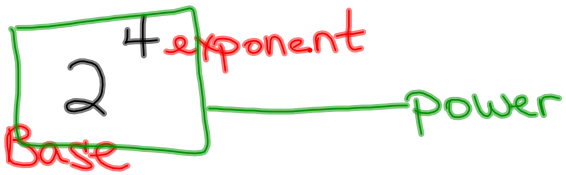
2-8 Powers and Exponents



Base - the number that is multiplied.

Exponent - tells how many times the base is used as a factor.

Power - the number that is expressed using an exponent.

$2^4 = 2^4 = 16$

$a \cdot b \cdot b \cdot a \cdot b$

$a^2 b^3 = a \cdot a \cdot b \cdot b \cdot b$

$10^3 = 10 \cdot 10 \cdot 10 = 1000$

$10^2 = 10 \cdot 10 = 100$

$10^1 = 10 = 10$

$10^0 = 1$ any number to the zero power = 1

negative exponents

$10^{-1} = \frac{1}{10}$

numerator = 1

$10^{-2} \quad \frac{1}{10 \cdot 10} = \frac{1}{100}$

denominator is the base as a factor (exponent) times

$10^{-3} \quad \frac{1}{10 \cdot 10 \cdot 10} = \frac{1}{1000}$

EXAMPLE

$3^{-2} = \frac{1}{3 \cdot 3} = \frac{1}{9}$

$2^{-3} = \frac{1}{2 \cdot 2 \cdot 2} = \frac{1}{8}$

$6^{-3} = \frac{1}{6 \cdot 6 \cdot 6} = \frac{1}{216}$

Evaluate (value)

$a^2 \cdot b^4$

$3^2 \cdot 5^4$

$9 \cdot 625$

5625

if $a=3$
$b=5$

Substitute to find the value.

16) $5 \cdot 5 \cdot 5 \cdot 5$

$5^4 = 625$