

Math 9 This week

Monday--Section 2.5

Tuesday--Open book on 2.4/2.5

Wednesday/Thursday-Practice for test

Friday-Chapter 2 Test

Warm-Up

October 24, 2016



Simplify [use exponent laws] then evaluate

a. $7^9 \times 7^3 \div 7^6$

$9+3-6$
 7^6 Simplified single power
 117649

b. $\frac{(-6)^2(-6)^4}{(-6)^3}$

$\frac{(-6)^{2+4}}{(-6)^3} = \frac{(-6)^6}{(-6)^3} = (-6)^3 = -216$

c) $3^5 \times 3^2 \div 4^7 \div 4^2$

$3^{5+2} \div 4^{7-2}$
 $3^7 \div 4^5$
 2187 ÷ 1024
 2.14

d) $\frac{3^5 \times 3^4}{2^3 \times 2^2}$

$\frac{3^9}{2^5}$

$\frac{19683}{32} = 615.1$

e) $2^4 \times 2^3 + 2^2 - 2^5$

$2^7 + 2^2 - 2^5$ Simplified
 128 + 4 - 32

100 Evaluate

Fill in the following chart



Power	As Repeated Multiplication	As a Product of Factors	As a power → single	As a product of Powers
$(5^2)^3$	$5^2 \times 5^2 \times 5^2$	$5 \times 5 \times 5 \times 5 \times 5 \times 5$	5^6	
$[(-2)^3]^3$	$(-2)^3 \times (-2)^3 \times (-2)^3$	$-2 \times -2 \times -2 \times -2 \times -2 \times -2 \times -2 \times -2 \times -2 \times -2 \times -2$	$(-2)^9$	
$(7 \times 2)^3$ $(7 \times 2)^3$	$(7 \times 2)(7 \times 2)(7 \times 2)$	$7 \times 7 \times 7 \times 2 \times 2 \times 2$ $\underbrace{\hspace{1cm}}_{7^3} \quad \underbrace{\hspace{1cm}}_{2^3}$		$7^3 \times 2^3$
$(-3 \times 5)^2$ $(-3)^2 \times 5^2$	$[(-3)^2 \times 5] [(-3)^2 \times 5]$	$[(-3) \times (-3) \times 5] \times [(-3) \times (-3) \times 5]$		$(-3)^4 \times 5^2$

Exponent Law for a power of a power.
 To raise a power to a power
MULTIPLY the exponents!

$$-3^4 \quad (a^m)^n$$

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

$5^9 \times 3^6$

Single
Power

$(5^3)^3$

5^9

Write as a Product of Powers

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

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

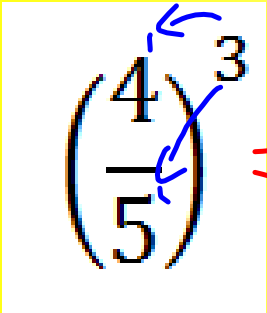
$$c) (2^6 \times 3^4)^2$$

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

Quotient of Powers

[Dividing]

1 Write below as a repeated multiplication.


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

2. Look at the numerators and denominators can you express them as a single power



Exponent Law for a Quotient of Powers



$$\left(\frac{a}{b}\right)^n = \frac{a^n}{b^n} \quad \text{[Dividing]}$$



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

The variable "n" 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) $\left(\frac{3^8}{6^3}\right)^2 = \frac{3^{16}}{6^6}$

Simplify $\left(\frac{3^8}{3^2}\right)^2$ Use exponent laws!

$$\left(3^{8-2}\right)^2$$

$$\left(3^6\right)^2$$

$$3^{12}$$

OR

$$\left(\frac{3^8}{3^2}\right)^2 = \frac{3^{16}}{3^4} = 3^{12}$$

Simplify use exponent laws!



$$(5 \times 2)^3 + (2^8 \div 2^5)^4$$

$$(5^3 \times 2^3) + (2^3)^4$$

$$\boxed{5^3 \times 2^3 + 2^{12}}$$

OR $(5 \times 2)^3 + (2^8 \div 2^5)^4$

$$(5^3 \times 2^3) + (2^{32} \div 2^{20})$$

$$\boxed{(5^3 \times 2^3) + 2^{12}}$$

Simplify



$$(6^2 \times 7)^2 + (3^8 \div 3^6)^3 \quad \text{or} \quad (6^2 \times 7)^2 + (3^8 \div 3^6)^3$$

$$6^4 \times 7^2 + (3^2)^3$$

$$6^4 \times 7^2 + 3^6$$

$$6^4 \times 7^2 + (3^{24} \div 3^{18})$$

$$6^4 \times 7^2 + 3^6$$

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4, 5, 6,



Simplify
Evaluate

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

$$6^3 \times 4^3$$

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

$$8^3 \div 5^3$$

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

$$3^8$$