

Math 125 - Spring 2007  
Exam 1  
May 17, 2007

Name: \_\_\_\_\_

Section: \_\_\_\_\_

Student ID Number: \_\_\_\_\_

1	10	
2	10	
3	10	
4	6	
5	7	
6	7	
Total	50	

- You are allowed to use a scientific calculator (**no graphing calculators**) and one **hand-written** 8.5 by 11 inch page of notes.
- You must show your work on all problems. The correct answer with no supporting work may result in no credit.
- There are multiple versions of the exam. Any student found engaging in academic misconduct will receive a score of 0 on this exam. In addition, students found engaging in academic misconduct are typically put on academic probation. So **DONT CHEAT!** It could serious hurt your career.
- Write down everything you know about each problem and don't erase any work. You should try to give us as much information as possible so that we can give appropriate partial credit if needed. **Clearly put a box around your final answer.**

GOOD LUCK!

1. (10 points) Compute the following integrals.

(a)  $\int_1^e x \ln(x) dx.$

(b)  $\int \sin^2(x) \cos^3(x) dx$

2. (10 points) Compute the following integrals.

(a)  $\int \frac{e^x}{(e^x)^2 - 4} dx$

(b)  $\int \frac{1}{(4 - x^2)^{\frac{3}{2}}} dx.$

3. (10 points) Compute the following integrals.

(a)  $\int \frac{x+2}{x(x+1)^2} dx.$

(b)  $\int \frac{1}{\sqrt{x^2+8x+7}} dx.$

4. (6 points) Use Simpson's rule with  $n = 4$  subdivisions to approximate the definite integral

$$\int_2^4 \frac{x}{\ln(x)} dx.$$

5. (7 points) Determine whether the following integral is convergent or divergent. If it is convergent, evaluate it.

$$\int_1^{\infty} x e^{-2x} dx.$$

6. (7 points) A cable that weighs 4 pounds per foot is used to lift 400 pounds of coal up a mineshaft. If the mineshaft is 300 feet deep, how much work is required to lift the coal halfway to the top?