LESSON DIGITS 3-3/3-4

9/16/2019

1

Goal: I will be able to **multiply and divide exponents**

Tool Bag: Formulas, equations, Vocabulary, etc	Here's How…Notes & Examples
Vocabulary	3^{2} ← Exponent ↑ ← Variable Coefficient (Base) 5^{4} ← exponent ↑ base $1x^{1} = x$

2

Example	$5^4 = 5\cdot5\cdot5\cdot5$ ← $5^3 = 5\cdot5\cdot5$
$4+3=7$ $5+2=7$	$5^4\cdot5^3 = (\underset{1}{5}\cdot\underset{2}{5}\cdot\underset{3}{5}\cdot\underset{4}{5})(\underset{5}{5}\cdot\underset{6}{5}\cdot\underset{7}{5}) = 5^7$
$3^7\ 3^{10}\ 9^7\ 9^{10}$	$3^{5}\cdot3^{2} = (\underset{1}{3}\ \underset{2}{3}\ \underset{3}{3}\cdot\underset{4}{3}\ \underset{5}{3})(\underset{6}{3}\cdot\underset{7}{3}) = 3^{7}$
$9+3=12$	$6^9\ 6^3 = 6^{9+3} = 6^{12}$

3

Rule Multiply Exponents	$x^a \cdot x^b = x^{a+b}$
	$3^4 \cdot 2^3 = 3\cdot3\cdot3\cdot3\cdot2\cdot2\cdot2$
Example $x^3 = x\cdot x\cdot x$ $(x^3 = (x)(x)(x)$ $2\times3=6$	$(3^2)^3 = (3^2)(3^2)(3^2)$ $= 3\cdot3\cdot3\cdot3\cdot3\cdot3 = 3^6$

4

$3\times5=15$	$(4^3)^5 = (4^3)(4^3)(4^3)(4^3)(4^3)$ $= 4\cdot4\cdot4\cdot4\cdot4\cdot4\cdot4\cdot4\cdot4\cdot4\cdot4\cdot4\cdot4\cdot4$ $= 4^{15}$
Rule Power to a Power	$(x^a)^b = x^{a\cdot b}$

5

Example $1^3\ 1^4\ 5^3\ 5^4$	$\frac{5^6}{5^2} = \frac{5\cdot5\cdot5\cdot5\cdot5\cdot5}{5\cdot5} = 5^4$
$\frac{5\cdot5\cdot5\cdot5}{5\cdot5\cdot5\cdot5}$	$\frac{x^5}{x^3} = \frac{x\cdot x\cdot x\cdot x\cdot x}{x\cdot x\cdot x} = x^2$
Rule Dividing Exponents	$\frac{x^a}{x^b} = x^{a-b}$

6

Example	$\left(\frac{5}{8}\right)^4 = \left(\frac{5}{8}\right)\left(\frac{5}{8}\right)\left(\frac{5}{8}\right)\left(\frac{5}{8}\right)$ $= \frac{5\cdot5\cdot5\cdot5}{8\cdot8\cdot8\cdot8} = \frac{5^4}{8^4}$
	$\left(\frac{x}{7}\right)^5 = \left(\frac{x}{7}\right)\left(\frac{x}{7}\right)\left(\frac{x}{7}\right)\left(\frac{x}{7}\right)\left(\frac{x}{7}\right)$ $= \frac{x\cdot x\cdot x\cdot x\cdot x}{7\cdot7\cdot7\cdot7\cdot7} = \frac{x^5}{7^5}$
Rule	$\left(\frac{x}{y}\right)^a = \frac{x^a}{y^a}$