CLASS 10 MATHS – CHAPTER 3

PAIR OF LINEAR EQUATIONS – ALL FORMULAE

Basic Idea

- Two unknown quantities involved
- Represent real-life problems
- Forms two equations
- Used in cost, age, number problems
- Need common solution
- Both equations must be satisfied

Linear Equation

- Form: $ax + by + c = 0$
- x, y → variables
- a, b, c → constants
- a & b not both zero
- Degree always 1
- Graph is straight line
- Can be written in different forms
- Easy to solve graphically

Solution Pair

- (x, y) satisfies equation
- Infinite solutions possible
- Each solution = point on line
- Verified by substitution
- Lies on graph
- Same pair satisfies both equations
- Intersection point is solution

Pair Of Equations

- Two equations together
- $a_1x+b_1y+c_1=0$
- $a_2x+b_2y+c_2=0$
- Represent two lines
- Solve simultaneously
- Can have different solutions
- Used in word problems
- Forms system of equations

Graph Method

- Each equation → straight line
- Plot 2 points for each
- Draw both lines
- Intersection = solution
- Not always accurate
- Needs graph paper
- Visual understanding method
- Easy but less precise

Nature Of Lines

- Intersecting → one solution
- Parallel → no solution
- Coincident → infinite solutions
- Based on graph position
- Important for concept
- Intersecting → consistent
- Parallel → inconsistent
- Coincident → dependent

Condition Formula

- $a_1/a_2 \neq b_1/b_2$ → one solution
- $a_1/a_2 = b_1/b_2 \neq c_1/c_2$ → no solution
- $a_1/a_2 = b_1/b_2 = c_1/c_2$ → infinite
- Based on coefficients
- Helps without graph
- Used in theory questions
- Quick solution check
- Saves time in exams

Algebraic Methods

- Substitution method
- Elimination method
- Cross multiplication
- More accurate than graph
- Used in exams
- No need of graph
- Step-by-step solving
- Gives exact values