# Properties of Exponents

$a^0 = 1$

$5^0 = 1$  $(-5)^0 = 1$  $-5^0 = -1$  $(3x^2y)^0 = 1$

anything to
zero power = 1.

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$a^{-1} = \dfrac{1}{a^1}$

move/flip it!

$4^{-1} = \dfrac{1}{4}$  $\dfrac{2}{x^{-3}} = 2x^3$  $\dfrac{12^{-5}}{c^{-3}} = \dfrac{c^3}{12^5}$

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

$x^2 \cdot x^5 = x^7$  $5^4 \cdot 5^3 = 5^7$  $a^2 b \cdot b^4 = a^2 b^5$

add exps when
multiplying like bases

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

subt. when
dividing

$\dfrac{6^9}{6^3} = 6^6$  $\dfrac{14 e^5 f}{28 e f^4} = \dfrac{1 e^4 f^{-3}}{2} = \boxed{\dfrac{1 e^4}{2 f^3}}$

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$(a^m)^n = a^{m \cdot n}$

mult. across ( ).

$(7^8)^9 = 7^{72}$  $(x^4)^{-1} = x^{-4} = \dfrac{1}{x^4}$

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

mult. across ( ).

$(12p^3)^2 = 12^2 p^6$

means
$(12p^3)(12p^3) = 144 p^6$

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$\left(\dfrac{a}{b}\right)^n = \dfrac{a^n}{b^n}$

$\left(\dfrac{3^1 x^1 x^{12}}{2^1 x^8}\right) = \dfrac{3^{12} x^{12}}{2^{12} x^{96}} = \boxed{\dfrac{3^{12}}{2^{12} x^{84}}}$