H.Geometry – Chapter 3 – Definition Sheet
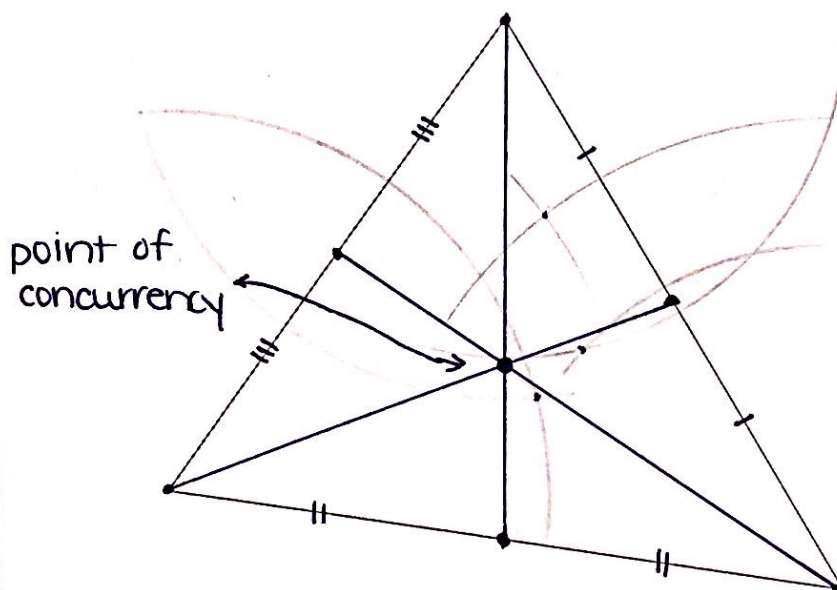
Section 3.9

Name	Concurrency of:	Special Properties:
Incenter	angle bisectors	center of inscribed circle
Circumcenter	⊥ bisectors	center of circum-scribed circle
Orthocenter	altitudes	?
?	Medians	?

Investigation

Are Medians Concurrent???

yes

point of concurrency

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Median Concurrency Conjecture	The three ___medians___ of a triangle are ___concurrent___.
___centroid___ of a triangle	The point of concurrency of the ___medians___ of a triangle.
___centroid___ Conjecture	The ___centroid___ of a triangle divides each ___median___ into two parts, so that the distance from the centroid to the vertex is ___twice___ the distance to the midpoint. IN OTHER WORDS: (1) The distance from the centroid to the vertex is $\frac{2}{3}$ of the medians length. (2) The distance from the centroid to the midpoint is ___$1/3$___ of the medians length.

Section 3.8 (Exploration)	
___center of gravity___	• The "balancing point" of a figure • In physics, it's the imaginary point where an object's total weight is concentrated. • Questions: Where is the center of gravity of a triangle? centroid Where is a human's center of gravity? belly button
Center of Gravity Conjecture	The ___centroid___ of a triangle is the center of gravity of the triangular region
___Euler Line___	A special line that contains 3 out of the 4 points of concurrency.
___Euler Line___ conjecture	The ___centroid___, the ___orthocenter___, and the ___circumcenter___ are the three points of concurrency that always lie on the Euler Line.

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<u>Euler Segment</u>	Segment on Euler Line created by the three points of concurrency.
<u>Euler Segment</u> conjecture	The ___<u>centroid</u>___ divides the Euler segment into two parts, so that the smaller part is ___<u>half as long as</u>___ the longer part. IN OTHER WORDS: The longer part is <u>twice</u> as big as the <u>smaller</u> part.

Points of Concurrency in Triangles

Point Name	Concurrency of:	Special Properties	On Euler Line?
Incenter	angle bisectors	center of inscribed circle	no
Circumcenter	⊥ bisectors	center of circumscribed circle	yes
Orthocenter	altitudes	—	yes
Centroid	medians	center of gravity	yes

median divided into $\frac{2}{3}$ and $\frac{1}{3}$