Exponent rules

$a^m \cdot a^n = a^{m+n}$

$(a^m)^n = a^{mn}$

$(ab)^m = a^m \cdot b^m$

$\left(\frac{a}{b}\right)^m = \frac{a^m}{b^m}$ where $b \neq 0$

$a^{-n} = \frac{1}{a^n}$

$\frac{1}{b^{-n}} = b^n$

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

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

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

$\sqrt[n]{a} = a^{\frac{1}{n}}$

$\sqrt[n]{a^m} = a^{\frac{m}{n}}$

$\sqrt{abc} = \sqrt{a} \cdot \sqrt{b} \cdot \sqrt{c}$

Exponents

Properties:	Examples:
$a^0 = 1 \quad (a \neq 0)$	$10^0 = 1$
$(ab)^m = a^m b^m$	$(2x)^2 = 2^2 x^2 = 4x^2$
$a^m \cdot a^n = a^{m+n}$	$x^2 \cdot x^3 = x^5$ $(x \cdot x)(x \cdot x \cdot x) = x^5$
$(a^m)^n = a^{mn}$	$(y^2)^3 = y^6$ $(y \cdot y)(y \cdot y)(y \cdot y) = y^6$
$\frac{a^m}{a^n} = a^{m-n}$	$\frac{x^5}{x^3} = x^2$ $\frac{x \cdot x \cdot x \cdot x \cdot x}{x \cdot x} = x^2$
$a^{-n} = \frac{1}{a^n}$	$(6y)^{-2} = \frac{1}{36y^2}$ Note: $6y^{-2} = \frac{6}{y^2}$
$\left(\frac{a}{b}\right)^{-n} = \left(\frac{b}{a}\right)^n$	$\left(\frac{2x}{3}\right)^{-2} = \left(\frac{3}{2x}\right)^2 = \frac{3^2}{2^2 x^2} = \frac{9}{4x^2}$