

Warm up

1. $(-w^{10}) \cdot w$

4. $(-3a)^5 \cdot (4a)^2$

2. $(-2xy)^4$

5. $(-ab)(a^2b)^2$

3. $-(2xy)^4$

6. $(-2wz^2)^5(wz)^2$

Warm Up

Week 10

Simplify the expression.

1) $(-2x)^6$

$$(-2)^6 \times x^6$$

$$64x^6$$

2) $(2mn)^6$

$$2^6 m^6 n^6$$

$$64m^6n^6$$

3) $(-xyz)^5$

$$(-1)^5 x^5 y^5 z^5$$

$$-1 x^5 y^5 z^5$$

4) $-(2xy)^4$

$$-1 \cdot 2^4 x^4 y^4$$

$$-1 \cdot 16 x^4 y^4$$

$$-16x^4y^4$$

Homework Questions?

Self Scoring Scale

4- I can *summarize* the concepts and explain it to others.

3- I can *apply* the concepts to answer questions correctly.

2- I can *apply* the concepts but with some *mistakes*.

1- I *need help* to know how to apply the concepts.

0- I *can't* apply the concepts even with help.

8.2 Zero and Negative Exponents

Goals: • Evaluate powers that have zero or negative exponents.

EQ: How do you switch negative exponents into positive exponents?

The Unit Organizer		NAME _____	DATE _____
④ BIGGER PICTURE		Algebra 1.5 Concepts	
② LAST UNIT/Experience Systems	① CURRENT UNIT Exponents & Exponential Functions	③ NEXT UNIT/Experience Quadratics	
⑧ Student Activities or Assignments 8.1 8.2 8.3 8.4 8.5 8.6 8.7	⑤ UNIT MAP		
	⑥ UNIT SELF-TEST QUESTIONS		
	1. What properties can be used to simplify & evaluate exponential expressions? 2. What do exponential graphs look like? 3. Can you write numbers in both decimal form and in scientific notation? 4. How can exponential growth and decay equations be used to represent and solve real world problems?		
	Simplify Graph Apply Represent		
	⑥ UNIT RELATIONSHIPS		
	⑦		

ZERO AND NEGATIVE EXPONENTS

Let a be a nonzero number and let n be an integer.

• A nonzero number to the zero power is 1: $a^0 = 1, a \neq 0$

• a^{-n} is the reciprocal of a^n : $a^{-n} = \frac{1}{a^n}, a \neq 0$

$$10^3 = 1000$$

$$10^2 = 100$$

$$10^1 = 10$$

$$10^0 = 1$$

Example 1: Powers with Zero and Negative Exponents

Evaluate the expression.

a. $(21)^0 = 1$

b. $\left(\frac{2}{5}\right)^0 = 1$

c. $4^{-2} = \frac{1}{4^2}$

$$= \frac{1}{16}$$

d. $\frac{1}{3^{-3}} = \frac{3^3}{1} = 27$

Try It Evaluate the expression.

1. 2^0
 $\textcircled{1}$

2. $(-1)^0$
 $\textcircled{1}$

3. $2^{-3} = \frac{1}{2^3}$
 $= \frac{1}{8}$
 $\textcircled{\frac{1}{8}}$

4. $\frac{1}{(-8)^{-2}} = \frac{(-8)^2}{1}$
 $= \textcircled{64}$

Example 2: Evaluate Exponential Expressions

Evaluate the expression.

a. $2^4 \cdot 2^{-4} = 2^{4+(-4)} = 2^0 = \textcircled{1}$

b. $(3^{-2})^{-2} = 3^4 = \textcircled{81}$

c. $(-2 \cdot 3)^{-2} = \frac{1}{(-2)^2 \cdot 3^2} = \frac{1}{4 \cdot 9}$
 $= \textcircled{\frac{1}{36}}$

Try It

Evaluate the expression without using a calculator.

$$5. \underline{7^4} \cdot \underline{7^{-4}} = 7^0 = \textcircled{1}$$

$$6. (2^{-2})^{-2} = 2^4 = \textcircled{16}$$

$$7. (-3 \cdot 3)^{-2} = \frac{(-3)^2 \cdot 3^{-2}}{(-3)^2 \cdot 3^2} = \frac{1}{9 \cdot 9} = \textcircled{\frac{1}{81}}$$

Example 3: Simplify Exponential Expressions

Rewrite the expression with positive exponents.

$$a. \underline{3x^{-4}y^{-5}} = \frac{3}{x^4 y^5}$$

$$b. \frac{a^{-1}}{b^{-2}} = \frac{b^2}{a^1} = \frac{b^2}{a}$$

$$c. (7c)^{-2} = \frac{7^2 \cdot c^{-2}}{7^2 c^2} = \frac{1}{49c^2}$$

8.2 Day 1 Homework

Negative Exponents wkst (p.34)

Warm Up

Week 10

$$1) \frac{x^3 y^{-6}}{1} = \frac{x^3}{y^6} \quad 2) \frac{1}{11x^{-2}y^{-7}} = \frac{x^2 y^7}{11}$$

$$3) (2x^{-10})^7 = \frac{2^7 x^{-70}}{1} = \frac{2^7}{x^{70}} = \frac{128}{x^{70}}$$

$$4) (2^{-4}x^3y^{-3})^{-2} = \frac{2^8 x^{-6} y^6}{1} = \frac{256 y^6}{x^6}$$

Homework Questions?

Example 3: Simplify Exponential Expressions

Rewrite the expression with positive exponents.

$$\text{a. } \frac{3x^{-4}y^{-5}}{1} = \frac{3}{x^4y^5}$$

$$\text{b. } \frac{a^{-1}}{b^{-2}} = \frac{b^2}{a^1} = \frac{b^2}{a}$$

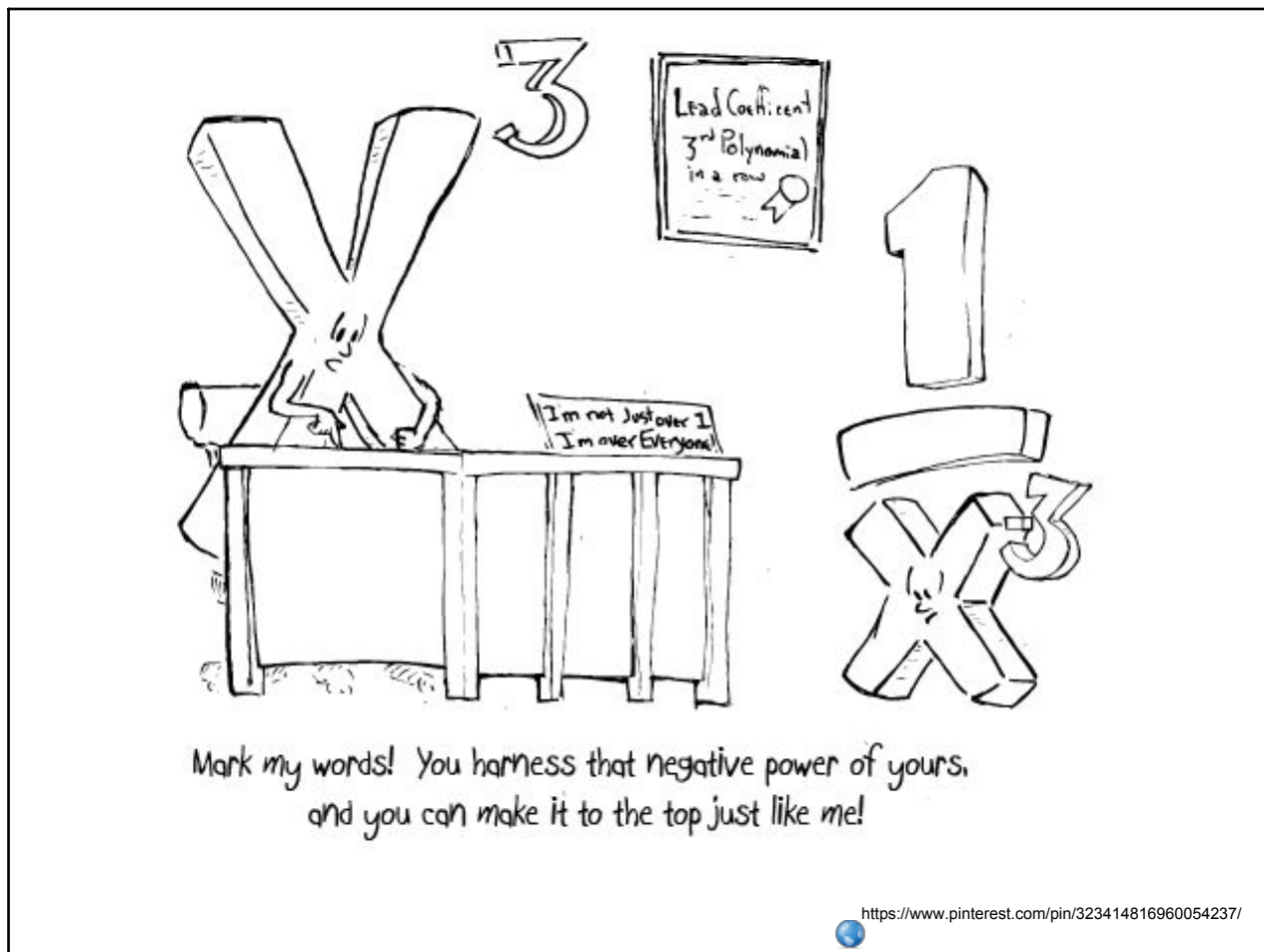
$$\text{c. } (7c)^{-2} = \frac{1}{7^2c^2} = \frac{1}{49c^2}$$

Try It Rewrite the expression with positive exponents.

$$\text{8. } \frac{3c^7d^{-7}}{1} = \frac{3c^7}{d^7}$$

$$\text{9. } \frac{u^{-5}}{v^{-3}} = \frac{v^3}{u^5}$$

$$\text{10. } (3t)^{-3} = \frac{1}{3^3t^3} = \frac{1}{27t^3}$$



Summary

EQ: How do you switch negative exponents into positive exponents?

8.2 Homework

8.2 p.452 #3-10, 15-18, 22-40even