

\overline{LM} is midsegment

$$2 \text{ midseg} = \text{base}$$

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

$$4x - 22 = x + 8$$

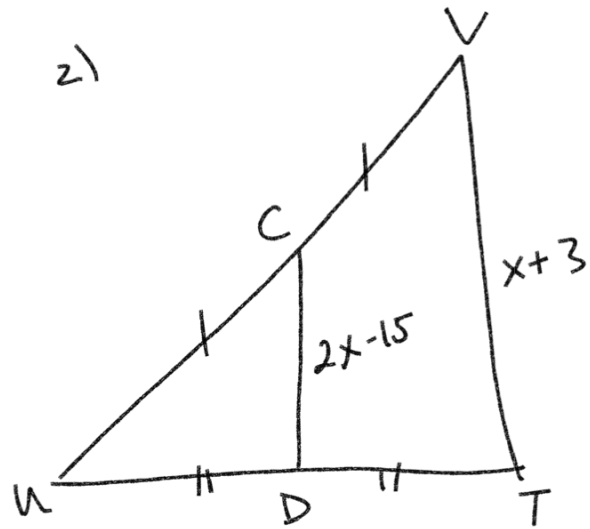
$$\begin{array}{r} -8 \quad -8 \end{array}$$

$$4x - 30 = x$$

$$\begin{array}{r} -4x \quad -4x \end{array}$$

$$\begin{array}{r} -30 = -3x \\ -3 \quad -3 \end{array}$$

$$\boxed{x=10}$$



\overline{CD} is midsegment

$$2 \left(\frac{1}{2} \text{ base} = \text{midseg} \right)$$

$$\text{base} = 2 \text{ midseg}$$

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

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

$$\begin{array}{r} -3 \quad -3 \end{array}$$

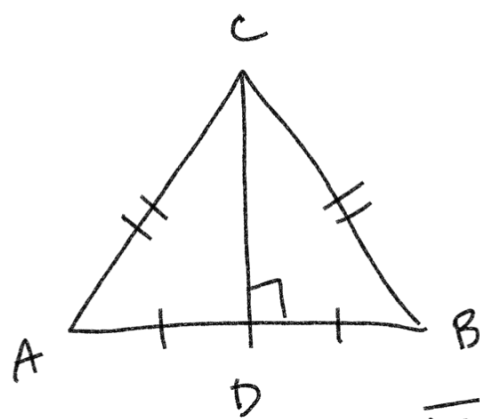
$$x = 4x - 33$$

$$\begin{array}{r} -4x \quad -4x \end{array}$$

$$\begin{array}{r} -3x = -33 \\ -3 \quad -3 \end{array}$$

$$\boxed{x=11}$$

Perpendicular Bisector



\overline{CD} perpendicular bisector

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

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

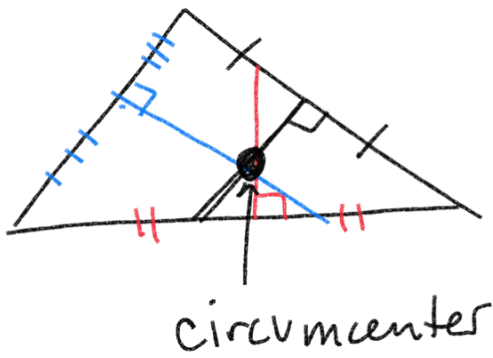


Distance Formula

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

$$d = \sqrt{(x_2 - x_1)^2 + (y_2 - y_1)^2}$$
$$\sqrt{(-5 - 7)^2 + (3 - (-2))^2}$$
$$\sqrt{(-12)^2 + 5^2} = \sqrt{144 + 25} = \sqrt{169}$$

13

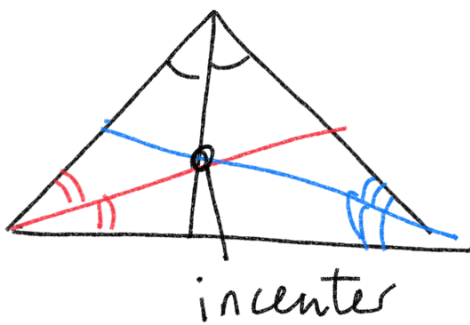


Perpendicular Bisector

- Divides opposite segment in half.
- forms a 90° angle

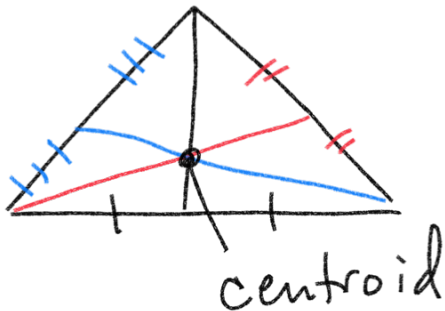
Angle Bisector

Divides angle into two equal pieces



Median

- Divides opposite segment into two equal pieces
- Originates at vertex, does not form a 90° angle.

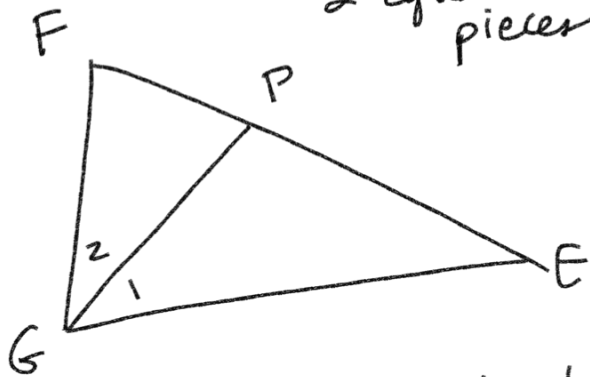


Altitude (Height)

- from vertex to the opposite side forming a 90° angle.



Angle Bisectors
2 equal pieces



\overline{GP} is an angle bisector

$$\angle 1 = 3x + 36$$

$$\angle 2 = 2x + 48$$

$$\angle 1 = \angle 2$$

$$\begin{array}{r} \downarrow \qquad \qquad \downarrow \\ 3x + 36 = 2x + 48 \\ -36 \qquad \qquad -36 \end{array}$$

$$\begin{array}{r} 3x = 2x + 12 \\ -2x \quad -2x \end{array}$$

$$\boxed{x = 12}$$

$$\angle 2 = 7x - 1$$

$$\angle UWV = 12x + 4$$

$$2(\angle 2) = \angle UWV$$

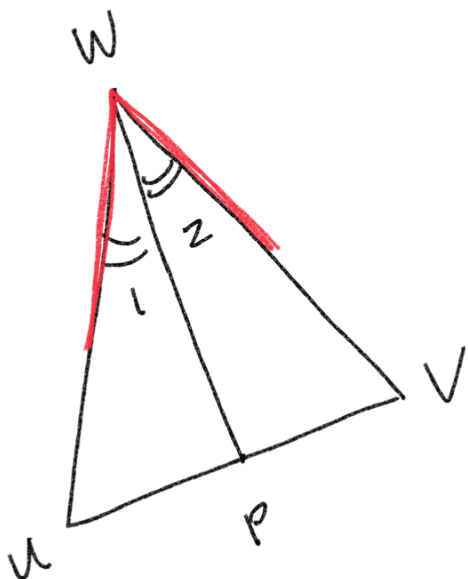
$$\begin{array}{r} \downarrow \qquad \qquad \downarrow \\ 2(7x - 1) = 12x + 4 \end{array}$$

$$\begin{array}{r} 14x - 2 = 12x + 4 \\ -12x \qquad -12x \end{array}$$

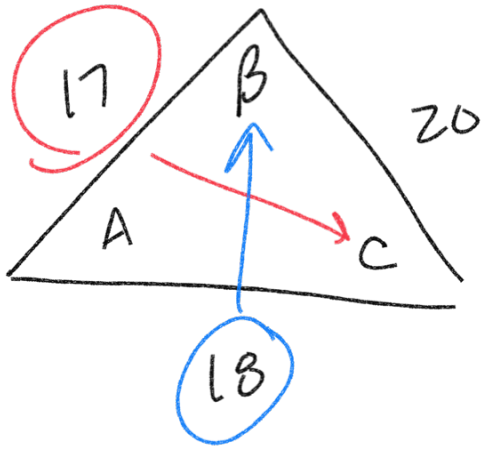
$$\begin{array}{r} 2x - 2 = 4 \\ +2 \qquad +2 \\ \hline 2x = 6 \\ \hline \frac{2x}{2} = \frac{6}{2} \end{array}$$

$$\boxed{x = 3}$$

2.)



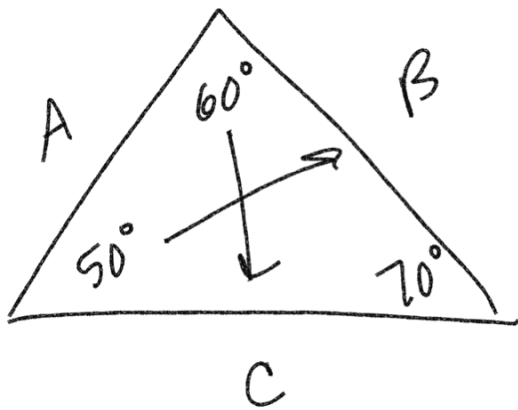
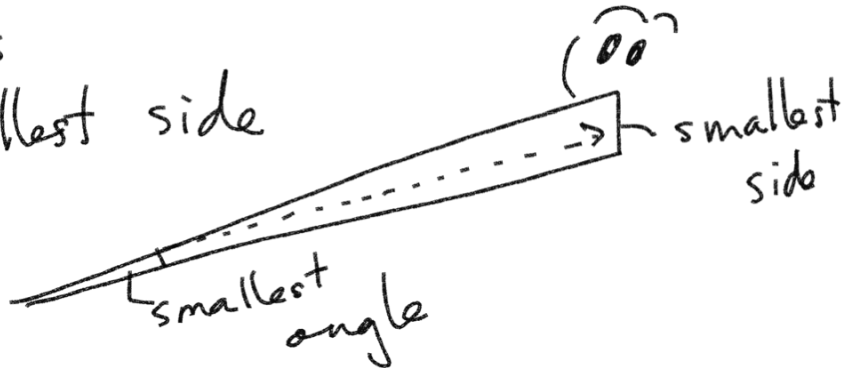
\overline{WP} an angle bisector



Smallest angle → Largest angle

C, B, A

Smallest angle is opposite the smallest side



Order the sides from least → Greatest

B, C, A

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

3, 8, 10 Triangle

$$3+8=11 \quad 11 > 10$$

$$8+10=18 \quad 18 > 3$$

$$3+10=13 \quad 13 > 8$$

3, 8, 12 ^{Not} triangle

$$3+12=15 \quad 15 > 8$$

$$8+12=20 \quad 20 > 3$$

$$3+8=11 \quad 11 < 12$$

Can each of the following be a triangle?

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

2.) 9, 13, 22 $9+13=22 \quad 22 < 22$ Not triangle

3.) 12, 8, 21 $12+8=20 \quad 20 < 21$ Not triangle

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