

## Suggestions for Studying for the Final Exam in Math 135

The final exam in Math 135 covers the entire course. However, students can expect that there will be a slight emphasis on the material in Chapter 5, since that material has not been covered on earlier hour exams.

Students should carefully review the study suggestions for the hour exams. In reviewing the material in Chapter 5, students should be sure that they

- Understand the definition of an indefinite integral or antiderivative.
- Are able to check whether a given function  $F$  is an antiderivative of another function  $f$ .
- Know antiderivatives for polynomials,  $\sin x$ ,  $\cos x$ ,  $\sec^2 x$ ,  $\sec x \tan x$ , and  $e^x$ , and can compute antiderivatives of functions related to these by the method of substitution.
- Understand  $\Sigma$  notation for sums.
- Understand the definition of a Riemann sum and can compute the value of a Riemann sum given the function, the interval, the partition, and the choice of representative points.
- Understand that definite integrals are limits in an appropriate sense of Riemann sums.
- Understand the interpretation of definite integrals as the “net” area under the graph of a function, where area above the  $x$ -axis is counted positively and area below the  $x$ -axis is counted negatively.
- Can evaluate definite integrals using antiderivatives.
- Can differentiate functions defined as definite integrals with varying upper or lower limits.

Chapter 5 contains The Fundamental Theorem of Calculus, in fact two versions of that theorem. Certainly students should pay attention to a theorem that is described as the fundamental result of the subject.