NCERT Solutions for Class 10 Maths Chapter 3: NCERT Solutions for Class 10 Maths Chapter 3 Pair of Linear Equations in Two Variables are designed to help students in comprehending the solution methods for problems within this topic.

Mathematics is a subject that necessitates ample practice, and students preparing for 10th-grade board exams can utilize NCERT Solutions Class 10 as a reference. These solutions for the Chapter Pair of Linear Equations in Two Variables provide step-by-step explanations for all the mathematical problems found in the NCERT textbook. A linear equation in two variables x and y can be expressed in the form ax + by + c = 0, where a, b, and c are real numbers, and neither a nor b is zero.

NCERT Solutions for Class 10 Maths Chapter 3 PDF

You can access the PDF link for NCERT Solutions for Class 10 Maths Chapter 3 by clicking the provided link. These solutions provide detailed explanations and step-by-step guidance to help you understand the concepts covered in this chapter.

Whether you're preparing for exams or simply seeking to enhance your understanding of pair of linear equations in two variables, these NCERT solutions serve as a valuable resource. With clear explanations and solved examples, you can strengthen your grasp of the subject and tackle mathematical problems with confidence.

NCERT Solutions for Class 10 Maths Chapter 3 PDF

NCERT Solutions for Class 10 Maths Chapter 3 Pair of Linear Equations in Two Variables

These solutions provide a comprehensive guide for students preparing for their board exams, aiding in thorough comprehension of the topic.

NCERT Solutions for Class 10 Maths Chapter 3 Exercise 3.1

1. Aftab tells his daughter, “Seven years ago, I was seven times as old as you were then. Also, three years from now, I shall be three times as old as you will be.” (Isn’t this interesting?) Represent this situation algebraically and graphically.

Answer:

Let the present age of Aftab and his daughter be x and y respectively.
Seven years ago, Age of Aftab = x – 7 and Age of his daughter = y – 7
According to the given condition,

$=x - 7 = 7(y - 7)$
$=x - 7 = 7y - 49$
$=x = 7y - 42 \dots\dots\dots\dots\dots..(i)$

Putting x = 5,6,7

X = 7×5 – 42 = 35 – 42 = -7
X = 7×6 – 42 = 42 – 42 = 0
X = 7×7 – 42 = 49 – 42 = 7

X	-7	0	7
Y	5	6	7

Three years from now ,
Age of Aftab = x+3
Age of Daughter = y+3
According to the question,
$=x - 3 = 3(y + 3)$
$=x - 3 = 3y + 9$
$=x = 3y + 6 \dots\dots\dots\dots\dots\dots\dots\dots\dots..(ii)$
Putting , y = -2 , -1 ,0

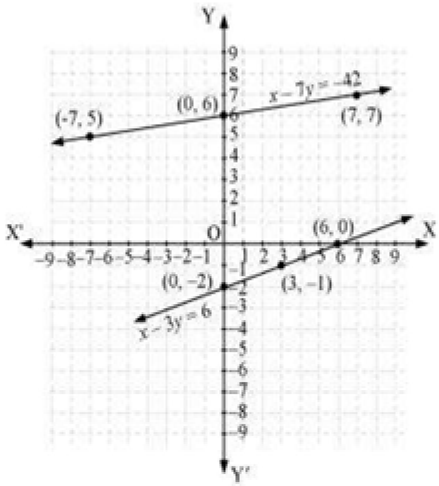
X	0	3	6
Y	-2	-1	0

Thus, the given conditions can be algebraically represented as:
x – 7y = –42

$\dots\dots\dots.(i)$

And x – 3y = 6

$\dots\dots\dots\dots\dots..(ii)$



The graphical representation is as follows:

2. The coach of a cricket team buys 3 bats and 6 balls for Rs 3900. Later, she buys another bat and 3 more balls of the same kind for Rs 1300. Represent this situation algebraically and graphically.
Answer:<.

Let the cost of a bat and a ball be Rs x and Rs y respectively.
The given conditions can be algebraically represented as:
3x + 6y = 3900
x + 2y = 1300

$=x = 1300 - 2y$

Putting y = -1300 , 0 , 1300 we get,

X = 1300 – 2(-1300) = 1300+2600 = 3900
X = 1300 – 2(0) = 1300
X = 1300 – 2(1300) = 1300 – 2600 = -1300

Three solutions of this equation can be written in a table as follows:

x	3900	1300	-1300
y	-1300	0	1300

She buys another bat and 2 more balls of the same kind for Rs.1300 (Given)

$= x + 2y = 1300 \ldots\ldots\ldots..(ii)$

$= x = 1300 - 2y$

Putting y = -1300 , 0 , 1300 we get,

X = 1300 – 2(-1300) = 1300+2600 = 3900

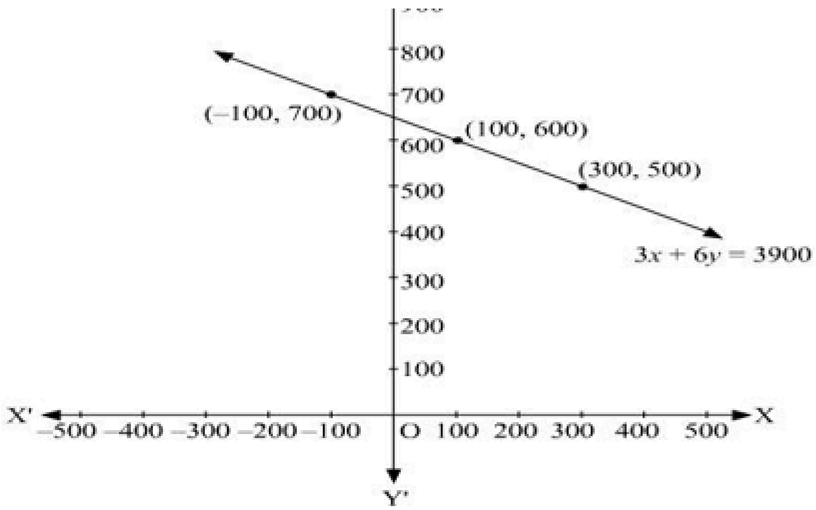
X = 1300 – 2(0) = 1300

X = 1300 – 2(1300) = 1300 – 2600 = -1300

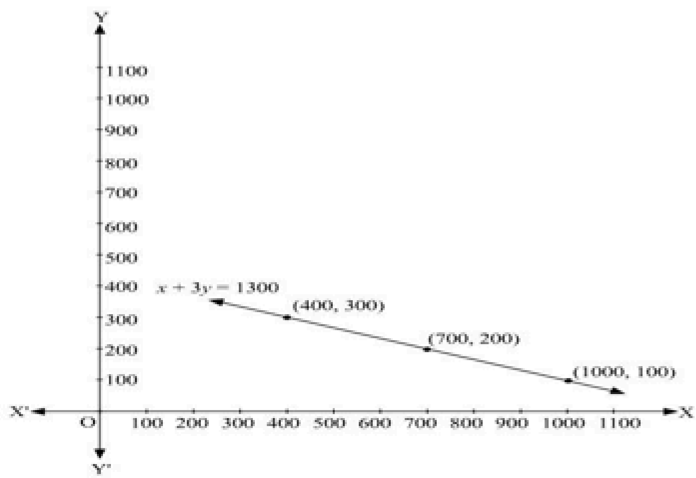
Three solutions of this equation can be written in a table as follows:

x	3900	1300	-1300
y	-1300	0	1300

The graphical representation is as follows:



Graphical Representation for second equation:



3. The cost of 2 kg of apples and 1 kg of grapes on a day was found to be Rs 160. After a month, the cost of 4 kg of apples and 2 kg of grapes is Rs 300. Represent the situation algebraically and geometrically.

Answer:

Let cost of 1 kg of apples = Rs x and let cost of 1 kg of grapes= Rs y

According to given conditions, we have

$2x + y = 160$… (1)

$4x + 2y = 300$

$\Rightarrow 2x + y = 150$… (2)

So, we have equations (1) and (2), 2x + y = 160 and 2x + y = 150 which represent given situation algebraically.

For equation 2x + y = 160, we have following points which lie on the line

According to the question,

$=2x + y = 160 \ldots\ldots\ldots\ldots (i)$

$= 2x = 160 - y$

$=x = \frac{160-y}{2}$

Putting y = 0, 80 , 160 we get,

$X = \frac{160-0}{2} = 80$

$X = \frac{160-80}{2} = 40$

$X = \frac{160-160}{2} = 0$

X	80	40	0
Y	0	80	160

Cost of 4 kg of apples and 2 kg of grapes is Rs. 300................................(Given)

So,

$= 4x + 2y = 300 \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots (ii)$

Dividing the equation by 2 , we get,

$= 2x + y = 150$

$= y = 150 - 2x$

Putting y = 0, 50 , 100 we get,

Y = 150 – 2×0 = 150

Y = 150 – 2(50) = 150 – 100 = 50

Y = 150 – 2(100) = 150 – 200 = -50

X	0	50	100
Y	150	50	-50

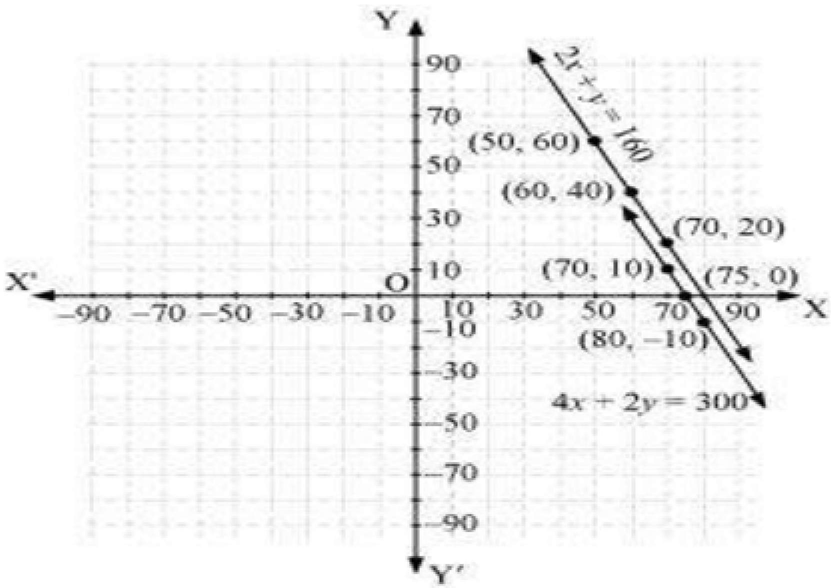
Algebraic representation :

2x+y = 160 ....(i)

4x+2y= 300.................(ii)

Graphical representation :

We plot the points for both of the equations and it is the graphical representation of the given situation.



NCERT Solutions for Class 10 Maths Chapter 3 Exercise 3.2

1. Form the pair of linear equations in the following problems, and find their solutions graphically.

(i) 10 students of class X took part in a mathematics quiz. If the number of girls is 4 more than the number of boys, find the number of boys and girls who took part in the quiz.

(ii) 5 pencils and 7 pens together cost Rs 50, whereas 7 pencils and 5 pens together cost Rs. 46. Find the cost of one pencil and that of one pen.

Answer:

(i) Let number of boys = x

Let number of girls = y

According to given conditions, we have

x + y = 10

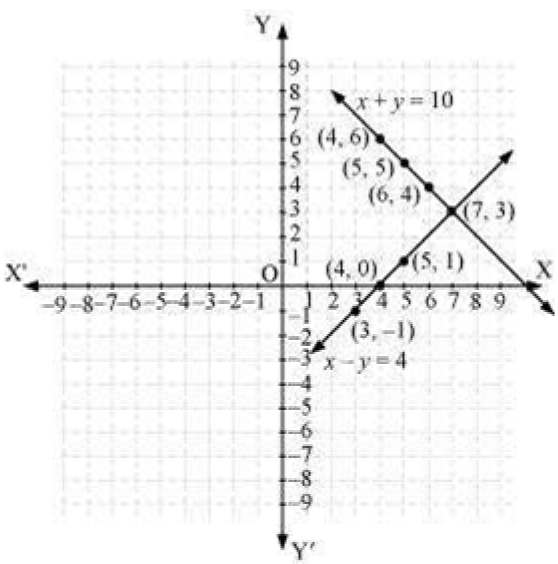
And, x = 10 - y

putting y=0,5,10,we get,
X=10-0=10
X=10-5=5,
X=10-10=0

x	10	5	0
y	0	5	10

Number of girls is 4 more than number of boys ....Given,
so,
Y=x+4
putting x=-4,0,4 we get,
Y=-4+4=0
Y=0+4
Y=4+4=8

x	-4	0	4
y	0	4	8



We plot the points for both of the equations to find the solution.

(ii)

Let the cost of one pencil=Rs.X
and Let the cost of one pen=Rs.Y
According to the given conditions, we have:
=5x + 7y = 50
=5x=50-7y
=x=10-7/5y

Putting value of y = 5 , 10 , 15 we get,

$X = 10 - \frac{7}{5} \times 5 = 10 - 7 = 3$

$X = 10 - \frac{7}{5} \times 10 = 10 - 14 = -4$

$X = 10 - \frac{7}{5} \times 15 = 10 - 21 = -11$

Three solutions of this equation can be written in a table as follows:

x	3	-4	-11
y	5	10	15

Now,

7 pencils and 5 pens together cost Rs. 46

$7x + 5y = 46$

$= 5y = 46 - 7x$

$= y = 9.2 - 1.4x$

Putting x = 0 , 2 , 4 we get,

$Y = 9.2 - 1.4 \times 0 = 9.2$

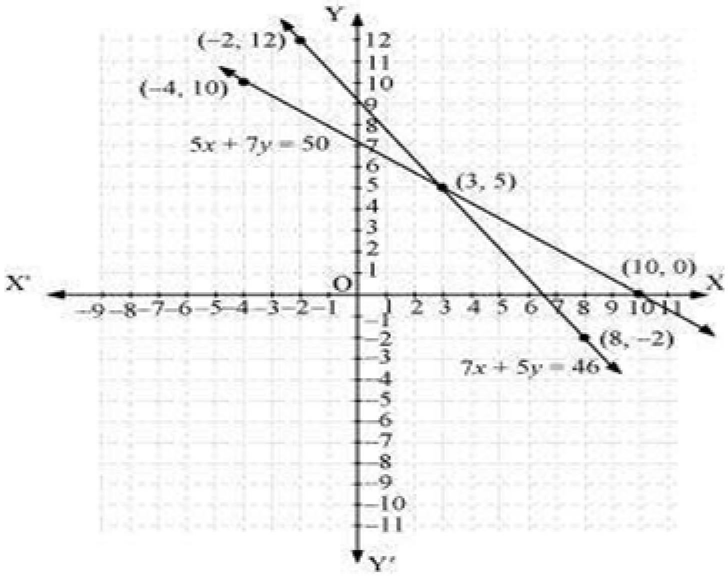
$Y = 9.2 - 1.4 \times 2 = 9.2 - 2.8 = 6.4$

$Y = 9.2 - 1.4 \times 4 = 9.2 - 5.6 = 3.6$

Three solutions of this equation can be written in a table as follows:

x	0	2	4
y	9.2	6.4	3.6

The graphical representation is as follows:



2. On comparing the ratios a_1/a_2,b_1/b_2 and c_1/c_2 , find out whether the lines representing the following pairs of linear equations intersect at a point, are parallel or coincident:

(i) 5x − 4y + 8 = 0

(ii)9x + 3y + 12 = 0

7x + 6y – 9 = 018x + 6y + 24 = 0

(iii) 6x − 3y + 10 = 0

2x – y + 9 = 0

Answer:

(i) 5x − 4y + 8 = 0, 7x + 6y – 9 = 0

Comparing equation 5x − 4y + 8 = 0 with $a_1x + b_1y + c_1 = 0$and 7x + 6y – 9 = 0 with $a_2x + b_2y + c_2 = 0$,

We get,

$= a_1 = 5\,, b_1 = -4\,, c_1 = 8$

$= a_2 = 7, b_2 = 6\,, c_2 = -9$

Hence,

$= \frac{a_1}{a_2} = \frac{5}{7}\,, \frac{b_1}{b_2} = \; -\frac{4}{6}\; and\, \frac{c_1}{c_2} = \frac{8}{-9}$

we find that,

$\frac{a_1}{a_2} \neq \frac{b_1}{b_2}$

(ii) 9x + 3y + 12 = 0, 18x + 6y + 24 = 0

Comparing equation 9x + 3y + 12 = 0 with $a_1x + b_1y + c_1 = 0$and 7x + 6y – 9 = 0 with $a_2x + b_2y + c_2 = 0$,

We get,

$= a_1 = 9 , b_1 = 3 , c_1 = 12$

$= a_2 = 18, b_2 = 6 , c_2 = 24$

Hence

$= \frac{a_1}{a_2} = \frac{9}{18} = \frac{1}{2} , \frac{b_1}{b_2} = \frac{3}{6} = \frac{1}{2} \; and \; \frac{c_1}{c_2} = \frac{12}{24} = \frac{1}{2}$

We find that,

$= \frac{a_1}{a_2} = \frac{b_1}{b_2} = \frac{c_1}{c_2}$

Hence, lines are coincident.

(iii) 6x − 3y + 10 = 0, 2x – y + 9 = 0

Comparing equation 6x − 3y + 10 = 0 with $a_1x + b_1y + c_1 = 0$and 7x + 6y – 9 = 0 with $a_2x + b_2y + c_2 = 0$,

We get,

$= a_1 = 6 , b_1 = -3, c_1 = 10$

$= a_2 = 2, b_2 = -1 , c_2 = 9$

Hence

$= \frac{a_1}{a_2} = \frac{6}{2} = 3 , \frac{b_1}{b_2} = -\frac{3}{-1} = 3 \; and \; \frac{c_1}{c_2} = \frac{10}{9}$

We find that,

$= \frac{a_1}{a_2} = \frac{b_1}{b_2} \neq \frac{c_1}{c_2}$

Hence,
lines are parallel to each other.

3. On comparing the ratios a_1/a_2,b_1/b_2 and c_1/c_2 , find out whether the following pair of linear equations are consistent, or inconsistent.

(i) 3x + 2y = 5, 2x − 3y = 8

(ii) 2x − 3y = 7, 4x − 6y = 9

(iii) 3x/2 + 5y/3 = 7, 9x − 10y = 14

(iv) 5x − 3y = 11, −10x + 6y = −22

Answer:

(i) 3x + 2y = 5, 2x − 3y = 7

Comparing equation 3x + 2y = 5 with $a_1x + b_1y + c_1 = 0$and 7x + 6y – 9 = 0 with $a_2x + b_2y + c_2 = 0$,

We get,

$= \frac{a_1}{a_2} = \frac{3}{2}$

$= \frac{b_1}{b_2} = -\frac{2}{3}$

$= \frac{c_1}{c_2} = \frac{8}{9}$

Hence,

$= \frac{a_1}{a_2} \neq \frac{b_1}{b_2}$

Therefore,these linear equations will intersect at one point only and have only one possible solution.
And,pair of linear euations is consistent

(ii) 2x − 3y = 8, 4x − 6y = 9

Comparing equation 2x − 3y = 8 with $a_1x + b_1y + c_1 = 0$and 7x + 6y – 9 = 0 with $a_2x + b_2y + c_2 = 0$,

We get,

$= \frac{a_1}{a_2} = \frac{2}{4} = \frac{1}{2}$

$= \frac{b_1}{b_2} = \frac{-3}{-6} = \frac{1}{2}$

$= \frac{c_1}{c_2} = \frac{8}{9}$

Hence,

$= \frac{a_1}{a_2} = \frac{b_1}{b_2} \neq \frac{c_1}{c_2}$

Therefore,these linear equations are parallel to each other and have no possible solution.in
And,pair of linear euations is inconsistent

(iii) $\frac{3}{2}x + \frac{5}{3}y = 7$ 9x − 10y = 14

We get,

$= \frac{a_1}{a_2} = \frac{\frac{3}{2}}{9} = \frac{3}{18} = \frac{1}{6}$

$= \frac{b_1}{b_2} = \frac{\frac{5}{3}}{-10} = \frac{5}{-30} = -\frac{1}{6}$

$= \frac{c_1}{c_2} = \frac{7}{14} = \frac{1}{2}$

Hence,

$= \frac{a_1}{a_2} \neq \frac{b_1}{b_2}$

Therefore, these linear equations will intersect each other at one point and have only one possible solution.
And,pair of linear euations is consistent

(iv) 5x − 3y = 11, −10x + 6y = −22

Comparing equation 5x − 3y = 11 with $a_1x + b_1y + c_1 = 0$and 7x + 6y – 9 = 0 with $a_2x + b_2y + c_2 = 0$,

We get,

$= \frac{a_1}{a_2} = \frac{5}{-10} = -\frac{1}{2}$

$= \frac{b_1}{b_2} = -\frac{3}{6} = -\frac{1}{2}$

$= \frac{c_1}{c_2} = \frac{11}{-22} = -\frac{1}{2}$

Hence,

$= \frac{a_1}{a_2} = \frac{b_1}{b_2} = \frac{c_1}{c_2}$

Therefore these pair of lines have infinite number of solutions
And,pair of linear euations is consistent

4. Which of the following pairs of linear equations are consistent/inconsistent? If consistent, obtain the solution graphically:

4. (i) x + y = 5, 2x + 2y = 10

(ii) x – y = 8, 3x − 3y = 16

(iii) 2x + y = 6, 4x − 2y = 4

(iv) 2x − 2y – 2 = 0, 4x − 4y – 5 = 0

Answer:

(i) x + y = 5, 2x + 2y = 10

We get,

$= \frac{a_1}{a_2} = \frac{1}{2}$

$= \frac{b_1}{b_2} = \frac{1}{2}$

$= \frac{c_1}{c_2} = \frac{5}{10} = \frac{1}{2}$

Hence,

$= \frac{a_1}{a_2} = \frac{b_1}{b_2} = \frac{c_1}{c_2}$

Therefore these pair of lines have infinite number of solutions and *pair of linear equation is consistent,*

x + y = 5

x = 5 - y

putting y = 1,2,3 we get,

x = 5 -1 = 4

x = 5 - 2 = 3

x = 5 - 3 = 2

X	4	3	2
Y	1	2	3

And, 2x + 2y = 10

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

X	4	3	2
Y	1	2	3

(ii) x – y = 8, 3x − 3y = 16

We get,

$= \frac{a_1}{a_2} = \frac{1}{3}$

$= \frac{b_1}{b_2} = \frac{-1}{-3} = \frac{1}{3}$

$= \frac{c_1}{c_2} = \frac{8}{16} = \frac{1}{2}$

Hence,

$= \frac{a_1}{a_2} = \frac{b_1}{b_2} \neq \frac{c_1}{c_2}$

Therefore, these linear equations are intersecting each other at one point and thus have only one possible solution.
Hence,the pair of linear equations is inconsistent.

(iii) 2x + y = 6, 4x − 2y = 4

We get,

$= \frac{a_1}{a_2} = \frac{2}{4} = \frac{1}{2}$

$= \frac{b_1}{b_2} = \frac{1}{-2}$

$= \frac{c_1}{c_2} = \frac{-6}{-4} = \frac{3}{2}$

Hence,

$= \frac{a_1}{a_2} \neq \frac{b_1}{b_2}$

Therefore, these linear equations are intersecting each other at one point and thus have only one possible solution.
Hence,the pair of linear equations is consistent

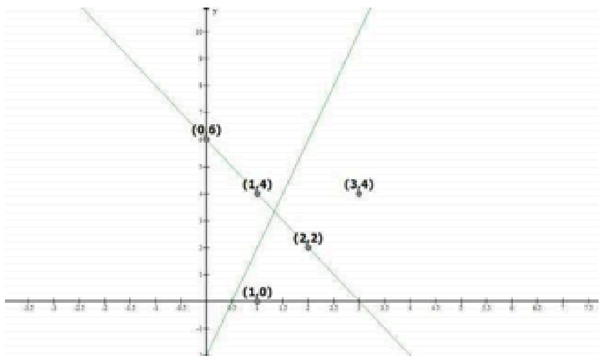
$= 2x + y - 6 = 0$
$= y = 6 - 2x$

X	0	1	2
Y	6	4	2

And, $4x - 2y - 4 = 0$
$= y = \frac{4x-4}{2}$

X	1	2	3
Y	0	2	4

Graphical representation



(iv) 2x − 2y – 2 = 0, 4x − 4y – 5 = 0

We get,

$= \frac{a_1}{a_2} = \frac{2}{4} = \frac{1}{2}$
$= \frac{b_1}{b_2} = \frac{-2}{-4} = \frac{1}{2}$
$= \frac{c_1}{c_2} = \frac{2}{5}$S

Hence,

$= \frac{a_1}{a_2} = \frac{b_1}{b_2} \neq \frac{c_1}{c_2}$

Therefore, these linear equations are parallel to each other and have no possible solution, Hence,the pair of linear equations is inconsistent.

5. Half the perimeter of a rectangle garden, whose length is 4 m more than its width, is 36 m. Find the dimensions of the garden.

Answer:

Let width of rectangular garden = x metres
and length=y

So,

$y - x = 4$............ (1)

$y + x = 36$........... (2)

$y - x = 4$

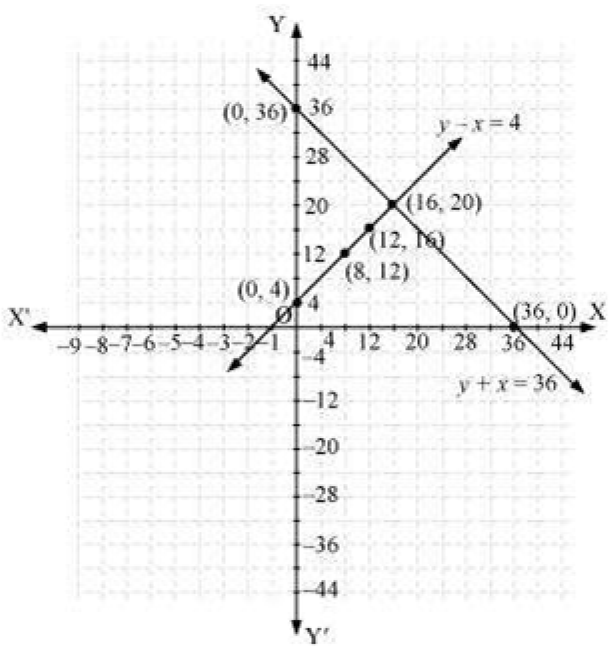
$y = x + 4$

x	0	8	12
y	4	12	16

$y + x = 36$

x	0	36	16
y	36	0	20

Hence, the graphic representation is as follows.



6. Given the linear equation (2x + 3y – 8 = 0), write another linear equation in two variables such that the geometrical representation of the pair so formed is:

(i) Intersecting lines

(ii) Parallel lines

(iii) Coincident lines

Answer:

(i) Let the second line be equal to $a_2x + b_2y + c_2 = 0$,

Intersecting Lines:For this Condition,

$$\frac{a_1}{a_2} \neq \frac{b_1}{b_2}$$

The Second line such that it is intersecting the given line is
2x+4y-6=0

As,

$$\frac{a_1}{a_2} = \frac{2}{2} = 1,$$

$$\frac{b_1}{b_2} = \frac{3}{4} \; and \; \frac{a_1}{a_2} \neq \frac{b_1}{b_2}$$

(ii) Let the second line be equal to $a_2x + b_2y + c_2 = 0$,

parallel Lines:
For this Condition,

$$\frac{a_1}{a_2} = \frac{b_1}{b_2} \neq \frac{c_1}{c_2}$$

Hence,the second line can be 4x+6y-8=0

As,

As $\frac{a_1}{a_2} = \frac{2}{4} = \frac{1}{2}$,

$$\frac{b_1}{b_2} = \frac{3}{6} = \frac{1}{2},$$

$$\frac{c_1}{c_2} = \frac{-8}{-8} = 1$$

So,

$$\frac{a_1}{a_2} = \frac{b_1}{b_2} \neq \frac{c_1}{c_2}$$

(iii) Let the second line be equal to $a_2x + b_2y + c_2 = 0$, Coincident lines: For coincident lines,

$$\frac{a_1}{a_2} = \frac{b_1}{b_2} = \frac{c_1}{c_2}$$

Hence,the second line can be 6x+9y-24=0

As,

$$\frac{a_1}{a_2} = \frac{2}{6} = \frac{1}{3},$$

$$\frac{b_1}{b_2} = \frac{3}{9} = \frac{1}{3},$$

$$\frac{c_1}{c_2} = \frac{-8}{-24} = \frac{1}{3}$$

So,

$$\frac{a_1}{a_2} = \frac{b_1}{b_2} = \frac{c_1}{c_2}$$

7. Draw the graphs of the equations x – y + 1 = 0 and 3x + 2y – 12 = 0. Determine the coordinates of the vertices of the triangle formed by these lines and the x-axis, and shade the triangular region.

Answer:

For equation x – y + 1 = 0, we have following points which lie on the line

$x - y + 1 = 0$

$x = y - 1$

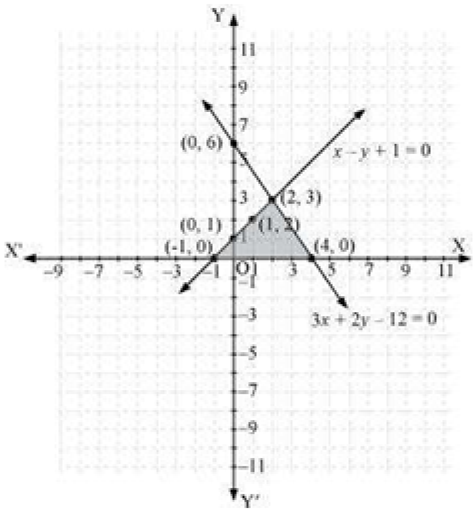
X	0	1	2
Y	1	2	3

For equation 3x + 2y – 12 = 0, we have following points which lie on the line

$3x + 2y - 12 = 0$

$x = \frac{12 - 2y}{3}$

X	4	2	0
Y	0	3	6



We can see from the graphs that points of intersection of the lines with the x–axis are (–1, 0), (2, 3) and (4, 0).

NCERT Solutions for Class 10 Maths Chapter 3 Exercise 3.3

1. Solve the following pair of linear equations by the substitution method.

(i) x + y = 14

x – y = 4

(ii) s – t = 3

s/3 + t/2 = 6

(iii) 3x – y = 3

$9x - 3y = 9$

(iv) $0.2x + 0.3y = 1.3$

$0.4x + 0.5y = 2.3$

(v) $\sqrt{2}x + \sqrt{3}y = 0$

$\sqrt{3}x - \sqrt{8}y = 0$

(vi) $3x/2 - 5y/3 = -2$

$x/3 + y/2 = 13/6$

Answer:

(i) $x + y = 14$ …(1)

$x - y = 4$ … (2)

$x = 4 + y$ from equation (2)

Putting this in equation (1), we get

$4 + y + y = 14$

$\Rightarrow 2y = 10 \Rightarrow y = 5$

Putting value of y in equation (1), we get

$x + 5 = 14$

$\Rightarrow x = 14 - 5 = 9$

Therefore, x = 9 and y = 5

(ii) $s - t = 3$ … (1)

$= \frac{s}{3} + \frac{t}{2} = 6$ …(2)

Using equation (1), we can say that $s = 3 + t$

Putting this in equation (2), we get

$= \frac{t+3}{3} + \frac{t}{2} = 6$

$\Rightarrow$ 2t + 6 + 3t =36

$\Rightarrow$ 5t + 6 = 36

$\Rightarrow$ 5t = 30$\Rightarrow$ t = 6

Putting value of t in equation (1), we get

s – 6 = 3$\Rightarrow$ s = 3 + 6 = 9

Therefore, t = 6 and s = 9

(iii) 3x – y = 3 … (i)

9x − 3y = 9 … (ii)

From equation (i),we get,
y =3x − 3 … (iii)

putting value of y from equation(iii) to equation(ii)
9x-3(3x-3)=9
=9x-9x+9=9
=9=9

This is always true,and pair of these equations have infinite possible solutions.
Therefore one possible solutions is x=1 and y=0

(iv) 0.2x + 0.3y = 1.3 … (1)

0.4x + 0.5y = 2.3 … (2)

Using equation (1), we can say that

0.2x = 1.3 − 0.3y

$\Rightarrow$ x = $\frac{1.3-0.3y}{0.2} = 6.5 - 1{,}5y \ldots\ldots\ldots\ldots\ldots (iii)$

Putting this in equation (2), we get

0.4x(6.5-1.5y)+ 0.5y = 2.3

$\Rightarrow$ 2.6 − 0.6y + 0.5y = 2.3

$\Rightarrow$ −0.1y = −0.3 $\Rightarrow$ y = 3

Putting value of y in (1), we get

0.2x + 0.3 (3) = 1.3

⇒ 0.2x + 0.9 = 1.3

⇒ 0.2x = 0.4 ⇒ x = 2

Therefore, x = 2 and y = 3

(v) $\sqrt{2}x + \sqrt{3}y = 0$ ……….(1)

$\sqrt{3}x - \sqrt{8}y = 0$ ……….(2)

Using equation (1), we can say that

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

Putting this in equation (2), we get

$\sqrt{3}\left(\frac{-\sqrt{3}y}{\sqrt{2}}\right) - \sqrt{8}y = 0$ ⇒ $-\frac{3y}{\sqrt{2}} - 2\sqrt{2}y = 0$

⇒ $y\left(-\frac{3}{\sqrt{2}} - 2\sqrt{2}y\right) = 0$ ⇒ y = 0

Putting value of y in (1), we get x = 0

Therefore, x = 0 and y = 0

(vi) $\frac{3}{2x} - \frac{5}{3y} = -2$ … (1)

$\frac{x}{3} + \frac{y}{2} = \frac{13}{6}$ … (2)

Using equation (2), we can say that

9x - 10y = -12

⇒ x = $\frac{-12+10y}{9}$

Putting this in equation (1), we get

$= \frac{\frac{-12+10y}{9}}{3} + \frac{y}{2} = \frac{13}{6}$

$\Rightarrow = \frac{-24+20y+27y}{54} = \frac{13}{6}$

$\Rightarrow = 47y = 117 + 24$

$\Rightarrow = 47y = 141$

$\Rightarrow y = \frac{141}{47} = 3 \quad \Rightarrow y = 3$

Putting value of y in equation (2), we get

$x = \frac{-12+10y}{9}$

$\Rightarrow \frac{-12+10\times3}{9}$

$\Rightarrow \frac{18}{9} = 2$

$\Rightarrow x = 2$

Therefore, x = 2 and y = 3

2. Solve 2x + 3y = 11 and 2x − 4y = −24 and hence find the value of 'm' for which

y = mx + 3.

Answer:

2x + 3y = 11 … (1)

2x − 4y = −24 … (2)

Using equation (2), we can say that

2x = −24 + 4y

⇒ x = −12 + 2y

Putting this in equation (1), we get

$2(-12 + 2y) + 3y = 11$

$\Rightarrow -24 + 4y + 3y = 11$

$\Rightarrow 7y = 35 \Rightarrow y = 5$

Putting value of y in equation (1), we get

$2x + 3(5) = 11$

$\Rightarrow 2x + 15 = 11$

$\Rightarrow 2x = 11 - 15 = -4 \Rightarrow x = -2$

Therefore, $x = -2$ and $y = 5$

Putting values of x and y in $y = mx + 3$, we get

$5 = m(-2) + 3$

$\Rightarrow 5 = -2m + 3$

$\Rightarrow -2m = 2 \Rightarrow m = -1$