Math 110
Exam 3
March 13, 2007

Name: _____

1. Your exam contains 7 questions and 4 pages; Please make sure you have a complete exam.
2. The entire exam is worth 50 points. Point values for problems vary and these are clearly indicated. You have 50 minutes for this exam.
3. Make sure to ALWAYS SHOW YOUR WORK; you will not receive any partial credit unless all work is clearly shown. If in doubt, ask for clarification.
4. If you need extra space, use the back of the page and clearly indicate this.
5. You are allowed one 8.5×11 sheet of handwritten notes (both sides). Graphing and scientific calculators are allowed.

Problem	Total Points	Score
1	6	
2	10	
3	6	
4	4	
5	8	
6	8	
7	8	
Total	50	

1. (6 points) You invest \$1,000 at an interest rate of 6% per year. How much money will you have in 8 years if interest is compounded

(a) quarterly?

(b) continuously?

2. (10 points) Evaluate the following expressions without a calculator:

(a) $\log_5 5$

(b) $\log_3 \frac{1}{3}$

(c) $\log_a a^{x+4}$

(d) $\log_9 1$

(e) $\log_2 \sqrt{2}$

3. (6 points) Combine the expression: $\log_3(x+1) + 5\log_3 y - 2\log_3 5$

4. (4 points) Give a decimal approximation for $\log_5 22$. Use four decimal places.

5. (8 points) Solve the following equations:

(a) $5e^{x+2} = 40$

(b) $2 - \log(x-5) = 0$

6. (8 points) A bacteria culture initially has 250 bacteria, and the population is growing at a rate of 30% per hour.

(a) What is the population after 3 hours?

(b) At what time will the population have tripled?

7. (8 points) A radioactive element decays from 400 mg to 280 mg in 3 days.

(a) Find a function that models the mass remaining in t days.

(b) What is the half-life of the element?