

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

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

Quadrants and Signs of Coordinates

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

Coordinates of a Point

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

$$\boxed{(x, y)}$$

Where:

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

Points on Axes

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

$$\boxed{(x, 0)}$$

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

$$\boxed{(0, y)}$$

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 $P(x, y)$:

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