Lesson 10-7

Example 1   Find the Power of a Power
Simplify $(7^6)^2$.

$(7^6)^2 = 7^{6 \cdot 2}$ Power of a Power
$\quad\quad = 7^{12}$ Simplify.

Example 2   Find the Power of a Power
Simplify $(c^4)^8$.

$(c^4)^8 = c^{4 \cdot 8}$ Power of a Power
$\quad\quad = c^{32}$ Simplify.

Example 3   Power of a Product
Simplify $(3n^2)^4$.

$(3n^2)^4 = 3^4 \cdot n^{2 \cdot 4}$
$\quad\quad = 81n^8$ Simplify.

Example 4   Power of a Product
Simplify $(-4a^6b^3)^3$.

$(-4a^6b^3)^3 = (-4)^3 a^{6 \cdot 3} b^{3 \cdot 3}$
$\quad\quad\quad = -64a^{18}b^9$ Simplify.

Example 5   Real-World Example
FRAMES   A square picture frame has a side length of $5y^3z^2$ units. Express the area of the frame as a monomial.

$A = s^2$ Area of a square
$A = (5y^3z^2)^2$ Replace s with $5y^3z^2$.
$A = 5^2(y^3)^2(z^2)^2$ Power of a Product
$A = 25y^6z^4$ Simplify.

The area of the frame is $25y^6z^4$ square units.