

Algebra 1B Live Lesson Class

U6L1: Simplifying Rational Expressions
(Chapter 11-1 in textbook)



Agenda



1. Review topics and problems from U6L1 – Simplifying 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?
3. Write down your own questions.
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

U6L1 - 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.

U6L1 - Vocabulary



- rational expression
- excluded value

U6L1 - Introduction



- A **rational expression** has the form:

$$\frac{\textit{polynomial}}{\textit{polynomial}}$$

- **Excluded values:** a value of a variable for which a rational expression is undefined

Keep in mind that the denominator cannot equal 0.

U6L1 - Introduction



■ To simplify a rational expression:

- Divide common factors from the numerator and denominator
- You may have to factor the polynomial first

U6L1 – Simplifying a Rational Expression



What is the simplified form of the expression? State any excluded values.

$$\begin{aligned} & \frac{18d^2}{4d+8} \\ = & \frac{18d^2}{4(d+2)} \\ = & \frac{9d^2}{2(d+2)} \end{aligned}$$

Excluded values:

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

$$\begin{aligned} d + 2 &= 0 \\ d &= -2 \end{aligned}$$

$$\frac{9d^2}{2(d+2)}, d \neq -2$$

U6L1 – Simplifying a Rational Expression



What is the simplified form of the expression? State any excluded values.

$$\begin{aligned} & \frac{26c^3 + 91c}{2c^2 + 7} \\ &= \frac{13c(2c^2 + 7)}{2c^2 + 7} \\ &= 13c \end{aligned}$$

Excluded values:

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

$$2c^2 + 7 = 0$$

$$2c^2 = -7$$

$$c^2 = -\frac{7}{2}$$

13c, none

U6L1 – Simplifying a Rational Expression



What is the simplified form of the expression? State any excluded values.

$$\frac{2x-8}{x^2-2x-8}$$
$$= \frac{2(x-4)}{(x-4)(x+2)}$$
$$= \frac{2}{x+2}$$

Excluded values:

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

$$(x-4)(x+2) = 0$$

$$x-4 = 0 \quad x+2 = 0$$

$$x = 4 \quad x = -2$$

$$\frac{2}{x+2}, x \neq 4, -2$$

U6L1 - Tip



$x - 3$ and $3 - x$ are opposites

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

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

$$= -1$$

U6L1 – Simplifying a Rational Expression



What is the simplified form of the expression? State any excluded values.

$$\frac{5-x}{x^2-2x-15}$$
$$= \frac{-1(\cancel{x-5})}{(\cancel{x-5})(x+3)}$$
$$= \frac{-1}{x+3}$$

Excluded values:

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

$$(x-5)(x+3) = 0$$

$$x-5 = 0 \quad x+3 = 0$$

$$x = 5 \quad x = -3$$

$$\frac{-1}{x+3}, x \neq 5, -3$$

U6L1 – Simplifying a Rational Expression



What is the simplified form of the expression? State any excluded values.

$$\begin{aligned} & \frac{y^2 - 16}{4 - y} \\ &= \frac{(y + 4)(y - 4)}{4 - y} \\ &= \frac{(y + 4)\cancel{(y - 4)}}{-1\cancel{(y - 4)}} \\ &= \frac{y + 4}{-1} = -y - 4 \end{aligned}$$

Excluded values:

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

$$4 - y = 0$$

$$4 = y$$

$$-y - 4, y \neq 4$$

U6L1 – Using a Rational Expression



A square has side length $6x+2$.
A rectangle with width $3x+1$ has
the same area as the square,
What is the length of the
rectangle?

Area of square: $(6x+2)(6x+2)$

Area of rectangle: $(3x+1)(length)$

$$(3x + 1)(length) = (6x + 2)(6x + 2)$$

$$length = \frac{(6x + 2)(6x + 2)}{3x + 1}$$

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

$$length = 4(3x + 1)$$

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.

U6L1 - Review Problems



Simplify each expression. State any excluded values.

$$1) \frac{8b^5}{64b^4} \quad \frac{\cancel{2} \cdot \cancel{2} \cdot \cancel{2} \cdot \cancel{b} \cdot \cancel{b} \cdot \cancel{b} \cdot \cancel{b} \cdot b}{\cancel{2} \cdot \cancel{2} \cdot \cancel{2} \cdot 2 \cdot 2 \cdot 2 \cdot \cancel{b} \cdot \cancel{b} \cdot \cancel{b} \cdot \cancel{b}} \quad \frac{b}{8}$$

$$2) \frac{n^2 - n - 12}{n^2 - 4n} \quad \frac{\cancel{(n-4)}(n+3)}{n\cancel{(n-4)}} \quad \frac{n+3}{n} \quad n \neq 0$$

U6L1 - Review Problems



Simplify each expression. State any excluded values.

$$3) \quad \frac{3x^2 + 19x - 14}{x^2 - 49} \quad \frac{(3x - 2)\cancel{(x + 7)}}{(x - 7)\cancel{(x + 7)}} \quad \frac{3x - 2}{x - 7} \quad x \neq 7, -7$$

$$4) \quad \frac{25y^2 - 121}{15y - 33} \quad \frac{(5y + 11)\cancel{(5y - 11)}}{3\cancel{(5y - 11)}} \quad \frac{5y + 11}{3} \quad y \neq 11/5$$

U6L1 - Review Problems



5) The length of a rectangle is $x-2$. Its area is $2x-4$. What is a simplified expression for the width?



$$l = x - 2$$

$$A = 2x - 4$$

$$A = l \cdot w$$

$$2x - 4 = w(x - 2)$$

$$\frac{2x - 4}{x - 2} = \frac{w(x - 2)}{x - 2}$$

$$w = \frac{2x - 4}{x - 2}$$

$$w = \frac{2(x - 2)}{x - 2}$$

$$w = 2$$