Name_____

Math 141 First Midterm Exam Redux Due Tuessday October 24 2006

I	20 Points	
II	20 Points	
III	20 Points	
IV	20 Points	
V	20 Points	
Total	100 Points	

The same rules as to disclosure apply as for the problems. Numerical answers are required. You must explain how you got your answer and why you believe it to be correct. Hand in the original exam together with this one.

I. (20 points.) You deposit \$100 at 3% per year. What is the balance at the end of one year if the interest is compounded monthly?

II. (20 points.) You want to save up $3000 for a vacation two years from now. Starting at the end of this month you will make 24 equal monthly deposits into a savings account that pays 7% interest per year compounded monthly. What is the size of these deposits? (Assume that it is the beginning of the month and that your first payment is at the end of the month.)

III. (20 points.) This problem is the same as problem II except that the savings account pays 7% interest per year compounded daily. (Assume that one year = 360 days and that one month = 30 days.) *Hint: The answer to this problem should be almost the same as the answer to the previous problem. The only difference is that the effective interest rate is slightly different.*

IV. (20 points.) To solve a certain problem in financial mathematics you must evaluate the follow sum:

$$S = 400\left(1+\frac{0.1}{52}\right)^{10} + 400\left(1+\frac{0.1}{52}\right)^{11} + \cdots + 400\left(1+\frac{0.1}{52}\right)^{98}.$$

State the geometric series formula and show how use it to evaluate S on a calculator. *Hint: To apply the geometric series formula you must factor something out.* $x^{p+q} = x^p \cdot x^q$.

V. (20 points.) You put \$10,000 into an account which earns 10% per year compounded annually but every year you must pay a 30% tax on the gain. How much is in the account at the end of the 20th year? (The 30% tax is on the difference between what is in the account at the beginning of the year and what is in the account at the end of the year and is paid from the account.) *The original problem asked how much is in the account at the end of the 5th year; I changed this to the 20th year.*