NCERT Solutions for Class 10 Maths Chapter 3 Exercise 3.2: NCERT Solutions for Class 10 Maths Chapter 3 - Pair of Linear Equations in Two Variables Exercise 3.2 helps students practice solving linear equations using the Substitution and Elimination Methods.

The exercise includes word problems where students translate the situation into equations and solve them. By working through these problems, students learn to find the values of the variables that satisfy both equations. This exercise improves problem-solving skills and understanding of linear equations.

NCERT Solutions for Class 10 Maths Chapter 3 Exercise 3.2 Overview

NCERT Solutions for Class 10 Maths Chapter 3 Exercise 3.2 focuses on solving pairs of linear equations in two variables using the Substitution Method and the Elimination Method. The exercise provides problems where students are required to apply these methods to solve real-world situations represented by linear equations.

In the Substitution Method, one equation is solved for one variable, and that expression is substituted into the other equation to find the second variable. In the Elimination Method, the coefficients of one of the variables are made equal in both equations, and then the equations are subtracted or added to eliminate that variable, allowing for the solution of the remaining variable.

This exercise helps build a deeper understanding of the methods for solving linear equations, equipping students with the skills to approach problems efficiently.

NCERT Solutions for Class 10 Maths Chapter 3 Exercise 3.2 PDF

The NCERT Solutions for Class 10 Maths Chapter 3 Exercise 3.2 PDF provides step-by-step solutions to the problems from this exercise, which focuses on solving pairs of linear equations in two variables.

This PDF is created to help students in understanding the process of solving such equations more clearly. Students can use this PDF to practice and enhance their problem-solving skills in linear equations. The PDF is a valuable resource for self-study and revision.

NCERT Solutions for Class 10 Maths Chapter 3 Exercise 3.2 PDF

NCERT Solutions for Class 10 Maths Chapter 3 Exercise 3.2 (Pair of Linear Equations in Two Variables)

Here are the NCERT Solutions for Class 10 Maths Chapter 3 Ex 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
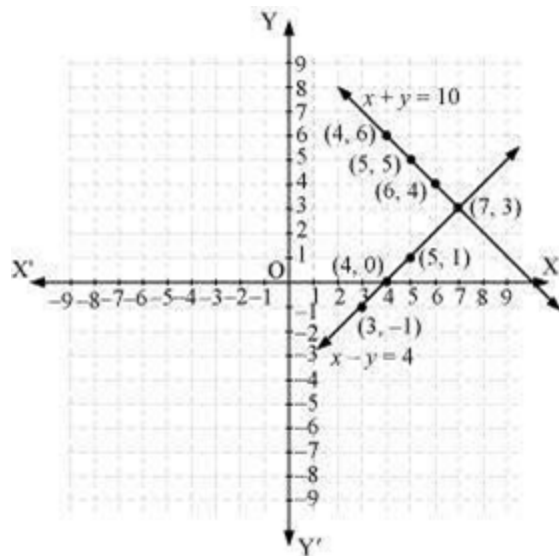
We plot the points for both of the equations to find the solution.

(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
$7x + 5y = 46$
$= 5y = 46 - 7x$
$= y = 9.2 - 1.4x$
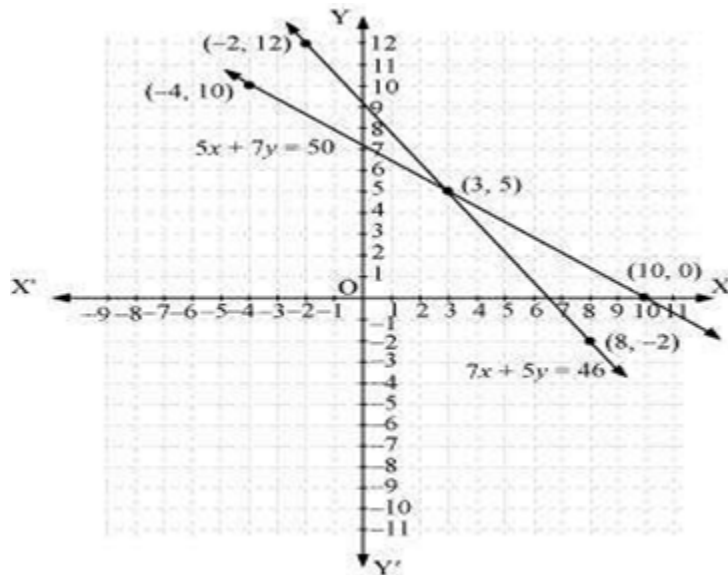Putting $x = 0, 2, 4$ we get,
$Y = 9.2 - 1.4 \times 0 = 9.2$
$Y = 9.2 - 1.4 \times 2 = 9.2 - 2.8 = 6.4$
$Y = 9.2 - 1.4 \times 4 = 9.2 - 5.6 = 3.6$

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)$9x + 3y + 12 = 0$

$7x + 6y - 9 = 0$ $18x + 6y + 24 = 0$

(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,

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

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

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

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.

(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

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

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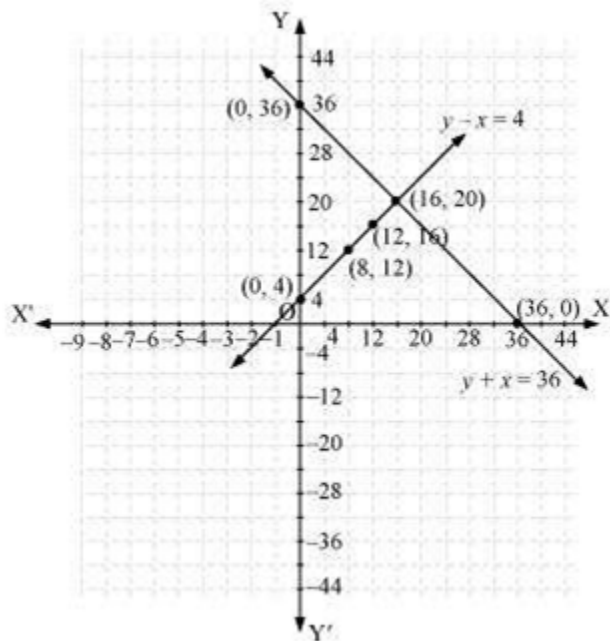
6. Given the linear equation (2x + 3y – 8 = 0), write another linear equation in two variables such that the geometrical representation of the pair so formed is:

(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,

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

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

(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

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).

Benefits of Solving NCERT Solutions for Class 10 Maths Chapter 3 Exercise 3.2

- **Enhanced Understanding**: The step-by-step solutions help students better understand the methods of solving pairs of linear equations, like the **Substitution Method** and **Elimination Method**. This strengthens conceptual clarity.
- **Improved Problem-Solving Skills**: By practicing these exercises, students can improve their ability to solve complex problems, building strong analytical and logical skills.
- **Increased Accuracy**: The solutions guide students on how to approach problems methodically, minimizing errors and improving accuracy in solving linear equations.
- **Better Exam Preparation**: Regular practice with NCERT solutions enhances preparation for exams, as students become familiar with the types of questions and efficient problem-solving techniques.
- **Time Management**: With consistent practice, students learn how to solve problems more quickly and efficiently, an important skill during exams.
- **Confidence Boost**: Solving a variety of problems in the exercise helps students build confidence in their ability to handle similar questions in exams.