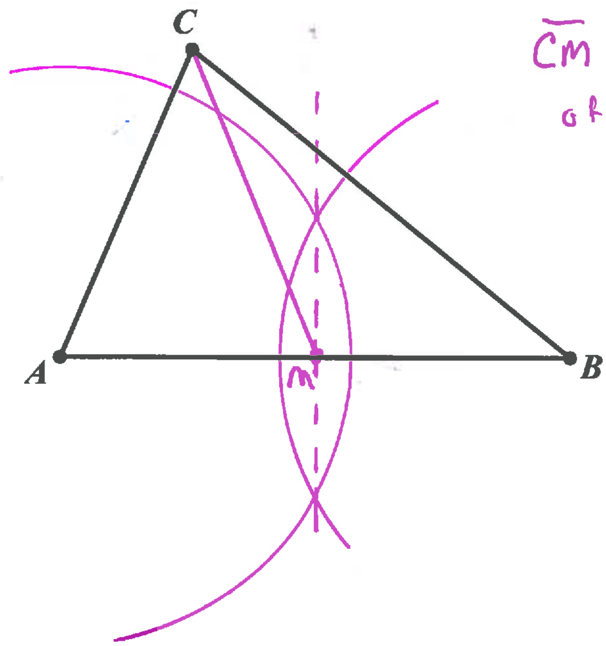
Geometry R – Mr. Bo
Unit 6 – Day 2 Notes

Name notes.
Date________________

Medians & Centroids
Altitudes & Orthocenters

Median of a Triangle – A segment drawn from the vertex of a triangle to the midpoint of the opposite side.

1. Construct the median of ΔABC by drawing a segment from C to the midpoint of $\overline{AB}$.



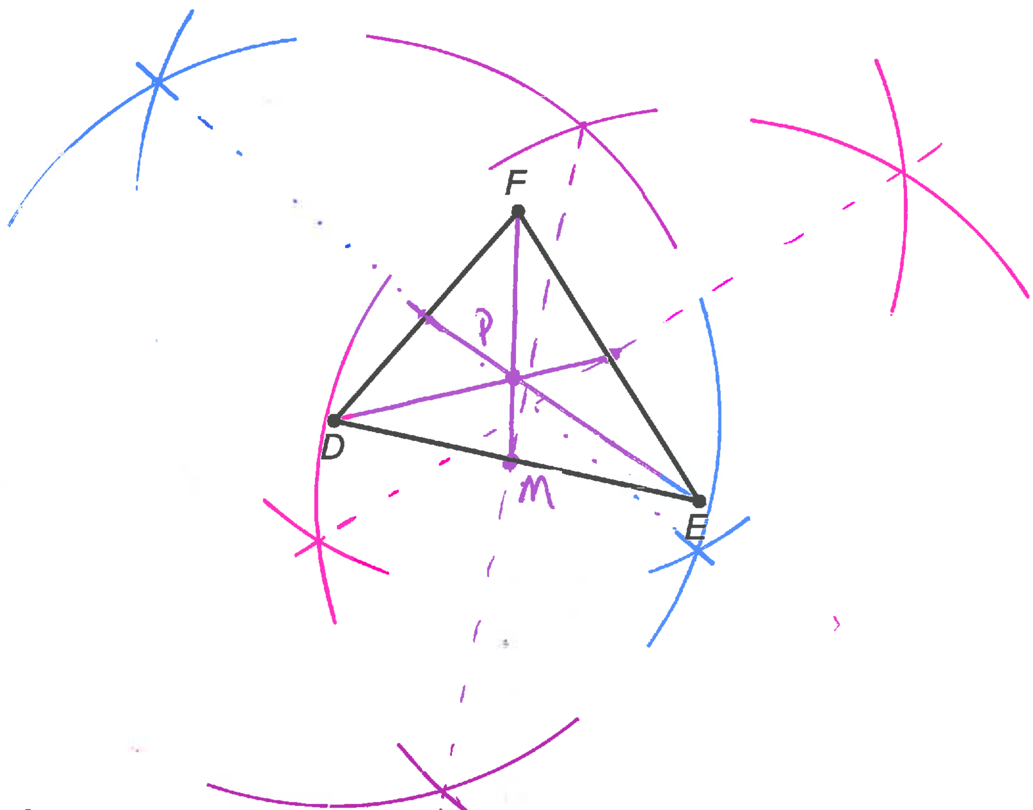
$\overline{CM}$ is a median of ΔABC.

Notice:

A triangle **Median** is also a Segment bisector, so the "Rain-Bo connection" can be used.

Centroid– The *point of concurrence* of the 3 **Medians** of a triangle.

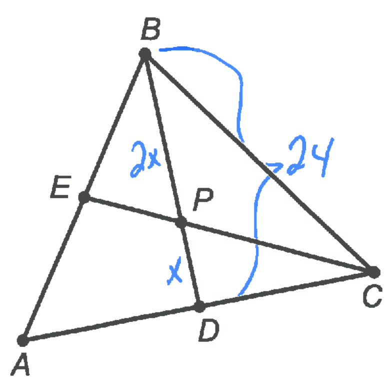
2. Construct the Median for each side of the triangle. Label the **Centroid** P.
   (Be careful and precise or they may not intersect).



The Centroid Theorem – The **Centroid** divides a median into 2 parts such that the parts are in a 2:1 ratio. What is this theorem saying is true in your construction above, in other words, what does "2:1 ratio" mean? *(Write and equality statement)*

$FP = 2(PM)$ $\overline{FP}$ is twice as long as $\overline{PM}$.

3. Apply the Centroid Theorem: In ΔABC, $\overline{BD}$ and $\overline{CE}$ are medians. If BD = 24, find the lengths of BP and PD.



$\overline{BP}$ is twice as long as $\overline{PD}$.

$BP + PD = BD$ Seg Addition

$2x + x = 24$

$3x = 24$

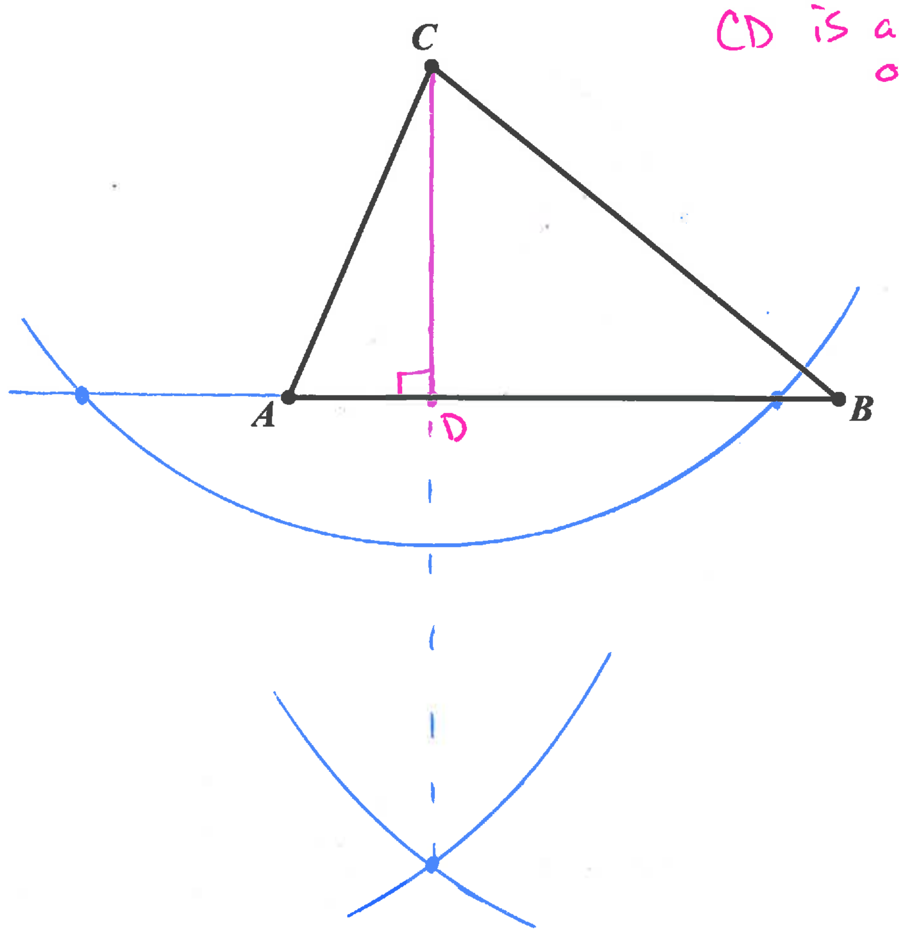
$x = 8$

$BP = 2(8) = 16$ units

$PD = 8$ units.

Altitude of a Triangle – A segment drawn from a vertex perpendicular to the line containing the opposite side.

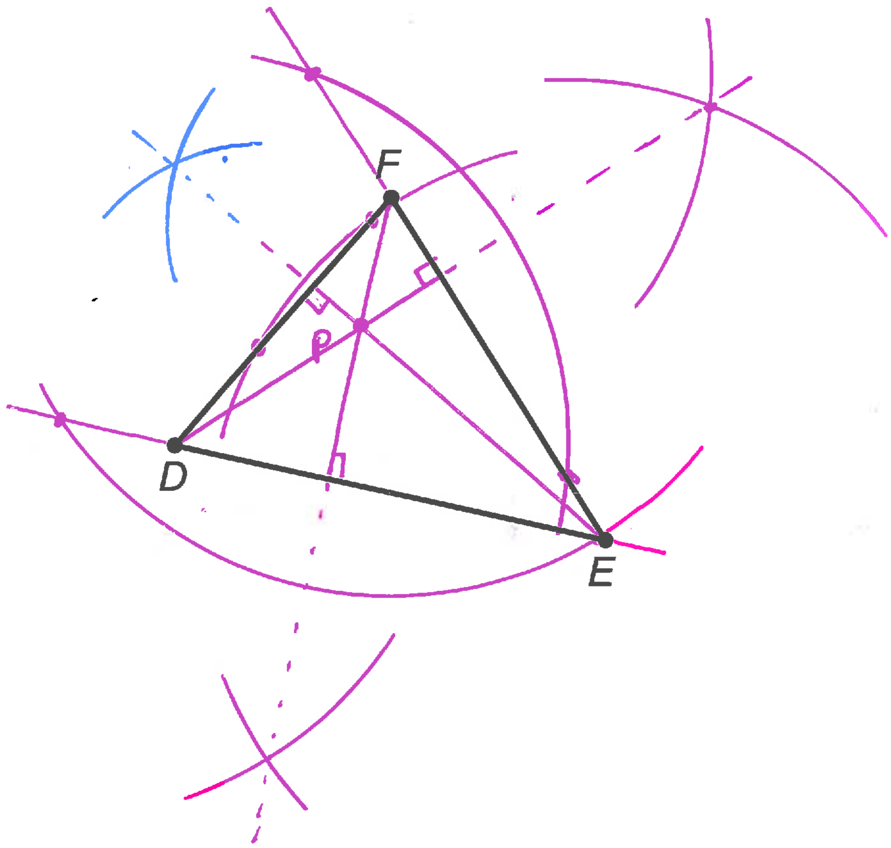
4. Construct an altitude of ΔABC by constructing a line through C perpendicular to $\overline{AB}$.



$\overline{CD}$ is an Altitude of ΔABC.

Orthocenter – The *point of concurrence* of the 3 **Altitudes** of a triangle.

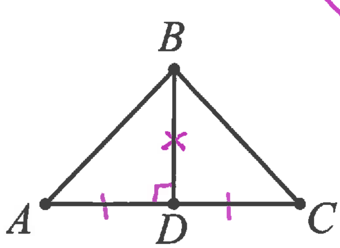
5. Construct the Altitudes for each side of the triangle. Label the **Orthocenter** P.
(Be careful and precise or they may not intersect).



6. Given: $\overline{BD}$ is an altitude of ΔABC

$\overline{AD} \cong \overline{CD}$

Prove: $\angle A \cong \angle C$



$\overline{BD} \perp \overline{AC}$

Alt. ⊥ to side of Δ.

$\angle ABD$ Rt
$\angle BDC$ Rt

⊥ lines make Rt ∠'s

$\angle ABD \cong \angle CBD$

Rt ∠'s are ≅

$\overline{BD} \cong \overline{BD}$

Reflexive

$\Delta ABD \cong \Delta CBD$

SAS

$\angle A \cong \angle C$

CPCTC