

Coordinate Geometry

CBSE Class 10 Maths · Knowledge organiser

KEY DEFINITIONS

Distance formula

The length between two points, from Pythagoras.

Section formula

Gives the point that divides a line segment in a given ratio $m : n$.

Mid-point

The point halfway along a segment: the average of the coordinates.

KEY FORMULAS

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

$$\begin{aligned} \text{Section formula,} \\ \text{ratio } m : n \\ \text{(internal)} \end{aligned} \quad \left(\frac{mx_2 + nx_1}{m+n}, \frac{my_2 + ny_1}{m+n} \right)$$

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

Ratio in which a line or axis divides AB : take $k : 1$ and solve for k

YOU SHOULD BE ABLE TO...

- Find the distance between two points and the mid-point of a segment without slips.
- Use the section formula both ways: to find the dividing point and to find the ratio (or an unknown coordinate).
- Prove the type of a quadrilateral or triangle from coordinates in a full, reasoned long answer.
- Handle trisection points, points equidistant from three given points and right-angle conditions.

WORKED EXAMPLE

Distance between $(2, -1)$ and $(-4, 7)$: $\sqrt{36 + 64} = 10$.

COMMON MISTAKES

- ✗ Swapping m_1 and m_2 in the section formula — m_1 multiplies the coordinates of the *second* point.
- ✗ Forgetting the square root, or squaring a negative difference incorrectly.
- ✗ Concluding “square” from equal sides alone (a rhombus also has equal sides); check the diagonals.
- ✗ Leaving the final distance unsimplified ($\sqrt{72} = 6\sqrt{2}$).