8.2: Apply Exponent Properties Involving Quotients

Goals: *Divide expressions with the same base and having exponents
*Raise a quotient to a power

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1)

2)

Write out the following as a quotient:

$\frac{a^5}{a^3} =$

Can you come up with a rule for dividing expressions with the same base raised to a power?

Simplify the following expressions. Write the answer using an exponent.

Ex: $\frac{4^7}{4^2}$

Ex: $\frac{8^{10}}{8^4}$

Ex: $\frac{5^4 \cdot 5^8}{5^7}$

Ex: $\frac{(-3)^9}{(-3)^3}$

Ex: $\frac{1}{x^4} \cdot x^6$

Ex: $\frac{9^{12}}{9^5}$

Ex: $\frac{(-2)^4}{(-2)^3}$

Ex: $\frac{6^3 \cdot 6^4}{6^2}$

Ex: $\frac{1}{r^5} \cdot r^8$

Write the following out as a product:

$\left(\frac{a}{b}\right)^4 =$

Can you come up with a rule to simplify a quotient being raised to a power?

Use the rule you came up with to simplify the following expressions.

Ex: $\left(\frac{3}{2}\right)^7$ **Ex:** $\left(\frac{x}{y}\right)^3$ **Ex:** $\left(\frac{-7}{x}\right)^2$ **Ex:** $\left(\frac{c}{d}\right)^6$

Ex: $\left(\frac{-2}{y}\right)^4$ **Ex:** $\left(\frac{4x^2}{5y}\right)^3$ **Ex:** $\left(\frac{a^2}{b}\right)^5$

Try some more difficult ones:

Ex: $\left(\frac{2f^2g^3}{3fg}\right)^4$ **Ex:** $\frac{2s^3t^3}{st^2} \cdot \frac{(3st)^3}{s^2t}$

Ex: $\left(\frac{2m^5n}{4m^2}\right)^2 \cdot \left(\frac{mn^4}{5n}\right)^2$ **Ex:** $\left(\frac{3x^3y}{x^2}\right)^3 \cdot \left(\frac{y^2x^4}{5y}\right)^2$