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Warmup 1/(# of lives a cat has)
PLEASE BRING YOUR
TEXTBOOK TODAY!!!!!

Evaluate: (means "find the value of")

1) 7^{3} 2) $(-5)^{4}$ 3) $\left(\frac{11}{9}\right)^{2}$

BAND STUDENTS:

• Please turn in your warmups now!

REMEMBER:

- The corrections/extension assignment is due Monday. (Band students – don't forget this!)
- Do a good job on this! Write specific explanations, not vague ones.
- Also 30 min ALEKS

A simple question...

- If you fold a piece of paper in half 7 times, how many layers are there?
- Try it!!!

We're starting a NEW table of contents...

• You should keep your old TOC/old notes. But you could move them to the back section of your binder. These new notes should be in front.

Table of Contents (2nd Semester)

p. 1 Exponent Basics (1.2)

Exponent Basics

Objective:

-Review how exponents work

-Look at powers of negative numbers

Remember...

- Anything in **RED** is something you **MUST** write down.
- Anything else is up to you. You should know your learning style best. Write down what you feel will be helpful to you.

Also...

• Please do NOT work on the homework during the lesson.



What is the number "out in front" called?



"Expanding"

- Expand = write out all the factors
- Expanding will be VERY VERY VERY helpful later when we are learning more complicated rules.

Expand and simplify if possible: • 10⁴

IMPORTANT



- **RIGHT:** $7 \cdot x \cdot x \cdot x \cdot x \cdot x$ • **WRONG:** $7x \cdot 7x \cdot 7x \cdot 7x \cdot 7x$
- (The coefficient is NOT connected to the exponent!)

Example: Write using powers

 $8 \cdot k \cdot m \cdot k \cdot k \cdot 8 \cdot 8 \cdot k \cdot k$

"Write using powers" = leave it with an exponent "Evaluate" = actually work it out



•
$$2^1 = 2$$

- $2^2 = 4$
- $2^3 = 8$
- 2⁴ = 16
- $2^5 = 32$
- $2^6 = 64$
- $2^7 = 128$
- $2^8 = 256$
- $2^9 = 512$
- $2^{10} = 1024$
- $2^{11} = 2048$
- $2^{12} = 4096$
- $2^{13} = 8192$
- $2^{14} = 16384$
- $2^{15} = 32768$

Powers of 3

- $3^1 = 3$
- $3^2 = 9$
- $3^3 = 27$
- 3⁴ = 81
- $3^5 = 243$
- $3^6 = 729$
- $3^7 = 2187$

Powers of 4

- $4^1 = 4$
- $4^2 = 16$
- $4^3 = 64$
- 4⁴ = 256
- $4^5 = 1024$
- $4^6 = 4096$

Powers of 5

- $5^1 = 5$
- $5^2 = 25$
- $5^3 = 125$
- $5^4 = 625$
- $5^5 = 3125$

Negative bases Powers of -2... $(-2)^1 = -2$ $(-2)^2 = 4$ $(-2)^3 = -8$ $(-2)^4 = 16$ $(-2)^5 = -32$ $(-2)^6 = 64$

A negative number to an odd power is negative. A negative number to an even power is positive.

This is the reason that you <u>can</u> do the cube root of a negative but you <u>can't</u> do a square roots of a negative!

Do we really need the parentheses?

VS.

 $(-3)^2$

IF THERE ARE NO PARENTHESES, YOU EVALUATE THE POWER FIRST AND <u>THEN</u> MAKE IT NEGATIVE, BECAUSE THE NEGATIVE SIGN IS NOT CONNECTED TO THE EXPONENT.

 -2^{2}

OR BECAUSE: A NEGATIVE SIGN IS LIKE MULTIPLYING BY -1. AND EXPONENTS COME BEFORE MULTIPLICATION!

IMPORTANT:

$(-3)^2$ is 9 -3² is the same as -(3²) which is -9

Negative sign is NOT connected to the exponent here

Practice

- 1. Simplify: $(-10)^4 = (-10) \cdot (-10) \cdot (-10) \cdot (-10) = 10,000$
- 2. Simplify: $-5^2 = -(5 \cdot 5) = -25$
- 3. Simplify: $\left(\frac{3}{2}\right)^3 = \left(\frac{3}{2}\right) \left(\frac{3}{2}\right) \left(\frac{3}{2}\right) = \frac{3 \cdot 3 \cdot 3}{2 \cdot 2 \cdot 2} = \frac{27}{8}$

 $= 9 \cdot 4^2 = 9 \cdot 16 = 144$

- 4. Evaluate $9x^2$ when x = 4.
- 5. Evaluate $-a^6$ when a = 2. $= -(2)^6 = -64$
- 6. Evaluate c^2 when c = -31. = $(-31)^2 = 961$
- 7. Is the value of (-84)⁶³ positive or negative? Explain how you know.
 Negative; any negative number to an odd power is negative.

Homework

p. 19 (1 – 5, 7, 9 – 12) NO CALCULATOR!

• (9-12 are challenging: be careful!!!)

Today during SEL/PLT:

- Panorama survey must complete this before doing anything else
- surveys.panoramaed.com/nashville
- Your "access code" is your student ID number (190.....)