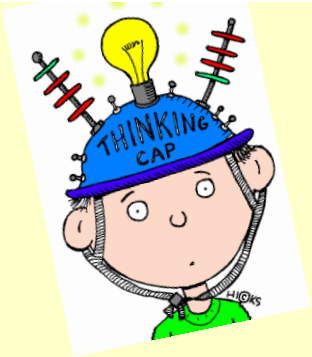
Grade 9 Warm Up



Simplify using exponent laws

1) $(2^4)^3$

2) $[(-2)^2 \times (-2)^4]^2$

3) $[(-1)^{11}]^3$

Write each expression as a product or quotient of powers. Then evaluate.

1) $[(-3) \times (5)]^2$

2) $\left(\frac{6}{5}\right)^4$

Simplify then evaluate:

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

Grade 9 Warm Up

Simplify using exponent law 1 or 2,

1) $(2^4)^3$

$= 2^{12}$

2) $[(-2)^2 \times (-2)^4]^2$

$[(-2)^6]^2$

$(-2)^{12}$

3) $[(-1)^{11}]^3$

$(-1)^{33}$

Write each expression as a product or quotient of powers. Then evaluate.

1) $[(-3) \times (5)]^2 = (-3)^2 \times 5^2$

9×25

$[-15]^2 = 225$

2) $\left(\frac{6}{5}\right)^4$

$\frac{6^4}{5^4} = \frac{1296}{625}$

Simplify then evaluate:

$$\frac{(3^2 \times 3^4)^5}{(3^2)^5 (3^6)^2} = \frac{(3^6)^5}{3^{10} \times 3^{12}} = \frac{3^{30}}{3^{22}}$$

$$= 3^8$$

$$\frac{3^8 \times 2^5 \times 3^9 \times 2^8}{2^6 \times 3^5 \times 2^4 \times 3^7}$$

$$\frac{3^8 \times 3^9}{3^5 \times 3^7} \times \frac{2^5 \times 2^8}{2^6 \times 2^4}$$

$$\frac{3^{17}}{3^{12}} \times \frac{2^{13}}{2^{10}}$$

$$3^5 \times 2^3$$

Test Outline

Unit 2: Powers and the Exponent Laws

Page 86
Study Guide

Powers

- Base
- Exponent
- Repeated Multiplication
- The Zero Exponent
- Powers of ten
- Expanded form to Standard form and vice versa

Order of Operations

BEDMAS

Exponent Laws

- Product of Powers
- Quotient of Powers
- Power of a Power
- Power of a Product
- Power of a Quotient

Exponent Laws

1) Zero Rule

-Anything raised to the exponent of zero is 1

$(-5)^0 = 1$ or $(x)^0 = 1$

2) Product of Powers Rule

When you multiply like bases you add the exponents

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

3) Quotient Rule

When you divide like bases you Subtract the exponents

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

4) Power to a Power Rule

With a power to a power we multiply exponents

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

5) Power of Product Rule

With a power of products we multiply exponents

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

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

6) Power of Quotient Rule

With a power of quotient we multiply exponents

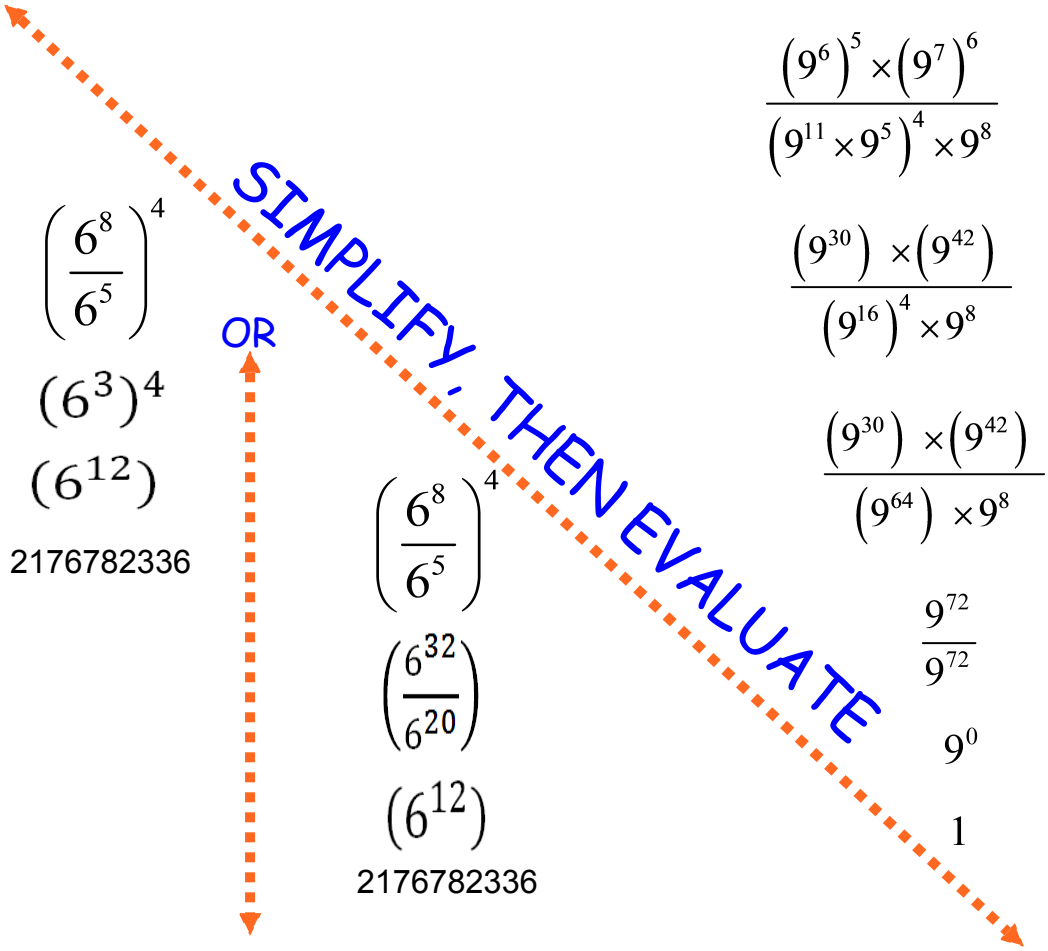
$\left[\frac{(-3)^6}{(5)^3}\right]2 = \frac{(-3)^{12}}{(5)^6}$

$$\left(\frac{6^8}{6^5}\right)^4$$

$$\frac{\left(9^6\right)^5 \times \left(9^7\right)^6}{\left(9^{11} \times 9^5\right)^4 \times 9^8}$$

SIMPLIFY, THEN EVALUATE

See next page for answers


SIMPLIFY, THEN EVALUATE
OR
$\left(\frac{6^8}{6^5}\right)^4$
$(6^3)^4$
(6^{12})
2176782336
$\left(\frac{6^8}{6^5}\right)^4$
$\left(\frac{6^{32}}{6^{20}}\right)$
(6^{12})
2176782336
$\frac{(9^6)^5 \times (9^7)^6}{(9^{11} \times 9^5)^4 \times 9^8}$
$\frac{(9^{30}) \times (9^{42})}{(9^{16})^4 \times 9^8}$
$\frac{(9^{30}) \times (9^{42})}{(9^{64}) \times 9^8}$
$\frac{9^{72}}{9^{72}}$
9^0
1

Class/Homework

Page 87-89 You have Two classes to do

Complete the following review questions:

1
3
7a,
8abc,
9,
10a
12,
13 ad,
14,
17,
18 bc,
19,
20 ac,
23 bd,
24,
26,
27,

And

Practice test

Page 90 all questions

If you finish this there is a simplifying worksheet that you can work on: