

# Linear Equations in Two Variables

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Comprehensive study notes for

Linear Equations in Two Variables

by

Ajay Yadav

(Math King of Katargam). Master every concept with clear explanations, solved examples, and practice problems.

Key Concepts

Linear Equations

An equation of the form

$$ax + by + c = 0$$

where  $a, b, c$  are real numbers and  $a, b$  are not both zero, is called a linear equation in two variables  $x$  and  $y$ . The graph of such an equation is a straight line

.

Solution of a Linear Equation

A solution is a pair of values  $(x, y)$  that satisfies the equation. A linear equation in two variables has infinitely many solutions

. Each solution represents a point on the line.

Graph of a Linear Equation

To draw the graph: (i) Find at least two solutions. (ii) Plot the corresponding points. (iii) Join them to form a straight line.

Every point on the line is a solution.

Equation of Lines Parallel to Axes

$$x = k$$

represents a line parallel to the  $y$ -axis at distance  $k$  from it.

$$y = k$$

represents a line parallel to the  $x$ -axis at distance  $k$  from it.  $x = 0$  is the  $y$ -axis;  $y = 0$  is the  $x$ -axis.

Important Formulas

Standard Form

$$ax + by + c = 0$$

Slope-Intercept

$$y = mx + c \text{ (where } m = \text{slope, } c = \text{y-intercept)}$$

Line parallel to  $y$ -axis

$$x = k$$

Line parallel to  $x$ -axis

$$y = k$$

## Solved Examples

### Example 1:

Write four solutions of  $2x + y = 7$ .

Solution:

$y = 7 - 2x$ . Solutions: (0,7), (1,5), (2,3), (3,1).

Infinitely many possible.

### Example 2:

Draw the graph of  $x + y = 5$ .

Solution:

Find points: (0,5) and (5,0). Plot and join with a straight line. The line extends infinitely showing all solutions.

### Example 3:

Which line is  $x = -3$  parallel to?

Solution:

$x = -3$  is a vertical line parallel to the

y-axis

at a distance of 3 units to the left of the origin.

## Practice Questions

Find four solutions of  $3x - 2y = 6$ .

Draw the graph of  $2x + 3y = 12$ . Find the coordinates where it meets the axes.

Write the equation of a line parallel to the x-axis passing through (2, -5).

Check whether (2, 1) is a solution of  $3x - 2y = 4$ .

The cost of a notebook is twice the cost of a pen. Write a linear equation in two variables.

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