Math 120 A - Spring 2005
Mid-Term Exam Number One
April 21, 2005

Name: _____ Section: _____

1	10	
2	10	
3	10	
4	10	
Total	40	

- Complete all questions.
- You may use a calculator during this examination. Other electronic devices are not allowed, and should be turned off for the duration of the exam.
- If you use a trial-and-error or guess-and-check method, or read a numerical solution from a graph on your calculator when an algebraic method is available, you will not receive full credit.
- You may use one hand-written 8.5 by 11 inch page of notes.
- Show all work for full credit.
- You have 50 minutes to complete the exam.

.

1. Maria decides to take her helicopter for a spin. Her starting point is Culver City. She starts flying directly toward River City, located 25 miles East and 60 miles North of Culver City. After flying for 10 miles, she turns and heads due South for 15 miles and then lands the helicopter. How far from River City is she?

2. Bob has 100 meters of fencing to make a rectangular enclosure. He want to use some of the fencing to make two partitions inside the enclosure, both parallel to the same side of the enclosure. The partitions will cut the enclosure into three separate regions. What should the dimensions of the enclosure be in order to have the largest possible total area?

3. Sara works for a production company, and is paid daily based on the number of hours she works. For the first eight hours she works, she makes $\$14.00$ per hour. For the first three hours beyond eight hours she works, she makes $\$18.00$ per hour. For any time over that, she is paid $\$30.00$ per hour.

   (a) Express the amount Sara is paid if she works x hours in a day.

   (b) Sara's friend Tim makes $\$17.00$ per hour for every hour he works. On Tuesday, Tim and Sara worked the same number of hours and made the same amount of money. How many hours did they work?

4. (a) Let $f(x) = 3x - 4$ and $g(x) = 5x + 8$. Find $f(g(x))$.

(b) Let $r(x) = 2x - 3$ and $s(x) = cx + d$. Find c and d so that $r(s(x)) + s(r(x)) = 5x - 11$

(c) Find a function $k(x)$ such that $k(k(k(x))) = 12x + 2$.