

**Math 111**  
**Exam 2**  
**May 20th, 2011**

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

1. Your exam contains 7 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 any partial credit unless all work is clearly shown. If in doubt, ask for clarification.
4. Simplify your answers as much as possible.
5. Put a box around your final answer where applicable.
6. You are allowed one 3"×5" notecard (both sides). You must turn in your notecard along with your exam.
7. You may use a calculator, but I will not give credit for work done solely by a calculator (aside from arithmetic).
8. If you need extra space, attach a sheet to the back of the exam and clearly indicate this.
9. Be sure to **check your answers!**

Problem	Total Points	Score
1	20	
2	7	
3	20	
4	20	
5	9	
6	9	
7	15	
Total	100	

1. (20 pts.) The population of flying monkeys is given by  $P(t) = 8e^{0.4t}$  in **thousands** of monkeys for a given year  $t$ .

(a) (5 pts.) What is the population after 3 years? Round your answer to the nearest whole monkey.

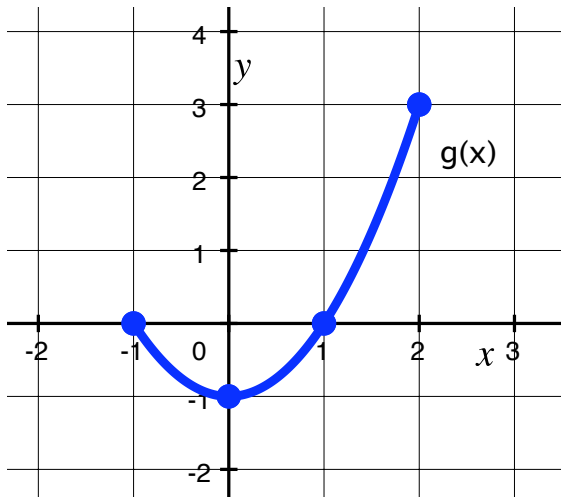
(b) (9 pts.) When will there be 40,000 monkeys?

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

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2. (7 pts.) For the function  $F(x) = 3\ln(x + 2)$ , give the domain and the **equation** of the vertical asymptote. (You do not need to show work for this problem.)

3. (20 pts.) The function  $g(x)$  is shown below. Use the graph of  $g(x)$  for parts (a)-(c) below.

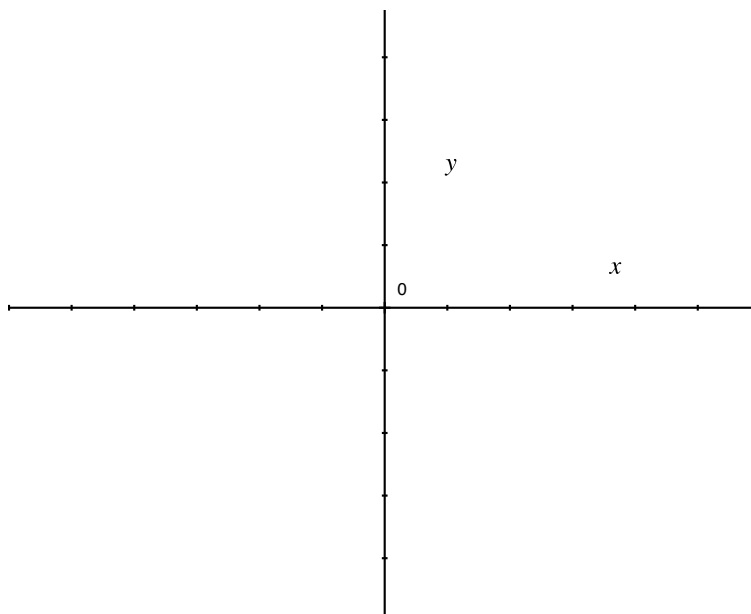


(a) (4 pts.) Give the domain and range of  $g(x)$ .

Domain: \_\_\_\_\_

Range: \_\_\_\_\_

(a) (11 pts.) Write down the transformations of  $g(x)$  to get the new function  $g(-\frac{1}{2}x) - 1$ . Then, sketch the graph of  $g(-\frac{1}{2}x) - 1$ . Put a scale on your axes.



(b) (5 pts.) Give the range of  $3g(x + 5)$ .

4. (20 pts.) Solve the following equations. Give **exact** answers.

(a) (8 pts.)  $\log_x 1331 = 3$

(b) (12 pts.)  $2^x = 0.25(3)^x$

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5. (9 pts.) A ball is kicked into the air at time 0. The height (in feet) of the ball is given by

$$h(t) = -16t^2 + 48t \quad \text{where } t = \text{seconds after it is kicked.}$$

What is the maximum height of the ball and when does it occur? (Include units in your answers.)

6. (9 pts.) Find an equation of the parabola with a vertex of  $(2, -5)$  and a  $y$ -intercept of  $(0, 1)$ .

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7. (15 pts.) The line  $y = 2x + 5$  and the **exponential** function  $f(x)$  are shown below. Find the formula for  $f(x)$  given the information in the graph.

