

TOPIC: PROPERTIES OF LOGARITHMS

PRACTICE

Write each logarithmic expression as a single log.

(A)

$$\log_2 \frac{1}{9x} + 2 \log_2 3x$$

(B)

$$\ln \frac{3x}{y} + 2 \ln 2y - \ln 4x$$

PRACTICE

Write each single logarithm as a sum or difference of logs.

(A)

$$\log_3 \left(\frac{\sqrt{x}}{9y^2} \right)$$

(B)

$$\log_5 \left(\frac{5(2x+3)^2}{x^3} \right)$$

TOPIC: PROPERTIES OF LOGARITHMS

Evaluating Logarithms Using the Change of Base Property

- ◆ If a logarithm doesn't have a base that is easy to evaluate, you can simply _____ the base.
 - You'll most often want to change the base to be either ____ or ____, to easily evaluate with any calculator.

New

Change of Base Property

$$\log_b M = \frac{\log_a}{\log_a}$$

$\log_b M = \frac{\log_{10} M}{\log_{10} b} = \frac{}{}$

$\log_b M = \frac{\log_e M}{\log_e b} = \frac{}{}$

EXAMPLE

Evaluate the given logarithms using the change of base property and a calculator. Use common logs for (A), (B) and natural logs for (C), (D).

(A) $\log_7 31 =$

(B) $\log_\pi 9 =$

(C) $\log_\pi 9 =$

(D) $\log_{\sqrt{3}} e =$

TOPIC: PROPERTIES OF LOGARITHMS

PRACTICE

Evaluate the given logarithms using the change of base formula and a calculator. Use common logs.

(A)

$$\log_3 17$$

(B)

$$\log_9 67$$

PRACTICE

Evaluate the given logarithms using the change of base formula and a calculator. Use natural logs.

(A)

$$\log_8 41$$

(B)

$$\log_2 3789$$