

RS Aggarwal Solutions for Class 9 Maths Chapter – 4

Linear Equations in Two Variables

EXERCISE 4(A)

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1. Express each of the following equations in the form $ax + by + c = 0$ and indicate the values of a, b, c in each case.

(i) $3x + 5y = 7.5$

(ii) $2x - \frac{y}{5} + 6 = 0$

(iii) $3y - 2x = 6$

(iv) $4x = 5y$

(v) $\frac{x}{5} - \frac{y}{6} = 1$

(vi) $\sqrt{2}x + \sqrt{3}y = 5$

Solution:

(i) It is given $3x + 5y = 7.5$

We can also write it as

$$3x + 5y - 7.5 = 0$$

We know that 7.5 can be written as $\frac{15}{2}$

So we get,

$$3x + 5y - 7.5 = 0$$

$$3x + 5y - \left(\frac{15}{2}\right) = 0$$

Multiplying the equation with 2 we get,

$$6x + 10y - 15 = 0$$

By comparing the equation with $ax + by + c = 0$

The value of $a = 6$, $b = 10$ and $c = -15$

(ii) It is given

$$2x - \frac{y}{5} + 6 = 0$$

Multiplying the equation with 5 we get,

$$10x - y + 30 = 0$$

By comparing the equation with $ax + by + c = 0$

The value of $a = 10$, $b = -1$ and $c = 30$

(iii) It is given $3y - 2x = 6$

We can also write it as

$$3y - 2x - 6 = 0$$

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

By comparing the equation with $ax + by + c = 0$

The value of $a = -2$, $b = 3$ and $c = -6$

(iv) It is given

$$4x = 5y$$

We can also write it as

$$4x - 5y = 0$$

By comparing the equation with $ax + by + c = 0$

The value of $a = 4$, $b = -5$ and $c = 0$

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- (v) It is given
 $\frac{x}{5} - \frac{y}{6} = 1$
 The LCM of 5 and 6 is 30
 So we get,
 $\frac{6x-5y}{30} = 1$
 Multiplying the equation with 30 we get
 $6x - 5y = 30$
 We can also write it as
 $6x - 5y - 30 = 0$
 By comparing the equation with $ax + by + c = 0$
 The value of $a = 6$, $b = -5$ and $c = -30$
- (vi) It is given
 $\sqrt{2}x + \sqrt{3}y = 5$
 We can also write it as
 $\sqrt{2}x + \sqrt{3}y - 5 = 0$
 By comparing the equation with $ax + by + c = 0$
 The value of $a = \sqrt{2}$, $b = \sqrt{3}$ and $c = -5$

2. Express each of the following equations in the form $ax + by + c = 0$ and indicate the values of a , b , c in each case.

- (i) $x = 6$
 (ii) $3x - y = x - 1$
 (iii) $2x + 9 = 0$
 (iv) $4y = 7$
 (v) $x + y = 4$
 (vi) $\frac{x}{2} - \frac{y}{3} = \frac{1}{6} + y$

Solution:

- (i) It is given
 $x = 6$
 We can also write it as
 $x - 6 = 0$
 So it can be written as
 $1x + 0y - 6 = 0$
 By comparing the equation with $ax + by + c = 0$
 The value of $a = 1$, $b = 0$ and $c = -6$
- (ii) It is given $3x - y = x - 1$
 We can also write it as
 $3x - x - y + 1 = 0$
 $2x - y + 1 = 0$
 By comparing the equation with $ax + by + c = 0$
 The value of $a = 2$, $b = -1$ and $c = 1$
- (iii) It is given

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$$2x + 9 = 0$$

So it can be written as

$$2x + 0y + 9 = 0$$

By comparing the equation with $ax + by + c = 0$

The value of $a = 2$, $b = 0$ and $c = 9$

(iv) It is given

$$4y = 7$$

We can also write it as

$$0x + 4y - 7 = 0$$

By comparing the equation with $ax + by + c = 0$

The value of $a = 0$, $b = 4$ and $c = -7$

(v) It is given $x + y = 4$

We can also write it as

$$x + y - 4 = 0$$

By comparing the equation with $ax + by + c = 0$

The value of $a = 1$, $b = 1$ and $c = -4$

(vi) It is given

$$\frac{x}{2} - \frac{y}{3} = \frac{1}{6} + y$$

We can also write it as

$$\frac{x}{2} - \frac{y}{3} - y = \frac{1}{6}$$

LCM of 2 and 3 is 6 we get

$$\frac{3x - 2y - 6y}{6} = \frac{1}{6}$$

Multiplying by 6 we get

$$3x - 2y - 6y = 1$$

So we get

$$3x - 8y - 1 = 0$$

By comparing the equation with $ax + by + c = 0$

The value of $a = 3$, $b = -8$ and $c = -1$

3. Check which of the following are the solutions of the equation $5x - 4y = 20$.

(i) $(4, 0)$

(ii) $(0, 5)$

(iii) $(-2, \frac{5}{2})$

(iv) $(0, -5)$

(v) $(2, -\frac{5}{2})$

Solution:

(i) It is given $5x$

$$- 4y = 20$$

Now by substituting $(4, 0)$ in the place of x and y

We know that the LHS

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$$= 5x - 4y =$$

$$5(4) - 4(0)$$

On further calculation

$$= 20$$

$$= \text{RHS}$$

Therefore, (4, 0) is the solution of $5x - 4y = 20$

(ii) It is given $5x$

$$- 4y = 20$$

Now by substituting (0, 5) in the place of x and y

We know that the LHS

$$= 5x - 4y =$$

$$5(0) - 4(5)$$

On further calculation

$$= -20 \neq$$

RHS

Therefore, (0, 5) is not the solution of $5x - 4y = 20$

(iii) It is given

$$5x - 4y = 20$$

Now by substituting $(-2, \frac{5}{2})$ in the place of x and y

We know that the LHS

$$= 5x - 4y$$

$$= 5(-2) - 4(\frac{5}{2})$$

On further calculation

$$= -10 - 10 =$$

$$-20$$

$\neq \text{RHS}$

Therefore, $(-2, \frac{5}{2})$ is not the solution of $5x - 4y = 20$

(iv) It is given $5x$

$$- 4y = 20$$

Now by substituting (0, -5) in the place of x and y

We know that the LHS

$$= 5x - 4y =$$

$$5(0) - 4(-5)$$

On further calculation

$$= 20$$

$$= \text{RHS}$$

Therefore, (0, -5) is the solution of $5x - 4y = 20$

(v) It is given

$$5x - 4y = 20$$

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Linear Equations in Two Variables

Now by substituting $(2, -\frac{5}{2})$ in the place of x and y We
know that the LHS

$$= 5x - 4y$$

$$= 5(2) - 4(-\frac{5}{2})$$

On further calculation

$$= 10 + 10$$

$$= 20$$

$$= \text{RHS}$$

Therefore, (0, -5) is the solution of $5x - 4y = 20$

4. Find five different solutions of each of the following equations.

(a) $2x - 3y = 6$

(b) $\frac{2x}{5} + \frac{3y}{10} = 3$

(c) $3y = 4x$

Solution:

(a) It is given

$$2x - 3y = 6$$

Now substitute $x = 0$ in the equation

$$2(0) - 3y = 6$$

$$0 - 3y = 6$$

On further calculation

$$3y = -6$$

Dividing by 3 we get

$$y = -2$$

Therefore, (0, -2) is the solution of $2x - 3y = 6$

Now substitute $y = 0$ in the equation

$$2x - 3(0) = 6$$

$$2x = 6$$

By division

$$x = 3$$

Therefore, (3, 0) is the solution of $2x - 3y = 6$

Now substitute $x = 6$ in the equation

$$2(6) - 3y = 6$$

$$12 - 3y = 6$$

On further calculation

$$3y = 6$$

By division

$$y = 2$$

Therefore, (6, 2) is the solution of $2x - 3y = 6$

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Linear Equations in Two Variables

Now substitute $y = 4$ in the equation

$$2x - 3(4) = 6$$

$$2x - 12 = 6$$

On further calculation

$$2x = -6$$

By division

$$x = -3$$

Therefore, $(-3, 4)$ is the solution of $2x - 3y = 6$

Now substitute $x = -3$ in the equation

$$2(-3) - 3y = 6$$

$$-6 - 3y = 6$$

On further calculation

$$-3y = 12$$

Dividing by 3 we get

$$y = -4$$

Therefore, $(-3, -4)$ is the solution of $2x - 3y = 6$

(b) It is given

$$\frac{2x}{5} + \frac{3y}{10} = 3$$

LCM of 5 and 10 is 10

So we get

$$\frac{4x+3y}{10} = 3$$

Multiplying by 10 we get

$$4x + 3y = 30$$

Now substitute $x = 0$ in the equation

$$4(0) + 3y = 30$$

$$3y = 30$$

By division

$$y = 10$$

Therefore, $(0, 10)$ is the solution of $\frac{2x}{5} + \frac{3y}{10} = 3$

Now substitute $x = 3$ in the equation

$$4(3) + 3y = 30$$

$$12 + 3y = 30$$

On further calculation

$$3y = 18$$

By division

$$y = 6$$

Therefore, $(3, 6)$ is the solution of $\frac{2x}{5} + \frac{3y}{10} = 3$

Now substitute $x = -3$ in the equation

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Linear Equations in Two Variables

$$4(-3) + 3y = 30$$

$$-12 + 3y = 30$$

On further calculation

$$3y = 42$$

By division

$$y = 14$$

Therefore, $(-3, 14)$ is the solution of $\frac{2x}{5} + \frac{3y}{10} = 3$

Now substitute $y = 2$ in the equation

$$4x + 3(2) = 30$$

$$4x + 6 = 30$$

On further calculation

$$4x = 24$$

By division

$$x = 6$$

Therefore, $(6, 2)$ is the solution of $\frac{2x}{5} + \frac{3y}{10} = 3$

Now substitute $y = -2$ in the equation

$$4x + 3(-2) = 30$$

$$4x - 6 = 30$$

On further calculation

$$4x = 36$$

By division

$$x = 9$$

Therefore, $(9, -2)$ is the solution of $\frac{2x}{5} + \frac{3y}{10} = 3$

(c) It is given

$$3y = 4x$$

Now substitute $x = 3$ in the equation

$$3y = 4(3)$$

$$3y = 12$$

On further calculation

$$y = 4$$

Therefore, $(3, 4)$ is the solution of $3y = 4x$

Now substitute $x = -3$ in the equation

$$3y = 4(-3)$$

$$3y = -12$$

On further calculation

$$y = -4$$

Therefore, $(-3, -4)$ is the solution of $3y = 4x$

Now substitute $x = 9$ in the equation

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$$3y = 4(9)$$

$$3y = 36$$

On further calculation

$$y = 12$$

Therefore, (9, 12) is the solution of $3y = 4x$

Now substitute $y = 8$ in the equation

$$3(8) = 4x$$

$$24 = 4x$$

By division

$$x = 6$$

Therefore, (6, 8) is the solution of $3y = 4x$

Now substitute $y = -8$ in the equation

$$3(-8) = 4x$$

$$-24 = 4x$$

By division

$$x = -6$$

Therefore, (-6, 8) is the solution of $3y = 4x$

5. If $x = 3$ and $y = 4$ is a solution of the equation $5x - 3y = k$, find the value of k . Solution:

It is given

$$5x - 3y = k$$

Now by substituting the value of x and y in the equation

$$5(3) - 3(4) = k$$

So we get,

$$15 - 12 = k$$

$$k = 3$$

Therefore, the value of k is 3.

6. If $x = 3k + 2$ and $y = 2k - 1$ is a solution of the equation $4x - 3y + 1 = 0$, find the value of k . Solution:

It is given

$$4x - 3y + 1 = 0$$

Now by substituting the value of x and y in the equation

$$4(3k + 2) - 3(2k - 1) + 1 = 0$$

On further calculation

$$12k + 8 - 6k + 3 + 1 = 0$$

$$6k + 12 = 0$$

So we get $6k$

$$= -12$$

By division

$$k = -2$$

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7. The cost of 5 pencils is equal to the cost of 2 ballpoints. Write a linear equation in two variables to represent this statement. (Take the cost of a pencil to be ₹ x and that of a ballpoint to be ₹ y).

Solution:

Consider cost of pencil as ₹ x and cost of ballpoint as ₹ y

So we can write the cost of 5 pencils as ₹ $5x$

And the cost of 2 ballpoints as ₹ $2y$

We can write it as

$$5x = 2y$$

Therefore the linear equation can be written as

$$5x - 2y = 0$$

EXERCISE 4(B)

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1. Draw the graph of each of the following equations.

(i) $x = 4$

(ii) $x + 4 = 0$

(iii) $y = 3$

(iv) $y = -3$ (v) $x = -2$

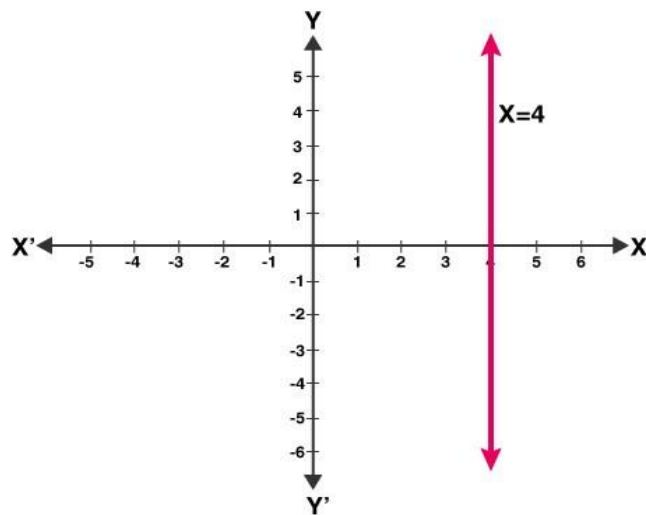
(vi) $x = 5$

(vii) $y + 5 = 0$ (viii) $y = 4$ **Solution:**

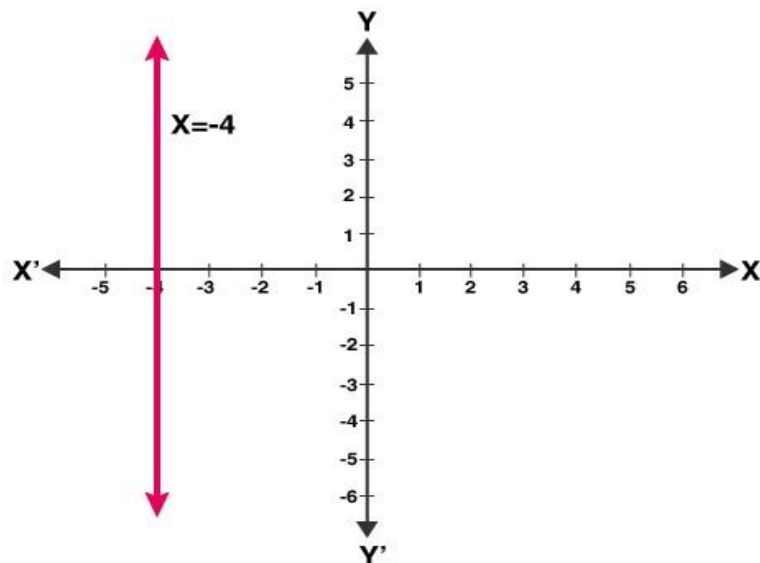
(i) On the graph $x = 4$ is a line which is parallel to the y axis to the right at 4 units distance.

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Linear Equations in Two Variables



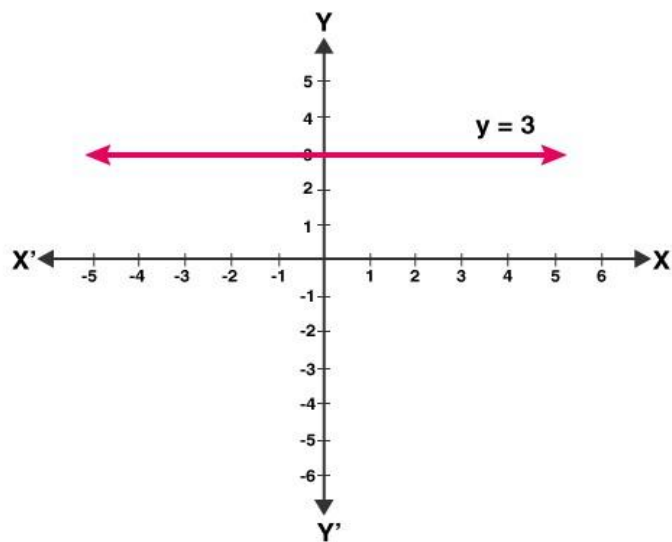
- (ii) It is given $x + 4 = 0$ We can also write it as $x = -4$



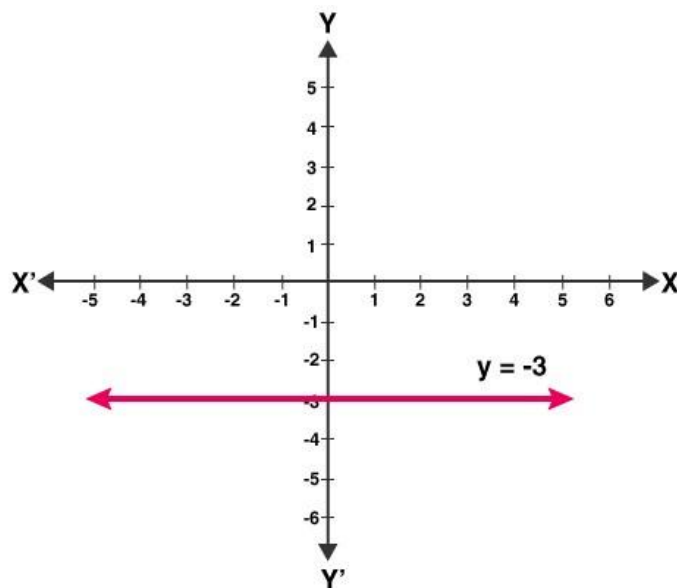
- (iii) On the graph $y = 3$ is a line which is parallel to the x axis which is above at 3 units distance.

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Linear Equations in Two Variables



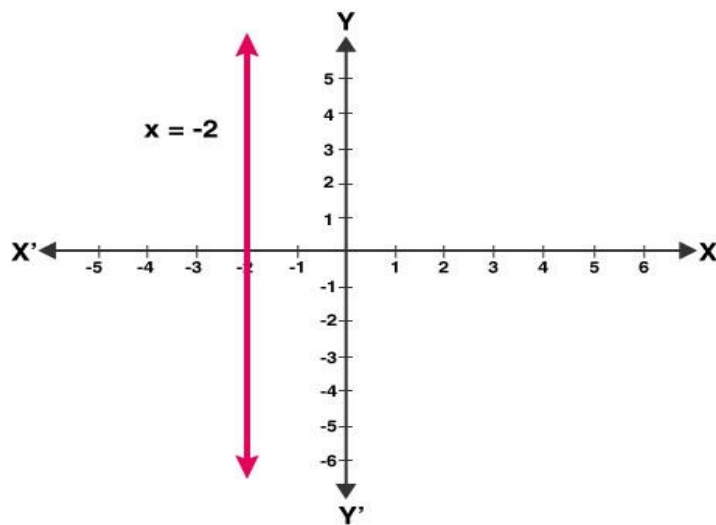
- (iv) On the graph $y = -3$ is a line which is parallel to the x axis which is below at 3 units distance.



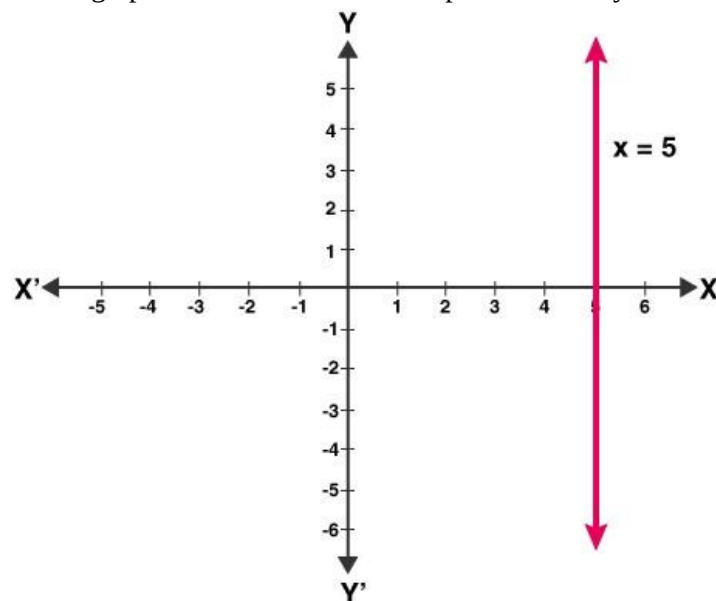
- (v) On the graph $x = -2$ is a line which is parallel to the y axis to the left at 2 units distance.

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Linear Equations in Two Variables



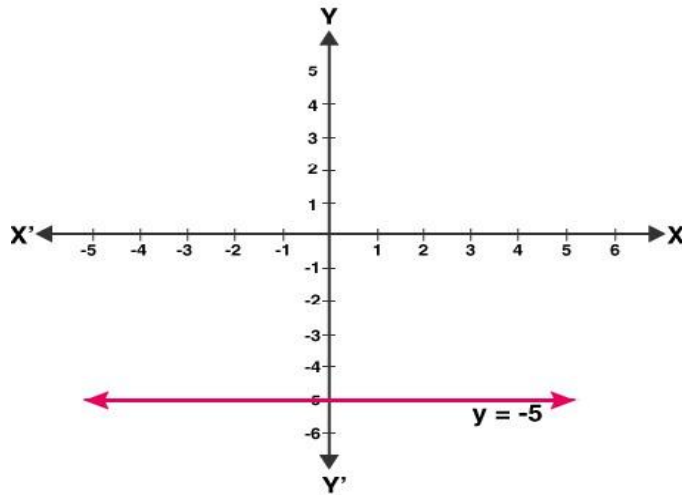
- (vi) On the graph $x = 5$ is a line which is parallel to the y axis to the right at 5 units distance.



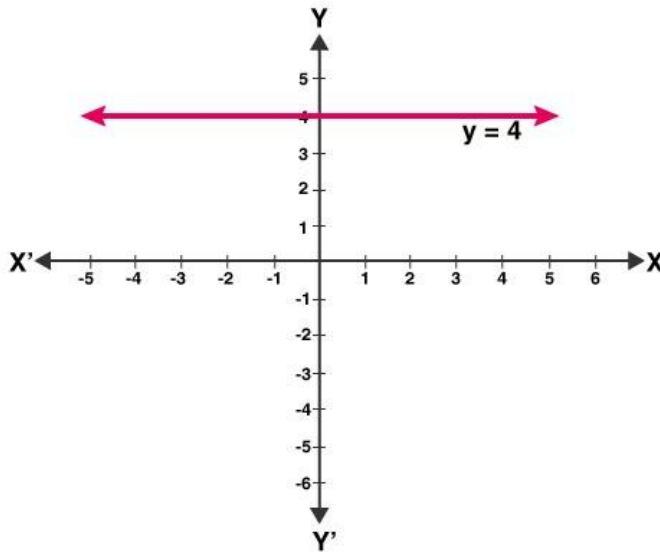
- (vii) It is given $y + 5 = 0$
We can also write it as $y = -5$

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Linear Equations in Two Variables



- (viii) On the graph $y = 4$ is a line which is parallel to the x axis which is above at 4 units distance.



2. Draw the graph of the equation $y = 3x$.
From your graph, find the value of y when

- (i) $x = 2$
(ii) $x = -2$

Solution:

- (i) It is given
 $y = 3x$

Substituting $x = 1$ in the given equation
 $y = 3(1)$ So
we get
 $y = 3$

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Linear Equations in Two Variables

Substituting $x = -1$ in the given equation

$$y = 3(-1) \text{ So}$$

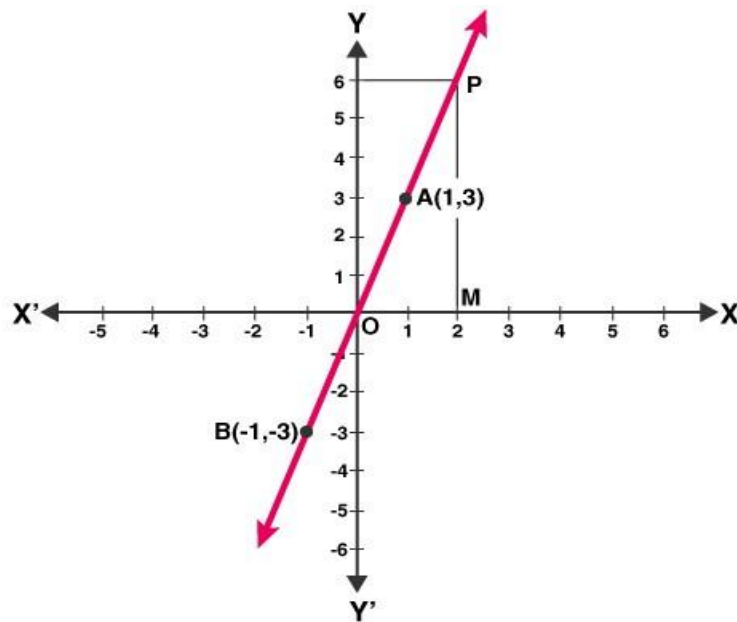
we get

$$y = -3$$

x	1	-1
y	3	-3

Now draw a graph using the points A (1, 3) and B (-1, -3)

Join the points AB through a line and find the value of y.



Based on the graph,

Consider $x = 2$ on X-axis as point M

Now the line joining AB and a point on the Y-axis gives the value of y

Therefore, when $x = 2$ the value of $y = 6$.

(ii) It is given

$$y = 3x$$

Substituting $x = 1$ in the given equation

$$y = 3(1)$$

So we get

$$y = 3$$

Substituting $x = 2$ in the given equation

$$y = 3(2) \text{ So}$$

we get

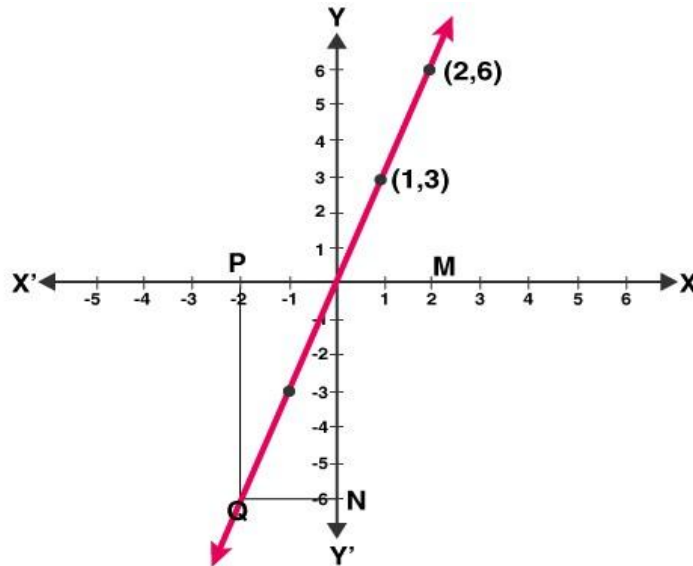
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Linear Equations in Two Variables

$$y = 6$$

x	1	2
y	3	6

Now draw a graph using the points A (1, 3) and B (2, 6)
Join the points PQ through a line and find the value of y.



Based on the graph,

Consider $x = -2$ on X-axis as point P

Now the line joining AB and a point on the Y-axis gives the value of y

Therefore, when $x = -2$ the value of $y = -6$.

3. Draw the graph of the equation $x + 2y - 3 = 0$.

From your graph, find the value of y when

(i) $x = 5$

(ii) $x = -5$

Solution:

(i) It is given $x + 2y - 3 = 0$

Substituting $y = 1$ in the given equation

$$x + 2(1) - 3 = 0$$

So we get

$$x - 1 = 0$$

$$x = 1$$

Substituting $y = 0$ in the given equation

$$x + 2(0) - 3 = 0$$

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Linear Equations in Two Variables

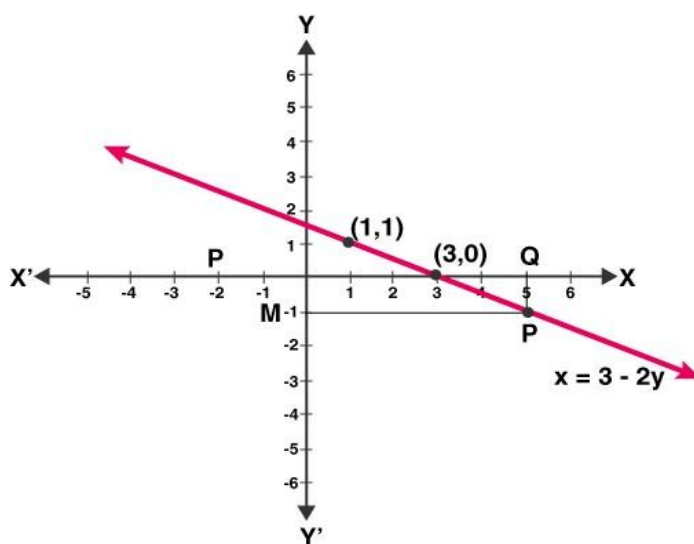
So we get

$$x - 3 = 0$$

$$x = 3$$

x	1	3
y	1	0

Now draw a graph using the points A (1, 1) and B (3, 0)
Join the points PQ through a line and find the value of y.



Based on the graph,

Consider $x = 5$ on X-axis as point Q

Now the line joining AB and a point on the Y-axis i.e. M gives the value of y

Therefore, when $x = 5$ the value of $y = -1$.

(ii) It is given $x +$
 $2y - 3 = 0$

Substituting $x = -1$ in the given equation

$$(-1) + 2y - 3 = 0$$

So we get

$$2y - 4 = 0$$

$$2y = 4$$

Dividing by 2 we get

$$y = 2$$

Substituting $x = 1$ in the given equation

$$1 + 2y - 3 = 0$$

So we get

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Linear Equations in Two Variables

$$2y - 2 = 0$$

$$2y = 2$$

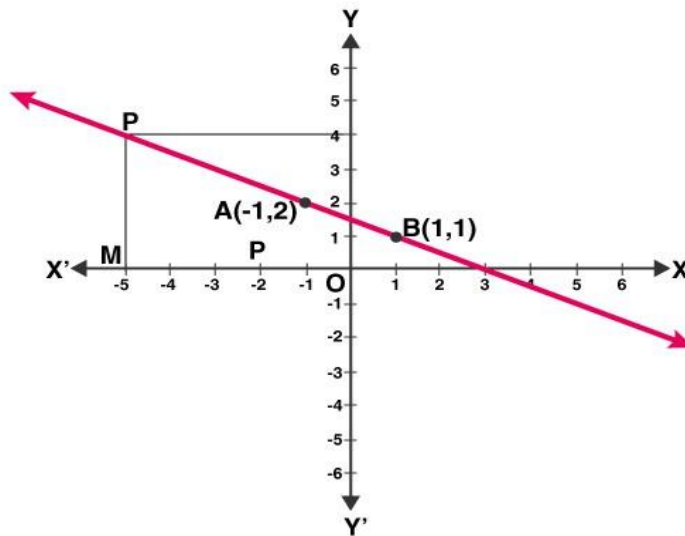
Dividing by 2 we get

$$y = 1$$

x	-1	1
y	2	1

Now draw a graph using the points A (-1, 2) and B (1, 1)

Join the points PM through a line and find the value of y.



Based on the graph,

Consider $x = -5$ on X-axis as point M

Now the line joining AB and a point on the Y-axis gives the value of y

Therefore, when $x = -5$ the value of $y = 4$.

4. Draw the graph of the equation, $2x - 3y = 5$.

From your graph, find (i) The

value of y when $x = 4$ (ii) The

value of x when $y = 3$.

Solution:

It is given

$$2x - 3y = 5$$

We can write it as

$$3y = 2x - 5$$

So we get

$$y = \frac{2x-5}{3}$$

Substituting $x = 4$ in the given equation

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Linear Equations in Two Variables

$$y = \frac{2(4)-5}{3}$$

So we get

$$y = \frac{8-5}{3}$$

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

By division we get

$$y = 1$$

Substituting $x = -2$ in the given equation

$$y = \frac{2(-2)-5}{3}$$

So we get

$$y = \frac{-4-5}{3}$$

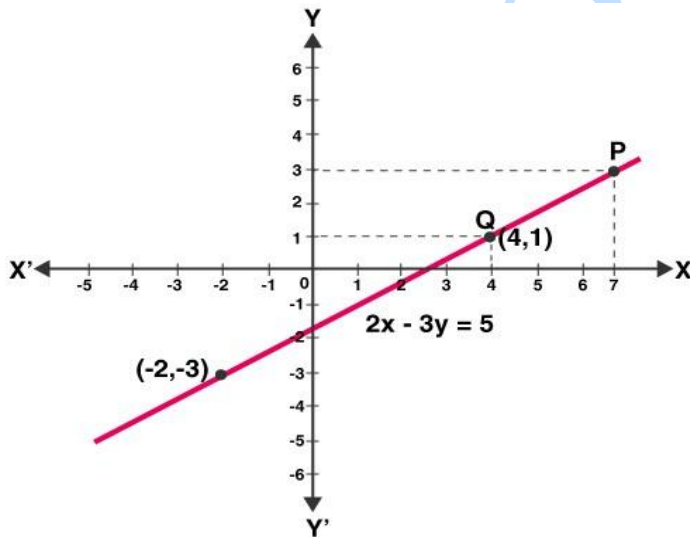
$$y = \frac{-9}{3}$$

By division we get

$$y = -3$$

x	4	-2
y	1	-3

Now draw a graph using the points (4, 1) and (-2, -3)
Join the points through a line and find the value of y.



- (i) Based on the graph, Consider
 $x = 4$ on X-axis
 Now the line joining the two points and a point on the Y-axis gives the value of y
 Therefore, when $x = 4$ the value of $y = 1$.

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Linear Equations in Two Variables

- (ii) Based on the graph, Consider
 $y = 3$ on Y-axis
Now the line joining the two points and a point on the X-axis gives the value of x
Therefore, when $y = 3$ the value of $x = 7$.

5. Draw the graph of the equation, $2x + y = 6$.

Find the coordinates of the point where the graph cuts the x – axis. Solution:

It is given

$$2x + y = 6$$

We can also write it as

$$2x + y - 6 = 0$$

Substituting $x = 1$ in the given equation

$$2(1) + y - 6 = 0$$

So we get

$$y - 4 = 0$$

$$y = 4$$

Substituting $x = 2$ in the given equation

$$2(2) + y - 6 = 0$$

So we get

$$y - 2 = 0$$

$$y = 2$$

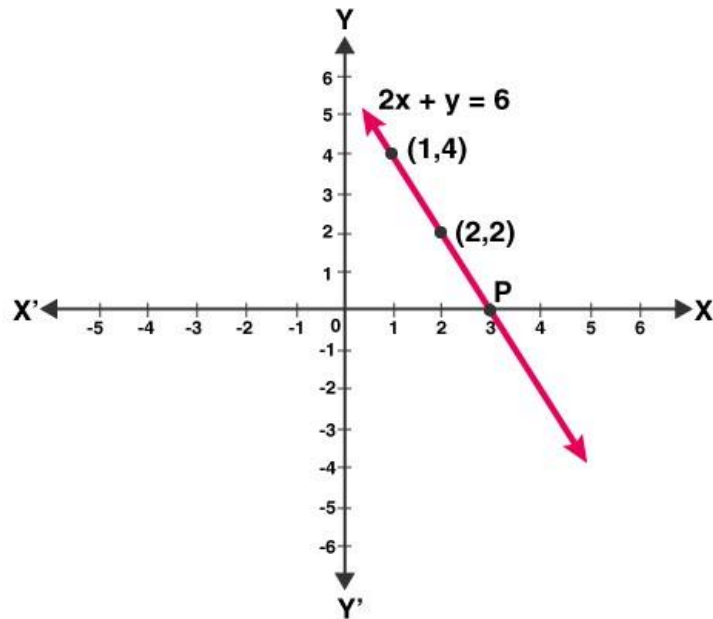
x	1	2
y	4	2

Now draw a graph using the points (1, 4) and (2, 2)

Join the points through a line and find the coordinates which cuts x -axis.

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Linear Equations in Two Variables



From the graph we know that the line joining the two points cut the x-axis at a point P which is at the right of y-axis at 3 units distance.

Therefore, the coordinates of the point is P (3, 0).

6. Draw the graph of the equation, $3x + 2y = 6$.

Find the coordinates of the point where the graph cuts the y – axis. Solution:

It is given

$$3x + 2y = 6$$

We can also write it as

$$2y = 6 - 3x$$

$$y = \frac{6-3x}{2}$$

Substituting $x = 2$ in the given equation

$$y = \frac{6-3(2)}{2}$$

So we get

$$y = \frac{6-6}{2}$$

$$y = 0$$

Substituting $x = 4$ in the given equation

$$y = \frac{6-3(4)}{2}$$

So we get

$$y = \frac{6-12}{2}$$

$$y = \frac{-6}{2}$$

By division

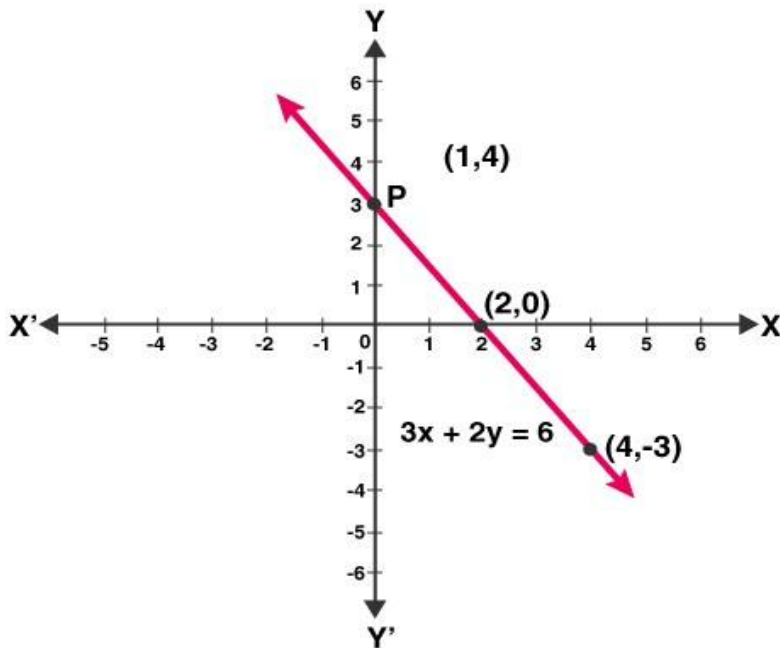
$$y = -3$$

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Linear Equations in Two Variables

x	2	4
y	0	-3

Now draw a graph using the points (2, 0) and (4, -3)
Join the points through a line and find the coordinates which cuts y-axis.



From the graph we know that the line joining the two points cut the y-axis at a point P which is above x-axis at 3 units distance.

Therefore, the coordinates of the point is P (0, 3).

7. Draw the graphs of the equations $3x - 2y = 4$ and $x + y - 3 = 0$.

On the same graph paper, find the coordinates of the point where the two graph lines intersect.

Solution:

It is given

$$3x - 2y = 4$$

We can also write it as

$$2y = 3x - 4$$

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

Substituting $x = 2$ in the given equation

$$y = \frac{3(2)-4}{2}$$

So we get

$$y = \frac{6-4}{2}$$

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

RS Aggarwal Solutions for Class 9 Maths Chapter – 4

Linear Equations in Two Variables

By division

$$y = 1$$

Substituting $x = -2$ in the given equation

$$y = \frac{3(-2)-4}{2} \text{ So}$$

we get

$$y = \frac{-6-4}{2}$$

$$y = \frac{-10}{2}$$

By division

$$y = -5$$

x	2	-2
y	1	-5

Now draw a graph using the points A (2, 1) and B (-2, -5) Join the points AB through a line and extend in both the directions. It is given

$$x + y - 3 = 0$$

We can also write it as

$$y = 3 - x$$

Substituting $x = 1$ in the given equation

$$y = 3 - 1$$

So we get

$$y = 2$$

Substituting $x = -1$ in the given equation

$$y = 3 - (-1)$$

So we get

$$y = 4$$

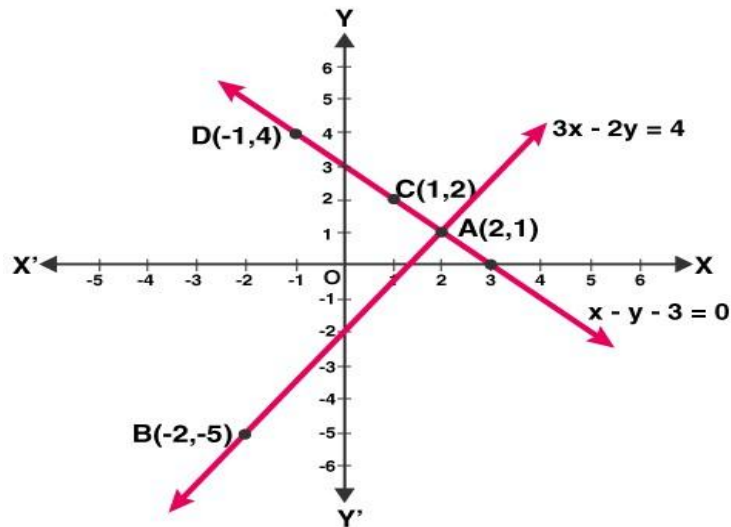
x	1	-1
y	2	4

Now draw a graph using the points C (1, 2) and D (-1, 4)

Join the points CD through a line and extend in both the directions.

RS Aggarwal Solutions for Class 9 Maths Chapter – 4

Linear Equations in Two Variables



Therefore, the coordinates of the point where the two graph lines intersect is A (2, 1).

8. Draw the graph of the line $4x + 3y = 24$.

- Write the coordinates of the points where this line intersects the x-axis and the y-axis.
- Use this graph to find the area of the triangle formed by the graph line and the coordinate axes.

Solution:

It is given

$$4x + 3y = 24$$

We can also write it as

$$3y = 24 - 4x$$

$$y = \frac{24-4x}{3}$$

Substituting $x = 0$ in the given equation

$$y = \frac{24-4(0)}{3}$$

So we get

$$y = \frac{24}{3}$$

By division

$$y = 8$$

Substituting $x = 3$ in the given equation

$$y = \frac{24-4(3)}{3}$$

So we get

$$y = \frac{24-12}{3}$$

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

By division

$$y = 4$$

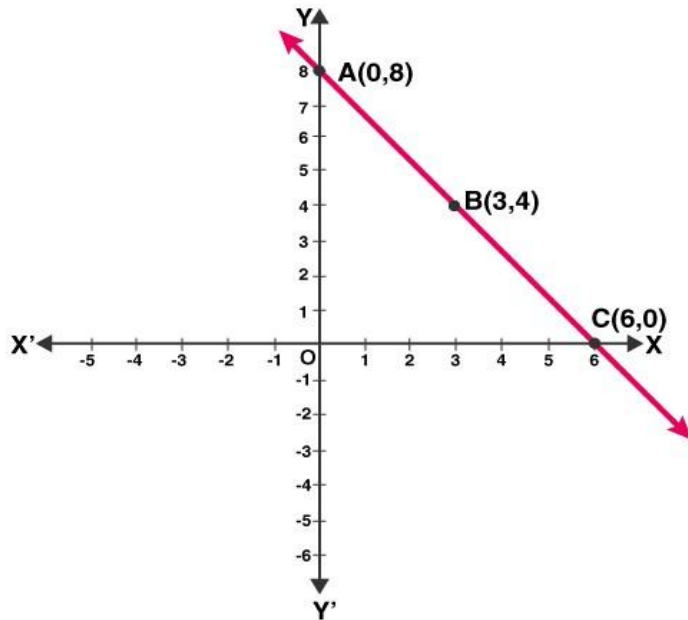
RS Aggarwal Solutions for Class 9 Maths Chapter – 4

Linear Equations in Two Variables

x	0	3
y	8	4

Now draw a graph using the points A (0, 8) and B (3, 4)

Join the points AB through a line and extend in both the directions.



(i) From the graph we know that the line AB intersects at point C (6, 0) on the x-axis and A (0, 8) on the y-axis.

(ii) From the graph
 Area of the triangle = Area of ΔAOC
 $= \frac{1}{2} \times b \times h$
 $= \frac{1}{2} \times 6 \times 8$

On further calculation we get

Area of the triangle = 24 sq. units

9. Draw the graphs of the lines $2x + y = 6$ and $2x - y + 2 = 0$. Shade the region bounded by these lines and the x-axis. Find the area of the shaded region. Solution:

It is given

$$2x + y = 6$$

We can also write it as

$$y = 6 - 2x$$

Substituting $x = 1$ in the given equation

$$y = 6 - 2(1)$$

So we get

RS Aggarwal Solutions for Class 9 Maths Chapter – 4

Linear Equations in Two Variables

$$y = 6 - 2$$

$$y = 4$$

Substituting $x = 2$ in the given equation

$$y = 6 - 2(2)$$

So we get

$$y = 6 - 4$$

$$y = 2$$

x	1	2
y	4	2

Now draw a graph using the points A (1, 4) and B (2, 2)

Join the points AB through a line and extend in both the directions.

It is given

$$2x - y + 2 = 0$$

We can also write it as

$$y = 2x + 2$$

Substituting $x = -1$ in the given equation

$$y = 2(-1) + 2$$

So we get

$$y = -2 + 2$$

$$y = 0$$

Substituting $x = 2$ in the given equation

$$y = 2(2) + 2$$

So we get

$$y = 4 + 2$$

$$y = 6$$

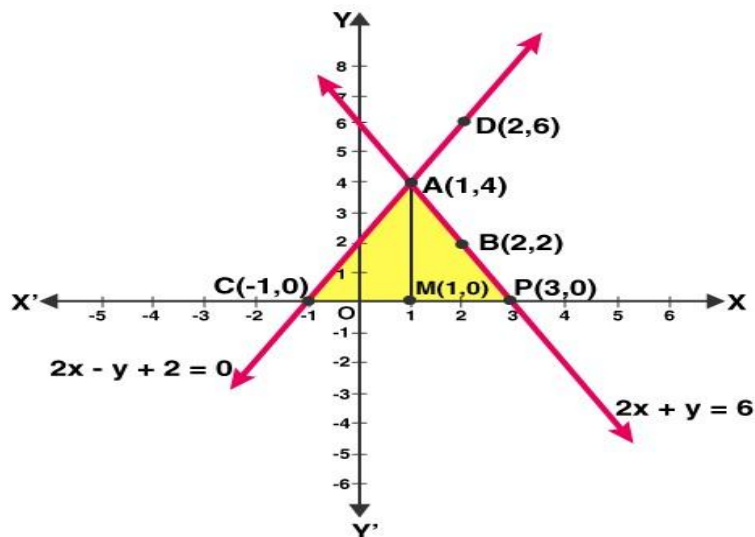
x	-1	2
y	0	6

Now draw a graph using the points C (-1, 0) and D (2, 6)

Join the points CD through a line and extend in both the directions.

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Linear Equations in Two Variables



From the graph we know that the two lines AB and CD intersect at A (1, 4)

Draw a perpendicular on X-axis from point A and name it as AM

PM is the y-coordinate of A (1, 4) = 4 and CP = 4

We know that area of shaded region = area of ΔACP

$$= \frac{1}{2} \times b \times h$$

$$= \frac{1}{2} \times CP \times AM$$

By substituting the values we get

$$\text{Area of shaded region} = \frac{1}{2} \times 4 \times 4 = 8 \text{ sq. units}$$

Therefore the area of shaded region is 8 sq. units.

10. Draw the graphs of the lines $x - y = 1$ and $2x + y = 8$. Shade the areas formed by these two lines and the y-axis. Also, find this area.

Solution:

It is given

$$x - y = 1$$

We can also write it as

$$y = x - 1$$

Substituting $x = 1$ in the given equation

$$y = 1 - 1$$

So we get

$$y = 0$$

Substituting $x = 2$ in the given equation

$$y = 2 - 1$$

So we get

$$y = 1$$

RS Aggarwal Solutions for Class 9 Maths Chapter – 4

Linear Equations in Two Variables

x	1	2
y	0	1

Now draw a graph using the points A (1, 0) and B (2, 1)

Join the points AB through a line and extend in both the directions.

It is given

$$2x + y = 8$$

We can also write it as

$$y = 8 - 2x$$

Substituting $x = 2$ in the given equation

$$y = 8 - 2(2)$$

So we get

$$y = 8 - 4$$

$$y = 4$$

Substituting $x = 3$ in the given equation

$$y = 8 - 2(3)$$

So we get

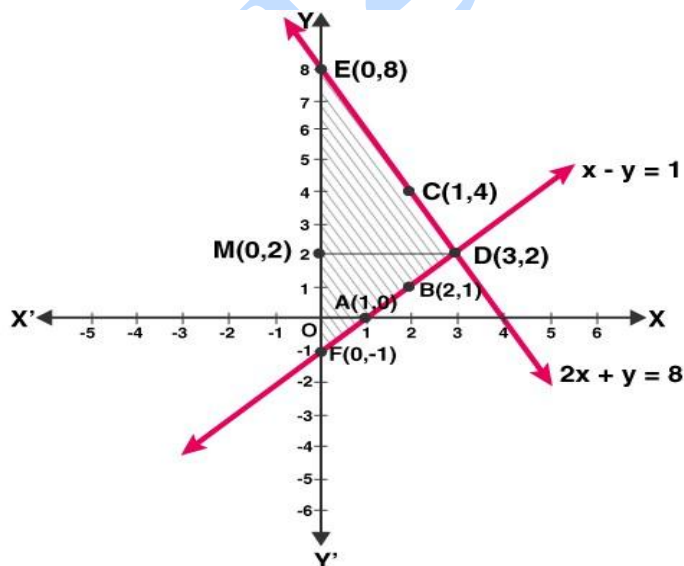
$$y = 8 - 6$$

$$y = 2$$

x	2	3
y	4	2

Now draw a graph using the points C (2, 4) and D (3, 2)

Join the points CD through a line and extend in both the directions.



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Linear Equations in Two Variables

From the graph we know that the lines AB and CD intersect at D (3, 2)

Draw a perpendicular from point D on the y-axis and name it as DM

We know that DM is the x-coordinate of D (3, 2) = 3 and EF = 9

So the area of shaded region = area of ΔDEF

$$= \frac{1}{2} \times b \times h$$

$$= \frac{1}{2} \times EF \times DM$$

By substituting the values we get

$$\text{Area of shaded region} = \frac{1}{2} \times 9 \times 3 = 13.5 \text{ sq. units}$$

Therefore the area of shaded region is 13.5 sq. units.

11. Draw the graph for each of the equations $x + y = 6$ and $x - y = 2$ on the same graph paper and find the coordinates of the point where the two straight lines intersect. Solution:

It is given

$$x + y = 6$$

We can also write it as

$$y = 6 - x$$

Substituting $x = 2$ in the given equation

$$y = 6 - 2$$

So we get

$$y = 4$$

Substituting $x = 3$ in the given equation

$$y = 6 - 3$$

So we get

$$y = 3$$

x	2	3
y	4	3

Now draw a graph using the points A (2, 4) and B (3, 3)

Join the points AB through a line and extend in both the directions.

It is given $x - y =$

26

We can also write it as $y = x -$

26

Substituting $x = 3$ in the given equation

26

$$y = 3 -$$

28

So we get

$$y = 1$$

Substituting $x = 4$ in the given equation

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Linear Equations in Two Variables

$$y = 4 - 2$$

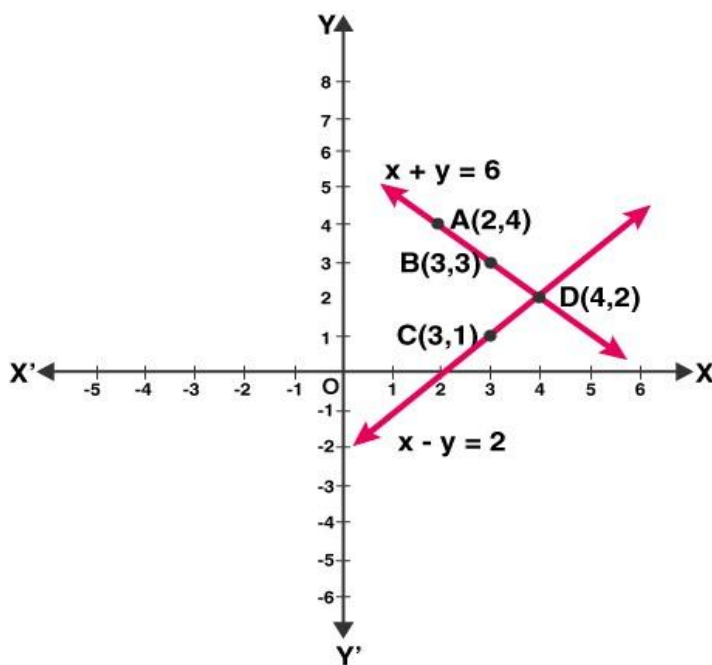
So we get

$$y = 2$$

x	3	4
y	1	2

Now draw a graph using the points C (3, 1) and D (4, 2)

Join the points CD through a line and extend in both the directions.



Therefore, the coordinates of the point where the two straight lines intersect is D (4, 2).

12. Two students A and B contributed ₹ 100 towards the Prime Minister's Relief fund to help the earthquake victims. Write the linear equation to satisfy the above data and draw its graph.
Solution:

Consider the amount contributed by two students A and B is ₹ x and ₹ y.

Total amount contributed by both A and B = ₹ 100

According to the question

$$x + y = 100 \text{ We can write}$$

it as

$$y = 100 - x$$

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Linear Equations in Two Variables

Substitute $x = 25$ in the given equation

$$y = 100 - 25 \text{ So we get}$$

$$y = 75$$

Substitute $x = 50$ in the given equation

$$y = 100 - 50 \text{ So we get}$$

$$y = 50$$

x	25	50
y	75	50

Now draw a graph using the points A (25, 75) and B (50, 50) Join the points AB through a line and extend in both the directions.

