Math 113, Applications of the Derivative

In this project we will be working on the following objectives:

- Learning to apply course material
- Developing skill in expressing myself orally or in writing

Each group of 3-5 students will present one of eight application topics in class on April 8 or 10. I will email the class to solicit input on the assignment of groups and topics.

Group Preparation

- Read and discuss the relevant section (or portion of a section) of the textbook.
- Solve the designated problem. (Problems marked with an asterisk are challenge problems.)
- Write up your solution (only one per group) and turn it in on the day that you present. It will count as a quality solution.
- Create and rehearse your presentation. (Time yourselves!)

Group Presentation

A good presentation will explain: (1) the background situation, (2) why a derivative is appropriate in this situation, and (3) the solution to your assigned problem. Do not neglect (1) and (2); they are just as important as (3). (Note that, in order to address (2), you may need to explain how certain formulas in the textbook are derived. This is certainly the case for the 3.7 problems.)

- Length: 7-10 minutes.
- Use the board. Come early to class to write up the main points of your explanations.
- Give each group member a chance to speak.
- The presentation will count towards your grade like a quality solution.

Application Problems

(*Wed Apr 8*)	(*Fri Apr 10*)
Linear density (physics)	**E. coli population growth (biology)**
3.7 #17	3.8 #2
Gravitation (physics)	**Radiocarbon dating (archeology)**
3.7 #20	3.8 #11
Relativistic Force (physics)	**Compounded interest (finance)**
3.7 #21*	3.8 #20, 19*
Reaction rates (chemistry)	**Atmospheric pressure (geology)**
3.7 #24(a)(c)(d), skip (b)	3.8 #17*
Blood flow (biology)	**Boyle's law (chemistry)**
3.7 #29	3.9 #33*
Marginal cost (economics)	**Resistance in a circuit (physics)**
3.7 #31	3.9 #35*