Zero and Negative Exponents

Rules	Completed Examples	Additional Examples
Zero as an exponent • <u>Any</u> number raised to the power of zero equals 1 $a^0 = 1 \qquad a \neq 0$	Ex 1) Evaluate 5^0 • Any number raised to the power of 0 equals 1, so $5^0 = 1$ Ex 2) Evaluate x^0 • Even though we don't know what x equals, we know that any number raised to the power of 0 equals 1, so $x^0 = 1$	
Negative Exponents *We can't evaluate negative exponents, no matter where/how they appear** We need to rewrite them so that they become positive, using the rules below. $a^{-n} = \frac{1}{a^n} \qquad a \neq 0$ If the term with a negative exponent is a part of a fraction, move the term and its exponent to the denominator, and make the exponent positive. If the term with a negative exponent is NOT a part of a fraction, make a fraction, and move the term and its exponent to the denominator, and make the exponent positive. $a^n = \frac{1}{a^{-n}} \qquad a \neq 0$ If there is a term with a negative exponent in the denominator of a fraction, bring the term and its exponent to the numerator, and make the exponent positive.	Ex 3) Evaluate 2^{-1} • We can make the exponent positive by creating a fraction-1 would be the numerator and the denominator would be the given expression, but with a positive exponent $2^{-1} = \frac{1}{2^1} = \frac{1}{2}$ Ex 4) Evaluate d^{-2} Using the same method used in ex 3: $d^{-2} = \frac{1}{d^2}$ Ex 5) Evaluate $\frac{1}{2^{-3}}$ • We can make the exponent positive by bringing 2^{-3} to the numerator, and in turn making the exponent positive $\frac{1}{2^{-3}} = 2^3 = 8$ Ex 6) Evaluate $\frac{1}{y^{-7}}$ Using the same method as ex 5: $\frac{1}{y^{-7}} = y^7$	

Important things to remember about exponents:

Additional Examples: