

## Review with Recommended Study Problems for Test #1

**5.1:** Know how to find the approximate area under a given curve using Riemann sums. Know how to find the exact area under a given curve using limits. Be able to work with sigma notation. Be able to tell if the right-hand or left-hand rule is too large or too small based on the shape of the given function.

**Problems:** 1, 3, 5, 9-25 odd.

**5.2:** Know the definition of the definite integral. Know what net area is. Know all the terminology and properties of definite integrals. Be able to find the approximate and exact areas of definite integrals, and be able to use the left, right, and midpoint rules. Know the sigma formulae on page 303.

**Problems:** 1-59 odd.

**5.3:** Know both parts of the Fundamental Theorem of Calculus. Be able to find the derivative of a function given as a definite integral. Be able to use the chain rule in conjunction with the first fundamental theorem of calculus. Be able to use the second fundamental theorem of calculus to find the values of definite integrals. Know when you are allowed to use the second fundamental theorem of calculus to integrate.

**Problems:** 1-39 odd, 47, 49, 51, 55, 57

**5.4:** Know what an indefinite integral is. Memorize the table at the top of page 325. Know what net change is and be able to interpret net change for applications.

**Problems:** 1-41 odd, 47-57 odd, 61, 63.

**5.5:** Be able to use u-substitution to correctly perform both indefinite and definite integrals. Be able to tell if a function is even or odd, and use that to help you evaluate related definite integrals.

**Problems:** 1-49 odd, 55, 57

**6.1:** Be able to find the area between two curves, by integrating with respect to either  $x$  or  $y$ . Know which variable to choose. Know when you need to break up the interval to get total area.

**Problems:** 1-33 odd, 39-45 odd.

**6.2:** Be able to use the methods of cross-section, disks and washers to find volumes. Know when to integrate  $dy$  or  $dx$ . Be sure to review the problems that are not volumes of revolution.

**Problems:** 1- 35 odd, 39-61 odd.

**6.3:** Be able to use the method of cylindrical shells to find volumes of revolution. Know when to integrate  $dy$  or  $dx$ . Know when to use shells vs. disks/washers.  
**Problems:** 1-31 odd, 35-45 odd.

**6.5:** Know what the average value of a function is, and how to find it. Know the mean value theorem for integrals.  
**Problems:** 1-17 odd.

**7.1:** Be able to tell if a function is one-to-one, algebraically or graphically. Know the definition of an inverse function and be able to use it. Be able to find the domain and range of a function and its inverse. Be able to find an inverse, either graphically or algebraically. Be able to find the derivative of the inverse.  
**Problems:** 1, 2, 5-43 odd.

**I highly recommend completing the concept check and true/false quizzes in the Chapters 5-7 reviews. There are also a large number of additional review problems in the review sections. For Chapter 5, do Concept Check all, True/False all (we went over these in class), Exercises all. For Chapter 6, do Concept Check 1-4 and 6, Exercises 1-26, 30-31. For Chapter 7, do Concept Check 1, True/False 1-3, Exercises 1-4.**