06/04/2009 **STUDY SHEET for FINAL EXAM (Friday, May 5)**

The test will cover:
- Ch. 1: Sections: 1.1, 1.2, 1.3, 1.5, 1.6
- Ch. 2: Sections: 2.1, 2.2, 2.3, 2.4, 2.5, 2.6, 2.7, 2.8
- Ch. 3: Sections: 3.1, 3.2, 3.3, 3.4, 3.5, 3.6, 3.7, 3.8, 3.9, 3.10
- Ch. 4: Sections: 4.1, 4.2, 4.3, 4.5, 4.7, 4.9
- Ch. 5: Sections: 5.1, 5.2, 5.3, 5.4, 5.5

Please look at Reviews for Test 1, Test 2, and Test 3.

Here is what you have to have an idea about after Test 3:

1. Indeterminate forms of type $\frac{0}{0}, \frac{\infty}{\infty}$ and L' Hospital's Rule. Indeterminate forms of type $0\cdot\infty$, $\infty-\infty$, 0^{∞},0^{0}, and 1^{∞}. (4.4)
2. Optimization problems. Steps in solving optimization problems. (4.7)
3. First Derivative Test for Absolute Extreme Values. (4.7)
4. Antiderivatives. (4.9)
5. The area problem, the distance problem. (5.1)
6. The definite integral. Riemann sum. Integrable functions. Properties of the definite integral. (5.2)
7. The fundamental theorem of calculus: part I and part II. (5.3)
8. Indefinite integrals. The net change problem. (5.4)
9. The substitution rule for indefinite integrals. The substitution rule for definite integrals. (5.5)

Below is the list of typical problems in the most general from which you can expect on the test:

1. Evaluate the limit by using l'Hospital's rule. (See problems 7-14 on page 348)
2. Find two positive integers such that the sum of the first number and four times the second number is 1000 and the product of the numbers is as large as possible.
3. Find the point on the hyperbola $xy = 8$ that is closest to the point (3, 0).
4. Problem 59 on page 349.
5. Find antiderivative. (See problems 65-72 on page 350)
6. A particle is moving with velocity $v(t) = 2t - \frac{1}{1+t^2}$. Find the position of the particle if $s(0) = 1$.
7. Evaluate the Riemann sum for $f(x) = x^2 - x$, $0 \le x \le 2$ with four subintervals, taking the sample points to be the right end points.
8. Evaluate $\int_{-1}^{3}(3-2x)dx$ by interpreting it in terms of areas.
9. Write $\int_{1}^{5}(x+2x^5)dx$ as a limit of Riemann sum, taking the sample points to be right endpoints.
10. Problems on pages 410-411: 5, 7, 9-38, 43, 49, 57