

# CLASS 9 MATHS - CHAPTER 3

## COORDINATE GEOMETRY – ALL FORMULAE

### Cartesian Coordinate System

- **X-axis** → Horizontal number line
- **Y-axis** → Vertical number line
- **Origin** → Intersection of X-axis and Y-axis

$$\text{Origin} = (0,0)$$

### Quadrants and Signs of Coordinates

Quadrant	x-coordinate	y-coordinate
I	+	+
II	-	+
III	-	-
IV	+	-

I	+	+
II	-	+
III	-	-
IV	+	-

### Coordinates of a Point

- Position of a point in a plane is written as:

$$(x, y)$$

Where:

- $x =$  **Abscissa** (distance from Y-axis)
- $y =$  **Ordinate** (distance from X-axis)

### Points on Axes

- Any point on **X-axis**:

$$(x, 0)$$

- Any point on **Y-axis**:

$$(0, y)$$

## Distance Formula

### ◆ Distance between two points

$A(x_1, y_1)$  and  $B(x_2, y_2)$

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

### ◆ Distance from X-axis

For a point  $P(x, y)$ :

$$\text{Distance from X-axis} = |y|$$

### ◆ Distance from Y-axis

For a point  $P(x, y)$ :

$$\text{Distance from Y-axis} = |x|$$

### ◆ Distance from Origin

For a point  $P(x, y)$ :

$$\text{Distance from origin} = \sqrt{x^2 + y^2}$$