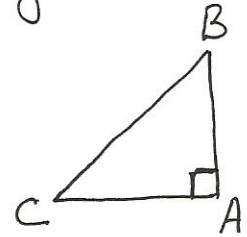


(iii) For an Equilateral triangle: Show that all the three distances are equal.

(iv) For right angled triangle: use Pythagoras theorem to prove that any one angle is right angle.

i.e. Prove $BC^2 = AB^2 + AC^2$



(v) To prove that points lie in a straight line: Show that one distance is equal to the sum of other two

(vi) For a parallelogram: Show that opposite distances are equal.

(vii) For a rectangle: Show that
(i) opposite sides are equal
(ii) Diagonals are equal.

(viii) For a Square: Show
(i) Four sides (distances) are equal
(ii) Diagonals are equal.

Cont Pg-7

(ix) For a rhombus: show that

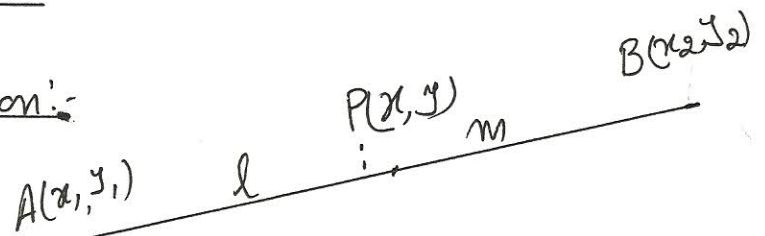
(i) all four sides are equal

(ii) Diagonals are at right angles.

These are few geometrical figures which can be asked in class X.

6. Section Formula:

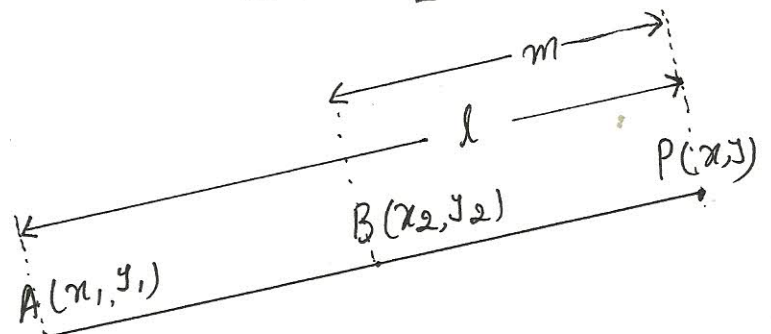
(a) Internal Division:



The Co-ordinate of a point P which divides the join of two points $A(x_1, y_1)$ and $B(x_2, y_2)$ in the ratio $l:m$ is (internally)

$$P \left[\frac{lx_2 + mx_1}{l+m}, \frac{ly_2 + my_1}{l+m} \right]$$

(b) External Division:



The Co-ordinate of a point $P(x, y)$ which divides the join of $A(x_1, y_1)$ and $B(x_2, y_2)$ externally in the ratio $l:m$ is

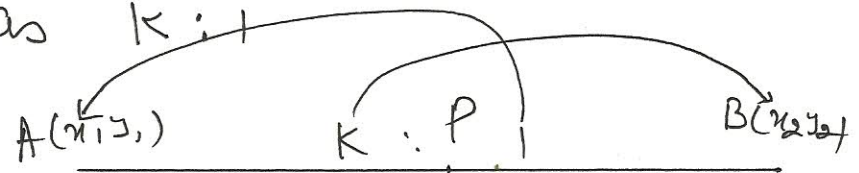
$$P \left[\frac{lx_2 - mx_1}{l-m}, \frac{ly_2 - my_1}{l-m} \right]$$

Cont-Pg-8

(7) Mid Point Formula: The Co-ordinate of a point P which divides the join of two points $A(x_1, y_1)$ and $B(x_2, y_2)$ in the ratio $1:1$ is

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

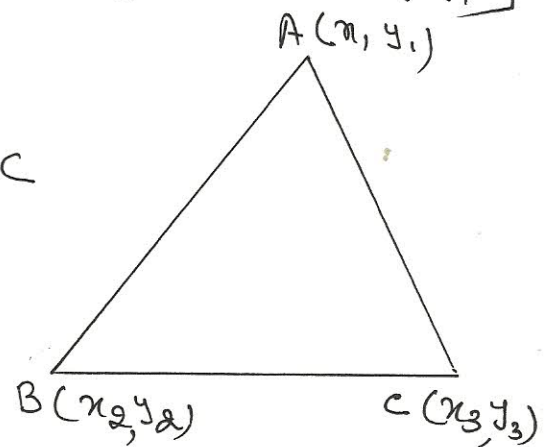
Note: To find the ratio, When a given point divides the join of two given points, It is advisable to take the ratio as $k:1$



The Co-ordinate of P is $P \left[\frac{kx_2 + x_1}{k+1}, \frac{ky_2 + y_1}{k+1} \right]$

8. Area of a triangle:-

Area of a triangle ABC whose Co-ordinates are $A(x_1, y_1)$, $B(x_2, y_2)$ and $C(x_3, y_3)$ is



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

Square units

Note:- (1) The units of area in square units

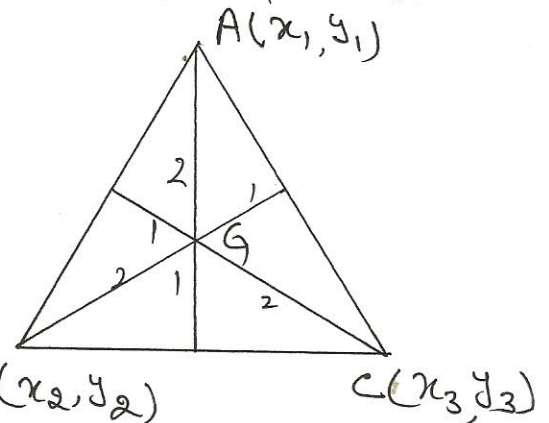
(2) Since area is a measure, which cannot be negative, so take the absolute value of area
e.g. if area of a Δ is coming out to be -5

So actual area is $|-5| = 5 \text{ sq. units}$
(3) If area of a $\Delta = 0$, points are collinear.

9.

Centroid of a triangle:- The point of intersection of three medians is called Centroid. It divides a median in the ratio $2:1$

The centroid of a ΔABC whose co-ordinates are $A(x_1, y_1)$, $B(x_2, y_2)$, $C(x_3, y_3)$ is



$$G \left[\frac{x_1 + x_2 + x_3}{3}, \frac{y_1 + y_2 + y_3}{3} \right]$$