Name:

HW 9: §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.

1. Evaluate the following.

   (a) $\log_3(81)$

   (b) $\ln(e^4)$

   (c) $\log(1000)$

   (d) $\log_{2016}(1)$

2. Expand the following expressions as much as possible.

   (a) $\log_2\left(\frac{8x^2\sqrt[3]{y}}{z^4}\right)$

   (b) $\log\left(100a^4b^{-4}\right)$

3. Write the following expressions using one logarithm.

   (a) $2\log(x) - \frac{1}{2}\log(y) - \log(z)$

   (b) $4 + \log_2(x) - 2\log_2(y)$

4. Convert the function $y = 25(1.04)^x$ into an exponential function of base $e$.

5. Suppose Tabitha is taking out a loan for \$2000 at an interest rate of 5%, compounded continuously.

   (a) Write a function that gives the amount Tabitha owes on the loan as a function of the number of years that have passed.

   (b) How much does Tabitha owe after 10 years?

**Optional Problems:**

4.1: All
4.2: 1-24, 33-38
4.4: 1-16, 23-55