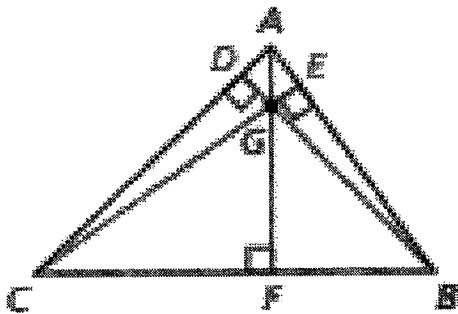


Points of Concurrency

Definition: The point at which *certain* lines intersect. There are 4 points of concurrency that we will be discussing today.

ORTHOCENTER

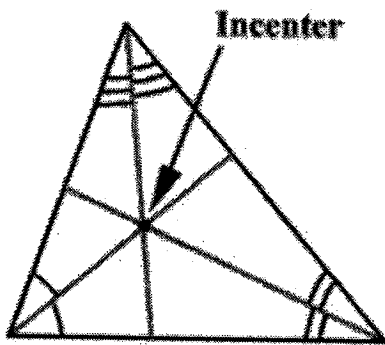
- The orthocenter is the point of intersection that is created from the altitudes of a triangle (see the diagram below).



The ORTHOCENTER can be inside an acute triangle, on a vertex of a right triangle and outside an obtuse triangle.

INCENTER

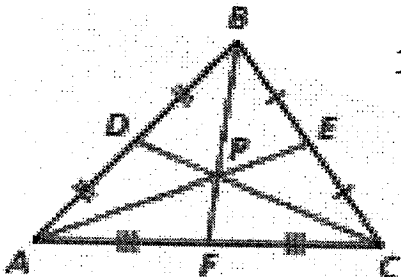
- The incenter is the point of intersection that is created from the angle bisectors of a triangle (see the diagram below).



The INCENTER is equidistant from the sides of a triangle.

CENTROID

- The centroid is the point of intersection that is created from the medians of a triangle (see the diagram below).



If comparing
whole
median to
part of
median,
use:

The CENTROID is two-thirds
the distance from each vertex
to the midpoint of the
opposite side.

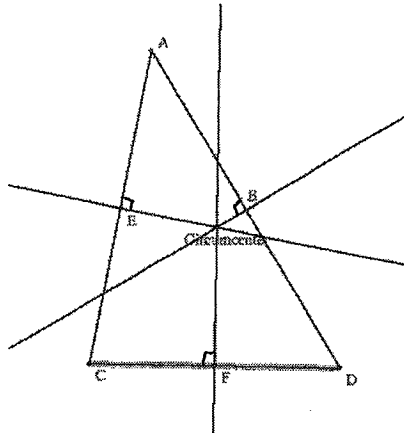
$$\rightarrow \text{Ex.} \rightarrow \overline{AP} = \frac{2}{3} \overline{AD} \text{ and } \overline{PD} = \frac{1}{3} \overline{AD}$$

$$\text{OR } 2:1 \text{ ratio Ex.} \rightarrow \frac{AP}{PD} = \frac{2}{1}$$

If comparing the parts, use: \rightarrow

CIRCUMCENTER

- The circumcenter is the point of intersection that is created from the perpendicular bisectors of a triangle (see the diagram below).



The CIRCUMCENTER is equidistant from the vertices of the triangle.

