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 (I	Day 3)			
	•				
	Simplify each expression. Write your answer in	n exponential notation.			
	Example 21				
	-	$5^5 \cdot 2^9 \cdot 5^4$			
a)	$\frac{4^5 \cdot 4^3}{2^2 \cdot 2^6}$	<b>b)</b> $\frac{5^5 \cdot 2^9 \cdot 5^4}{10^3}$			
	22				

#### Lesson 1.4 The Power of a Product and the **Power of a Quotient (Day 3)** Simplify each expression. Write your answer in exponential notation. Example 21 $\frac{4^5 \cdot 4^3}{2^2 \cdot 2^6}$ $\frac{5^5 \cdot 2^9 \cdot 5^4}{10^3}$ b) Solution Solution $\frac{5^5 \cdot 2^9 \cdot 5^4}{10^3} = \frac{5^{5+4} \cdot 2^9}{10^3}$ Use the product of powers property. $\frac{4^5 \cdot 4^3}{2^2 \cdot 2^6} = \frac{4^{5+3}}{2^{2+6}}$ $=\frac{5^9 \cdot 2^9}{10^3}$ Simplify. $=\frac{4^8}{2^8}$ $=\frac{(5\cdot 2)^9}{10^3}$ Use the power of a product property. $=\frac{10^9}{10^3}$ Simplify. $=\left(\frac{4}{2}\right)^{8}$ $= 10^{9-3}$ Use the product of quotient property. $= 10^{6}$ $= 2^{8}$ Simplify.

Simplify each expression. Write your answer in exponential notation.

<b>c)</b> $\frac{(7^2)^3 \cdot 4^6}{2^6}$		
2 <sup>6</sup>		

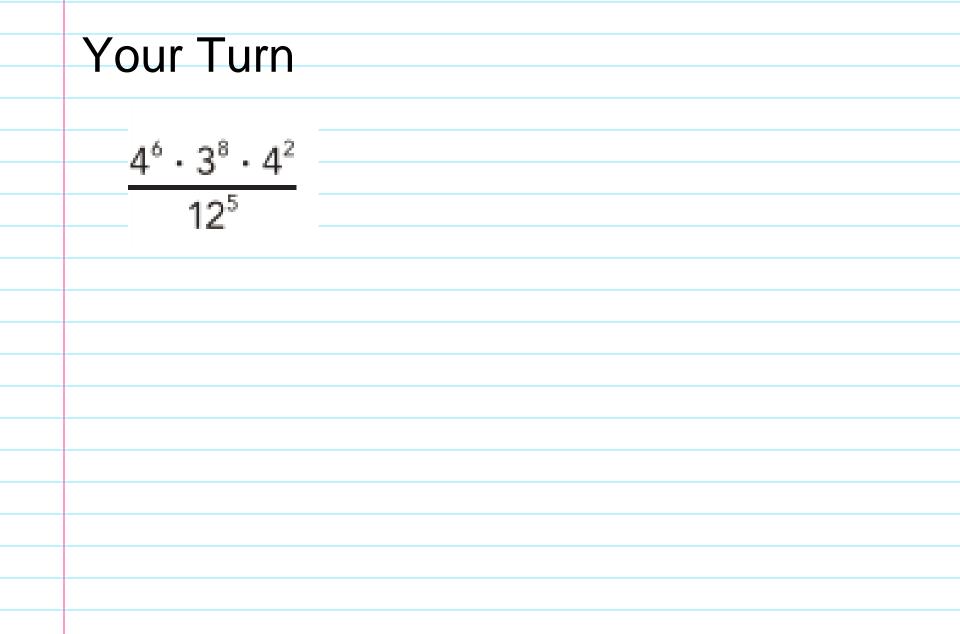
Simplify each expression. Write your answer in exponential notation.

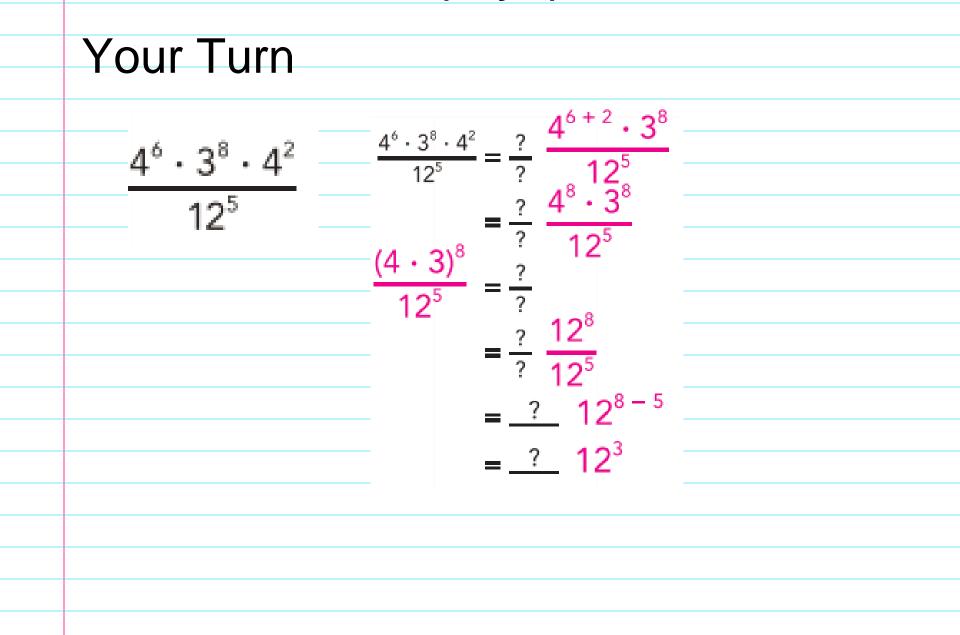


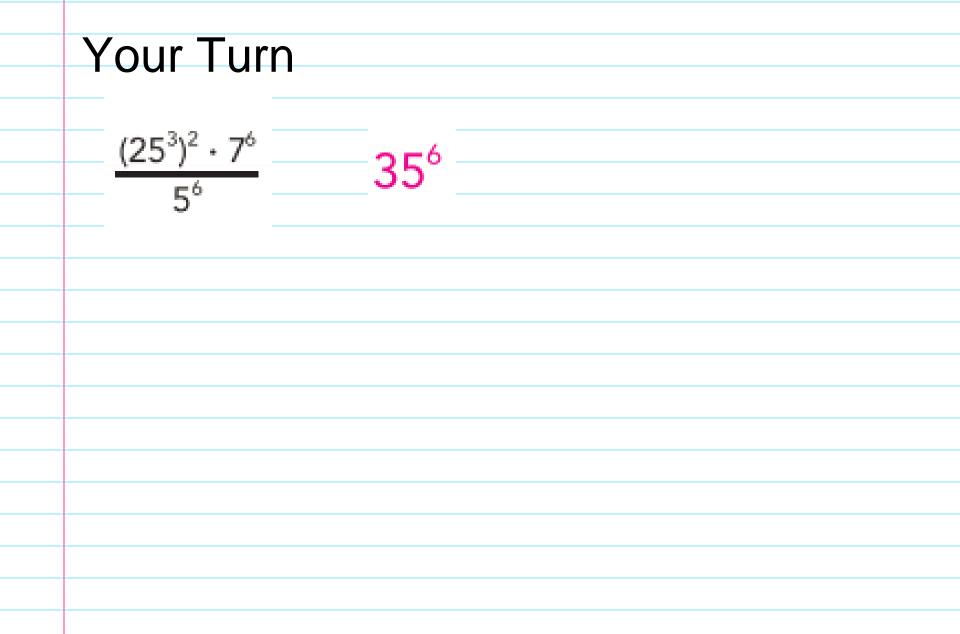
c)

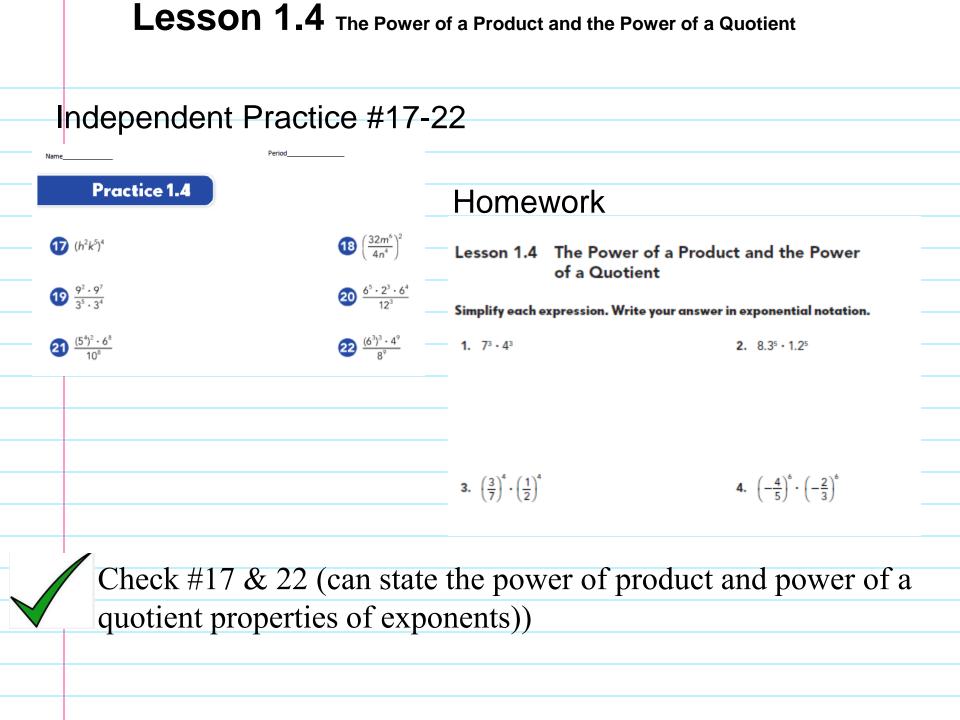
$$\frac{(7^2)^3 \cdot 4^6}{2^6} = \frac{7^{2 \cdot 3} \cdot 4^6}{2^6}$$
$$= \frac{7^6 \cdot 4^6}{2^6}$$
$$= \frac{(7 \cdot 4)^6}{2^6}$$
$$= \frac{28^6}{2^6}$$
$$= \left(\frac{28}{2}\right)^6$$
$$= 14^6$$

Use the power of a power property.
Simplify.
Use the power of a product property.
Simplify.
Use the power of a quotient property.
Simplify.









#### Lesson 1.4

#### **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.