Do Now: (no packet)

Define:

Point of Concurrency- pt of intersection.

Circumcenter- where all the $\perp$ bisectors meet.

Incenter- where all the angle bisectors meet.

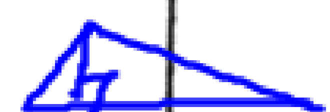
5.4 Use Medians and Altitudes

VOCABULARY

Median of a triangle a segment from the vertex to the midpt of the other side.

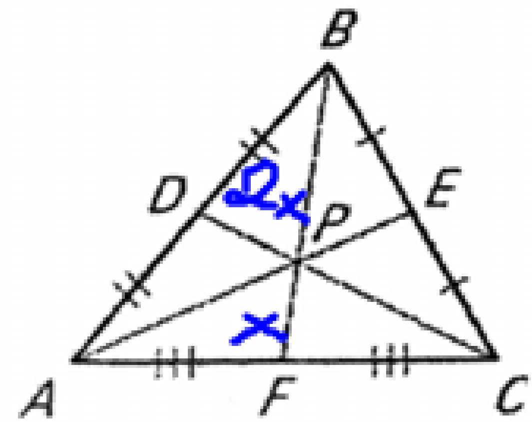
Centroid where all 3 medians of a triangle intersect.

Altitude of a triangle a perpendicular segment from the vertex to the opposite side.



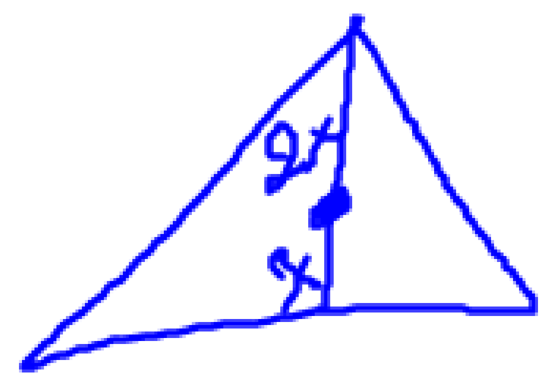
Orthocenter where all 3 altutudes intersect.

THEOREM 5.8: 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.

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.



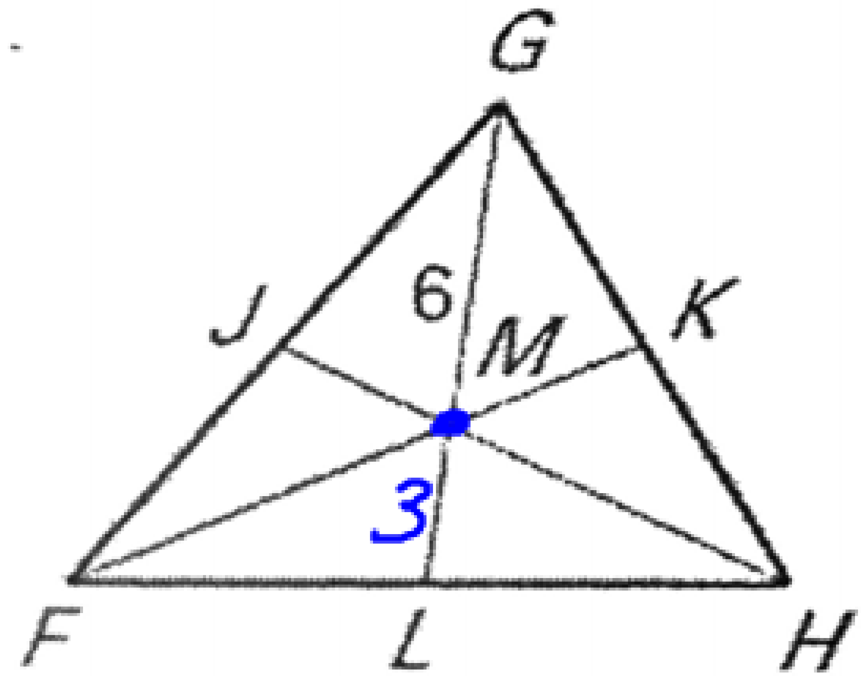
Example 1 Use the centroid of a triangle

In $\triangle FGH$, M is the centroid and $GM = 6$. Find ML and GL.

$Gm = 2ML$

$6 = 2(x)$

$\boxed{x = 3}$

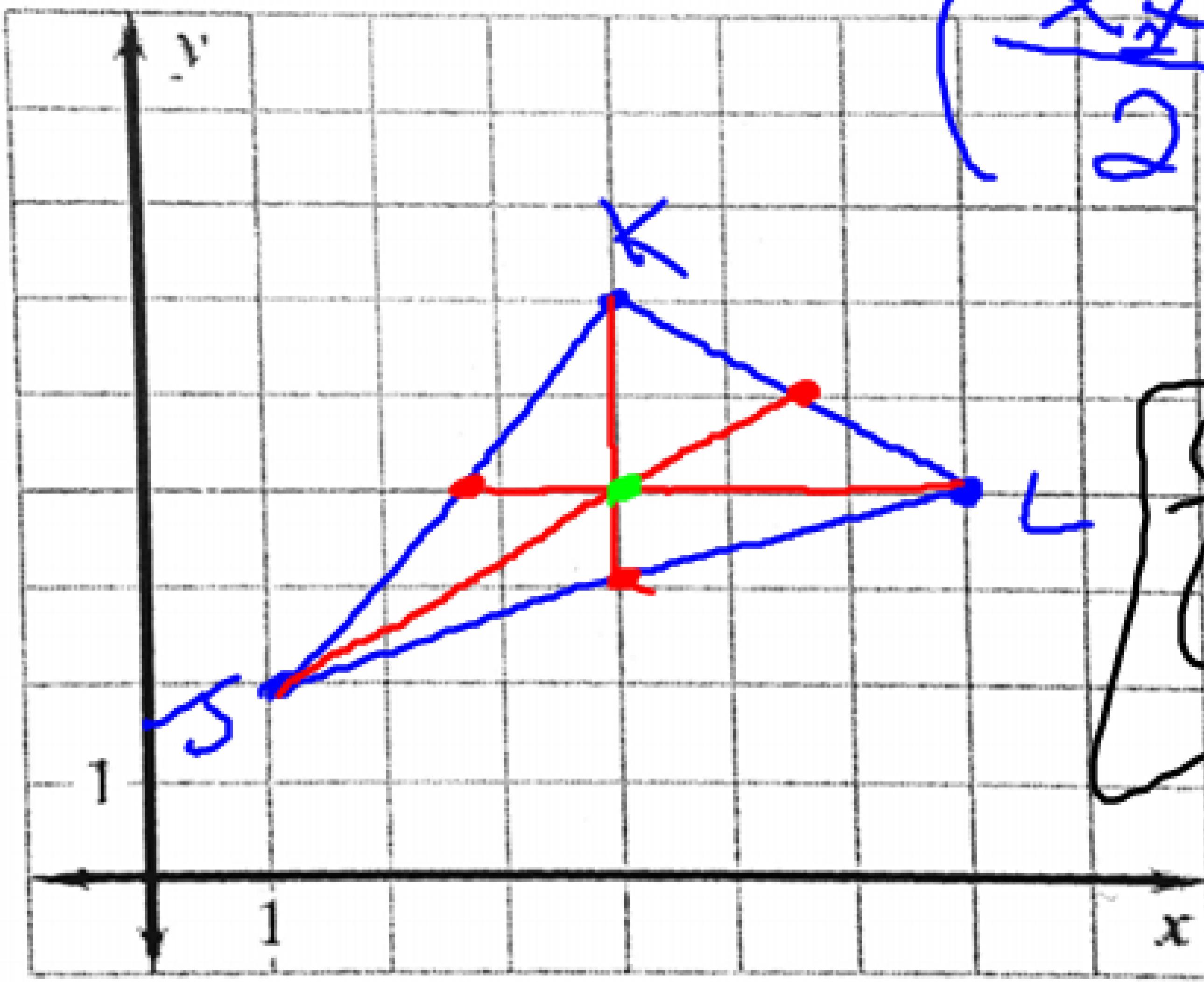


$GL = 9$

Example 2 *Find the centroid of a triangle*

The vertices of $\triangle JKL$ are $J(1, 2)$, $K(4, 6)$, and $L(7, 4)$. Find the coordinates of the centroid P of $\triangle JKL$.

$$\left(\frac{x_2+x_1}{2}, \frac{y_2+y_1}{2}\right)$$

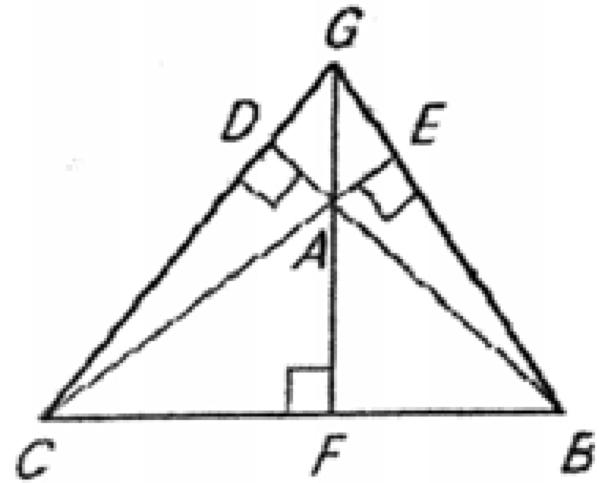


Centroid
$(4, 4)$

THEOREM 5.9: CONCURRENCY OF ALTITUDES OF A TRIANGLE

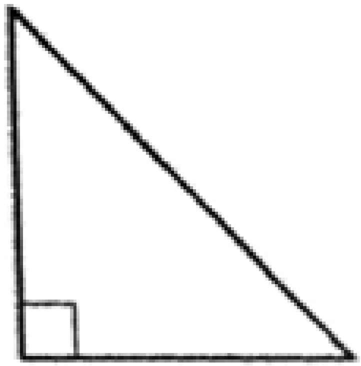
The lines containing the altitudes of a triangle are Concurrent

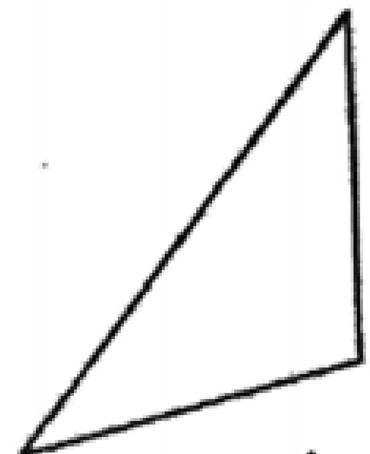
The lines containing $\overline{AF}$, $\overline{BE}$, and $\overline{CD}$ meet at G.



Example 3

Find the orthocenter *P* in the triangle.

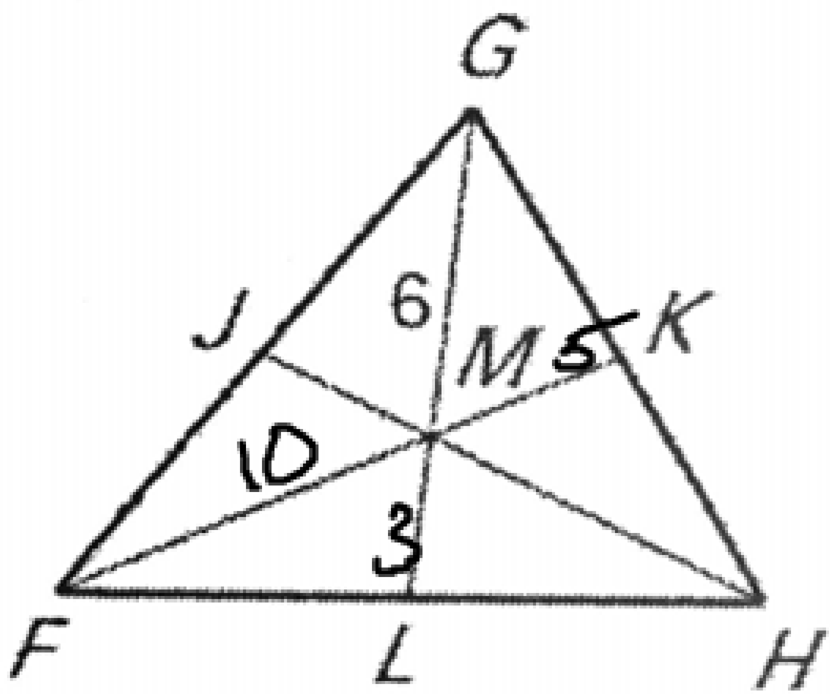
a. 

b. 

Of a right, - ON the triangle
acute, - inside the triangle
& obtuse outside the △
Triangle

Checkpoint

1. In Example 1, suppose $FM = 10$. Find MK and FK.



$FM = 2(MK)$

$\boxed{MK = 5}$

$FM + MK = FK$

$\boxed{FK = 15}$

Define:

Orthocenter:

Incenter:

Circumcenter:

Centroid: