Product of Powers	$x^a \cdot x^b = x^{a+b}$ Like bases multiplied → Add exponents	$3^2 \cdot 3^4 = 3^{2+4} = 3^6$ $p^2 \cdot p^3 = p^{2+3} = p^5$
Quotient of Powers	$\frac{x^a}{x^b} = x^{a-b}$ Like bases divided → Subtract exponents	$\frac{3^4}{3^2} = 3^{4-2} = 3^2$ $\frac{p^9}{p^3} = p^{9-3} = p^6$
Power of a Power	$(x^a)^b = x^{a \cdot b}$ Base raised to two powers → Multiply exponents	$(3^3)^2 = 3^{3 \cdot 2} = 3^6$ $(d^2)^4 = d^{2 \cdot 4} = d^8$
Power of a Product	$(x \cdot y)^a = x^a \cdot y^a$ Two bases multiplied, raised to the same power outside → Give power to both inside	$(2k)^4 = 2^4 \cdot k^4 = 16k^4$ $(ab)^3 = a^3 b^3$
Power of a Quotient	$\left(\frac{x}{y}\right)^a = \frac{x^a}{x^b}$ Two bases divided, raised to a power outside → Give power to both inside	$\left(\frac{2}{k}\right)^3 = \frac{2^3}{k^3}$ $\left(\frac{a}{b}\right)^5 = \frac{a^5}{b^5}$
Zero Power	$x^0 = 1, x \neq 0$ Anything to the zero power is 1, except 0. {0^0 is undefined}	$7^0 = 1$ $(2ab^3)^0 = 1$
Negative Power	$x^{-a} = \frac{1}{x^a}$ A negative exponent will be put in the denominator as its positive exponent.	$2^{-3} = \frac{1}{2^3}$ $x^{-4} = \frac{1}{x^4}$

$\frac{1}{x^{-a}} = x^a$ Negative powers in denominators move up to the numerator as their positive exponents.	$\frac{1}{2^{-3}} = 2^3$ $\frac{1}{v^{-4}} = v^{-4}$
$\frac{x^{-a}}{y^{-b}} = \frac{y^b}{x^a}$ If both the numerator and denominator have negative powers, they switch.	$\frac{2^{-2}}{3^{-3}} = \frac{3^3}{2^2} = \frac{27}{4}$ $\frac{x^{-2}}{y^{-4}} = \frac{y^4}{x^2}$
$\left(\frac{x}{y}\right)^{-a} = \left(\frac{y}{x}\right)^a$ If you have a quotient to a negative power, the quotient inside flips and the power outside becomes positive.	$\left(\frac{2}{3}\right)^{-2} = \left(\frac{3}{2}\right)^2 = \frac{3^2}{2^2} = \frac{9}{4}$ $\left(\frac{2x}{3y}\right)^{-3} = \left(\frac{3y}{2x}\right)^3 = \frac{(3y)^3}{(2x)^3} = \frac{3^3y^3}{2^3x^3} = \frac{27y^3}{8x^3}$