5-2 Properties of Logarithms

I can use the properties of logarithms to simplify logarithms.

I can use the properties of logarithms to express logarithms in different ways.

Jan 27-9:39 AM

$6^x = y$ $\log_6 y = x$

$\log_h m = c$ $h^c = m$

$\log_2 8 = 3$

$\log_6 36 = 2$

$\log_3 27 = 3$ $\log 10000 = 4$

$\log_4 4 = 1$

Dec 3-9:02 AM

Use your calculator to approximate the following:

$\log_4 45 \approx 2.7$

$\log_3 26 = 2.9$

① Math
② Alpha
③ Math

Apr 29-2:06 PM

Inverse Property: When the base of the exponential and the logarithm are the same they cancel each other out

$$\boxed{b^{\log_b M} = M \qquad \log_a a^r = r}$$

$\cancel{5}^{\log_{\cancel{5}} 20} = 20$ $\log_{\cancel{4}} \cancel{4}^3 = 3$

$8^{\log_8 12}$ 12 $\cancel{\ln} e^7$ 7

Apr 29-9:26 AM

Evaluate

$12^{\log_{12} 3}$ 3

$10^{\log 6}$ 6

$\log_8 8^3$ 3

$\log_{10} 10^4$ 4

Apr 29-9:31 AM

$2(x+1)$

$2x+2$

Dec 3-9:12 AM

Multiplication expands to addition

$$\log_b(MN) = \log_b M + \log_b N$$

$\log_2(5 \cdot 3) = \log_2 5 + \log_2 3$

Apr 29-9:37 AM

Expand the following logarithms

$\log_4(9 \cdot 5)$

$\log_4 9 + \log_4 5$

$\log(5w)$ $\log 5 + \log w$

$\ln(6z)$ $\ln 6 + \ln z$

Apr 29-9:41 AM

Division expands to Subtraction

$$\log_b\left(\frac{M}{N}\right) = \log_b M - \log_b N$$

$$\log_2\left(\frac{5}{3}\right)$$ $\log_2 5 - \log_2 3$

Apr 29-9:41 AM

Expand the following logarithms

$$\log_7\left(\frac{9}{5}\right)$$

$$\ln\left(\frac{p}{3}\right)$$ $\ln p - \ln 3$

$$\log\left(\frac{y}{5}\right)$$

Apr 29-10:26 AM

Expand the following logarithms

$$\log_3\left(\frac{3m}{n}\right)$$

$$\log_3\left(\frac{q}{3p}\right)$$

Apr 29-10:34 AM

Power Rule: Exponents can be brought to the front as ~~an exponent~~ a coefficient.

$$\log_b M^r = r\log_b M$$

$$\log_8 3^5$$ $5\log_8 3$

$$\ln x^3$$ $3\ln x$

Apr 29-10:26 AM

Expand the following logarithms.

$\log_2(x^2y^3)$ $\log_2 x^2 + \log_2 y^3$

$2\log_2 x + 3\log_2 y$

$\log\left(\frac{100x}{y}\right)$

Apr 29-1:48 PM

Expand the following logarithms.

$\log_4(a^2b)$ $2\log_4 a + \log_4 b$

$\log_3\left(\frac{9m^4}{n}\right)$

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