Lesson 1.4 The Power of a Product and the Power of a Quotient (Day 2)
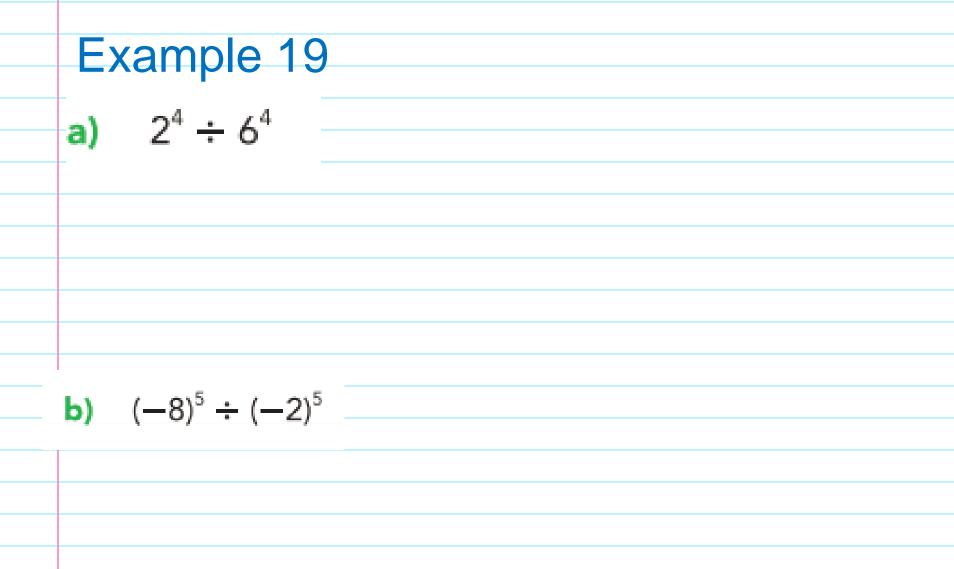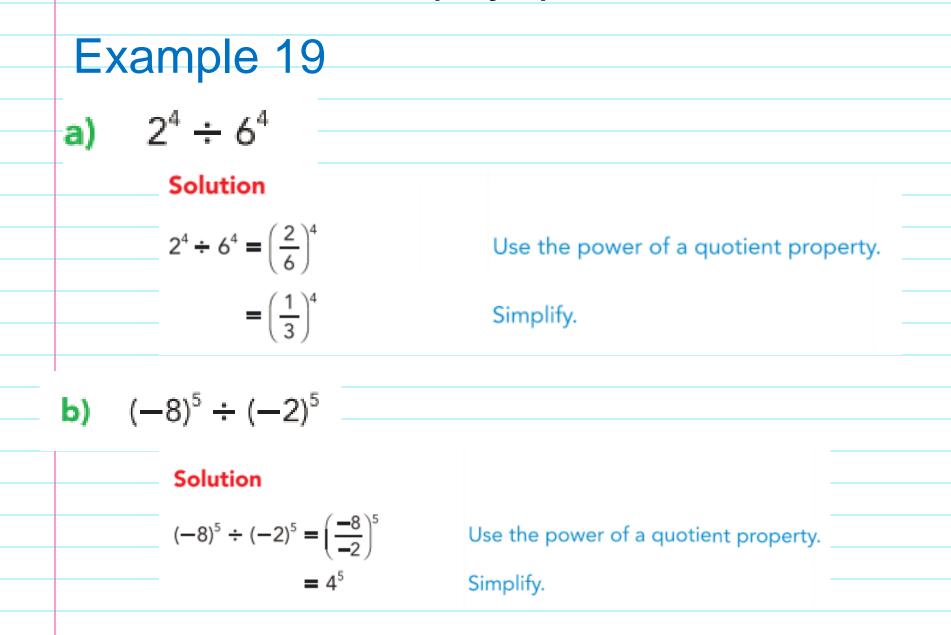
Objective

*Understand the power of a product property

*Understand the power of quotient property

*Use properties of exponents to simplify expressions

- **Common Core State Standards** *8.EE.1*
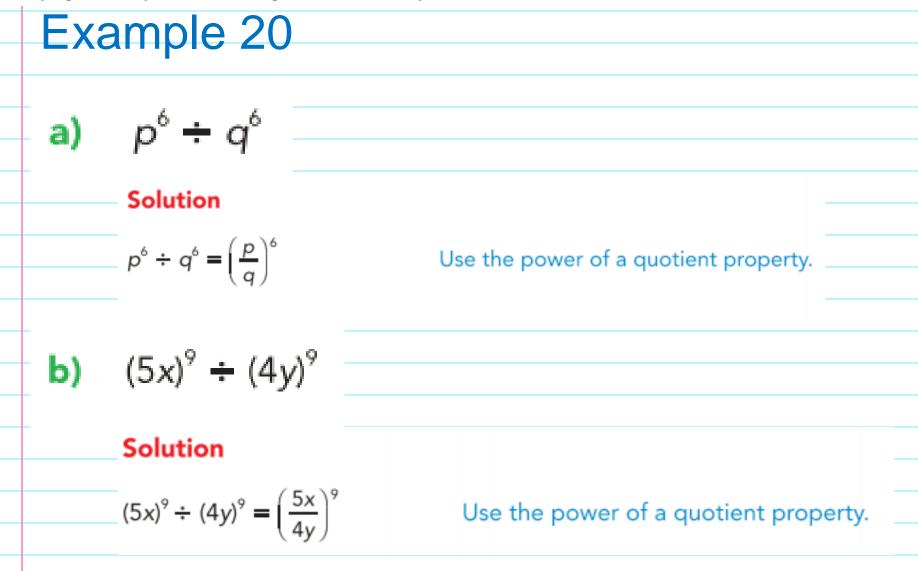- **Mathematical Practices** 4. Model mathematics. 5. Use tools strategically. 6. Attend to precision.

Lesson 1.4 The Power of a Product and the Power of a Quotient (Day 2)

Example 19

a) $2^4 \div 6^4$

b) $(-8)^5 \div (-2)^5$

Lesson 1.4 The Power of a Product and the Power of a Quotient (Day 2)

Example 19

a) $\quad 2^4 \div 6^4$

Solution

$$2^4 \div 6^4 = \left(\frac{2}{6}\right)^4 \qquad \text{Use the power of a quotient property.}$$

$$= \left(\frac{1}{3}\right)^4 \qquad \text{Simplify.}$$

b) $\quad (-8)^5 \div (-2)^5$

Solution

$$(-8)^5 \div (-2)^5 = \left(\frac{-8}{-2}\right)^5 \qquad \text{Use the power of a quotient property.}$$

$$= 4^5 \qquad \text{Simplify.}$$

Lesson 1.4 The Power of a Product and the Power of a Quotient (Day 2)

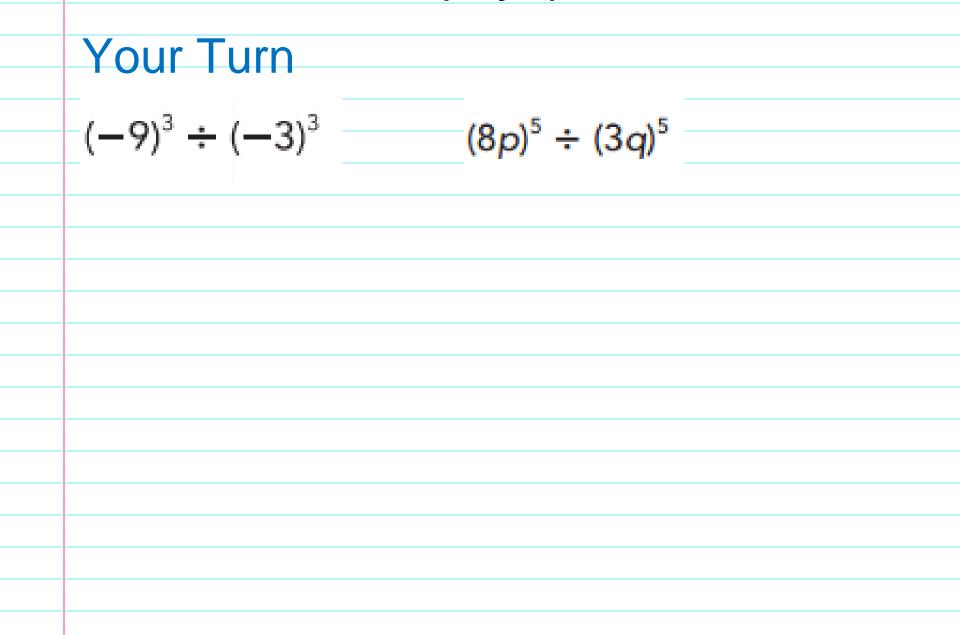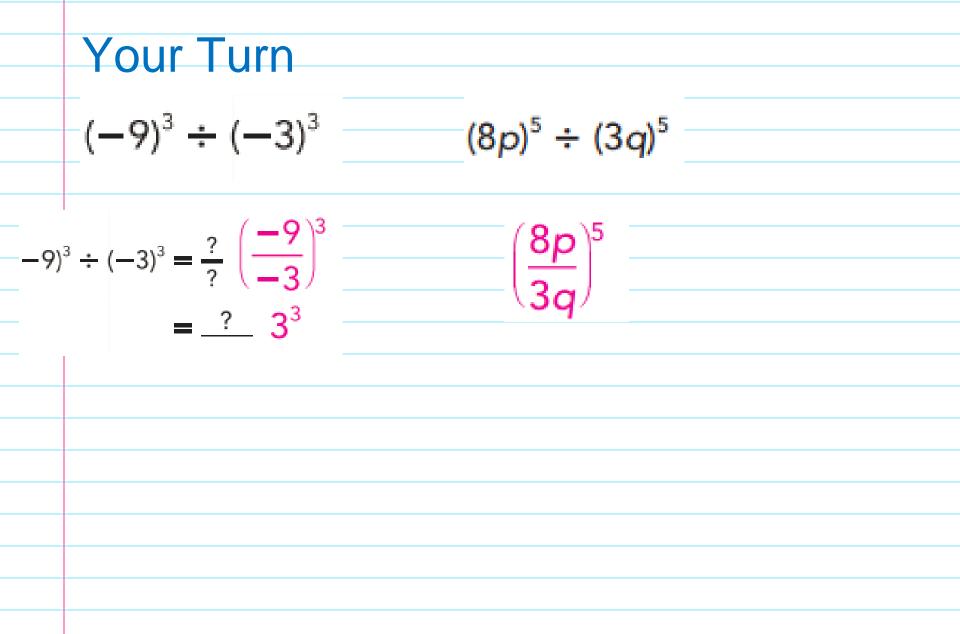Simplify each expression. Write your answer in exponential notation.

Example 20

a) $p^6 \div q^6$

b) $(5x)^9 \div (4y)^9$

Lesson 1.4 The Power of a Product and the Power of a Quotient (Day 2)

Simplify each expression. Write your answer in exponential notation.

Example 20

a) $p^6 \div q^6$

Solution

$$p^6 \div q^6 = \left(\frac{p}{q}\right)^6$$

Use the power of a quotient property.

b) $(5x)^9 \div (4y)^9$

Solution

$$(5x)^9 \div (4y)^9 = \left(\frac{5x}{4y}\right)^9$$

Use the power of a quotient property.

Lesson 1.4 The Power of a Product and the Power of a Quotient (Day 2)

Your Turn

$(-9)^3 \div (-3)^3$ $\qquad$ $(8p)^5 \div (3q)^5$

Lesson 1.4 The Power of a Product and the Power of a Quotient (Day 2)

Your Turn

$$(-9)^3 \div (-3)^3 \qquad\qquad (8p)^5 \div (3q)^5$$

$$-9)^3 \div (-3)^3 = \frac{?}{?} \quad \left(\frac{-9}{-3}\right)^3 \qquad\qquad \left(\frac{8p}{3q}\right)^5$$

$$= \underline{\ ?\ }\ 3^3$$

Independent Practice #8-16

Practice 1.4

8 $9^2 \div 3^2$

9 $10^6 \div 5^6$

10 $2.8^7 \div 0.7^7$

11 $15^2 \div 25^2$

12 $7.2^9 \div 2.4^9$

13 $(3.3x)^9 \div (1.1y)^9$

14 $(-6)^8 \div (-2)^8$

15 $s^5 \div r^5$

16 $(3a)^6 \div (2b)^6$

Lesson Check #8 & 16 (can use the power of quotient property to simplify expressions)

Lesson 1.3 Powers of Powers

Understanding of Learning

Lesson 1.4 The Power of a Product and the Power of a Quotient

Ticket Out the Door

Using algebraic notation, state the power of a product property and the power of a quotient property.