Math 99
Exam 3
June 1st, 2007

Name: _____

1. Your exam contains 6 questions and 5 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 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 an extra sheet attached to the back of the exam and clearly indicate this.
5. You are allowed one 8.5×11 sheet of handwritten notes (both sides).
6. Leave answers in exact form (as simplified as possible) or round to 4 decimal places.

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

1. (10 pts.) Carry out the following operations and simplify as much as possible.

   (a) (5 pts.) $(5 - 3i) - (2 + i)$

   (b) (5 pts.) $(5 - 3i) \cdot (2 + i)$

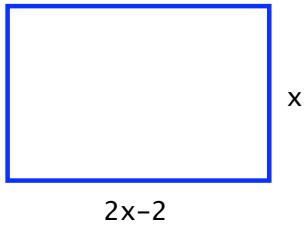
2. (25 pts.) You launch a toy rocket with an initial velocity of 120 feet/second. The height of the rocket is given by $h = -16t^2 + 120t$ in feet at t seconds.

   (a) (10 pts.) When does the rocket land?

   (b) (5 pts.) How high is the rocket after 3 seconds?

(c) (10 pts.) Find all the times at which the rocket is 144 feet high.

3. (15 pts.) The following rectangle has an area of 84 square units. What are the dimensions of the rectangle given the lengths in the diagram below?



4. (15 pts.)

   (a) (5 pts.) Use the discriminant to determine the number and type (rational, irrational, or imaginary) of solutions of the equation $x^2 - 6x + 13 = 0$.

   (b) (10 pts.) Use the quadratic formula to solve the equation $x^2 - 6x + 13 = 0$.

5. (20 pts.) Solve the following equations. Simplify your answer as much as possible.

   (a) (10 pts.) $(3m + 6)^2 + 4 = 1$

(b) (10 pts.) $4x^2 + 22x = 12$ (Solve by completing the square.)

6. (15 pts.) Graph the parabola $f(x) = -(x-2)^2 + 3$ on the axis below. Plot at least 2 points in addition to the vertex. State the vertex, domain, and range.