Minitest 4 Review

Dr. Graham-Squire, Spring 2013

•The test will cover sections 4.8, 5.1, 5.2, and 5.3.

•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 is Minitest 1 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 are allowed on this test, but for certain questions you will not be allowed to use a calculator.

•Some practice problems to work on in class today:

1. Find the most general antiderivative of $f'(x) = x(x+2)^2 + \sec^2 x$.
2. 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.
3. (a) Using midpoints as your evaluation points, find an approximation for $\int_3^5 (2x-7)dx$ using 4 rectangles.

   (b) Use formula(s) from geometry to calculate the exact value of $\int_3^5 (2x-7)dx$.

   (c) Use the Fundamental Theorem of Calculus (the Evaluation Theorem) to evaluate $\int_3^5 (2x-7)dx$. How close is your answer to 2(a)? Explain.
4. Calculate the definite integrals:

   (a) $\int_1^e \left(\frac{x^3 - x}{x^4}\right) dx$

   (b) $\int_0^1 \left(\frac{1}{1+x^2}\right) dx$