Precalculus Worksheet #1 Chapter 4 Selected Solutions

Find each of the following without using a calculator.

4. $\log_5 0.04 = \underline{\quad -2 \quad}$

$0.04 = 1/25 = 5^{-2}$

Let $w = \log_B 2$, $x = \log_B 3$, and $y = \log_B 5$. Express each of the following in terms of w, x, and/or y.

15. $\log_B 125 = \underline{\quad 3y \quad}$

$\log_B 5^3 = 3\log_B 5$

17. $\log_B (3B^3) = \underline{\quad x + 3 \quad}$

$\log_B 3 + 3\log_B B$

Express each of the following as the log of a single expression.

20. $2\ln x - \ln y + 5\ln z = \ln\left(\frac{x^2 z^5}{y}\right)$

$\ln(x^2) - \ln y + \ln(z^5)$

Solve each of the following problems.

21. $1000 is invested at 9% per year compounded continuously. What will be the balance after 20 years?

$A = Pe^{rt}$ $\quad A = 1000e^{[(0.09)(20)]}$

$P = \$1000$ $\quad A = 1000e^{1.8}$

$r = 0.09$ $\quad A \approx 6049.65$

$t = 20$ $\quad$ **The balance will be about $6,050.**

$A = ???$

Solve each of the following equations, without using a calculator.

6. $9^{(2x-3)} = 27^x$

$(3^2)^{(2x-3)} = (3^3)^x$

$3^{(4x-6)} = 3^{3x}$

$4x - 6 = 3x$

$\underline{x = 6}$

7. $\log_3 x + \log_3 (x - 6) = 3$

$\log_3 [x(x - 6)] = 3$

$x(x - 6) = 3^3$

$x^2 - 6x - 27 = 0$

$(x - 9)(x + 3) = 0$

$x = 9$ or $x \neq -3$

$\underline{x = 9}$

Solve each of the following equations. Express your solutions rounded to two decimal places.

25. $\ln x = 1.75$

$x = e^{1.75}$

$x \approx 5.75$

26. $e^{(3x-2)} = 6$

$3x - 2 = \ln 6$

$x = (2 + \ln 6)/3$

$x \approx 1.26$