Chapter 2 Problems

1. Why is $1 today worth more than $1 next year?

   Because the $1 today can be invested to earn a return that will make it worth more than $1 next year.

2. What do the FVIF and PVIF represent?

   The FVIF represents the earning of a fixed rate of interest for a finite period of time in the future. The PVIF represents the removal of a fixed rate of interest for a finite period of time in order to determine the present value of a future cash flow.

3. What is an annuity?

   A series of equal cash flows made at regular intervals for a finite period of time.

4. What is the difference between an ordinary annuity and an annuity due?

   An ordinary annuity requires payments at the end of the period, while an annuity due requires payments at the beginning of the period.

5. You have $16,000 that you wish to invest for five years in an investment that is expected to pay 7.25% APR. How much will you have available when you cash out in five years if compounding is done:

   a. Annually 22,704.21
   b. Semiannually (twice per year) 22,843.65
   c. Quarterly 22,916.17
   d. Monthly 22,965.61
   e. Weekly 22,984.87
   f. Continuously 22,990.68

6. You are expecting to receive a cash payment of $75,000 six years from today. If you had that money today, you would put it into an investment that will earn 6.55% APR. What is the present value of this cash flow, assuming discounting is done:

   a. Annually 51,255.51

b. Semiannually (twice per year) 50,947.02
c. Quarterly 50,788.56
d. Monthly 50,681.29
e. Weekly 50,639.68
f. Continuously 50,627.16

7. With an APR of 8.65%, what is the effective annual rate (EAR) if compounding occurs:
   a. Semiannually 8.84%
   b. Quarterly 8.93%
   c. Monthly 9.00%
   d. Weekly 9.03%
   e. Continuously 9.04%

   Round your answers to two decimal places (0.04428 = 4.43%).

8. You want to start a college fund for your little sister, so you arrange to put $250 per month into an annuity account that pays 6.0% APR, compounded monthly. Your first payment is due at the end of this month. How much will be in the account at the end of eight years?

   FVA = $30,707.14

9. You win a lottery that pays $5,000 per month for 20 years, starting today. You have the option of taking a lump sum today instead of the monthly payments. The lottery people tell you that, if you take the monthly payments, the money you won is expected to earn 7.25% APR, compounded monthly, for the entire 20 years it will be invested. Given these data, what is the lump sum you would expect to receive today?

   PVAD = $636,432.33

10. You are scheduled to receive a cash payment of $100,000 eight years from now. An attorney offers to pay you a lump sum of $45,000 today if you sign over the rights to the $100,000 future payment. What annual interest rate is the attorney charging you for this transaction?

APR = 10.50%

11. You purchase a car that costs $25,000 complete (title, license, etc.). Your bank loans you the $25,000, and in return you must make monthly payments of $484.00 per month for five years (60 payments). Based on these data, what monthly interest rate is your bank charging you? What is the equivalent annual rate?
    Monthly rate = 0.5049%; EAR = 6.2296%

12. You put money into an investment that is expected to pay 8.0% interest annually. At this annual interest rate, how many years will it take for you to double your money?
    N = 9.01

13. You get an offer for a credit card that charges 13.99% interest APR, compounded monthly. What effective annual interest rate does this credit card charge?
    i = 14.92%

14. You borrow $22,500 from your bank, to be repaid in monthly payments over four years (48 payments), starting at the end of the month. If the bank charges you 6.5% interest APR, compounded monthly, what will your monthly payment be?
    PMT = $533.59

15. You are expecting to receive the following cash flows: $1,000 one year from now, $1,500 two years from now, $2,500 three years from now, $4,000 four years from now and $5,000 five years from now. If your discount rate is 4.5%, what is the present value of these cash flows?
    PV = $11,887.78

16. You intend to deposit the following cash flows into your bank: $750 one year from now, $1,000 two years from now, $1,250 three years from now, $1,500 four years from now, $1,750 five years from now and $2,000 six years from now. Assuming the bank pays you

6.25% interest APR, compounded annually, how much will be in your account at the end of six years (when the final payment is made)?

FV = $9,342.06

17. You plan to take a Caribbean cruise in five years. The cruise will cost you $15,000, with payment due exactly five years from today. You have a savings account that pays 5.5% APR, compounded monthly. The savings account currently has $4,500 in it, which you will leave in the account to help pay for the cruise. How much more must you deposit into the savings account today in order to have exactly $15,000 in the account five years from today?

    EAR = .0564079; FV(4,500) = $5,920.67; balance needed = $9,079.33; PV(balance) = $6,900.74.