

**Math 110**  
**Exam 3**  
**Fall 2007**

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

1. Your exam contains 7 questions and 5 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  $8.5 \times 11$  sheet of handwritten notes (both sides). Graphing and scientific calculators are allowed.

Problem	Total Points	Score
1	5	
2	6	
3	15	
4	4	
5	10	
6	5	
7	5	
Total	50	

1. (5 points) You invest \$250 in a bank account which earns 6% interest, compounded monthly. How much money is in the account in 7 years?

2. (3 points each)

(a) Express the equation in exponential form:  $\log_3(x + 2) = 12$

(b) Express the equation in logarithmic form:  $2^{3y} = 10$ .

3. (3 points each) Evaluate:

(a)  $\log_6 36$

(b)  $\log_5 5^{2w}$

(c)  $\log_3 1$

(d)  $\log_{49} 7$

(e)  $\log_3 \frac{1}{9}$

4. (4 points) What is the domain of  $\log_2(10 + 2x)$ ?

5. (5 points each)

(a) Expand the expression:  $\log_3 \frac{x^2 y}{z^5}$

(b) Combine the expression:  $\log 5 + 5 \log m - 2 \log n$

6. (5 points) Solve the equation:  $\log_6 x + \log_6(x - 5) = 1$

7. Suppose the mass in mg of a sample of a radioactive element decays according to the formula  $n(t) = 300e^{-0.0084t}$ , where  $t$  is in days.

(a) (2 points) What is the initial mass of the sample?

(b) (3 points) What is the element's half-life?