Individual Homework #6: Due in class Friday, March 1

Please **read** Sections 3.2 and 3.3 of your text. Please **do** the following exercises:

Section 3.2, Part 1 (Basic properties of the logarithm function) (p. 147): Exercises 1abcefgjklo, 2adfghij.

Section 3.2, Part 2 (Modeling growth and decay with the exponential function) (pp. 147–148): Exercises 5, 6, 8, 10, 11.

Section 3.3 (pp. 157–158): Exercises 1, 2, 3, 4, 5, 8, 10.

Some hints and notes on these exercises:

- Please supply *units* with all of your answers!
- Exercise 6, page 148: Be careful with your units. The variable s denotes distance in feet, but some information here is given in terms of inches.
- Exercise 11, page 148: If P is air pressure and a is altitude, then you have $dP/da = -kP$ and $P_0 = 30$. (P is a function of altitude a, not time t.) Solve this initial value problem using what you know about exponential decay. You can find the per unit decay rate k using the fact that $P(6000) = 24$. Then you can solve $P(a) = 20$ for a.
- Exercises 2 and 3, page 157: you may want to consult Example 3.3.5.
- Exercise 8, page 157: you may want to consult Example 3.3.4.
- Exercise 10, page 158: write $f(x) = x^3$ and $g(x) = \sqrt[3]{x}$. Now follow, very closely, the differentiation strategy employed in Example 3.3.1. (In that example, see especially the part beginning with "For our above functions $f(x) = x^2$ and $g(x) = \sqrt{x}$ we have...," starting on page 153.)