

# Math 2300: Calculus II, Fall 2005; Instructor: Dana Ernst

## Review for Midterm Exam 1

Here is a review for your upcoming exam. The exam covers sections 6.7-6.9, 7.2-7.4, and 8.1 of the textbook (note that section 7.5 is not covered on this exam). I will not collect this. Do what you want with it. This review will give you a good indication of what you will be expected to know for the exam.

On the exam, we will provide any new integral formulas that we have learned. You should memorize all of the necessary formulas from the Calculus I curriculum. If you have any questions about what you need to memorize, just ask.

The following is a list of topics that you should know and understand. For each section, I have included some problems that would be helpful to work on as part of your studying.

**6.7** Definition of the natural log as an integral, rules of logs (especially the "power rule" for logs), exponential form compared to log form, derivatives and integrals of exponential functions involving bases other than  $e$ , derivatives of logs involving bases other than  $e$ .

**Problems:** #7, 17 (see also 3.8: #39, 43)

**6.8** Definitions of the inverse trig functions (including the restricted domains necessary to define them), evaluate trig and inverse trig functions, differentiate and integrate functions involving inverse trig functions.

**Problems:** #1, 3, 11, 17, 25, 33, 37, 41, 53

**6.9** Definitions of cosh, sinh, and tanh, fundamental identity:  $\cosh^2 x - \sinh^2 x = 1$ , differentiate and integrate functions involving hyperbolic trig functions and inverse hyperbolic trig functions.

**Problems:** #43, 45

**7.2** Do simple substitutions to make integrals match formulas, some miscellaneous integration techniques.

**Problems:** #33, 49

**7.3** Integration by parts, what to pick for  $u$  and  $dv$ .

**Problems:** #3, 7, 21, 25, 31 (do more if you feel weak in this area)

**7.4** Integration of functions involving trig functions.

**Problems:** #9, 17, 19, 27, 30, 35

**8.1** Formulas for exponential growth and decay, how to solve for  $t$ .

**Problems:** #23, 33

**Other suggestions:** Look over your homework assignments! Also, spend some time quizzing yourself on what technique of integration you would use on different problems. Lastly, don't forget:

**Midterm Exam 1: Wednesday, September 14th, 5:15–6:45 PM in HUMN 1B50**