Mathematics 131, section 1 – Calculus for Physical and Life Sciences, 1
Information on Final Examination
December 6, 2004

General Information

- The final examination for this class will be given during the scheduled period 2:30 to 5:30pm on Monday, December 13.
- Unlike the midterms, this one will be given in our regular classroom, Swords 328, and each MATH 131 section will be getting a separate final exam.
- The final will be similar in format to the midterm exams but perhaps 1.75 times as long. I expect that if you are well prepared and you work steadily, then you should be able to finish the exam in 2 hours. However, you will have the full 3 hour period to work on the exam if you need that much time.
- As on the midterm, a basic scientific (non-graphing) calculator will be provided for "number crunching."
- No cell-phones, computers, or other electronic devices may be used during the exam. Please do not bring them with you; they will be subject to confiscation for the period of the exam if you use them.
- If there is interest, we could arrange a review session during the reading period (Wednesday, December 8 through Friday, December 10). We can discuss this in class on Monday, December 6.
- I will also be available during regular office hours for questions as you prepare.

Topics to be Covered

- This will be a *comprehensive* final – it will cover all the topics we have studied this semester, with roughly equal weight given to the three sections of the course. In addition, you should expect a question on the material on the definite integral (Chapter 5 in the text) that we studied the past two weeks.
- See the review sheets for the three midterms for a detailed breakdown of the topics we studied earlier. Those review sheets are now reposted on the course homepage if you need another copy of any of them.
- The topics not covered on the previous exams are:
    1. Computing total distance from velocity (Section 5.1). This is the motivation for the introduction of the left- and right-hand sums and the integral.
    2. Definition of the definite integral (Section 5.2). You should know how to compute left- and right-hand sums for basic functions on intervals using a small number of subdivisions (say $n \leq 5$).
    3. Interpretations of the definite integral (Section 5.3): Integral of rate of change of f gives total change of f:

$$\int_a^b f'(t)\ dt = f(b) - f(a),$$

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(one version of the Fundamental Theorem of Calculus), the integral as signed area, integrals for average values:

$$\overline{y} = \frac{1}{b-a} \int_a^b f(x) \, dx$$

- Some good practice problems on these topics: Section 5.3/3, 11, 13, 27. Chapter 5 Review: 1, 3, 5, questions like 9-13 (on these, first write an integral that would compute the areas described, then approximate that integral with left- and right-hand sums), 17.

Suggestions on How To Prepare

- Get started reviewing early and do some work on this *every day* between now and the date of the final. Don't try to "cram" at the end. There's a lot of stuff that you need to know!
- Go over your corrected problem sets and the midterm exams with the solutions. If there were questions where you lost a lot of points, be sure you understand why what you did was not correct, and how to solve those questions.
- Reread your class notes in addition to the text, especially for topics where you lost points on the midterms. There are a lot of worked-out examples and discussions of all of the topics we have covered there.
- Be sure you actually do enough practice problems so that you have the facility to solve exam-type questions in a limited amount of time. *Even if you have saved solutions for practice problems from the midterms*, it is going to be much more beneficial to do practice problems starting "from scratch" rather than just reading old solutions. Remember, the goal of the course is to get you to be able to develop solutions to these problems yourselves, not just to understand solutions that someone else (that includes you, one or more months ago!) has written down. Another analogy – as most of you know from your study of languages, it's much easier to understand another language passively than it is to actually use a language actively yourself (for instance, to form your own complete, grammatically correct sentences). The goal of this course is to make you reasonably proficient "calculus speakers" and there's no substitute for active practice on those skills.