

CBSE Class–10 Mathematics NCERT solutions

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

Age of his daughter seven years ago =  $(y - 7)$  years.

According to the given condition:

Aftab age seven years ago = 7 times daughter's age seven years ago :  $(x - 7) = 7(y - 7)$

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

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

After 3 years, Aftab age =  $(x+3)$  years

Daughter's age after 3 years =  $(y+3)$  years

According to the give condition:

Aftab age after 3 years = 3 times of his daughter's age after 3 years :  $x + 3 = 3(y + 3)$

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

$$\Rightarrow x = 3y + 6 \dots\dots\dots(2)$$

**Algebraic representation of the situation:**

$$x = 7y - 42 \dots\dots\dots(\text{Equation 1})$$

$$x = 3y + 6 \dots\dots\dots(\text{Equation 2})$$

**Three solutions for equation 1,  $x = 7y - 42$  :**

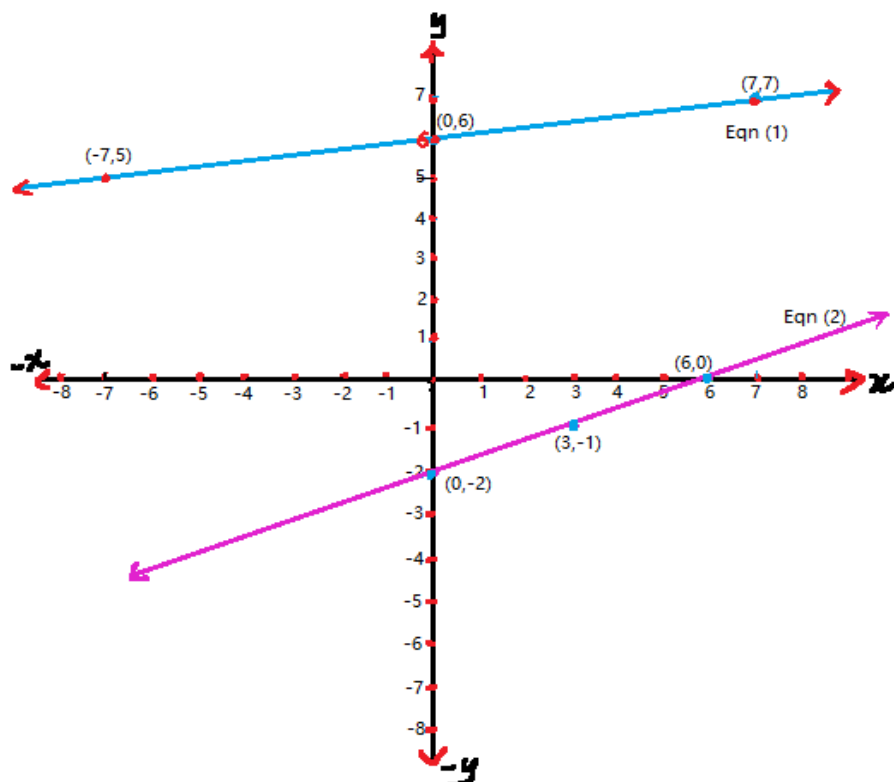
X	-7	0	7
Y	5	6	7

\*Avoid taking solutions that come as decimals or fractions so that you can accurately point the solutions on the graph

**Three solutions for equation 2,  $x = 3y + 6$  :**

X	6	3	0
Y	0	-1	-2

Now represent the solutions of equation 1 and 2 on the graph by plotting points for both the equations.



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

**3 bats and 6 balls for Rs. 3900/-**

$3x + 6y = 3900 \Rightarrow$  Simplifying the equation,  $x + 2y = 1300$ ... Eqn (1)

**One bat and 3 balls for Rs. 1300/-**

$x + 3y = 1300$ ... Eqn (2)

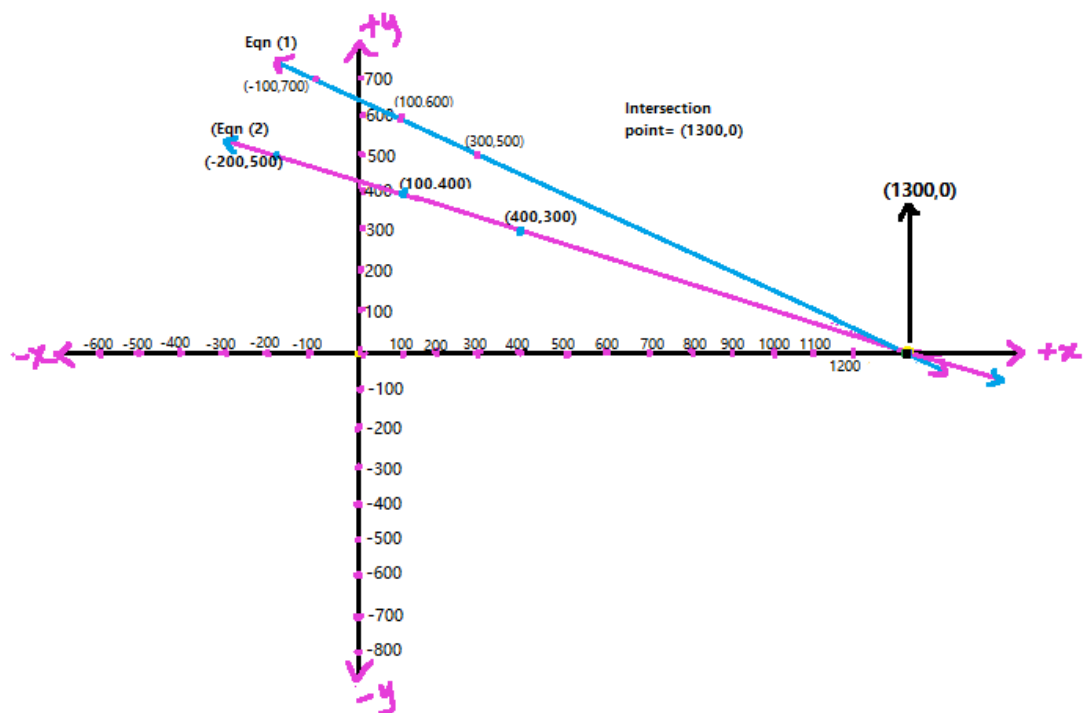
For equation (1),  $x + 2y = 1300$ , we have following points which satisfy the equation:

x	300	100	- 100
y	500	600	700

For equation(2),  $x + 3y = 1300$ , we have following points which satisfy the equation:

x	100	400	- 200
y	400	300	500

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



They both intersect at (1300,0). So, the cost of bat would be Rs. 1300/- and that of ball is Rs. 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

Let cost of 1 kg of grapes = Rs y

According to given conditions,

Cost of 2 Kg apples and 1 Kg grapes:  $2x + y = 160 \Rightarrow y = (160 - 2x)$ .....Eqn (1)

After a month,

Cost of 4 Kg apples and 2 Kg grapes:  $4x + 2y = 300 \Rightarrow y = (300 - 4x)/2$

$\Rightarrow y = (150 - 2x)$  .... Eqn (2)

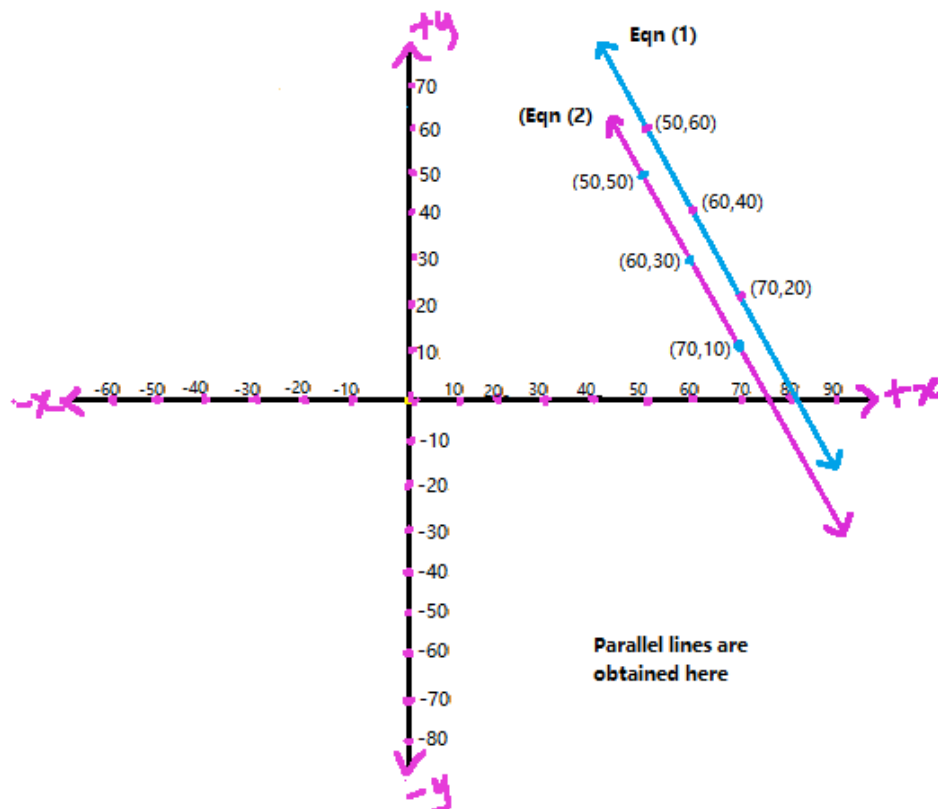
**For equation (1),  $y = (160 - 2x)$ , we have following points which satisfy the equation:**

x	50	60	70
y	60	40	20

For equation (2),  $y = (150 - 2x)$ , we have following points which satisfy the equation:

x	50	60	70
y	50	30	10

Representation of the situation graphically:



Clearly, the lines obtained by the two equations are parallel i.e. not intersecting.