Directions: Show all necessary work in a neat and easy to read format. It is suggested that you work each problem on your own paper and transfer your work to this sheet when you are satisfied with the answer. Answers without supporting work are not acceptable. Please staple all sheets together. Failure to follow all directions on each worksheet will result in a 5 point penalty.

1) You have selected a new Dodge Sebring with a sticker price of $24,440. The dealer will give you a 6% discount if you sign the papers today. Chrysler Corporation is also offering a $650 rebate on this car. You have $7500 cash as a down payment on this car. You are buying this car in Maryland so there is a 5% sales tax and the tags and title will cost another $165. The State of Maryland also collects $2 fee for a tire recycling fund to help dispose and cleanup old tire dumps. You will finance the remainder of the cost of the car at 4.8% compounded monthly for 5 years. (15 points)
   a) How much will the loan be? And what is your monthly payment?

b) If you make all the payments for 5 years, how much interest will you pay on this loan?
   Assume all payments are the same for this problem.

c) If you decide to pay off this loan after exactly three years, what will be the amount?
2) The Jones’ buy a home. The builder accepts their bid of $245,000. All closing costs (including taxes) will amount to about 6% of the purchase price. If the Jones’ have a total of $27,000 available for closing costs and down payment, and they sign a 30 year mortgage at 5.94% compounded monthly, how much do they finance? (20 points)
a) What is the amount of the loan?

b) What will be their monthly house payment on the 30 year loan?

c) How much interest will be paid in the 100th payment? And how much of their monthly payment will go to reducing the balance of their loan?
Recursive formula ________________________________

The builder has also said that houses have been increasing in value over the past several years. If their house increases in value at an average of 2% per year, how much equity will the Jones’ have at the end of 15 years?

The Jones’ are also told that taxes on their home are $1800 per year and insurance will be $948 per year. They must pay this total amount in equal payments with their monthly mortgage payments. What is their monthly payment that now includes the repayment of the loan, taxes and insurance?
3) I have $18,500 to invest at 3.3% compounded monthly in a CD. What is the balance in the account after … (10 points)

\[ i = \underline{\phantom{0}}, \quad P = \underline{\phantom{0}} \]

Write the equation that you are using:

\[ \underline{\phantom{\text{equation}}} \]

1 year ______________
2 years ______________
3 years ______________

Directions: Use a recursive formula to find the solution to the following problems:

4) Bill deposited $6500 into a Certificate of Deposit (CD) paying 3.6% interest compounded monthly. How much is available to withdraw after… (10 points)

Recursive formula:

\[ \underline{\phantom{\text{recursive formula}}} \]

1 month ______________
2 months ______________
6 months ______________
1 year ______________
5 years ______________
20 years ______________

How much interest did Bill earn if he waited to withdraw the money after 20 years?

WORK:

5) Fred opened an annuity with $6600 paying 3.42% compounded quarterly. The terms of this annuity called for an additional deposit of $70 every quarter. How much is available to withdraw after … (10 points)

Recursive formula:

\[ \underline{\phantom{\text{recursive formula}}} \]

1 quarter ______________
2 quarters ______________
6 quarters ______________
4 years ______________
8 years ______________
20 years ______________

How much interest did Fred earn if he waited to withdraw the money after 20 years?

WORK:
6) Joan receives an inheritance of $11,000 that she places in an account paying 4.812% compounded annually in order to save enough money to pay for her children’s education in 12 years. Her friend Kathy hears about Joan’s plan, but did not receive any inheritance. Still, she does not want to be outdone by Joan. Kathy plans to start saving immediately and annually deposits an amount into a bank that will pay her 5.25% compounded annually. At the end of the 12 years, Kathy will have approximately the same amount in her account as Joan does in hers. Complete the table below showing the respective totals in each account at the end of each year, assuming that Kathy can save the proper amount for her match. (Hint: Do Joan’s account first then use the information to complete Kathy’s account.)

(10 points)

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<tr>
<th></th>
<th>Joan’s amount</th>
<th>Kathy’s amount</th>
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Calculate the interest earned in Joan’s account: _________________________________
Joan’s recursive formula: __________________________________________

How much will Kathy have to deposit each year? And how much does she pay over the length of the 12 years into this account? Calculate the interest earned in Kathy’s account.
Kathy’s recursive formula: __________________________

B-14
7) If I deposit $200,000 at 4.2% compounded semiannually into a CD, how long (in years) will I have to wait until the CD is worth at least $1,000,000? (5 points)

Recursive formula __________________________________________________________

\[ n \approx \text{___________} \text{ or } \text{_______} \text{ years for a balance of } \text{________________________} \]

8) I borrowed $3500 from Ray at 6.6% interest compounded monthly. I agree to pay him back at the rate of $200 per month until the loan is fully amortized. Create the amortization table for the first eight months of the loan in table form. Your table is to show payment number, payment amount, and interest for the month, amount applied to principal and remaining balance. (5 points)

<table>
<thead>
<tr>
<th>Payment #</th>
<th>Payment</th>
<th>Interest</th>
<th>Applied to Principle</th>
<th>Remaining Balance</th>
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Recursive formulas: __________________________________________________________

What should be the amount of the last payment?
9) Judi and George took out a home mortgage loan of $220,000. The rate of interest was 6.12% compounded monthly for 30 years. (15 points)

a) Calculate their monthly payment

b) How much of their first payment went towards paying down the principal on this loan?

Recursive formula


c) After one year, what is the remaining balance of the loan?

d) After one year, by how much was the original loan reduced?

e) What was the total amount of their payments for the year?

f) Judi and George continue to make house payments for exactly 5 years. What is the remaining balance at this time?

g) At this five year mark, Judi and George decided to double their house payment. After three years of doing this, now what is the remaining balance on their loan?

Recursive formula: