

# Geometry B Live Lesson Class

U2L1 – Ratios and Proportions  
(Ch 7-1 in textbook)



# Agenda



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1. Review topics from Unit 2, Lesson 1.

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
2. School-Wide Learner Outcomes
3. LL Objectives
4. Vocabulary words
5. Problems
6. Summary (End of class)

1. Write down important details.
2. What are you going to work on this week?
- 3.
4. Definitions (fill in as we go)
5. Steps to solving problems
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

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.

## What to do

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

# U2L1 – Objectives



- Write ratios and solve problems

# U2L1 – Key Words



- Cross Products Property
- extended ratio
- extremes
- means
- proportion
- ratio

# U2L1 – Ratios and Proportions



Ratio: a comparison of two quantities by division

What are the different ways to write ratios?

$$\frac{a}{b}, a : b, a \text{ to } b$$

$a$  and  $b$  are usually expressed in the same unit and the ratio is written in simplest form



## U2L1 – Ratios and Proportions



$a$  and  $b$  are usually expressed in the same unit and the ratio is written in simplest form

Write the ratio of the length of a tennis racket (2 ft 10 in.) and the length of a table tennis paddle (10 in.).

$$\begin{aligned}\frac{\textit{Tennis Racket}}{\textit{Tennis Paddle}} &= \frac{2\textit{ft}, 10\textit{ in.}}{10\textit{ in.}} \\ &= \frac{24\textit{ in} + 10\textit{ in.}}{10\textit{ in.}} \\ &= \frac{34\textit{ in}}{10\textit{ in.}} \\ &= \frac{17}{5}\end{aligned}$$

## U2L1 – Ratios and Proportions



Ratios can describe how a 'whole' is broken up.

The measure of two supplementary angles are in the ratio 1:4. What are the measures of the angles?

$$\frac{\text{angle 1}}{\text{angle 2}} = \frac{1}{4}$$

$$\frac{\text{angle 1}}{\text{angle 1} + \text{angle 2}} = \frac{1}{5}$$

$$\frac{1}{5} = \frac{x}{180}$$

$$5x = 180$$

$$\text{angle 1} = 36^\circ$$

$$\text{angle 2} = 144^\circ$$

$$\frac{\text{angle 1}}{\text{angle 2}} = \frac{36}{144} = \frac{1}{4}$$

Red and blue M&M's are in a bowl. The ratio of the number of red M&M's to the number of blue M&M's is  $\frac{3}{4}$ . There were 49 M&M's in all. How many red M&M's are there?

$$\frac{\text{Red M\&M's}}{\text{Blue M\&M's}} = \frac{3}{4}$$

$$\frac{\text{Red M\&M's}}{\text{Total M\&M's}} = \frac{3}{7}$$

$$\frac{3}{7} = \frac{x}{49} \quad x = 21$$

## U2L1 – Extended Ratios



Extended ratio: A ratio that compares three (or more) numbers

Example -  $a:b:c$

The sides of a triangle have the ratio 5:12:13. Find the length of the shortest side of the triangle if its perimeter is 240 cm.

$$\frac{\text{side 1}}{\text{total}} = \frac{5}{5 + 12 + 13} = \frac{5}{30} = \frac{1}{6}$$

$$\frac{\text{side 1}}{\text{total}} \quad \frac{1}{6} = \frac{x}{240} \quad \frac{\text{side 2}}{\text{total}} \quad \frac{12}{30} = \frac{y}{240}$$

$$6x = 240$$

$$x = 40$$

$$\frac{12}{30} = \frac{y}{240}$$

$$30x = 2880$$

$$y = 96 \quad z = 104$$

**40 cm: 96 cm: 104 cm**

# U2L1 – Proportions



What is the difference between a ratio and a proportion?

- A proportion states that two ratios are equal

The first and last numbers in a proportion: extremes

The middle two numbers in a proportion: means

$$\begin{array}{c} \text{extremes} \\ \swarrow \quad \searrow \\ 2 : 3 = 4 : 6 \\ \uparrow \quad \uparrow \\ \text{means} \end{array}$$

$$\begin{array}{l} \text{extremes} \rightarrow \\ \text{means} \rightarrow \end{array} \begin{array}{c} \textcircled{2} = \textcircled{4} \\ \textcircled{3} = \textcircled{6} \end{array}$$

## U2L1 – Cross Products Property



The product of the extremes equals the product of the means.

### Symbols

If  $\frac{a}{b} = \frac{c}{d}$ , where  $b \neq 0$  and  $d \neq 0$ , then  $ad = bc$ .

### Example

$$\begin{aligned}\frac{2}{3} &= \frac{4}{6} \\ 2 \cdot 6 &= 3 \cdot 4 \\ 12 &= 12\end{aligned}$$

What is the solution of the proportion?

$$\frac{15}{x+1} = \frac{3}{x}$$

$$15x = 3(x + 1)$$

$$15x = 3x + 3$$

$$15x - 3x = 3x - 3x + 3$$

$$12x = 3$$

$$x = \frac{3}{12} = \frac{1}{4}$$

# U2L1 – Properties of Proportions



$a$ ,  $b$ ,  $c$ , and  $d$  do not equal zero.

**Property**

(1)  $\frac{a}{b} = \frac{c}{d}$  is equivalent to  $\frac{b}{a} = \frac{d}{c}$ .

(2)  $\frac{a}{b} = \frac{c}{d}$  is equivalent to  $\frac{a}{c} = \frac{b}{d}$ .

(3)  $\frac{a}{b} = \frac{c}{d}$  is equivalent to  $\frac{a+b}{b} = \frac{c+d}{d}$ .

Use the proportion  $\frac{x}{6} = \frac{y}{7}$ .  
What ratio completes the equivalent proportion?

$$\frac{6}{x} = \frac{\square}{\square} \frac{7}{y}$$

$$\frac{x+6}{6} \frac{\square}{\square} = \frac{y+7}{7}$$

# Questions?

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- 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.