Homework for Monday: logarithmic functions review

Mr. Neeman, 10B, Sept. 2, 2011.

#1. Simplify each of the following expressions:
(a) $\log_3((\frac{1}{3})^{2x})$
(b) $\ln((\sqrt{e})^x)$
(c) $\left(\frac{1}{4}\right)^{\log_2 x}$
(d) $e^{1+\ln\frac{x}{2}}$

#2. Solve the following equations:
(a) $\log_7(5x+3) = 4$
(b) $3^{x^2+3} - 4 = 6$
(c) $3 - \log_{\frac{1}{3}}(2x) = 5$

#3. For each of the following functions, answer each of the following parts, finding the indicated images and preimages: (a) find the indicated image, (b) find the indicated preimage, (c) Find the function's intersection with the x axis, (d) Sketch the function's graph, labeling your result from (c), (e) find the function's domain (f) find the function's range, (g) find whether the function injective, surjective, both, or neither, (h) find whether the function is increasing or decreasing, (i) find the function's concavity, (j) find the <u>equation</u> of the function's asymptote.

(i) $f(x) = \log_5 x$, image of $\frac{1}{25}$, preimage of $\frac{3}{2}$.
(ii) $f(x) = -\log_{\frac{1}{5}} x$, image of $\sqrt[3]{5}$, preimage of -1.
(iii) $f(x) = \log_4 x - 3$, image of 16, preimage of -5.

#4. Khan Academy: (a) for previous homework, to not get a zero: add me as a coach (my username is oneeman@gmail.com), watch the videos and do the exercises (except those who got over 90 on the midterm). If there are technical issues, you must try different browsers and different computers as far as is in your power, and send me a **detailed** email explaining exactly what you are able to do, what you aren't, what happens when you try, what browsers you tried, what operating systems. Otherwise, on Monday I will enter a zero for that homework. (b) next homework (for this Monday): watch (in their entirety): Introduction to Function Inverses, Function Inverses Example 1, 2, and 3, Algebra II: Quadratics and Shifts; and do 20 exercises in "Shifting and reflecting functions".