

NCERT Solutions for Class 9 Maths Chapter 4 Linear Equations in Two Variables Ex 4.3

Question 1.

Draw the graph of each of the following linear equations in two variables:

(i) $x + y = 4$

(ii) $x - y = 2$

(iii) $y = 3x$

(iv) $3 = 2x + y$

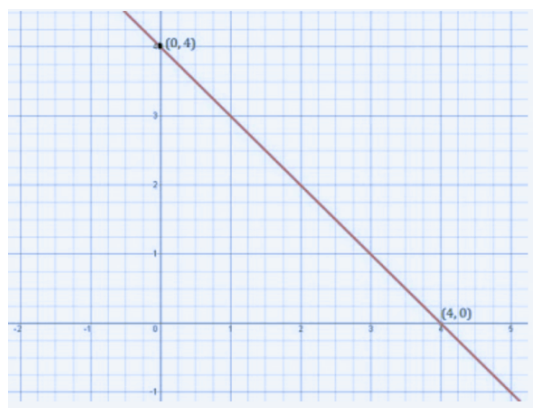
Solution.

(i) Given equation: $x + y = 4$

Put $x = 0$ hence, $y = 4$

Put $x = 4$ hence, $y = 0$

X	0	4
Y	4	0

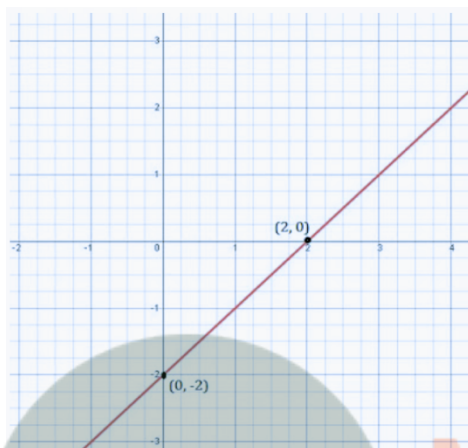


(ii) $x - y = 2$

Put $x = 0$ hence, $y = -2$

Put $x = 2$ hence, $y = 0$

X	0	2
Y	-2	0

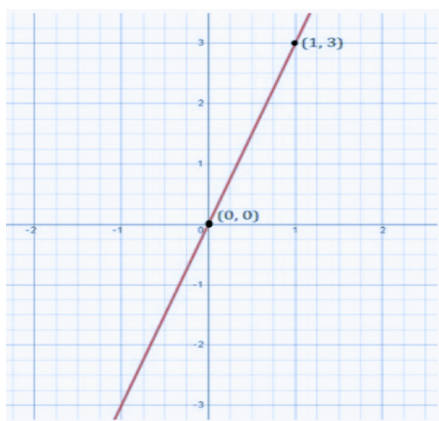


(iii) $y = 3x$

Put $x = 0$ hence, $y = 0$

Put $x = 1$ hence, $y = 3$

x	0	1
y	0	3

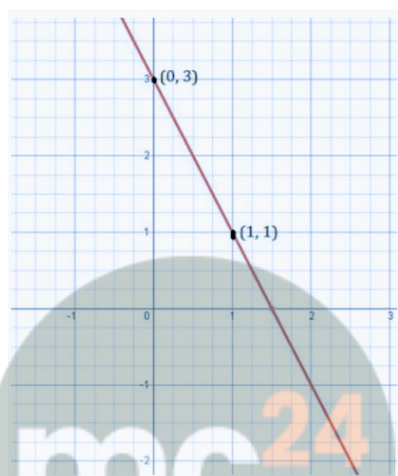


(iv) $3 = 2x + y$

Put $x = 0$ hence, $y = 3$

Put $x = 1$ hence, $y = 1$

X	0	1
Y	3	1



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Question 2.

Give the equations of two lines passing through $(2, 14)$. How many more such lines are there, and why?

Solution.

Here,

$$x = 2 \text{ and } y = 14$$

Hence,

$$x + y = 1$$

Also,

$$y = 7x$$

$$y - 7x = 0$$

Therefore,

The equations of two lines passing through (2, 14) are:

$$x + y = 1$$

And,

$$y - 7x = 0$$

There would be infinite such lines because infinite number of lines can pass through a given point.

Question 3.

If the point (3, 4) lies on the graph of the equation $3y = ax + 7$, find the value of a

Solution.

The point (3, 4) lies on the graph of the equation

Therefore,

Put $x = 3$ and $y = 4$ in the equation,

$$3y = ax + 7,$$

Hence,

$$3 * 4 = a * 3 + 7$$

$$12 = 3a + 7$$

$$3a = 12 - 7$$

$$3a = 5$$

$$a = 5/3$$

Question 4.

The taxi fare in a city is as follows: For the first kilo-meter the fare is Rs 8 and for the subsequent distance it is Rs 5 per km. Taking the distance covered as x km and total fare as Rs y , write a linear equation for this information, and draw its graph.

Solution.

Total fare of the taxi = y

Total distance covered = x

Fair for the subsequent distance after 1st kilometer = Rs 5

Fair for 1st kilometer = Rs 8

As per the question,

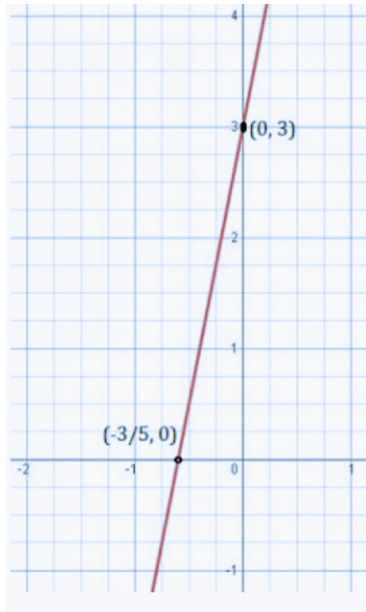
$$y = 8 + 5(x - 1)$$

$$y = 8 + 5x - 5$$

$$y = 5x + 3$$

x	0	$-3/5$
y	3	0

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Question 5.

From the choices given below, choose the equation whose graphs are given in Figure (1) and (2)

For Fig 1

(i) $y = x$

(ii) $x + y = 0$

(iii) $y = 2x$

(iv) $2 + 3y = 7x$

For Fig 2

(i) $y = x + 2$

(ii) $y = x - 2$

(iii) $y = -x + 2$

(iv) $x + 2y = 6$

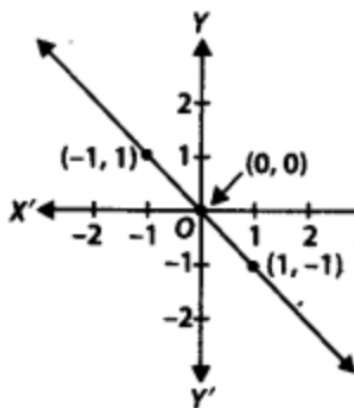


Fig. (1)

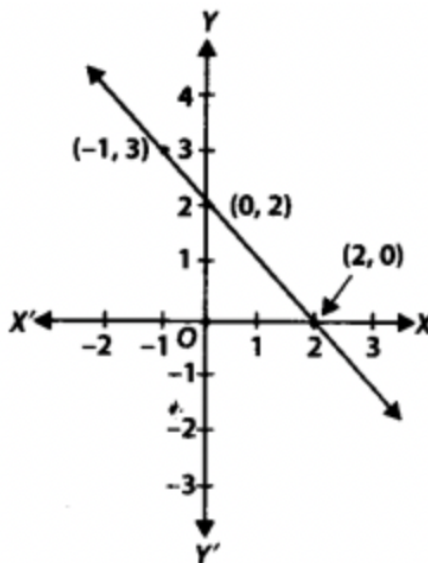


Fig. (2)

Solution.

In figure (1) and (2),

Points plotted are $(0, 0)$, $(-1, 1)$ and $(1, -1)$

Hence,

Equation (11) $x + y = 0$ is correct because it satisfies all the given points.

In figure (1) and (2), points are $(-1, 3)$, $(0, 2)$ and $(2, 0)$

Hence,

Equation (iii) $y = -x + 2$ is correct because it satisfies all the given points

Question 6.

If the work done by a body on application of a constant force is directly proportional to the distance travelled by the body, express this in the form of an equation in two variables and draw the graph of the same by taking the constant force as 5 units. Also read from the graph the work done when the distance travelled by the body is (i) 2 units (ii) 0 unit

Solution.

Let the distance travelled be x by the body and y be the work done by the force

Given: $y \propto x$

To equate the proportional, we need a constant.

Here, it is given 5

Hence,

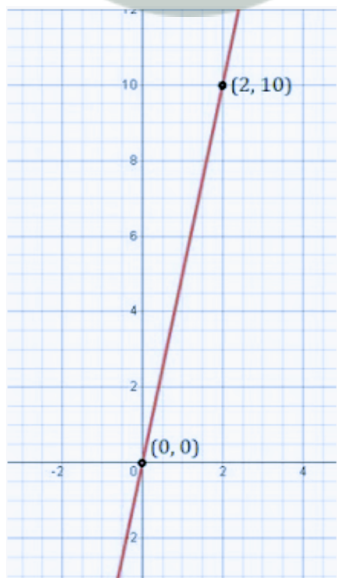
$$y = 5x$$

According to question,

(i) When $x = 2$ units then $y = 10$ units

(ii) When $x = 0$ unit then $y = 0$ unit

X	2	0
Y	10	0



Question 7.

Yamini and Fatima, two students of Class IX of a school, together contributed Rs 100 towards the Prime Minister's Relief Fund to help the earthquake victims. Write a linear equation which satisfies this data. (You may take their contributions as Rs x and Rs y) Draw the graph of the same.

Solution.

Let the amount contributed by Yamini be x and amount contributed by Fatima be y

Now, According to question,

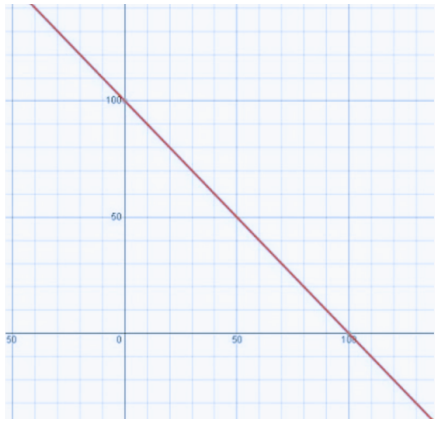
$$x + y = 100$$

When $x = 0$ then $y = 100$

When $x = 50$ then $y = 50$

When $x = 100$ then $y = 0$

X	0	50	100
Y	100	50	0



Question 8.

In countries like USA and Canada, temperature is measured in Fahrenheit, whereas 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 linear equation above using Celsius for x-axis and Fahrenheit for 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) If the temperature is 0°C , what is the temperature in Fahrenheit and if the temperature is 0°F , what is the temperature in Celsius?

(v) Is there a temperature which is numerically the same in both Fahrenheit and Celsius? If yes, find it.

Solution.

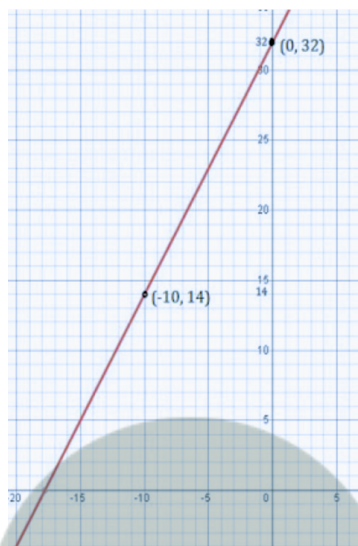
(i) Give: $F = (9/5)C + 32$

When $C = 0$ then $F = 32$

And

When $C = -10$ then $F = 14$

C	0	-10
F	32	14



(ii) Putting the value of $C = 30$ in $F = (9/5)C + 32$, we get

$$F = 9/5 * 30 + 32$$

$$F = 54 + 32$$

$$F = 86$$

(iii) Putting the value of $F = 95$ in $F = (9/5)C + 32$, we get

$$95 = (9/5)C + 32$$

$$(9/5)C = 95 - 32$$

$$C = 63 * 5/9$$

$$C = 35$$

(iv) After putting the value of $F = 0$ in

$$F = (9/5)C + 32,$$

We get:

$$0 = (9/5) C + 32$$

$$(9/5) = -32$$

$$C = -32 * 5/9$$

$$C = -\frac{160}{9}$$

Putting the value of $C = 0$ in

$$F = (9/5) C + 32,$$

We get:

$$F = (9/5) * 0 + 32$$

$$F = 32$$

(v) We have to find when $F = C$

Hence,

After putting $F = C$ in

$$F = (9/5)C + 32,$$

We get:

$$F = (9/5)F + 32$$

$$F - 9/5 F = 32$$

$$\frac{-4}{5} F = 32$$

$$F = -40$$

