1) $1,000 is deposited in an account paying 6% compounded monthly. (10 points)

a) Find the monthly interest rate $i$. __________

b) Complete the following table:

<table>
<thead>
<tr>
<th></th>
<th>Interest earned in this month</th>
<th>Balance at the end of this month</th>
</tr>
</thead>
<tbody>
<tr>
<td>$1,000</td>
<td></td>
<td>$1,000</td>
</tr>
<tr>
<td>1st month</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2nd month</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3rd month</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

c) When will the balance reach $2,000? ________________

2) Sam needs $5,000 three years from now in order to pay off a loan. (10 points)

a) How much must she save each quarter for the next three years if the interest rate is 8% compounded quarterly?

b) How much of the $5,000 will be the interest?
3) Anne and Bob wanted to start saving for their son Charles’s college fund. They decided they would like to deposit $200 at the end of each quarter for 16 years in an account paying 7.6% compounded quarterly. (15 points)

a) How much would be in Charles’ college fund after 16 years? ___________

b) How much interest would they earn after 16 years? ___________

Charles’ godfather decided he would help too. But he wanted to make a lump sum deposit that would grow to the same amount in Anne and Bob’s account in 16 years. This account would pay 8.1% interest compounded monthly.

c) How much should he deposit (the lump sum)? ___________

d) How much interest would he earn after 16 years? ________________

e) How much money will be available, when Charles goes to college in 16 years?

________________
4) Tim and Mary bought a house for $150,000 fifteen years ago. The real estate agent
told them if their down payment was 20% of the purchase price, then they did not
have to purchase the mortgage insurance. Tim and Mary made this amount of the
down payment and financed the remainder. They got a 30-year loan at a 7.2 %
interest rate compounded monthly. (20 points)

a) What is the amount of the loan?

b) What is the monthly payment for the loan?

c) Find the recursive formula for the loan. _________________________________
_________________________________

d) What is the pay–off on the loan after 15 years of payments? _____________

e) They would like to refinance the amount in d). The bank now is offering a 15-year
loan with 5.1 % interest compounded monthly. What will be their monthly
payment if they refinance the loan? __________________

f) How much money will they save over the remaining 15 years if they decide
to refinance? __________________
5) Dave, for his retirement, started an annuity with a credit union with a $1,000 initial deposit. He then deposited $100 at the end of each month. The interest rate is 7.5% compounded monthly. (20 points)

a) Find the recursive formula for Dave’s account. __________________________
   __________________________
   __________________________

b) What would the balance be after 5 years? __________________________


c) After 5 years, the credit union reduced the interest rate to 4.2% compounded monthly. Because of that, Dave decided to deposit a lump sum of $3,000 at the end of the fifth year and raised his monthly deposit to $150. How much would be in his account at the end of the 10th year after the changes occur?
   __________________________


d) How much interest would be earned at the end of the entire 15 year period?
   __________________________
6) I received a phone call from a credit card company. The salesman urged me to transfer my debts to their credit card. They will not charge me interest for the first 3 months, and after that the interest rate would be 12% compounded monthly. Since I did not have any debts on my credit cards, he advised me to transfer my car loan to their credit card. Currently I have a loan of $8,000 and my monthly payment is $188 and I will be debt free in 48 months. Suppose I accept this deal and pay $188 monthly.

(15 points)

a) Find my debt after 3 months. _______________

b) If I transfer my loan to the credit card and still pay $188 monthly, find the recursive formula for my account after the first three months.

_____________________________

_____________________________


c) If I transfer my loan to the credit card, and still pay $188 monthly, how long will it take me to pay off the debt assuming that I make no new charges to my account?

_____________________________
7) I have found the car I really want. It is a new Ford Taurus SHO with a sticker price of $24,500. It is loaded with every option I want so there will be nothing to add to this price. The dealer is going to subtract 10% from this price “if I buy this car today.” I am trading in my old Chevy Caprice and will be given $1,650 for that. Ford is offering a rebate of $1,500 on this car and I have $5,000 cash that I will use as a down payment. The State of Maryland also collects $2 for a tire recycling fund to help dispose and cleanup the old tire dumps. There is a 5% sales tax on the purchase price of the car in the State of Maryland. The tag and title will cost another $165. I will finance the remainder of the cost of the car at 6.75% compounded monthly over 5 years with monthly payments. (10 Points)

a) How much is the loan? ________________

b) What will be the monthly payment? ________________