

Properties of Logs

solving w/ calc

change of base

$$\log_a b = \frac{\log b}{\log a} = \frac{\ln b}{\ln a}$$

ex 1 $\log_7 9$

$$\frac{\log 9}{\log 7} = 1.129$$

ex 2 $\log_{1/2} 13$

$$\frac{\ln 13}{\ln 1/2} = -3.7$$

properties

$$\log_a (km) = \log_a k + \log_a m$$

$$\log_a \left(\frac{v}{k}\right) = \log_a v - \log_a k$$

$$\log_a (v^2) = 2 \log_a v$$

ex 3 expand $\log_3 (2x)$

$$\log_3 2 + \log_3 x$$

ex 4 $\log (x^3 y^4)$

$$3 \log x + 4 \log y$$

ex 5 $\log_4 \sqrt{k} = \log_4 k^{1/2}$

$$\frac{1}{2} \log_4 k$$

ex 6 $\log (10m)$

$$\log 10 + \log m = 1 + \log m$$

ex 7 $\ln \left(\frac{\sqrt{3x-5}}{7}\right)$

$$\ln \sqrt{3x-5} - \ln 7$$

$$\frac{1}{2} \ln (3x-5) - \ln 7$$

ex 8 $\ln \left(\frac{3}{x^2 y^4}\right)$

$$\ln 3 - (2 \ln x + 4 \ln y)$$

$$= \ln 3 - 2 \ln x - 4 \ln y$$