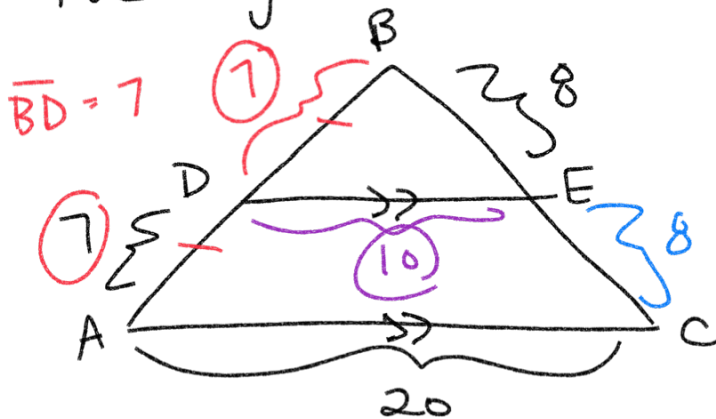


Midsegment of Triangles

- 1.) Parallel with the base.  
 $\overline{DE}$  is parallel with  $\overline{AB}$
- 2.) segment bisector for the legs of the triangle.  
 Cuts the legs into 2 equal pieces.

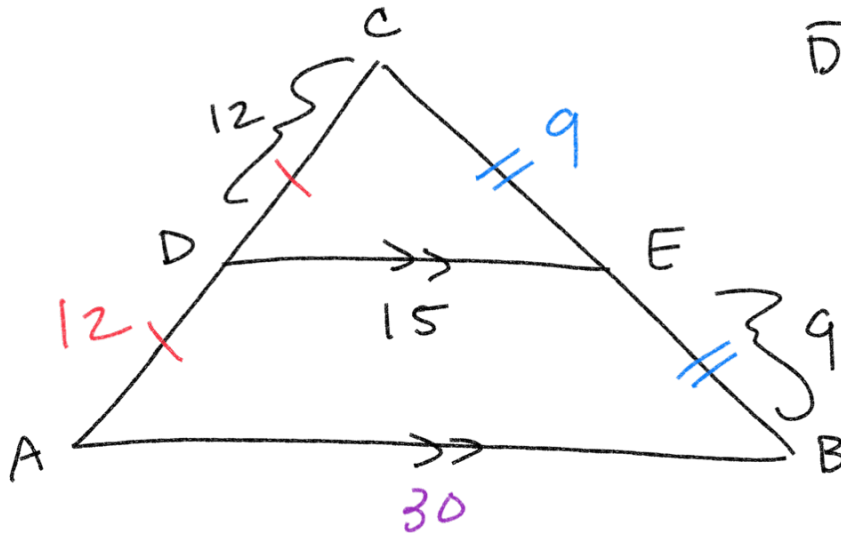
Midsegment is half the length of the base



$\overline{DE}$  is a midsegment

$\overline{EC} = 8$

$\overline{DE} = 20 * \frac{1}{2} = 10$



$\overline{DE} =$  midsegment

$\overline{AD} = 12$

$\overline{CE} = 9$

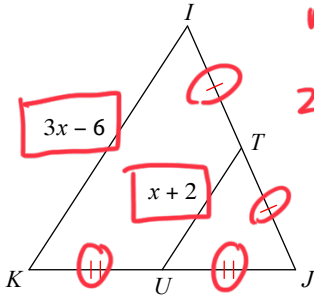
$\overline{AB} = 30$

$15 * 2 = 30$

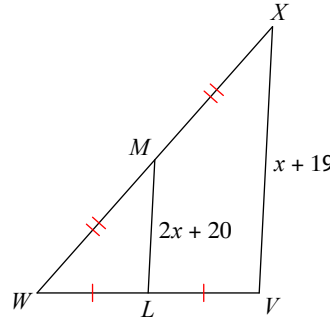
Assignment

Solve for x.

1)

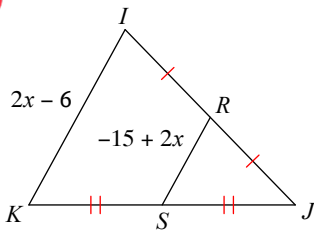


$\overline{UT}$  is midsegment  
 midsegment =  $\frac{1}{2}$  base  
 or  
 2 midsegment = base  
 $2(x+2) = 3x-6$   
 $2x+4 = 3x-6$   
 $-2x \quad -2x$



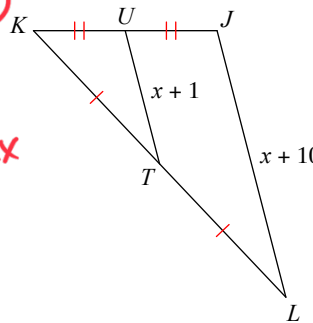
2 midseg = base  
 $2(2x+20) = x+19$   
 $4x+40 = x+19$   
 $-x \quad -x$   
 $3x+40 = 19$   
 $-40 \quad -40$   
 $3x = -21$   
 $\frac{3x}{3} = \frac{-21}{3}$   
 $x = -7$

3)



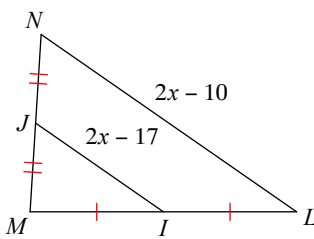
$2x-6 = -15+2x$   
 $2x-6 = -15+2x$   
 $-2x \quad -2x$   
 $-6 = -15$   
 $+6 \quad +6$   
 $0 = -9$   
 $10 = x$

4)



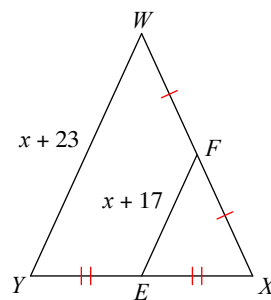
$2(x+1) = x+10$   
 $2x+2 = x+10$   
 $-2 \quad -2$   
 $x = 8$

5)



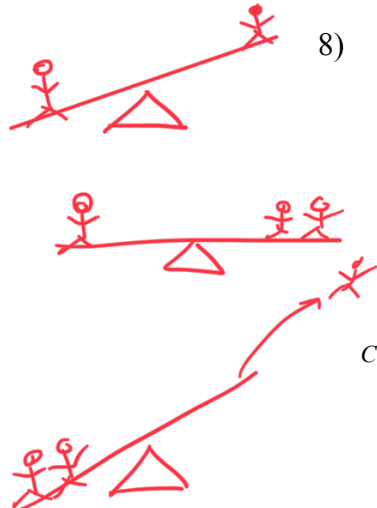
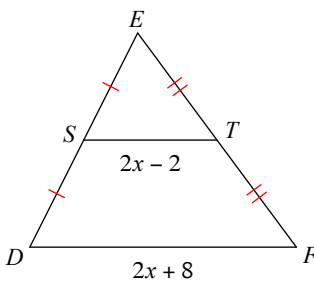
$2x-10 = 2x-17$   
 $-2x \quad -2x$   
 $-10 = -17$   
 $+15 \quad +15$   
 $5 = -2$   
 $12 = x$

6)

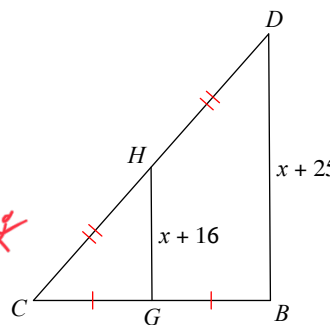


$x = 8$

7)



8)

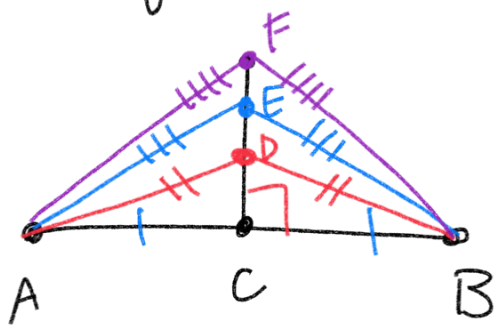


**Perpendicular**

**Bisector**

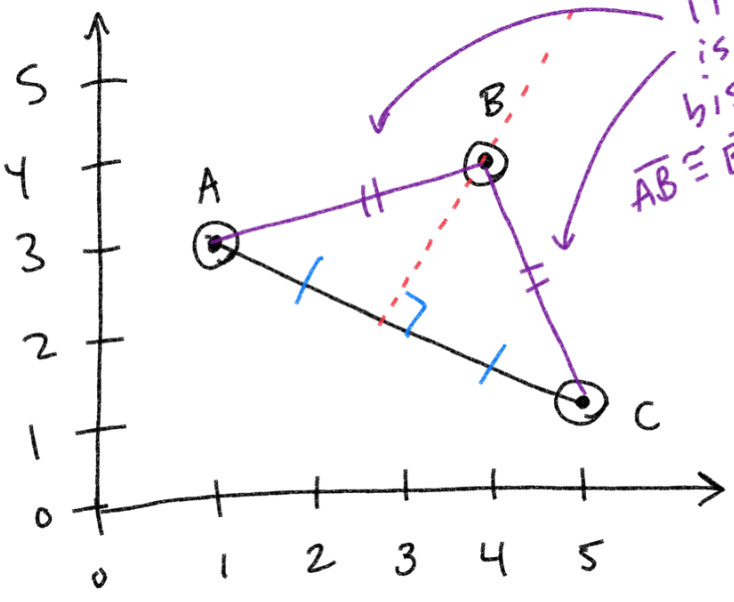
90° angle  
"right"

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 (isosceles triangle)



If it is perp. bisector,  
 $\overline{AB} \cong \overline{BC}$

A	B	C
(1,3)	(4,4)	(5,1)

  
Question: is (4,4) on the perpendicular bisector of  $\overline{AC}$ ?

Distance Formula

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

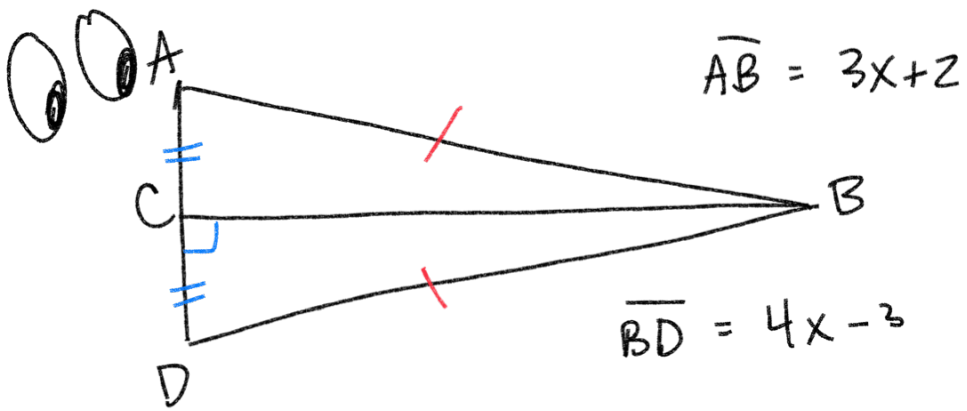
Does  $\overline{BC} = \sqrt{10}$   
 B(4,4) C(5,1)

$\sqrt{(5-4)^2 + (1-4)^2}$

$\sqrt{1^2 + (-3)^2} = \sqrt{1+9} = \sqrt{10}$

$\sqrt{(4-1)^2 + (4-3)^2}$   
 $\sqrt{3^2 + 1^2}$   
 $\sqrt{9+1} = \sqrt{10}$

it is on the perp. bisector



$$\begin{array}{r} \overline{AB} \cong \overline{BD} \\ \downarrow \qquad \downarrow \\ 3x+2 = 4x-3 \\ \quad +3 \qquad +3 \end{array}$$

$$\begin{array}{r} 3x+5 = 4x \\ -3x \qquad -3x \end{array}$$

$$\boxed{5 = x}$$