1 Consider the following cash flows:

<table>
<thead>
<tr>
<th>Year</th>
<th>Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>0 - 13</td>
<td>$10</td>
</tr>
<tr>
<td>14 - 25</td>
<td>$20</td>
</tr>
</tbody>
</table>

(a) Suppose the annually compounded interest rates are: 5% from year 0 through year 8, 6% from year 8 through year 15, 10% from year 15 through year 25. Find the PV of cash flows at year zero and the future value at year 25. Show that \( FV_{25} = PV_0 (1.05)^8 (1.06)^7 (1.10)^{10} \).

(b) Suppose the annually compounded rates of interest are: 8% per period from year 0 to year 7, 10% per period from year 7 to year 25. Find the PV at year 0 and FV at year 25. Show \( PV_0 = FV_{25} (1.08)^{-7} (1.10)^{-18} \).

(c) Find \( FV_{25} \) of the CF’s in part (a) if we have simple rates of interest instead.

(d) Find \( FV_{25} \) of the CF’s in part (b) if we have simple rates of interest instead.

2 Miami Autos is offering free credit (0% financing) on a new $10,000 car: you pay $1000 down and then $300 a month for the next 30 months. Kendall Autos does not offer free credit but will give you $1000 off the list price on the same model. If APR is 10% and interest is compounded monthly, which company is offering the better deal? (hint: choose the one with lower present value.)

3 You want to set up a college fund (as an annuity) for your daughter which will worth $60,000 at her 18th birthday. Assume the APR is 12%.

(a) How much must you deposit each year (at her birthday, starting at her first birthday) if interest is compounded annually?

(b) How much must you deposit each year (at her birthday, starting at her first birthday) if interest is compounded monthly?

(c) What will the deposits be if they are made at the beginning of the year (the first deposit is at her birth and the last payment made at her 17th birthday)?

4. You set up a college fund for your child that will worth $100,000 at age 18. You deposit $5,000 at her birth. In addition, to accumulate the required amount at APR=10%, how much you need to deposit if you make

(a) annual deposit and interest is compounded annually?

(b) monthly deposit and interest is compounded monthly?
(c) annual deposit and interest is compounded monthly?
(d) monthly deposit and interest is compounded quarterly?

5. You deposit $200 at the end of every other year (bi-annually) for 50 years, compute the FV and PV of this cash flow stream if APR is 10% and interest is compounded annually? If interest is compounded quarterly?

6. You deposit $200 every quarter (end of quarter) for 10 years, compute the FV and PV of this cash flow if APR is 10% and interest is compounded (a) annually? (b) semi-annually? (c) monthly?

7. You plan to establish a retirement fund by depositing $5,000 at the end of each year for 40 years in an account that earns 10% APR. Compute the FV and PV of the retirement fund if interest is compounded (a) annually? (b) quarterly? (c) continuously?

8. You retired with $1,000,000 in your account that earns 8% APR. You expect to withdraw monthly checks from the account for 25 years. How much you can withdraw if interest is compounded (a) semi-annually? (b) quarterly? (c) continuously?