

## Exam 2 Review Sheet      Calc 1      7/14/2004

Format: 10 problems with generally ascending difficulty, plus an extra credit opportunity.

Prerequisites: The exam is comprehensive over everything since kindergarten. In particular, although the exam is primarily over chapters 3 and 4, all of the material reviewed in chapter 1 is important for some stages of larger problems and the material in chapter 2 is crucial to understanding how and why we're doing the things we are now. Linear, exponential, and sinusoidal functions in particular will be likely to show up.

Content: The exam will cover §3.1 through §4.6.

- ▶ Know the definition of the derivative (both at a point and as a function).
- ▶ Be able to use the definition of the derivative to prove results like the Sum Rule, Difference Rule, Constant Rule, and Constant Multiple Rule.
- ▶ Be able to use the definition of the derivative to prove the Product and Quotient Rules.
- ▶ Know and be able to use all the rules for differentiation, including the Product, Quotient, and Chain Rules.
- ▶ Know the derivatives of a wide variety of functions including polynomials, trig functions, exponential functions, hyperbolic trig functions, and inverses of all of these.
- ▶ Know when and how to use L'Hôpital's Rule.
- ▶ Know when and how to perform implicit differentiation.
- ▶ Know how to find derivatives of curves defined parametrically.
- ▶ Understand how derivatives relate to the shapes of curves, including aspects like slope, concavity, critical points, inflection points, and non-differentiable points.
- ▶ Be able to do typical optimization problems.
- ▶ Be able to model typical situations and optimize the functions involved.

Grading: Each problem is worth 10 points.

- ▶ 10 points indicates complete, accurate, and adequately justified completion of a problem.
- ▶ Isolated mistakes within an otherwise valid solution generally cost about a third of the points possible (3 or 4 points out of 10).
- ▶ Even if you can't complete a problem, make an effort to indicate to me how much you know so I can gauge credit accordingly.
- ▶ Pay attention to what's asked for: You don't need to waste time working out answers if you're only asked to set them up. Providing a decimal approximation when an exact value is requested, or vice versa, costs you points. Pay attention to the difference.

Resources: You are welcome to use a calculator of your choice, and scratch paper will be provided.