Math 140 - Test #3 Study Guide

Fall 2016, Prof. Beydler

Test #3

- Date: Wednesday, November 30, 2016
- Will cover sections 5.1-5.5, 6.1-6.3.
- You'll have the entire class to finish the test.
- No notes or books during the test. For this test, you'll need a **scientific calculator**.
- Please visit my office hours if you need help. If you don't understand something, don't be embarrassed to stop by—I'm very patient. If you can't make it to my office hours, then feel free to e-mail me with any questions: dbeydler@mtsac.edu Also, don't forget to visit the TMARC and get extra credit for doing so! (see syllabus for details)

<u>Some</u> of the stuff on the test:

- Find indefinite integrals (remember "+C") and definite integrals (use $F(b) - F(a)$). You'll be given an integral and will have to determine yourself which method is appropriate/best. Aside from the common integrals rules (see 5.1 Notes, page 1), you'll need to know how to use integration by substitution (5.2) and integration by parts (6.1).
- Given slope of tangent line, find the function that passes through a given point. (5.1)
- There will be one problem where you have to solve a differential equation, and one where you have to solve an initial value problem. (5.1, 5.2)
- Use the properties given on page 2 of the 5.3 Notes. (5.3)
- Find the area between curves. (5.4)
- Find the average value of a function over an interval—see given formula below. (5.4)
- There will be a consumer/producer surplus type of problem—guaranteed. (5.5)
- Know how to use the trapezoidal rule and Simpson's rule for approximating integrals—see given formulas below. (6.2)
- Evaluate improper integrals, or show that they diverge. (6.3)

Formulas given on test:

- Average value of f over $a \leq x \leq b$: $V = \frac{1}{b-a}\int_a^b f(x)\, dx$
- Trapezoidal rule: $\int_a^b f(x)\, dx \approx \frac{\Delta x}{2}[f(x_1) + 2f(x_2) + \cdots + 2f(x_n) + f(x_{n+1})$
- Simpson's rule: $\int_a^b f(x)\, dx \approx \frac{\Delta x}{3}[f(x_1) + 4f(x_2) + 2f(x_3) + 4f(x_4) + \cdots + 2f(x_{n-1}) + 4f(x_n) + f(x_{n+1})]$

Extra Credit!

- If you write up the answers to all of the review exercises listed below, and hand them in at the test, you can earn up to 3% extra credit towards your test (depending on neatness and completeness)!

These review exercises don't cover everything. Also, some of the exercises are tough, but hey, you've got to work for your extra credit! ☺

- Review exercises:
    - Chapter 5: p.469 #1-45 odd, 59-63 odd, 80abc, 81 (Note: for #27 $r^2 - 1$ should be $t^2 - 1$, answer to #80: a) 3 units, b) $127.50, c) $31.50)
    - Chapter 6: p.532 #1-7 odd, 17-25 odd, 29, 51