

Linear Equation in Two Variables

Degree : 1
2 Variables
 $a.x + b.y = c$

MIND MAP

Linear Equation in Two Variables

Pair of Linear Equation in Two Variables

Two linear equations in the same two variables are called a pair of linear equations in two variables.

The most general form of a pair of linear equations is

$$a_1x + b_1y + c_1 = 0$$

$$a_2x + b_2y + c_2 = 0$$

where $a_1, a_2, b_1, b_2, c_1, c_2$ are real numbers, such that

$$a_1^2 + b_1^2 \neq 0, a_2^2 + b_2^2 \neq 0.$$

- (i) intersecting, then $\frac{a_1}{a_2} \neq \frac{b_1}{b_2}$. 
- (ii) coincident, then $\frac{a_1}{a_2} = \frac{b_1}{b_2} = \frac{c_1}{c_2}$. 
- (iii) parallel, then $\frac{a_1}{a_2} = \frac{b_1}{b_2} \neq \frac{c_1}{c_2}$. 

A pair of linear equations in two variables can be represented, and solved, by the:

- (1) graphical method
- (2) algebraic method

1.Graphical Method of solution of a Pair of Linear Equations

Compare the ratios	Graphical representation	Algebraic interpretation
$\frac{a_1}{a_2} \neq \frac{b_1}{b_2}$	Intersecting lines	Exactly one solution (unique) Consistent
$\frac{a_1}{a_2} = \frac{b_1}{b_2} = \frac{c_1}{c_2}$	Coincident lines	Infinitely many solutions Consistent
$\frac{a_1}{a_2} = \frac{b_1}{b_2} \neq \frac{c_1}{c_2}$	Parallel lines	No solutions Inconsistent

2. Algebraic Method of solving pair of LE

- Substitution Method
- Elimination method