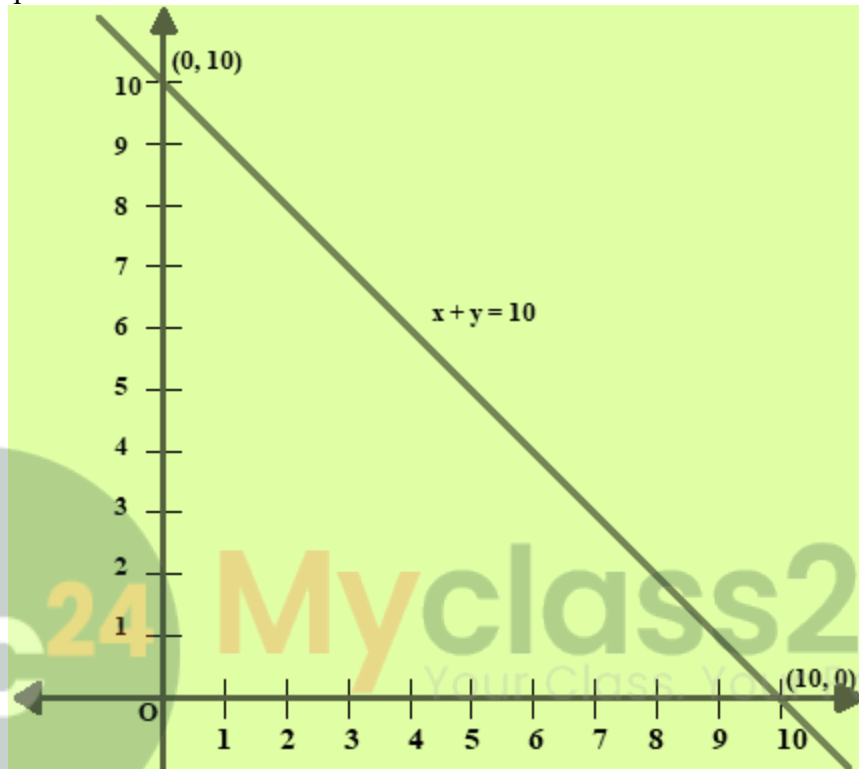


$$x = 10 - y$$

Values of x and y satisfying the equation=

x	10	5	0
y	0	5	10

Plotting the graph:



5. Write the linear equation such that each point on its graph has an ordinate 3 times its abscissa.

Solution:

According to the question,

A linear equation such that each point on its graph has an ordinate(y) which is 3 times its abscissa(x).

So we get,

$$\Rightarrow y = 3x.$$

Hence, $y = 3x$ is the required linear equation.

EXERCISE 4.4

1. Show that the points A (1, 2), B (-1, -16) and C (0, -7) lie on the graph of the linear equation $y = 9x - 7$.

Solution:

We have the equation,

$$y = 9x - 7$$

For A (1, 2),

Substituting the values of $(x,y) = (1, 2)$,

We get,

$$2 = 9(1) - 7 = 9 - 7 = 2$$

For B (-1, -16),

Substituting the values of $(x,y) = (-1, -16)$,

We get,

$$-16 = 9(-1) - 7 = -9 - 7 = -16$$

For C (0, -7),

Substituting the values of $(x,y) = (0, -7)$,

We get,

$$-7 = 9(0) - 7 = 0 - 7 = -7$$

Hence, we find that the points A (1, 2), B (-1, -16) and C (0, -7) satisfies the line $y = 9x - 7$.

Hence, A (1, 2), B (-1, -16) and C (0, -7) are solutions of the linear equation $y = 9x - 7$

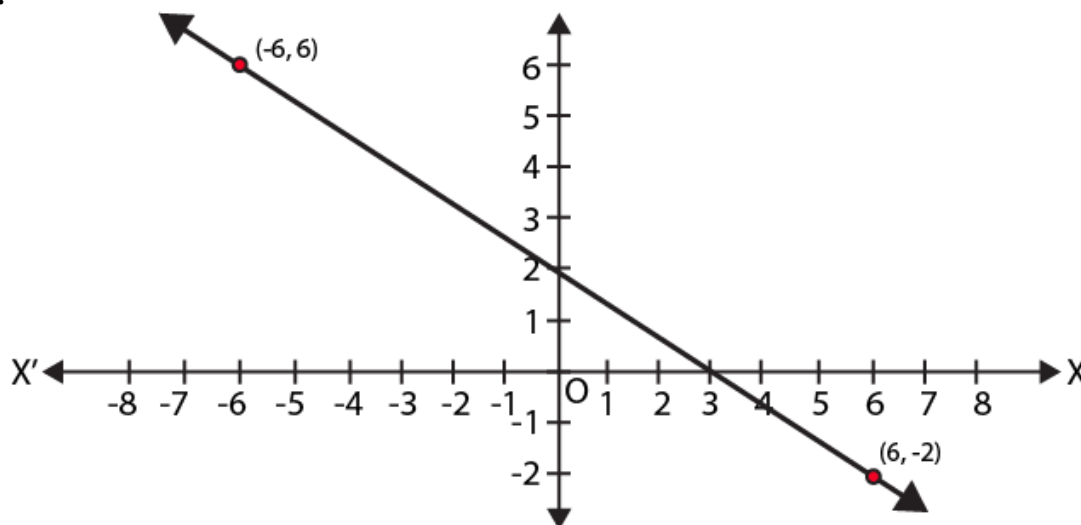
Therefore, points A (1, 2), B (-1, -16), C (0, -7) lie on the graph of linear equation $y = 9x - 7$.

2. The following observed value of x and y are thought to satisfy a linear equation. Write the linear equation-

x	6	-6
y	-2	6

Draw the graph using the value of x, y as given in the above table. At what points the graph of the linear equation (i) cuts the X-axis ? (ii) cuts the Y-axis?

Solution:



We know that,

The linear equation of a line is,

$y = mx + c$, where, c is the y-intercept

From the graph,

We get y-intercept is 2.

$$\Rightarrow c = 2.$$

Also, from the graph,

We get,

$$x_1 = 6, y_1 = -2 \text{ and } x_2 = -6, y_2 = 6$$

We know that,

$m = \text{slope of the line}$

$$\Rightarrow m = \frac{y_2 - y_1}{x_2 - x_1}$$

$$\Rightarrow m = \frac{6 - (-2)}{-6 - 6}$$

$$\Rightarrow m = \frac{8}{-12}$$

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

\therefore we get the linear equation,

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

Multiplying whole equation by 3, we get,

$$\Rightarrow 3y = -2x + 6$$

$$\Rightarrow 2x + 3y - 6 = 0$$

Thus, the points the graph of the linear equation cuts

(i)x-axis

Since, the point is on x axis, we have, $y = 0$.

Substituting $y = 0$ in the equation, $2x + 3y - 6 = 0$,

We get,

$$2x + 3 \times 0 - 6 = 0$$

$$\Rightarrow 2x = 6$$

$$\Rightarrow x = 3$$

Hence, the point at which the graph cuts x-axis = (3, 0).

(ii) y-axis

Since, the point is on y axis, we have, $x = 0$.

Substituting $x = 0$ in the equation, $2x + 3y - 6 = 0$,

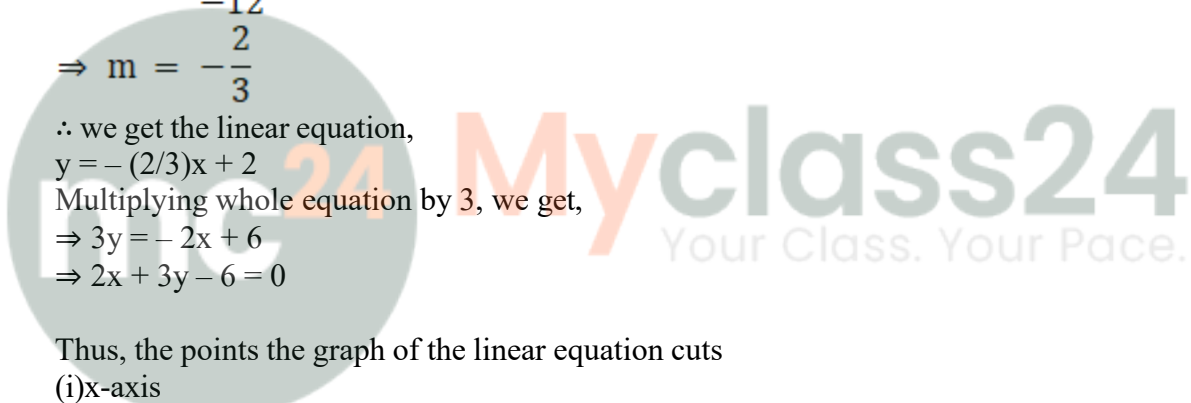
We get,

$$2 \times 0 + 3y - 6 = 0$$

$$\Rightarrow 3y = 6$$

$$\Rightarrow y = 2$$

Hence, the point at which the graph cuts x-axis = (0, 2).



3. Draw the graph of the linear equation $3x + 4y = 6$. At what points, the graph cuts X and Y-axis?

Solution:

According to the question,

We get the equation,

$$3x + 4y = 6.$$

We need at least 2 points on the graph to draw the graph of this equation,

Thus, the points the graph cuts

(i) x-axis

Since, the point is on x axis, we have, $y = 0$.

Substituting $y = 0$ in the equation, $3x + 4y = 6$,

We get,

$$3x + 4 \times 0 = 6$$

$$\Rightarrow 3x = 6$$

$$\Rightarrow x = 2$$

Hence, the point at which the graph cuts x-axis = $(2, 0)$.

(ii) y-axis

Since, the point is on y axis, we have, $x = 0$.

Substituting $x = 0$ in the equation, $3x + 4y = 6$,

We get,

$$3 \times 0 + 4y = 6$$

$$\Rightarrow 4y = 6$$

$$\Rightarrow y = 6/4$$

$$\Rightarrow y = 3/2$$

$$\Rightarrow y = 1.5$$

Hence, the point at which the graph cuts x-axis = $(0, 1.5)$.

Plotting the points $(0, 1.5)$ and $(2, 0)$ on the graph.

