

Test 1 Review

Dr. Adam Graham-Squire, Spring 2013

- The test will cover sections 5.1 through 5.6.

- To study, you should look over your notes, rework HW problems, quizzes, and problems from the notes, as well as work out the practice problems given for each section. The Review Questions at the end of Chapter 5 are good practice (in particular: T/F on page 424- numbers 1, 3, 5-8, 11; Exercises on page 425- numbers 1-5, 7-21), as are the Minitest 1s on my website. Note that Minitest 1 from Spring 2012 does not include any questions involving integration by parts, but our Minitest 1 will have questions involving integration by parts.

- Calculators/Maple are allowed for certain questions on this test, but for some questions you will not be allowed to use a calculator. So, in particular, you need to be able to calculate integrals and derivatives by hand.

- Some practice problems to work on are below. Note that these problems are just guides to the type/difficulty level of the questions that could be on the test. You should NOT assume that these exact questions will be on the test.

1. Suppose a particle on a line has velocity $v(t) = t(2 - t)$, for t -values between 0 and 4.
(a) Explain in words the difference between the *displacement* of the particle and the *total distance traveled* from $t = 0$ to $t = 4$. (b) Now calculate each of them using integrals.

2. (a) Using midpoints as your evaluation points, find an approximation for $\int_3^5 (2x - 7)dx$ using 4 rectangles.

(b) Use the Fundamental Theorem of Calculus to evaluate $\int_3^5 (2x - 7)dx$. How close is your answer to 2(a)? Explain.

3. Evaluate the indefinite integral $\int [x(x+2)^2 + \sec^2 x] dx$.

4. Find $h'(x)$ if $h(x) = \int_0^{e^{2x}} \sin^3 t \, dt$.

5. Evaluate the integrals.

(a) $\int_0^{\pi^2} \frac{\sin \sqrt{x}}{\sqrt{x}} \, dx$

(b) $\int x^2 \sqrt[3]{1-x} \, dx$

(c) $\int x \ln x \, dx$