GW TM 6.4 & 6.5: Personal Finance

Name: **Group #**

1) Suppose you have two different banks offering competitive interest rates for their savings accounts. Bank A offers 2.9% interest, compounded continuously; while Bank B offers 3%, compounded quarterly. Which is the better savings plan? How do you know?

Fact: Let P be the amount that you deposit each month into an investment account with interest rate r (in decimal form), compounded monthly. If A is the amount in the investment account after t years, then

$$A = \frac{P\left[\left(1+\frac{r}{12}\right)^{12t} - 1\right]}{\left(\frac{r}{12}\right)}$$

2) Imagine a dollar amount that you think you could afford to consistently deposit into such an investment account each month, and that the investment account consistently pays 6% interest, compounded monthly.

a) Assuming you only make these consistent deposits each month and never withdraw anything, how much will be in this account after 30 years?

b) How much of the money in this account will have come out of your own pocket?

c) How much of the money in this account will you have received "for free?"

d) Suppose you want to have a million dollars in this account after 30 years. This would correspond to $A = 1{,}000{,}000$. Solve the above formula for P and then plug in all the given values to find out how much* you will need to deposit consistently each month to achieve this.

e) *Perhaps it will be difficult to do this now, but suppose that for the first 5 years you could afford to consistently deposit $300; for the following 5 years you could afford to deposit $600 consistently; and for the final 20 years you could afford to deposit $1500 per month (by this time, with a degree, a good job, and the effects of inflation this is doable). How much would be in the account at the end of this 30 year period? Determine this by answering the following questions:

(i) What would be the result of consistently depositing $300 per month for 5 years?

(ii) What will the amount in part (i) grow to by just sitting in a savings account paying 6%, compounded monthly, for 25 years?

(iii) What would be the result of consistently depositing $600 per month for 5 years?

(iv) What will the amount in part (iii) grow to by just sitting in a savings account paying 6%, compounded monthly, for 20 years?

(v) What would be the result of consistently depositing $1500 per month for 20 years?

(vi) How much $ do you get by adding the amounts from parts (ii), (iv), and (v)? (this is what the strategy in part (e) will yield.)