Minitest 4 Review

Dr. Graham-Squire, Spring 2014

•The test will cover sections 5.1-5.5.

•To study, you should look over your notes and video lectures, 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 4 from 2013 on my website. From 2011, none of the material matches.

•You can also look at Minitest 1 from my Calculus 2 classes (click on the link on the sidebar from the Calc 1 page). All of the questions from 2013 are fair game except for number 6 (and number 5 is probably more advanced than I would put on your test, though is technically something you have been taught), and all of them are fair game for the 2012 test. I cannot find the answer key for the 2012 test, but am happy to go over the problems with you if you get stuck on them.

•Calculators <u>are</u> allowed on this test, but for certain questions you will <u>not</u> be allowed to use a calculator.

•Some practice problems to work on in class today:

1. Calculate $\int (x(x+2)^2 + \sec^2 x)\, dx$.

2. (a) Using <u>midpoints</u> 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.

3. Calculate the integrals:

   (a) $\int \left(\dfrac{x^3 - x}{x^4}\right) dx$

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

   (c) $\int_0^{\pi^2} \dfrac{\sin\sqrt{x}}{\sqrt{x}}\, dx$

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

5. 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.