Algebra 1B Live Lesson Class

U6L2: Multiplying and Dividing Rational Expressions
(Chapter 11-2 in textbook)

CONNECTIONS ACADEMY®

Agenda

1. Review topics and problems from U6L2 – Multiplying and Dividing Rational Expressions

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.	6. Call (559) 549 - 3244 and leave a voicemail if call is not answered.
Remember: You need at least 2 phone calls with Mr. Elizondo per semester.	Make an appointment at: https://elizondo.youcanbook.me
	Send a WebMail

U6L2 - California Common Core State Standards

- HSA-APR.D.7: Understand that rational expressions form a system analogous to the rational numbers, closed under addition, subtraction, multiplication, and division by a nonzero rational expression; add, subtract, multiply, and divide rational expressions.

- HSA-APR.D.6: Rewrite simple rational expressions in different forms; write a(x)/b(x) in the form q(x) + r(x)/b(x), where a(x), b(x), q(x), and r(x) are polynomials with the degree of r(x) less than the degree of b(x), using inspection, long division, or, for the more complicated examples, a computer algebra system.

U6L2 - Objectives

- Multiply and divide rational expressions

- Simplify complex fractions

U6L2 - Vocabulary

- Complex fraction

U6L2 - Introduction

- Remember how to multiply fractions?

$$\frac{a}{b} \cdot \frac{c}{d} = \frac{ac}{bd}$$

- The same concept applies when multiplying polynomials

U6L2 – Multiplying Rational Expression

What is the product? State any excluded values.

$$\frac{6}{a^2} \cdot \frac{-2}{a^3}$$

$$= \frac{6(-2)}{a^2(a^3)}$$

$$= \frac{-12}{a^5}$$

Excluded values:

When is the denominator of the original expression equal to 0?

$$a^2 = 0, a^3 = 0$$

$$a = 0$$

$$\frac{-12}{a^5}, a \neq 0$$

U6L2 – Multiplying Rational Expression

What is the product? State any excluded values.

$$\frac{x}{x-2} \cdot \frac{x+1}{x-3}$$

$$= \frac{x(x+1)}{(x-2)(x-3)}$$

Excluded values:

When is the denominator of the original expression equal to 0?

$$x-2=0 \qquad x-3=0$$

$$x=2 \qquad\qquad x=3$$

$$\frac{x(x+1)}{(x-2)(x-3)}, x \neq 2,3$$

U6L2 – Multiplying Using Factoring

What is the product?

$$\frac{3x^2}{x+2} \cdot \frac{x^2+3x+2}{x}$$

$$= \frac{3x^2}{x+2} \cdot \frac{(x+2)(x+1)}{x}$$

$$= \frac{3x}{1} \cdot \frac{(x+1)}{1}$$

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

What is the product?

$$\frac{2x-14}{4x-6} \cdot (6x^2 - 13x + 6)$$

$$= \frac{\overset{1}{\cancel{2}}(x-7)}{\underset{1}{\cancel{2}}(2x-3)} \cdot \frac{(2x-3)(3x-2)}{1}$$

$$= \frac{(x-7)(3x-2)}{1}$$

$$= (x-7)(3x-2)$$

U6L2 - Reminder

- Remember how to divide fractions?

$$\frac{a}{b} \div \frac{c}{d} \quad = \frac{a}{b} \cdot \frac{d}{c} \quad = \frac{ad}{bc}$$

- The same concept applies when multiplying polynomials

What is the quotient?

$$\frac{4k+8}{6k-10} \div \frac{k^2+6k+8}{9k-15}$$

$$= \frac{4k+8}{6k-10} \cdot \frac{9k-15}{k^2+6k+8}$$

$$= \frac{\overset{2}{\cancel{4(k+2)}}^{\,1}}{\underset{1}{\cancel{2(3k-5)}}} \cdot \frac{3\cancel{(3k-5)}^{\,1}}{(k+4)\underset{1}{\cancel{(k+2)}}}$$

$$\frac{2 \cdot 3}{k+4}$$

$$\frac{6}{k+4}$$

What is the quotient?

$$\frac{z^2 - 2z + 1}{z^2 + 2} \div (z - 1)$$

$$= \frac{z^2 - 2z + 1}{z^2 + 2} \cdot \frac{1}{z - 1}$$

$$= \frac{(z - 1)(z - 1)}{z^2 + 2} \cdot \frac{1}{z - 1}$$

$$= \frac{z - 1}{z^2 + 2}$$

U6L2 - Complex Fractions

Complex fraction: a fraction that contains one or more fractions in its numerator, denominator, or both

$$\frac{\dfrac{x}{y}}{\dfrac{a}{b}}$$

$$= \frac{x}{y} \div \frac{a}{b}$$

$$= \frac{x}{y} \cdot \frac{b}{a}$$

$$= \frac{xb}{ya}$$

What is the simplified form?

$$\frac{\frac{1}{q+4}}{\frac{2q^2}{2q+8}}$$

$$= \frac{1}{q+4} \div \frac{2q^2}{2q+8}$$

$$= \frac{1}{q+4} \cdot \frac{2q+8}{2q^2}$$

$$= \frac{1}{q+4} \cdot \frac{2(q+4)}{2q^2}$$

$$= \frac{1}{q^2}$$

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.

U6L2 - Review Problems

1) Multiply $\dfrac{5w-25}{5w-10} \cdot \dfrac{w}{w^2-25}$

$$\dfrac{w}{(w-2)(w+5)}$$

$$\dfrac{\cancel{5}(\cancel{w-5})}{\cancel{5}(w-2)} \cdot \dfrac{w}{(w+5)(\cancel{w-5})}$$

$$\dfrac{w}{w^2+3w-10}$$

2) Multiply $\dfrac{j^2+11j-42}{26j-52} \cdot \dfrac{39j}{j-3}$

$$\dfrac{j+14}{2(j-2)} \cdot \dfrac{3j}{1}$$

$$\dfrac{(j+14)(\cancel{j-3})}{\underset{2}{\cancel{26}}(j-2)} \cdot \dfrac{\overset{3}{\cancel{39}}j}{\cancel{j-3}}$$

$$\dfrac{3j^2+42}{2j-4}$$

U6L2 - Review Problems

3) Multiply $\dfrac{9x^2 + 6x - 35}{3x - 7} \cdot \dfrac{6x^2 - 13x - 63}{3x + 7}$

$$\dfrac{(3x + 7)(3x - 5)}{3x - 7} \cdot \dfrac{(3x - 7)(2x + 9)}{3x + 7}$$

$$\dfrac{3x - 5}{1} \cdot \dfrac{2x + 9}{1}$$

$$(3x - 5)(2x + 9)$$

$$6x^2 + 27x - 10x - 45$$

$$6x^2 + 17x - 45$$

U6L2 - Review Problems

4) Divide $\dfrac{8x^2 - 12x}{x+7} \div (4x^2 - 9)$

$$\dfrac{4x}{(x+7)(2x+3)}$$

$$\dfrac{8x^2 - 12x}{x+7} \bullet \dfrac{1}{4x^2 - 9}$$

$$\dfrac{4x(2x-3)}{x+7} \bullet \dfrac{1}{(2x+3)(2x-3)}$$

$$\dfrac{4x}{2x^2 + 17x + 21}$$

$$\dfrac{4x}{x+7} \bullet \dfrac{1}{2x+3}$$

6-2: Review Problems

5) Simplify
$$\dfrac{\dfrac{a^2+2a-3}{3a}}{\dfrac{a+3}{a-2}}$$

$$\dfrac{a-1}{3a} \bullet \dfrac{a-2}{1}$$

$$\dfrac{a^2+2a-3}{3a} \div \dfrac{a+3}{a-2}$$

$$\dfrac{(a-1)(a-2)}{3a}$$

$$\dfrac{a^2+2a-3}{3a} \bullet \dfrac{a-2}{a+3}$$

$$\dfrac{a^2-3a+2}{3a}$$

$$\dfrac{(a+3)(a-1)}{3a} \bullet \dfrac{a-2}{a+3}$$