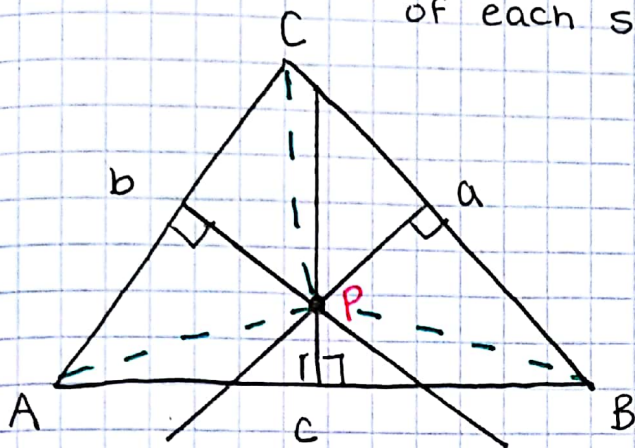


# Centers of Triangles

**Circumcenter** - It is where the "perpendicular bisectors" (lines that are at right angles to the midpoint of each side)



## Concurrency of Perpendicular Bisectors Theorem

The perpendicular bisectors of the sides of a triangle are concurrent at a point equidistant from the vertices.

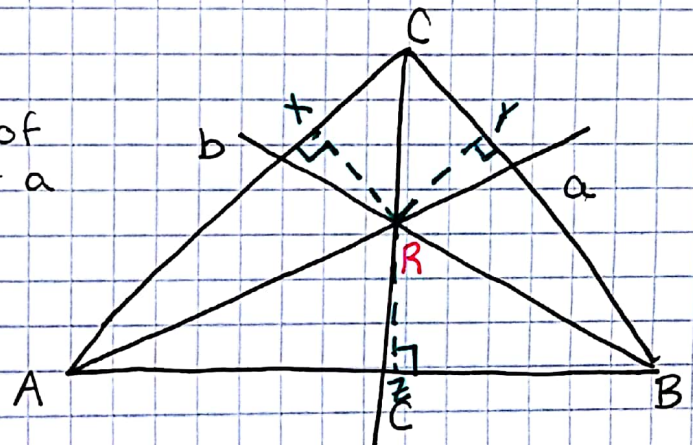
$$PA = PB = PC$$

**Incenter** - It is where the "angle bisectors" (lines that split each corner's angle in half) meet.

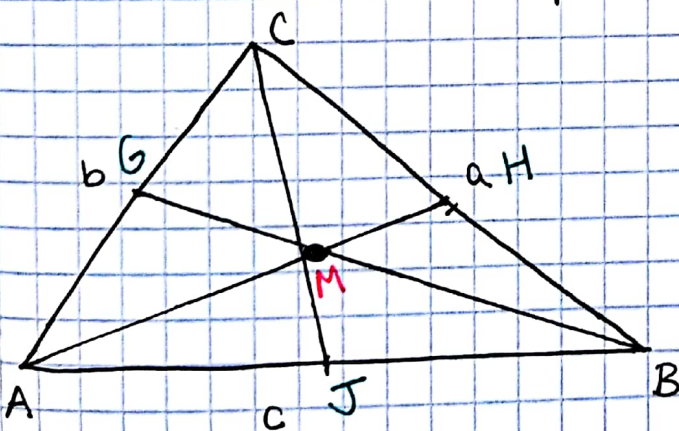
## Concurrency of Angle Bisectors Theorem

The bisectors of the angles of a triangle are concurrent at a point equidistant from the sides of the triangle.

$$RX = RY = RZ$$



**Centroid** - It is where the "median" (lines joining a vertex to the midpoint of the opposing side bisecting it)



## Concurrency of Medians Theorem

The medians of a triangle are concurrent at a point that is two thirds the distance from each vertex to the midpoint of the opposite side.

$$AM = \frac{2}{3} AJ \quad BM = \frac{2}{3} BH$$

$$CM = \frac{2}{3} CG$$