

Coordinate Geometry

CBSE Class 9 Maths · Knowledge organiser

KEY DEFINITIONS

Origin

The point $O(0, 0)$ where the x -axis and y -axis meet.

Coordinates

(x, y) : the distances of a point from the y -axis and the x -axis, with signs.

Quadrant

One of the four regions the axes divide the plane into.

KEY FORMULAS

Quadrants I to IV: $(+, +)$, $(-, +)$, $(-, -)$, $(+, -)$; on the x -axis $y = 0$, on the y -axis $x = 0$

$$\begin{array}{l} \text{Distance} \quad AB = \sqrt{(x_2 - x_1)^2 + (y_2 - y_1)^2}; \\ \quad \quad \quad OP = \sqrt{x^2 + y^2} \end{array}$$

$$\text{Mid-point} \quad \left(\frac{x_1 + x_2}{2}, \frac{y_1 + y_2}{2} \right)$$

Parallelogram: diagonals share a mid-point; equidistant point P : $PA^2 = PB^2$

YOU SHOULD BE ABLE TO...

- Place and read points, name the quadrant and use the distance and mid-point formulas in one step.
- Find unknown coordinates from a distance or a mid-point and test triangles for right angles or equal sides.
- Write complete answers that classify quadrilaterals and triangles from coordinates, and solve map-style case studies.
- Handle equidistance conditions, equilateral triangles and proofs in coordinates.

WORKED EXAMPLE

Find the distance between $A(-1, 3)$ and $B(5, -5)$.

$$AB = \sqrt{6^2 + (-8)^2} = \sqrt{100} = 10.$$

COMMON MISTAKES

- ✗ Writing (y, x) instead of (x, y) , or reading the ordinate as the distance from the y -axis.
- ✗ Squaring a negative difference wrongly: $(-8)^2 = 64$, not -64 .
- ✗ Stopping at $\sqrt{52}$ instead of simplifying to $2\sqrt{13}$, or "simplifying" $\sqrt{a^2 + b^2}$ to $a + b$.
- ✗ Forgetting the second value when an equation such as $(a - 5)^2 = 9$ gives $a - 5 = \pm 3$.