**Quiz Problems – Chapter 4**

1. If you take out a 30-year mortgage for $200,000 at a fixed interest rate of 7.5% (APR), what will your monthly payments be? What is the payoff on your mortgage ten years later – immediately after you make your 120th payment? What is the payoff one month after that, when your 121st payment is immediately due?
2. Your company has the opportunity to lease a new copying machine which would cost $10,000 if it was purchased. This is a five-year lease. At the end of the five years, the copier is expected to have no value because newer technology is expected to make it obsolete by then. The cost of the lease is $200 per month with the first payment being made immediately and the last payment being made five years from today. Your boss realizes that there is some sort of an implicit interest rate being charged for this lease and has asked you to determine what it is. Express your answer first as an APR, and then as an EAR.
3. You plan to retire in 25 years. You have $50,000 currently saved and you plan to save an additional $500 every month (starting one month from now) until you retire. If you expect your retirement savings to grow at 7 percent per year (APR with monthly compounding), how much money do you expect to have saved when you retire?
4. You are saving for the college education of your two children. They are two years apart in age: one will begin college 15 years from today and the other will begin 17 years from today. You estimate that your children’s college expenses will be $30,000 per year per child, with payments to be made at the beginning of each school year (assume four years of college for each child). Your savings are expected to grow at a rate of 8 percent per year. How much money must you deposit in an account each year to fund your children’s education? Your deposits begin one year from today. You will make your last deposit when your oldest child enters college.

1. You have just taken out a 15-year fixed rate mortgage with a balance of $100,000. The interest rate (APR) is 6 percent. If, instead of making your scheduled monthly payments of $843.86 each month, you decide to pay an even $1,000 each month, how much sooner will you be able to pay off your mortgage?
2. You can either lease a new car or purchase it with a 3-year loan. The purchase price of the car is $35,000. The dealer has a special leasing arrangement where you pay $450 per month for three years with your first payment being made today and your last payment being made exactly three years from now. Three-year car loans are currently being offered at an APR of 8% with monthly payments, so you decide to use this rate to evaluate the lease. If you buy the car, you expect that you will be able to sell it at the end of the three years for $23,000. Should you buy or lease the car? What break-even resale price in three years would make you indifferent between buying and leasing?
3. If you deposit $5,000 into a bank account today, how much will it have grown to in ten years if the money is earning 6 percent APR? What is the EAR? Assume your earnings are compounded A) Annually B) Quarterly C) Daily D) Continuously
4. After earning your degree from the Freeman School of Business, you decide to purchase a new car. The price of the car is $35,000. You decide to take out a four-year loan to finance your purchase at an APR of 6.5%. How much will your monthly payments be? With your first monthly payment, how much will be principal and how much will be interest?
5. You have just won a new lottery game. Congratulations! You are now faced with a choice: You can either receive 30 annual payments of $10, 000 each with the first payment coming today (Option 1), or receive 20 annual payments of $20,000 each with the first payment coming 10 years from today (Option 2). If the interest rate is 6%, determine the present value of each option.
6. A brand new hybrid car (runs on both gas and electricity) costs $30,000 and gets 35 miles per gallon. The same model car which runs only on gasoline costs $26,000 and gets 25 miles per gallon. Both cars are expected to have the same maintenance, repair and insurance costs. You are trying to decide which car is the most economical to purchase. You plan to buy the car, drive it for eight years, and then dispose of it (no salvage value for either car). You estimate that the average cost of gas will be $3.50 per gallon for the next eight years and that you will drive 400 miles per week. The appropriate discount rate is 7% (APR) with weekly compounding. Calculate the cost of gasoline per week for each car and then find the present value of your gas savings with the hybrid vehicle. Use this information to determine which car is more economical to purchase with a lower present value of total costs.