# Algebra 1B Live Lesson Class

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



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 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
- 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?

- 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: <u>https://elizondo.youcanbook.me</u>

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?

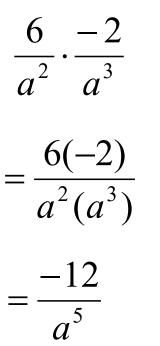
$$\frac{a}{b} \cdot \frac{c}{d} = \frac{ac}{bd}$$

 The same concept applies when multiplying polynomials

## U6L2 – Multiplying Rational Expression



What is the product? State any excluded values.



#### 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**

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

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

What is the product?

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

=3x(x+1)





What is the product?

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

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

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

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

### **U6L2 - Reminder**



Remember how to divide fractions?

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

 The same concept applies when multiplying polynomials

## **U6L2 – Dividing Rational Expressions**

What is the quotient?  

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

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

$$= \frac{4(k+2)}{2(3k-5)} \cdot \frac{3(3k-5)}{(k+4)(k+2)}$$

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

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



# U6L2 – Dividing a Rational Expression by a Polynomial



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

$$\frac{x}{y}$$

<u>a</u>

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

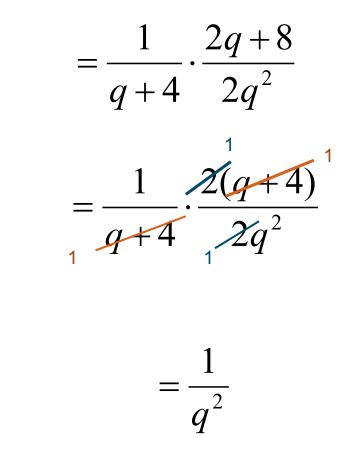
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$$b = \frac{x}{y} \div \frac{a}{b}$$

## **U6L2 - Complex Fractions**



What is the simplified form?  $\frac{\frac{1}{q+4}}{\frac{2q^2}{2q+8}}$  $=\frac{1}{q+4}\div\frac{2q^2}{2q+8}$ 



# **Questions?**



- Check the Message Board first
- Send a WebMail
- You can also make an appointment at <u>https://elizondo.youcanbook.me</u>
- 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 
$$\frac{5w-25}{5w-10} \cdot \frac{w}{w^2-25}$$
  $\frac{w}{(w-2)(w+5)}$   
 $\frac{5(w-5)}{5(w-2)} \cdot \frac{w}{(w+5)(w-5)}$   $\frac{w}{w^2+3w-10}$   
2) Multiply  $\frac{j^2+11j-42}{26j-52} \cdot \frac{39j}{j-3}$   $\frac{j+14}{2(j-2)} \cdot \frac{3j}{1}$   
 $\frac{(j+14)(j-3)}{26(j-2)} \cdot \frac{39j}{j-3}$   $\frac{3j^2+42}{2j-4}$ 

# **U6L2 - Review Problems**



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

$$\frac{(3x+7)(3x-5)}{3x-7} \cdot \frac{(3x-7)(2x+9)}{3x+7}$$
$$\frac{3x-5}{1} \cdot \frac{2x+9}{1}$$
$$(3x-5)(2x+9)$$
$$6x^{2} + 27x - 10x - 45$$

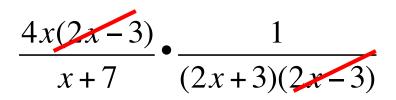
 $6x^2 + 17x - 45$ 

# **U6L2 - Review Problems**



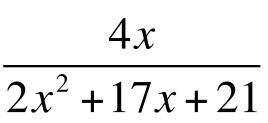
4) Divide 
$$\frac{8x^2 - 12x}{x + 7} \div (4x^2 - 9)$$
  $\frac{4x}{(x + 7)(2x + 3)}$ 

$$\frac{8x^2 - 12x}{x + 7} \cdot \frac{1}{4x^2 - 9}$$



 $4x \bullet 1$ 

 $x + 7 \quad 2x + 3$ 



## **6-2: Review Problems**



5) Simplify 
$$\frac{\frac{a^2+2a-3}{3a}}{\frac{a+3}{a-2}}$$
  $\frac{a-1}{3a} \cdot \frac{a-2}{1}$   
 $\frac{a^2+2a-3}{3a} \cdot \frac{a+3}{a-2}$   $\frac{(a-1)(a-2)}{3a}$   
 $\frac{a^2+2a-3}{3a} \cdot \frac{a-2}{a+3}$   $\frac{a^2-3a+2}{3a}$   
 $\frac{(a+3)(a-1)}{3a} \cdot \frac{a-2}{a+3}$