

Math 026L.01 Spring 2000  
Assignment #4

This assignment is due at the beginning of class on Wednesday, March 8, 2000. You must work through all problems on your own. You may consult any reference materials, and seek help in the Help Room, but do not discuss these problems with anyone else in the class. Show all work neatly and in order, and clearly indicate your final answers. Answers must be justified whenever possible in order to earn full credit.

1. (6 points) Evaluate the following integrals.

a. (3 pts)  $\int x^2 e^x dx$

b. (3 pts)  $\int x e^{x^2} dx$

2. (2 points) *Calculus* Page 173 #1

3. (3 points) *Calculus* Page 332 #40

4. (3 points) *Calculus* Page 338 #52

(Note that the total energy is the integral of rate. That is,  $E = \int r(t) dt$ .)

5. (3 points) Consider the function  $f(x) = \frac{6}{x^2}$  on  $[1, c]$ . Find the value of  $c$  so that the average value of  $f(x)$  on  $[1, c]$  is equal to 1.

6. (3 points) Suppose that  $f(x) = \sqrt{x}$  and  $g(x) = x^2$ . Find the area *between*  $f(x)$  and  $g(x)$  from  $x = 0$  to  $x = 1$ .

(Hint: Draw a picture and figure out where  $f(x)$  and  $g(x)$  intersect.)