Few things to know:

- Suggestion Box (can be anonymous)
- Name tags put on bulletin board at end of each class
- Will switch up seating chart each unit
- Lots of group and partner work/activities
- I do lots of random calling on people, so be prepared to answer.
- Try my best to grade by next class, but not always possible
- Stay after school when Mrs. Watkins stays (Tuesday/ Wednesday, with exceptions)
- Feel free to e-mail me anytime with questions

(mwilmert@parkwayschools.net)

Today is Day 1 of Unit 8:
Segments of Triangles

Unit 8 Assessment:

Quiz 6.1-6.4 --> Wednesday 1/29 Thursday 1/30

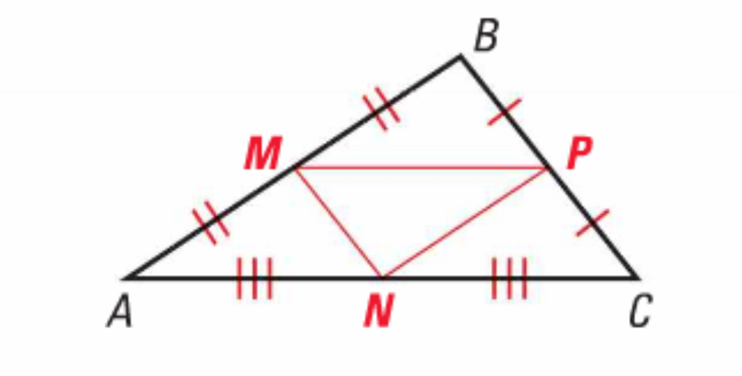
Today's I Can Statement:

ST-1: I can identify the different segments in a triangle.

· I. Midsegments

Definition: A **midsegment of a triangle** is a segment that connects the midpoints of two sides of the triangle.

*Every triangle has three midsegments.



Use the materials in the middle of your table

1.) Draw a triangle ABC and cut it out, labeling the vertices with A, B, and C (C at the top).

2.) Fold A to C and pinch at the midpoint. Do NOT fold all the way. Label the midpoint D.

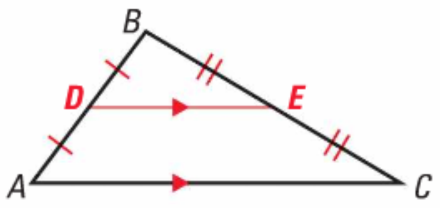
3.) Fold B to C and pinch the midpoint again. Do NOT fold all the way. Label the midpoint E.

4.) Fold C down to the opposite side and create a crease. Draw a line connecting D and E, creating the midsegment.

5.) Using the ruler find the length of DE and AB. Is there a relationship(s)? Compare your findings with your table.

Midsegment Theorem

The segment connecting the midpoints of two sides of a triangle is parallel to the third side and is half as long as that side.

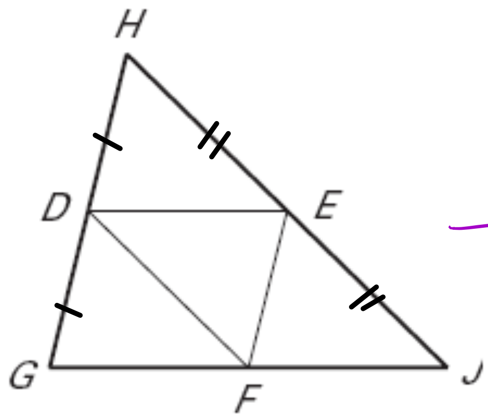


$\overline{DE} \parallel \overline{AC}$ and $DE = \frac{1}{2}AC$

I. Midsegments

Example

If $DE = 4x + 5$ and $GJ = 3x + 25$, what is DE?



$2(4x+5) = 3x + 25$

$8x + 10 = 3x + 25$

$-3x \quad -3x$

$5x + 10 = 25$

$-10 \quad -10$

$\frac{5x}{5} = \frac{15}{5}$

$x = 3$

$DE = 4(3)+5$

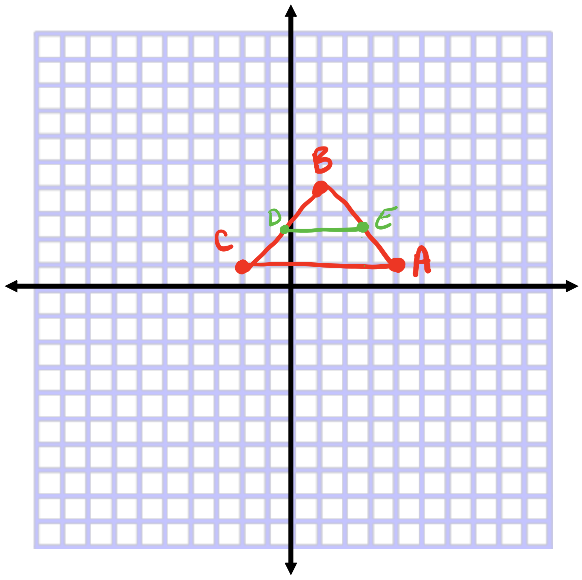
$= 12 + 5 = 17$

I. Midsegments

Verifying the Midsegment Theorem

Plot A(4,1), B(1,4) and C(-2,1)

Given D is the midpoint of BC and E is the midpoint of AB.



1. Find the endpoints of DE

(midpoint formula) $\left(\frac{x_1+x_2}{2}, \frac{y_1+y_2}{2}\right)$

$D=\left(\frac{1+-2}{2}, \frac{1+4}{2}\right)=(-0.5, 2.5)$ $E=\left(\frac{4+1}{2}, \frac{1+4}{2}\right)=(2.5, 2.5)$

2. Verify that DE = 1/2 AC

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

$DE=\sqrt{(2.5+0.5)^2+(2.5-2.5)^2}=\sqrt{9}=3$

$AC=\sqrt{(-2-4)^2+(1-1)^2}=\sqrt{36}=6$

3. Verify that DE || AC

(slopes) $\text{slope}=\frac{y_2-y_1}{x_2-x_1}=\frac{\text{rise}}{\text{run}}$

$\text{slope } DE = \frac{0}{3} = 0$

$\text{slope } AC = \frac{0}{6} = 0$

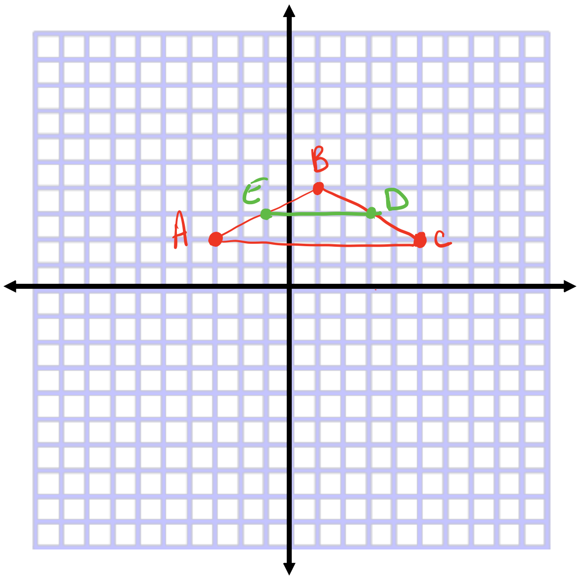
slope DE = slope AC

so DE // AC

I. Midsegments

Verifying the Midsegment Theorem

Plot A(-3,2), B(1,4) and C(5,2)



Given D is the midpoint of BC and E is the midpoint of AB.

1. Find the endpoints of DE
   (midpoint formula)

   D(3,3) E(-1,3)

2. Verify that DE = 1/2 AC
   (distance formula)

   $DE = \sqrt{16} = 4$
   $AC = \sqrt{64} = 8$

3. Verify that DE || AC
   (slopes)

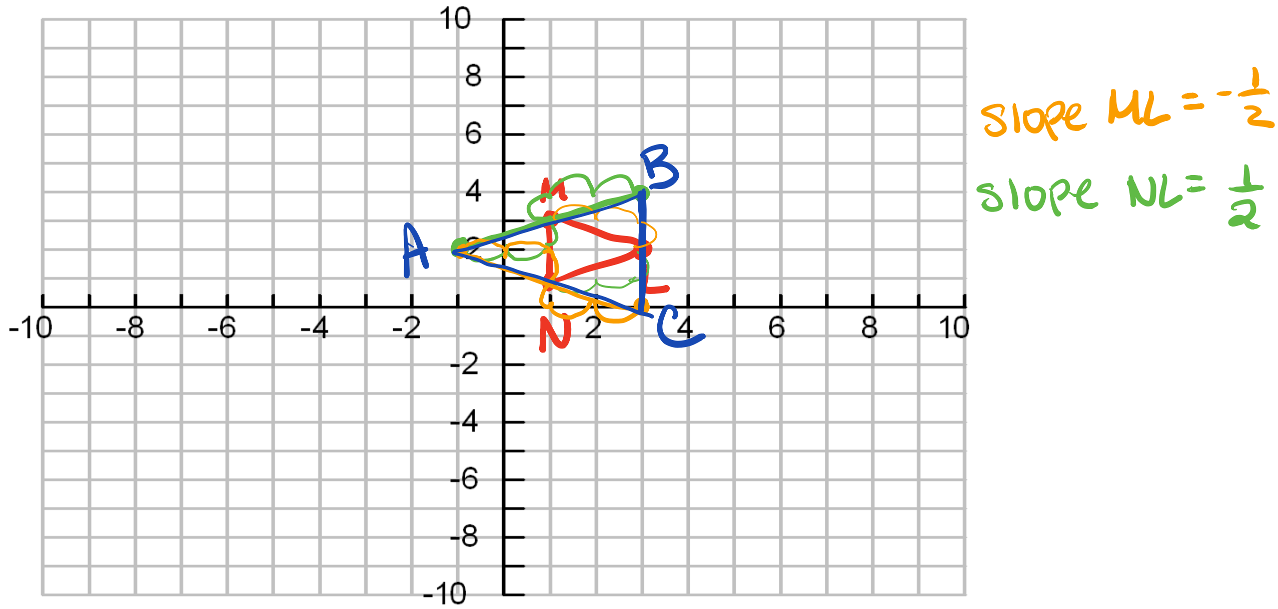
   Slope DE = $\frac{0}{4} = 0$
   Slope AC = $\frac{0}{8} = 0$

   0 = 0
   slope DE = slope AC

I. Midsegments

Example

You are given the midpoints of the sides of a triangle. Find the coordinates of the vertices of the triangle. L(3,2) M(1,3) N(1,1)



$\triangle ABC$ = original triangle

I. Midsegments

Let's write what we just did:

1. Plot the midpoints

2. Find the slope of one midsegment then use that slope off of the third point.

3. Find the slope of a second midsegment then use that slope off of the third point.

Let's do another one....(next slide)

I. Midsegments

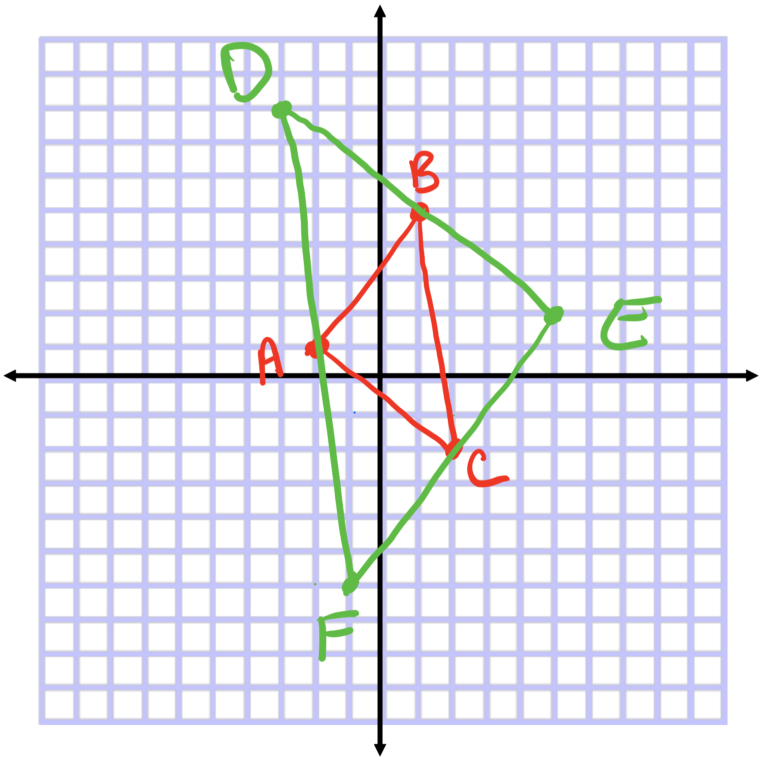
Given Midpoints
A (-2,1)
B (1,5)
C (2,-2)

Find the Vertices:

Slope BC = $-\frac{7}{1}$

Slope AC = $-\frac{3}{4}$

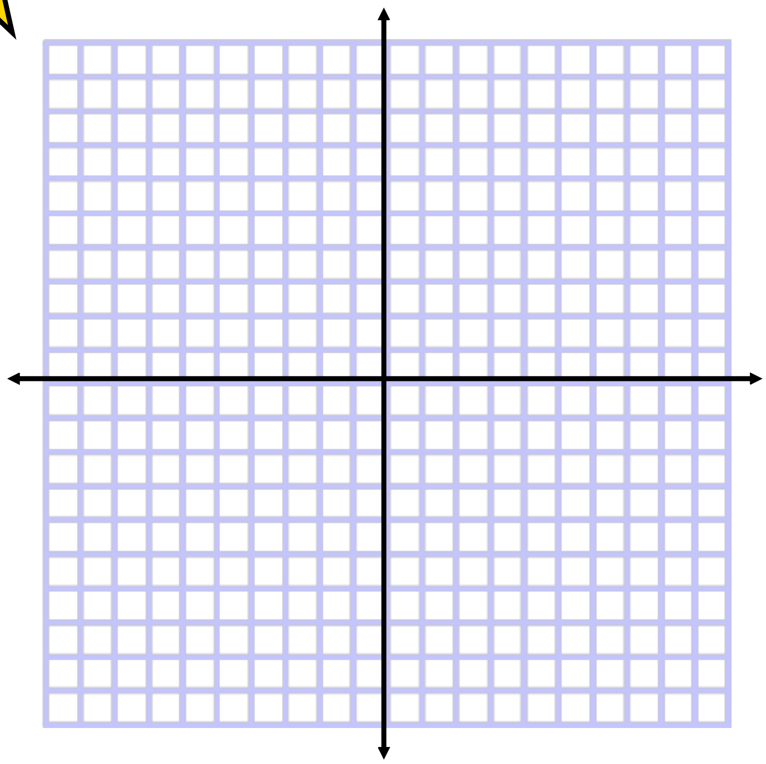
D(-3,8)
E(5,2)
F(-1,-6)



I. Midsegments

Given Midpoints
A (3, 6)
B (1, -2)
C (6, 2)

Find the Vertices:



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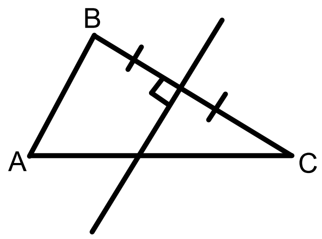
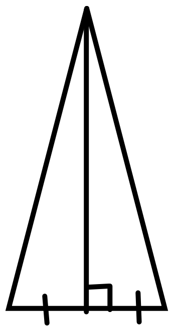
II. Special Segment Definitions

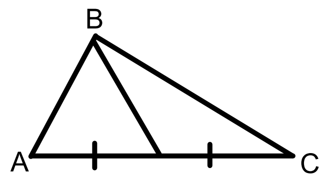
Perpendicular Bisector

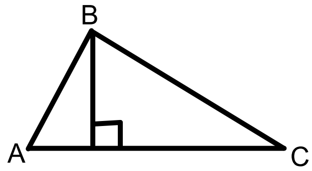
Examples





Nonexamples



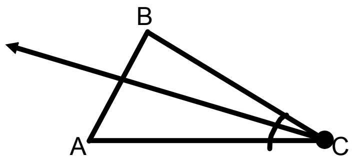


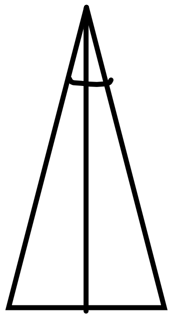
DEF: A segment, ray, line, or plane that is perpendicular to a segment at its midpoint

II. Special Segment Definitions

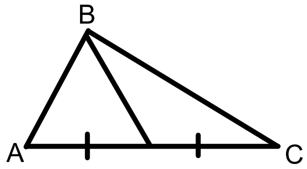
Angle Bisector

Examples





Nonexamples

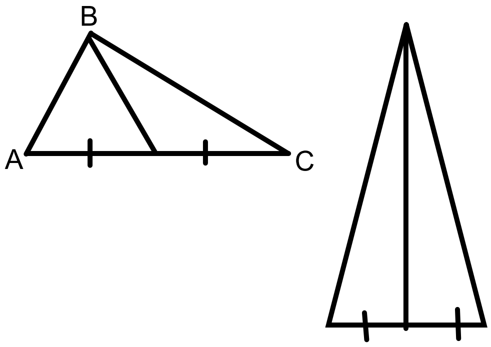


Def: a ray that divides an angle into two congruent adjacent angles.

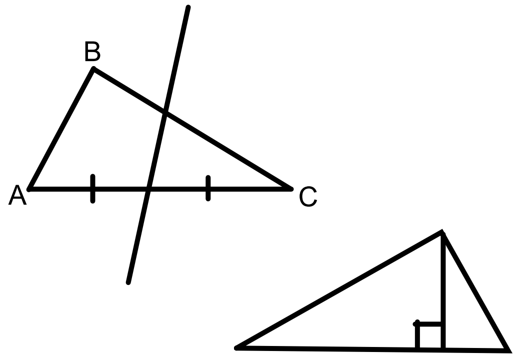
II. Special Segment Definitions

Median

Examples



Nonexamples

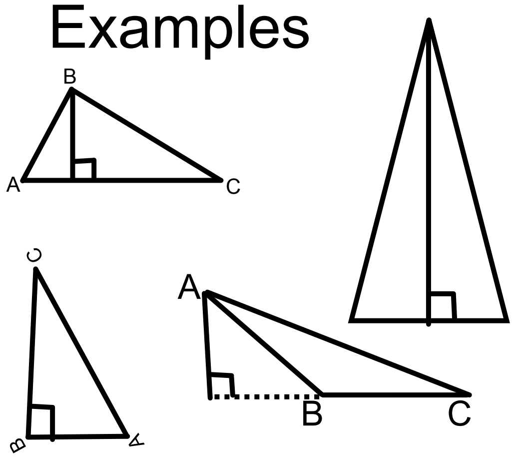


Def: a segment whose endpoints are a vertex of the triangle and the midpoint of the opposite side.

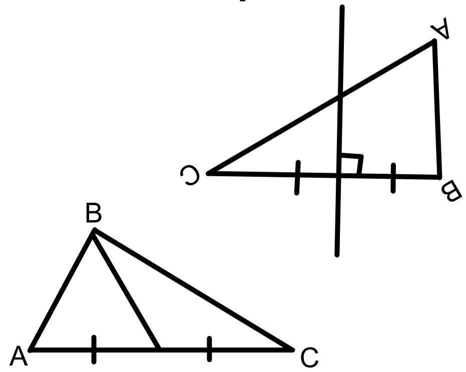
II. Special Segment Definitions

Altitude

Examples



Nonexamples



Def: the perpendicular segment from a vertex to the opposite side or to the line that contains the opposite side.

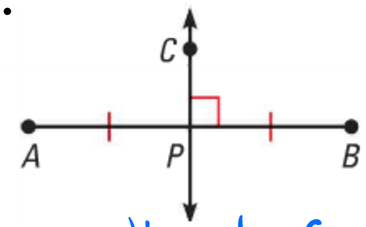
*An altitude can lie inside, on, or outside the triangle. (aka height)

http://www.mathopenref.com/triangle.html

II. Special Segment Definitions Example

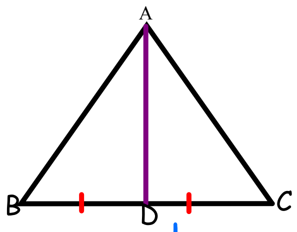
Review of Definitions. If we don't know these we cannot do the rest of the chapter!

1.



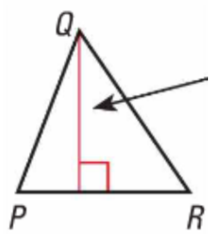
Perpendicular Bisector

2.



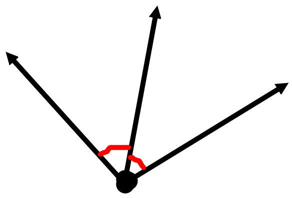
median

3.



Altitude

4.

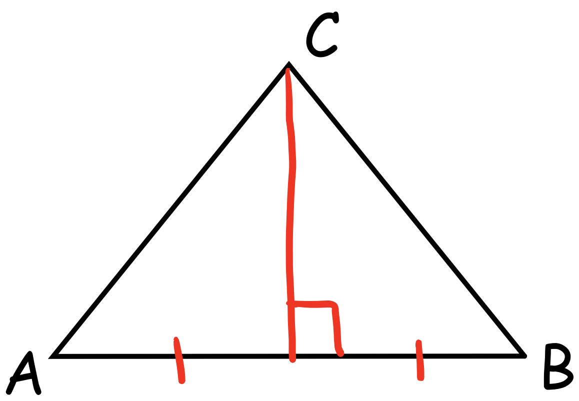


Angle Bisector

II. Special Segment Definitions Example

Let's Practice some drawings! Don't forget your markings. Otherwise, how do we know what you are intending?

1. Draw a perpendicular bisector of $\overline{AB}$



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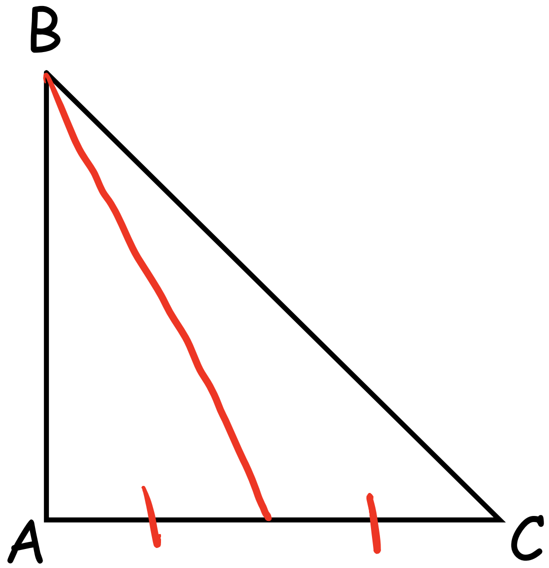
II. Special Segment Definitions

Example

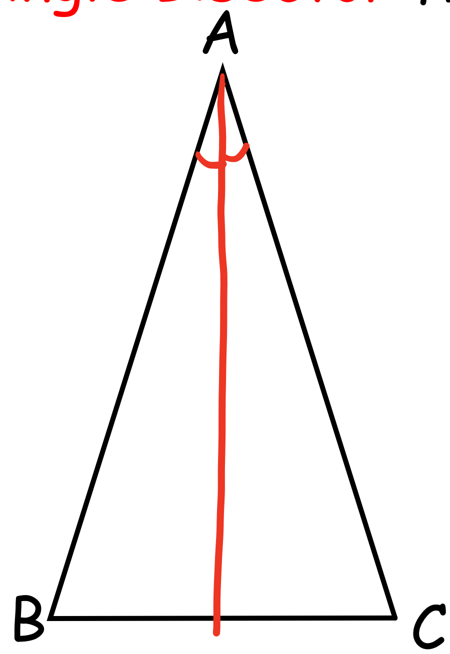
2. Draw a median from B to $\overline{AC}$



II. Special Segment Definitions

Example

3. Draw an Angle Bisector from angle C

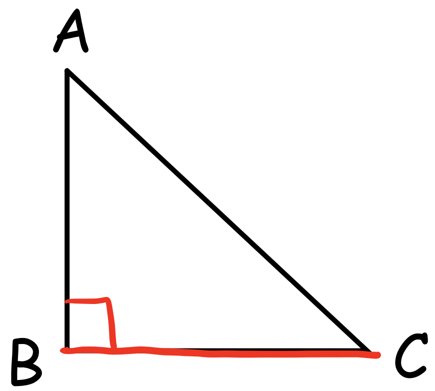


II. Special Segment Definitions

Final ones. Draw an Altitude

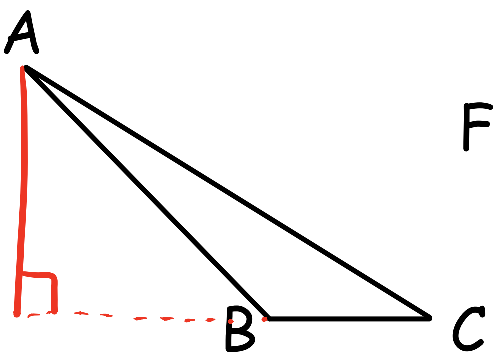
Example

4.



From ∠C to AB

5.



From ∠A to BC

Let's Practice!

Drawing Segments Worksheet

Tonight's Assignment:

Triangles Worksheet + Pg. 333 #3-17

Looking Ahead:

Quiz 6.1-6.4 --> Wednesday 1/29 Thursday 1/30

Today's I Can Statements:

ST-1: I can identify the different segments in a triangle.