

Check It Out! Example 3

Homework

Simplify.

a.  $(3^4)^5 = 3^{20}$

b.  $(6^0)^3 = 1$

c.  $(a^3)^4 \cdot (a^{-2})^3 = a^{12} \cdot a^{-6} = a^6$

Pg. 464 #1 - 5, 23 - 28

**Objective**

Use multiplication properties of exponents to evaluate and simplify expressions.

Powers of products can be found by using the meaning of an exponent.

$(8x)^3 = 8x \cdot 8x \cdot 8x = 8 \cdot 8 \cdot 8 \cdot x \cdot x \cdot x = 8^3 x^3 = 512x^3$

$(8x)^3$   
 $8 \cdot 8 \cdot 8 \cdot x \cdot x \cdot x$   
 $8^3 x^3 = 512x^3$

WORDS	NUMBERS	ALGEBRA
A product raised to a power equals the product of each factor raised to that power.	$(2 \cdot 4)^3 = 2^3 \cdot 4^3$ $= 8 \cdot 64$ $= 512$	If $a$ and $b$ are any nonzero real numbers and $n$ is any integer, then $(ab)^n = a^n b^n$ .

Power of the product property  
 \* when you have a product raised to a power, the exp. multiplies by the exp of each.  $(8x)^3 = 8^3 x^3$

Example 4: Finding Powers of Products

Check It Out! Example 4

Simplify.

A.  $-(2y)^2$   
 $-2^2 y^2$   
 $-4y^2$

B.  $(-2y)^3$   
 $-2^3 y^3$   
 $-8y^3$

C.  $(x^6 \cdot y^{-3})^2$   
 $x^{12} \cdot y^6$   
 $\frac{x^{12}}{y^6}$

Simplify.

a.  $(4p)^3$   
 $4^3 p^3$   
 $64p^3$

b.  $(-5t^2)^2$   
 $25t^4$

c.  $(x^2 y^3)^4 \cdot (x^2 y^4)^{-4}$   
 $x^8 y^{12} \cdot x^{-8} y^{-16}$   
 $\frac{1}{y^4}$

## Lesson Quiz: Part I

## Daily Practice

Simplify.

1.  $3^2 \cdot 3^4$

2.  $z^4 \cdot z^{-2} \cdot z$

3.  $(x^3)^2$

4.  $-(t^{-3})^5$

5.  $(5g)^3$

6.  $(-3f^{-4})^2$

7.  $(x^2y)^3 \cdot (x^3y^2)^{-2}$

Pg. 464 #32 - 37, 43 - 46, 54