Quiz, Math 110, April 17, 1996   Name _____

1) The amount of $10,000 is put into a bank account which pays an annual interest of 6%.
   a) Compute the amount of money in the account after 4 years if the bank compounds interest quarterly.

   b) How much more would have been in this account if the bank would have compounded interest continuously instead?

2) **a)** The purchaser of a home obtains a $120,000 mortgage at an annual interest rate of 8%. The agreement with the bank calls for the mortgage to be paid off with fixed monthly payments over 25 years. How much are the monthly payments?

   b) Your aunt has been paying $20 per month into an account earning interest at an annual rate of 0.06 starting on the day you were born. She will give you all the money that has accumulated in this account on your 21st birthday. How much will you get?

3) You purchased a bond yesterday on April 16th, 1996. It has a face value of $1000, pays its semi-annual coupon payments of $57 on February 1st and August 1st of each year, and it matures on August 1st of the year 2001.

a) Describe the payments (when and how much) that you will receive from the bond from now until it matures.

b) Modify one of the present value formulas below to one with which the price at which you purchased the bond can be estimated. Use it to estimate this purchase price if the prevailing interest rate was 0.06 on April 16th 1996.

FORMULAS

$$A_p = A_0\left(1 + \frac{r}{n}\right)^p \qquad A(t) = A_0\left(1 + \frac{r}{n}\right)^{nt} \qquad A(t) = A_0 e^{rt}$$

$$S_p = \frac{12}{r} A_0\left(1 + \frac{r}{12}\right)\left(\left(1 + \frac{r}{12}\right)^p - 1\right)$$

$$\$B\left(1 + \frac{r}{12}\right)^{-p}$$

$$PV_p = B\left(1 + \frac{r}{12}\right)^{-1} + B\left(1 + \frac{r}{12}\right)^{-2} + B\left(1 + \frac{r}{12}\right)^{-3} + \ldots + B\left(1 + \frac{r}{12}\right)^{-p}$$

$$PV_p = \frac{12B}{r}\left[1 - \left(1 + \frac{r}{12}\right)^{-p}\right]$$