Use a calculator to complete.

thousandths

1. $\ln 33.7 = 3.517$

2. $\log \frac{5}{6} = -.079$

3. $e^{-.2} = .819$

4. $230e^{.35} = 326.386$

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4.2 Exp growth & Decay

Continuous Exp growth

$A = A_0 e^{rt}$

19% per hour

683 bac

After 4 hours

$A = 683e^{(.19)(4)}$

$A = 1460.4$

A: Total Amount

A_0: Init Amount

e: Euler's number

r: rate

t: time

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4.2 Inverse

$h(x) = \frac{9x-2}{7x+5}$

① $y = \frac{9x-2}{7x+5}$

② (Switch) $x = \frac{9y-2}{7y+5}$

③ $x(7y+5) = 9y-2$

$7xy+5x = 9y-2$

$-5x \quad -9y$

$7xy-9y = -5x-2$

$y(7x-9) = -5x-2$

$\frac{y(7x-9)}{7x-9} = \frac{-5x-2}{7x-9}$

$y = \frac{-5x-2}{7x-9}$

$h^{-1}(x) = \frac{5x-2}{7x-9}$ *

Domain $7x-9 = 0$

$x = \frac{9}{7}$

$(-\infty, \frac{9}{7}) \cup (\frac{9}{7}, \infty)$ *

Range $7x+5 = 0$

$x = -\frac{5}{7}$

$(-\infty, -\frac{5}{7}) \cup (-\frac{5}{7}, \infty)$ *

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4.3 Converting Log → exp & exp → log

$\log_a x = y$ log

$a^y = x$ exp

$\begin{cases} \ln c = b \\ e^b = c \end{cases}$

(A) $\ln x = 2$

$e^2 = x$

(B) $e^7 = y$

$\ln y = 7$

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Properties for Log

$\log_a(mn) = \log_a m + \log_a n$

$\log_a\left(\frac{m}{n}\right) = \log_a m - \log_a n$

$\log_a M^p = p\log_a M$

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a. $\log_4(7 \cdot 10) = \log_4 7 + \log_4 10$

b. $\log_3 \frac{5}{8} = \log_3 5 - \log_3 8$

c. $\log_8 25 = \log_8 5^2 = 2\log_8 5$

Expand $\log \frac{z}{x^3}$

$\log z - \log x^3$

$\log z - 3\log x$

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$3(\log_4 y - 5\log_4 w) + 3\log_4 x$

$3\log_4 y - 15\log_4 w + 3\log_4 x$

$(\log_4 y^3 - \log_4 w^{15}) + \log_4 x^3$

$\log_4 \frac{y^3}{w^{15}} + \log_4 x^3$

$\log_4 \frac{x^3 y^3}{w^{15}}$

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Change of Base

$\log_a b = \frac{\log_{10} b}{\log_{10} a}$ $\log_{10}$

$\log_5 \frac{1}{4} = \frac{\log(\frac{1}{4})}{\log 5} = -.861$

$\log_{\square} \square$

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