# Lippmann Chapter 4 Paper Review

This is NOT intended to be comprehensive!

1) State the domain of each of the following functions.
   a) $y = e^x$
   b) $y = \log x$

2) Fill in the following table:

| Function | Base, *b* | *y*-intercept | Growth or decay? | Growth or decay rate |
|---|---|---|---|---|
| $y = 2(1.08)^x$ | | | | |
| $y = 6(0.87)^x$ | | | | |
| $y = 3e^{-0.07x}$ | | | | |
| | | (0, 23) | Growth | 12% |

3) Find an equation for an exponential passing through the points (-2, 5) and (3, 160)

4) According to one source, in 1984 there were approximately 1500 AIDS cases in California. By 1986 there were 4000 cases. Uncontrolled, a virus tends to spread exponentially. Assuming the virus were to spread uncontrolled,
   a) Write an equation for the number of AIDS cases *t* years after 1984.

   b) Describe your equation in words

   c) According to your model, how many people would have been infected in California in 2001?

5) A population can be described by $P(t) = 200(1.05)^t$. What is the doubling time for this population?

6) Solve each of the equations below for x using algebra and properties of logarithms and exponents. Show all steps!

   a) $4(1.7)^x = 7(1.08)^x$

   b) $3e^{x+5} = 7$

   c) $\log(x + 3) = 3$

   d) $\log(x - 1) + \log(x + 1) = 2$

7) A population doubles every 8 years. Assuming exponential growth, find the
   a) Continuous growth rate
   b) Annual growth rate

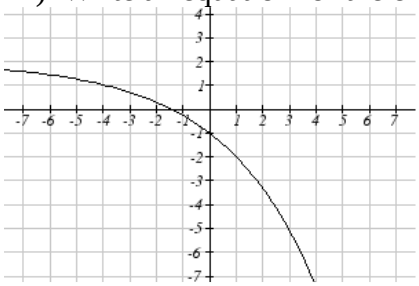
8) Alex invests $4000 in a money-market account earning 6% compounded monthly. Shauna invests $2000 in a mutual fund earning 9% compounded quarterly. When will their accounts be worth the same amount?

9) Suppose the half-life of Kryptonite is 300 years. (give answers to 4 decimal places)

a) What is the annual decay rate?
b) What is the continuous decay rate?

10) Rewrite as a single logarithm: $2\log(x) + 3\log(2)$

11) Write an equation for the exponential graphed below



12) Write the letter of the graph(s) that fit the description in the blank next to the following descriptions.

_____ a. This/these graph(s) are linear

_____ b. This/these graph(s) are exponential

_____ c. This/these graph(s) are logarithmic

A B C D E