

Midterm 1 Review Guide

The exam will cover Chapters 1.1-2.4. It will cover functions, limits, vertical and horizontal asymptotes, continuous functions, derivatives and derivative rules, tangent and secant lines, velocities and marginals. There will be

- 1 problem for definitions
- 2 limit and continuity problems
- 2 derivative problems

Some important topics that will be covered include but are not limited to:

- (1) Be able to define the following:
 - a function f
 - what it means for a function f to be continuous at a number c
 - a secant line to a graph
 - the derivative of a function f at a number x , as a limit of difference quotients
- (2) Functions:
 - composition of functions, inverse functions
 - identifying a function from its graph; vertical and horizontal line tests
- (3) Limits and continuous functions
 - finding limits using limit laws
 - finding limits of rational functions
 - determining intervals of continuity
 - types of discontinuities: removable, infinite, jump
- (4) Derivatives
 - secant lines and tangent lines
 - finding derivatives using the definition
 - finding derivatives using the derivative rules (sum, difference, constant multiple, power rules, product and quotient rules.)
- (5) Applications of derivatives
 - velocity
 - marginals and approximation

The problems will be a composite of homework-like problems, quiz-like problems, and some conceptual problems testing your understanding of the definitions. In order to study, I recommend:

- Go over old homework and ask questions on the problems you do not understand.
- Look at problems in the book similar to homework problems.
- Quiz yourself (or have someone quiz you) on definitions and simple derivative problems; you'll be well off if you can do the simple problems quickly.
- Come to office hours/calculus room to get holes in our understanding fixed.