Geometry B Live Lesson Class

U2L4 – Similarity in Right Triangles
(Chapter 7-4 in textbook)

Agenda

1. Review topics and problems from Unit 2, Lesson 4.

2. Use the 2-column note system to take better notes in math class. Bring your math notebook and pen or pencil to each math LiveLesson class.

2-Column Notes Template

1. Announcements/To Do's	1. Write down important details.
2. School-Wide Learner Outcomes	2. What are you going to work on this week?
3. LL Objectives	
4. Vocabulary words	4. Definitions (fill in as we go)
5. Problems	5. Steps to solving problems
6. Summary (End of class)	6. 1 or 2 sentences about the LL class.

Reminders and To – Do's

Information

1. Complete 1 math lesson per day.

2. Check your WebMail every day

3. Be prepared to spend 4 - 6 hours per day on schoolwork.

4. Remind your Learning Coach to take daily attendance

What to do

1. Go to your Planner in Connexus to find the math lesson for the day

2. Go to Connexus to find WebMail

3. Complete lessons for the day from your Planner. Do not get behind on lessons.

4. Have your Learning Coach log into Connexus daily.

Reminders and To – Do's

Information

What to do

5. Go to the Message Board first for information about our math class.

6. Contact Mr. Elizondo for math questions.

Remember: You need at least 2 phone calls with Mr. Elizondo per semester.

6. Call (559) 549 - 3244 and leave a voicemail if call is not answered.

Make an appointment at:
https://elizondo.youcanbook.me

Send a WebMail

U2L4 - California Common Core State Standards

- HSG-SRT.A.2: Given two figures, use the definition of similarity in terms of similarity transformations to decide if they are similar; explain using similarity transformations the meaning of similarity for triangles as the equality of all corresponding pairs of angles and the proportionality of all corresponding pairs of sides.

- HSG-SRT.B.5: Use congruence and similarity criteria for triangles to solve problems and to prove relationships in geometric figures.

U2L4 – Objectives

- Find and use relationships in similar right triangles

U2L4 – Key Words

- geometric mean

U2L4 – Similarity in Right Triangles

Geometric Mean

The geometric mean of a and b is the positive number x such that $\frac{a}{x} = \frac{x}{b}$

Find the geometric mean of 4 and 16.

$$\frac{4}{x} = \frac{x}{16}$$
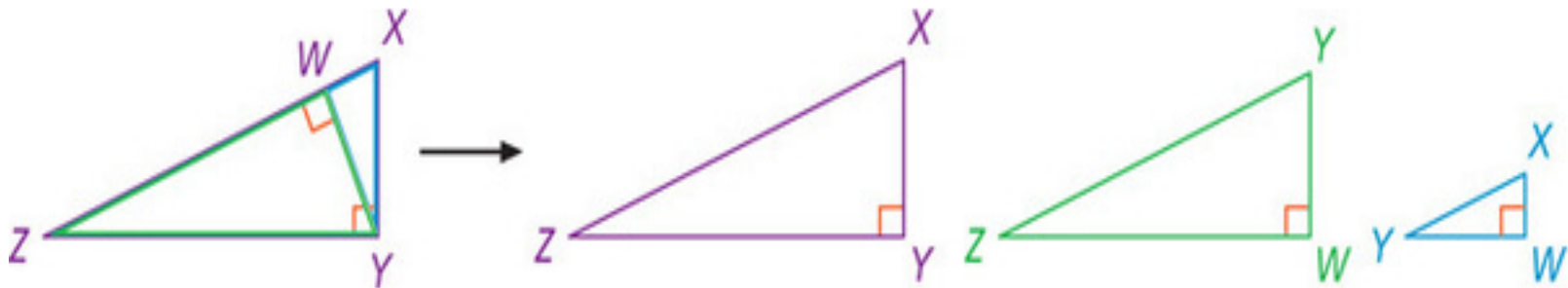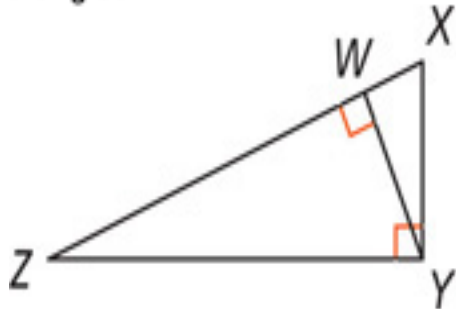
$$\sqrt{x^2} = \sqrt{64}$$

$$x^2 = 64$$

$$x = 8$$

Find the geometric mean of 4 and 10.

$$\frac{4}{x} = \frac{x}{10}$$

$$\sqrt{x^2} = \sqrt{40}$$

$$x^2 = 40$$

$$x \approx 6.32$$

U2L4 – Similarity in Right Triangles

$\overline{YW}$ is the altitude to the hypotenuse of right $\triangle\ XYZ$, so you can use Theorem 7-3. There are three similar triangles.
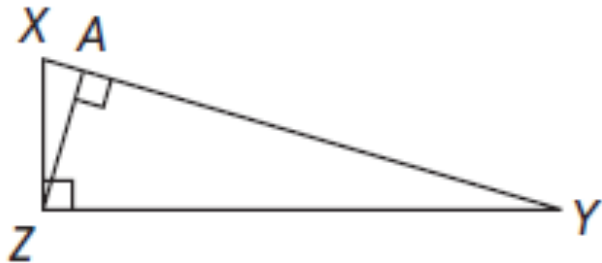
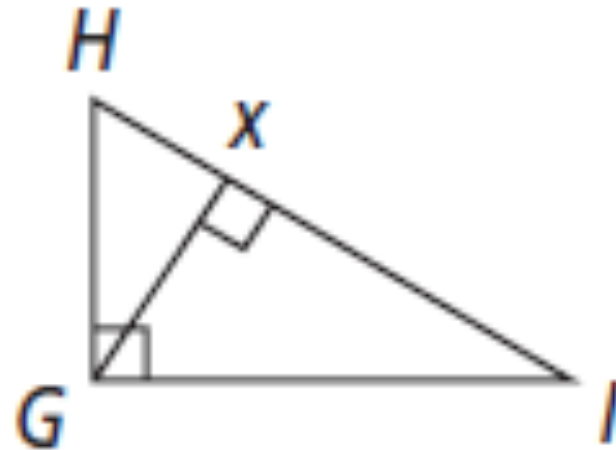$$\Delta XYZ \sim \Delta YWZ \sim \Delta XWY$$

U2L4 – Similarity in Right Triangles

The altitude to the hypotenuse of a right triangle divides the triangle into two triangles that are similar to the original triangle and to each other.

Write a true similarity statement.

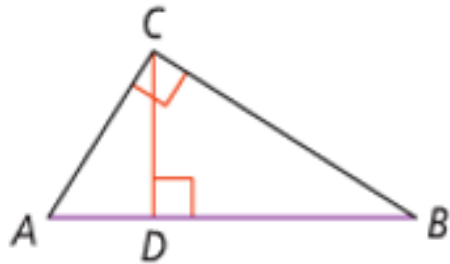$$\Delta IGH \sim \Delta IXG \sim \Delta GXH$$

U2L4 – Proving Triangles Similar

Corollary 1

The length of the altitude to the hypotenuse of a right triangle is the geometric mean of the lengths of the segments of the hypotenuse.
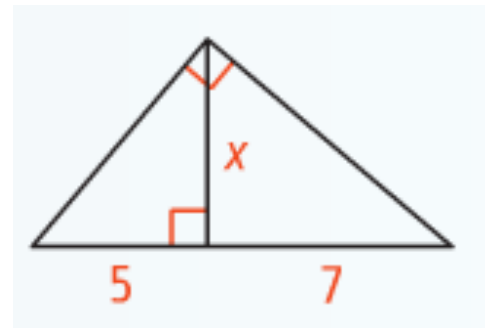
If . . .

Then . . .

$$\frac{AD}{CD} = \frac{CD}{DB}$$

$$\frac{\text{small piece of hypotenuse}}{\text{altitude}} = \frac{\text{altitude}}{\text{large piece of hypotenuse}}$$

Solve for x.

$$\frac{5}{x} = \frac{x}{7}$$

$$x^2 = 35$$

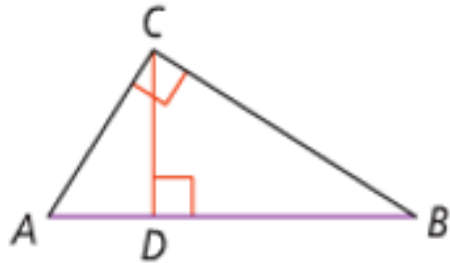$$\sqrt{x^2} = \sqrt{35}$$

$$x \approx 5.92$$

U2L4 – Proving Triangles Similar

Corollary 1

The length of the altitude to the hypotenuse of a right triangle is the geometric mean of the lengths of the segments of the hypotenuse.
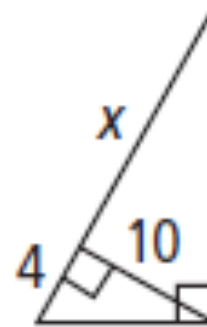
If . . .

C

A   D   B

Then . . .

$$\frac{AD}{CD} = \frac{CD}{DB}$$

$$\frac{\text{small piece of hypotenuse}}{\text{altitude}} = \frac{\text{altitude}}{\text{large piece of hypotenuse}}$$

Solve for x.

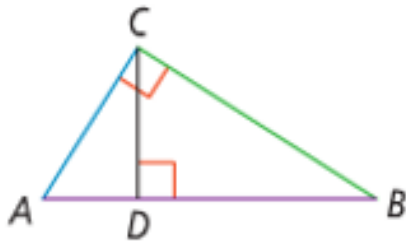$$\frac{4}{10} = \frac{10}{x}$$

$$x = 25$$

$$4x = 100$$

Corollary 2

The altitude to the hypotenuse of a right triangle separates the hypotenuse so that the length of each leg of the triangle is the geometric mean of the length of the hypotenuse and the length of the segment of the hypotenuse adjacent to the leg.

If . . .

Then . . .

$$\frac{AB}{AC} = \frac{AC}{AD}$$

$$\frac{AB}{CB} = \frac{CB}{DB}$$

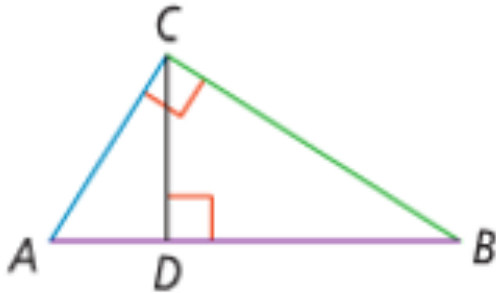$$\frac{\text{Total hypotenuse}}{\text{Leg}} = \frac{\text{Leg}}{\text{Adjacent piece of hypotenuse}}$$
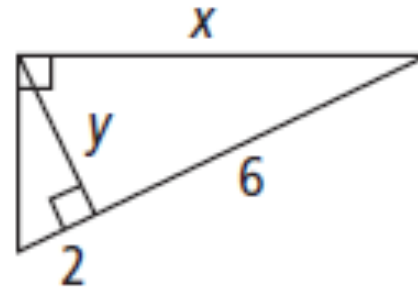
U2L4 – Proving Triangles Similar

$$\frac{\text{small piece of hypotenuse}}{\text{altitude}} = \frac{\text{altitude}}{\text{large piece of hypotenuse}}$$

$$\frac{\text{Total hypotenuse}}{\text{Leg}} = \frac{\text{Leg}}{\text{Adjacent piece of hypotenuse}}$$

Solve for x and y.

$$\frac{2}{y} = \frac{y}{6} \qquad\qquad \frac{8}{x} = \frac{x}{6}$$

$$y^2 = 12 \qquad\qquad x^2 = 48$$

$$\sqrt{y^2} = \sqrt{12} \qquad\qquad \sqrt{x^2} = \sqrt{48}$$

$$y \approx 3.46 \qquad\qquad x \approx 6.93$$

U2L4 – Proving Triangles Similar
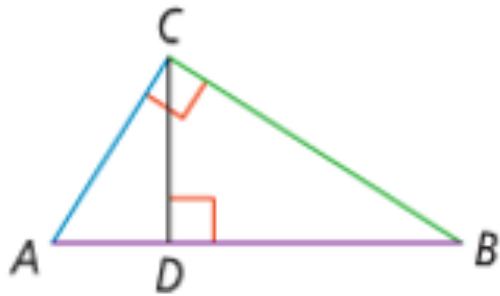
$$\frac{\text{small piece of hypotenuse}}{\text{altitude}} = \frac{\text{altitude}}{\text{large piece of hypotenuse}}$$

$$\frac{\text{Total hypotenuse}}{\text{Leg}} = \frac{\text{Leg}}{\text{Adjacent piece of hypotenuse}}$$

Solve for x and y.

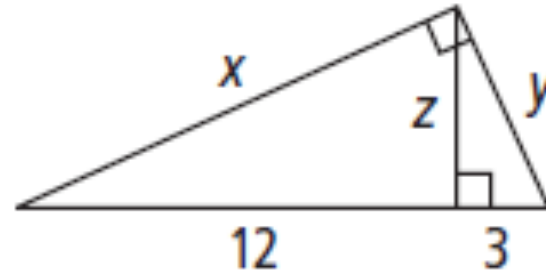$$\frac{15}{y} = \frac{y}{3} \qquad\qquad \frac{15}{x} = \frac{x}{12}$$

$$y^2 = 45 \qquad\qquad x^2 = 180$$

$$\sqrt{y^2} = \sqrt{45} \qquad\qquad \sqrt{x^2} = \sqrt{180}$$

$$y \approx 6.71 \qquad\qquad x \approx 13.42$$

Questions?

- Check the Message Board first

- Send a WebMail

- You can also make an appointment at https://elizondo.youcanbook.me

- You can also call me at (559) 549-3244. If I'm not available to answer your call, please leave a voicemail with your full name and phone number.