Math 125 - Spring 2006
Exam 2
May 18, 2006

Name: _____

Section: _____

Student ID Number: _____

TA's Name: _____

1	10	
2	10	
3	10	
4	6	
5	6	
6	8	
Total	50	

- Check that your exam contains all the problems listed above.

- You are allowed to use a basic scientific calculator (NO graphing calculators)

- You may use one **hand-written** 8.5 by 11 inch page of notes. Put your name on your sheet of notes and turn it in with the exam.

- You must show your work on all problems. The correct answer with no supporting work, or unclear supporting work, may result in no credit. As announced in class, you are allowed to quote any integral from page 506 of your text (these are simply all the basic integrals that we evaluate in one step during class). For all other integrals you must use an appropriate integration technique and show your work.

- Box in your final answer.

- Any student found engaging in academic misconduct will receive a score of 0 on this exam.

- You have 80 minutes to complete the exam.

GOOD LUCK!

1. Evaluate each of the following integrals.

    (a) (5 points) $\displaystyle\int \frac{x^3 + 1}{x^2 - 5x}\, dx$

    (b) (5 points) $\displaystyle\int \tan^4(3x) \sec^4(3x)\, dx$

2. Evaluate each of the following integrals.

   (a) (5 points) $\displaystyle\int \frac{1}{(x^2 + 25)^{3/2}}\, dx$

   (b) (5 points) $\displaystyle\int_0^\infty xe^{-5x}\, dx$

3. Evaluate each of the following integrals.

(a) (5 points) $\displaystyle\int \frac{\cos^3(\ln(x))}{x}\,dx$

(b) (5 points) $\displaystyle\int \frac{x}{\sqrt{40 - 6x - x^2}}\,dx$

4. (6 points) Use Simpson's Rule with $n = 4$ subintervals to approximate the integral $\int_1^9 \frac{\sin(x)}{x}\, dx$. Write out the correct sum and evaluate all the terms correctly, but you do not have to simplify your answer any further.

5. (6 points) Find the average value of $f(x) = \ln(x)$ from $x = 1$ to $x = e$.

6. (8 points) A bag of sand is lifted from the ground to the top of a 30 foot high building at a constant speed with a cable that weighs 2 lb/ft. A small tear in the bag causes sand to slowly pour out. Initially the bag contains 100 pounds of sand, but the sand leaks out at a constant rate and the bag weighs 90 pounds just as it reaches the 30 foot height. How much work is done?

(Hint: Find a linear equation for the force (weight) of the bag of sand at a given height.)