Calculus I, 21-111
Homework # 12
Due Thursday, May 3

Complete all exercises.

Textbook exercises:

- Section 5.2 # 12, 25

- Section 5.4 # 12 a,b,c,d

Additional exercises:

1. The formula for the Richter scale measures the "size" of an earthquake in terms of the reading of a seismograph. the equivalent formula

$$\text{magnitude } = \frac{2}{3} \log \left(\frac{E}{10^4.4} \right)$$

gives the same measurement in terms of the actual energy E (in joules) released by the earthquake.

How many times stronger (in terms of energy) is a magnitude 6.8 earthquake than one which measures 6.0?

2. You can find a table of the population of North America from 1750 to the present here:

http://en.wikipedia.org/wiki/World_population

Here is a webpage which allows you to print graph paper with logarithmic scales:

http://incompetech.com/graphpaper/logarithmic

Using these two resources, make a graph with the years 1750-2000 (every 50 years) on the x-axis, and the population of North America on the y-axis. Use a logarithmic scale on the y-axis (you will need to decide how many "cycles" are needed on your graph paper). Why does it make sense to use a logarithmic scale for the y-axis?