Linear Equation in two Variables

Exercise 6.3

Q. 1. A. Draw the graph of each of the following linear equations.

2y = -x + 1

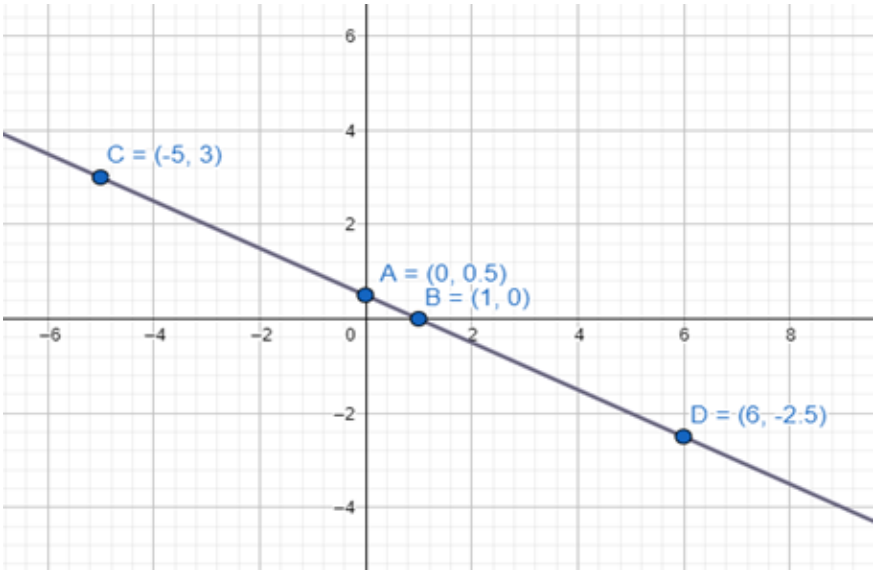
Answer : For graph, we'll first make the table of solutions by putting some random values of x and thereafter we'll find corresponding values of y and then we'll plot these points on graph, join them and extend them in straight line to find the graph.

(Note: ∵ equation is linear graph will always be straight line.)

Table of solutions for the given equation-

x	Value: $y = \frac{-x+1}{2}$	Y	Point
0	$y = \frac{-0+1}{2}$	$y = \frac{1}{2}$	$A(0,\frac{1}{2})$
1	$y = \frac{-1+1}{2}$	$y = 0$	B(1,0)
-5	$y = \frac{-(-5)+1}{2}$	$y = 3$	C(-5,3)
6	$y = \frac{-6+1}{2}$	$y = -\frac{5}{2}$	$D(6,-\frac{5}{2})$

GRAPH:



Q. 1. B. Draw the graph of each of the following linear equations.

–x + y = 6

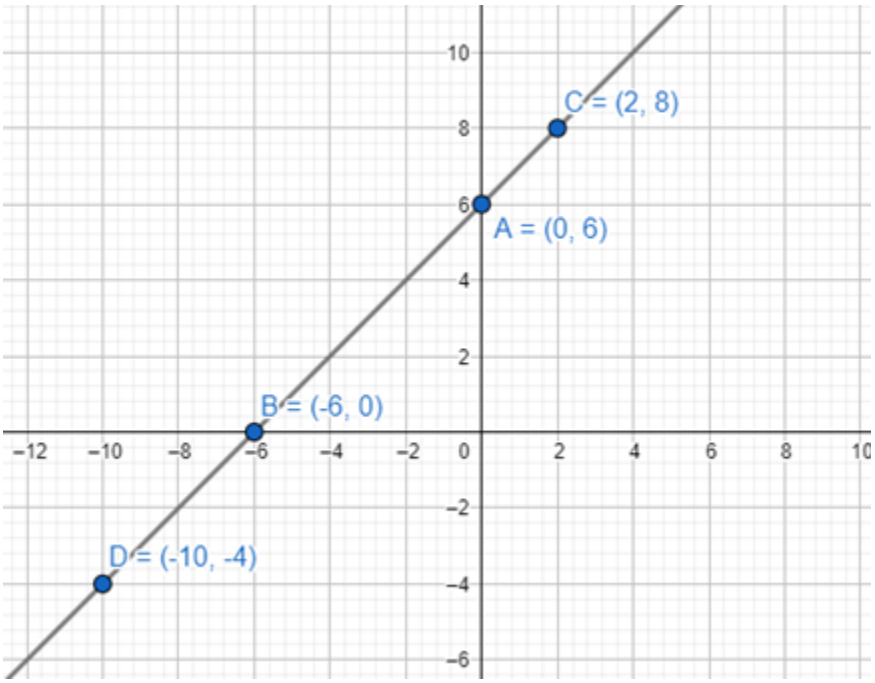
Answer : For graph, we'll first make the table of solutions by putting some random values of x and thereafter we'll find corresponding values of y and then we'll plot these points on graph, join them and extend them in straight line to find the graph.

(Note: ∵ equation is linear graph will always be straight line.)

Table of solutions for the given equation-

x	Value: y = 6 + x	Y	Point
0	y = 6 + 0	y = 6	A(0,6)
-6	y = 6 + (-6)	y = 0	B(-6,0)
2	y = 6 + 2	y = 8	C(2,8)
-4	y = 6 + (-4)	y = 2	D(-4,2)

GRAPH:



Q. 1. C. Draw the graph of each of the following linear equations.

3x + 5y = 15

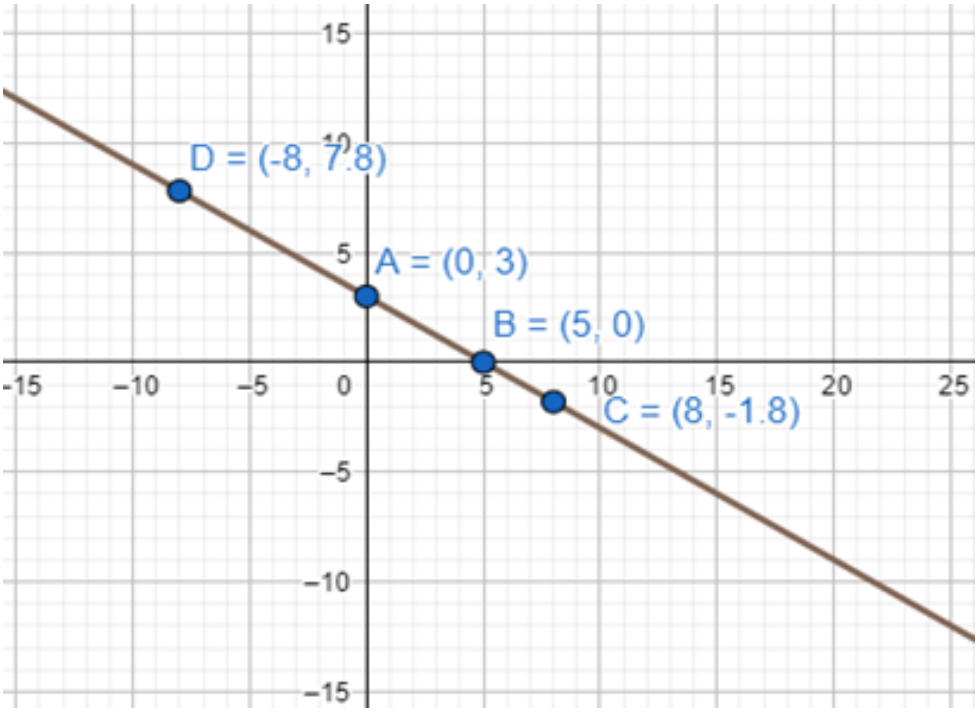
Answer : For graph, we'll first make the table of solutions by putting some random values of x and thereafter we'll find corresponding values of y and then we'll plot these points on graph, join them and extend them in straight line to find the graph.

(Note: ∵ equation is linear graph will always be straight line.)

Table of solutions for the given equation-

x	Value: $y = \frac{15-3x}{5}$	Y	Point
0	$y = \frac{15-3(0)}{5}$	$y = 3$	A(0,3)
5	$y = \frac{15-3(5)}{5}$	$y = 0$	B(5,0)
8	$y = \frac{15-3(8)}{5}$	$y = -\frac{9}{5}$	$C(8, -\frac{9}{5})$
-8	$y = \frac{15-3(-8)}{5}$	$y = \frac{39}{5}$	$D(-8, \frac{39}{5})$

GRAPH:



Q. 1. D. Draw the graph of each of the following linear equations.

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

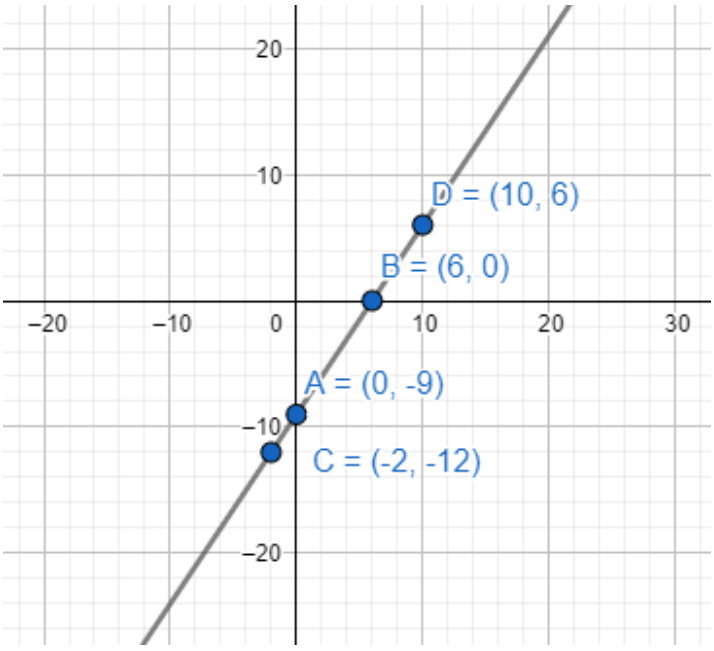
Answer : For graph, we'll first make the table of solutions by putting some random values of x and thereafter we'll find corresponding values of y and then we'll plot these points on graph, join them and extend them in straight line to find the graph.

(Note: ∵ equation is linear graph will always be straight line.)

Table of solutions for the given equation-

x	Value: $y = \frac{-18+3x}{2}$	Y	Point
0	$y = \frac{-18+3(0)}{2}$	y = -9	A(0,3)
6	$y = \frac{-18+3(6)}{2}$	y = 0	B(5,0)
-2	$y = \frac{-18+3(-2)}{2}$	y = -12	C(-2,-12)
10	$y = \frac{-18+3(10)}{2}$	y = 6	D(10,6))

GRAPH:



Q. 2. A. Draw the graph of each of the following linear equations.

y = x

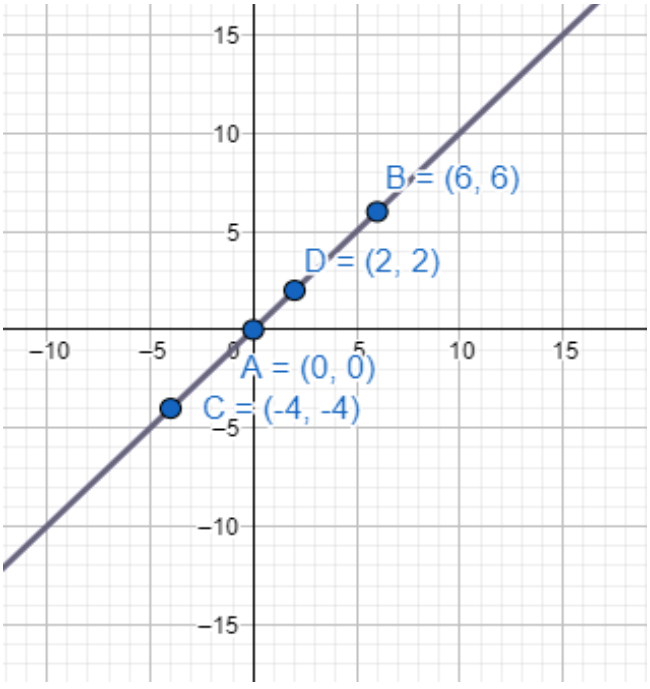
Answer : For graph, we'll first make the table of solutions by putting some random values of x and thereafter we'll find corresponding values of y and then we'll plot these points on graph, join them and extend them in straight line to find the graph.

(Note: ∵ equation is linear graph will always be straight line.)

Table of solutions for the given equation-

x	Value: y = x	Y	Point
0	y = 0	y = 0	A(0,0)
6	y = 6	y = 6	B(6,6)
-4	y = -4	y = -4	C(-4,-4)
2	y = 2	y = 2	D(2,2)

GRAPH:



Q. 2. B. Draw the graph of each of the following linear equations.

y = 2x

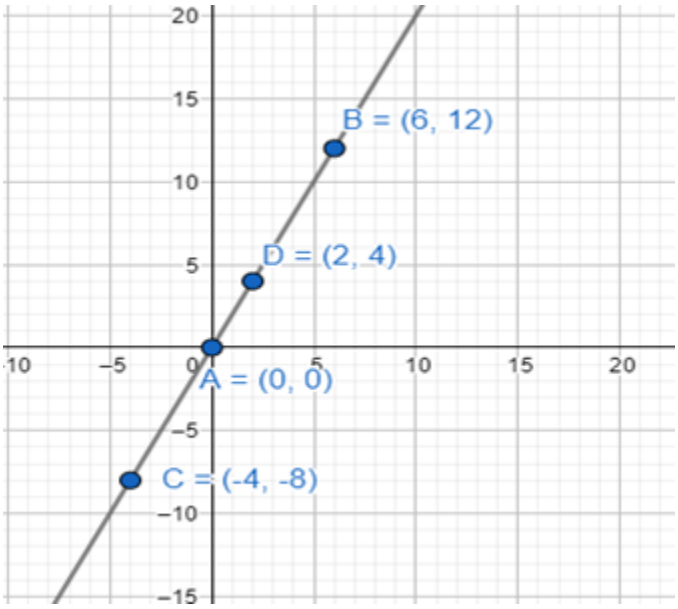
Answer : For graph, we'll first make the table of solutions by putting some random values of x and thereafter we'll find corresponding values of y and then we'll plot these points on graph, join them and extend them in straight line to find the graph.

(Note: ∵ equation is linear graph will always be straight line.)

Table of solutions for the given equation-

x	Value: y = 2x	Y	Point
0	y = 0	y = 0	A(0,0)
6	y = 2(6)	y = 12	B(6,12)
-4	y = 2(-4)	y = -8	C(-4,-8)
2	y = 2(2)	y = 4	D(2,4)

GRAPH:



Q. 2. C. Draw the graph of each of the following linear equations.

y = -2x

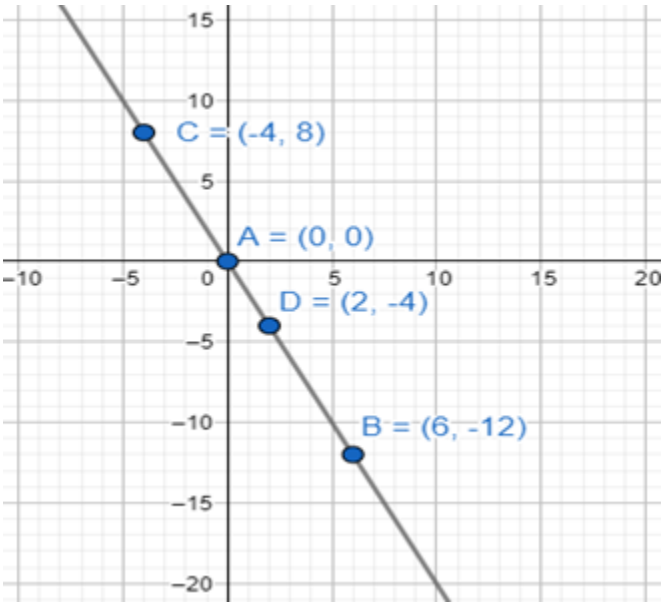
Answer : For graph, we'll first make the table of solutions by putting some random values of x and thereafter we'll find corresponding values of y and then we'll plot these points on graph, join them and extend them in straight line to find the graph.

(Note: ∵ equation is linear graph will always be straight line.)

Table of solutions for the given equation-

x	Value: y = -2x	Y	Point
0	y = 0	y = 0	A(0,0)
6	y = -2(6)	y = -12	B(6-,12)
-4	y = -2(-4)	y = 8	C(-4,8)
2	y = -2(2)	y = -4	D(2-,4)

GRAPH:



Q. 2. D. Draw the graph of each of the following linear equations.

y = 3x

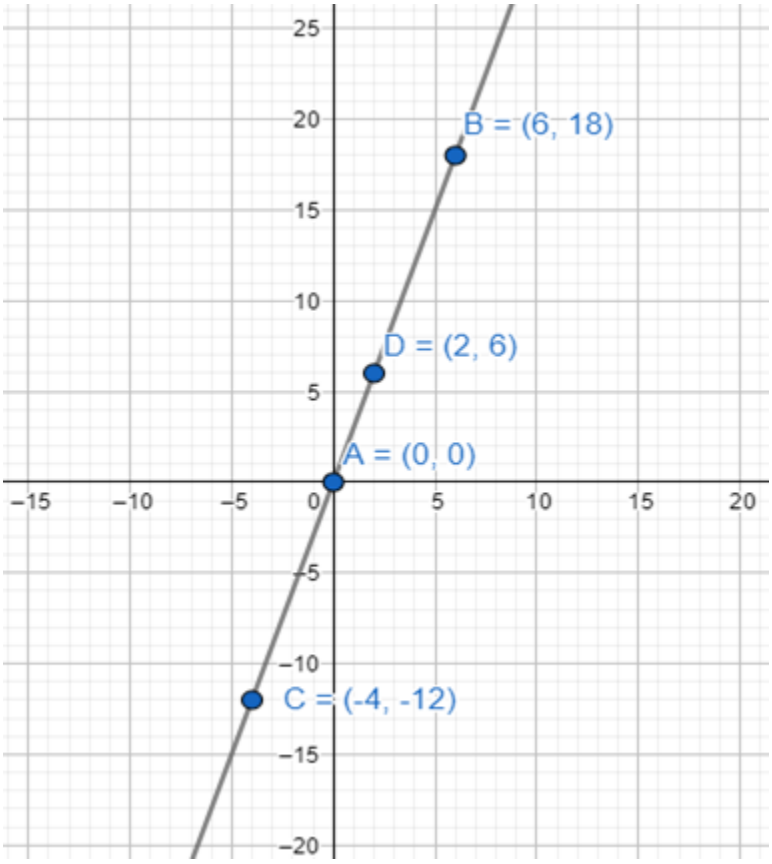
Answer : For graph, we'll first make the table of solutions by putting some random values of x and thereafter we'll find corresponding values of y and then we'll plot these points on graph, join them and extend them in straight line to find the graph.

(Note: ∵ equation is linear graph will always be straight line.)

Table of solutions for the given equation-

x	Value: y = 3x	Y	Point
0	y = 0	y = 0	A(0,0)
6	y = 3(6)	y = 18	B(6,18)
-4	y = 3(-4)	y = -12	C(-4,-12)
2	y = 3(2)	y = 6	D(2,6)

GRAPH:



Q. 2. E. Draw the graph of each of the following linear equations.

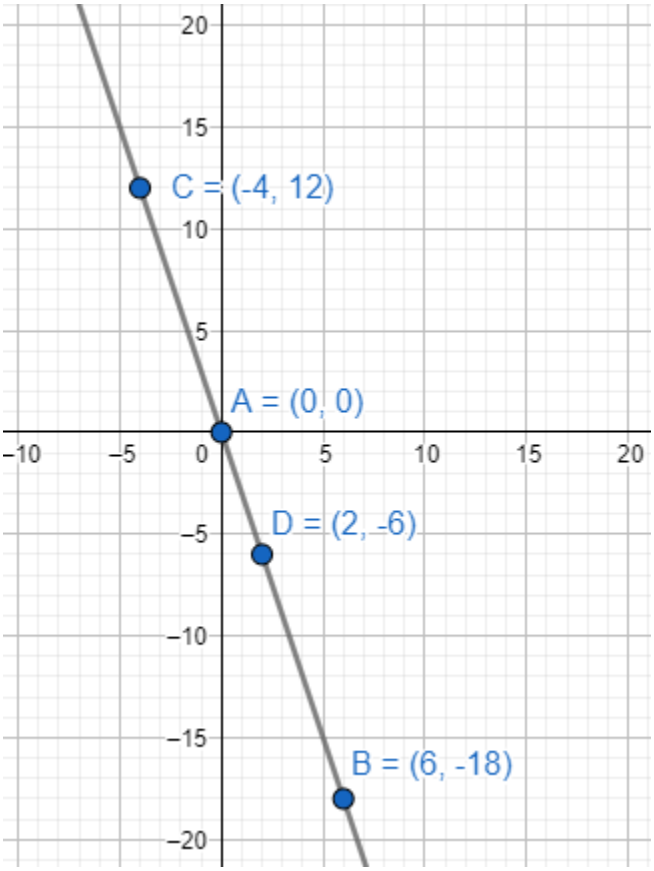
y = -3x

Answer : For graph, we'll first make the table of solutions by putting some random values of x and thereafter we'll find corresponding values of y and then we'll plot these points on graph, join them and extend them in straight line to find the graph.

(Note: ∵ equation is linear graph will always be straight line.) Table of solutions for the given equation-

X	Value: y = -3x	Y	Point
0	y = -3(0)	y = 0	A(0,0)
6	y = -3(6)	y = -18	B(6,-18)
-4	y = -3(-4)	y = 12	C(-4,12)
2	y = -3(2)	y = -6	D(2,-6)

GRAPH:



Q. 2. F. Answer the following question related to above graphs.

i) Are all these equations of the form y = mx, where m is a real number?
ii) Are all these graphs passing through the origin?
iii) What can you conclude about these graphs?

Answer : (i) Yes, all these are equations of the form y = mx, where m is a real number and m = 1,2,-2,3,-3 respectively in the above equations.

(ii) Yes, all these are graphs passing through the origin, i.e., pt. A in every graph

(iii) ∴ we can conclude that every graph of type y = mx passes through origin, where m is a real number.

Q. 3. Draw the graph of the equation 2x + 3y = 11. Find from the graph value of y when x = 1

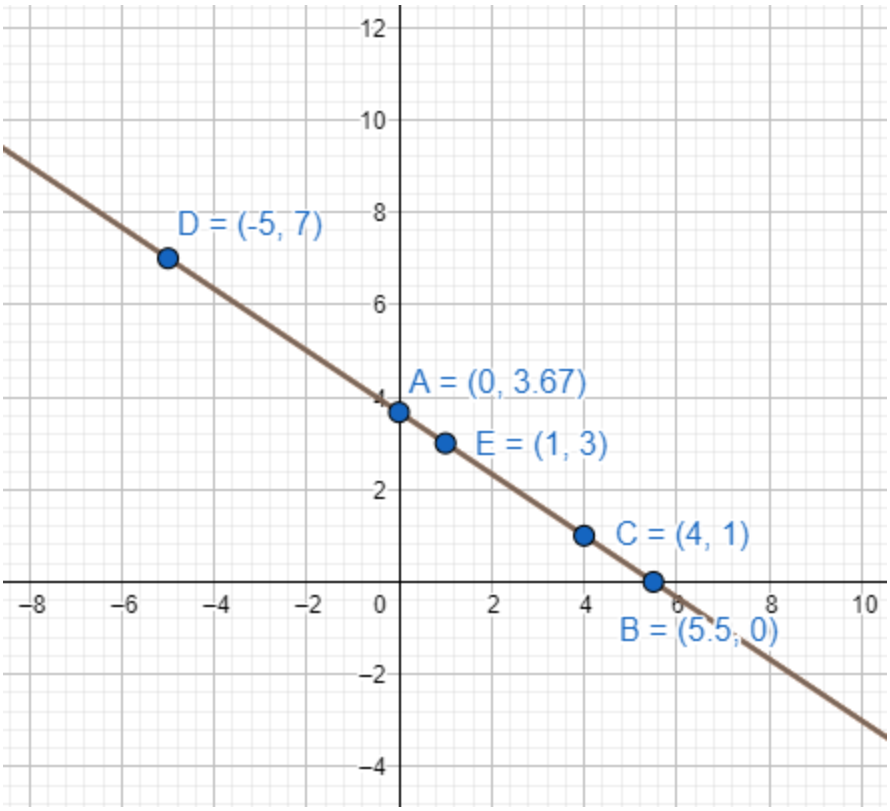
Answer : For graph, we'll first make the table of solutions by putting some random values of x and thereafter we'll find corresponding values of y and then we'll plot these points on graph, join them and extend them in straight line to find the graph.

(Note: ∵ equation is linear graph will always be straight line.)

Table of solutions for the given equation-

X	Value: $y = \frac{11-2x}{3}$	y	Point
0	$y = \frac{11-2(0)}{3}$	$y = \frac{11}{3}$	$A(0, \frac{11}{3})$
$\frac{11}{2}$	$y = \frac{11-2(\frac{11}{2})}{3}$	y = 0	$B(\frac{11}{2}, 0)$
4	$y = \frac{11-2(4)}{3}$	y = 1	C(4,1)
-5	$y = \frac{11-2(-5)}{3}$	y = 7	D(-4,7)

GRAPH:



From the graph (pt. E) we can see that for x = 1, the y = 3.

(Note: Also we can put x = 1 in the given equation and can find the value of y-

We have, $y = \frac{11-2x}{3}$

At x = 1, $y = \frac{11-2(1)}{3}$

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

$\Rightarrow$ y = 3

Q. 4. Draw the graph of the equation y - x = 2. Find from the graph

i) the value of y when x = 4
ii) the value of x when y = -3

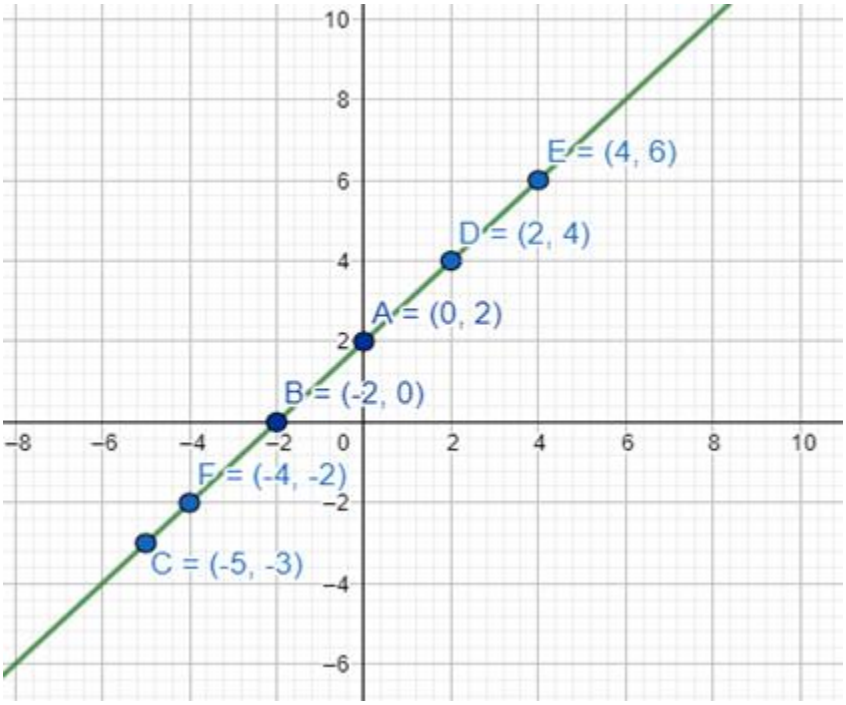
Answer : For graph, we'll first make the table of solutions by putting some random values of x and thereafter we'll find corresponding values of y and then we'll plot these points on graph, join them and extend them in straight line to find the graph.

(Note: ∵ equation is linear graph will always be straight line.)

Table of solutions for the given equation-

X	Value: y = x + 2	Y	Point
0	y = 0 + 2	y = 2	A(0,2)
-2	y = -2 + 2	y = 0	B(-2,0)
-4	y = -4 + 2	y = -2	C(-4,-2)
2	y = 2 + 2	y = 4	D(2,4)

GRAPH:



i) The value of y when x = 4 is y = 6 (pt. E)

ii) The value of x when y = -3 is y = -5 (pt. F)

Q. 5. Draw the graph of the equation 2x + 3y = 12. Find the solutions from the graph

i) Whose y-coordinate is 3
ii) Whose x-coordinate is -3

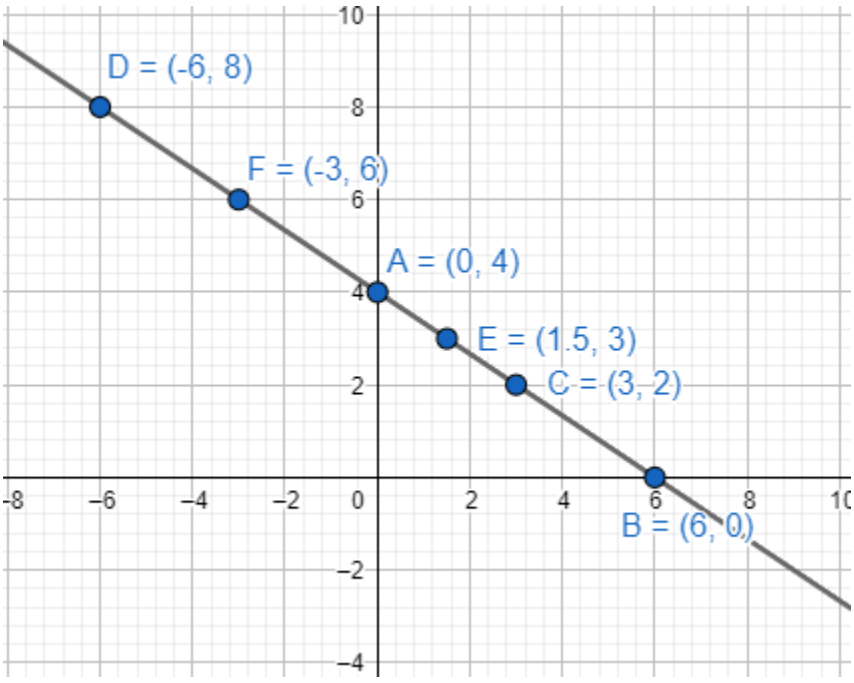
Answer : For graph, we'll first make the table of solutions by putting some random values of x and thereafter we'll find corresponding values of y and then we'll plot these points on graph, join them and extend them in straight line to find the graph.

(Note: ∵ equation is linear graph will always be straight line.)

Table of solutions for the given equation-

X	Value: $y = \frac{12-2x}{3}$	Y	Point
0	$y = \frac{12-2(0)}{3}$	$y = \frac{11}{3}$	$A(0, \frac{11}{3})$
6	$y = \frac{12-2(6)}{3}$	y = 0	B(6,0)
3	$y = \frac{12-2(3)}{3}$	y = 2	C(3,2)
-6	$y = \frac{12-2(-6)}{3}$	y = 8	D(-6,8)

GRAPH:



(i) From the graph, we can see that for y = 3 is pt. E and the

$$x = \frac{3}{2} = 1.5$$

(ii) From the graph, we can see that for x = -3 is pt. F and the corresponding y = 6 for that.

Q. 6. A. Draw the graph of each of the equations given below and also find the coordinates of the points where the graph cuts the coordinate axes

6x - 3y = 12

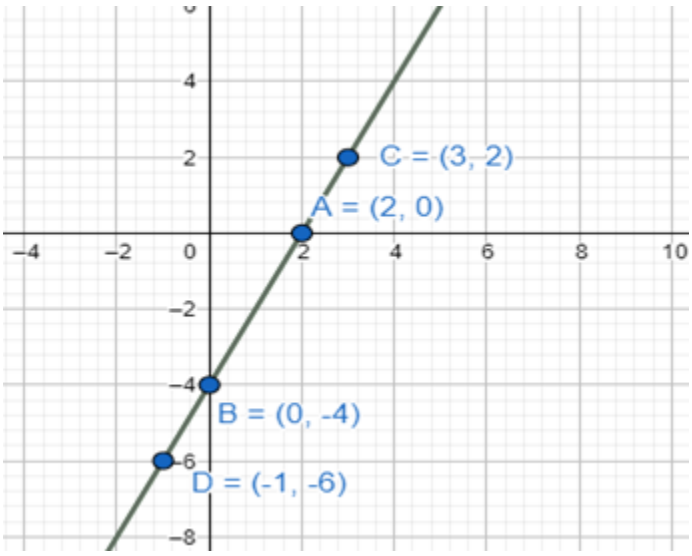
Answer : For graph, we'll first make the table of solutions by putting some random values of x and thereafter we'll find corresponding values of y and then we'll plot these points on graph, join them and extend them in straight line to find the graph.

(Note: ∵ equation is linear graph will always be straight line.)

Table of solutions for the given equation-

X	Value: $y = \frac{-12 + 6x}{3}$	Y	Point
0	$y = \frac{-12 + 6(0)}{3}$	y = -4	A(0,-4)
2	$y = \frac{-12 + 6(2)}{3}$	y = 0	B(2,0)
3	$y = \frac{-12 + 6(3)}{3}$	y = 2	C(3,2)
-6	$y = \frac{-12 + 6(-2)}{3}$	y = -8	D(-6,-8)

GRAPH:



⇒ ∴ the pts. Where graph cuts the co-ordinate axis(i.e., where x = 0 and where y = 0) are pt. A = (2,0) and pt. B = (0,-4)

Q. 6. B. Draw the graph of each of the equations given below and also find the coordinates of the points where the graph cuts the coordinate axes

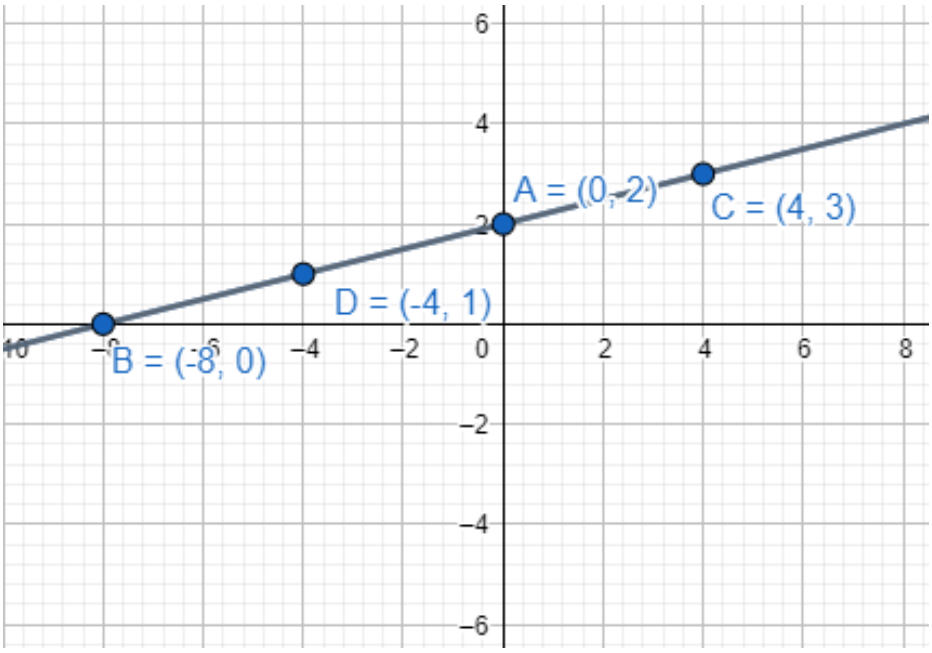
- x + 4y = 8

Answer : For graph, we'll first make the table of solutions by putting some random values of x and thereafter we'll find corresponding values of y and then we'll plot these points on graph, join them and extend them in straight line to find the graph.

(Note: ∵ equation is linear graph will always be straight line.)

Table of solutions for the given equation-

x	Value: $y = \frac{8+x}{4}$	Y	Point
0	$y = \frac{8 + (0)}{4}$	y = -4	A(0,-4)
-8	$y = \frac{8 + (-8)}{4}$	y = 0	B(-8,0)
4	$y = \frac{8 + 4}{4}$	y = 3	C(3,3)
-4	$y = \frac{8 + (-4)}{4}$	y = 1	D(-4,1)



⇒ ∴ the pts. Where graph cuts the co-ordinate axis(i.e., where x = 0 and where y = 0) are pt. A = (-8,0) and pt. B = (0,2).

Q. 6. C. Draw the graph of each of the equations given below and also find the coordinates of the points where the graph cuts the coordinate axes

3x + 2y + 6 = 0

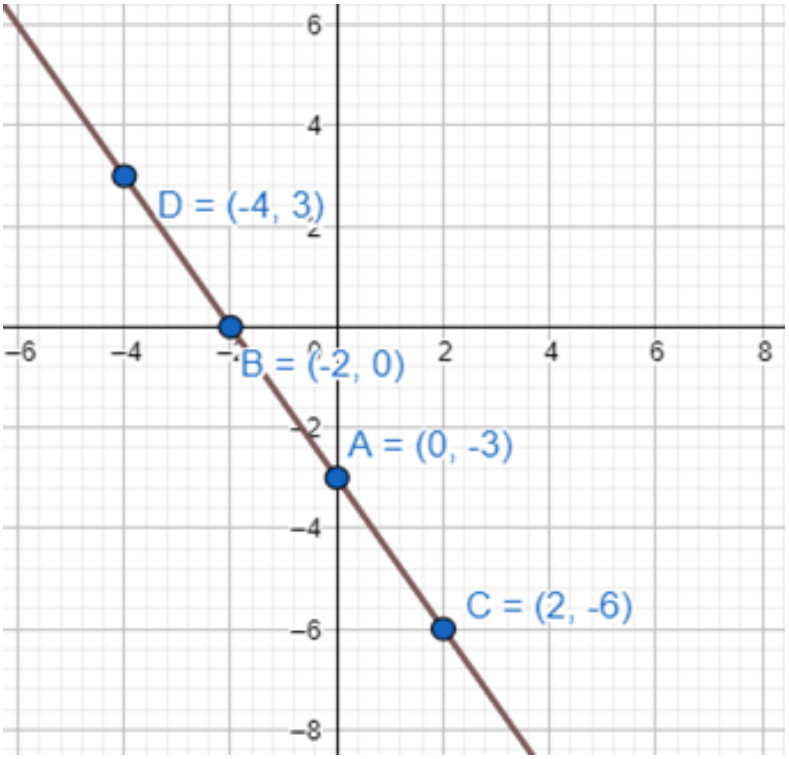
Answer : For graph, we'll first make the table of solutions by putting some random values of x and thereafter we'll find corresponding values of y and then we'll plot these points on graph, join them and extend them in straight line to find the graph.

(Note: ∵ equation is linear graph will always be straight line.)

Table of solutions for the given equation-

x	Value: $y = \frac{-6-3x}{2}$	y	Point
0	$y = \frac{-6-3(0)}{2}$	y = -3	A(0,-3)
-2	$y = \frac{-6-3(-2)}{2}$	y = 0	B(-2,0)
2	$y = \frac{-6-3(2)}{2}$	y = -6	C(2,-6)
-4	$y = \frac{-6-3(-4)}{2}$	y = 3	D(-4,3)

GRAPH:



⇒ ∴ the pts. Where graph cuts the co-ordinate axis(i.e., where x = 0 and where y = 0) are pt. A = (-2,0) and pt. B = (0,-3).

Q. 7. Rajiya and Preethi two students of Class IX together collected ₹ 1000 for the Prime Minister Relief Fund for victims of natural calamities. Write a linear equation and draw a graph to depict the statement.

Answer : Given that together Rajiya and Preethi collected Rs.1000.

Now, Let the amount collected by Rajiya be Rs. x and by Preethi be Rs. y.

∴ the linear equation will be-

⇒ x + y = 1000

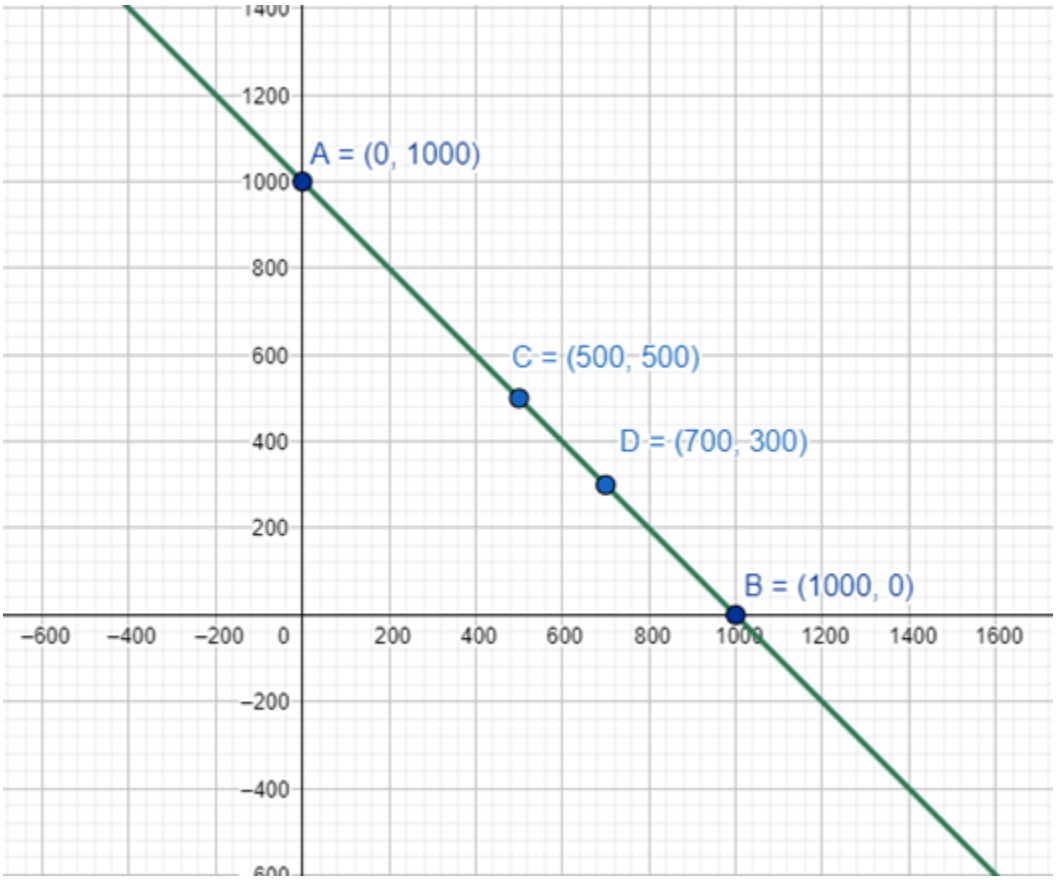
For graph, we'll first make the table of solutions by putting some random values of x and thereafter we'll find corresponding values of y and then we'll plot these points on graph, join them and extend them in straight line to find the graph.

(Note: ∵ equation is linear graph will always be straight line.)

Table of solutions for the given equation-

x	Value: y = 1000-x	y	Point
0	y = 1000-0	y = 1000	A(0,1000)
1000	y = 1000-1000	y = 0	B(1000,0)
500	y = 1000-500	y = 500	C(500,500)
700	y = 1000-100	y = 300	D(700,300)

GRAPH:



Q. 8. Gopaiah sowed wheat and paddy in two fields of total area 5000 square meters. Write a linear equation and draw a graph to represent the same?

Answer : Given that total area = 5000 sq. m.

Let the area of field with wheat = x sq. m and area of field with paddy = y sq.m

∴ The linear equation will be-

⇒ x + y = 5000

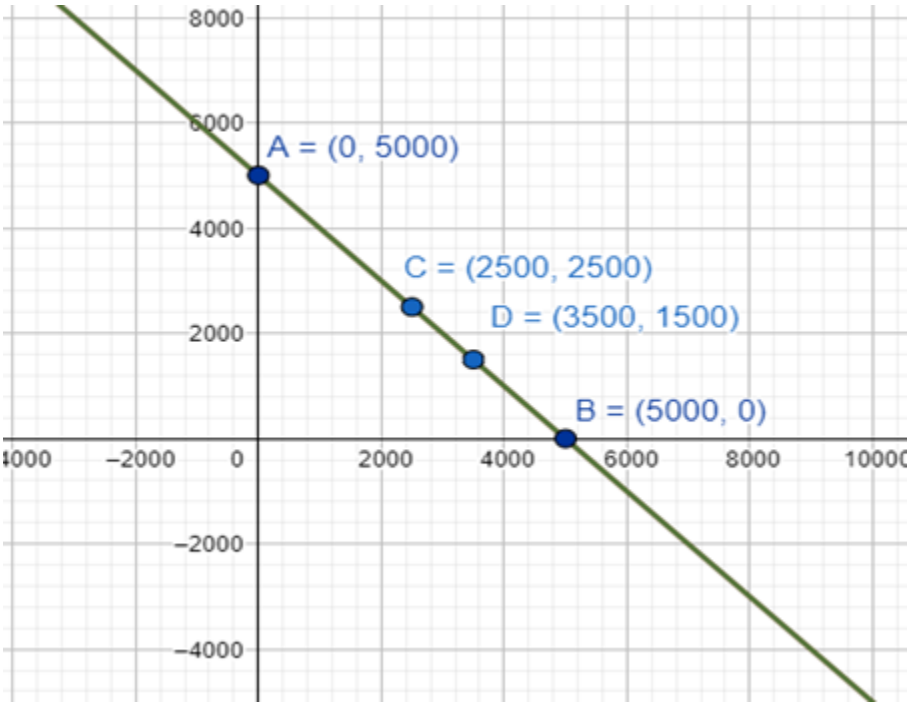
For graph, we'll first make the table of solutions by putting some random values of x and thereafter we'll find corresponding values of y and then we'll plot these points on graph, join them and extend them in straight line to find the graph.

(Note: ∵ equation is linear graph will always be straight line.)

Table of solutions for the given equation-

x	Value: y = 5000-x	y	Point
0	y = 5000-0	y = 5000	A(0,5000)
5000	y = 5000-0	y = 0	B(5000,0)
2500	y = 5000-2500	y = 2500	C(2500,2500)
3500	y = 5000-3500	y = 1500	D(3000,1500)

GRAPH:



Q. 9. The force applied on a body of mass 6 kg. is directly proportional to the acceleration produced in the body. Write an equation to express this observation and draw the graph of the equation.

Answer : Given that mass (m) = 5 kg

Also, from Newton's send law of motion, we have-

$\Rightarrow$ f = ma (where, f is force and a is acceleration)

$\Rightarrow$ f = 6a is the equation to express this observation.

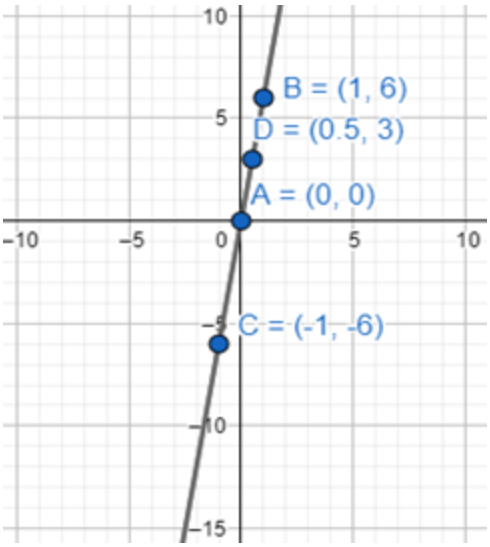
For graph, we'll first make the table of solutions by putting some random values of x and thereafter we'll find corresponding values of y and then we'll plot these points on graph, join them and extend them in straight line to find the graph.

(Note: $\because$ equation is linear graph will always be straight line.)

Table of solutions for the given equation-

a	Value: f = 6a	F	Point
0	f = 6(0)	f = 0	A(0,0)
1	f = 6(1)	f = 6	B(1,6)
-1	f = 6(-1)	f = -6	C(-1,-6)
$\frac{1}{2}$	f = $6(\frac{1}{2})$	f = 3	D$(\frac{1}{2}, 3)$

GRAPH:



(Note: a = -1 means, a is negative and negative acceleration is called retardation.)

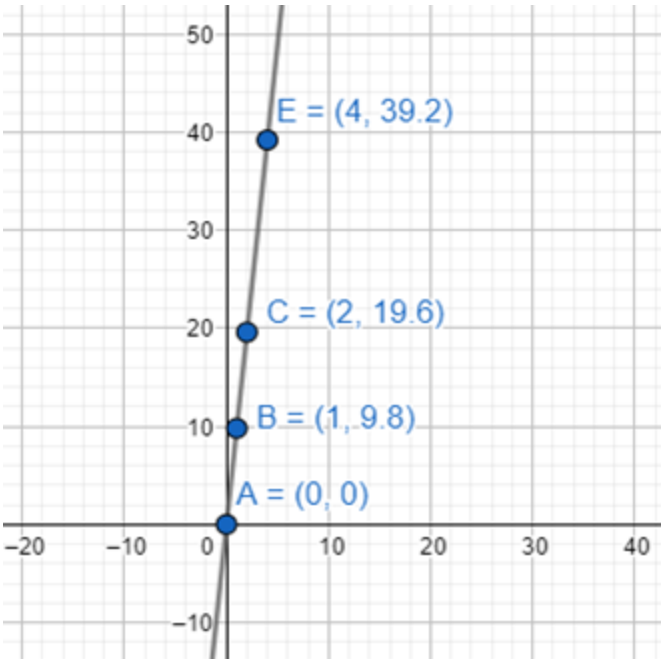
Q. 10. A stone is falling from a mountain. The velocity of the stone is given by V = 9.8t. Draw its graph and find the velocity of the stone '4' seconds after start.

Answer : For graph, we'll first make the table of solutions by putting some random values of x and thereafter we'll find corresponding values of y and then we'll plot these points on graph, join them and extend them in straight line to find the graph.

(Note: ∵ equation is linear graph will always be straight line.) Table of solutions for the given equation-

t	Value: V = 9.8t	V	Point
0	V = 9.8(0)	V = 0	A(0,0)
1	V = 9.8(1)	V = 9.8	B(1,9.8)
2	V = 9.8(2)	V = 19.6	C(2,19.6)

GRAPH:



From the graph (pt. E) we can see that for t = 4, the V = 39.2.

Q. 11. In a election 60% of voters cast their votes. Form an equation and draw the graph for this data. Find the following from the graph.

(i) The total number of voters, if 1200 voters cast their votes
(ii) The number votes cast, if the total number of voters are 800
[Hint: If the number of voters who cast their votes be 'x' and the total number of voters be 'y' then x = 60% of y.]

Answer : Let the number of voters who cast their votes be 'x' and the total number of voters be 'y'

⇒ x = 60% of y

$$\Rightarrow x = \frac{60}{100} \times y$$

$$\Rightarrow x = \frac{3}{5} \times y$$

⇒ 5x = 3y is the equation.

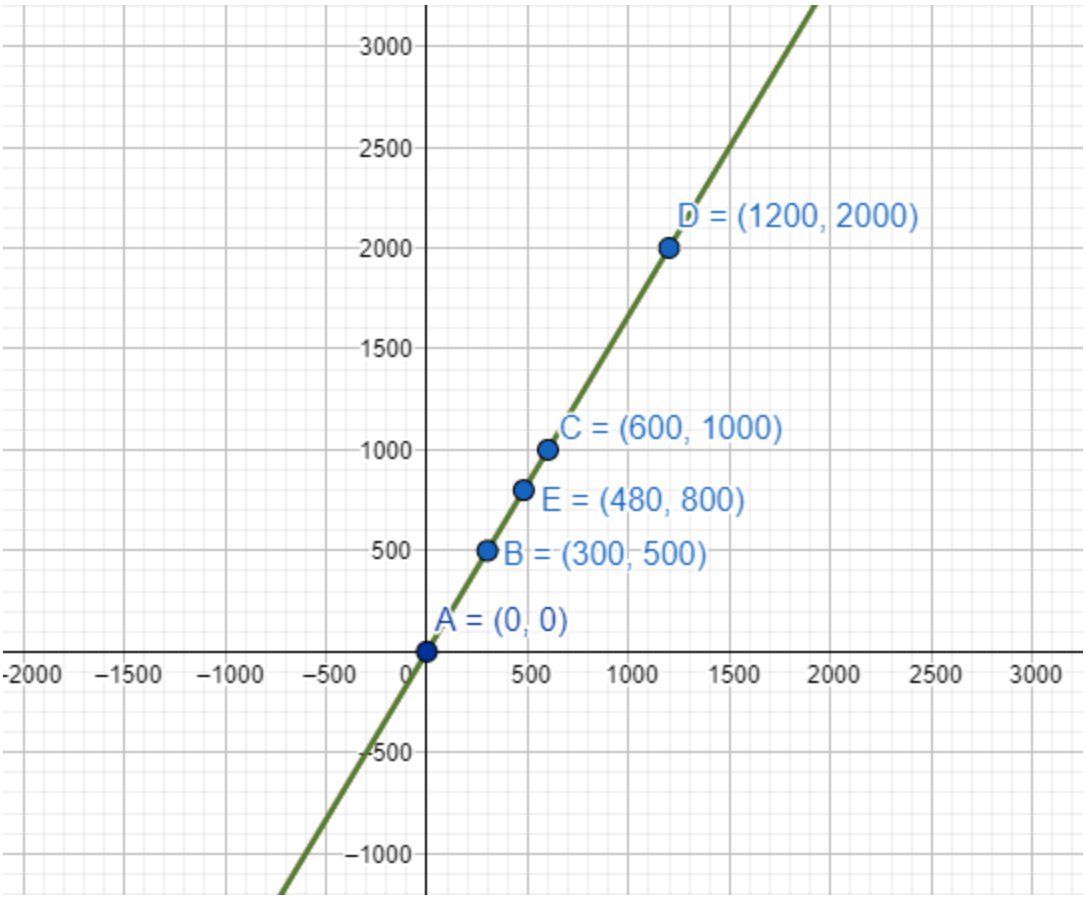
For graph, we'll first make the table of solutions by putting some random values of x and thereafter we'll find corresponding values of y and then we'll plot these points on graph, join them and extend them in straight line to find the graph.

(Note: ∵ equation is linear graph will always be straight line.)

Table of solutions for the given equation-

X	Value: $y = \frac{5x}{3}$	y	Point
0	$y = \frac{5(0)}{3}$	y = 0	A(0,0)
300	$y = \frac{5(300)}{3}$	y = 500	B(300,500)
600	$y = \frac{5(600)}{3}$	y = 1000	C(600,1000)

GRAPH:



From the graph we can see that for x = 1200, the value of y = 2000

And for y = 800, the value of x = 480

(Where, no. of voters who cast their vote = x, and Total no. of voters = y)

Q. 12. When Rupa was born, his father was 25 years old. Form an equation and draw a graph for this data. From the graph find

(i) The age of the father when Rupa is 25 years old.
(ii) Rupa's age when her father is 40 years old.

Answer : Give that, When Rupa was born, his father was 25 years old.

Now, let the age of Rupa's father be 'x' and Rupa's be 'y.'

⇒ x - y = 25 is the equation.

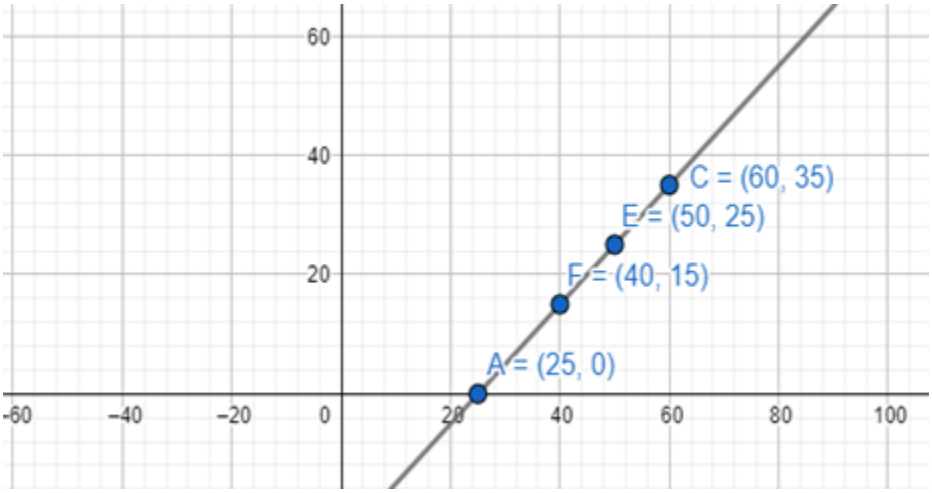
For graph, we'll first make the table of solutions by putting some random values of x and thereafter we'll find corresponding values of y and then we'll plot these points on graph, join them and extend them in straight line to find the graph.

(Note: ∵ equation is linear graph will always be straight line.)

Table of solutions for the given equation-

X	Value: y = x-25	Y	Point
25	y = 25-25	y = 0	A(25,0)
60	y = 60-25	y = 35	C(60,35)

GRAPH:



(i) Given that y = 25.

∴ From the graph x = 50 (pt. E)

(ii) Given that x = 40

∴ From the graph y = 40 (pt. F) (; 15

(Where, Father's age = x and Rupa's age = y)

Q. 13. An auto charges ₹ 15 for first kilometer and ₹ 8 each for each subsequent kilometer. For a distance of 'x' km. an amount of ₹ 'y' is paid.

Write the linear equation representing this information and draw the graph. With the help of graph find the distance travelled if the fare paid is ₹ 55? How much would have to be paid for 7 kilometers?

Answer : Given that, An auto charges ₹ 15 for first kilometer and ₹ 8 each for each subsequent kilometer. For a distance of 'x' km. an amount of ₹ 'y' is paid.

⇒ the extra charge for first kilometer apart from 8-

= 15-8 = Rs.7

⇒ y = 8x + 7 is the linear equation.

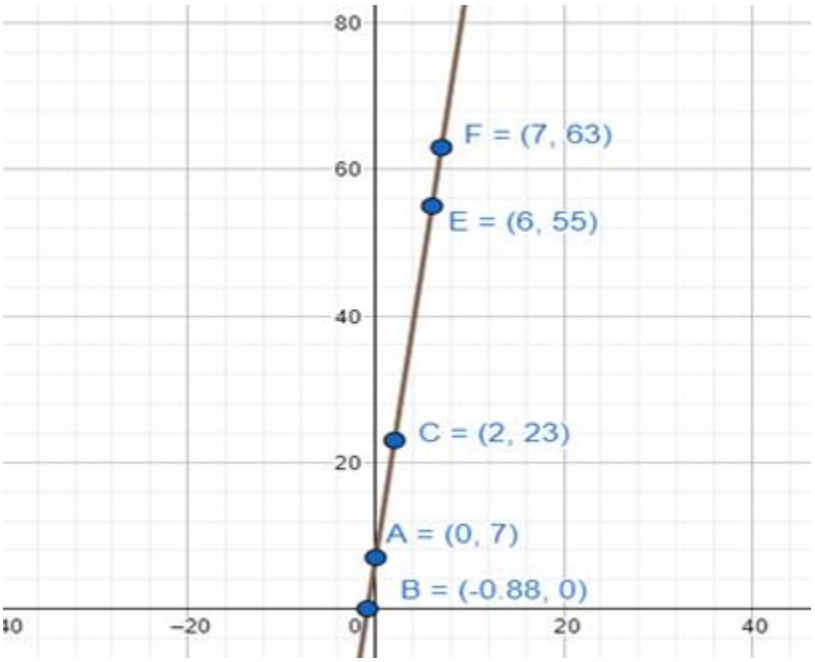
For graph, we'll first make the table of solutions by putting some random values of x and thereafter we'll find corresponding values of y and then we'll plot these points on graph, join them and extend them in straight line to find the graph.

(Note: ∵ equation is linear graph will always be straight line.)

Table of solutions for the given equation-

x	Value: y = 8x + 7	Y	Point
0	y = 8(0) + 7	y = 7	A(0,7)
$-\frac{7}{8}$	$y = 8(-\frac{7}{8}) + 7$	y = 0	$B(-\frac{7}{8},0)$
2	y = 8(2) + 7	y = 23	C(2,23)

GRAPH:



Now, from the graph, distance travelled if the fare paid is Rs.55 is 6 km (pt. E)

And the money to be paid for 7 kilometers is Rs. 63. (pt. F)

Q. 14. A lending library has fixed charge for the first three days and an additional charges for each day thereafter. John paid ₹ 27 for a book kept for seven days. If the fixed charges be ₹ x and subsequent per day charges be ₹ y, then write the linear equation representing the above information and draw the graph of the same. From the graph if the fixed charge is ₹ 7 the subsequent per day charge ? And if the per day charge is ₹ 4/- find the 'fixed' charge ?

Answer : John paid Rs. 27 for a book kept for seven days. If the fixed charges be Rs. x and subsequent per day charges be

Rs. y

$\Rightarrow x + 4y = 27$ is the equation.

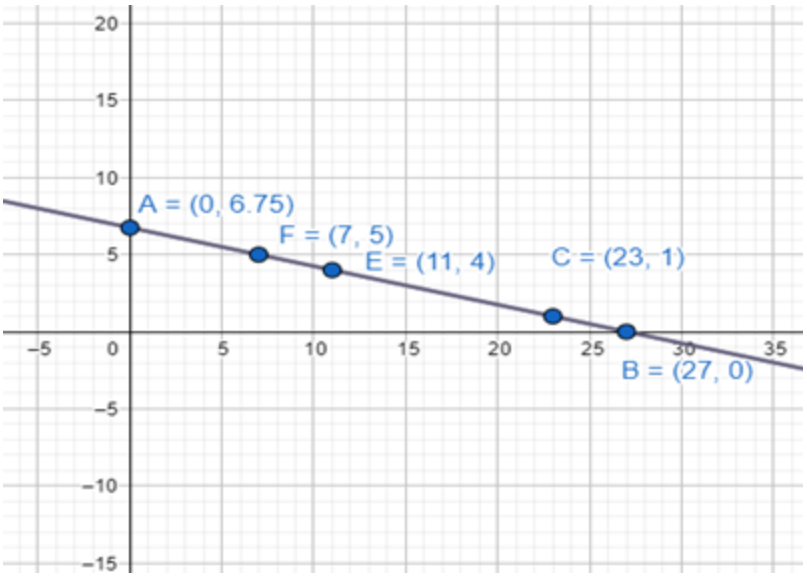
For graph, we'll first make the table of solutions by putting some random values of x and thereafter we'll find corresponding values of y and then we'll plot these points on graph, join them and extend them in straight line to find the graph.

(Note: ∵ equation is linear graph will always be straight line.)

Table of solutions for the given equation-

X	Value: $y = \frac{27-x}{4}$	Y	Point
0	$y = \frac{27-0}{4}$	y = 7	A(0,7)
27	$y = \frac{27-27}{4}$	y = 0	B(27,0)
23	$y = \frac{27-23}{4}$	y = 1	C(23,1)

GRAPH:



Now, from the graph if the fixed charge is Rs. 7 the subsequent per day charge is Rs. 5 (pt. E)

And if the per day charge is Rs. 4, then the fixed charge is Rs. 11. (pt. F)

Q. 15. The parking charges of a car in Hyderabad Railway station for first two hours is ₹ 50 and ₹10 for each subsequent hour. Write down an equation and draw the graph. Find the following charges from the graph

(i) For three hours
(ii) For six hours
(iii) How many hours did Rekha park her car if she paid ₹ 80 as parking charges?

Answer : Give that, the parking charges of a car for first two hours is Rs. 50 and Rs. 10 for each subsequent hour.

⇒ the extra charges for first two hours apart from Rs. 10 per hour = 50-(10× 2)

= 30

Now, let ‘x’ be no. of hours and ‘y’ be the parking charges.

⇒ y = 10x + 30 is the equation.

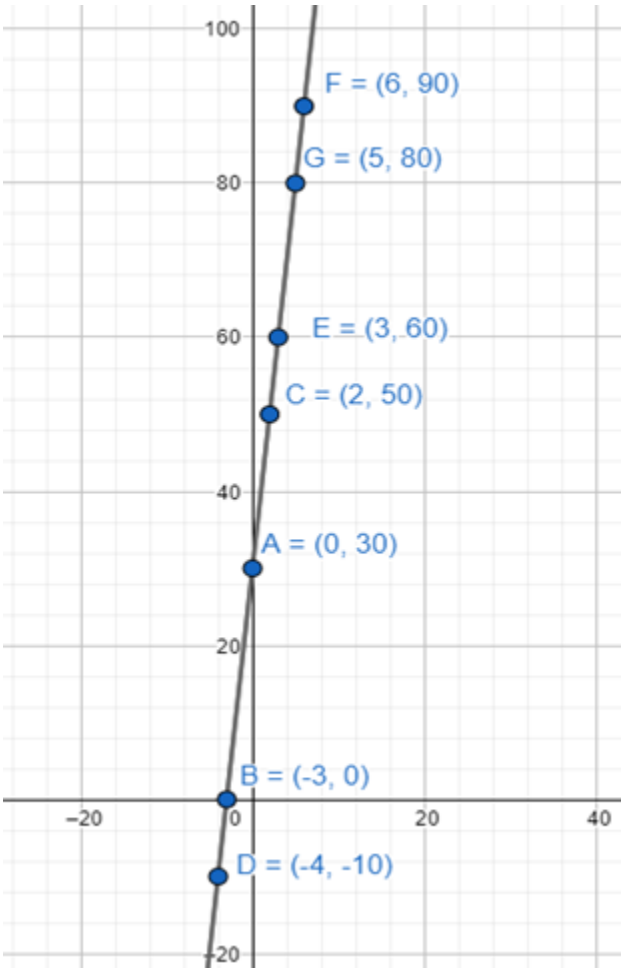
For graph, we’ll first make the table of solutions by putting some random values of x and thereafter we’ll find corresponding values of y and then we’ll plot these points on graph, join them and extend them in straight line to find the graph.

(Note: ∵ equation is linear graph will always be straight line.)

Table of solutions for the given equation-

X	Value: y = 10x + 30	Y	Point
0	y = 10(0) + 30	y = 7	A(0,7)
-3	y = 10(-3) + 30	y = 0	B(-3,0)
2	y = 10(2) + 30	y = 50	C(2,50)
-4	y = 10(-4) + 30	y = -10	D(-4,-10)

GRAPH:



(Note: Negative values are taken just to make graph but these values are practically impossible)

(i) Given, x = 3 hr.

From the graph, the corresponding y = 60 hr. (pt. E)

(ii) Given, x = 6 hr.

From the graph, the corresponding y = 90 hr. (pt. F)

(iii) Given, y = Rs. 80

From the graph, the corresponding x = 5 hr. (pt. G)

(Where, No. of hours = x ; Parking charges = y)

Q. 16. Sameera was driving a car with uniform speed of 60 kmph. Draw distance-time graph. From the graph find the distance travelled by Sameera in

(i) $1\frac{1}{2}$ hours

(ii) 2 hours

(iii) $3\frac{1}{2}$ hours

Answer : Given that, speed = 60 km ph.

Also, distance = speed× time

⇒ d = 60 t (where, d = distance, t = time);

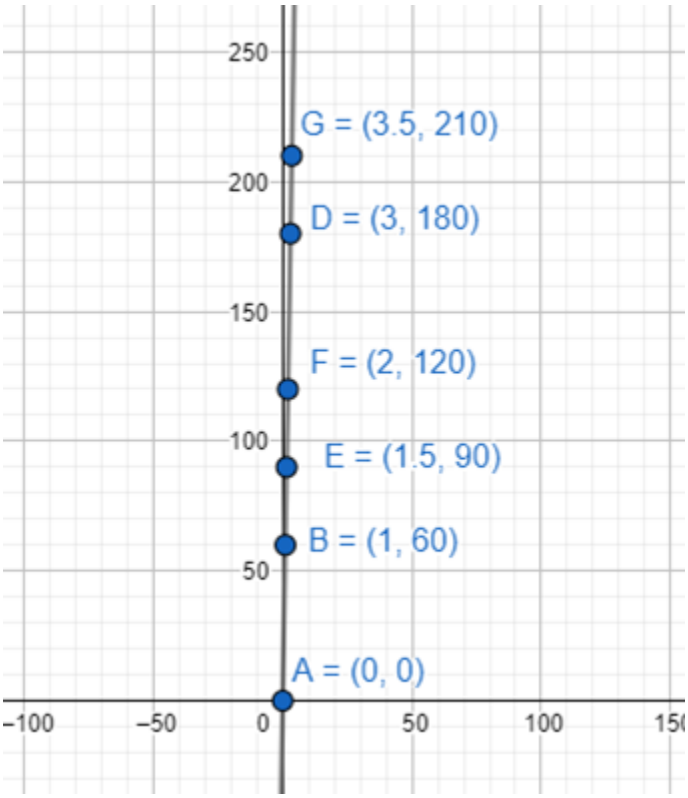
For graph, we'll first make the table of solutions by putting some random values of x and thereafter we'll find corresponding values of y and then we'll plot these points on graph, join them and extend them in straight line to find the graph.

(Note: ∵ equation is linear graph will always be straight line.)

Table of solutions for the given equation-

T	Value: d = 60t	d	Point
0	d = 60(0)	d = 0	A(0,0)
1	d = 60(1)	d = 60	B(1,60)
3	d = 60(3)	d = 180	D(3,180)

GRAPH:



(i) Given, t = 1.5 hr.

From the graph, we have corresponding y = 90 km. (pt. E)

(ii) Given, t = 2 hr.

From the graph, we have corresponding y = 120 km. (pt. F)

(iii) Given, t = 3.5 hr.

From the graph, we have corresponding y = 210 km. (pt. G)

Q. 17. The ratio of molecular weight of Hydrogen and Oxygen in water is 1:8. Set up an equation between Hydrogen and Oxygen and draw its graph. From the graph find the quantity of Hydrogen if Oxygen is 12 grams. And quantity of oxygen if hydrogen is $\frac{3}{2}$ gms?

[Hint : If the quantities of hydrogen and oxygen or 'x' and 'y' respectively, then x : y = 1:8 ⟹ 8x = y]

Answer : Given that, ratio of molecular weight of Hydrogen and Oxygen in water is 1:8.

Now, Let the quantity of hydrogen and oxygen or 'x' and 'y' respectively.

$$\Rightarrow \frac{x}{y} = \frac{1}{8}$$

⇒ 8x = y

⇒ y = 8x is the equation.

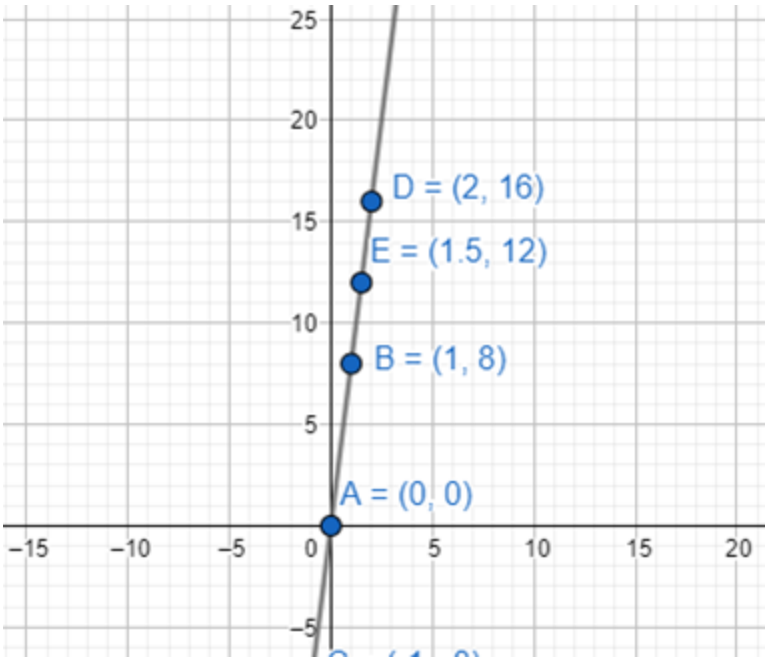
For graph, we'll first make the table of solutions by putting some random values of x and thereafter we'll find corresponding values of y and then we'll plot these points on graph, join them and extend them in straight line to find the graph.

(Note: ∵ equation is linear graph will always be straight line.)

Table of solutions for the given equation-

X	Value: y = 8x	y	Point
0	y = 8(0)	y = 0	A(0,0)
1	y = 8(1)	y = 8	B(1,8)
2	y = 8(2)	y = 16	D(2,16)

GRAPH:



From the graph, the quantity of Hydrogen if Oxygen is 12 grams is $\frac{3}{2}$ grams. (pt. E)

And quantity of oxygen if hydrogen is $\frac{3}{2}$ grams is 12 grams (pt. E).

Q. 18. In a mixture of 28 litres, the ratio of milk and water is 5:2. Set up the equation between the mixture and milk. Draw its graph. By observing the graph find the quantity of milk in the mixture.

[Hint: Ratio between mixture and milk = 5 + 2 : 5 = 7 : 5]

Answer : Given that, the ratio of milk and water is 5:2.

∴ Ratio between mixture and milk = 5 + 2 : 5 = 7 : 5

Now, let the quantity of mixture be ‘x’ and milk be ‘y’.

$$\Rightarrow \frac{x}{y} = \frac{7}{5}$$

⇒ 7y = 5x is the equation.

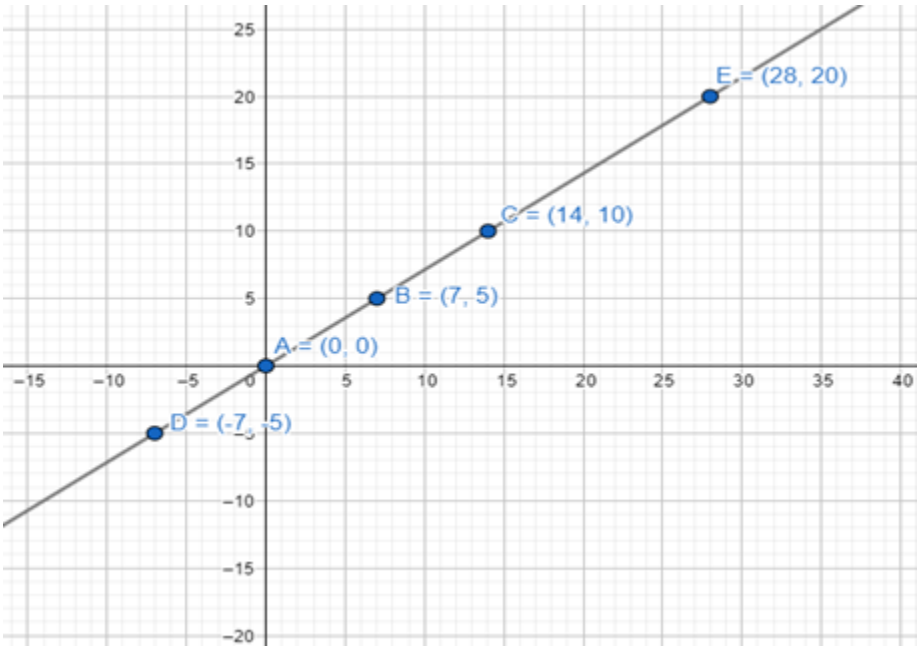
For graph, we’ll first make the table of solutions by putting some random values of x and thereafter we’ll find corresponding values of y and then we’ll plot these points on graph, join them and extend them in straight line to find the graph.

(Note: ∵ equation is linear graph will always be straight line.)

Table of solutions for the given equation-

X	Value: $y = \frac{5x}{7}$	Y	Point
0	$y = \frac{5(0)}{7}$	y = 0	A(0,0)
7	$y = \frac{5(7)}{7}$	y = 1	B(7,1)
14	$y = \frac{5(14)}{7}$	y = 10	C(14,10)

GRAPH:



Now, given mixture(x) = 28

From the graph, (pt. E)- the corresponding quantity of milk(y) = 20

Q. 19. In countries like USA and Canada temperature is measured in Fahrenheit where as in countries like India, it is measured in Celsius. Here is a linear equation that converts Fahrenheit to Celsius $F = \left(\frac{9}{5}\right)C + 32$

(i) Draw the graph of the above linear equation having Celsius on x-axis and Fahrenheit on Y-axis.
(ii) If the temperature is 30°C, what is the temperature in Fahrenheit?
(iii) If the temperature is 95°F, what is the temperature in Celsius?

(iv) Is there a temperature that has numerically the same value in both Fahrenheit and Celsius? If yes find it?

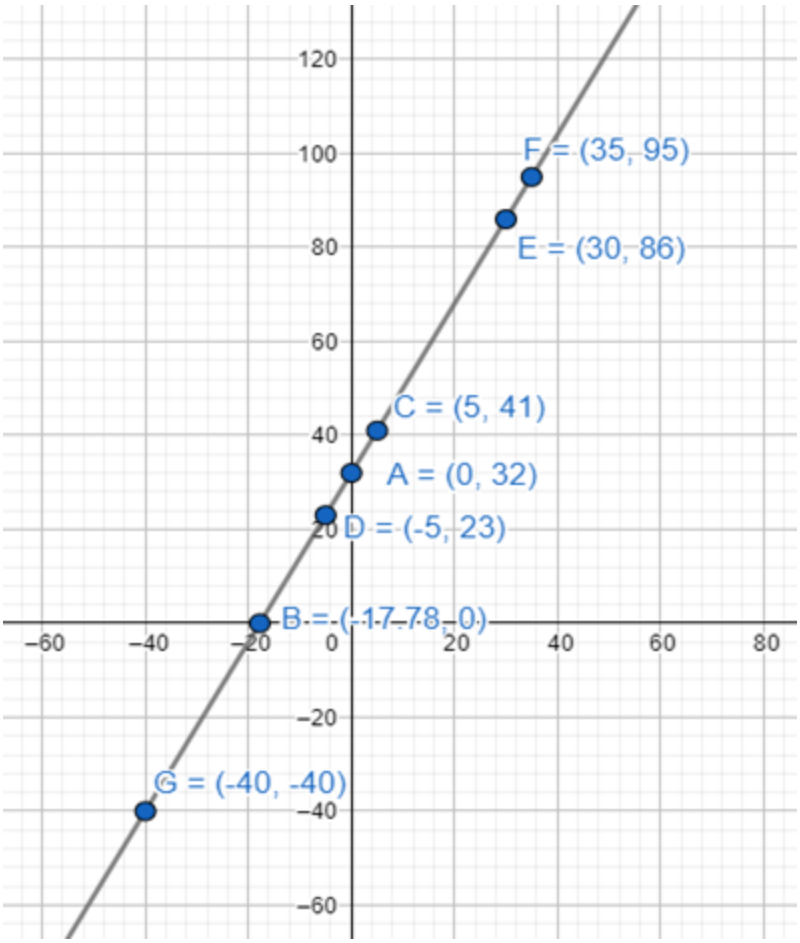
Answer : (i) For graph, we'll first make the table of solutions by putting some random values of x and thereafter we'll find corresponding values of y and then we'll plot these points on graph, join them and extend them in straight line to find the graph.

(Note: ∵ equation is linear graph will always be straight line.)

Table of solutions for the given equation-

c	Value: $f = \frac{9c + 160}{5}$	f	Point
0	$f = \frac{9(0) + 160}{5}$	f = 32	A(0,7)
$-\frac{160}{9}$	$f = \frac{9(-\frac{160}{9}) + 160}{5}$	f = 0	$B(-\frac{160}{9}, 0)$
5	$f = \frac{9(5) + 160}{5}$	f = 41	C(5,41)
-5	$f = \frac{9(-5) + 160}{5}$	f = 23	D(-5,23)

GRAPH:



(ii) If the temperature is 30°C, then from the graph, the temperature in Fahrenheit is 86° F. (pt. E)

(iii) If the temperature is 30°C, what is the temperature in Fahrenheit is 35° C. (pt. F)

(iv) Yes.

The temperature that has numerically the same value in both Fahrenheit and Celsius is -40 (pt. G)

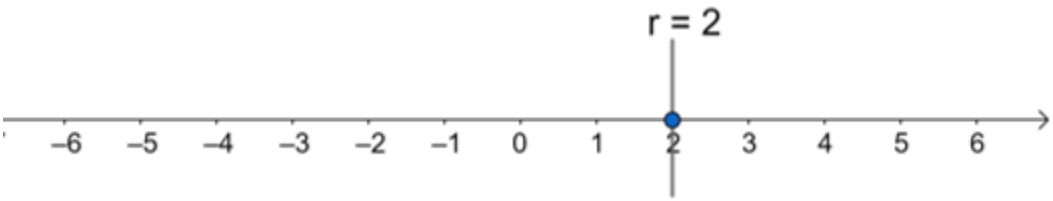
Exercise 6.4

Q. 1. A. Give the graphical representation of the following equation.

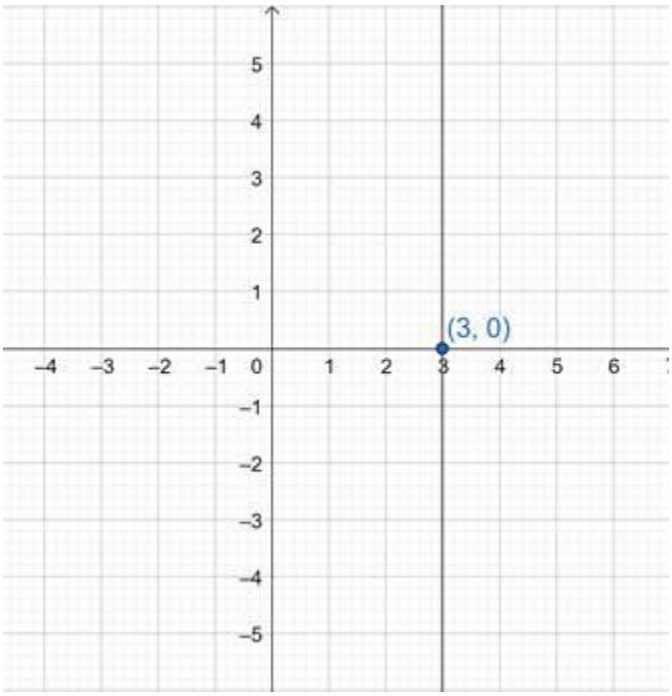
a) On the number line and
b) On the Cartesian plane
x = 3

Answer : We are given, x = 3

The representation of the solution on the number line, when equation is treated as an equation in one variable.



The representation of the solution on the Cartesian plane, it is parallel to y axis passing through-the point (2,0) is shown below



Q. 1. B. Give the graphical representation of the following equation.

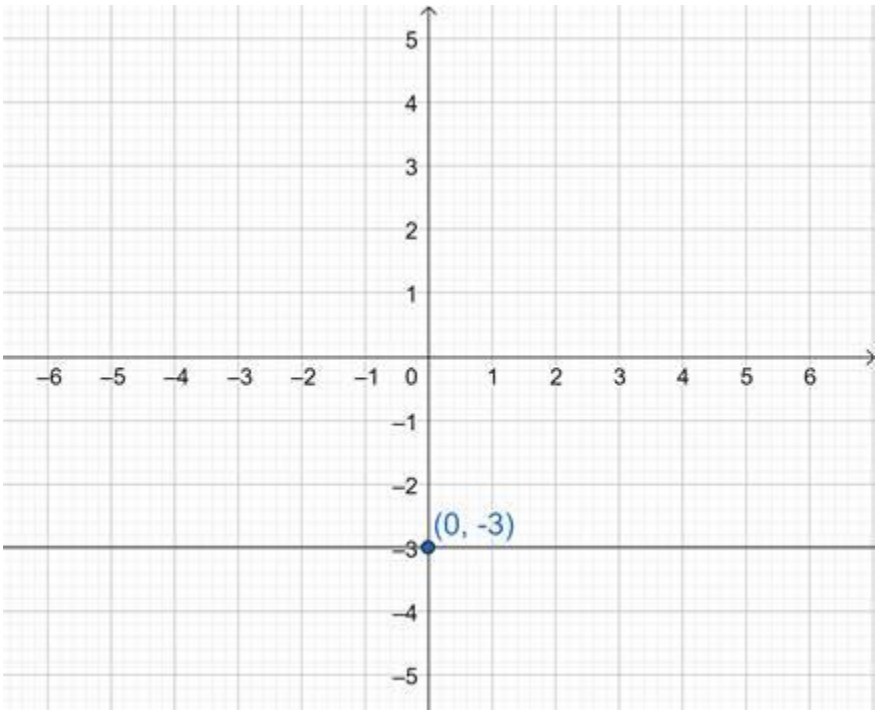
a) On the number line and
b) On the Cartesian plane
y + 3 = 0

Answer : We are given, y + 3 = 0

We get, y = -3

The representation of the solution on the number line, when equation is treated as an equation in one variable.

The representation of the solution on the Cartesian plane, it is parallel to y axis passing through-the point (0,-3) is shown below

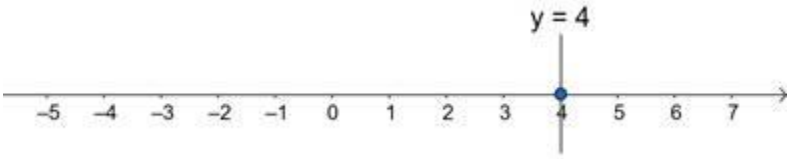


Q. 1. C. Give the graphical representation of the following equation.

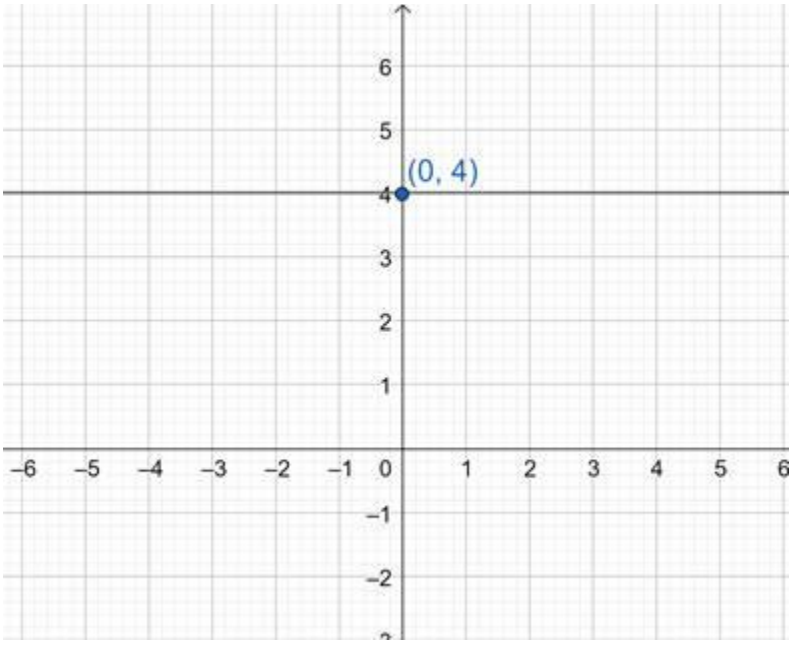
a) On the number line and
b) On the Cartesian plane
y = 4

Answer : We are given, y = 4

The representation of the solution on the number line, when equation is treated as an equation in one variable.



The representation of the solution on the Cartesian plane, it is parallel to y axis passing through-the point (0,4) is shown below



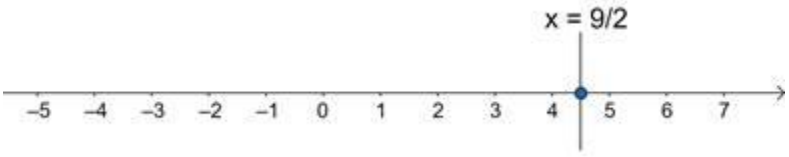
Q. 1. D. Give the graphical representation of the following equation.

a) On the number line and
b) On the Cartesian plane
2x – 9 = 0

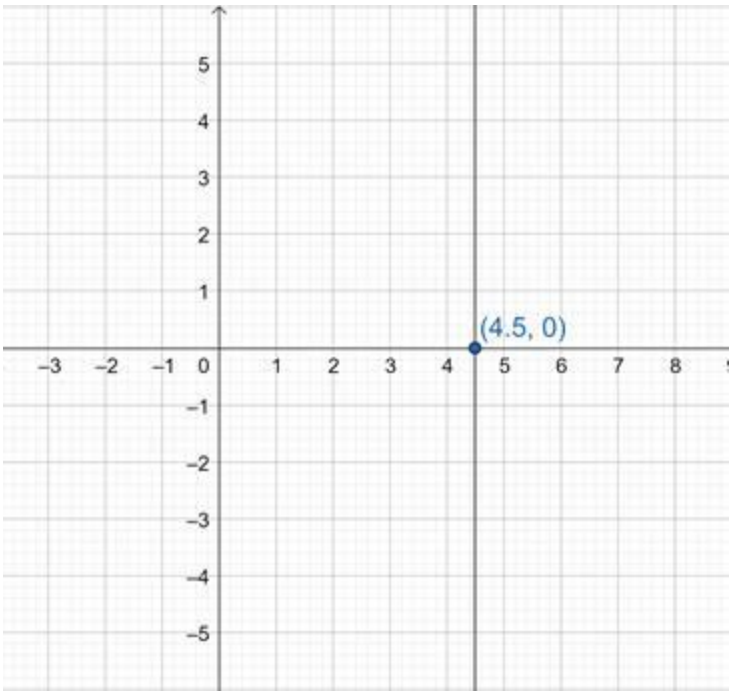
Answer : We are given, 2x – 9 = 0

We get, 2x = 9 ⇒ x = $9/2$

The representation of the solution on the number line, when equation is treated as an equation in one variable.



The representation of the solution on the Cartesian plane, it is parallel to y axis passing through-the point $(\frac{9}{2},0)$ is shown below



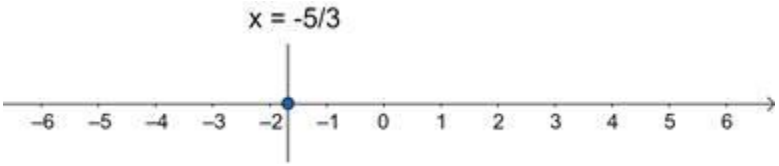
Q. 1. E. Give the graphical representation of the following equation.

a) On the number line and
b) On the Cartesian plane
3x + 5 = 0

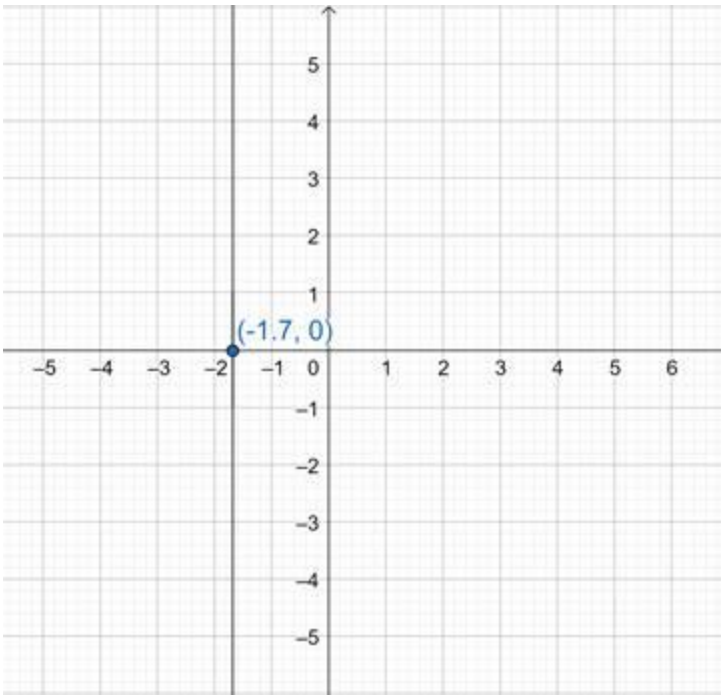
Answer : We are given, 3x + 5 = 0

We get, 3x = -5 ⇒ x = $-\frac{5}{3}$

The representation of the solution on the number line, when equation is treated as an equation in one variable.



The representation of the solution on the Cartesian plane, it is parallel to y axis passing through-the point ($-\frac{5}{3}$,0) is shown below



Q. 2. Give the graphical representation of 2x - 11 = 0 as an equation in

i) one variable
ii) two variables

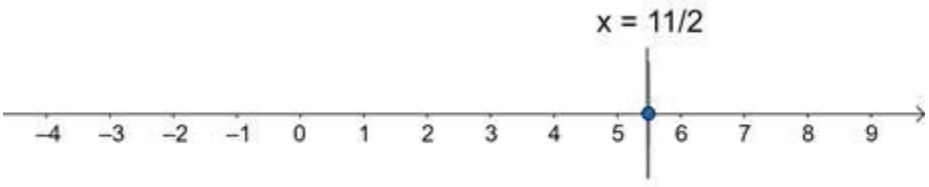
Answer : We are given, 2x -11 = 0

We get,

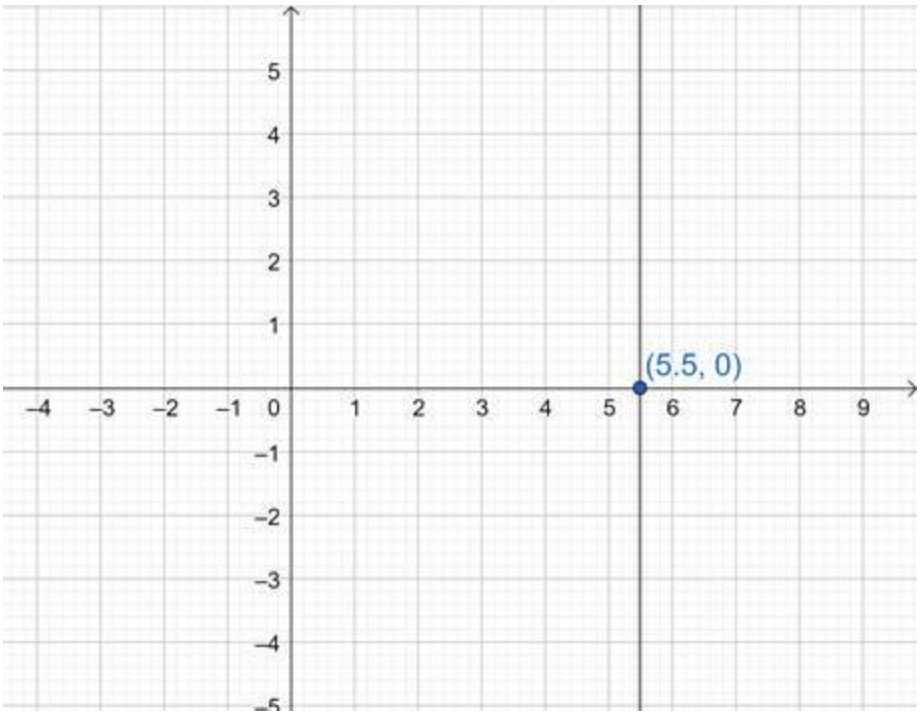
2x = 11

$x = \frac{11}{2}$

The representation of the solution on the number line, when equation is treated as an equation in one variable.



The representation of the solution on the Cartesian plane, it is parallel to y axis passing through- the point $\left(\frac{11}{2}, 0\right)$ is shown below



Q. 3. Solve the equation 3x + 2 = 8x - 8 and represent the solution on

i) the number line
ii) the Cartesian plane

Answer : We are given that, 3x + 2 = 8x - 8

We get,

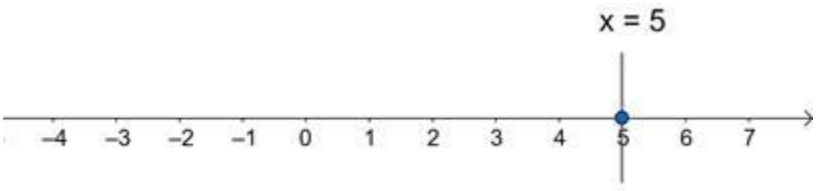
3x – 8x = -8 – 2

⇒ -5x = -10

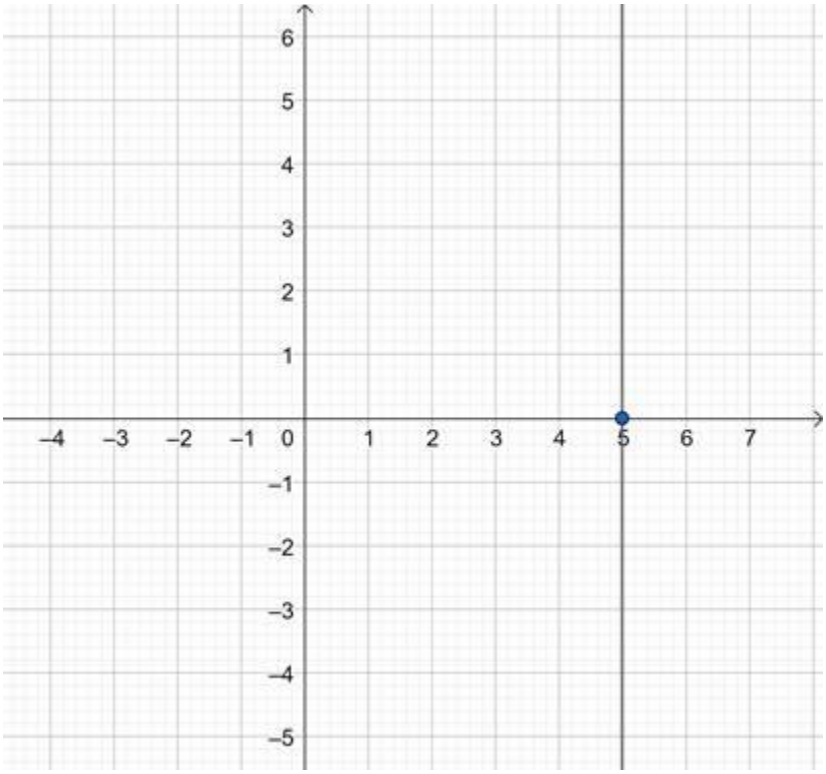
$$\Rightarrow x = \frac{-10}{-5}$$

⇒ x = 2

The representation of the solution on the number line, when given equation is treated as an equation in one variable.



The representation of the solution on the Cartesian plane, it is a line parallel to y-axis passing through the point (5,0) is shown below



Q. 4. Write the equation of the line parallel to X-axis, and passing through the point

i) (0, –3)
ii) (0, 4)
iii) (2, –5)
iv) (3, 4)

Answer : i). We are given the co-ordinates of the Cartesian plane at (0,-3)

For the equation of the line parallel to x-axis, we assume the equation as a one variable equation independent of x containing y equal to -3

We get the equation,

y = -3

ii). We are given the co-ordinates of the Cartesian plane at (0,4)

For the equation of the line parallel to x-axis, we assume the equation as a one variable equation independent of x containing y equal to 4

We get the equation,

y = 4

iii). We are given the co-ordinates of the Cartesian plane at (2,-5)

For the equation of the line parallel to x-axis, we assume the equation as a one variable equation independent of x containing y equal to -5

We get the equation,

y = -5

iv). We are given the co-ordinates of the Cartesian plane at (3,4)

For the equation of the line parallel to x-axis, we assume the equation as a one variable equation independent of x containing y equal to 4

We get the equation,

y = 4

Q. 5. Write the equation of the line parallel to Y-axis and passing through the point

i) (–4, 0)
ii) (2, 0)
iii) (3, 5)
iv) (–4, –3)

Answer : i). We are given the co-ordinates of the Cartesian plane at (-4,0)

For the equation of the line parallel to y-axis, we assume the equation as a one variable equation independent of y containing x equal to -4

We get the equation,

x = -4

ii). We are given the co-ordinates of the Cartesian plane at (2,0)

For the equation of the line parallel to y-axis, we assume the equation as a one variable equation independent of y containing x equal to 2

We get the equation,

x = 2

iii). We are given the co-ordinates of the Cartesian plane at (3,5)

For the equation of the line parallel to y-axis, we assume the equation as a one variable equation independent of y containing x equal to 3

We get the equation,

x = 3

iv). We are given the co-ordinates of the Cartesian plane at (-4,-3)

For the equation of the line parallel to y-axis, we assume the equation as a one variable equation independent of y containing x equal to -4

We get the equation,

x = -4

Q. 6. Write the equation of three lines that are

(i) parallel to the X-axis
(ii) parallel to the Y-axis.

Answer : i). Equation of lines Parallel to x-axis

1: y = 4

2: y = -3

3: y = 8

ii). Equation of lines parallel to y-axis

1: x = 6

2: x = -2

3: x = 1