Class 10 Mathematics – Chapter: Coordinate Geometry

1. Introduction

Coordinate geometry links algebra and geometry using the coordinate plane with x-axis and y-axis.

2. Cartesian Plane

- The plane formed by two number lines intersecting at right angles.

- The point of intersection is called the origin (0, 0).

- Horizontal line is the x-axis, vertical line is the y-axis.

3. Coordinates of a Point

A point P in the plane is represented as (x, y) where:

- x = distance from y-axis (abscissa)

- y = distance from x-axis (ordinate)

4. Distance Formula

Distance between two points $P_1(x_1, y_1)$ and $P_2(x_2, y_2)$:

$$d = \sqrt{(x_2 - x_1)^2 + (y_2 - y_1)^2}$$

5. Midpoint Formula

Midpoint M of the segment joining points P_1 and P_2:

$$M = \left(\frac{x_1 + x_2}{2}, \frac{y_1 + y_2}{2} \right)$$

6. Area of Triangle Using Coordinates

For triangle with vertices $A(x_1, y_1)$, $B(x_2, y_2)$, $C(x_3, y_3)$:

$$\text{Area} = \frac{1}{2} \left| x_1(y_2 - y_3) + x_2(y_3 - y_1) + x_3(y_1 - y_2) \right|$$

7. Important Tips for Exams

- Practice plotting points accurately on graph paper.

- Use formulas carefully, watch signs (+/-).

- Memorize formulas for distance, midpoint, and area.

- Apply coordinate geometry to solve geometry problems.