

Math 99
Exam 4
December 14, 2006

Name: _____

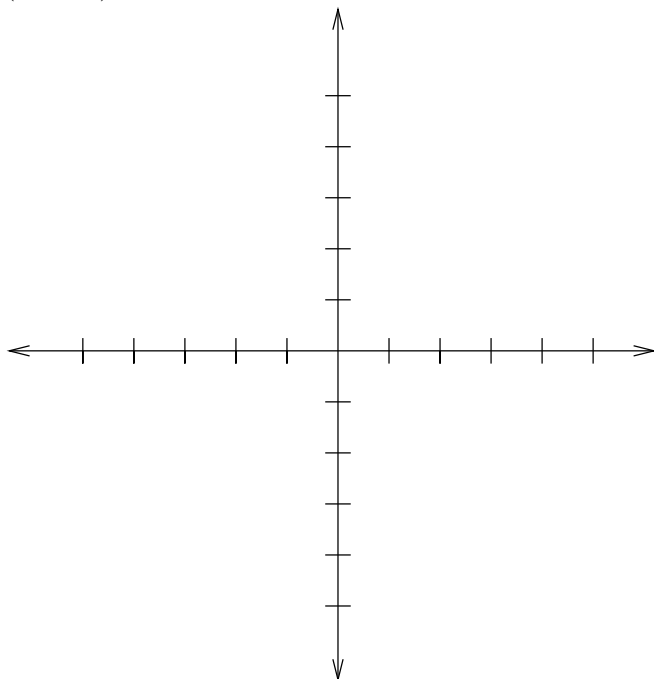
1. Your exam contains 6 questions and 6 pages; Please make sure you have a complete exam.
2. The entire exam is worth 100 points. Point values for problems vary and these are clearly indicated. You have 2 hours for this exam.
3. Make sure to ALWAYS SHOW YOUR WORK; you will not receive any partial credit unless all work is clearly shown. If in doubt, ask for clarification.
4. If you need extra space, use an extra attached sheet and clearly indicate this.
5. You are allowed one 8.5×11 sheet of handwritten notes (both sides). Graphing and scientific calculators are allowed.
6. Leave answers in exact form (as simplified as possible).

Problem	Total Points	Score
1	15	
2	10	
3	25	
4	20	
5	15	
6	15	
Total	100	

1. (15 pts.) $f(x) = 3x^2 - 12x + 8$

(a) (5 pts.) The graph of f is a parabola. What is the vertex of the parabola?

(b) (10 pts.) Draw the graph of f on the axis below. Include 2 points other than the vertex.



2. (10 pts.) Solve for the indicated variables. Simplify your answer as much as possible and leave \pm in your answers.

(a) (5 pts.) Solve $F = \frac{kA}{v^2}$ for the variable v .

(b) (5 pts.) Solve $p = \sqrt{\frac{kL}{g}}$ for the variable g .

3. (25 pts.) You launch a toy rocket upward so that its distance (in feet) above the ground t seconds after firing is given by $h(t) = -16t^2 + 128t$.

(a) (10 pts.) Find the maximum height the toy rocket reaches and the number of seconds it takes to reach that height.

(b) (5 pts.) When does the rocket land?

(c) (10 pts.) When is the rocket 112 feet above the ground? Find all times.

4. (20 pts.) Fill in the following table by writing the exponential or logarithmic form for the corresponding equation.

	Exponential Form	Logarithmic Form
a	$3^2 = 9$	
b	$4^{-4} = \frac{1}{256}$	
c		$\log_6 216 = 3$
d		$\log_{12} \frac{1}{1728} = -3$

5. (15 pts.) Solve the following equations for the variable x . Simplify your answers as much as possible.

(a) (5 pts.) $3^x = \frac{1}{27}$

(b) (5 pts.) $16^{6x-2} = 64^{2x}$

(c) (5 pts.) $4^{2x+1} = 8^{x+3}$

6. (15 pts.) You decide to buy a llama farm and monitor the growth of the population of llamas. Initially, there are 72 llamas and you project that the population of llamas can be described by the following exponential function: $L(t) = 72(2)^t$ where t is the number of years after you buy the farm.

(a) (8 pts.) According to your function, how many llamas do you expect to have on your farm 10 years after the purchase date?

(b) (7 pts.) When do you expect to have 2304 llamas?