

Warm up

1. Evaluate without a calculator.

a. $y = \log_5 \frac{1}{5}$ -1

b. $y = \log_2 32$ 5

c. $y = \log 10^2$ 2

d. $y = \ln e$ 1

e. $y = \log_{12} 1$ 0

GO COUGARS!



Homework Questions

3.3 Properties of Logs

Change of base

More Properties of logs

Expand Logs

Condense Logs

Change of Base

If asked to evaluate $\log_3 4 \rightarrow$ calc can't do.

$$\log_a x = \frac{\log x}{\log a} \qquad \frac{\log 4}{\log 3} = \frac{\ln 4}{\ln 3}$$

Change y base says $\frac{\log_b x}{\log_b a} = \frac{\log_{10} x}{\log_{10} a} = \frac{\ln x}{\ln a}$

base b base 10 base e

$$\log_5 62$$

Properties of Logs

$$\log_a mn = \log_a m + \log_a n \quad \bullet \longrightarrow \text{Each } m \text{ or } n \text{ must be a single \# or variable}$$

$$\log_a \frac{m}{n} = \log_a m - \log_a n$$

$$\log_a m^n = n \log_a m$$

$$\log_a \frac{1}{m} = \log_a m^{-1} = -1 \log_a m$$

Expand

$$\log_a 3x^3y^4 = \log_a 3 + \log_a x^3 + \log_a y^4$$

$$\log_a 3 + 3\log_a x + 4\log_a y$$

$$\ln \frac{x^3 \sqrt{y}}{z^4 w} = \ln x^3 + \ln y^{1/2} - \ln z^4 w$$

$$3\ln x + \frac{1}{2}\ln y - (4\ln z + \ln w)$$

$$\ln \left(\frac{(x^2 - 1)}{x} \right) = \ln(x^2 - 1) - \ln x$$

$$\ln(x+1)(x-1) - \ln x$$

$$\ln(x+1) + \ln(x-1) - \ln x$$

Condense Logs

$$\log_2 7 + 4\log_2 x = \log_2 7 + \log_2 x^4$$
$$\log_2 7x^4$$

$$2\log_4(x-2) - \log_4 x$$
$$= \log_4 \frac{(x-2)^2}{x}$$

$$-6\log x + 4\log y - \log z$$

$$\log x^{-6} + \log y^4 - \log z$$

$$\log \frac{x^{-6}y^4}{z} = \log \frac{y^4}{y^6z}$$

Evaluate

$$\log_2 4 + \log_3 27 - \log 100$$

$$2 + 3 - 2$$

$$\textcircled{3}$$

$$\log_3 18 - \log_3 2$$

$$\log_3 \frac{18}{2} = \log_3 9$$

$$\textcircled{2}$$

HOMework



p 211 5-13 odd, 39, 43, 47, 49, 55,
61, 67, 71-75 odd, 81-91 odd