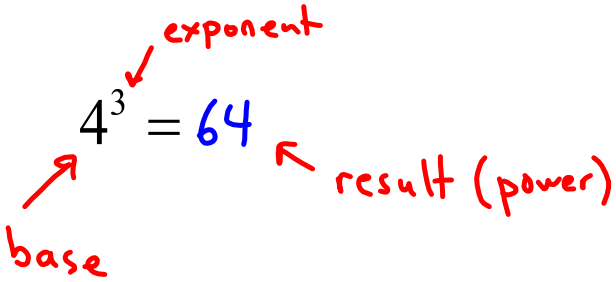
LOGARITHMS

(exponents)

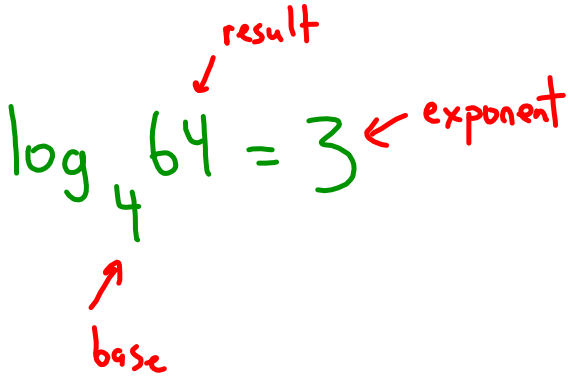
Goal: - to become familiar with logs

- to use logs to solve equations

We are very familiar with exponential form:



A very different but important form is called logarithmic form:



" Log base 4 of 64 equals 3. "

Write the following in logarithmic form:

$5^2 = 25$

$\log_5 25 = 2$

$2^{-1} = \frac{1}{2}$

$\log_2 \frac{1}{2} = -1$

$10^4 = 10000$

$\log 10000 = 4$

↖ don't need to write base 10

Base ten is called the "common logarithm"

log on calculator

Evaluate the following logarithms:

$\log_2 16 = 4$

$\log_6 216 = 3$

$\log_3 \frac{1}{3} = -1$

$\log 0.01 = -2$

$10^{-2} = 0.01 = \frac{1}{10^2}$

$10^{-1} = 0.1 = \frac{1}{10}$

$10^0 = 1$

$10^1 = 10$

$10^2 = 100$

$10^3 = 1000$

$\log_9 1 = 0$

What about $\log_3 15$?

$$\log_3 15 = \frac{\log 15}{\log 3} = 2.46$$

$$\log_c a = \frac{\log a}{\log c}$$

change of base law

Evaluate the following:

$\log_7 45$

$\log_{\frac{1}{2}} 8$

$\log_3 -9$