The second test for this course will be given in class on Wednesday, March 9. It will cover all material that we have done from Chapters 5 and 6. This includes Section 5.1, Section 5.2 pages 382 to 386 only, and Sections 6.1 to 6.5. The "theme" of the test is applications of integration.

I will have the test graded for Thursday, March 10. I will be in my office that day from 10:00 AM until 2:00 PM. If you want to pick up your test before Spring Break, you can get it at that time. I will also be able to tell you your current standing in the course.

You should be able to solve relatively simple differential equations, that is, those that can be solved using separation of variables. You should be able to verify that a given function is a solution, even if the equation is not one that you can solve. You should understand the difference between the general solution of a differential equation and particular solutions. You should be able to reason about the *meaning* of a differential equation.

You should know the formula $y = Ce^{kt}$ for exponential growth and decay. You should be able to use it in various types of problems. Most of these problems give you enough information to find C and k, and then ask a question that involves solving for y or t. You should know about population growth, radioactive decay, and interest. You should understand the difference between simple interest and continuously compounded interest. (But you don't need to know the formula for interest that is compounded n times per year.)

From Chapter 6, you need to be able to compute various areas, volumes, surface areas, and lengths. You should know the formulas involved. Better yet, you should be able to recreate the formulas based on geometric reasoning, and you should in any case be able to explain what the formulas mean. You should be comfortable integrating with respect to either x or y. You should be able to use a Riemann sum to estimate area or volume.

Specific applications include: Area between two curves. Finding volume as an integral of cross-sectional area, as in the "circular base with square cross-sections" example. Volumes of revolution using disks, washers, or shells. Arc length of a curve $y = f(x)$. Surface area of a surface of revolution generated by rotating $y = f(x)$ about the x-axis.

As for section 6.5, which is about computing work with the formula $W = \int_a^b F(x)\,dx$, you will be OK if you know this formula. I will not give any problem where you have to find the formula for the force based on some physical problem