

# Properties of Exponents

Property	Completed Examples	Additional Examples
<b>Product of Powers</b> $a^m \cdot a^n = a^{m+n}$	$x^2 \cdot x^7 \cdot x = x^{2+7+1} = x^{10}$ $3^2 \cdot 3^7 = 3^{2+7} = 3^9 = 19,683$	
<b>Power of a Power</b> $(a^m)^n = a^{mn}$	$(n^3)^4 = n^{3 \cdot 4} = n^{12}$ $(4^2)^3 = 4^{2 \cdot 3} = 4^6 = 4,096$	
<b>Power of Product</b> $(ab)^m = a^m b^m$	$(xy)^5 = x^5 y^5$ $(42 \cdot 12)^2 = 42^2 \cdot 12^2 = 254,016$	
<b>Quotient of Powers</b> $\frac{a^m}{a^n} = a^{m-n}$	$\frac{x^{11}}{x^4} = x^{11-4} = x^7$ $\frac{6^{12}}{6^8} = 6^{12-8} = 6^4 = 1,296$	
<b>Power of a Quotient</b> $\left(\frac{a}{b}\right)^m = \frac{a^m}{b^m}, b \neq 0$	$\left(\frac{x}{y}\right)^5 = \frac{x^5}{y^5}$ $\left(\frac{x^2}{4y}\right)^3 = \frac{x^{2 \cdot 3}}{4^3 y^3} = \frac{x^6}{64y^3}$	

## Examples Involving More Than One Property: