NCERT Solutions for Class 10th Maths Chapter 3 Pair of Linear Equations in Two Variables Ex 3.1

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.

Solution:

Let the present age of Aftab be x years and her daughter age be y years
Seven years ago

Aftab's age = (x – 7)
His daughter's age = (y – 7)
(x – 7) = 7(y – 7) ..... (1)
Three years from now
Aftab's age = x + 3
His daughter age = y + 3
x + 3 = 3(y + 3) ..... (2)
(1) becomes,
x – 7 = 7(y – 7)
x – 7 = 7y – 49
x – 7y = – 42 ..... (3)
(2) becomes
x + 3 = 3(y + 3)
= 3y + 9
x – 3y = 6 .....(4)

Algebraically the two situations can be represented as follows:
$x - 7y + 42 = 0$, $x - 3y - 6 = 0$ where x and y are respectively the ages of Aftab and his daughter.
Graphic Representation :
$x - 7y = -42$.....(1)
$x - 3y = 6$.....(2)
$\Rightarrow x - 7y = -42$
$-7y = -42 - x$
$y = \frac{-42 - x}{-7}$
when x = 0,
$y = \frac{-42 - 0}{-7} = \frac{-42}{-7} = 6$
when x = 7,
$y = \frac{-42 - 7}{-7} = \frac{-49}{-7} = 7$
when x = 14,
$y = \frac{-42 - 14}{-7} = \frac{-56}{-7} = 8$
when x = -7,
$y = \frac{-42 + 7}{-7} = \frac{-35}{-7} = 5$
when x = -14,
$y = \frac{-42 + 14}{-7} = \frac{-28}{-7} = 4$

x	-14	-7	0	7	14
y	4	5	6	7	8

=> x − 3y = 6

-3y = 6 − x

$y = \frac{x-6}{3}$

when x = 0,

$y = \frac{x-6}{3} = \frac{-6}{3} = -2$

when x = 3,

$y = \frac{x-6}{3} = \frac{3-6}{3} = \frac{-3}{3} = -1$

when x = 6,

$y = \frac{x-6}{3} = \frac{6-6}{3} = 0$

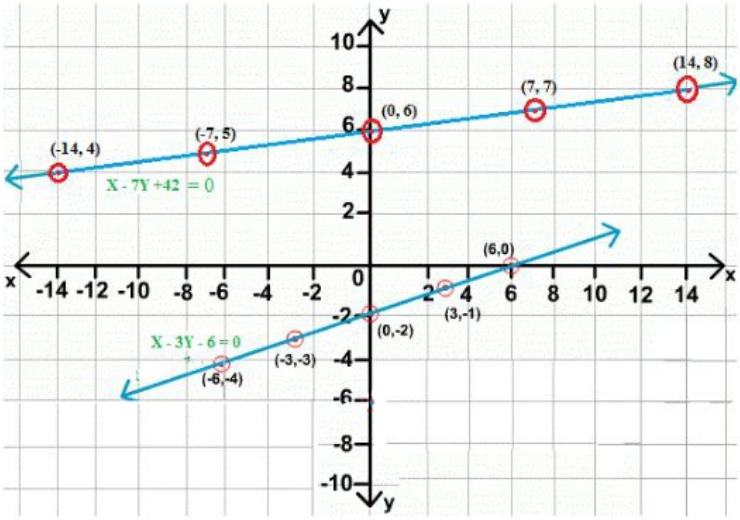
when x = -3,

$y = \frac{x-6}{3} = \frac{-3-6}{3} = \frac{-9}{3} = -3$

when x = -6,

$y = \frac{x-6}{3} = \frac{-6-6}{3} = -4$

x	-6	-3	0	3	6
y	-4	-3	-2	-1	0



Question-2

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

Solution:

Let the cost of each bat be `x

Let the cost of each ball be `y

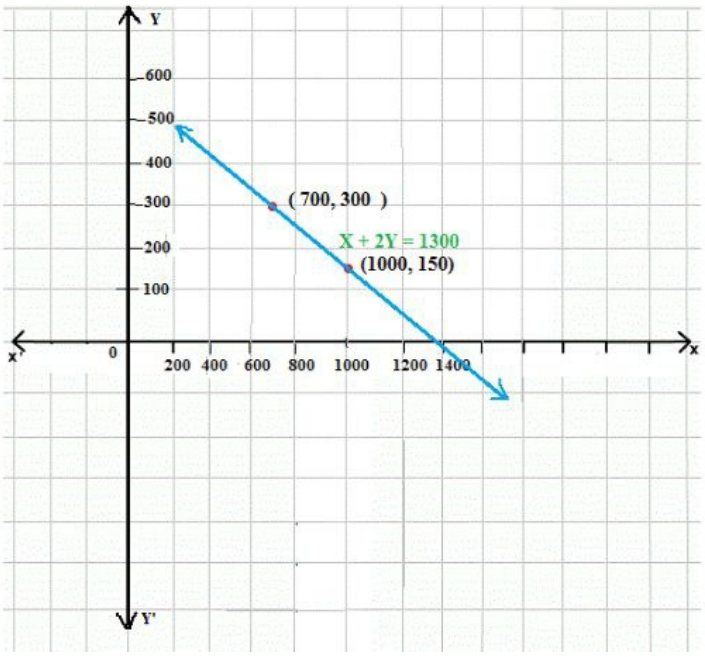
Algebraically

3x + 6y = 3900 .....(1)

(1) ⇒ x + 2y = 1300

x + 2y = 1300 .....(2)

X	1000	700
$y = \frac{1300 - x}{2}$	150	300



Question-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.

Solution:

Cost per kg of apple = Rs. x

Cost per kg of grapes = Rs. y

Algebraically 2x + y = 160 .....(1)

4x + 2y = 300 or 2x + y = 150.....(2)

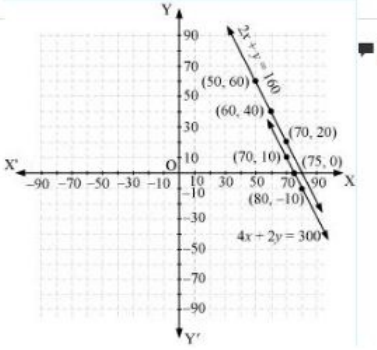
from (1) y = 160 – 2x

x	50	60
Y = 160-2x	60	40

From (2), y = 150 - 2x

x	50	60
Y = 150-2x	50	30

The graphical representation is as follows.



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