**Algebra 2 More Logarithm Questions** **2009-05-21**
**Section 8.4 in Textbook**

1. Evaluate the following logarithms *without* your calculator by rewriting as exponential equations:

a. $\log_4 8 =$ b. $\log_3 3^{11} =$ c. $\log_6 6\sqrt{6} =$

d. $\log_9 \sqrt[4]{3} =$ e. $\log_5 \dfrac{\sqrt[3]{5}}{\sqrt{5}} =$ f. $\log 10000 =$

g. $\log\left(\sqrt{10}\right)^7 =$ h. $\log_{27} 3^{10} =$ i. $\log_8 16^3 =$

2. Solve the following equations by rewriting the logarithm as an exponential equation. You may need to isolate the logarithm first.

a. $\log_7 x = -2$ b. $5\log(x+3) - 2 = 13$ c. $\log_2 \sqrt{x} = 3$

3. Find the inverse of each function, just like we did in the inverses unit: solve for $x$. But now now you may have to take the log of both sides or exponentiate both sides to isolate $x$.

a. $f(x) = 4^x - 7$ b. $f(x) = \dfrac{1}{3} \cdot 5^{x-2} + 4$ c. $f(x) = 3 \cdot (.6)^{x+1} - 2$

d. $f(x) = \log_5 x$ Hint: Rewrite in exponential form.

e. $f(x) = \log_3(x-2) + 7$ f. $f(x) = 5\log_4(2x) + 1$

4. Solve each of the following equations numerically by using the LOG button on your calculator. Give your answers as decimals rounded to three places.

a. $10^x + 4 = 82$ b. $\dfrac{1}{2} \cdot 10^x + 32 = 573$ c. $4236 = \dfrac{2}{5} \cdot 10^{x-7}$

d. $10^{2x-3} = 700$ e. $\left(10^x\right)^2 - 4 = 812$

**ANSWERS (not yet double checked)**

1a. $\dfrac{3}{2}$ b. 11 c. $\dfrac{3}{2}$ d. $\dfrac{1}{8}$ e. $-\dfrac{1}{6}$ f. 4 g. $\dfrac{7}{2}$ h. $\dfrac{10}{3}$ i. 4

2a. $\dfrac{1}{49}$ b. 997 c. 64 3a. $f^{-1}(x) = \log_4(x+7)$ b. $f^{-1}(x) = \log_5(3x-12) + 2$

c. $f^{-1}(x) = \log_{0.6}\left(\dfrac{x+2}{3}\right) - 1$ d. $f^{-1}(x) = 5^x$ e. $f^{-1}(x) = 3^{x-7} + 2$ f. $f^{-1}(x) = \dfrac{1}{2} \cdot 4^{\left(\frac{x-1}{5}\right)}$

4a. 1.892 b. 3.034 c. 11.025 d. 2.926 e. 1.706