Algebra 1B Live Lesson

U2L1 - Zero and Negative Exponents
(Chapter 7-1 in textbook)

Agenda

1. Review selected problems and topics from U2L1 (Chapter 7-1 in textbook).

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	What to do
1. Complete 1 math lesson per day.	1. Go to your Planner in Connexus to find the math lesson for the day
2. Check your WebMail every day	2. Go to Connexus to find WebMail
3. Be prepared to spend 4 - 6 hours per day on schoolwork.	3. Complete lessons for the day from your Planner. Do not get behind on lessons.
4. Remind your Learning Coach to take daily attendance	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.	5. Link to Message Board:
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

U2L1 - California Common Core State Standards

- HSF-IF.C.8: Write a function defined by an expression in different but equivalent forms to reveal and explain different properties of the function.

U2L1 - Objectives

- Simplify expressions involving zero and negative exponents

U2L1 - Introduction

- You can extend the idea of exponents to include zero and negative exponents.
- Consider 3^3, 3^2 and 3^1. Decreasing the exponents by 1 is the same as dividing by 3. If you continue the pattern, $3^0=1$ and $3^{-1}=1/3$

U2L1 – Zero and Negative Exponents

take note

Properties Zero and Negative Exponents

Zero as an Exponent For every nonzero number a, $a^0 = 1$.

Examples $4^0 = 1$ $(-3)^0 = 1$ $(5.14)^0 = 1$

Negative Exponent For every nonzero number a and integer n, $a^{-n} = \frac{1}{a^n}$.

Examples $7^{-3} = \frac{1}{7^3}$ $(-5)^{-2} = \frac{1}{(-5)^2}$

U2L1 - Zero and Negative Exponents

Why can't you use 0 as a base with zero exponents? The first property on the previous page implies the following pattern.

$3^0 = 1$ $2^0 = 1$ $1^0 = 1$ $0^0 = 1$

However, consider the following pattern.

$0^3 = 0$ $0^2 = 0$ $0^1 = 0$ $0^0 = 0$

It is not possible for 0^0 to equal both 1 and 0. Therefore 0^0 is undefined.

Why can't you use 0 as a base with a negative exponent? Using 0 as a base with a negative exponent will result in division by zero, which is undefined.

U2L1 – Simplifying Powers

$$9^{-2} = \frac{1}{9^2} = \frac{1}{81}$$

$$(-3.6)^0 = 1$$

$$4^{-3} = \frac{1}{4^3} = \frac{1}{64}$$

$$(-5)^0 = 1$$

$$(-4)^{-2} = \frac{1}{(-4)^2} = \frac{1}{16}$$

U2L1 – Simplifying Exponential Expressions

$$5a^3b^{-2} = 5a^3\left(\frac{1}{b^2}\right)$$

$$= \frac{5a^3}{b^2}$$

$$\frac{1}{x^{-5}} = 1 \div x^{-5}$$

$$= 1 \div \frac{1}{x^5}$$

$$= 1 \bullet x^5$$

$$= x^5$$

U2L1 – Evaluating an Exponential Expression

What is the value of $3s^3t^{-2}$ for $s = 2$ and $t = -3$?

Method 1: Simplify first.

$$3s^3t^{-2} = 3s^3\left(\frac{1}{t^2}\right)$$

$$= \frac{3s^3}{t^2}$$

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

$$= \frac{3(8)}{9} = \frac{24}{9} = 2\frac{2}{3}$$

Method 2: Substitute first.

$$3s^3t^{-2} = 3(2)^3(-3)^{-2}$$

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

$$= \frac{24}{9} = 2\frac{2}{3}$$

U2L1 - Review (What we learned from this LL)

- Learned how to simplify powers
- Learned how to simplify exponential expressions
- Learned how to evaluate exponential expressions

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.