Additional Homework over Chapter 5
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1. What is the value of the account at the end of 10 years if $1,000 is deposited every 6 months into an account earning 8%/year compounded semiannually?

2. You put $2,000 into an account and 5 years later had $8,450.50. If the account earned interest compounded monthly, what was the interest rate?

3. How much should you deposit in an account now, paying 8% per year compounded quarterly, in order to receive quarterly payments of $1,000 for the next four years?

4. What is the effective rate of 10%/year compounded quarterly?

5. Mark has started to think about his retirement and has decided that his goal is to receive quarterly payments of $6,000 for 15 years when he retires at age 65. To achieve this goal, Mark is going to make quarterly payments into his retirement account for forty years. He just turned 25. His retirement account earns interest at a rate of 6% per year compounded quarterly. What payments should he make to meet this goal?

6. A car dealership is offering a way to keep car payments low. The dealership has a loan where at the end of the loan, you are required to make a lump-sum payoff to payoff the car. The car that you want to buy is worth $28,000 and you will make monthly payments for 4 years while the loan's interest rate is 5% compounded monthly. What would you payments be if at the end of the loan you still owed $9,000? (Note: this is how some car leasing programs work.)

7. Your credit card has a balance of $2000 and the interest rate is 18%/year compounded monthly. If you only make the minimum monthly payment of $35 per month, how many years will it take to pay off the balance? How much interest did you pay? Assume that you are not making any more charges on the card.

8. redo the previous problem if you make a monthly payment of $50.

9. A company estimates it will have to replace a piece of equipment at a cost of $100,000 in 5 years. To have this money available in 5 years, a fund is established by depositing $30,000 and making fixed monthly payments into an account paying 7%/year compounded monthly. How much should each payment be?

10. If you buy a television set for $800 and agree to pay for it in eighteen equal monthly payments with an interest rate of 1.5% per month, or 18%/year compounded monthly, how much are your payments? How much interest will you pay?

11. Make an amortization schedule for the first 6 months of the previous problem.

Additional Homework answers.

1. N = 2*10; I= 8; PV = 0; PMT = -1000; P/Y=C/Y=2; Solve for FV; Future Value is $29,778.08

2. N = 5*12; PV = -2000; PMT = 0; FV = 8450.5; P/Y=C/Y=12; Solve for I; Interest rate is 29.17%

3. N = 4*4; I= 8; PMT = 1000; FV = 0; P/Y=C/Y=4; Solve for PV; deposit $1,3577.71

4. 10.38%

5. First figure out how much money is needed in the account so he can receive these payments.
N = 15*4; I= 6; PMT = 6000; FV = 0; P/Y=C/Y=4; Solve for PV; To receive these payments he needs 236,281.61 in the account when he turns 65.

Now figure out the payments to get to this amount. N = 40*4; I= 6; PV= 0; FV = 236281.61; P/Y=C/Y=4; Solve for PMT; He needs to make quarterly deposits of 360.61

6. N = 12*4; I= 5; PMT =28000; FV = -9000; P/Y=C/Y=12; Solve for PMT; payment is $475.06

7. I= 18; PV= 2000; PMT = -35; FV = 0; P/Y=C/Y=12; Solve for N and you get 130.697. So it will take 131 payments to pay off the balance, i.e. 10 years and 11 months. After 130 payments of $35 you will still have a balance.

    N=130; I= 18; PV= 2000; PMT = -35; P/Y=C/Y=12; Solve for FV and you get that the balance will be $24.12. But, you will still owe one more month of interest on this amount at the end of the next month.

    N=1; I= 18; PV=24.12; PMT=0, P/Y=C/Y=12; Solve for FV and you get $24.48 which is your last payment to pay off the credit card.

    Total paid: 35(130) + 24.48(1) = $4574.48

    Interest paid: 4574.48-2000 = $2574.48

8. I= 18; PV= 2000; PMT = -50; FV = 0; P/Y=C/Y=12; Solve for N and you get 61.54. So it will take 62 payments to pay off the balance, i.e. 5 years and 2 months. After 61 payments of $50 you will still have a balance.

    N=61; I= 18; PV= 2000; PMT = -50; P/Y=C/Y=12; Solve for FV and you get that the balance will be $26.84. But, you will still owe one more month of interest on this amount at the end of the next month.

    N=1; I= 18; PV=26.84; PMT=0, P/Y=C/Y=12; Solve for FV and you get $27.24 which is your last payment to pay off the credit card.

    Total paid: 50(61) + 27.24(1) = $3077.24

    Interest paid: $1077.24

9. N = 5*12; I= 7; PV = -30000; FV = 100000; P/Y=C/Y=12; Solve for PMT; Payment is $802.75

10. N = 1.5*12; I= 18; PV = 800; FV = 0; P/Y=C/Y=12; Solve for PMT; payment of $51.04 total interest of $118.72

11. amortization schedule

period	interest owed	payment	amt. toward principal	outstanding principal
0	—	—	—	800
1	12	51.04	39.04	760.96
2	11.41	51.04	39.63	721.33
3	10.82	51.04	40.22	681.11
4	10.22	51.04	40.82	640.29
5	9.6	51.04	41.44	598.85
6	8.98	51.04	42.06	556.79