Name: _____ Date: Feb 3 Hour: 2nd

Unit 5 Day 9: Exponents Review

Focus Question: Am I ready for my test tomorrow?

Rule Name	Rule	Examples
Product Rule (same base)	$a^m \cdot a^n =$ a^{m+n}	$5^3 \cdot 5^8 = 5^{3+8} = 5^{11}$ $x^{10} \cdot x^{2} = x^{12}$
Quotient Rule (same base)	$\frac{a^m}{a^n} =$ a^{m-n}	$\frac{3^{10}}{3^3} = 3^7$ $\quad \frac{m^9}{m^3} = m^6$
Power Rule	$(a^m)^n =$ $a^{m \cdot n}$	$(x^3)^5 = x^{15}$ $\quad (10^3)^2 = 10^6$
Zero Rule ($a \neq 0$)	$a^0 =$ 1	$3^0 = 1$ $\quad 5x^0$ $5 \cdot 1 = 5$
Negative Exponent Rule ($a \neq 0$)	$a^{-1} =$ $\frac{1}{a^1}$	$x^{-7} = \frac{1}{x^7}$

Practice Test

E means x10 is the base

1. Write the numbers in standard form. Then, order the numbers from least to greatest:

~~4.3 E 6~~ move decimal 6 right 3,240 $\quad$ ~~1.34×10^{-2}~~ move decimal 2 left ~~0.9~~ $\quad$ ~~2 E 0~~ don't move decimal $\quad$ ~~1.1×10^3~~ move decimal 3 right

4,300,000 $\quad$ 0.0134 $\quad$ 2 $\quad$ 1,100

1.34×10^{-2} $\quad$ 0.9 $\quad$ 2E0 $\quad$ 1.1×10^3 $\quad$ 3,240 $\quad$ 4.3E6

Least $\quad\quad$ Greatest

2. Visible light waves have a frequency of 3×10^{15}. Radio waves have a frequency of 3×10^9. How many times bigger is a visible light wave than a radio wave?

~~Radio~~ ? = light / Radio $\quad$ $\frac{(3 \times 10^{15})}{(3 \times 10^9)} =$ 1E6 or 1,000,000 times

Know 1 salary ...

3. McDonalds has about 2.1×10^5 managers and each manager makes on average 4×10^4 dollars per year. How much money does McDonalds spend on its managers each year?

$(4\times10^4)\cdot(2.1\times10^5) = \$8,400,000,000$

OR

8.4×10^9

4. Use the properties of exponents to write each expression below as a single positive power.

$4^0 =$ 1

$5^2 =$ 25

$3^2 \cdot 3^4 =$ 3^6 or 729

$x^{-6} =$ $\frac{1}{x^6}$

$(x^5)^4 =$ x^{20}

$\frac{4^{10}}{4^2} =$ 4^8 or 65,536

$n^8 \cdot n^{-3} =$ n^5

$\frac{x^7}{x^4} =$ x^3

$(m^3)^4 \cdot 4m^6 =$ $4m^{18}$

3.4 +6

$3x^{10} \cdot 4x^{8} = 12x^{18}$

$\frac{10h^{7}}{2h^3} = 5h^{4}$

$(u^2)^{3} = u^{6}$

$12x^5 \div 3x^1 =$ $4x^4$

$\frac{12}{3}x^{5-1}$

$(4x^2)^5 \cdot x^3 =$ $1024x^{13}$

$4^5 x^{2\cdot5} \cdot x^3$

$1024x^{10} \cdot x^3$

$(5x^0)^3 \cdot x^6 =$ $125x^6$

$5^3 x^{0\cdot3} \cdot x^6$

$125x^0 x^6$