Name :_____

5.1 Perpendicular and Angle Bisectors

Example 1:

Given $\overline{AD}$ is the perpendicular bisector of $\overline{BC}$, AB=12.4, AC=12.4, and DC=12.6, find BC.

12.6×2

$BC = 25.2$

12.4   12.4

B   C

12.6   D   12.6
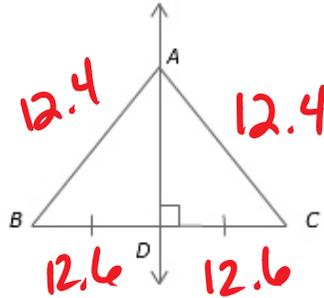
Example 2:

Given $m\angle TSV = 32°$, find $m\angle UST$.

$32 \times 2 = 64$

$\angle UST = 64°$

32°
32°
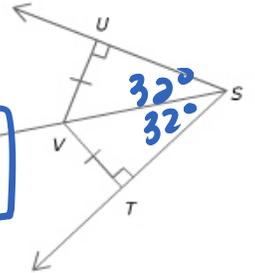
Example 3:

Given $\overline{AD}$ is the ⊥ bisector of $\overline{BC}$, BD= 3a -1

AB = 2a + 7, and AC = 6a – 21, identify AC.

$2a+7$ $6a-21$

B   C

$3a-1$ D
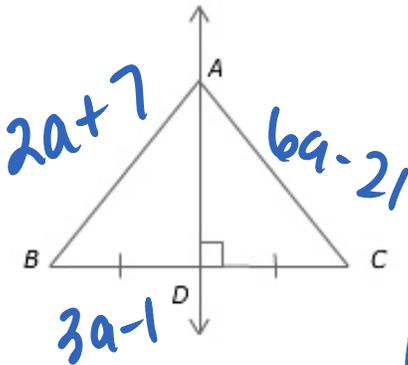
$2a+7 = 6a-21$

$28 = 4a$

$a = 7$

$\overline{AC} = 6 \cdot 7 - 21$

$\overline{AC} = 21$

Example 4:

Given $m\angle USV = (2x+17)°$ and

$m\angle VST = (5x-10)°$, find the $m\angle UVT$.

$2 \cdot 9 + 17 = 35$

$2x+17$
$5x-10$
$5 \cdot 9 - 10 = 35$

$2x+17 = 5x-10$

$27 = 3x$

$x = 9$

$55 \cdot 2$

55   35
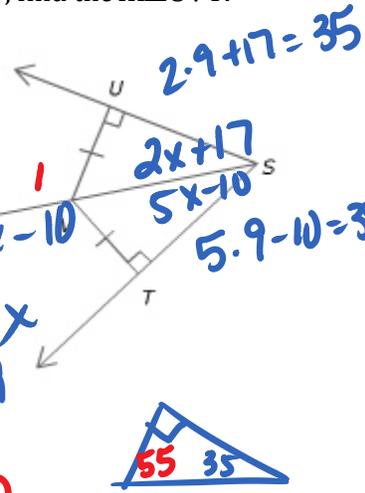
$\angle UVT = 110°$

5.3 Points of Concurrency
The point of concurrency is the point where three or more lines meet.

The **centroid** is formed by the __medians__ of the triangle. Another name for the centroid is the **center of gravity**.

Example 1: In ΔABC, AE = 12, DG = 7, and BG = 9. Find all possible side lengths.
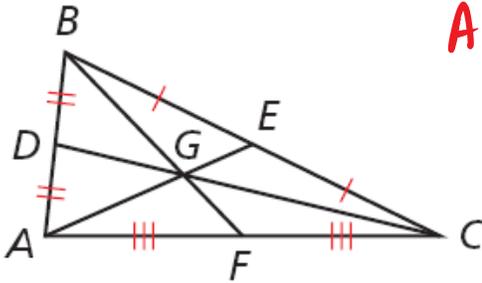
AE=12
AG = 8
GE = 4
DG = 7
GC = 14
DC = 21
BG = 9
GF = 4.5
BF = 13.5

Example 2: What is a median?
Draw a picture and explain in words.

Joins vertex to midpt. of opp. side
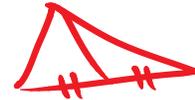
Example 3: What is an altitude?
Draw a picture and explain in words.

Joins vertex to opp. side @ 90° ∠.


5.4 Midsegment Theorem

Triangle Midsegment Theorem:

A **midsegment** of a triangle is __||__ to a side of the triangle, and its length is __½__ the length of that side.

Example 1: Use the diagram below to answer Examples 1-4.
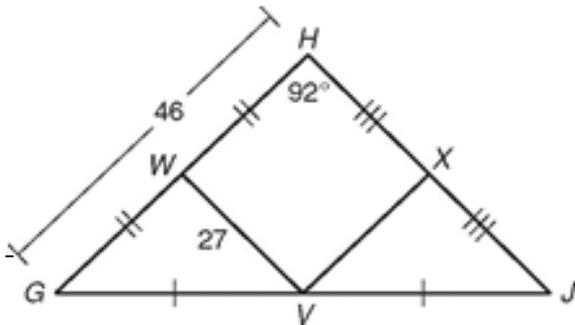
Example 1: VX= ½(46)=23

Example 2: HJ= 27(2) = 54

Example 3: m∠VXJ= 180-92= 88°

Example 4: XJ= 27

Angle-Side Relationships in △'s:

If two sides of a triangle are not congruent, then the angles across from those sides are _____ _____, and the larger angle is _____ the longer side.

Example 1: Name the angles in order from smallest to largest.
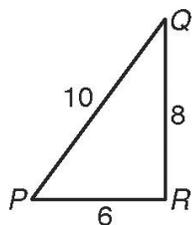
<Q, <P, <R

Example 2: Name the sides in order from smallest to largest.
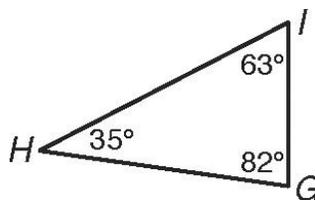
$\overline{IG}, \overline{HG}, \overline{IH}$

Triangle Inequality Theorem:

The sum of any two **side** lengths of a triangle is **more than** than the **biggest** side length.

Directions: For examples 1 and 2, tell whether a triangle can have sides with the given lengths. Explain.

Example 1:
8, 15, 25

$8 + 15 > 25$

$23 \not> 25$

Not a △

Example 2:
3, 10, 12

$3 + 10 > 12$

$13 > 12$

△ yes!

Example 3:
If a = 12 and b = 37, what are the possible lengths for side c?

$37 - 12 = 25$
$37 + 12 = 49$

$\boxed{25 < x < 49}$