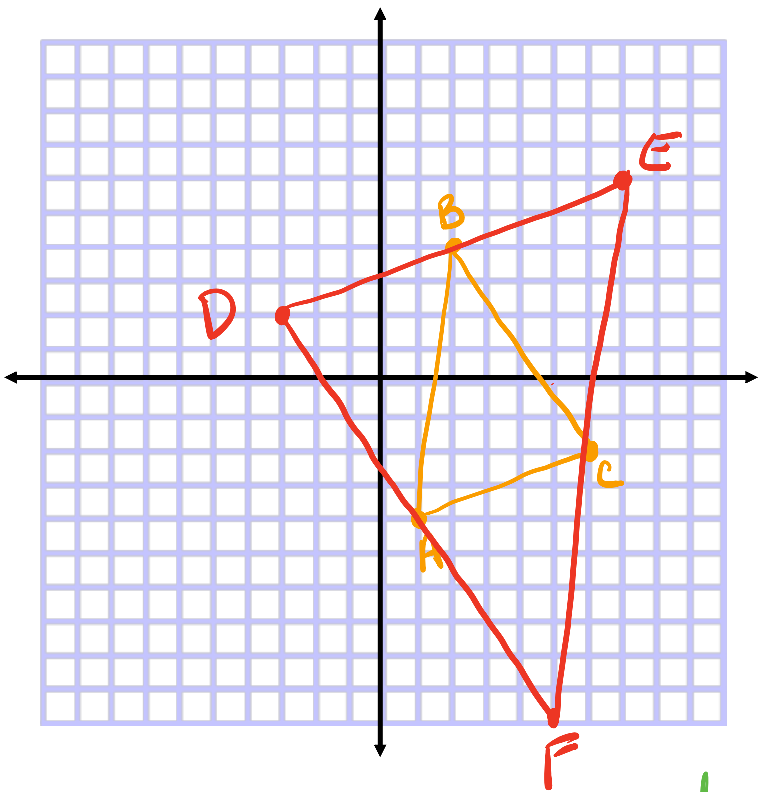
DO NOW:

Find the endpoints of a triangle with the following midpoints.

A (1, -4)
B (2, 4)
C (6, -2)



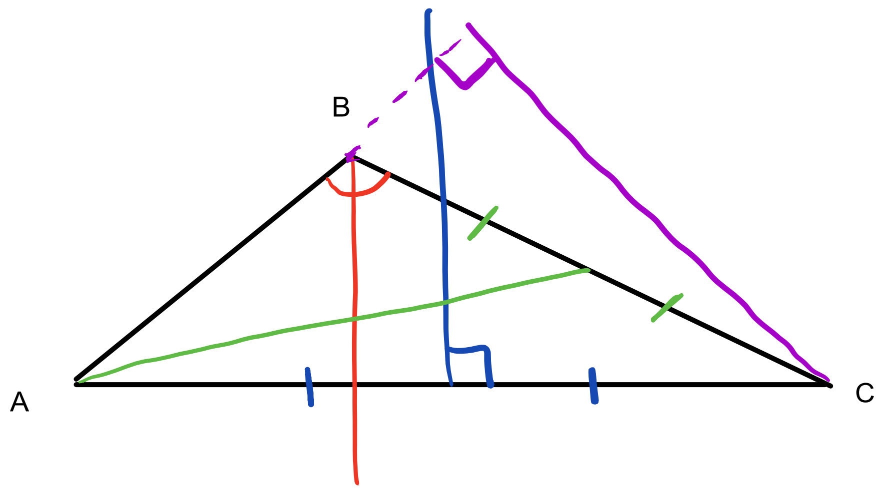
m of AC = $\frac{2}{5}$

m of BC = $-\frac{6}{4}$

D(-3, 2)
E(7, 6)
F(5, -10)

* Write the coordinates *

Review:



a.) Draw an angle bisector for angle B

b.) Draw a perpendicular bisector of side AC

c.) Draw a median from angle A to side BC

d.) Draw an altitude from angle C to side AB

Unit 8 Day 2:
Segments of Triangles
Points of Concurrency
(6.1-6.4)

Find your 2 o'clock partner and find a seat :)

Today's I Can Statements:

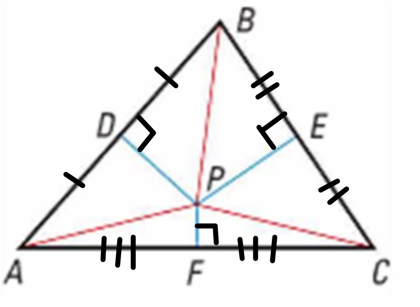
ST-1: I can identify different segments in a triangle.
ST-3: I can use coordinates to prove geometric theorems algebraically.

Point of Concurrency: The point where 2 or more lines, rays, or segments intersect.

CIRCUMCENTER

The perpendicular bisectors of a triangle intersect at a point that is equidistant from the vertices of the triangle.

If $\overline{PD}$, $\overline{PE}$, and $\overline{PF}$ are perpendicular bisectors, then $PA = PB = PC$.



http://www.mathopenref.com/trianglecircumcenter.html

Example

USING CONCURRENCY **In the diagram, the perpendicular bisectors of $\triangle ABC$ meet at point G and are shown in blue. Find the indicated measure.**

13. Find AG. 25

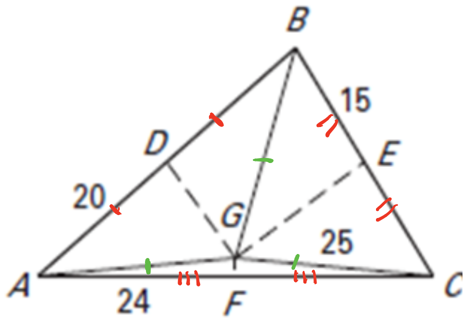
14. Find BD. 20

15. Find CF. 24

16. Find BG. 25

17. Find CE. 15

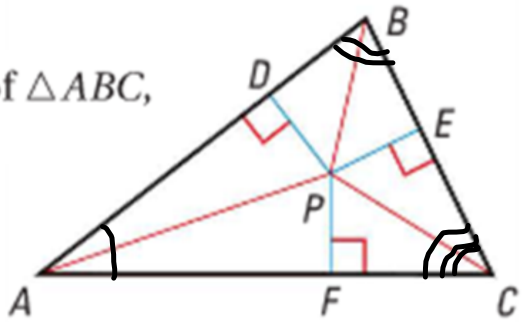
18. Find AC. 48



INCENTER

The angle bisectors of a triangle intersect at a point that is equidistant from the sides of the triangle.

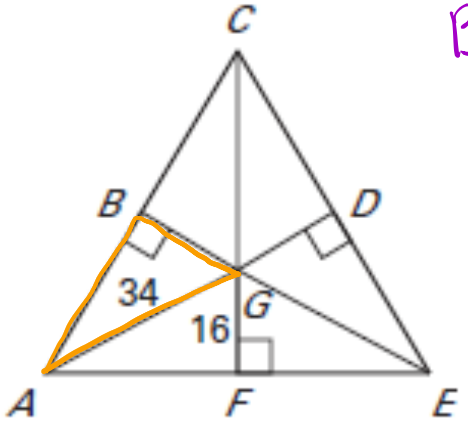
If $\overline{AP}$, $\overline{BP}$, and $\overline{CP}$ are angle bisectors of $\triangle ABC$, then $PD = PE = PF$.



http://www.mathopenref.com/triangleincenter.html

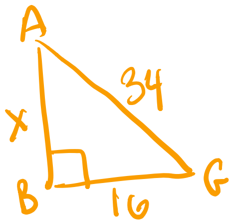
Example

a.) Point G is the incenter of $\triangle ACE$.
Find BG.



$\overline{BG} = 16$

b.) Find AB.



$16^2 + x^2 = 34^2$

$x^2 = 34^2 - 16^2$

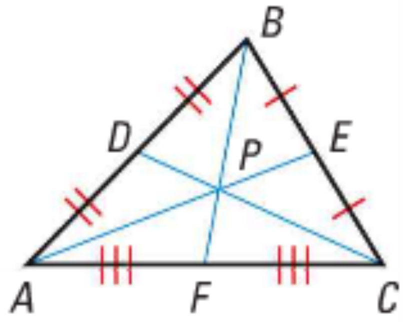
$\sqrt{x^2} = \sqrt{900}$

$x = 30 \longrightarrow \overline{AB} = 30$

CENTROID

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.

The medians of $\triangle ABC$ meet at P and $AP = \frac{2}{3}AE$, $BP = \frac{2}{3}BF$, and $CP = \frac{2}{3}CD$.



http://www.mathopenref.com/trianglecentroid.html

Example

G is the centroid of $\triangle ABC$, $AD = 8$, $AG = 10$, and $CD = 18$. Find the length of the segment.

1. $\overline{BD}$ 8

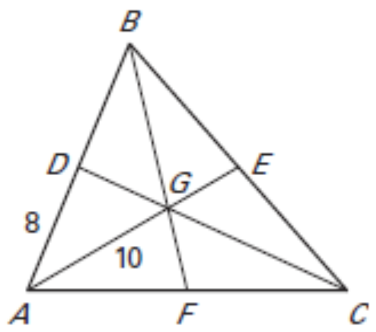
2. $\overline{AB}$ 16

3. $\overline{EG}$ 5

4. $\overline{AE}$ 15

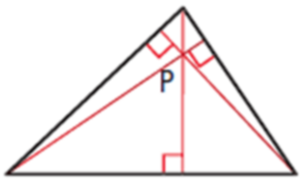
5. $\overline{CG}$ 12

6. $\overline{DG}$ 6



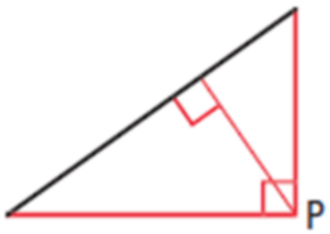
ORTHOCENTER

The point of concurrency of the 3 altitudes of the triangle (where the three altitudes intersect)



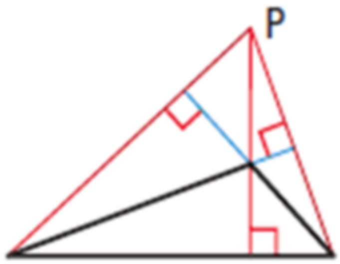
Acute triangle

P is inside triangle



Right triangle

P is on triangle



Obtuse triangle

P is outside triangle

http://www.mathopenref.com/triangleorthocenter.html

Tonight's Assignment:
Page 315 #3-6,11-14,29-32
Page 324 #3-14, 31-36

Remember:
Segments of Triangles Quest will be:
Friday 1/31 Monday 2/3