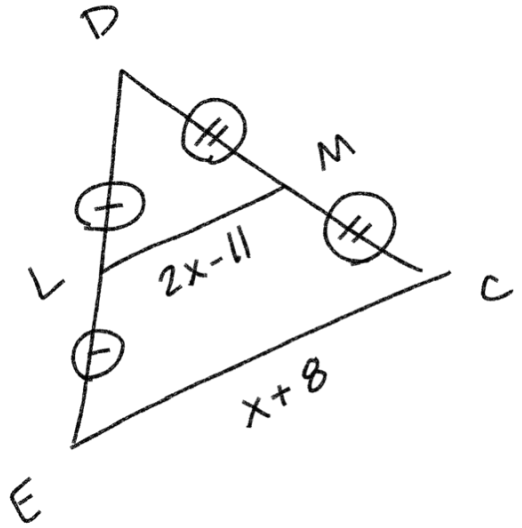
M-G Geometry Week 24 3/20

1.)



$\overline{LM}$ is a midsegment

midsegment = $\frac{1}{2}$ base

{ 2 midsegment = base }

$2(2x-11) = x+8$

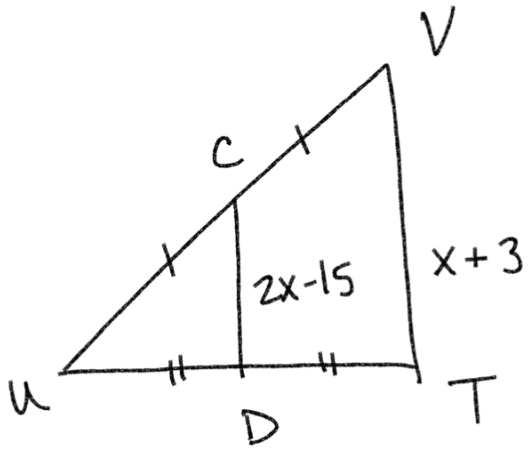
$4x - 22 = x + 8$
$\quad +22 \qquad +22$

$4x = x + 30$
$-x \quad -x$

$\frac{3x}{3} = \frac{30}{3}$

$\boxed{x = 10}$

2.)



$\overline{CD}$ is a midsegment

2 midsegment = base

$2(2x-15) = x+3$

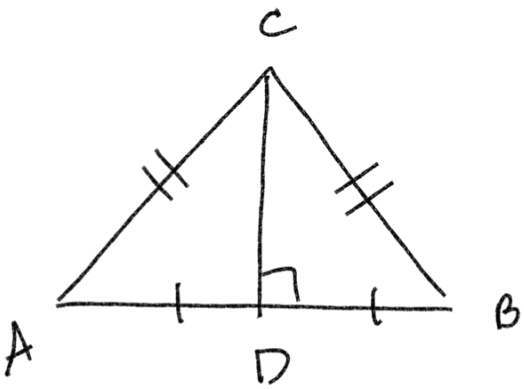
$4x - 30 = x + 3$
$-x \qquad -x$

$3x - 30 = 3$
$\quad +30 \quad +30$

$\frac{3x}{3} = \frac{33}{3}$

$\boxed{x = 11}$

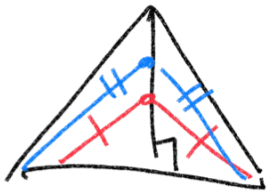
Perpendicular Bisector



$\overline{CD}$ is a perpendicular bisector

$\overline{AD} \cong \overline{DB}$

$\overline{AC} \cong \overline{CB}$



Distance Formula

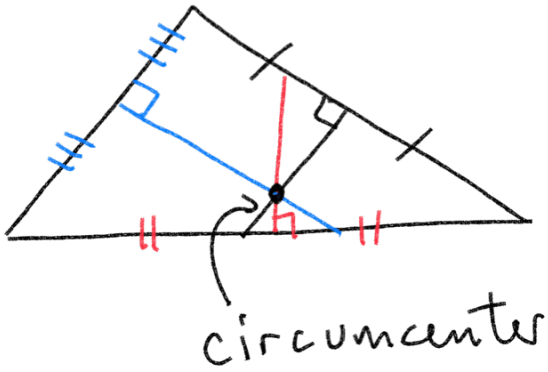
$(7,-2)$ $(-5,3)$

$$d = \sqrt{(x_2 - x_1)^2 + (y_2 - y_1)^2}$$

$$\sqrt{(7-(-5))^2 + (3-(-2))^2}$$

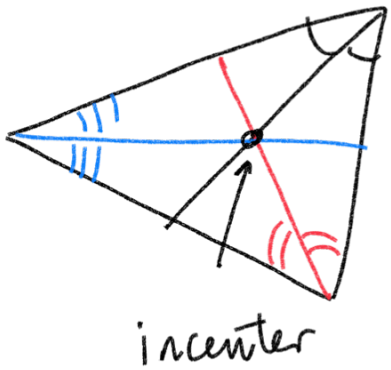
$$\sqrt{12^2 + 5^2}$$

$$\sqrt{144 + 25} = \sqrt{169} = \boxed{13}$$



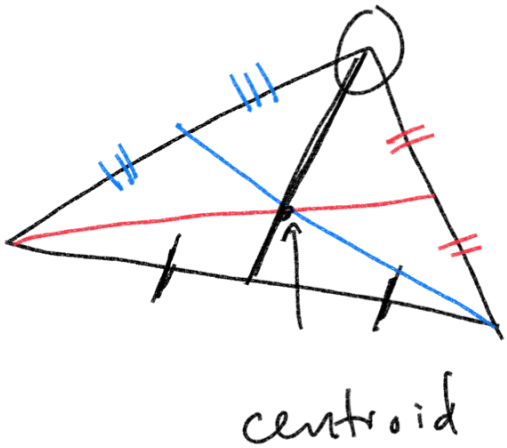
perpendicular bisector

- Divides segment in half.
- Forms a 90° angle



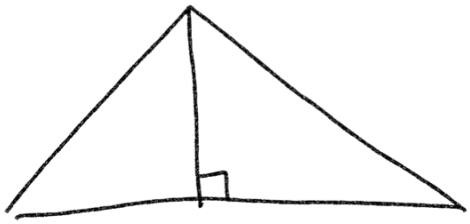
Angle Bisector

- Divide an angle into two equal pieces



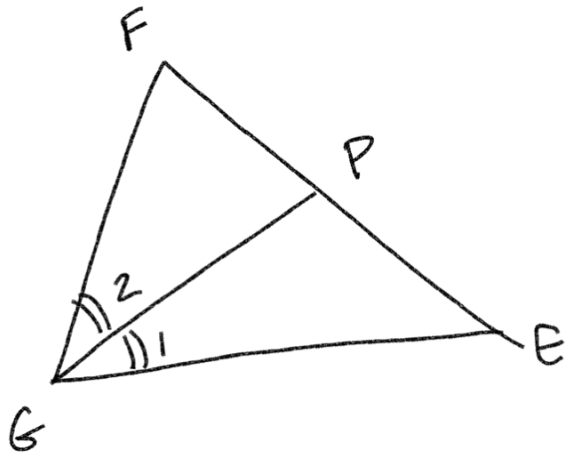
Median

- Divide opposite side into two equal pieces
- originates at a vertex, does <u>not</u> form a 90° angle



Altitude (height)

- from vertex to opposite side, forms a 90° angle



$\overline{GP}$ is an angle bisector

2 equal pieces

$\measuredangle 1 = 3x + 36$

$\measuredangle 2 = 2x + 48$

$\measuredangle 1 = \measuredangle 2$

$3x + 36 = 2x + 48$

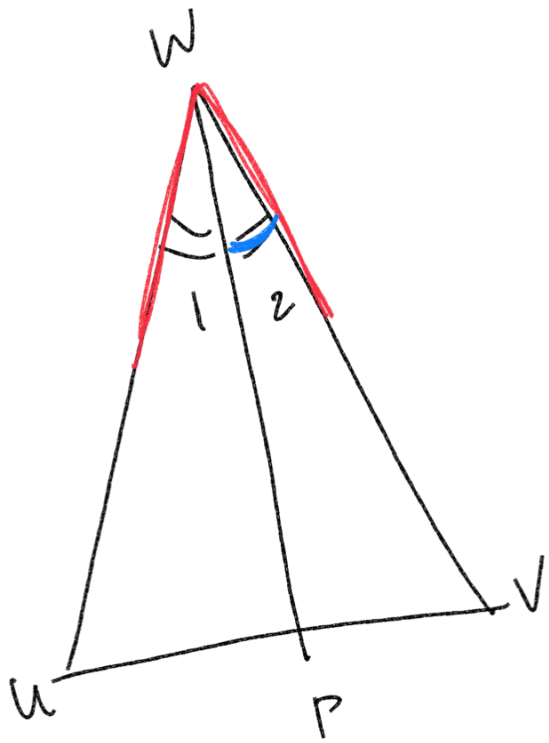
$-2x \qquad -2x$

$x + 36 = 48$

$-36 \quad -36$

$\boxed{x = 12}$

2.)



$\overline{WP}$ is an angle bisector

$\measuredangle 2 = 7x - 1$

$\measuredangle UWV = \boxed{12x + 4}$

$\measuredangle 1 = \measuredangle 2$

Angle Add Post

$\measuredangle UWV = \measuredangle 1 + \measuredangle 2$

substitution

$\measuredangle UWV = \measuredangle 2 + \measuredangle 2$

$\measuredangle UWV = 2(\measuredangle 2)$

$12x + 4 = 2(7x - 1)$

$12x + 4 = 14x - 2$

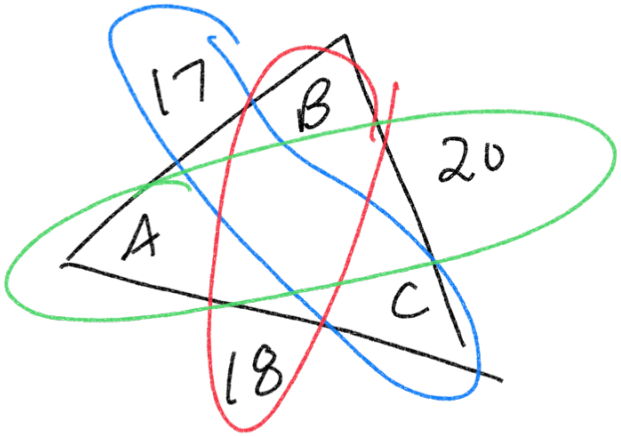
$-12x \qquad -12x$

$4 = 2x - 2$

$+2 \qquad +2$

$\frac{6}{2} = \frac{2x}{2}$

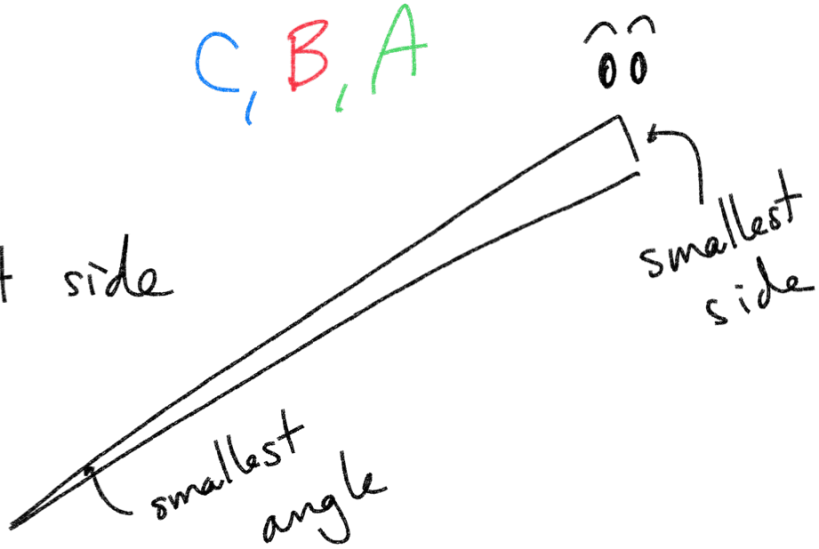
$\boxed{x = 3}$

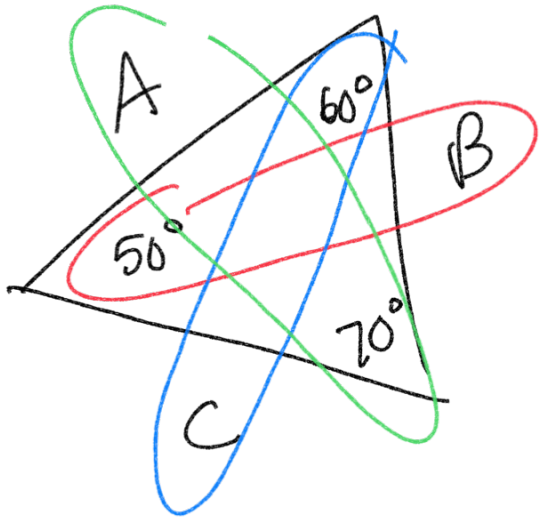


Smallest Angle → Largest angle

C, B, A

smallest angle is opposite the smallest side





Order the sides from least to greatest

B, C, A

The sum of any two sides of a triangle is greater than any one side.

3, 8, 10 $\boxed{\text{Triangle}}$

$3+8=11$ $11>10$ ✓

$8+10=18$ $18>3$ ✓

$3+10=13$ $13>8$ ✓

3, 8, 12 Not triangle

$8+12=20$ $20>3$ ✓

$12+3=15$ $15>8$ ✓

$3+8=11$ $\cancel{11>12}$

Can each of the following be a triangle?

1.) 8, 17, 24 $8+17=25$ $25>24$ ✓ triangle

2.) 9, 13, 22 $9+13=22$ $\cancel{22>22}$ not triangle

3.) 12, 8, 21 $12+8=20$ $\cancel{20>21}$ not triangle

4.) 15, 18, 4 $15+4=19$ $19>18$ ✓ triangle