CBSE Class–10 Mathematics
NCERT solution
Chapter - 3
Pair of Linear Equations in Two Variables - 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.

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

$$(x-7) = 7(y-7)$$

$$\Rightarrow x - 7 = 7y - 49$$

$$\Rightarrow x - 7y = -42$$

Again, Three years hence, Age of Aftab = x + 3 and Age of his daughter = y + 3
According to the given condition,

$$(x+3) = 3(y+3)$$

$$\Rightarrow x + 3 = 3y + 9$$

$$\Rightarrow x - 3y = 6$$

Thus, the given conditions can be algebraically represented as:

x - 7y = –42

$$\Rightarrow x = -42 + 7y$$

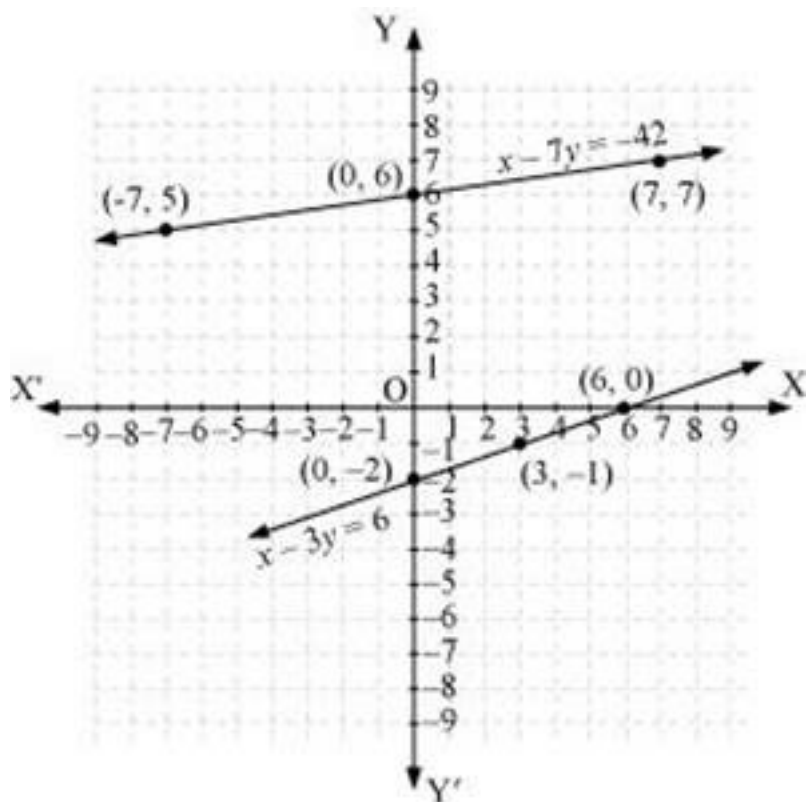Three solutions of this equation can be written in a table as follows:

x	–7	0	7
y	5	6	7

And x – 3y = 6

$\Rightarrow$ x = 6 + 3y

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

x	6	3	0
y	0	−1	−2

The graphical representation is as follows:

Concept insight: In order to represent the algebraic equations graphically the solution set of equations must be taken as whole numbers only for the accuracy. Graph of the two linear equations will be represented by a straight line.

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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.

Ans. Let cost of 1 cricket bat = Rs x and let cost of 1 cricket ball= Rs y

According to given conditions, we have

$3x + 6y = 3900 \Rightarrow x + 2y = 1300$... **(1)**

And x + 3y = 1300... **(2)**
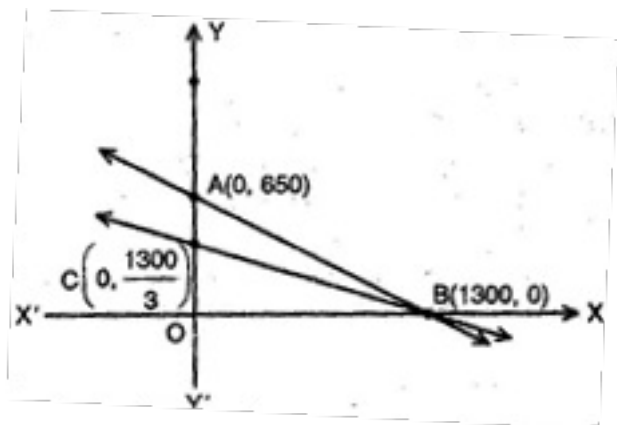
For equation x + 2y = 1300, we have following points which lie on the line

x	0	1300
y	650	0

For equation x + 3y = 1300, we have following points which lie on the line

x	0	1300
y	$\dfrac{1300}{3}$	0

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

It is clear that these lines intersect at B (1300,0).

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.

Ans. 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)**

$4x + 2y = 300$

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

x	50	45
y	60	70

For equation $2x + y = 150$, we have following points which lie on the line

x	50	40
y	50	70

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