Math 026L.01 Spring 2000
Assignment #6

This assignment is due Friday, April 21, 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. Answers must be justified whenever possible in order to earn full credit.

1. Consider the function $f(x) = ce^{-3x}$ defined for $0 < x < \infty$.

a. Find the value of c so that $f(x)$ is a density function.

b. Sketch the graph of $f(x)$.

c. Compute the distribution function $F(x)$ for f.

d. Sketch the graph $F(x)$.

e. For what value of a does $\int_0^a f(x)\,dx = \frac{1}{2}$. *($a$ is called the median of f.)*

f. Compute $\int_0^\infty xf(x)\,dx$. *(This value is called the mean of f.)*

2. Calculus Page 422 #4

3. Calculus Page 422 #6

4. (Do Not Hand In) Calculus Page 422 #7, #8

5. Calculus Page 422 #9 (Just use techniques from Math 25L for finding critical points and inflection points.)

6. Suppose that two standard six-sided dice are tossed and that the outcome of the toss is recorded as (a, b) where a is the upmost face on the first die and b is the upmost face on the second die.

a. What are all the possible outcomes (a, b)? (Answer this question by listing all the possibilities. *Hint: There are 36 possibilities.*)

b. Do you think that any one outcome is more likely to occur than the others? Why or why not?

Suppose that we are now interested in the **sum** of the two upmost faces.

c. What are all the different possible values for this sum?

d. Is the sum affected by the order in which the dice are observed? Why or why not?

e. What is the chance of obtaining each of the outcomes you listed in **c.**? (Write your answer in a table with the chances expressed as fractions.)

f. Suppose that I offer to play the following game with you: I give you \$3 to toss one die and you give me \$$X$ where X is the value of the upmost face on your roll. Would you like to play this game with me? Why or why not?