1. Introduction

A linear equation in two variables is an equation that can be written in the form:

$$ax+by+c=0$$\boxed{ax + by + c = 0}ax+by+c=0

Where:

- x and y are variables
- a, b, and c are real numbers
- a and b are not both zero

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2. Key Terms

Term	Description
Variable	A symbol (like x or y) representing a number
Coefficient	The number multiplied by the variable
Constant	A fixed number (like 2 in x + y = 2)
Solution	A pair (x, y) that satisfies the equation

□ 3. Solution of a Linear Equation

Any ordered pair (x, y) that makes the equation true is called its solution.

□ Example:
Check if (1, 2) is a solution of the equation x+y=3x + y = 3x+y=3
□ LHS = 1 + 2 = 3 □ □ Yes, it is a solution.

□ 4. Infinite Solutions

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

□ 5. Graph of a Linear Equation

- The graph of a linear equation in two variables is always a straight line.
- Every point on the line is a solution of the equation.
- You can find solutions by assigning values to one variable and solving for the other.

 Example:
To graph x+y=4x + y = 4x+y=4, choose values:

x	y
0	4
2	2
4	0

Plot these (0,4), (2,2), (4,0) and draw a line.

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6. Important Properties

- Every linear equation in two variables represents a line on the graph.

- An equation like x=ax = ax=a or y=by = by=b is also a linear equation.
  - x=ax = ax=a vertical line
  - y=by = by=b horizontal line

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7. Exam Tips

 Must Know:

- General form: ax+by+c=0ax + by + c = 0ax+by+c=0
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How to find and verify solutions

- How to make a value table and plot a graph
- Recognize equations like x=2x = 2x=2, y=−3y = -3y=−3

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8. Common Questions in Exams

1. Write 4 solutions of the equation 2x+3y=62x + 3y = 62x+3y=6
2. Plot the graph of x+y=4x + y = 4x+y=4
3. Is (2, 1) a solution of 3x+2y=83x + 2y = 83x+2y=8?

4.

Write linear equations whose graphs are parallel to x-axis or y-axis

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9. Real-life Applications

- Budgeting (like total cost = price × quantity + delivery)
- Speed–time problems
- Business and profit analysis