

Chapter 3

- 3.1** Given a graph, formula, or table of values for the rate of change of some quantity, use Riemann sums (left sums and right sums) to approximate the total change in that quantity. If the graph for this rate of change is always increasing or if it is always decreasing, then you should be able to determine whether your approximation is an underestimate or overestimate to the exact total change. Averaging the left sum and right sum will usually give you a better approximation, but you may lose information about whether or not you have an underestimate or overestimate. Look at #3–9 from section 3.1.
- 3.2** Given a definite integral, be able to approximate its value using Riemann sums. If you have a formula for the integrand, then it is preferable to quickly obtain very good approximations using your calculator's built-in integrator. Look at #1–8, 12–18, 20 from section 3.2.
- 3.3** Set up and evaluate the definite integral (or integrals) needed to compute an area between two curves (one of these curves may just be the x -axis). Given a graph of a function, be able to approximate (or find exactly if you see the area of basic shapes like triangles or rectangles) a definite integral of that function. Remember that the definite integral of a function gives the “signed area” between the graph of that function and the x -axis. Look at #1–3, 7, 9–12, 15–18, 23 from section 3.3.
- 3.4** Given the rate at which some quantity is changing, be able to set up the definite integral which gives you the exact total change in that quantity. If the rate of change was given as a formula, then use the calculator's built-in integrator to evaluate the definite integral. If the rate of change was given as a graph, then use areas to approximate the definite integral. Look at #4, 5, 7, 8, 10, 18 from section 3.4.
- 3.5** The **Fundamental Theorem of Calculus** can be stated in either of the following two ways:

- Total change in a quantity from $t = a$ to $t = b$ equals \int_a^b (rate of change of that quantity) dt
- $\int_a^b F'(t) dt = F(b) - F(a)$

Be able to state and use the Fundamental Theorem in each of these ways. Look at #1–3, 5, 6, 10 from section 3.5.

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Chapter 6 (sections 5–6)

- 6.5** Be able to find antiderivatives and indefinite integrals without the use of a calculator. You should be able to find an antiderivative whose graph goes through a specific point. It will help to memorize the boxed-off formulas given on pages 318–320. You don't need to know those involving $\sin x$ or $\cos x$. Look at #1–46 from section 6.5, except those problems involving $\sin x$ or $\cos x$.
- 6.6** Be able to evaluate definite integrals exactly without using a calculator. Look at #1–12 from section 6.6.

Notes

- You should bring your own calculator and be able to use its graphing, table, and other built-in features effectively. In particular, you should be able to use it to evaluate definite integrals.
- The test will be in class on Monday, July 1, 2002.

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