

## Review with Recommended Study Problems for Test #2

**7.2\*:** Know the definition of the natural logarithm and its basic properties. Know the derivative of  $\ln(x)$ . Be able to graph  $\ln(x)$ . Know the definition of  $e$ . Know the antiderivative of  $1/x$  and  $\tan(x)$ . Be able to use logarithmic differentiation.

**Problems:** 1-41 odd, 45, 47, 49, 53, 55, 59-71 odd, 75-81 odd.

**7.3\*:** Know the definition of the natural exponential function and its basic properties. Be able to convert between exponential and logarithmic equations using the inverse function relationship. Know the derivative and the integral of  $e^x$ . Be able to graph  $e^x$ .

**Problems:** 1-51 odd, 61-71 odd, 75-87 odd, 91.

**7.4\*:** Know the definition of an exponential function with a general base. Know the definition of a logarithmic function with a general base. Know the rules of exponentials and logarithms with general bases, and their derivatives. Know the integrals of general exponential functions. Be able to graph a general exponential or logarithmic function. Know the difference between a power function and an exponential function. Know the change of base formula for logarithms. Know the value of  $e$  as a limit.

**Problems:** 1, 2, 3, 5, 7, 9, 13, 17-51 odd, 55, 57, 59.

**7.5:** Be able to use exponential functions to model various real world situations, including population growth, radioactive decay, Newton's law of cooling, and interest rates and loans.

**Problems:** all odd.

**7.6:** Know the domains and ranges of the trig and inverse trig functions. Be able to sketch them. Be able to use the triangle method to find identities. Know the formulae for the derivatives of the inverse trig functions and the corresponding integral formulae.

**Problems:** 1-13 odd, 17-39 odd, 43, 45, 51, 53, 57-69 odd.

**7.8:** Be able to identify whether a limit is an indeterminate form, and, if so, of which type. Be able to find the values of limits with or without L'Hopital's rule (as appropriate).

**Problems:** 1-21 odd, 25-63 odd, 69, 71, 73, 85, 87, 93.

**8.1:** Be able to identify when integration by parts is the right technique to use, and be able to execute it correctly, repeatedly if necessary. Be able to do problems that combine integration by parts with other techniques, such as substitution.

**KNOW THE TABLE OF INTEGRALS ON PAGE 488 (except row 6)!**

**Problems:** 1-19 odd, 23-37 odd, 53, 57-65 odd.

**8.4:** Be able to do partial fraction decompositions, and long division. Be able to integrate rational functions.

**Problems:** 1-25 odd, 31, 47, 49, 51, 63.

**I highly recommend completing the concept check and true/false quizzes in the Chapters 7-8 reviews. There are also a large number of additional review problems in the review sections. For Chapter 7, do Concept Check 1-3, 5a-g, 6-8, True/False 1-14, 16-18, Exercises 1-36, 38-42, 44, 47, 56-59, 61-66, 68-84, 87-103, 105-115. For Chapter 8, do Concept Check 1 and 4, True/False 1-5, Exercises 1-4, 6, 7, 9, 10, 12, 14, 15, 24, 29, 32, 34, 38, 51.**