

Name:

Quiz 7: §4.1-4.4

Complete the following problems to the best of your ability. **SHOW ALL OF YOUR WORK.** Unshown work will not be graded. You may use a calculator. **Decimal approximations are not required.**

1. Solve the following equations for  $x$ .

(a)  $x = \log_2(32)$

(b)  $e^{2x} = 4$

(c)  $x = \log_{2015}(1)$

(d)  $10^{x-2} = 3$

2. Simplify the expression

$$\ln(x+2) + 2\ln(y) - 3\ln(z-2)$$

3. Expand the expression

$$\log \left( \frac{x^2(y+1)^3}{\sqrt{z}} \right)$$

4. Frank Corlione's Extremely Legitimate Business Loans gives a loan of \$3000 to a customer at a monthly interest rate of 4%, **compounded continuously**.

- (a) Find a function for  $A$ , the amount owed on the loan in terms of  $t$  in terms of  $t$ , the number of months that have elapsed.

- (b) How long does it take until the customer owes \$10,000?

5. In chemistry, the pH of a solution is given by  $\text{pH} = -\log[\text{H}^+]$ , where  $[\text{H}^+]$  is the concentration of hydrogen ions in the solution. If the pH of a solution is 6.3, what is the concentration of hydrogen ions?