CLASS X : CHAPTER - 7
COORDINATE GEOMETRY

NCERT NICHOOD

Points to remember

- The distance of a point from the y-axis is called its **x-coordinate**, or **abscissa**.
- The distance of a point from the x-axis is called its **y-coordinate**, or **ordinate**.
- The coordinates of a point on the x-axis are of the form $(x, 0)$.
- The coordinates of a point on the y-axis are of the form $(0, y)$.

Distance Formula

The distance between any two points A (x_1, y_1) and B(x_2, y_2) is given by

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

$$or \quad AB = \sqrt{(\text{difference of abscissae})^2 + (\text{difference of ordinates})^2}$$

Distance of a point from origin

The distance of a point P(x, y) from origin O is given by OP = $\sqrt{x^2 + y^2}$

Problems based on geometrical figure

To show that a given figure is a

- Parallelogram – prove that the opposite sides are equal
- Rectangle – prove that the opposite sides are equal and the diagonals are equal.
- Parallelogram but not rectangle – prove that the opposite sides are equal and the diagonals are not equal.
- Rhombus – prove that the four sides are equal
- Square – prove that the four sides are equal and the diagonals are equal.
- Rhombus but not square – prove that the four sides are equal and the diagonals are not equal.
- Isosceles triangle – prove any two sides are equal.
- Equilateral triangle – prove that all three sides are equal.
- Right triangle – prove that sides of triangle satisfies Pythagoras theorem.

Section formula

The coordinates of the point P(x, y) which divides the line segment joining the points A (x_1, y_1) and B(x_2, y_2), internally, in the ratio $m_1 : m_2$ are

$$\left(\frac{m_1 x_2 + m_2 x_1}{m_1 + m_2}, \frac{m_1 y_2 + m_2 y_1}{m_1 + m_2} \right)$$

This is known as the **section formula**.

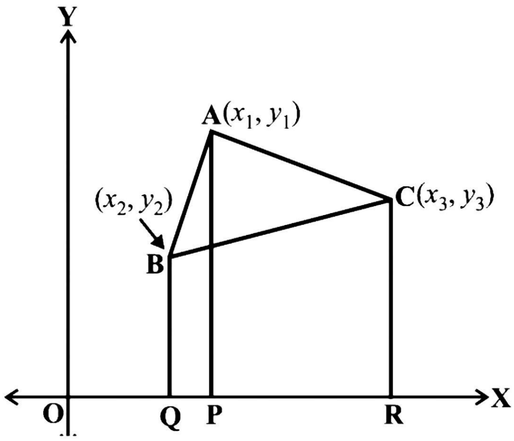
Mid-point formula

The coordinates of the point P(x, y) which is the midpoint of the line segment joining the points A (x_1, y_1) and B(x_2, y_2), are $\left(\frac{x_1 + x_2}{2}, \frac{y_1 + y_2}{2} \right)$

Area of a Triangle

If A(x_1, y_1), B(x_2, y_2) and C(x_3, y_3) are the vertices of a Δ ABC, then the area of Δ ABC is given by

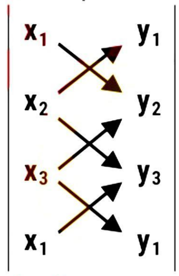
$$\textit{Area of } \Delta ABC = \frac{1}{2}[x_1(y_2 - y_3) + x_2(y_3 - y_1) + x_3(y_1 - y_2)]$$



Trick to remember the formula

The formula of area of a triangle can be learn with the help of following arrow diagram:

$\Delta ABC = \frac{1}{2}$



Find the sum of products of numbers at the ends of the lines pointing downwards and then subtract the sum of products of numbers at the ends of the line pointing upwards, multiply the difference by $\frac{1}{2}$. .e. $\textit{Area of } \Delta ABC = \frac{1}{2}[(x_1y_2 + x_2y_3 + x_3y_1) - (x_1y_3 + x_3y_2 + x_2y_1]$