

**Math 111**  
**Exam 2**  
**November 9th, 2007**

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

1. Your exam contains 5 questions and 5 pages; Please make sure you have a complete exam.
2. The entire exam is worth 100 points. Point values vary and these are indicated on each problem. You have 50 minutes for this exam.
3. Make sure to ALWAYS SHOW YOUR WORK; you will not receive full credit unless all work is clearly shown. If in doubt, ask for clarification.
4. If you need extra space, use the back of the exam 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.
6. Leave answers in exact form (as simplified as possible) or round to 4 decimal places.

Problem	Total Points	Score
1	20	
2	8	
3	25	
4	20	
5	12	
Take Home	15	
Total	100	

1. (20 pts.) Suppose you have an account that gives interest at 9% compounded quarterly.
- (a) (12 pts.) How much would you need to invest in the account today to have \$3000 in the account 8 years from now?

(b) (8 pts.) What is the effective rate of the account?

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2. (8 pts.) If I borrow \$15000 at 6% simple interest for 18 months, how much would I owe at the end of the loan?

3. (25 pts.) A population of flying monkeys is given by  $P(t) = 5e^{0.5t}$  in **thousands** at year  $t$ .

(a) (7 pts.) What is the population after 3 years? (Approximate to the nearest monkey.)

(b) (12 pts.) When is the population equal to 20,000 flying monkeys?

(c) (6 pts.) What is the percentage change in the population each year? Is the population increasing or decreasing?

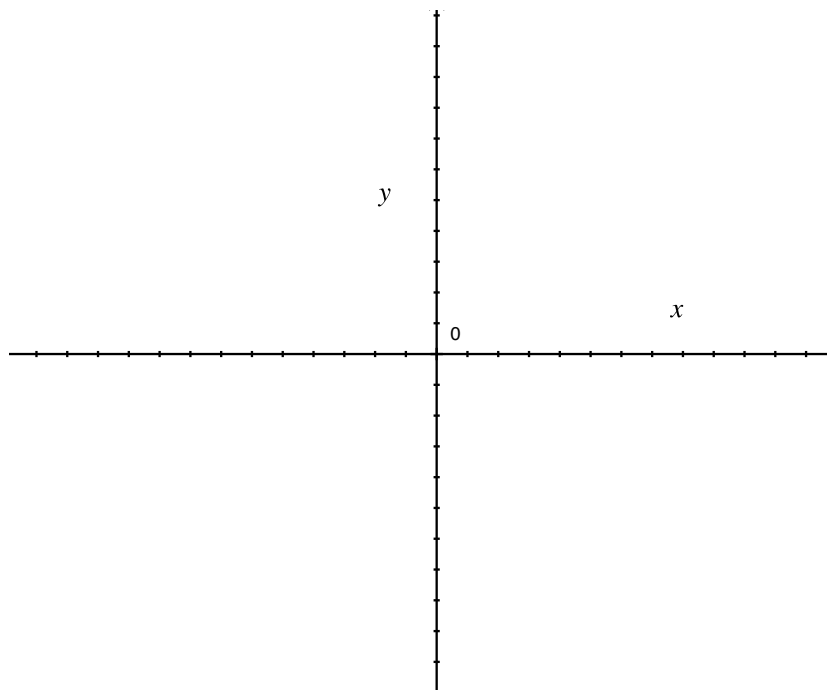
4. (20 pts.) Solve the following equations. (Note: Remember that you can check your answers.)

(a) (12 pts.)  $16(0.2)^{-x} = 20^x$

(b) (8 pts.)  $\log(4x + 8) = 2$

5. (12 pts.)

(a) (8 pts.) Sketch a graph of  $h(x) = 2^x$  on the axis below. Plot and label at least 3 points.



(b) (4 pts.) What is the equation of the asymptote of  $h(x) = 2^x$ ?