

## Review for Test 2

As for Test 1, you are encouraged to practice by trying a few of the problems at the end of each section that look similar to the ones that were assigned.

**6.2 Volumes.** You should try to re-read and understand all of this section up to and including Example 6. You need not read Examples 7, 8, or 9.

**6.3 Volumes by cylindrical shells.** Read the whole section. It would be very helpful to compare the derivation of the formula for volume in the box on page 394 with the derivation of the formula for volume in the box on page 384. They are both formulas for computing the same thing, but they come out looking quite different from each other.

**6.4 Work.** Read the whole section. In the assignment I gave over this section, problem 12 turned out to be harder than I expected, not because of the calculus involved, but because of the algebra involved. There won't be a problem as long and involved on the exam. Studying the problem certainly won't hurt, but you don't need to worry about it if you don't feel like it.

**7.1 Inverse functions.** You do not need to know any of the material in this section. However, knowing what an "inverse function" is does help to understand the relation between  $e^x$  and  $\ln x$ , and the relation between the trig functions and the inverse trig functions. You might take a look at pages 416 and 417, just to get the flavor of what is involved.

**7.2 Exponential functions and their derivatives.** Read the entire section carefully, except you can skip the subsection titled "Applications of Exponential Functions" on pp. 425-6. The laws of exponents in the box at the top of page 424 should be familiar to you from earlier math classes; make sure you have them memorized. Also memorize the definition of  $e$  that I gave in class, and the proof that I gave in class for the formula  $\frac{d}{dx} e^x = e^x$ . You can also find this definition and this proof in the book, written up somewhat differently from what I gave in class (the proof is partly on page 426 and partly on page 427). It is OK to give either version, or a version in your own words, but whatever version you give has to be complete in detail. It's probably easiest just to use the versions I gave in class.

Note: I strongly recommend looking at problems 71 to 78 on p. 433. I neglected to assign any of these for homework, but they are very relevant to what we have learned in class, and problems similar to them may appear on the exam.

**7.3 Logarithmic functions.** You should read the entire section. This material should be familiar to you from previous classes; if it is not, then try to devote careful study to it.

**7.4 Derivatives of logarithmic functions.** Read the entire section up to, but not including, the subsections on "Logarithmic differentiation" (page 446) and "The number  $e$  as a limit" (page 448). These subsections will be covered on later exams.

Memorize the proof that the derivative of  $\ln x$  is  $1/x$ . This proof is given on page 441, and was also given in class.