

Objectives 34-35

Apply the power of a product or quotient of powers property to a monomial numerical expression

Vocab:

Power of Product Property: To find the power of a power, multiply the exponents

$$(a^b)^c = a^{b \cdot c}$$

Quotient of Powers Property: To divide the powers, subtract the exponents

$$\frac{a^b}{a^c} = a^{b-c}$$

Example 1: $(5^3)^4 =$

Step 1: Multiply the exponents

$$(5^3)^4 = 5^{3 \cdot 4}$$

Step 2: Simplify

$$5^{3 \cdot 4} = 5^{12} \leftarrow \boxed{\text{Answer is } 5^{12}}$$

Example 2: $\frac{(-7)^{-3}}{(-7)^{-6}}$

Step 1: Subtract the exponents $\frac{(-7)^{-3}}{(-7)^{-6}} = (-7)^{-3-(-6)}$

Step 2: Simplify. *Notice the exponent is now positive*

$$(-7)^{-3-(-6)} = (-7)^3 \leftarrow \boxed{\text{Answer is } (-7)^3}$$

Guided Practice:

$$(2^5)^3 =$$

$$\frac{(-4)^8}{(-4)^3} =$$

$$(8^3)^{-5} =$$

$$\frac{6^{-7}}{6^3} =$$

Independent Practice

1. $(2^3)^4 =$

5. $\frac{7^3}{7^{-6}}$

2. $\frac{5^2}{5^9} =$

6. $[(-8)^5]^{-3} =$

3. $[(-8)^9]^{-7} =$

7. $\frac{6^{-2}}{6^8} =$

4. $\frac{4^{-2}}{4^8} =$

8. $(4^4)^3 =$

Additional Help:

<http://www.themathpage.com/alg/exponents.htm>

<https://www.youtube.com/watch?v=vBMYNH-Bi8s>