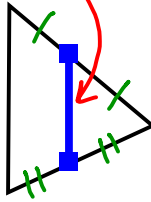


Section 5.1: Midsegment Thm.

EQ: What is the relationship between a midsegment and the non-adjacent side?

midsegment of a triangle

A segment whose endpoints are the midpts. of a triangle's sides

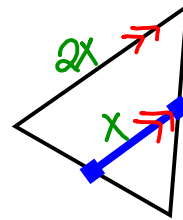


coordinate proof

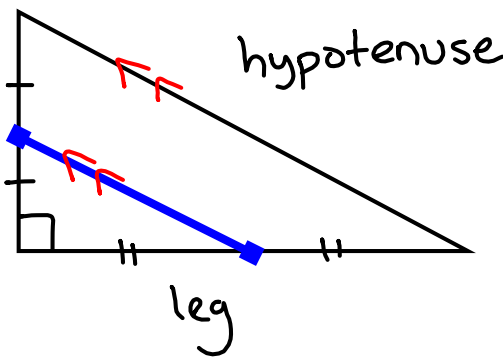
A proof involving algebra coordinates (x,y)

**Theorem 5.1: Midsegment Theorem**

The segment connecting \_\_\_\_\_ the midpoints \_\_\_\_\_ of two sides of any triangle \_\_\_\_\_ is parallel to and \_\_\_\_\_ half as long as the third side \_\_\_\_\_.

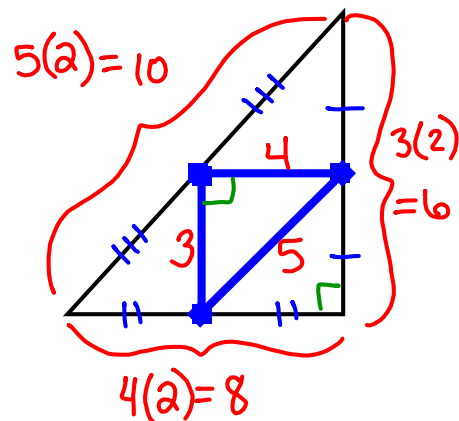


A1. Sketch a right triangle and its longest midsegment.

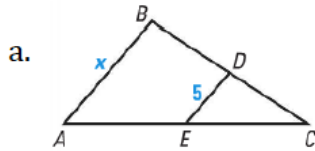


A2. Sketch  $\triangle ATL$  with 3, 4, and 5 for midsegments lengths.

A  $\triangle$  w/ lengths 3, 4 and 5 is a rt.  $\triangle$

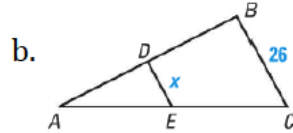


A3. Find the value of  $x$  if  $\overline{DE}$  is a midsegment.



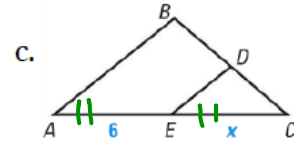
$$5(2) = 10$$

$$\boxed{X = 10}$$



$$26 \div 2$$

$$\boxed{X = 13}$$



$$\boxed{X = 6}$$

Since pt. E is a midpt.

A4. Explain why the conclusion is incorrect.

Thm. states midsegment is

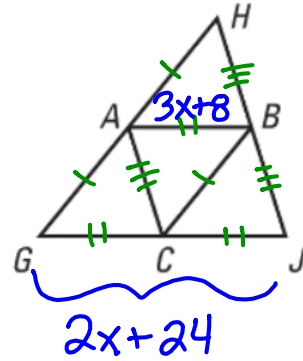
half as long and parallel.

$\overline{DE}$  is not  $\parallel$  to  $\overline{BC}$

$\therefore \overline{AD} \neq \overline{DB} \quad \overline{AE} \neq \overline{EC}$

$DE = \frac{1}{2}BC$ , so by the Midsegment Theorem  $\overline{AD} \cong \overline{DB}$  and  $\overline{AE} \cong \overline{EC}$ . X

A5. Use  $\triangle GHJ$ , where A, B, and C are midpoints. If  $AB = 3x + 8$  and  $GJ = 2x + 24$ , what is  $AB$ ?



$$2(3x + 8) = 2x + 24$$

$$\begin{array}{r} 6x + 16 = 2x + 24 \\ -2x \quad \quad -16 \\ \hline 4x = 8 \end{array}$$

$$4x = 8$$

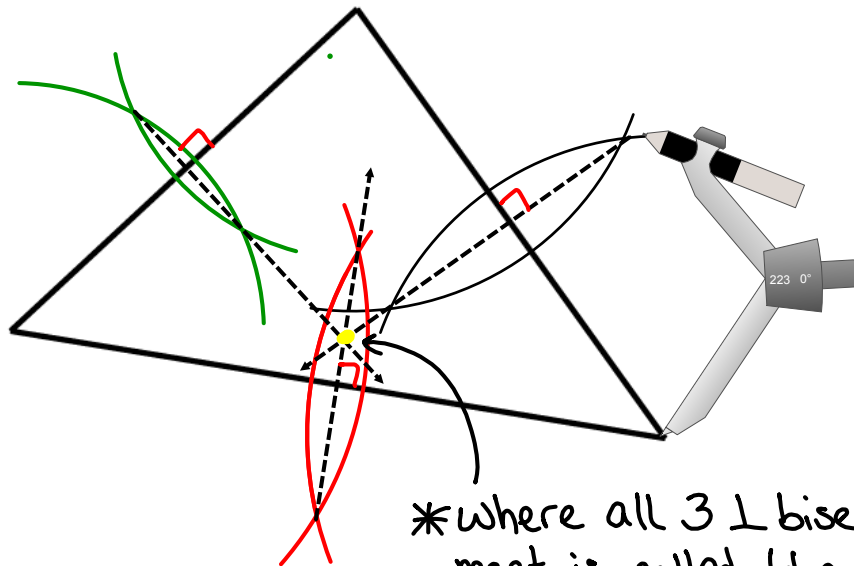
$$x = 2$$



$$AB = 3(2) + 8$$

$$AB = 14$$

A6. Construct the three midsegments of the triangle.

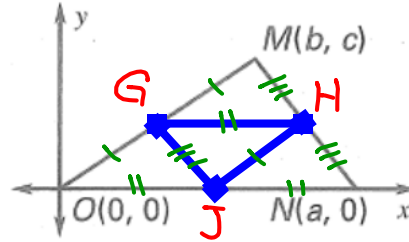


\*Where all 3  $\perp$  bisectors meet is called the Circumcenter (Section 5.2)

A7. Find the coordinate of the endpoints for each midsegment of  $\triangle MNO$ .

Midpt. G

$$\left(\frac{0+b}{2}, \frac{0+c}{2}\right) = \left(\frac{b}{2}, \frac{c}{2}\right)$$



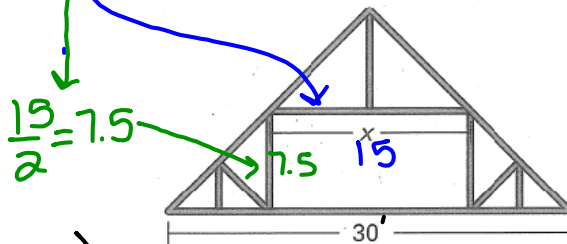
Midpt. H

$$\left(\frac{a+b}{2}, \frac{0+c}{2}\right) = \left(\frac{a+b}{2}, \frac{c}{2}\right)$$

Midpt. J

$$\left(\frac{0+a}{2}, \frac{0+0}{2}\right) = \left(\frac{a}{2}, 0\right)$$

A8. An attic truss provides storage space within the roof of a house. The midsegment of the truss is the ceiling of the storage space. If height of the storage space is half of the midsegment length, find the area of the truss' storage space.



$$\begin{aligned} \text{Area} &= (\text{Base})(\text{Height}) \\ &= (15)(7.5) \end{aligned}$$

$$A = 112.5 \text{ ft}^2$$

Thm 5.1  
 $\frac{30}{2} = 15 \text{ ft}$

5.1 Summary:

A midsegment is  $\frac{1}{2}$  the length of the nonadjacent side and is parallel to it.

