

## Quotients of Exponents Guided Lesson Explanation



$$1) \frac{a^4}{a}$$

We can use the Quotient Rule because the bases of the exponents are the same.

Quotient Rule = If the bases are the same, we can subtract the power in the denominator from the power in the numerator to find the quotient.

$$\frac{a^4}{a} = a^{4-1} = a^3$$

$$2) \frac{4d^{-4}}{2d^8}$$

Step 1) We can start to break this problem down into factors a) numeric and b) variable.

$$\frac{4d^{-4}}{2d^8} = \left( \frac{4}{2} \right) \left( \frac{d^{-4}}{d^8} \right)$$

Step 2) Find the quotient of each factor:

$$\frac{4}{2} = 2 \text{ (numeric)} \quad \frac{d^{-4}}{d^8} = d^{-4-8} \text{ (using Quotient Rule)} = d^{-12}$$

Step 3) Combine factors:

$$2d^{-12}$$



$$3) \frac{cw^5}{7c^2w^9}$$

Step 1) We can start to break this problem down into factors a) numeric and b) variable.

$$\frac{cw^5}{7c^2w^9} = \left(\frac{1}{7}\right) \left(\frac{c}{c^2}\right) \left(\frac{w^5}{w^9}\right)$$

Step 2) Find the quotient of each factor:

The numeric factor  $\left(\frac{1}{7}\right)$  is in simplest form.

$$\frac{c}{c^2} \text{ (Using the quotient rule) } c^{1-2} = c^{-1}$$

$$\frac{w^5}{w^9} \text{ (Using the quotient rule) } w^{5-9} = w^{-4}$$

Step 3) Combine factors:  $\frac{1}{7c^{-1}w^4}$

