Section and Mid-Point Formula

Co-ordinate geometry is that branch of mathematics which creates geometry algebraically.

The Section Formula

Section formula is used to find the co-ordinates of a point which divides the line segment joining two given points in a given ratio.

If point P divides the line segment joining the points A(x_1, y_1) and B(x_2, y_2), then the coordinates of point P are given by $\left(\frac{mx_2+nx_1}{m+n}, \frac{my_2+ny_1}{m+n}\right)$

Mid-Point Formula

Mid-Point formula is used to find the co-ordinates of the mid-point of the line segment joining two given points.

Let P(x, y) be a point lying on a line segment AB, where the coordinates of A and B are (x_1, y_1) and (x_2, y_2) respectively. Suppose P divides AB in the ratio 1 : 1. In other words, P is the mid-point of AB.

$\Rightarrow$ AP = PB

Then coordinates of P are given by $\left(\frac{x_1+x_2}{2}, \frac{y_1+y_2}{2}\right)$

Centroid of a Triangle

The straight line joining the vertex of a triangle to the mid-point of the opposite side is called a median of the triangle.

The point which divides a median of a triangle in the ratio 2 : 1 is called the centroid of the triangle.

Thus, if AD is a median of ΔABC and G is its centroid, then $\frac{AG}{GD}=\frac{2}{1}$

Let the vertices of ΔABC are *A(x_1, y_1), B(x_2, y_2)* and C(x_3, y_3).

Then the coordinate of centroid are given by $\left(\frac{x_1+x_2+x_3}{3}, \frac{y_1+y_2+y_3}{3}\right)$