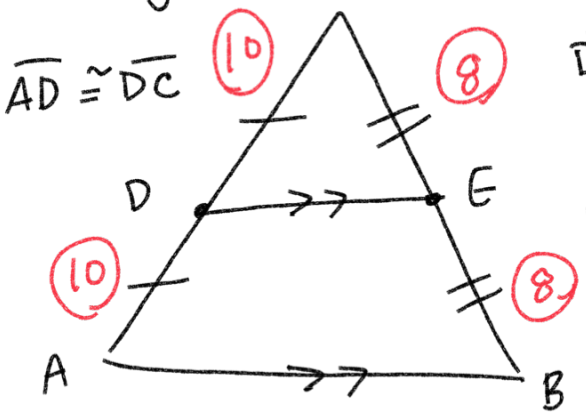
T-G Geometry Week 23 2/28

Midsegments of Triangles



$\overline{AD} \cong \overline{DC}$

$\overline{DE}$ is midsegment

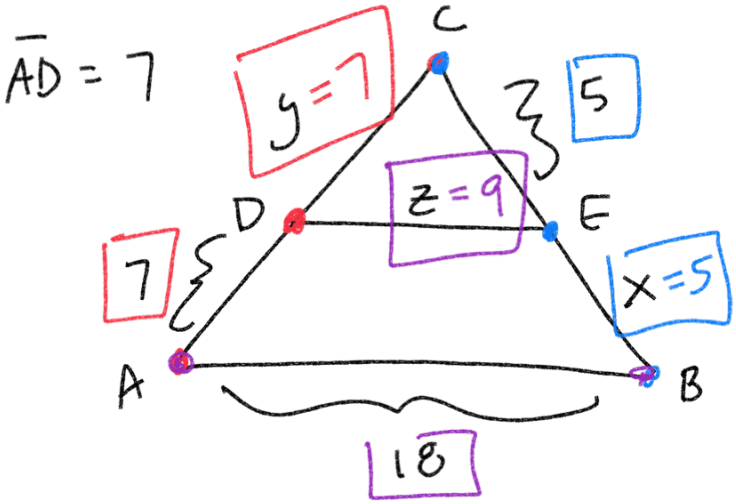
$\overline{CE} \cong \overline{BE}$

Midsegment is half the length of the base

Midsegment

1.) parallel with the base.

2.) segment bisector for the legs of the triangle. Cut the legs into equal pieces



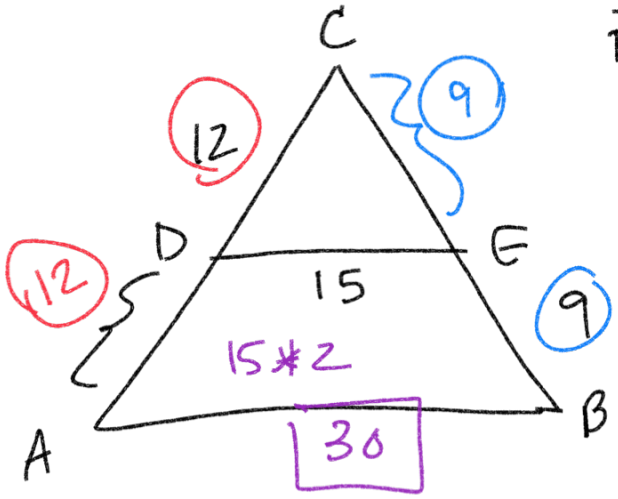
$\overline{AD} = 7$

$\overline{DE}$ is midsegment

$\overline{CE} = 5$

$\overline{AB} = 18$

$18 * \frac{1}{2} = 9$



$\overline{DC} = 12$

$\overline{EB} = 9$

$\overline{DE} = 15$

$\overline{DE}$ is a midsegment

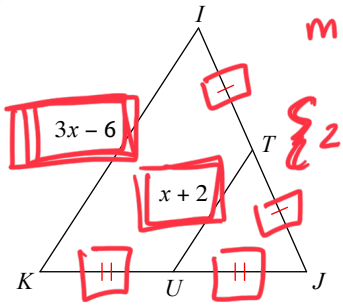
Geometry Name_____ ID: 1

Assignment

Date_____ Period____

Solve for *x*.

1)



$\overline{UT}$ midsegment

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

or

2 midsegment = base

$2(x+2) = 3x-6$

$2x+4 = 3x-6$

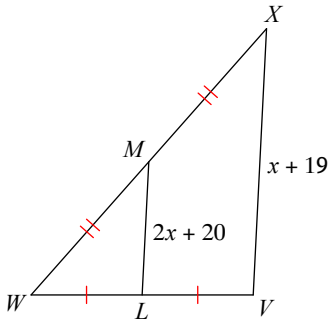
$+6 \quad +6$

$2x+10 = 3x$

$-2x \quad -2x$

$10 = x$

2)



2 midseg = base

$2(2x+20) = x+19$

$4x+40 = x+19$

$-40 \quad -40$

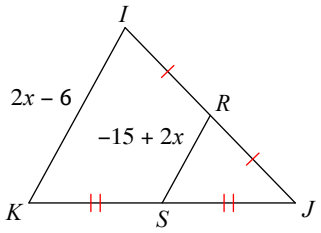
$4x = x-21$

$-x \quad -x$

$\frac{3x}{3} = \frac{-21}{3}$

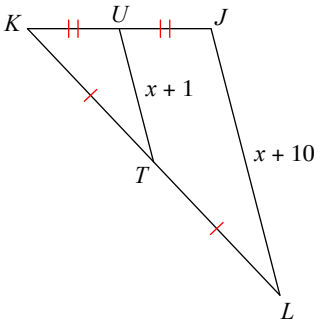
$x = -7$

3)



$x = 12$

4)



$2(x+1) = x+10$

$2x+2 = x+10$

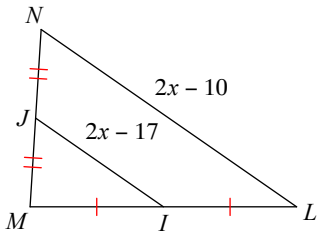
$-2 \quad -2$

$2x = x+8$

$-x \quad -x$

$x = 8$

5)



$2(-15+2x) = 2x-6$

$-30+4x = 2x-6$

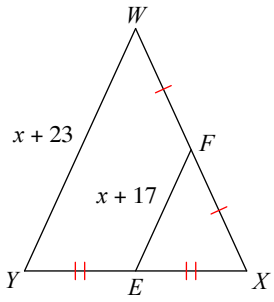
$+30 \quad +30$

$4x = 2x+24$

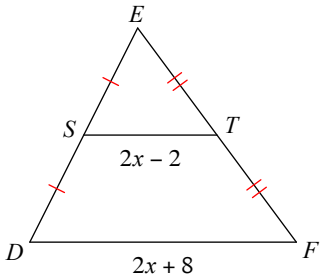
$-2x \quad -2x$

$\frac{2x}{2} = \frac{24}{2}$

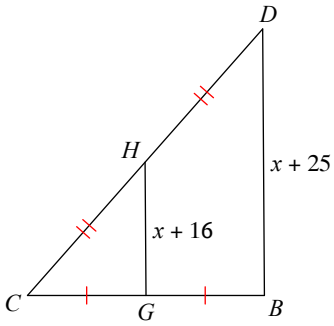
6)



7)



8)



Perpendicular Bisector

90° angle "right"

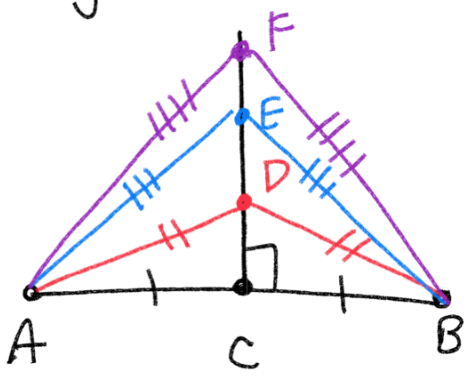
Divide into two equal pieces

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

$\overline{AE} \cong \overline{EB}$

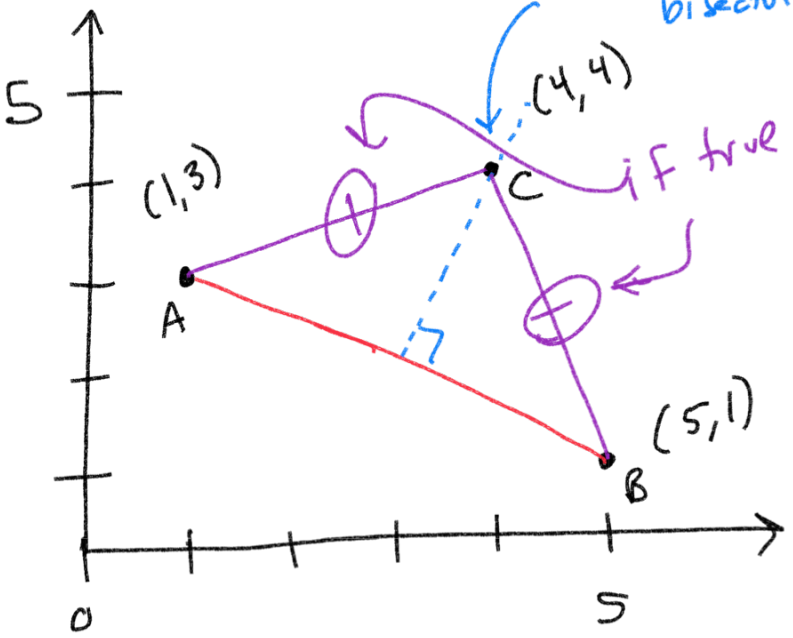
$\overline{AF} \cong \overline{FB}$

Any point on the perpendicular bisector will create a triangle with equal legs



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

perpendicular bisector? (1,3), (4,4), (5,1)



Question: is (4,4) on the perpendicular bisector of $\overline{AB}$ (between (1,3) and (5,1))

If C is on the perpendicular bisector for $\overline{AB}$, then $\overline{AC} \cong \overline{CB}$

Distance Formula

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

$\overline{AC}$ (1,3) and (4,4)

$$\sqrt{(4-1)^2 + (4-3)^2}$$

$$\sqrt{3^2 + 1^2} = \sqrt{9+1} = \boxed{\sqrt{10}}$$

$\overline{CB} = \sqrt{10}$?

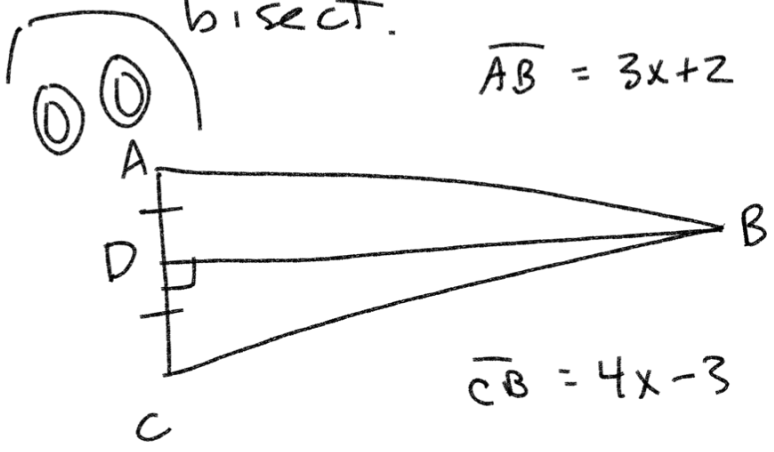
$C = (4,4)$ $B = (5,1)$ Distance of $\overline{CB}$

$$d = \sqrt{(x_2-x_1)^2 + (y_2-y_1)^2} = \sqrt{(4-5)^2 + (4-1)^2}$$

$$\sqrt{(-1)^2 + (3)^2}$$

$$\sqrt{1+9} = \sqrt{10}$$

yes! Point C is on the perpendicular bisect.



$\overline{AB} = 3x+2$

$\overline{CB} = 4x-3$

$\overline{DB}$ is a perpendicular bisector

$\overline{AB} = \overline{CB}$

$\downarrow$

$3x+2 = 4x-3$

$+3 \quad +3$

$3x+5 = 4x$

$-3x \quad -3x$

$\boxed{5 = x}$