

## Math 151H Group Project

- Choose one topic from the attached list.
- You are going to **CREATE** a teaching resource related to the **REAL WORLD PROBLEM**. This resource should be something that can be used to review the topic once it have been learned. You must cover the topic Numerically, Graphically, Algebraically and Verbally. You may integrate MatLab into your group project presentation. This project should be final draft quality and fully electronic. Be creative!
- You must have Title, Introduction, Definition, History of your topic, Examples, Methods, Visual Map and References on your project.
- Your teaching resource should be represented as a powerpoint show with pictures of relevant items.
- **Problem Creation:** The problems you create should be entirely your own. Simply changing the numbers in a problem you find elsewhere is unacceptable as well. You may consult multiple sources, but don't steal. To do so would be considered plagiarism.
- **Presenting the problem solution** keep in mind that one of your goals is to create a product (teaching resource) that will be of use to future calculus students. So don't skip steps or omit explanation. On the other hand, don't go overboard showing steps that it is reasonable to expect a calculus student to understand. Your solutions may also include comments on common mistakes made with these types of problems, other methods that would work besides the method you are presenting.
- **Graphs/Diagrams:** If a problem/solution requires diagrams or graphs, be sure to include these where appropriate.
- **Visual Map:** Explain in your map how your topic and methods you used to solve the problems are connected with other Calculus I (or Pre-Calculus, Algebra etc.) topics, concepts, methods etc.
- It is recommended to inform me about the progress. The project draft must be completed before November 9 and printed version of the presentation have to be submitted before 11/09. After that each group can make an appointment or visit me during office hours in order to discuss the submitted draft. It is not required that all group members will be presented on that meeting. All projects should be submitted as a printed copy and electronically before November 21 (you will be informed by e-mail about the details).
- Your project grade will be based on the following criteria:
  - Draft (submitted at time, draft content ) 5%
  - Professional looking document adhering to all requirements . . . 5%
  - Organization ( information is presented in logical, interesting sequence which audience can follow.) 10%
  - Quality of problems (clarity, variety of problems, ability to assist students, creativity) . . . 30%

- Quality of solutions (correctness, clarity, depth of understanding, ability to assist students) . . . 45%
- Presentation . . . 5%

- All additional information will be send by e-mail and/or announced in class.

**Here is a list of ideas for projects:**

1. Vectors (1.1-1.2)
2. Vector Functions (1.3, 2.1 (velocity in curvilinear motion), 2.2 (limit of vector function), 2.7, 3.7, 3.9)
3. Limits (2.2, 2.3, 2.6, 3.3, 3.4)
4. Continuity and Intermediate Value Theorem (2.5)
5. Derivatives: (3.1, 3.2,3.4, 3.8)
6. Chain Rule, Implicit Differentiation (3.5, 3.6, 3.8)
7. Slopes and Tangents (finding equation of tangent line at a point) (2.7, 3.9, 3.6)
8. Rates of change from graphs, tables, equations, word problems (chapter 3)
9. Differentials: Linear and Quadratic Approximation (3.11)
10. Inverse Functions: exponential and logarithmic (4.1,4.2, 4.3)
11. Inverse Functions: inverse trig functions (4.2, 4.6 )