

Name: _____ Period _____

Laws of Exponents!

What are the rules?

Rule	Property	Example
Zero Exponent	$x^0 = 1$	$7^0 = 1$
Negative Exponent	$x^{-1} = 1/x$	$4^{-1} = 1/4$
Product of Powers	$x^m x^n = x^{m+n}$	$x^2 x^3 = x^{2+3} = x^5$
Quotient of Powers	$\frac{x^m}{x^n} = x^{m-n}$	$x^6/x^2 = x^{6-2} = x^4$

How do I use them?

Expression	Which Rule?	Simplified
$x^7 x^2$		
$\frac{y^9}{y^5}$		
x^0		
x^{-5}		

You Try!

Expression	Which Rule?	Simplified
$z^8 z^9$		
$\frac{x^{11}}{x^{10}}$		
7^{-2}		
y^0		
$w^3 w^3$		

Name: _____ Period _____

Laws of Exponents - Practice

Expression	Simplified
1. a^5a^4	
2. $\frac{c^{14}}{c^9}$	
3. 4^{-3}	
4. y^0	
5. d^9d^8	
6. $\frac{b^{13}}{b^{12}}$	
7. $\frac{h^5}{h^5}$	
8. $x^{11}x^{13}$	
9. g^7g^{-4}	
10. $\frac{m^{15}}{m^8}$	
Challenge Problems:	
11. $c^5c^9c^6$	
12. $\frac{x^5y^4}{x^2}$	
13. $\frac{x^9y^7}{x^4y^3}$	
14. $xy^4 \bullet x^6y^5$	
15. $\frac{x^3x^9x^{11}}{x^{-4}}$	

Name: _____ Period _____

More Laws of Exponents!

Rule	Laws of Exponents	Example
Power of a Product	$(xy)^n = x^n y^n$	$(xy)^3 = x^3 y^3$
Power of a Quotient	$\left(\frac{x}{y}\right)^n = \frac{x^n}{y^n}$	$\left(\frac{x}{y}\right)^2 = \frac{x^2}{y^2}$
Power of a Power	$(x^m)^n = x^{mn}$	$(x^2)^3 = x^{2 \cdot 3} = x^6$

Practice! Name the rule that applies to each expression below and simplify.

Expression	Rule	Simplified
$\left(\frac{2}{p}\right)^3$		
$(x^5)^2$		
$(xy)^4$		
$(ab)^8$		
$\left(\frac{t}{3}\right)^2$		
$(y^8)^8$		
$(4^1)^3$		
$(yz)^6$		
$\left(\frac{x}{y}\right)^0$		
$(3m)^3$		

Name: _____ Period _____

More Laws of Exponents - Practice

Directions: Simplify each expression.

1. $(x^4x^7)^2$

2. $(xy)^9$

3. $(b^{11}b^8)^3$

4. $\left(\frac{a}{b}\right)^5$

5. $(c^6c^3)^6$

6. $\left(\frac{x^5}{y^2}\right)^3$

7. $\left(\frac{c}{7}\right)^2$

8. $\left(\frac{x^5}{y^2}\right)^3$

9. $(2b^4)^3$

10. $(2^2)^3$

11. $(1 \bullet 3)^4$

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

13. $(2^2 \bullet 3^2)^2$

14. $\left(\frac{d^3}{c^4}\right)^2$

15. $\left(\frac{a^5}{b^7}\right)^3$

16. $(3^2 \bullet 1^7)^2$

17. $(2x^7)^4$

18. $\left(\frac{x^5y^4}{x^2y}\right)^2$