

Math 99
Exam 4
December 12, 2006

Name: _____

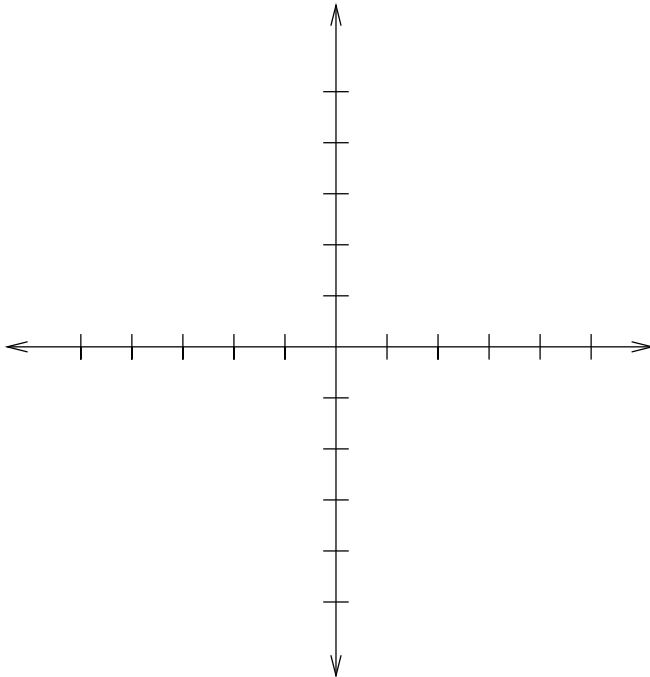
1. Your exam contains 6 questions and 6 pages; Please make sure you have a complete exam.
2. The entire exam is worth 100 points. Point values for problems vary and these are clearly indicated. You have 2 hours for this exam.
3. Make sure to ALWAYS SHOW YOUR WORK; you will not receive any partial credit unless all work is clearly shown. If in doubt, ask for clarification.
4. If you need extra space, use the back page of the exam 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	20	
3	20	
4	20	
5	10	
6	15	
Total	100	

1. (15 pts.) $f(x) = 2x^2 + 8x + 5$

(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. (20 pts.) Evaluate the following.

(a) (5 pts.) $\log_5 125 = ?$

(b) (5 pts.) $\log_{11} 11 = ?$

(c) (5 pts.) $\log_4 1 = ?$

(d) (5 pts.) $\ln 100 - \log 100 = ?$ (Give an approximation to four decimal places.)

3. (20 pts.) Fill in the following table by writing the exponential or logarithmic form for the corresponding equation.

	Exponential Form	Logarithmic Form
a	$2^4 = 16$	
b	$3^{-5} = \frac{1}{243}$	
c		$\log_7 343 = 3$
d		$\log \frac{1}{100} = -2$

4. (20 pts.) Solve the following equations for the variable x .

(a) (5 pts.) $4^x = \frac{1}{16}$

(b) (5 pts.) $9^{6x} = 27^{x+1}$

(c) (5 pts.) $\log_8 x = 2$

(d) (5 pts.) $\log_x 216 = 3$

5. (10 pts.) You fire a cannonball upward so that its distance (in feet) above the ground t seconds after firing is given by $h(t) = -16t^2 + 144t$. Find the maximum height it reaches and the number of seconds it takes to reach that height.

6. (15 pts.) A survey of the squirrel population on the Shoreline campus is conducted and it is found that 1200 squirrels are present on campus this quarter.* It is projected that the population of squirrels on campus can be described by the following exponential function: $s(t) = 1200(3)^t$ where t is the number of years after the survey is conducted.

(a) (8 pts.) How many squirrels can we expect to have on campus 8 years after the survey?

(b) (7 pts.) When can we expect to have 97200 squirrels on campus?

*Note: This survey and population estimate is completely fictional and no squirrels were harmed in this fictional survey.