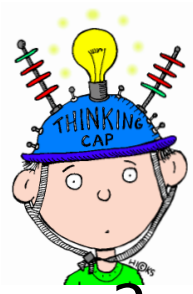
Warm-Up Oct.24



Follow exponent rules → Simplify then evaluate

a) $3^5 \times 3^2 \times 3^0 - 3^8 \div 4^7 \div 4^2$

$3^7 - 3^8 \div 4^5$

$2187 - 6561 \div 1024$ BEDMA

$2187 - 6.407$

2180.6

Simplify

a) $2^2 - 2^0 \times 2^1 + 2^3$

$2^2 - 2^1 + 2^3$

b) $-2^2 (2^3 \div 2^1) - 2^3$

$-2^2 \times 2^2 - 2^3$

$-2^4 - 2^3$

c) $4^3 \div 4^2 + 2^4 \times 3^2$

$4^1 + 2^4 \times 3^2$

d) $\frac{3^4}{3^3} + \frac{4^2 \times 4^0}{2^4}$

$3^1 + \frac{4^2}{2^4}$

Fill in the following chart

Power	As Repeated Multiplication	As a Product of Factors	As a power	As a ~~product~~ of Powers
$(5^2)^3$	$5^2 \times 5^2 \times 5^2$	$5\times5\times5\times5\times5\times5$	5^6	
$[(-2)^3]^2$	$(-2)^3 \times (-2)^3$	$(-2)(-2)(-2)(-2)(-2)(-2)$	$(-2)^6$	
$(7\times2)^3$	$(7\times2)\times(7\times2)\times(7\times2)$	$2\times2\times2\times7\times7\times7$		$2^3\times7^3$
$((-3)\times5)^2$	$((-3)\times5)\times((-3)\times5)$	$(-3)(-3)(5)(5)$ $(-3)\times(-3)\times5\times5$		$(-3)^2\times5^2$

Exponent Law for a power of a power.

To raise a power to a power

MULTIPLY the exponents!

$$(a^m)^n$$

Simplify: [Express as a single power]

a) $(-3^4)^3$ -3^{12}

b) $(2^2)^3$ 2^6

c) $(-2^4)^6$ -2^{24}

d) $((-2)^5)^3$ $(-2)^{15}$

Exponent Law for a Product of Powers

$$(ab)^m = a^m b^m$$

The variables "a" and "b" are any integer, except 0.

The variable "m" is any whole numbers.

Write as a product of powers

a) $(5^3 \times 3^2)^3$

$5^9 \times 3^6$

Write as a Product of Powers

b) $(3^5 \times (-2)^4)^0$

$3^0 \times (-2)^0$

c) $(2^6 \times 3^4)^2$

$2^{12} \times 3^8$

Quotient of Powers

1 Write below as a repeated multiplication.

$$\left(\frac{4}{5}\right)^3 = \frac{4}{5} \times \frac{4}{5} \times \frac{4}{5}$$

2. **Look at the numerators and denominators can yo express them as a single power?**

$$\frac{4^3}{5^3} \qquad \left(\frac{4^1}{5^{1\nearrow}}\right)^{3\nearrow}$$

Exponent Law for a Quotient of Powers

$$\left(\frac{a}{b}\right)^n = \frac{a^n}{b^n}$$ (dividing)

The variables "a" and "b" are any integer, except 0.

The variable "m" is any whole numbers.

Write as a quotient of powers:

a) $\left(\frac{4^3}{3^4}\right)^4 = \frac{4^{12}}{3^{16}}$

b) $\left(\frac{3^8}{6^3}\right)^2 = \frac{3^{16}}{6^6}$

c) $(4^3 \div 3^2)^4$ $4^{12} \div 3^8$

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4, 5, 6, 7,9,

4. a) $(6 \times 4)^3$

$6^3 \times 4$

5. a) $(8 \div 5)^3$

$8^3 \div 5^3$

6a) $(3^2)^4$

3^8

#14 simplify then evaluate

#16 simplify then evaluate