# CLASS 10 MATHS – CHAPTER 7

## COORDINATE GEOMETRY – ALL FORMULAE

### Basic Idea

- Links algebra & geometry
- Uses coordinate plane
- Points represented as (x, y)
- x-axis → horizontal
- y-axis → vertical
- Intersection = origin (0,0)
- Helps locate positions
- Used in graphs & shapes

### Coordinates

- (x, y) → ordered pair
- x = abscissa (horizontal)
- y = ordinate (vertical)
- Right → +x, Left → –x
- Up → +y, Down → –y
- Distance from axes
- Position of any point
- Unique representation

### Types Of Points

- On x-axis → (x, 0)
- On y-axis → (0, y)
- Origin → (0, 0)
- Points can be positive/negative
- Depends on coordinates
- Lies on axes or plane
- Easy to identify
- Important for graphs

### Quadrants

- 4 parts of plane
- I → (+, +)
- II → (–, +)
- III → (–, –)
- IV → (+, –)
- Signs decide position
- Origin not in any quadrant
- Important for plotting

## Distance Formula

- Finds distance between points
- Based on Pythagoras theorem
- $\sqrt{[(x_2-x_1)^2 + (y_2-y_1)^2]}$
- Always positive value
- Used in geometry problems
- Works for any two points

## Section Formula

- Divides line in ratio $m_1:m_2$
- Gives coordinates of point
- Internal division used
- Based on weighted average
- Important in numericals
- Used in real-life division

## Mid Point Formula

- Special case of section
- Ratio = 1:1
- $[(x_1+x_2)/2 , (y_1+y_2)/2]$
- Gives center of line
- Easy to apply
- Used in geometry
- Helps find middle point
- Very common formula

## Collinearity

- Points on same straight line
- Condition: AB + BC = AC
- Area of triangle = 0
- Verified using distance