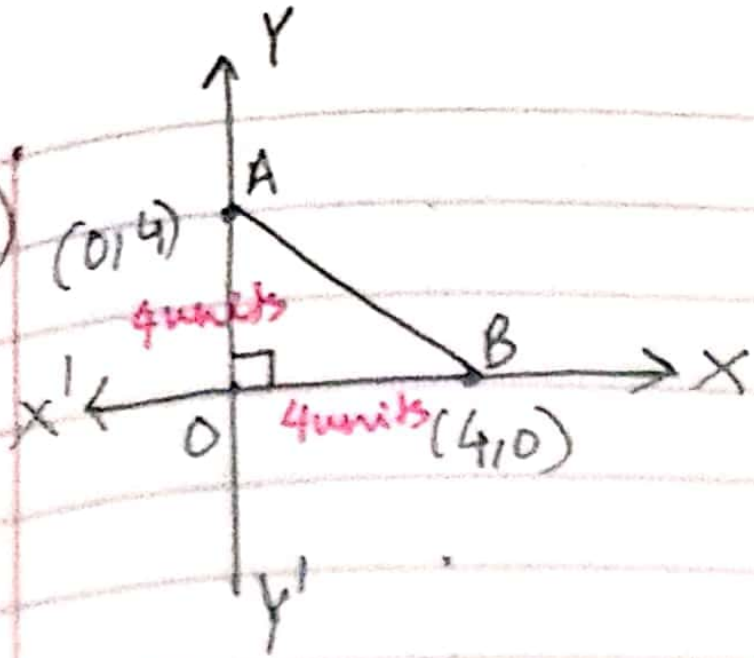
6)



In right $\triangle OAB$,

$$\text{area}(\triangle OAB) = \frac{1}{2} \times OB \times OA$$

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

$$= 8 \text{ sq. units}$$

7) $M(-2, 9) = M(1+x, y^2)$

$\therefore 1+x = -2 \quad | \quad y^2 = 9$

$x = -3 \quad | \quad y = 3 \quad [\because y > 0]$

$P(x, y) = P(-3, 3) \rightarrow$ II quadrant

$Q(2, x) = Q(2, -3) \rightarrow$ IV quadrant

$R(x^2, y-1) = R(9, 2) \rightarrow$ I quadrant

$S(2x, -3y) = S(-6, -9) \rightarrow$ III quadrant

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8) Let the no. of boys be x and total no. of students be y.

Since the ratio of girls to boys is 1 : 3,

no. of boys, $x = \frac{3}{4}y$

$\Rightarrow y = \frac{4}{3}x$ is the required equation.

x	0	30	60	
y	0	40	80	

(graph)

From the

When $y = 40$, the no. of boys $= \underline{\underline{30}}$

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9) The line which is parallel to the y-axis at a distance of 4 units from origin is $x=4$, on the right of y-axis.

when $x=4$, $2\times4+3y=9$

$3y=1$

$y=\frac{1}{3}$

Hence the required point is $(4, \frac{1}{3})$

10) Let the distance covered be x km and y be the total charge.

Then, $y = 10+4(x-1)$

$\Rightarrow y = 10+4x-4$

$\Rightarrow y = 4x+6$

$\Rightarrow 4x-y+6=0$ is the required linear equation in two variables which is of the form $ax+by+c=$

$y = 4x+6$

4 solutions are:

x	0	1	2	3
y	6	10	14	18

when $x=0$, $y=6$ i.e, $(0,6)$

when $x=1$, $y=4+6=10$ i.e, $(1,10)$

when $x=2$, $y=8+6=14$ i.e, $(2,14)$

when $x=3$, $y=12+6=18$ i.e, $(3,18)$

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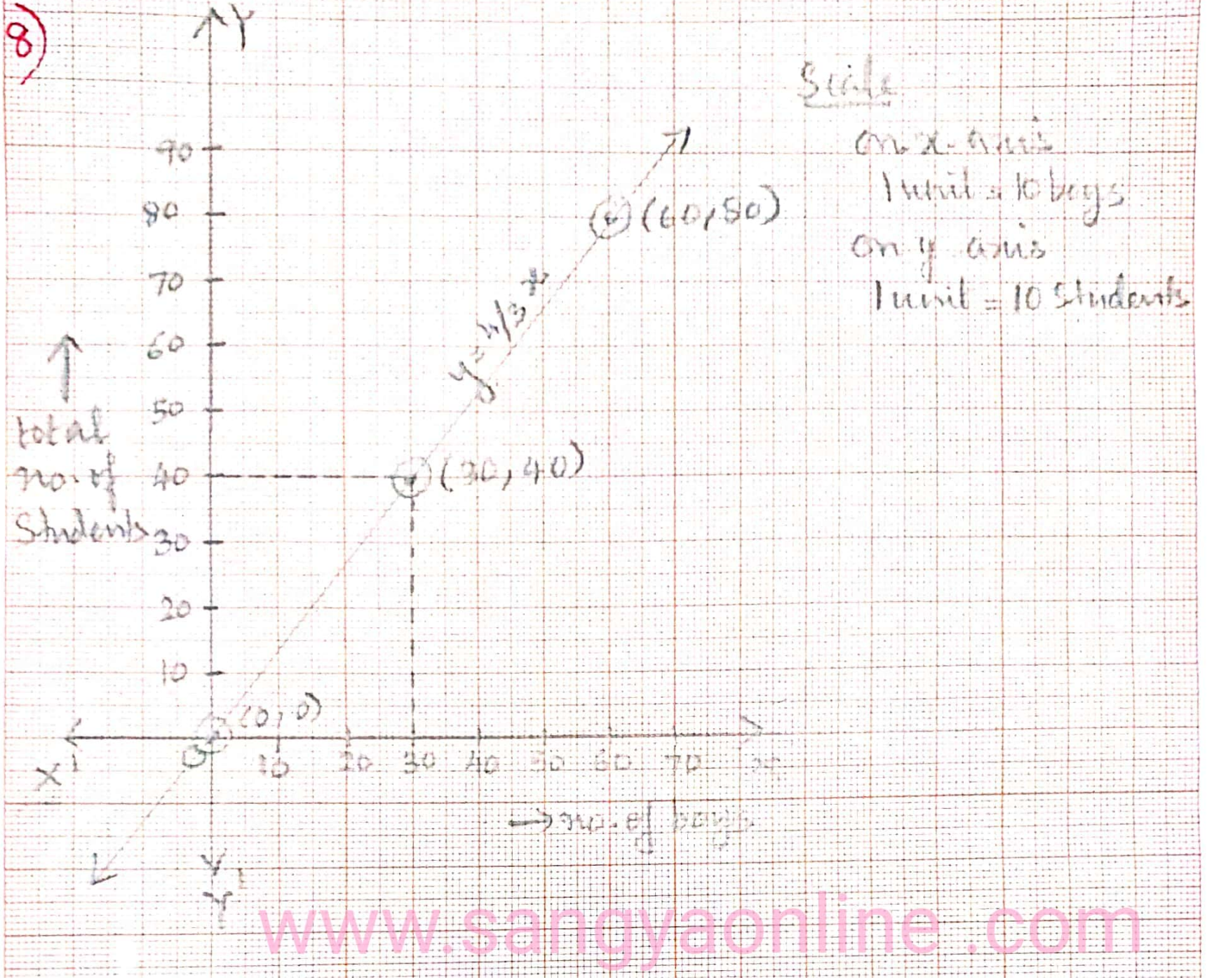
8)



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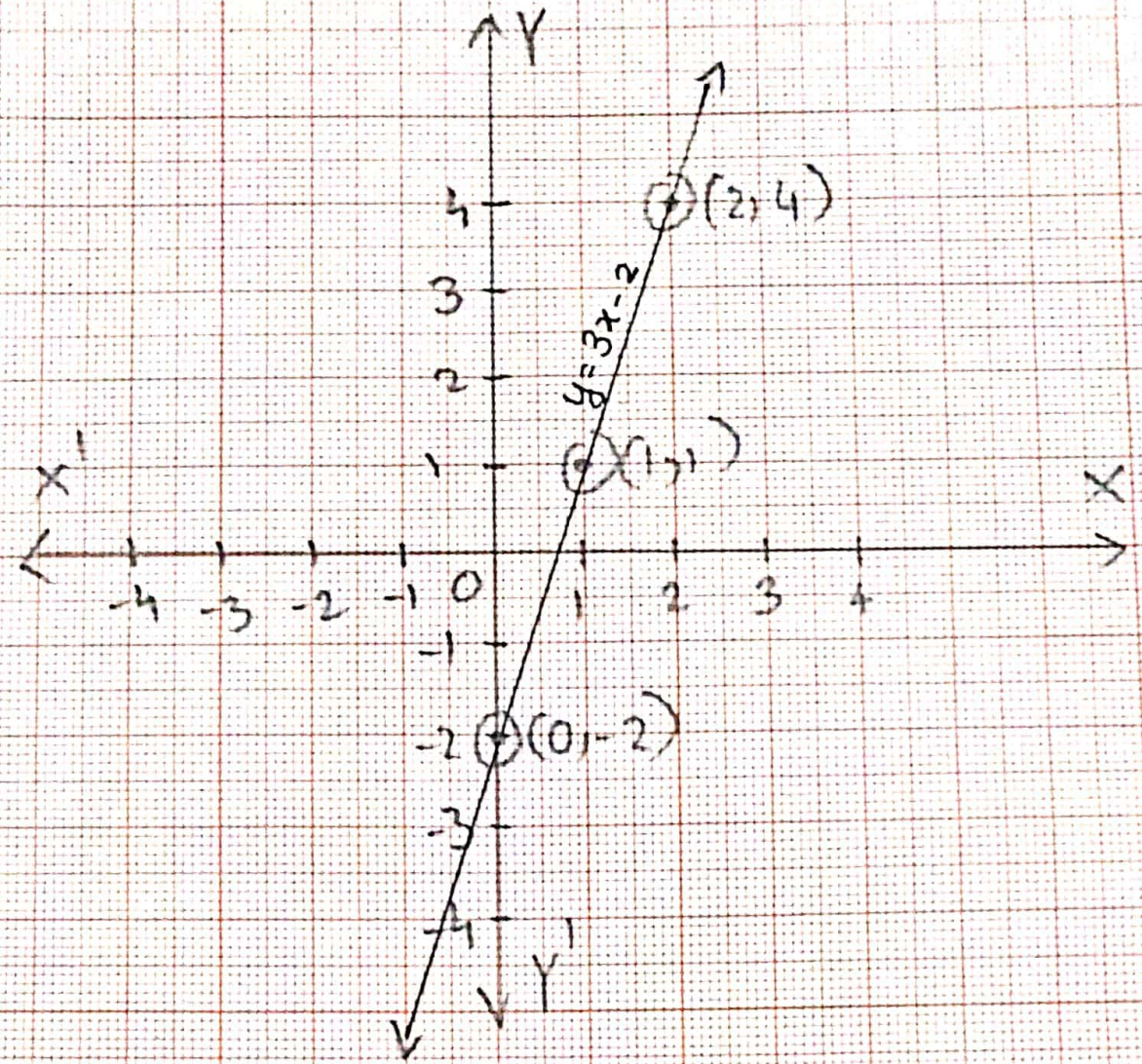
3)



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