The midterm will mostly cover Chapter 2, but Chapter 1 skills are needed at all times. The questions will be like WebAssign and Written Homework problems in Chapter 2. Note section 2.4 is skipped, along with the "precise definitions" material in section 2.6.

There are many old versions of Midterm Exam 1 on the "Exams" tab on the website. Print them out and do them, then check your work!

Here are important topics which you should review and make sure you understand, with the sections where they appear. Find and do example problems from each topic!

- average velocity and secant line slope §2.1
- the sentence definition of the basic (two-sided) limit $\lim_{x\to a} f(x)$ §2.2
- one-sided limits §2.2
- infinite limits §2.2
- limits at infinity §2.6
- vertical and horizontal asymptotes are defined by limits §2.2, 2.6
- using values close to $x = a$ to estimate the limit §2.2
- using algebra and limit laws to compute limits §2.3, 2.5, 2.6, 2.7, 2.8
  - you need to do algebra for "$\frac{0}{0}$," "$\frac{\infty}{\infty}$," and "$\infty - \infty$" limits
  - your basic approach is to cancel zeros, by cancelling, factoring, finding common denominators, or multiplying by conjugates
- getting limits from a given graph §2.2, 2.3, 2.5, 2.6
- given limits and values, generate (sketch) a graph §2.2, 2.3, 2.5, 2.6
- definition of continuity §2.5
  - if a function f is continuous at $x = a$ then the limit $\lim_{x\to a} f(x)$ is easy . . . just plug in a
- common functions are continuous on their domains §2.5
- using the Intermediate Value Theorem to show equations have solutions §2.5
- the derivative is defined as a limit §2.7
- computing a derivative from the definition §2.7, 2.8
- tangent line slope and instantaneous velocity: they are derivatives §2.7
- find equation of a tangent line §2.7
- the derivative as a new function derived from $f(x)$ §2.8
- sketching $f'(x)$ based on $f(x)$ §2.8
- notation: $f'(x) = y' = \frac{df}{dx} = \frac{dy}{dx}$ §2.8
- higher derivatives (and notation for them) §2.8