

Chapter 3

IN TWO VARIABLES 3

Exercise 3.1

Q.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.

Solution:

Let present age of Aftab = x

Let present age of daughter = y

Then, seven years ago

Age of Aftab = $x - 7$

Age of Daughter = $y - 7$

According to the question,

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

$$=x - 7 = 7y - 49$$

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

Putting $x = 5, 6, 7$

$$X = 7 \times 5 - 42 = 35 - 42 = -7$$

$$X = 7 \times 6 - 42 = 42 - 42 = 0$$

$$X = 7 \times 7 - 42 = 49 - 42 = 7$$

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,

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

$$=x - 3 = 3y + 9$$

$$=x = 3y + 12 \dots \dots \dots (ii)$$

Putting , $y = -2, -1, 0$

X	0	3	6
Y	-2	-1	0

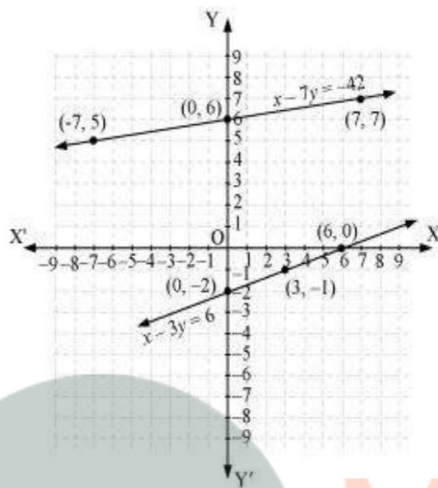
Algebraic representation,

from equation (i) and (ii)

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

$$= x - 3y = 6 \dots \dots \dots (ii)$$

Graphical representation ,



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

Solution:

Let cost of one bat = Rs. X

Let cost of one ball = Rs. Y

According to the question,

$$= 3x + 6y = 3900 \dots \dots \dots (i)$$

Dividing equation by 3.

$$= x + 2y = 1300$$

$$= x = 1300 - 2y$$

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

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

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

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

X	3900	1300	-1300
Y	-1300	0	1300

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

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

$$= x = 1300 - 2y$$

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

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

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

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

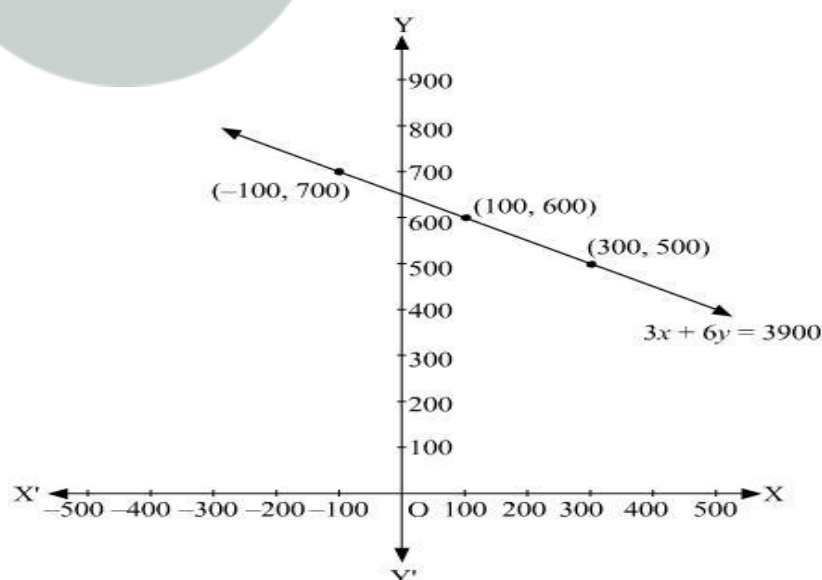
X	3900	1300	-1300
Y	-1300	0	1300

Algebraic representation:

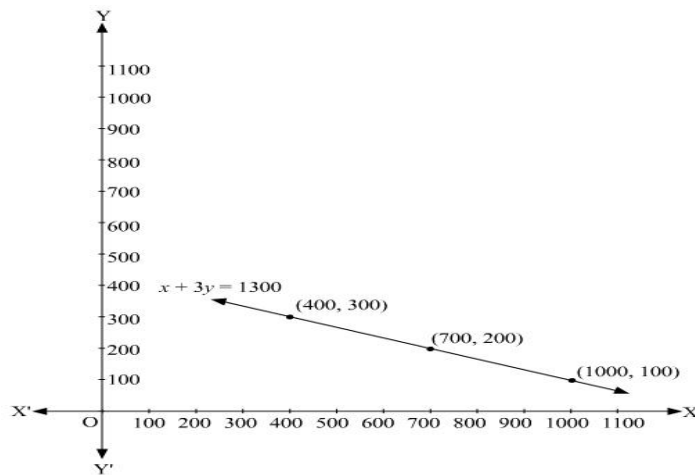
$$3x + 6y = 3900 \dots \dots (i)$$

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

Graphical Representation for first equation:



Graphical Representation for second equation:



Q.3

The cost of 2 kg of apples and 1kg 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.

Solution:

Let cost of each kg of apples = Rs. X

Let cost of each kg of grapes = Rs. Y

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 :

