Name:_____ Date:_____Period:_____

# Notes: Use the Quotient Rule to Simplify Expressions

The **Quotient Rule** states that when we _____ two powers with the same _____, we can _____ the _____.

$$\frac{a^m}{a^n} = a^{m-n}$$

WITH NUMBERS

$$\frac{2^3}{2^2} = 2^{3-2} =$$

WITH VARIABLES

$$\frac{x^4}{x^2} = x^{4-2}$$

Simplify each expression using the power rule.

**1.** $\frac{x^7}{x^3}$

**2.** $\frac{x^7y^8}{x^3y^2}$

**3.** $\frac{m^2}{m^2}$

**4.** $\frac{9x^5y^6}{3x^3y}$

**5.** $\frac{-15a^{10}b^4c}{5a^7b^4c}$

**6.** $\frac{6x^2y^9z^{13}}{14x^2y^5z^{12}}$

PUT IT ALL TOGETHER!

**7.** $\frac{12m^9n^5}{4m^7n} \cdot 4m^2n^4$

**8.** $\frac{64x^7y^4}{16x^4y^2} \cdot (2xy)^3$

**9.** $\left(\frac{45a^9b^6}{-9a^3b^2}\right)^2 \cdot (a^2)^4 + 6a^{12}b^8$

**10.** $\frac{2x^9y^7}{4x^6y} \cdot (2x^2y^2)^3 - 6x^9y^{12}$

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# A.___ Use the Quotient Rule to Simplify Expressions

Simplify each expression using the quotient rule.

**1.** $\frac{x^9}{x^2}$

**2.** $\frac{a^3b^4}{a^3b^2}$

**3.** $\frac{4x^7y^9}{x^3y^5}$

**4.** $\frac{24m^{18}n^8}{16m^7n^6}$

**5.** $\frac{-15x^{22}y^4z^{15}}{25x^{12}y^4z^{10}}$

**6.** $\frac{21x^3y^3z^3}{7x^3y^2z^3}$

**7.** $\frac{54a^{25}b^{16}c}{24a^{21}b^6c}$

**8.** $\frac{5x^3y^2z^5}{-5x^3y^2z^5}$

**9.** $\frac{35m^{19}n^{16}}{7m^5n^8}$

**10.** $\frac{-8x^{20}y^9}{-36x^5y^8}$

**11.** $\frac{17a^8b^{16}c^{24}\,d^2}{3a^4d^2}$

**12.** $\frac{50x^{25}y^7}{10x^{24}y^6}$

PUT IT ALL TOGETHER!

**13.** $\frac{6x^7y^{15}}{12x^3y^5} \cdot 8x^4y$

**14.** $\frac{32x^{35}y^{15}}{8x^2y^5} \cdot (4xy)^2$

**15.** $\left(\frac{-6a^6b^6}{3a^5b^4}\right)^2 \cdot (3a^3b)^2 + (-10a^8b^6)$

**16.** $\frac{x^2y^2}{3x^2y} \cdot (3x^4y)^4 - 7x^{16}y^5$