

# Unit 2 Test Review



Warm Up

<http://www.youtube.com/watch?v=dQ9A-o3dUIM>

1) Simplify ~~then Evaluate~~

$$\left(\frac{3^2}{3^1}\right)^4 - 2^5 \times 2^9 \div 2^6$$

$$(3^1)^4 - 2^{14} \div 2^6$$

$$3^4 - 2^8$$



Simplify ~~then Evaluate~~ →

$$\frac{(3^2)^6 \cdot (3^4)^5}{(3^4)^3 \cdot (3^2)^6} \times \frac{(4^6)^4 \cdot (4^2)^7}{(4^3)^5 \cdot (4^9)^2}$$

$$\frac{3^{12} \cdot 3^{20}}{3^{12} \cdot 3^{12}} \times \frac{4^{24} \cdot 4^{14}}{4^{15} \cdot 4^{18}}$$

$$\frac{3^{32}}{3^{24}}$$

$$3^8$$

×

$$\frac{4^{38}}{4^{33}}$$

$$4^5$$

×

$$3^8 \times 4^5$$

## Exponent Laws

## 1) Zero Rule

-Anything raised to the exponent of zero is 1

$$(-5)^0 = 1 \quad \text{or} \quad (x)^0 = 1$$

## 2) Product of Powers Rule

When you multiply like bases you add the exponents

$$(2)^3 \times (2)^5 = (2)^8 \quad \text{or} \quad (a)^m \times (a)^n = (a)^{m+n}$$

## 3) Quotient Rule

When you divide like bases you Subtract the exponents

$$\frac{(-4)^7}{(-4)^5} = (-4)^2 \quad \text{or} \quad (a)^m \div (a)^n = (a)^{m-n}$$

## 4) Power to a Power Rule

With a power to a power we multiply exponents

$$(2^5)^3 = (2)^{15} \quad \text{or} \quad (a^m)^n = (a)^{mn}$$

## 5) Power of Product Rule

With a power of products we multiply exponents

$$[(5^5) \times (6^4)]^3 = 5^{15} \times 6^{12}$$

$$\text{or} \quad [(a^m) \times (b^n)]^p = (a)^{mp} \times (b)^{np}$$

## 6) Power of Quotient Rule

With a power of quotient we multiply exponents

$$\left[ \frac{(-3)^6}{(5)^3} \right]^2 = \frac{(-3)^{12}}{(5)^6}$$

$$\text{or} \quad [(a^m) \div (b^n)]^p = (a)^{mp} \div (b)^{np}$$

$$\left[ \underbrace{2^2} \quad \underbrace{(2^2)^3} \right]^2$$

$$\downarrow$$
$$\left[ (2^2) (2^6) \right]^2$$

$$\left[ 2^8 \right]^2 = 2^{16}$$



# Unit 2 Test Review



1)

Write the BASE and the EXPONENT of these powers:

a)  $3^5$

Base: 3

Exponent: 5

b)  $(-2)^8$

Base: -2

Exponent: 8

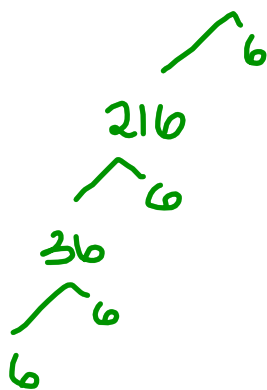
c)  $-6^7$

Base: 6

Exponent: 7

2) Write the following as the respecting base:

a)  $1296 = 6^?$



$6^4$

b)  $512 = 2^?$

$2^9$

3) Write the following in standard form

$$(6 \times 10^4) + (7 \times 10^2) + (9 \times 10^5) + (4 \times 10^0)$$

5 4 3 2 1<sup>0</sup>

9 6 0 7 0 4

4) Write the following numbers using powers of 10

5 4 3 2 1 0  
530 281

$$(5 \times 10^5) + (3 \times 10^4) + (2 \times 10^2) + (8 \times 10^1) + (1 \times 10^0)$$

5) Simplify then evaluate

$$a) [-(3)^2]^5$$

$$\bullet -(3)^{10}$$

$$\bullet -59049$$

$$b) 5^7 \cdot 5^3 - 2^4 \times 2^3$$

$$\underbrace{5^7 \cdot 5^3}_{5^4} - 2^7$$

$$625 - 128$$

$$497$$

$$c) (-3) \times (-3)^2 + (-3)^5 \cdot (-3)^0$$

$$\boxed{(-3)^3 + (-3)^5}$$

$$-27 + (-243)$$

$$-270$$

$$[\cancel{2^3 \times 2^3 \times 2^3}]^0 = 1$$

$$[7^8 \div 7^5]^{10} = 7^{80} \div 7^{50}$$

$$[7^3]^{10} = 7^{30}$$
$$7^{30}$$



$$\frac{\overbrace{(3^9)^2} \times \overbrace{(3^3)^3}}{\underbrace{(3^4)^3 \times (3^2)^4}} = \frac{3^{18} \times 1^{30}}{3^6 \times 3^8}$$

$$\frac{3^{18}}{3^{14}}$$

$$= 3^4$$