

CHAPTER 03

Pair of Linear Equations in Two Variables

Graphical method of solution of pair of Linear equations:

Step-1: Rewrite the given equation with 'y' as the subject.

Step-2: Select any 3 or 4 convenient values of 'x' and find the

corresponding values of 'y'.

Step-3: Make table of values.

Step-4: Draw the axes on the graph paper and choose suitable

scale.

Step-5: Plot the points on the graph paper.

Step-6: Join the points on the graph paper.

Step-7: Find the co-ordinates of the point of intersection of the

two lines drawn.

Step-8: The co-ordinates of the point of intersection will be the

common solution of the given equation.

Example.

Solve the following simultaneous equations graphically.

$$4x - y = 13 \rightarrow (1)$$

$$5x + y = 14 \rightarrow (2)$$

Step-1:

From (1)

$$4x - y = 13$$

$$\Rightarrow 4x - 13 = y$$

From (2)

$$5x + y = 14$$

$$\Rightarrow y = -5x + 14$$

Step-2:

Taking convenient values of 'x'

x	3	4	2
$y = 4x - 3$	-1	3	-5

Taking convenient values of 'x'

x	3	2	4
$y = -5x + 14$	-1	4	-6

Note:

$$4x - y - 13 = 0$$

$$a_1x + b_1y + c_1 = 0$$

$$\Rightarrow a_1 = 4, b_1 = -1, c_1 = -13$$

$$5x + y - 14 = 0$$

$$a_2x + b_2y + c_2 = 0$$

$$\Rightarrow a_2 = 5, b_2 = 1, c_2 = -14$$

Here, $\frac{a_1}{a_2} = \frac{4}{5}$, $\frac{b_1}{b_2} = \frac{-1}{1}$, $\frac{c_1}{c_2} = \frac{-13}{-14}$

Since, $\frac{a_1}{a_2} \neq \frac{b_1}{b_2}$, therefore they are intersecting lines and hence, it is a consistent pair of linear equation.

Example: Solve the equations $3x + 4y = 2$ and $6x + 8y = 4$



For the equation $3x + 4y = 2$

X	$y = \frac{2-3x}{4}$	(x, y)
0	$y = \frac{2-3(0)}{4} = \frac{2}{4} = \frac{1}{2}$	(0, -2.5)
2	$y = \frac{2-3(2)}{4} = -1$	(3, -0.5)
4	$y = \frac{2-3(4)}{4} = -2.5$	(6, 1.5)
6	$y = \frac{2-3(6)}{4} = -4$	(6, -4)

For the equation $6x + 8y = 4$

X	$y = \frac{4-6x}{8}$	(x, y)
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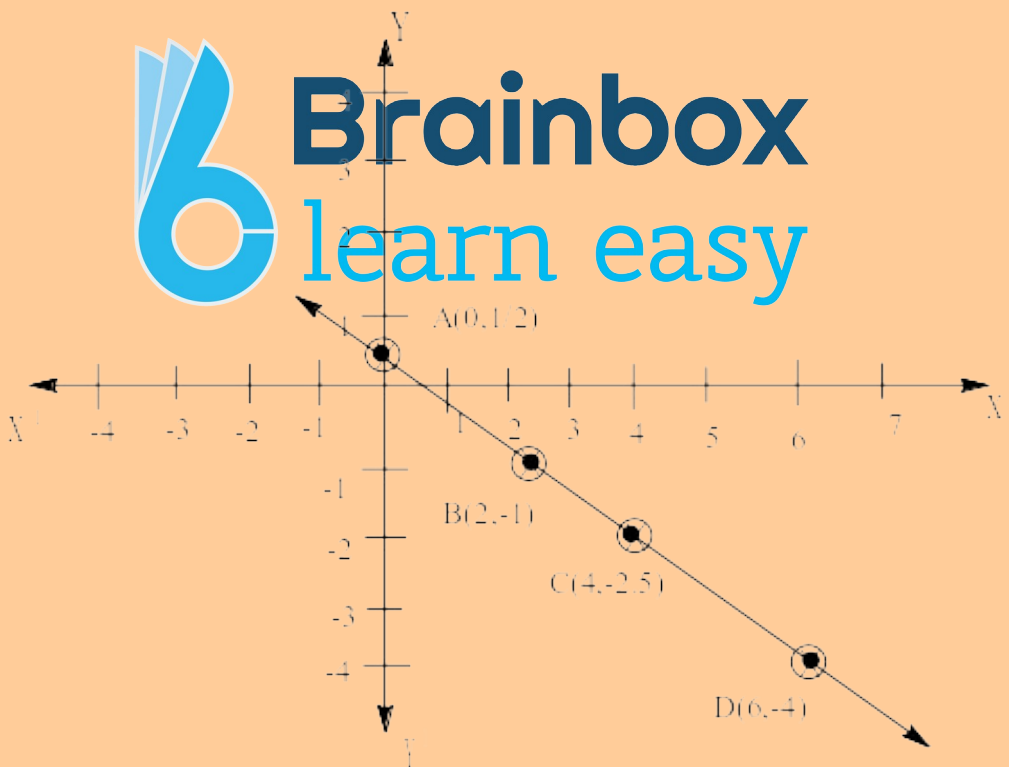
$$0 \quad y = \frac{4 - 6(0)}{5} = \frac{1}{2} \quad \left(0, \frac{1}{2}\right)$$

$$2 \quad y = \frac{4 - 6(2)}{8} = -1 \quad (2, -1)$$

$$4 \quad y = \frac{4 - 6(4)}{8} = -2.5 \quad (6, -2.5)$$

$$6 \quad y = \frac{4 - 6(6)}{8} = -4 \quad (6, -4)$$

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Here lines are coincide, hence given system of equations have infinitely many solutions.

