Math 120 D and E - Autumn 2005
Exam 1
October 20, 2005

Name: ───────────────────────────

Section: ─────────────────────────

Student ID Number: ──────────────

TA's Name: ───────────────────────

1	10	
2	10	
3	10	
4	10	
5	10	
Total	50	

- You are allowed to use a calculator and one **hand-written** 8.5 by 11 inch page of notes.

- Check that your exam contains all the problems listed above.

- You must show your work on all problems. The correct answer with no supporting work may result in no credit.

- Write your answers in the specified locations. Unless otherwise indicated, you may round your **final answer** to two digits after the decimal.

- If you need more room, use the backs of the pages and indicate to the reader that you have done so. If you still need more paper, please ask for some.

- Raise your hand if you have a question.

- Put your name on your sheet of notes and turn it in with the exam.

- Any student found engaging in academic misconduct will receive a score of 0 on this exam.

- You have 50 minutes to complete the exam.

GOOD LUCK!

1. (10 points) An airplane is flying east at 150 mph. An airport is located 70 miles east and 50 south of the plane's current location. The airport has radar for detecting any plane within 60 miles. How long, in minutes, will the airplane be within the radar region?

2. (10 points) Brad is standing 50 ft north of Matt. Matt runs toward a location 60 ft east and 30 ft north of his current position.

(a) At what location will Matt be closest Brad?

(b) Matt and Brad both run directly at the location from part (a). If Matt will get there in 3 seconds, how fast, in ft/sec, does Brad have to run so that they both arrive at the same time?

3. (10 points) Let $f(x) = |x| + 7$ and $g(x) = 3x + 6$.

   (a) Write the multipart rule for $f(g(x))$.

   (b) Find all solutions to the equation

   $$f(g(x)) = 13.$$

4. (10 points) Suppose you are in charge of ticket sales at a football stadium. You found if you charge $10 dollars a ticket, you sell 1000 tickets and if you charge $11 dollars a ticket, you sell 970 tickets. If the tickets sold is a linear function of price, what price should you charge to get the most money?

5. (10 points) Let $f(x) = 3x^2 - 4x$. Assuming $h \neq 0$, simplify the expression

$$\frac{f(x + h) - f(x)}{h}$$

as much as possible.