Math 120E **First Midterm** **Autumn 2007**

Your Name

Your Signature

Student ID #

	Andrey		Walker
Section	1:30	12:30	1:30
(circle one)	EA	EB	EC

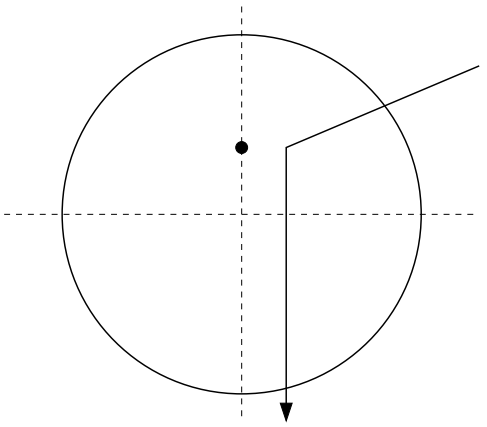
Problem	Total Points	Score
1	6	
2	6	
3	13	
4	13	
5	12	
Total	50	

- This exam is closed book. You may use one $8\frac{1}{2} \times 11$ sheet of notes.
- Do not share notes.
- In order to receive credit, you must show your work. Do not do computations in your head or only on your calculator. Instead, write them out on the exam paper.
- **Place a box around YOUR FINAL ANSWER to each question.**
- If you use a trial and error (or guess and check) method when an algebraic method is available, you will not receive full credit.
- If you need more room, use the backs of the pages and indicate to the reader that you have done so.
- Raise your hand if you have a question.

1 (6 points) Let $p(x) = 5x^2 - 8x$. Compute $\dfrac{p(x+h) - p(x)}{h}$ and simplify as much as possible (assume $h \neq 0$).

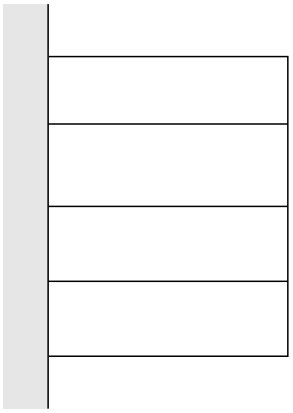
2 (6 points) For which value(s) of α does $12x^2 + 2\alpha x + 3 = 0$ have exactly one solution?

3 (13 points) The green at the 13th hole of the golf course is a circle of radius 20 feet. The hole is located 8 feet due North of the center of the green. Clovis starts walking from a point 22 feet East and 14 feet North of the center of the green. He walks straight towards the westernmost point of the green at a constant rate of 2 feet per second. (See the figure.)



(a) (6 points) At what point does Clovis enter the green?

(b) (7 points) When he reaches the point due East of the hole, Clovis turns and heads straight South. If he maintains a constant speed, what is the total time he spends in the green?



4 (13 points) Ida has 640 feet of fencing to make a rectangular enclosure for her goats. She will use the wall of her house for one side of the enclosure. She also wants to use some of the fencing to split the enclosure into four parts. (See the figure.)

(a) (7 points) What is the maximum possible area of the enclosure?

(b) (6 points) Find dimensions that would give the enclosure an area of 19,500 square feet. (Using all the fencing.)

5 (12 points) Let $f(x) = 2x + 1$ and $g(x) = \begin{cases} -x + 1 & \text{if } x \leq -2; \\ 7 - x^2 & \text{if } x \geq -2. \end{cases}$

(a) (6 points) Give a multipart formula for the composition $f(g(x))$.

(b) (6 points) Give all values of x that satisfy $g(x) = 2$.