Geometry
Unit 5 Day 3

Name______________

Set-Up: Find the Sketchpad file "Concurrent Lines of Triangles" on the M drive in the folder specified by your teacher.

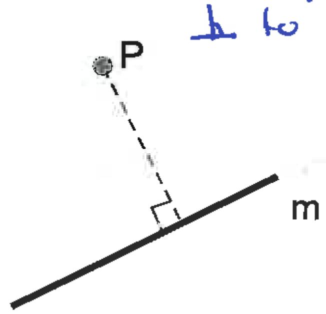
COPY and **PASTE** a copy to your H drive or to the C drive of the computer you are working on.

IMPORTANT: DO NOT ALTER THE ORIGINAL FILE FOUND ON THE M DRIVE!

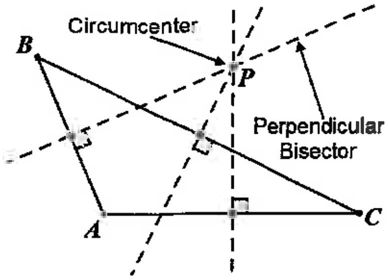
Follow the Directions Given in the Sketch!

Definitions: (Record these definitions in this space)

1. Conjecture: guess based on observation.
2. Angle Bisector: ÷ an angle into 2 ≅ ∠'s.
3. Perpendicular Bisector: passes through a midpt at a right angle.
4. Median of a Δ: goes from a vertex to the midpt of the opposite side
5. Altitude of a Δ: goes from a vertex ⊥ to the opposite side.
6. Concurrent Lines: 3 or more lines that intersect at a point.
7. Point of Concurrency: the point where 3 or more lines intersect.
8. Distance from a Point to a Line: length of the segment from the pt. ⊥ to the line.



Circumcenter of a Triangle: The point of concurrence of the $\perp$ bisectors of the sides.

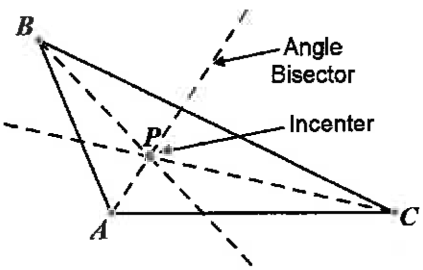


Measures: BP = 3.2 CP = 3.2 AP= 3.2

Conjecture: the distance from the circumcenter to each vertex is equal.

FUN FACT: P is the center of the smallest circle that can be drawn around the Δ.

Incenter of a Triangle: The point of concurrence of the angle bisectors .

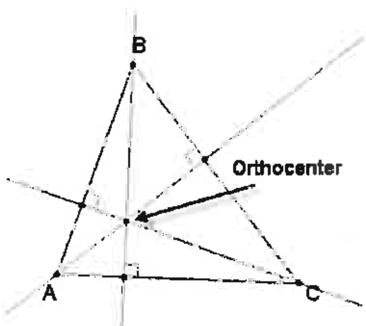


Measures: P to $\overline{AB}$ = 1.5 P to $\overline{BC}$ = 1.5 P to $\overline{AC}$ = 1.5

Conjecture: the distance from the incenter to each side of the Δ is equal.

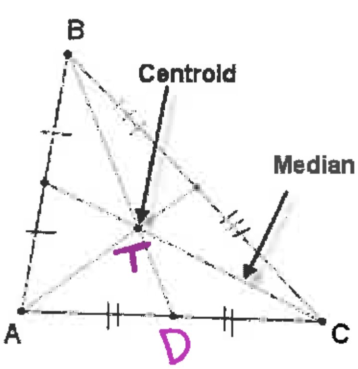
FUN FACT: P is the center of the largest circle that can be drawn inside the Δ.

Orthocenter of a Triangle: The point of concurrence of the altitudes. .



no conjecture.

Centroid of a Triangle: The point of concurrence of the medians. .



Measures: BT = 4.2 TD = 2.1 $\frac{BT}{TD} = \frac{4.2}{2.1} = \frac{2}{1}$

Conjecture:

"A Centroid divides a median *of a triangle into 2 segments whose ratio is* 2 : 1 *."*

Wrap-Up:

In an Isosceles triangle, the Incenter, Circumcenter, Orthocenter, & Centroid are Collinear.

In an Equilateral triangle, the Incenter, Circumcenter, Orthocenter, & Centroid are all the same point.

Still Wrapping Up:

In the table give the location of each point in relation to each triangle (Inside, Outside, or On)

	Acute Triangle	Obtuse Triangle	Right Triangle
Circumcenter	In	out	On
Incenter	In	In	In
Orthocenter	In	out	On
Centroid	In	In	In

And Finally…

Complete this table:

	Point of Concurrence	Conjecture (Special Relationship)
⊥ Bisectors	Circumcenter	equidistant to the verticies.
∠ Bisectors	Incenter	equidistant to the sides.
Altitudes	Orthocenter	none.
Meadians	Centroid	Divides median into a 2:1 ratio.