Chapter-07

Coordinate Geometry

- The length of a line segment joining A and B is the distance between two points

  A (x_1, y_1) and (x_2, y_2) is $\sqrt{\{(x_2 - x_1)^2 + (y_2 - y_1)^2\}}$

- The distance of a point (x, y) from the origin is $\sqrt{(x^2 + y^2)}$. The distance of P from x-axis is y units and from y-axis is x-units.

- The co-ordinates of the points p (x, y) which divides the line segment joining the points $A(x_1, y_1)$ and $B(x_{2,}\ y_2)$ in the ratio $m_1 : m_2$ are $\left(\frac{m_1x_2 + m_2x_1}{m_1 + m_2}, \frac{m_1y_2 + m_2y_1}{m_1 + m_2}\right)$ we can take ratio as $k:1,\ k = \frac{m}{m_2}$

- The mid-points of the line segment joining the points $P(x_1, y_2)$ and $Q(x_2, y_2)$ is $\left(\frac{x_1 + x_2}{2}, \frac{y_1 + y_2}{2}\right)$

- The area of the triangle formed by the points $(x_1, y_1), (x_2, y_2)$ and (x_3, y_3) is the numeric value of the expressions $\frac{1}{2}[x_1(y_2 - y_3) + x_2(y_3 - y_1) + (y_1 - y_2)]$.

- If three points are collinear then we cannot draw a triangle, so the area will be zero i.e.

  $|x_1(y_2 - y_3) + x_2(y_3 - y_1) + x_3(y_1 - y_2)| = 0$

- **Centroid of a triangle and its coordinates:** The medians of a triangle are concurrent. Their point of concurrence is called the centroid. It divides each median in the ratio 2:1. The coordinates of centroid of a triangle with vertices $A(x_1, y_1)$, and B (x_2, y_2) and C (x_3, y_3) are given by $\left(\frac{x_1 + x_2 + x_3}{3}, \frac{y_1 + y_2 + y_3}{3}\right)$