OBJECTIVE

1. I can use the rules of Logarithms to evaluate basic Logarithms.

2. I can apply the rules of Logarithms

NOTES

Logarithms:

$\log_b x = c$ if and only if _____

Basic Properties of Logarithms:

$\log_b 1 =$

$\log_b b =$

$\log_b b^c =$

$b^{\log_b x} =$

Change of base:

$\log_b x =$

Rules of Logarithms:

Product Rule: $\log_b(xy) =$

Quotient Rule: $\log_b\left(\frac{x}{y}\right) =$

Power Rule: $\log_b x^c =$

EXAMPLES

Rewrite each of the following in exponential form.

1. $\log_4 64 = 3$ $\qquad\qquad$ $\log_5 \frac{1}{25} = -2$ $\qquad\qquad$ $\log_{65} 1 = 0$

Rewrite each of the following in logarithmic form.

2. $3^4 = 81$ $\qquad\qquad$ $10^{-2} = \frac{1}{100}$ $\qquad\qquad$ $6^1 = 6$

Use the properties of logarithms to evaluate the expressions without a calculator.

3. $\log 10^{-4}$ $\qquad$ $3^{\ln 6}$ $\qquad\qquad$ $\log_3 1$ $\qquad$ $\log_{50} 50$

Evaluate.

4. $\log_2 5$ $\qquad$ $\log_4 16$ $\qquad$ $\log 65$ $\qquad$ $\ln 6$

Expand the following expressions.

5. $\log \frac{a^4 b}{c^5}$ $\qquad\qquad$ $\ln \sqrt{m^3 n}$ $\qquad\qquad$ $\log \frac{2w^4 h^3}{a^2 b^5}$

Condense the following into a single logarithm.

6. $\ln(x+1) - 3\ln(x-2)$ $\qquad\qquad$ $\ln a - \frac{3}{2}\ln b + 7\ln c - 5\ln d$