Properties of Exponents

NAME	SUMMARY	PROPERTY	EXAMPLE
Product of Powers	When multiplying powers with the same base, add the exponents.	$x^n \cdot x^m = x^{n+m}$	$5^3 \cdot 5^4 = 5^7$
Quotient of Powers	When dividing powers with the same base, subtract the exponents.	$\dfrac{x^n}{x^m} = x^{n-m}$	$\dfrac{2^8}{2^2} = 2^6$
Power of a Power	To find a power of a power, multiply the exponents.	$(x^n)^m = x^{n \cdot m}$	$(3^5)^2 = 3^{10}$
Power of a Product	To find the power of a product, multiply the powers of the individual factors.	$(x \cdot y)^n = x^n \cdot y^n$	$(6 \cdot 2)^4 = 6^4 \cdot 2^4$
Power of a Quotient	To find the power of a quotient, divide the powers of the numerator and denominator.	$\left(\dfrac{x}{y}\right)^n = \dfrac{x^n}{y^n}$	$\left(\dfrac{5}{9}\right)^3 = \dfrac{5^3}{9^3}$
Zero Exponent	Any nonzero base raised to the zero power equals 1.	$x^0 = 1$	$8^0 = 1$
Negative Exponent	If the base has a negative exponent, rewrite the expression as a fraction with 1 in the numerator and a positive exponent in the denominator.	$x^{-n} = \dfrac{1}{x^n}$	$4^{-3} = \dfrac{1}{4^3}$