

MAT 131: Calculus I

Fall 2005

End-of-Term Information

End-of-Term Office Hours

Monday, 12/12, 2:30-4pm; Friday, 12/16, Sunday, 12/18, and Tuesday, 12/20, 4-6pm. These will be held in Math 3-117. Please see the MLC website for their hours.

About the Final Exam

The final exam will take place on Wednesday, 12/21, 11-1:30pm; please check the course website for the location. The exam will be cumulative, but with emphasis on the last third of the course. As always, the exam will be closed book/notes/etc.; no calculators will be allowed. Please bring pencils.

You should be able to do all exercises from Sections 1.1-5.5 of the book (except for 1.7,3.3,4.4,4.7) and the related exercises from the End-of-Chapter Reviews for Chapter 1-5. You should also review the midterms, including the solutions, from this and past years, as well as the final exams from past years.

Some of the topics covered in class include:

- Relations between graphs of functions and limits/derivatives/anti-derivatives (odd/even, shifts/stretch, asymptotes, intervals of increase/decrease and up/down concavity, local/absolute max/min, inflection points)
- Limits (limit laws, computing limits). Four methods for computing limits were covered in Part I of the course and reviewed with examples on 10/10. The fifth is L'Hospital's rule, covered on 11/15.
- Derivatives (definitions, rules: especially product/quotient/chain, tricks: implicit/logarithmic). Remember that the product/quotient/chain rules for derivatives look quite different from those for limits and from what one might expect.
- Applications of Derivatives (related rates of change problems, linear approximations, Newton's method, finding max/min, optimization problems, L'Hospital's rule).
- Integrals and Anti-Derivatives (definitions, rules for integrals: especially substitution, Fundamental Theorems of Calculus). Remember that there is no simple product/quotient rules for integrals
- Applications of Integrals (finding distances/areas)

The final exam score is worth 40% of the total grade and may significantly alter your grade. So, please arrive 10 minutes before the start of the exam and do not stop working until the time is called unless you are absolutely certain that your solutions are correct. Do not give up on any problem!

Some Useful Formulas

$$\begin{aligned}e^{\ln a} &= a = \ln e^a \\e^{a+b} &= e^a \cdot e^b, & (e^a)^b &= e^{ab}, \\ \ln(ab) &= \ln a + \ln b, & \ln a^b &= b \ln a.\end{aligned}$$

In particular, $e^{a+b} \neq e^a + e^b$ and $\ln(a+b) \neq \ln a + \ln b$.

$$\sqrt{ab} = \sqrt{a} \cdot \sqrt{b}, \quad \sqrt{a/b} = \sqrt{a}/\sqrt{b}$$

However, $\sqrt{a \pm b} \neq \sqrt{a} \pm \sqrt{b}$.

Good Luck with all your final exams!