

SIMULTANEOUS LINEAR EQUATION

There 3 way to Solving Simultaneous Linear Equation Problem:

1. Solving by Graph
2. Solving by Substitution
3. Solving by Elimination

In this worksheet we will learn how to solve Simultaneous Linear Equation problems using elimination, substitution and their combination

Example:

Problem $\begin{cases} 3x - 2y = 29 \dots (1) \\ 4x + y = 24 \dots (2) \end{cases}$

Solving by Elimination

➤ *eliminate the variable x*

$$\begin{array}{r|l} 3x - 2y = 29 & \times 4 \\ 4x + y = 24 & \times \dots \end{array} \quad \begin{array}{r} 12x - 8y = 116 \\ \dots x + \dots y = \dots \\ \hline \dots y = \dots \\ y = \dots \end{array}$$

➤ *eliminate the variable y*

$$\begin{array}{r|l} 3x - 2y = 29 & \times 1 \\ 4x + y = 24 & \times \dots \end{array} \quad \begin{array}{r} 3x - 2y = 29 \\ \dots x + \dots y = \dots \\ \hline \dots x = \dots \\ x = \dots \end{array} +$$

Solution = (..... ,)

Solving by Substitution

- Determine value of y from equation 2

$$4x + y = 24$$

$$y = 24 - 4x \dots\dots(3)$$

- Substitute the value of y into equation 2

$$y = 24 - 4x \rightarrow 3x - 2(\dots\dots\dots) = 29$$

$$\dots\dots\dots = 29$$

$$\dots\dots x = \dots\dots\dots$$

$$x = \dots\dots\dots$$

- Substitute the value of y into equation 3

$$x = \dots\dots \rightarrow y = 24 - 4(\dots\dots\dots)$$

$$y = \dots\dots$$

$$\text{Solution} = (\dots\dots, \dots\dots)$$

Solving by Combination Elimination and Substitution

- *eliminate the variable x*

$$\begin{array}{r|l|l} 3x - 2y = 29 & \times 4 & 12x - 8y = 116 \\ 4x + y = 24 & \times \dots & \dots x + \dots y = \dots \\ \hline & & \dots y = \dots \\ & & y = \dots \end{array}$$

➤ **Substitute the value of y into equation 1 or 2 (free)**

$$y = \dots \rightarrow 4x + y = 24$$

$$4x + \dots = 24$$

$$4x = 24 - \dots\dots$$

X =

Solution = (..... ,)

Practice

$$1. \begin{cases} 3x + 2y = 7 \\ 4x - 3y = 2 \end{cases}$$

Solution = { A , B }

$$2. \begin{cases} 2x - y = 4 \\ 5x + y = 24 \end{cases}$$

Solution = { C , D }

$$3. \begin{cases} 5x + y = 11 \\ -2x + 2y = 10 \end{cases}$$

Solution = { E , F }

The crossword puzzle grid is composed of white squares for letters and black squares for empty space. The letters are placed as follows:

- A** is in the 6th square of the 2nd row.
- B** is in the 1st square of the 4th row.
- C** is in the 1st square of the 5th row.
- D** is in the 1st square of the 2nd column.
- E** is in the 8th square of the 2nd row.
- F** is in the 1st square of the 1st column.

(*for negative values use the word "minus")