

NCERT Solutions for Class 10 Maths Chapter 3 Exercise 3.1: NCERT Solutions for Class 10 Maths Chapter 3 Pair of Linear Equations in Two Variables Exercise 3.1 focuses on solving linear equations with two variables using different methods such as substitution and elimination.

The exercise introduces students to the concept of a pair of linear equations, which are equations of the form $Ax + By = C$ and $Dx + Ey = F$, where A, B, C, D, E, and F are constants. Students learn how to solve these equations by substitution, elimination, and graphically. The exercise emphasizes finding the values of the two variables that satisfy both equations simultaneously. Through this practice, students understand the geometric interpretation of solutions and how the lines represented by the equations intersect. The exercise provides a strong foundation for solving real-world problems involving two variables and helps build proficiency in algebraic methods.

NCERT Solutions for Class 10 Maths Chapter 3 Exercise 3.1 Overview

Chapter 3 of Class 10 Math titled **Pair of Linear Equations in Two Variables** introduces students to the concept of solving systems of linear equations involving two variables. The key objective of this chapter is to enable students to understand how to find the values of two variables that satisfy both equations simultaneously.

A **linear equation in two variables** is an equation that represents a straight line when graphed on a coordinate plane. These equations are typically in the form:

- $Ax + By = C$
- $Dx + Ey = F$

Where A,B,C,D,E,F are constants, and x and y are the variables.

In this chapter, students learn three methods to solve such systems of equations:

1. **Graphical Method:** This method involves graphing both equations on a coordinate plane. The point of intersection of the two lines represents the solution to the system of equations.
2. **Substitution Method:** This method involves solving one equation for one variable in terms of the other and then substituting this expression into the second equation to find the value of the second variable.
3. **Elimination Method:** This method involves manipulating the equations (by multiplying or dividing them) to eliminate one of the variables, making it easier to solve for the other variable.

NCERT Solutions for Class 10 Maths Chapter 3 Exercise 3.1 PDF

You can access the NCERT Solutions for Class 10 Maths Chapter 3 Exercise 3.1 in PDF format by clicking on the link provided below. This exercise focuses on solving a pair of linear equations in two variables using various methods such as the graphical method, substitution method, and elimination method. It is a valuable resource for students preparing for exams.

NCERT Solutions for Class 10 Maths Chapter 3 Exercise 3.1 PDF

NCERT Solutions for Class 10 Maths Chapter 3 Exercise 3.1

Here are the NCERT Solutions for Class 10 Maths Chapter 3 Ex 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,

$$\begin{aligned} &=x - 7 = 7(y - 7) \\ &=x - 7 = 7y - 49 \\ &=x = 7y - 42 \dots\dots\dots(i) \end{aligned}$$

Putting $x = 5, 6, 7$

$$\begin{aligned} X &= 7 \times 5 - 42 = 35 - 42 = -7 \\ X &= 7 \times 6 - 42 = 42 - 42 = 0 \\ X &= 7 \times 7 - 42 = 49 - 42 = 7 \end{aligned}$$

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,
 $=x - 3 = 3(y + 3)$
 $=x - 3 = 3y + 9$
 $=x = 3y + 6 \dots \dots \dots (ii)$
 Putting , $y = -2, -1, 0$

X	0	3	6
Y	-2	-1	0

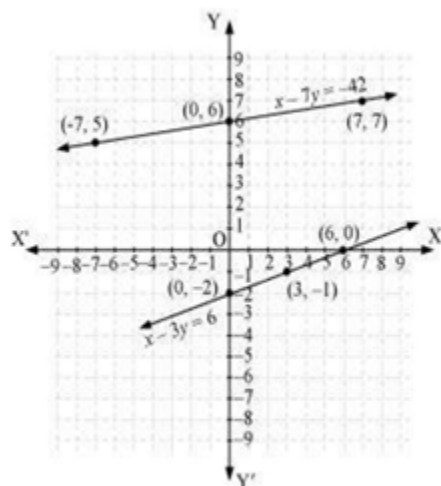
Thus, the given conditions can be algebraically represented as:

$$x - 7y = -42$$

..... (i)

$$\text{And } x - 3y = 6$$

..... (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)

$$= x + 2y = 1300 \dots \dots \dots (ii)$$

$$=x = 1300 - 2y$$

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

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

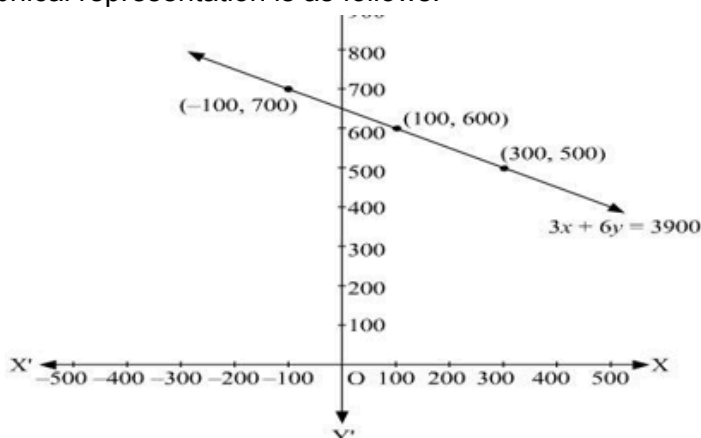
$$X = 1300 - 2(0) = 1300$$

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

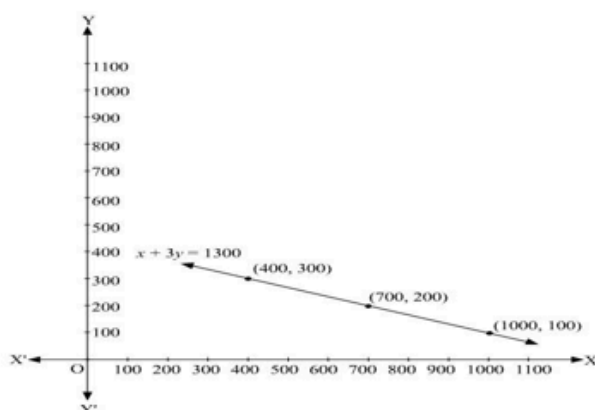
Three solutions of this equation can be written in a table as follows:

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

$$2x + y = 160 \dots (1)$$

$$4x + 2y = 300$$

$$\Rightarrow 2x + y = 150 \dots (2)$$

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,

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

$$= 2x = 160 - y$$

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

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,

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

Dividing the equation by 2, we get,

$$= 2x + y = 150$$

$$= y = 150 - 2x$$

Putting $y = 0, 50, 100$ we get,

$$Y = 150 - 2 \times 0 = 150$$

$$Y = 150 - 2(50) = 150 - 100 = 50$$

$$Y = 150 - 2(100) = 150 - 200 = -50$$

X	0	50	100
Y	150	50	-50

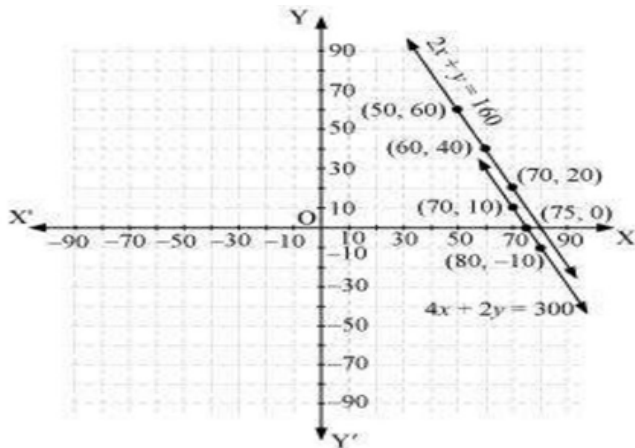
Algebraic representation :

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

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

Graphical representation :

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



Benefits of Solving NCERT Solutions for Class 10 Maths Chapter 3 Exercise 3.1

- Strengthens Algebraic Skills:** Solving the pair of linear equations in two variables enhances students' algebraic manipulation abilities. They learn to solve equations systematically using different methods like substitution, elimination, and graphical methods.
- Improves Problem-Solving Ability:** By practicing various types of problems, students become more confident in approaching and solving different kinds of linear equations. This improves their problem-solving skills and ability to handle complex problems in the future.
- Develops Understanding of Conceptual Clarity:** The chapter helps students understand the fundamental concept of pair of linear equations, their graphical interpretation and how they can be solved in multiple ways. This provides a strong foundation for advanced topics in algebra and other areas of mathematics.
- Time Management:** Solving exercises like 3.1 helps students learn how to manage time while solving problems, especially when solving problems during exams.
- Increases Analytical Thinking:** The different methods used to solve linear equations, especially the graphical method, encourage analytical thinking. Students learn to visualize equations and interpret them in real-life situations.
- Builds Confidence:** Solving problems from NCERT Solutions builds confidence, as students can measure their progress and identify areas that need improvement.