8/7/21

HOME ASSIGNMENT

Ch:-

Linear Equation In 2 variables

1. Find the value of k, if $x = 2$; $y = 1$ is a solution of the equation $2x + 3y = k$.

Ans) A/q,

$x = 2$, $y = 1$

So,

$\Rightarrow 2x + 3y = k$

$\Rightarrow 2(2) + 3(1) = k$

$\Rightarrow 4 + 3 = k$

$\Rightarrow 7 = k$

So the value of k is 7.

2. Find the points where the graph of the linear equation $3x + 4y = 12$ cuts the x-axis and y-axis.

Let $x = 0$,

$\Rightarrow 3x + 4y = 12$

$\Rightarrow 3(0) + 4y = 12$

$\Rightarrow 4y = 12$

$\Rightarrow y = \frac{12}{4} = 3$

$\Rightarrow y = 3$

$\therefore (0, 3)$

Let $y = 0$

$\Rightarrow 3x + 4y = 12$

$\Rightarrow 3x + 4(0) = 12$

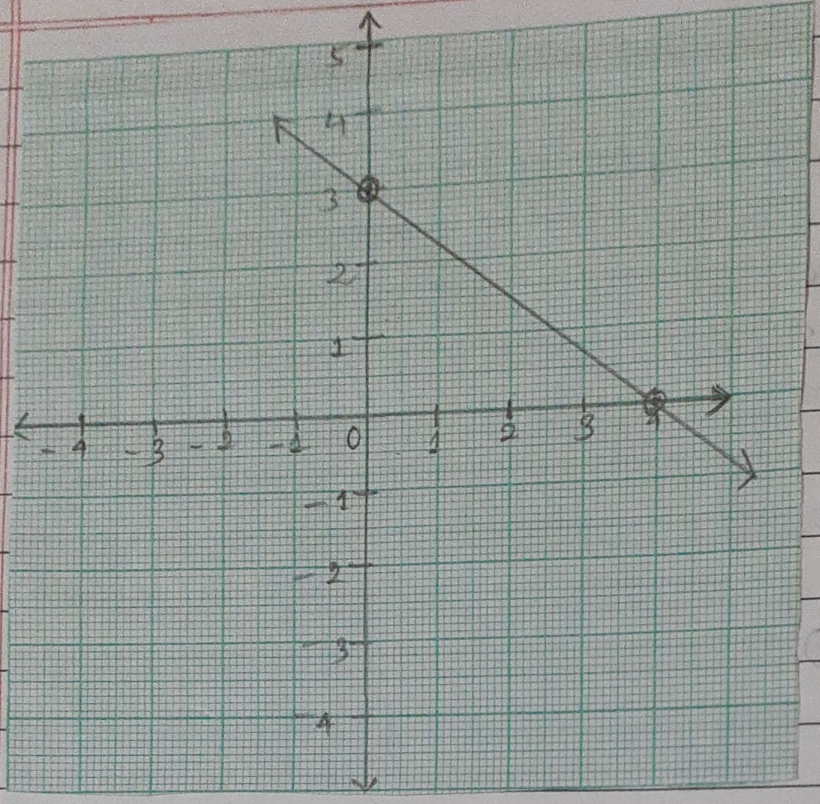
$\Rightarrow 3x = 12$

$\Rightarrow x = 12/3 = 4$

$\Rightarrow x = 4$

$\therefore (4, 0)$

So, it cuts x-axis at (4, 0) and y-axis at (0, 3).



3. At what point does the graph of the linear equation $x+y=5$ meet a line which is parallel to the y-axis, at a distance 2 units from the origin and in the positive direction of x-axis.

Ans The given line is $x+y=5$

$\Rightarrow \frac{x}{5}+\frac{y}{5}=1$

Thus, the x- intercept is 5 and y-intercept is 5.

Now, any line parallel to the y-axis is in the form $x=k$.

Since, this line is at a distance of 2 units from the origin hence and in the positive x-axis.

Hence, the equation of the line is $x=2$.

The intersection point of the line $x=2$ and the given line will give us the required point.

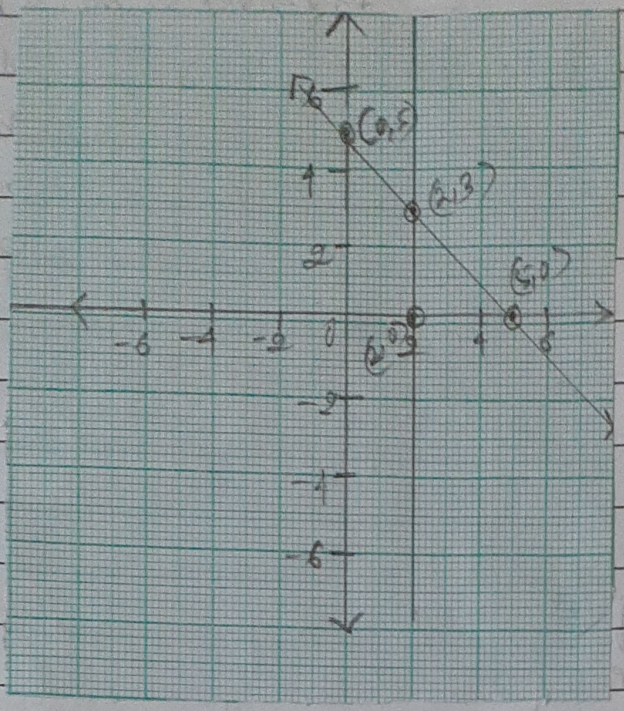
putting $x=2$ in the given equation,

$\Rightarrow 2+y=5$

$\Rightarrow y=5-3$

$\Rightarrow y=3$

i.e. The required point is (2,3).



4. Determine the point on the graph of the equation $2x+5y = 20$, whose x-coordinate is $5/2$ times its ordinate.

Ans) As the x-coordinate is $5/2$ times its ordinate, we have

$$x = \frac{5}{2}y$$

Substituting $x = \frac{5}{2}y$ in the given equation, we get

$$\Rightarrow 2\left(\frac{5}{2}y\right) + 5y = 20$$

$$\Rightarrow 5y + 5y = 20$$

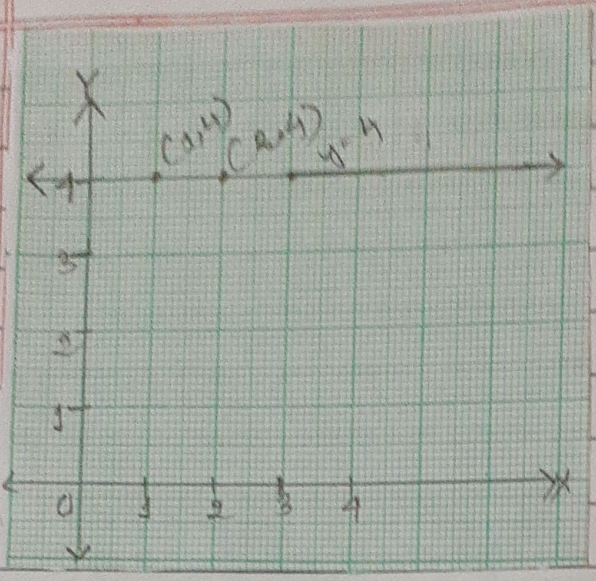
$$\Rightarrow 10y = 20$$

$$\Rightarrow y = \frac{20}{10} = 2$$

Thus, the required point is $\left(5, 2\right)$

5. Draw the graph of the equation represented by the straight line which is parallel to the x-axis and is 4 units above it.

Ans)



Any straight line parallel to x-axis is given by $y = k$, where k is the distance of the line from the x-axis. Here $k = 4$. Therefore, the equation of the line is $y = 5$

To draw:-

The graph of this equation, plot the points (1,4) and (2,4), join them.

6. Draw the graphs of linear equations $y = x$ and $y = -x$ on the same cartesian plane. What do you observe

Ans) For $x = 1$, $y = 1$, therefore (1,1) satisfies the linear equation $y = x$.

For $x = 4$, $y = 4$, therefore (4,4) satisfies the linear equation $y = x$

By plotting the points (1,1) and (4,4) on the graph paper and joining them by a line, we obtain the graph of $y = x$

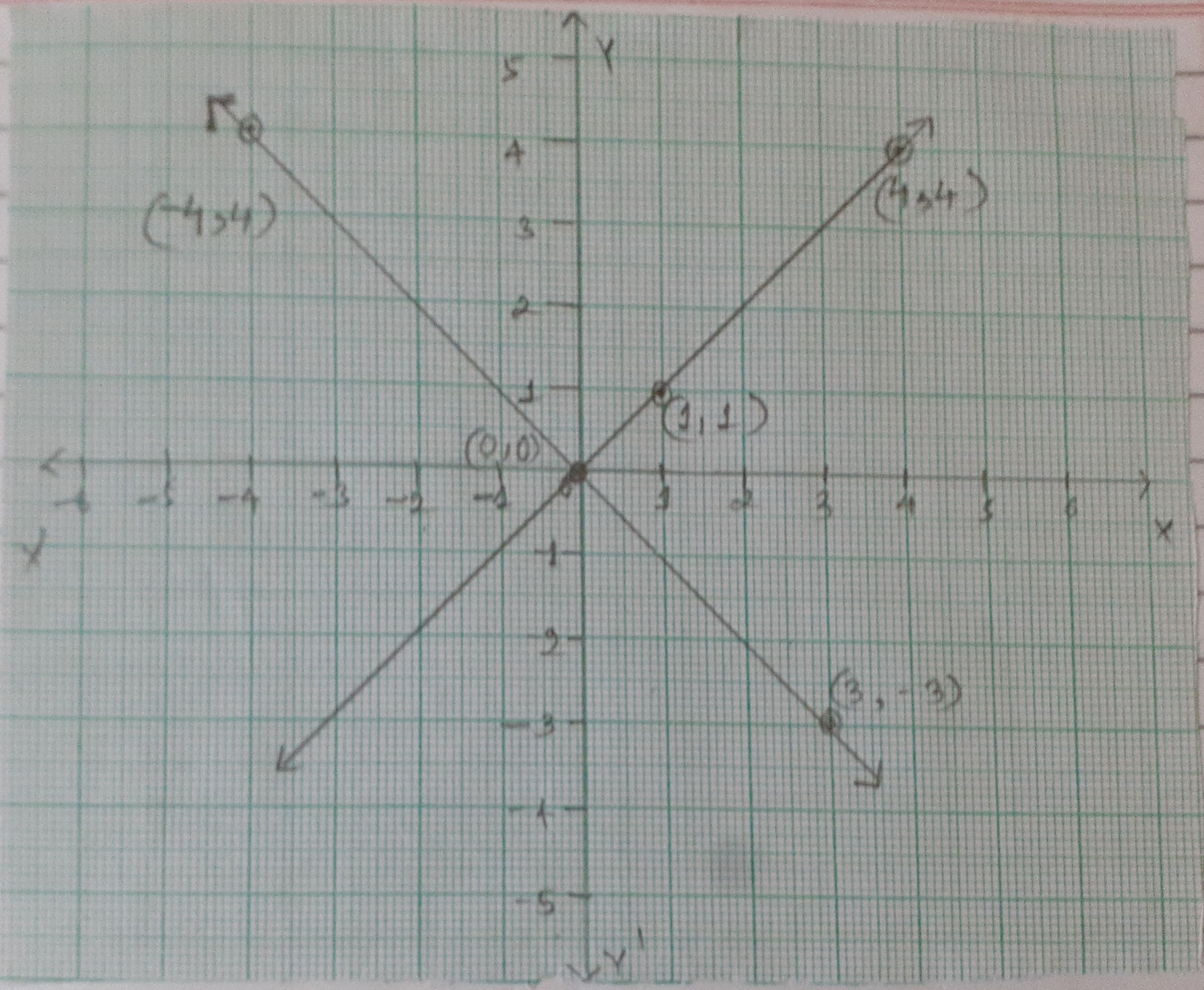
The given equation is $y = -x$. To draw the graph of this equation, we need at least two point lying on the given line

For $x = 3$, $y = -3$, therefore, (3,-3) satisfies the linear equation $y = -x$.

For $x = -4$, $y = 4$, therefore, (-4,4) satisfies the linear equation $y = -x$.

By plotting the points (3,-3) and (-4,4) on the graph paper and joining them by a line, we obtain the graph of $y = -x$.

We observe that, the line $y = x$ and $y = -x$, intersect at the point O(0,0).


Y
X
Y'
X'
(-4,4)
(4,4)
(1,1)
(0,0)
(3,-3)