Exam 2 Study Guide

General Info

- Exam 2 will cover §§4.6, 4.8-5.7
- Expect questions similar to those in §4.6 and others using the methods of §4.8
- At least one question will involve an application of the Fundamental Theorem of Calculus.
- There will be questions involving the Definite Integral as a(n) area/net change
- There will be at least one integral for each of the sections 5.3, 5.5, 5.6 and 5.7

Sample Questions

1. A cylindrical can is to be made to hold 1000 cm$^3$ of liquid. Find the dimensions that will minimize the surface area of the can.

2. A rectangular storage container with an open top is to have a volume of 10 m$^3$. The length of its base is twice its width. Material for the base costs $10 per square meter. Material for the sides costs $6 per square meter. Find the cost of materials for the cheapest such container.

3. Find the dimensions of the rectangle of largest area that can be inscribed in an equilateral triangle with sides of length 3 cm if one side of the rectangle lies on the base of the triangle.

4. State the iterative formula for Newton’s Approximation to the solution of $f(x) = 0$.

5. Use Newton’s Method to approximate $\sqrt{3}$ to 5 digits of accuracy. (You will need a non-trivial function $f$ such that $f(\sqrt{3}) = 0$.)

6. Use Newton’s Method to approximate the location of the maximum value of the function $f(t) = \cos t + t - t^2$ correct to eight decimal places.

7. §5.2 problem 5

8. Chapter 5 Review Problems 8, 9, 13, 15, 17, 22, 24, 28, 32, 39, 41, 63, 69, 70