RE 410 Real Estate Finance
Homework – Basic Financial Calculations

DUE DATE: Jan. 24

Problems:

1. Jim makes a deposit of $12,000 in a bank account. The deposit is to earn interest annually at the rate of 6% for 7 years.
   a. How much will Jim have on deposit at the end of 7 years?
   b. Assuming the deposit earned a 9% rate of interest compounded quarterly, how much would he have at the end of 7 years?
   c. In comparing (a) and (b), what are the respective effective annual yields? Which alternative is better?

2. Jones can deposit $5,000 at the end of each 6-month period for the next 12 years and earn interest at an annual rate of 8%, compounded semiannually. What will the value of the investment be after 12 years? If the deposits were made at the beginning of each period, what would the value of the investment be after 12 years assuming that he makes a payment at the end of year 12?

3. Suppose you deposit $2,500 at the end of year 1, nothing at the end of year 2, $750 at the end of year 3, and $1,300 at the end of year 4. Assuming that these amounts will be compounded at an annual rate of 15%, how much will you have on deposit at the end of 5 years?

4. An investor is considering an investment that will pay $2,150 at the end of each year for the next 10 years. He expects to earn a return of 12% on his investment, compounded annually. How much would he pay today for the investment? How much should he pay if the investment returns are received at the beginning of the each year?

5. John is considering the purchase of a lot. He can buy the lot today and expects the price to rise to $15,000 at the end of 10 years. He believes that he should earn an investment yield of 8% compounded annually on the investment. The asking price for the lot is $7,000. Should he buy it? What is the internal rate of return compounded annually on the investment if John purchases the property for $7,000 and is able to sell it 10 years later for $15,000?

6. The Dallas Development Corporation is considering the purchase of an apartment project for $100,000. They estimate that they will receive $15,000 at the end of each year for the next 10 years. At the end of the 10th year, the apartment project will be worth nothing. If Dallas purchases the project, what will be its internal rate of return compounded annually? If the company insists on an 8% return compounded annually on its investment, is this a good investment?

7. A pension fund is making an investment of $100,000 today and expects to receive $1,600 at the end of each month for the next 5 years. At the end of the 5th year, the capital investment of $100,000 will be returned. What is the internal rate of return compounded annually on this investment?

8. A loan of $60,000 is due 10 years from today. The borrower wants to make annual payments at the end of each year into a sinking fund that will earn interest at an annual rate of 10%. What will the annual payments have to be? Suppose that the monthly payments earn 10% interest compounded monthly. What would the annual payments have to be?

9. An investor has the opportunity to make an investment that will provide an effective annual yield of 12%. She is considering two other investments of equal risk that will provide compound interest monthly and quarterly, respectively. What must the equivalent nominal annual rate (ENAR) be for each of these two investments to ensure that an equivalent annual yield of 12% is earned?

10. An investment is expected to produce the following annual year-end cash flows: $5,000 in year 1; $1,000 in year 2; $0 in year 3; $5,000 in year 4; $6,000 in year 5; and $863.65 in year 6. The investment will cost $13,000 today.
    a. Will this investment be profitable?
    b. What will be the IRR compounded annually on this investment?
    c. Prove your answer in (b) by showing how much of each year's cash flow is recovery of the $13,000 investment and how much of the cash flow is return on investment.