Warm Up

Evaluate

$$\log_{12} 12^8 =$$

$$\log_3 9^{10} =$$

$$\log_a 1 = 0$$

$$\log_a a = 1$$

$$\log_a a^x = x$$

$$a^{\log_a x} = x$$

Sep 23-9:25 AM

Sec 8.4 <u>Laws of Logarithms</u>

Recall: $a^x \times a^y = a^{x+y}$

Let $m = a^x \ and \ n = a^y$

        $mn = a^{x+y}$ write in logarithmic form

        $\log_a mn = x + y$

replace x and y with their log counterparts

    $m = a^x \ then \ \log_a m = x$

    $n = a^y \ then \ \log_a n = y$

then

$$\boxed{\log_a mn = \log_a m + \log_a n}$$

Dec 19-10:04 AM

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By similar reasoning the following log rules can be developed:

Product law: $\log_a xy = \log_a x + \log_a y$

Quotient law: $\log_a\left(\dfrac{x}{y}\right) = \log_a x - \log_a y$

Power law: $\log_a x^r = r\log_a x$

Proof on page 470 - 471

Dec 31-3:09 PM

Let's practice...

$\log_4 2.5 + \log_4 25.6$

$\log_2 80 - \log_2 5$

$\log_5 \sqrt[3]{25}$

Dec 31-3:14 PM

Rewrite this is terms of $\log_a x$, $\log_a y$ and $\log_a w$

$$\log_a \sqrt{\dfrac{x^3 y^2}{w}}$$

Dec 21-1:54 PM

Homework:
p475 #1-3ace, 4,6,9,10

Dec 31-3:14 PM