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Writing Equivalent Algebraic Expressions For Multiplication and Division

<p>QUOTIENT OF POWERS PROPERTY</p> $\frac{a^m}{a^n} = a^{(m-n)}$	<p>EXPONENT</p> <p>BASE</p> $a^b = \underbrace{a \cdot a \cdot \dots \cdot a}_{b \text{ times}}$
$\frac{a^2}{a} = \frac{a^2}{a^1} =$ $a^{(2-1)}$	$\frac{a^2}{a} = \frac{a}{1} =$ $\frac{a}{1} = a$

- 1 Complete the equations.
 - 2 Explain how to use the quotient of powers property for like bases.
 - 3 Simplify the expressions using the quotient of powers property.
 - 4 Determine the value of each expression.
 - 5 Find the equivalent expressions.
 - 6 Rewrite the expressions in their simplest form.
- + with lots of tips, answer keys, and detailed answer explanations for all of the problems.



The complete package, including all problems, hints, answers, and detailed answer explanations is available for all [sofatutor.com](https://www.sofatutor.com) subscribers.



Complete the equations.

Fill in the blanks.

$a \cdot a$ a a a^1 a 1 a^{2-1}

QUOTIENT OF POWERS PROPERTY

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

$$\begin{aligned} \frac{a^2}{a} &= \frac{a^2}{\boxed{1}} = \boxed{2} \\ &= a^{\boxed{3}} = \boxed{4} \end{aligned}$$

$$\frac{a^2}{a} = \frac{\boxed{5}}{\boxed{6}} = \boxed{7}$$



Hints for solving these problems

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of 6

Complete the equations.

Hint #1

Keep $a^1 = a$ in mind.

Hint #2

Pay attention to the order of subtraction.

Hint #3

$$\frac{a^4}{a^2} = \frac{a \cdot a \cdot a \cdot a}{a \cdot a} = \frac{a^2}{1} = a^2$$

Using this given example you can see that given factors cancel out.



Answers and detailed answer explanations for these problems

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of 6

Complete the equations.

Answer key: 1: a^1 // 2: a^{2-1} // 3: 1 // 4: a // 5: $a \cdot a$ // 6: a // 7: a

You can determine the quotient of powers with like bases canceling as many factors as possible or using the quotient of powers property.

The result is always the same.

Canceling

$$\frac{a^2}{a} = \frac{a \cdot a}{a} = \frac{a}{1} = a$$

The quotient of powers property

$$\frac{a^2}{a} = a^{2-1} = a^1 = a \quad \checkmark$$