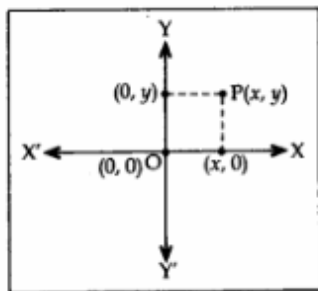
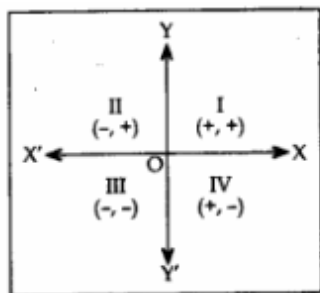


CBSE Class 10 Maths Notes Chapter 7 Coordinate Geometry

- Position of a point P in the Cartesian plane with respect to co-ordinate axes is represented by the ordered pair (x, y) .



- The line $X'OX$ is called the X-axis and YOY' is called the Y-axis.
- The part of intersection of the X-axis and Y-axis is called the origin O and the co-ordinates of O are $(0, 0)$.
- The perpendicular distance of a point P from the Y-axis is the 'x' co-ordinate and is called the abscissa.
- The perpendicular distance of a point P from the X-axis is the 'y' co-ordinate and is called the ordinate.
- Signs of abscissa and ordinate in different quadrants are as given in the diagram:



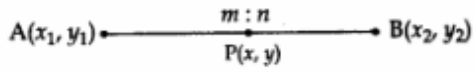
- Any point on the X-axis is of the form $(x, 0)$.
- Any point on the Y-axis is of the form $(0, y)$.
- The distance between two points $P(x_1, y_1)$ and $Q(x_2, y_2)$ is given by

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

Note. If O is the origin, the distance of a point $P(x, y)$ from the origin $O(0, 0)$ is given by

$$OP = \sqrt{x^2 + y^2}$$

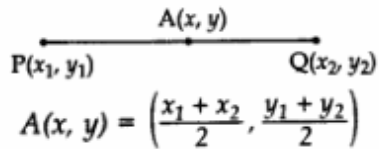
Section formula. The coordinates of the point which divides the line segment joining the points A(x₁, y₁) and B(x₂, y₂) internally in the ratio m : n are:



$$P(x, y) = \left(\frac{mx_2 + nx_1}{m + n}, \frac{my_2 + ny_1}{m + n} \right)$$

The above formula is section formula. The ratio m: n can also be written as $\frac{m}{n} : 1$ or k : 1, The co-ordinates of P can also be written as $P(x,y) = \frac{kx_2+x_1}{k+1}, \frac{ky_2+y_1}{k+1}$

The mid-point of the line segment joining the points P(x₁, y₁) and Q(x₂, y₂) is



$$A(x, y) = \left(\frac{x_1 + x_2}{2}, \frac{y_1 + y_2}{2} \right)$$

Here m : n = 1 : 1.

Area of a Triangle. The area of a triangle formed by points A(x₁, y₁), B(x₂, y₂) and C(x₃, y₃) is given by | Δ |, where $\Delta = \frac{1}{2} [x_1 (y_2 - y_3) + x_2 (y_3 - y_1) + x_3 (y_1 - y_2)]$ where Δ represents the absolute value.

- Three points are collinear if |A| = 0.
- If P is centroid of a triangle then the median divides it in the ratio 2 : 1. Co-ordinates of P are given by

$$P = \left(\frac{x_1 + x_2 + x_3}{3}, \frac{y_1 + y_2 + y_3}{3} \right)$$

Area of a quadrilateral, ABCD = ar(ΔABC) + ar(ΔADC)

