Date- 2.7.2020

Linear Equations in Two variables

Introduction

Recall

we have already know about linear equation in one variable.

for eg :-

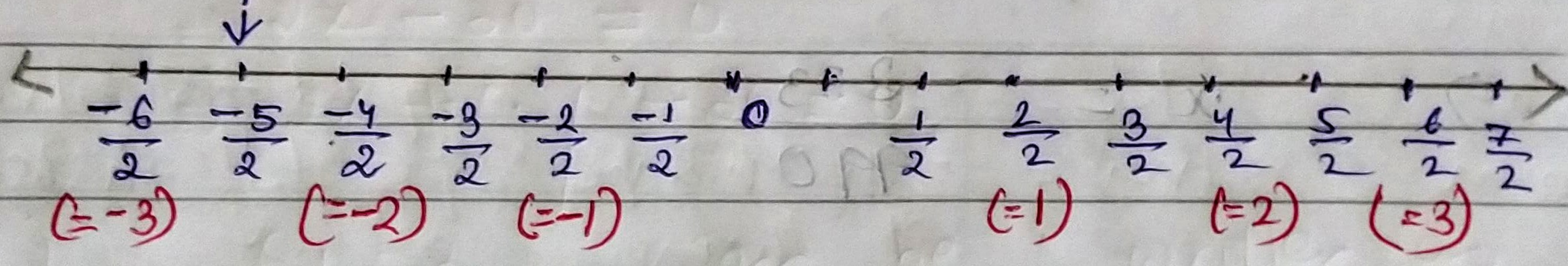
$$2x + 5 = 0$$

$$\Rightarrow 2x = -5$$

$$\Rightarrow x = \frac{-5}{2}$$

It's solution i.e root of the equation is $\frac{-5}{2}$

It can be represented on number line as shown below -



Linear equation in 2 variables :-

An equation of the form $ax + by + c = 0$ where a, b, c are real numbers and $a \neq 0$ as well as $b \neq 0$, is called a linear equation in x and y.

Examples :-

(i) $3x + 2y = 9$

$\Rightarrow 3x + 2y - 9 = 0$

(ii) $4x = 5y$

$\Rightarrow 4x - 5y + 0 = 0$

① what is the equation of x-axis?

equation of the x-axis is $y = 0$.

② what is the equation of y-axis?

equation of y-axis is $x = 0$

Q1 Express the following in standard form
i.e $ax + by + c = 0$

(i) $2x = -3y$ (ii) $4 = 5x - 3y$ (iii) $8y = -6$

solution

(i) $2x = -3y$

$\Rightarrow 2x + 3y = 0$

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

Here $a = 2$, $b = 3$, $c = 0$

(ii) $4 = 5x - 3y$

$\Rightarrow 0 = 5x - 3y - 4$

$\Rightarrow 5x - 3y - 4 = 0$

Here $a = 5$, $b = -3$, $c = -4$

(iii) $8y = -6$

$\Rightarrow 8y + 6 = 0$

$\Rightarrow 0 \cdot x + 8y + 6 = 0$

Here $a = 0$, $b = 8$, $c = 6$

② Express the following as an equation in 2 variables:-

(a) $4x = -5$ (b) $3y = 2$ (c) $2x = 30$

(d) $6y = 3$

Solution:-

(a) $4x = -5$ can be written as

$\Rightarrow 4x + 5 = 0$

$\Rightarrow 4x + 0.y + 5 = 0$

(b) $3y = 2$ can be written as

$\Rightarrow 3y - 2 = 0$

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

(c) $2x = 30$ can be written as

$\Rightarrow 2x - 30 = 0$

$\Rightarrow 2x + 0.y - 30 = 0$

(d) $6y = 3$ can be written as

$\Rightarrow 6y - 3 = 0$

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

③ Check whether $x=2, y=3$ satisfy the linear equation $3x - 4y + 6 = 0$

Ans

Putting $x=2, y=3$ in the given equation,

L.H.S	R.H.S
$= 3x - 4y + 6$	$= 0$
$= 3 \times 2 - 4 \times 3 + 6$	
$= 6 - 12 + 6$	
$= 0$	

$\therefore x=2, y=3$ satify $3x - 4y + 6 = 0$

So, $(2,3)$ is the solution of given equation