

CO-ORDINATE GEOMETRYIntroduction

- * **Distance Formula:** Formula to find the distance between two points A(x_1, y_1) and B(x_2, y_2) is given by

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

Note :

- * If one of the point being origin i.e., A(0, 0) and B(x, y) then the formula to find the distance between them is given by

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

- * If A (0, y) and B(x, 0) (or) A(x, 0) and B(0, y) then the formula to find the distance between them is given by

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

- * **Section Formula** => If 'p' divides the line segment which is formed by joining the points A(x_1, y_1) and B(x_2, y_2) internally in the ratio $m_1:m_2$, then the formula to find the co-ordinates of 'p' is given by P :-

$$P = \left[\frac{m_1x_2 + m_2x_1}{m_1 + m_2}, \frac{m_1y_2 + m_2y_1}{m_1 + m_2} \right]$$

Note :

- * If 'p' divides the line segment which is formed by joining the points A (x_1, y_1) and B(x_2, y_2) externally in the ratio $m_1: m_2$, then the formula to find the co-ordinates of 'p' is given by

$$P = \left[\frac{m_1x_2 - m_2x_1}{m_1 - m_2}, \frac{m_1y_2 - m_2y_1}{m_1 - m_2} \right]$$

- * If 'p' divides the line segment which is formed by joining the points A(x_1, y_1) and B(x_2, y_2) in the ratio 1:1, i.e., if 'p' is the mid-point of AB, then the formula to find the co-ordinates of 'p' is given by

$$P = \left[\frac{x_1 + x_2}{2}, \frac{y_1 + y_2}{2} \right]$$

- * The general form of any point on x-axis is given by (x, 0)

- * The general form of any point on y-axis is given by (0, y)

- * If $A(x_1, y_1)$, $B(x_2, y_2)$ and $C(x_3, y_3)$ are the three vertices of a ΔABC , then the formula to find its area is given by

$$\Delta = 1/2 | x_1(y_2 - y_3) + x_2(y_3 - y_1) + x_3(y_1 - y_2) |$$

Note:

- * If $A(0,0)$, $B(x, y)$ and $C(x_2, y_2)$ are the three vertices of a ΔABC then the formula to find its area is given by

$$\Delta = 1/2 | x_1y_2 - x_2y_1 |$$

- * If $A(0,0)$, $B(x, 0)$ and $C(0, y)$ are the three vertices of a ΔABC then the formula to find its area is given by

$$\Delta = 1/2 | xy |$$



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