

**MATH 1113A (FALL 2009) TEST II
TAKE-HOME PROBLEM**

Instructions. You are allowed to work with other members of your rank group on this problem. You may also ask questions of the instructor and TAs for MATH 1113A. However, you may not ask anyone else for assistance on this problem. If you collaborate with group members, you must write up your final solution on your own. This means you may not read or copy other students' solutions or discuss the solution with others once you begin to write your final solution. However, you may share scratch paper on which you've done computations to solve the problem. **Attach your solution to this piece of paper with a staple. At the top of this sheet of paper, write your name and group.** If you worked with other members of your group, write the statement "I collaborated with _____", filling in the blank with the names of the group members with whom you collaborated. You may use computers, calculators, textbooks, notes, and the Internet as you need to solve this problem. However, to receive full credit, your solution must use only techniques we have covered in this course. You must also fully explain all of the steps of your work using *complete sentences*. (Think about your solution like it's to be graded against the DPS rubric.)

By signing on the line below, you certify that you have followed the rules above, including that you have not discussed this problem with anyone other than the members of your rank group, the instructor, and the TAs. You also certify that you have adhered to the Georgia Tech Honor Code, the principles of which are embodied by the Challenge Statement:

I commit to uphold the ideals of honor and integrity by refusing to betray the trust bestowed upon me as a member of the Georgia Tech community.

Student signature: _____

Due date. Your solution to this problem is due no later than 0810 on Friday, 30 October 2009, in class. Late work will not be accepted. In the event you cannot make it to class, send a digital copy to keller@math.gatech.edu before it is due.

Problem 1. (10 points) Marita invested a total of \$25,000 in stocks, bonds, and a mutual fund. In one year (this is before the stock market crashed, apparently), she earned 8% on her stock investment, 10% on her bond investment, and 6% on her mutual fund. Her total return that year was \$1860. Unfortunately, the amount invested in the mutual fund was twice as large as the amount invested in the bonds. How much of her \$25,000 did she invest in each type of investment?

Problem 2. (10 points) For this problem, suppose you have decided to invest your money at a bank that compounds interest continuously.

- Suppose that you invest \$5,000 in an account that pays 3.75% annual interest. Find a function $A(t)$ that represents the amount of money in your account after t years. How much interest have you earned after 10 years? How many years will it take for your account to have \$9,000 in it?
- Suppose your account pays annual interest at a rate of r . Find a formula (in terms of r) for how many years will it take for the amount of money in your account to *triple*.