Name _____

Date _____Pd_____

PROPERTIES OF NEGATIVE AND ZERO EXPONENTS

Use the examples at the right to explore the properties of negative and zero exponents. First, subtract the exponents to simplify the expression. Then, write out the expanded form of each expression and simplify to see another equivalent expression.

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

EXPANDED:

SIMPLIFY:

$$\frac{3^4}{3^4} =$$

EXPANDED:

SIMPLIFY:

The examples above show us how to simplify negative exponents as well as a base raised to the power of zero as summarized below.

NEGATIVE EXPONENT PROPERTY	ZERO POWER PROPERTY
$a^{-x} =$ _____	$a^0 =$ _____
When an exponent is negative, write the _____ of the base, and the exponent becomes _____.	Any base raised to the power of zero is equal to _____.

In 1-3, simplify each expression. Do not leave any negative exponents in your answer.

1. h^{-6}	2. n^{-3}	3. $(b^{-4})^2$

In 4-7, simplify the expression and do not leave any exponents in your answer.

4. 8^{-2}	5. $\dfrac{10^3}{10^4}$	6. 2^{-4}	7. $\dfrac{5^8}{5^8}$

Apply the properties of exponents to simplify each expression below.

8.	9.	10.
$a^4 \cdot (a^{-5})^2$	$(m^3 n^{-3})^3$	$\dfrac{g^8 \cdot g^{-4}}{g^4}$

11.	12.
$\dfrac{d \cdot d^2}{(d^2)^{-3}}$	$(jk^2)^{-2}$

In 13-15, label the equality statement as true or false. Be sure to show your thinking.

13.	14.	15.
$z^{-7} \cdot z^2 = z^7 \cdot z^{-2}$	$\dfrac{a^{-8}}{a^3} = \dfrac{a^{-17}}{a^{-6}}$	$\dfrac{8^{-6}}{8^2} = (8^{-4})^2$

16. Olga's work simplifying an expression is shown below. Describe Olga's mistake and give the correct simplified expression.

$$\frac{x^4 \cdot x^4}{x^{-8}} = \frac{x^8}{x^{-8}} = x^0 = 1$$

Summarize today's lesson: