



# Rules of Exponents

## Guided Notes

Algebra Standards:  
N.RN.1

# Rules of Exponents

**N.RN.1** I CAN... rewrite expressions involving rational exponents using the properties of exponents.

## vocabulary:

**Monomial** A number, a variable, or a product of a number and one or more variables  
Examples  $34xy$ ,  $7a^2b$

**Power**  $\left\{ \begin{array}{l} 5^2 \\ \end{array} \right.$  Exponent  
Base

## rules of exponents:

<b>Product of Powers:</b> $a^m \cdot a^n = a^{m+n}$		
If multiplying two numbers with the same base, ADD the exponents		
$5^2 \cdot 5^6$		$y^4 \cdot y^3 \cdot y$
$(7y^5)(6y)$		$(-3x^2y^7)(5xy^6)$
<b>Quotient of Powers:</b> $\frac{a^m}{a^n} = a^{m-n}$		
If dividing two numbers with the same base, SUBTRACT the exponents		
$\frac{y^6}{y}$	$\frac{6^{13}}{6^2}$	$\frac{10a^7b^9}{15a^5b^9}$

# Rules of Exponents

## Zero Exponent: $a^0 = 1$

Any nonzero number with an exponent of zero is equivalent to 1

WHY?? Let's explore  $\frac{8^2}{8^2}$  .....

$$(-3x+7)^0$$

$$8x^0 + 5$$

## Negative Exponent $a^{-n} = \frac{1}{a^n}$

For any nonzero number "a" raised to a negative exponent, place the power in the denominator to rewrite the power with a positive exponent

WHY?? Let's Explore  $\frac{b^2}{b^5}$  .....

$$2^{-3}$$

$$(-3)^{-3}$$

# Rules of Exponents

**Power of a Power:**  $(a^m)^n = a^{m \cdot n}$

If raising a power to a power, **multiply** the exponents

**Examples:** Simplify. Write each answer using only positive exponents:

$(x^2)^8$

$(y^{-3})^{-4}$

**Power of a Product:**  $(ab)^m = a^m b^m$

Find the power of **each** factor in the parenthesis and multiply

$(4x^3yz)^3$

$(7xy^{-2})^{-2}$

$(6x^{-6}y^{-7}z^0)^{-2}$

**Power of a Quotient:**  $\left(\frac{a}{b}\right)^m = \frac{a^m}{b^m}$

For any numbers "a" and "b" where  $b \neq 0$ , if the quotient of a and b is raised to a power, raise both the numerator and the denominator to the given power

$\left(\frac{3}{5}\right)^2$

$\left(\frac{2a^5}{b^7}\right)^2$

$\left(\frac{3a^{-4}}{b^7}\right)^3$

$\left(\frac{a^{-2}b^{-5}}{c^{-11}}\right)^{-6}$

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Thanks for  
Shopping!!!

**I hope you enjoyed the Rules of Exponents Guided Notes! You may also enjoy the Rules of Exponents Reference Sheet or Rules of Exponents: Different Question/Same Answer Partner Activity, which are both available in my store.**

**Thanks..... Come back soon!!**

Elizabeth Kissel ☺