Math 111 Midterm Review

The Math 111 midterm will be during class on Wednesday, October 12. I have listed what you need to know below. It will be closed book/notes/calculator/internet/etc. A copy of the essential derivatives handout will be provided for your use during the exam.

Limits.

- ⋆ You will be asked the definition of the limit (Friday, Week 1). You should practice the definition by writing it from memory on a sheet of paper and comparing with the actual definition until you get it perfectly. Changing almost any part of the definition will break it!
- Use the definition of the limit to calculate the limit of a simple function (Friday, Week 1; Wednesday, Week 2).
- Know the statement of our main limit theorems (Friday, Week 2) and how to use them to calculate limits of actual functions (Monday, Week 3).
- Be able to give an ε-δ proof of the sum theorem for limits (end of class, Monday, Week 3)). It uses the "$\varepsilon/2$-trick". Use your review time to understand all of the steps of the proof. This proof will help you to deeply understand the definition of the limit.

Continuity.

- ⋆ You will be asked the definition of continuity (Wednesday, Week 3).

Derivatives.

- ⋆ You will be asked the definition of the derivative (Monday, Week 4).
- Be able to use the definition of the derivative to compute derivatives of uncomplicated functions (Monday and Wednesday, Week 4).
- Know the sum, product, and quotient rules for derivatives (Wednesday and Friday, Week 4). Know how to prove the sum rule for derivatives (Friday, Week 4).
- Be able to use the above rules and the chain rule to calculate derivatives (Monday, Week 5; also see the slides for Wednesday and Friday, Week 5).

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- Be able to compute the equation of a tangent line to a function at a given point (Wednesday, Week 4).
- Be able to use implicit differentiation to find the equation of the tangent line to an implicitly defined curve (Wednesday, Week 5; Monday, Week 6).