

Name:

Date:

Period:

Math Lab: Properties of Exponents

Property	Exponential Expression	Expanded Form	Simplified Form
Product of Powers	$3^5 \cdot 3^2$	$(3 \cdot 3 \cdot 3 \cdot 3 \cdot 3) \cdot (3 \cdot 3)$	3^7
	$5^3 \cdot 5^2$		
	$a^m \cdot a^n$		

When you multiply powers with the same base...

Power of a Power	$(2^3)^2$	$(2 \cdot 2 \cdot 2) \cdot (2 \cdot 2 \cdot 2)$	2^6
	$(6^2)^4$		
	$(a^m)^n$		

When you raise a power to a power...

Quotient of Powers	$\frac{2^4}{2^2}$	$\frac{2 \cdot 2 \cdot 2 \cdot 2}{2 \cdot 2}$	2^2
	$\frac{5^5}{5^2}$		
	$\frac{a^m}{a^n}$		

When you divide powers with the same base...

Power of a Product	$(2x)^3$	$(2x)(2x)(2x)$	$2^3 x^3$
	$(-3xy)^2$		
	$(ab)^m$		

When you raise a product to a power...

Power of a Quotient	$\left(\frac{x}{2}\right)^3$	$\left(\frac{x}{2}\right)\left(\frac{x}{2}\right)\left(\frac{x}{2}\right)$	$\frac{x^3}{2^3}$
	$\left(\frac{3}{y}\right)^5$		
	$\left(\frac{a}{b}\right)^m$		
When you raise a quotient to a power...			

Zero Power Property and Negative Exponent Property	
$2^3 =$	Each time you decrease the power, you...
$2^2 =$	
$2^1 =$	
$2^0 =$	$a^0 =$ Any base raised to the zero power equals...
$2^{-1} =$	$a^{-1} =$ Any base raised to a negative exponent equals...
$2^{-2} =$	
$2^{-3} =$	

Simplify the following expressions using properties of exponents. Evaluate numbers raised to a power and answers should have no negative exponents.

1. $n^5 n^2 =$

6. $\frac{-6x^5 y^3}{18xy^7} =$

2. $y^7 y^3 y^2 =$

3. $t^9 t^{-8} =$

7. $\left(\frac{2x^3 y^2}{-x^2 y^5}\right)^{-1} =$

4. $(2f^4)^3 =$

8. $\left(\frac{3}{2}d^2 f^4\right)^{-1} \left(-\frac{4}{3}d^5 f\right)^3 =$

5. $(-2b^{-2}c^0)^2 =$

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