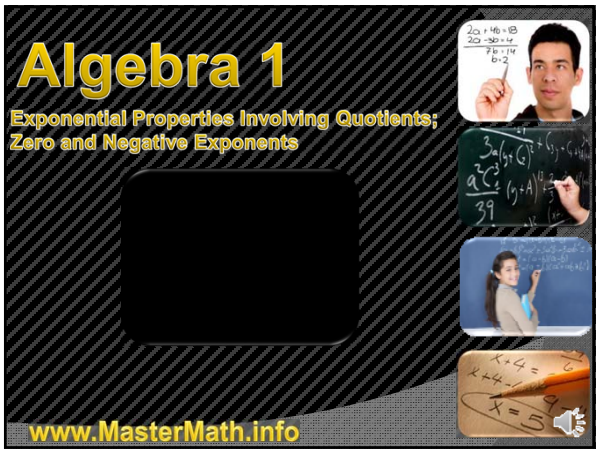
Algebra 1
Exponential Properties Involving Quotients; Zero and Negative Exponents
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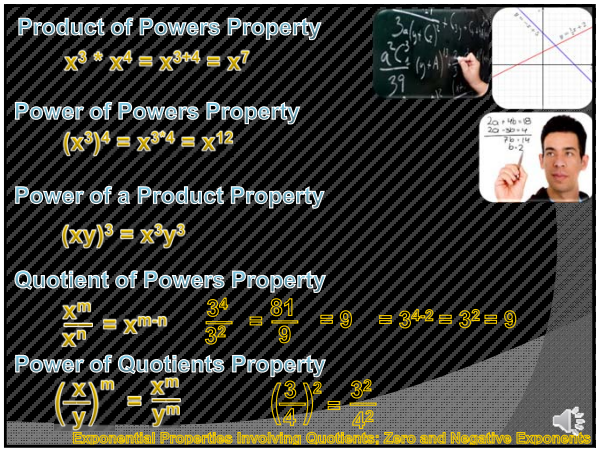
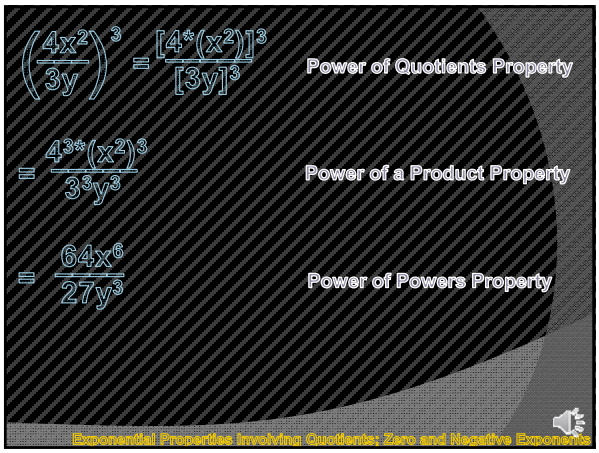
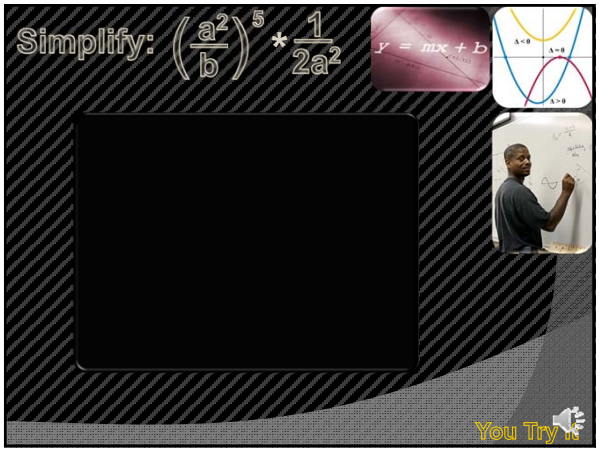
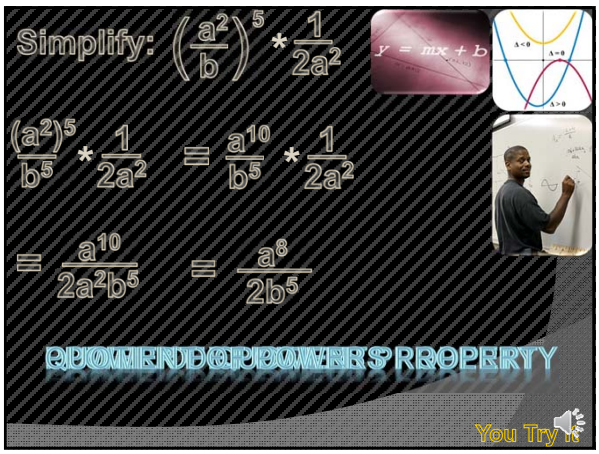
Quotient of Powers Property
Power of Quotients Property
Zero Exponents
Negative Exponents
Overview


Product of Powers Property
$x^3 * x^4 = x^{3+4} = x^7$
Power of Powers Property
$(x^3)^4 = x^{3*4} = x^{12}$
Power of a Product Property
$(xy)^3 = x^3y^3$
Quotient of Powers Property
$\frac{x^m}{x^n} = x^{m-n}$ $\frac{3^4}{3^2} = \frac{81}{9} = 9$ $= 3^{4-2} = 3^2 = 9$
Power of Quotients Property
$\left(\frac{x}{y}\right)^m = \frac{x^m}{y^m}$ $\left(\frac{3}{4}\right)^2 = \frac{3^2}{4^2}$
Exponential Properties Involving Quotients; Zero and Negative Exponents


$\left(\frac{4x^2}{3y}\right)^3 = \frac{[4*(x^2)]^3}{[3y]^3}$
Power of Quotients Property
$= \frac{4^3*(x^2)^3}{3^3y^3}$
Power of a Product Property
$= \frac{64x^6}{27y^3}$
Power of Powers Property
Exponential Properties Involving Quotients: Zero and Negative Exponents


Simplify: $\left(\frac{a^2}{b}\right)^5 * \frac{1}{2a^2}$
$y = mx + b$
You Try It!


Simplify: $\left(\frac{a^2}{b}\right)^5 * \frac{1}{2a^2}$
$y = mx + b$
$\frac{(a^2)^5}{b^5} * \frac{1}{2a^2} = \frac{a^{10}}{b^5} * \frac{1}{2a^2}$
$= \frac{a^{10}}{2a^2b^5} = \frac{a^8}{2b^5}$
QUOTIENT OF POWERS PROPERTY
You Try It!

$x^0 = 1$ Weird!

$2^0 = 1$
$2^1 = 2$
$2^2 = 4$
$2^3 = 8$

$x^{-2} = \frac{1}{x^2}$

$4^{-3} = \frac{1}{4^3} = \frac{1}{64}$

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

Exponential Properties Involving Quotients: Zero and Negative Exponents

## Properties of Exponents

$x^m * x^n = x^{m+n}$

$(x^m)^n = x^{m*n}$

$(xy)^m = x^m y^m$

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

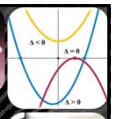
$\left(\frac{x}{y}\right)^m = \frac{x^m}{y^m}$

$x^0 = 1$

$x^{-m} = \frac{1}{x^m}$

Exponential Properties Involving Quotients: Zero and Negative Exponents

Simplify $(2x^2y^{-2})^{-3}$

You Try It

Simplify $(2x^2y^{-2})^{-3}$

$= 2^{-3}x^{2*(-3)}y^{-2*(-3)}$

$= \frac{1}{8}x^{-6}y^{6}$

$= \frac{y^6}{8x^6}$




You Try It

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