

Linear Equation Exercise 1

Question 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.

Question 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 geometrically.

Question 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 Rs300. . Represent this situation algebraically and geometrically.

Solution 1:

Let age of Aftab is represented by x

And age of daughter is represented by y

Then Seven years ago,

Age of Aftab = x - 7

Age of daughter = y - 7

As per the question Aftab was seven times as old as her daughter then were so we get

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

$$x - 7y = -42 \quad \dots(1)$$

Now Three years from now ,

Age of Aftab = x + 3

Age of daughter = y + 3

As per question Aftab shall be three times as old as her daughter will be so we get

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

$$x - 3y = 6 \quad \dots(2)$$

Algebraic representation of situation

$$x - 7y = -42 \quad \dots(1)$$

$$x - 3y = 6 \quad \dots(2)$$

To represent it graphically, we need to plot these equation on the XY coordinate system.

We can choose two values of each equation and plot it on XY coordinate system

$$x - 7y = -42$$

or

$$y = (x + 42) / 7$$

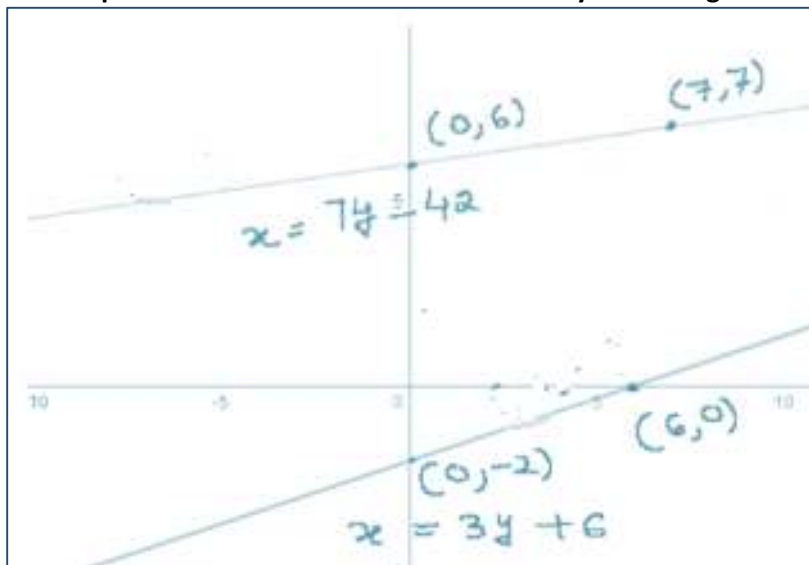
X	0	7
$Y=(x+42)/7$	6	7

$$x - 3y = 6$$

$$y = (x-6)/3$$

X	0	6
$Y=(x-6)/3$	-2	0

We can plot these two lines on XY coordinate system using the two point derived above



Solution 2:

Let Cost of one bat = Rs x

Cost of one ball = Rs y

3 bats and 6 balls for Rs 3900 So that

$$3x + 6y = 3900 \quad \dots (1)$$

Given that she buys another bat and 2 more balls of the same kind for Rs 1300

So we get

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

Algebraic representation of situation

$$3x + 6y = 3900 \quad \dots (1)$$

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

To represent it graphically, we need to plot these equation on the XY coordinate system.

We can choose two values of each equation and plot it on XY coordinate system

$$3x + 6y = 3900$$

or

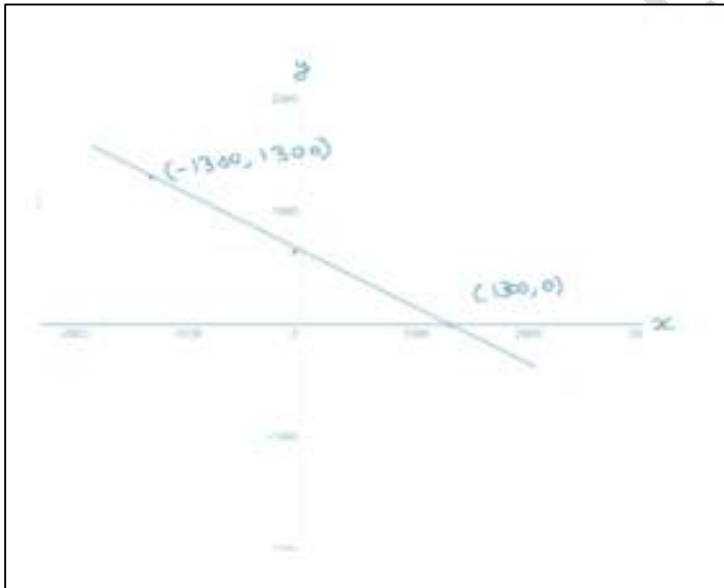
$$y = (3900 - 3x) / 6$$

X	-1300	1300
$y = (3900 - 3x) / 6$	1300	0

$$x + 2y = 1300$$

$$y = (1300 - x) / 2$$

X	1300	-1300
$y = (1300 - x) / 2$	0	1300



Solution 3:

Let cost each kg of apples = Rs x

Cost of each kg of grapes = Rs y

The cost of 2 kg of apples and 1kg of grapes on a day was found to be Rs 160

So that

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

Given that the cost of 4 kg of apples and 2 kg of grapes is Rs 300

so we get

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

Algebraic representation of situation

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

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

To represent it graphically, we need to plot these equation on the XY coordinate system.

We can choose two values of each equation and plot it on XY coordinate system

$$2x + y = 160$$

or

$$y = 160 - 2x$$

X	80	40
y=160-2x	0	80

$$4x + 2y = 300$$

$$y = (300 - 4x) / 2$$

X	0	50
y=(300-4x)/2	150	50

