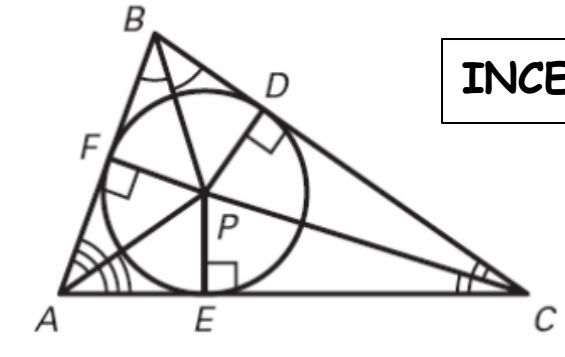
Points of Concurrency – Tips for the Project

- Orthocenter can lie inside and outside of a triangle.
- Incenter always lies inside the triangle.
- Centroid always lies inside the triangle. Also note that this is the point of balance for the triangle.
- Circumcenter can lie inside the triangle, on the triangle, or outside the triangle.
- Anything that involves an altitude may lie outside of the triangle.

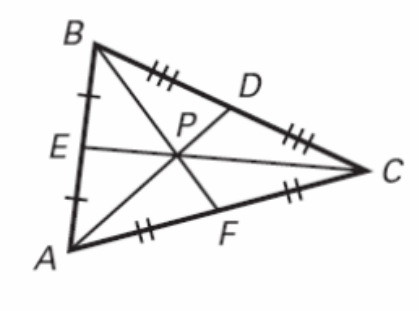
Helpful Theorems

- Concurrency of Angle Bisectors of a Triangle – The angle bisectors of a triangle intersect at a point that is equidistant from the sides of the triangle. PD = PE = PF



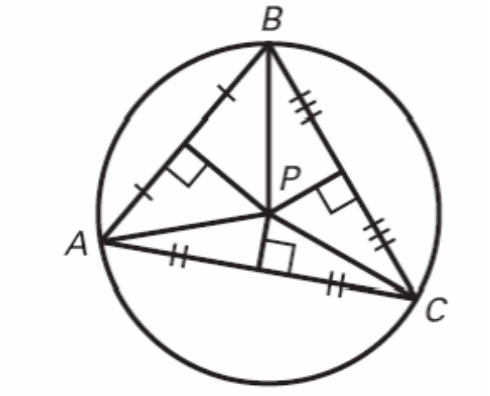
INCENTER

- Concurrency of Medians of a Triangle – The medians of a triangle intersect at a point that is two thirds of the distance from each vertex to the midpoint of the opposite side. If P is the centroid of triangle ABC, then AP= $\frac{2}{3}$AD, BP = $\frac{2}{3}$BF, and CP = $\frac{2}{3}$CE.



CENTROID

- Concurrency of Perpendicular Bisectors of a Triangle – The perpendicular bisectors of triangle intersect at a point that is equidistant from the vertices of the triangle. PA = PB = PC



CIRCUMCENTER