Key Idea

Quotient of Powers Property

Words   To divide powers with the same base, subtract
their exponents.

Numbers $\dfrac{4^5}{4^2} = 4^{5-2} = 4^3$ **Algebra** $\dfrac{a^m}{a^n} = a^{m-n}$, where $a \neq 0$

Evaluating Expressions

Ex:) Evaluate. Express answers with positive exponents.   Notes:

a. $\dfrac{2^6}{2^4}$

b. $\dfrac{(-7)^9}{(-7)^3}$

c. $\dfrac{h^7}{h^6}$

OYO:) Simplify. Leave answers in exponential form.   Notes:

a. $\dfrac{4.2^6}{4.2^5}$

b. $\dfrac{(-8)^8}{(-8)^4}$

Simplifying an Expression

Ex:)   Simplify $\dfrac{3^4 \cdot 3^2}{3^3}$. Write your answer in exponential notation.   Notes:

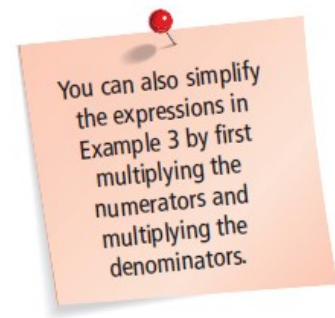OYO:)   Simplify $\dfrac{2^{15}}{2^3 \cdot 2^5}$. Write your answer in exponential notation.   Notes:

Simplifying Expressions

Ex:) Simplify the expression. Write your answer in exponential notation.   Notes:

$$\frac{(-4)^9 \square (-4)^8}{(-4)^5 (-4)^2}$$

> You can also simplify the expressions in Example 3 by first multiplying the numerators and multiplying the denominators.

b. $$\frac{a^{10} \square a^7}{a^6 \; a^4}$$

OYO:) Simplify the expression.   Notes:

a. $$\frac{p^3 \square p^6 \square p^4}{p^2 \; p}$$

b. $$\frac{(-5)^7 \square (-5)^6}{(-5)^5 \square (-5)^2}$$

Modeling Real Life

Ex:) The projected population of Tennessee in 2030 is about
5.9^8. Predict the average number of people per square mile
In Tennessee in 2030.

Land area:
about 5.9^6 mi^2
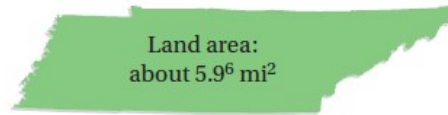
OYO:) An earthquake of magnitude 3.0 is 10^2 times stronger
than an earthquake of magnitude of 1.0. An earthquake of
magnitude 8.0 is 10^7 times stronger than an earthquake of
magnitude 1.0. How many times stronger is an earthquake of
magnitude 8.0 than an earthquake of magnitude 3.0?