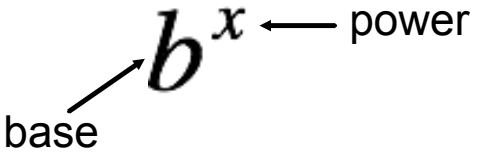
November 30, 2018

Unit 6: Exponential Functions

6-1: Exponent Rules

Objectives: I can simplify exponents

Vocab:



Base: 6^2

Main number

Power: Exponent on a number

Exponent

Like-terms review

Group the like terms and then combine

x^3 $\quad x \quad -5x \quad -x^2$

$2x^3 \quad x^2 \quad -6x^3 \quad 3x \quad 7x^2$

What's the difference between:

$x + x + x = 3x$

$x \cdot x \cdot x = x^3$

$2x + 2x + 2x = 6x$

$2x \cdot 2x \cdot 2x = 8x^3$

Practice Expanding and Simplifying:

$x^4 = x \cdot x \cdot x \cdot x$

$x^2 = x \cdot x$

$2^4 = 2 \cdot 2 \cdot 2 \cdot 2$

$y^5 = y \cdot y \cdot y \cdot y \cdot y$

$(2a)^3 = 2a \cdot 2a \cdot 2a$

$(jk)^5 = jk \cdot jk \cdot jk \cdot jk \cdot jk$

$x \cdot x \cdot x = x^3$

$x \cdot x \cdot x \cdot x \cdot x = x^5$

$5 \cdot 5 \cdot 5 \cdot 5 = 5^4$

$z \cdot z \cdot z \cdot z \cdot z \cdot z = z^6$

$(4y)(4y)(4y) = (4y)^3$

$(ab)(ab)(ab)(ab)(ab) = (ab)^5$

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EXPONENT RULES

Graphic Organizer

Name	Rule	Examples
ADDING & SUBTRACTING MONOMIALS	**COMBINE LIKE TERMS!!!** (DO NOT CHANGE common variables and exponents!)	1. $9x^2y - 10x^2y =$ $-1x^2y$ 2. Subtract $6w$ from $8w$. $8w - 6w = 2w$
PRODUCT RULE	$x^a \cdot x^b =$ x^{a+b}	1. $h^1 \cdot h^8 =$ h^9 2. $(-2a^2b) \cdot (7a^3b) =$ $-14a^5b^2$
POWER RULE	$(x^a)^b =$	1. $(x^2)^3 =$ 2. $(-2m^5)^2 \cdot m^3 =$
QUOTIENT RULE	$\frac{x^a}{x^b} =$	1. $\frac{27x^5}{42x} =$ 2. $\frac{(y^2)^2}{y^4} =$
NEGATIVE EXPONENT RULE	$x^{-a} =$	1. $-5x^{-2} =$ 2. $\frac{4k^2}{8k^5} =$
ZERO EXPONENT RULE	$x^0 =$	1. $7x^0 =$ 2. $\frac{(w^4)^2}{w^8} =$

ADDING & SUBTRACTING MONOMIALS

COMBINE LIKE TERMS!!!

(DO NOT CHANGE common variables and exponents!)

1. $9x^2y - 10x^2y =$

2. Subtract $6w$ from $8w$.

PRODUCT RULE

$$x^a \cdot x^b = x^{a+b}$$

$$(x^a)^b = x^{a \cdot b}$$

1. $(x^2)^3 =$

$x \cdot x \cdot x \cdot x \cdot x \cdot x = x^6$

$2 + 2 + 2$

2. $(-2m^5)^2 \cdot m^3 =$

$-2m^5 \cdot -2m^5 \cdot m^3 = -2 \cdot -2 \; mmm$

$= 4 \; mmmmm \; mmmmm \; mmm$

$= 4m^{13}$

$5 \qquad 5 \qquad 3$

QUOTIENT RULE

$$\frac{x^a}{x^b} = x^{a-b}$$

1. $\frac{27x^5}{42x} =$ $\frac{9}{14}x^4$

2. $\frac{(y^2)^2}{y^4} =$ $\frac{y^4}{y^4} = y^0 = 1$

NEGATIVE EXPONENT RULE

$$x^{-a} = \frac{1}{x^a}$$

1. $-5k^{-2} = \frac{-5}{x^2}$

2. $\frac{4k^2}{8k^5}$ $4 \div 4 = 1$, $8 \div 4 = 2$, k^{2-5}

$$\frac{1k^{-3}}{2} = \frac{1}{2k^3}$$

ZERO EXPONENT RULE

$$x^0 = 1$$

1. $7x^0 = 7 \cdot 1 = 7$

2. $\dfrac{(w^4)^2}{w^8} = \dfrac{w^{8-8}}{w^8} = w^0 = 1$

Simplify each of the following:

$x \bullet x \bullet x \bullet x \bullet x =$

$x^4 \bullet x^9 =$

$(ab)^{14} =$

$\left(\frac{a}{2}\right)^4 =$

$\frac{k^{12}}{k^5} =$

$\left(\frac{1}{4}\right)^0 =$