

CHAPTER 03

Pair of Linear Equations in Two Variables

Solution of a pair of linear equation by elimination method:

Procedure to Find elimination Method:

General equations are:

$$a_1x + b_1y = c_1 \rightarrow (1)$$

$$a_2x + b_2y = c_2 \rightarrow (2)$$

Step-1: Consider the co-efficients of one variable x , say a_1 and a_2 .

Step-2: Multiply first equation by the co-efficient of x of second equation and vice versa. So, we get two equations having same co-efficients for one variable.

Step-3: Now, we eliminate the terms having same co-efficients, either by adding or subtracting the equations. Hence, we obtain the value of one variable.

Step-4: Substituting the obtained value of the variable in 1st equation, we get the value of the second variable.

Hence the solution of the system in the values of “ x ” and “ y ” obtained.

Example:

Solve the equations $4x - 3y = -8$ & $2x + y = 6$.

Explanation:

Let the equations are:

$$4x - 3y = -8 \rightarrow (1)$$

$$2x + y = 6 \rightarrow (2)$$

Step-1: Let $a_1 = 4$ & $a_2 = 2$

Step-2: Eq. $(1) \times 2 \Rightarrow 8x - 6y = -16 \rightarrow (3)$

Eq. $(2) \times 4 \Rightarrow 8x + 4y = 24 \rightarrow (4)$

Step-3: $(3) - (4)$

$$\cancel{8x} - 6y = -16$$

$$\begin{array}{r} \cancel{8x} + 4y = 24 \\ (-) \quad (-) \quad (-) \end{array}$$

$$\hline -10y = -40$$

$$\Rightarrow y = \frac{-40}{-10} = 4$$

$$\Rightarrow \boxed{y = 4}$$

Step-4: Substitute value of 'y' in Eq. (2)

$$2x + 4 = 6$$

$$\Rightarrow 2x = 6 - 4$$

$$\Rightarrow 2x = 2$$

$$\Rightarrow x = \frac{2}{2} = 1$$

$$\Rightarrow \boxed{x = 1}$$

$\therefore$ The solution of the system of equations are

$$\boxed{x = 1, y = 4}$$