

Name: _____ Class: _____ Date: _____

Exponent Rules Discovery Activity

Directions: Fill out the table following the example provided for you. Upon completion, answer the questions below.

Expression	Repeated Multiplication	Rewrite
$2^2 \times 2^3$	$2 \times 2 \times 2 \times 2 \times 2$	2^5
$7^4 \times 7^1$		
$3^2 \times 3^3 \times 3^1$		
$x^6 \times x^3$		

1) Look back at your table. Did you notice a pattern with the beginning Expression and the final Rewrite? Explain what you see.

2) Write a rule using bases and exponents for this pattern.

3) Using the rule, rewrite the following WITHOUT doing the repeated multiplication.

a) $5^5 \times 5^6$

b) $x^{10} \times x^{30}$

c) $10^7 \times 10^8 \times 10^{10}$

d) $x^9 \times x^6 \times x^3$

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Exponent Rules Discovery Activity

Directions: Fill out the table following the example provided for you. Upon completion, answer the questions below.

Expression	Repeated Multiplication	Cancelling Out	Rewrite
$\frac{3^6}{3^4}$	$\frac{3 \times 3 \times 3 \times 3 \times 3 \times 3}{3 \times 3 \times 3 \times 3}$	$\frac{\cancel{3} \times \cancel{3} \times \cancel{3} \times \cancel{3} \times 3 \times 3}{\cancel{3} \times \cancel{3} \times \cancel{3} \times \cancel{3}}$	3^2
$\frac{x^4}{x^3}$			
$\frac{8^5}{8^2}$			
$\frac{y^3}{y^1}$			

1) Look back at your table. Did you notice a pattern with the beginning Expression and the final Rewrite? Explain what you see.

2) Write a rule using bases and exponents for this pattern.

3) Using the rule, rewrite the following WITHOUT doing the repeated multiplication.

a) $\frac{12^9}{12^7}$

b) $\frac{x^{10}}{x^5}$

c) $\frac{90^{50}}{90^{25}}$

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Exponent Rules Discovery Activity

Directions: Fill out the table following the example provided for you. Upon completion, answer the questions below.

Expression	Repeated Multiplication	Repeated Multiplication (Again)	Rewrite
$(4^2)^3$	$4^2 \times 4^2 \times 4^2$	$(4 \times 4) \times (4 \times 4) \times (4 \times 4)$	4^6
$(x^3)^4$			
$(2^2)^4$			
$(x^4)^5$			

1) Look back at your table. Did you notice a pattern with the beginning Expression and the final Rewrite? Explain what you see.

2) Write a rule using bases and exponents for this pattern.

3) Using the rule, rewrite the following WITHOUT doing the repeated multiplication.

a) $(10^{10})^3$

b) $(x^5)^6$

c) $(5^{12})^3$

d) $(6^7)^8$

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Exponent Rules Discovery Activity

Directions: Fill out the table following the example provided for you. Upon completion, answer the questions below.

Expression	Quotient Rule	Repeated Multiplication	Cancelling Out	Rewrite
$\frac{5^3}{5^5}$	5^{-2}	$\frac{5 \times 5 \times 5}{5 \times 5 \times 5 \times 5 \times 5}$	$\frac{\cancel{5 \times 5 \times 5}}{\cancel{5 \times 5 \times 5} \times 5 \times 5}$	$\frac{1}{5^2}$
$\frac{x^2}{x^6}$				
$\frac{10^4}{10^5}$				

1) Look back at your table. Did you notice a pattern with the beginning Expression and the final Rewrite? Explain what you see.

2) Write a rule using bases and exponents for this pattern.

3) Using the rule, rewrite the following WITHOUT doing the repeated multiplication.

a) $x^2 \times x^{-5}$

b) $\frac{5^6}{5^{12}}$

c) $(8^{-2})^9$

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Exponent Rules Discovery Activity

Directions: Fill out the table following the example provided for you. Upon completion, answer the questions below.

Expression	Quotient Rule	Repeated Multiplication	Simplify	Rewrite
$\frac{5^2}{5^2}$	5^0	$\frac{5 \times 5}{5 \times 5}$	$\frac{25}{25}$	1
$\frac{10^3}{10^3}$				
$\frac{2^5}{2^5}$				

- 1) Look back at your table. Did you notice a pattern with the beginning Expression and the final Rewrite? Explain what you see.
- 2) Write a rule using bases and exponents for this pattern.