

Remember:

* Anything to the 0 power is equal to 1.

$$b^0 = 1$$

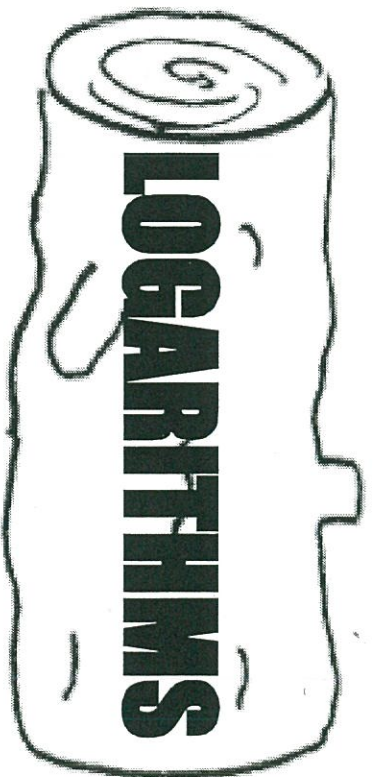
* Fractional exponents are radical.

$$9^{\frac{1}{2}} = \sqrt{9} = 3$$

* Negative exponents: Use the reciprocal

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

$$\left(\frac{1}{2}\right)^{-3} = \left(\frac{2}{1}\right)^3 = 2^3 = 8$$



A logarithm is just a special way to ask a specific question.

$$\log_b a = c$$

The QUESTION:

What exponent do I raise b to, $\rightarrow c$ in order to get a ?

Exponential Form

$$b^c = a$$

Ex: $3^4 = 81$

Logarithmic Form

$$\log_b a = c$$

$$\log_3 81 = 4$$

Calculate the following logarithms.

$$\log_4 64 = 3$$

$$\log_6 216 = 3$$

$$\log_4 16 = 2$$

$$\log_3 \frac{1}{243} = -5$$

$$\log_5 125 = 3$$

$$\log_2 4 = 2$$

$$\log_{343} 7 = \frac{1}{3}$$

(because $343^{\frac{1}{3}} = \sqrt[3]{343}$)

$$\log_{64} 4 = \frac{1}{3}$$

(because $64^{\frac{1}{3}} = \sqrt[3]{64}$)

Convert between exponential and logarithmic form.

$$\left(\frac{1}{5}\right)^x = y$$

$\log_{\frac{1}{5}} y = x$

$$\log_u \frac{15}{16} = v$$

$u^v = \frac{15}{16}$

$$9^y = x$$

$\log_9 x = y$

$$\log_7 \frac{x}{4} = y$$

$\frac{x}{4} = 7^y$

$$6^y = x$$

$\log_6 x = y$

$$\log_u v = -16$$

$u^{-16} = v$

$$b^a = 123$$

$\log_b 123 = a$

$$\log_v u = 4$$

$v^4 = u$

$$u^{-14} = v$$

$\log_u v = -14$

$$\log_2 v = u$$

$2^u = v$

$$8^b = a$$

$\log_8 a = b$

$$\log_y x = -8$$

$y^{-8} = x$