Math 10 – College Algebra – Chapter 4 Test – spring '03 NAME_____
Show all responses on separate paper. Show all work for credit.

1. Rewrite the equation $-1=\log_{16}(x+4)$ in equivalent exponential form, then solve for *x*. Finally, use a approximate *x* to the nearest hundredth.

2. Rewrite the equation $2^{x-1}+3=8$ in equivalent logarithmic form, then solve for *x*. Finally, use a calculator to approximate *x* to the nearest hundredth.

3. Rewrite the expression
   a. $\log\left(\frac{10}{3x^n}\right)$ without any exponentiation, multiplication or division.
   b. $\ln 1+\frac{1}{2}\ln(e-x)-\ln(x)$ as a single logarithm.

4. Given $f(x)=2e^{x/3}-8$.
   a. Find a formula for the inverse function, $y=f^{-1}(x)$.
   b. Find the intercepts and asymptotes of $f(x)$.
   c. Find the intercepts and asymptotes of $f^{-1}(x)$.
   d. Sketch a graphing showing $y=f(x)$ and $y=f^{-1}(x)$ together and illustrating the symmetry through $y=x$.

5. Solve the equation for *x*.
   a. $8+4^{0.125x}=24$
   b. $2^{1-x^2}=\frac{1}{8}$
   c. $1+\log(17x+104)=2$
   d. $\log_3(8-x)+\log_3(x+4)=3$

6. Suppose the Gorkon population on planet Xorda in April of 1999 was 1380, and it is estimated that the population will increase by 2% every 400 years.
   a. Assuming a natural growth model for the zebra mussel, when will its population have grown to 2000?
   b. By what percentage will the population grow in 1800 years?

7. If $300 is invested at 3.65% annual interest rate compounded daily, how long will it take to reach a value of $500?

8. Actinium has a half life of about 7.04×10^8 years. How long will it take a 1 gram sample to decay to one milligram (one thousandth of a gram).

9. Find an exponential function (of the form $f(x)=a\cdot b^x$) which passes through the points (0,3) and (2,5).