Directions: Please answer the following questions and make sure your answer are legible. If you don’t show work and/or I can’t follow it, I won’t give partial credit. You may use a calculator (not the calculator function on other technology) and the Formula Sheet that I provide you, nothing else. Good Luck.

1. (2 points)

Calculate the $a_{n|i}$ value for this problem. (You do NOT need to do anything else)

You are determining what your retirement goal is (how much you need in the bank on the day you retire). You plan to be retired for 25 years, and determine that you would like to be able to pay yourself $2000 per month for those 25 years. You assume your real rate of return on your retirement account will be 4.05%.

$$n = 25 \times 12 = 300$$

$$a_{n|i} = \frac{(1 + \frac{.0405}{12})^{300}}{(\frac{.0405}{12})} \div (1 + \frac{.0405}{12})$$

$$\approx 188.4653$$

2. (6 points) Nancy Botwin’s credit card whose billing period begins on the 14th of each month. On Sept 14, her balance was $800.00. On the 17th she charged $40.00, on the 27th she charged $2,500, on October 3rd she charged $184.05. Then on October 9th she paid $1,000. Finally on Oct 10 she charged $84.50.

Compute Nancy’s Average Daily Balance (ADB) for this billing period. **Hint, make a table**

<table>
<thead>
<tr>
<th>Date</th>
<th>Activity</th>
<th>Balance</th>
<th>Days @ Bal</th>
<th>Days + Bal</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sept 14</td>
<td>beg.</td>
<td>800</td>
<td>3 (17-14)</td>
<td>2400</td>
</tr>
<tr>
<td>Sept 17</td>
<td>c. 40</td>
<td>840</td>
<td>10 (27-17)</td>
<td>8400</td>
</tr>
<tr>
<td>Sept 27</td>
<td>c. 2500</td>
<td>3340</td>
<td>6 *</td>
<td>20040</td>
</tr>
<tr>
<td>Oct 3</td>
<td>c. 184.05</td>
<td>2524.05</td>
<td>6</td>
<td>2114.30</td>
</tr>
<tr>
<td>Oct 9</td>
<td>p 1000</td>
<td>2524.05</td>
<td>1</td>
<td>2524.05</td>
</tr>
<tr>
<td>Oct 10</td>
<td>c. 84.50</td>
<td>2608.55</td>
<td>4</td>
<td>10434.30</td>
</tr>
<tr>
<td>End (Oct 14)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**ADB** = \[ \frac{64,943.55}{30} \]

**ADB** = \[ \frac{164.75}{1} \]

Continued on Reverse
3. (1 point) Determine Andy owes interest for the indicated billing period. (If yes, explain why). Assume he has a grace period of 21 days.

Andy's billing period begins on the 10th of each month. On December 10 his balance was $592.05. On Dec 13 he charged $190.94, on Dec 14 he charged $8.99, on Dec 19 he charged $390.95, on Dec 21 he paid $500, on Dec 23 he charged $97.94, on Dec 28 he charged $32.94 and on January 4 he charged $159.90.

Yes, he owes interest. He didn't pay the full $592.05 within 21 days
(he only paid $500)

4. (4 points)
   (a) Doug Wilson has a house worth $220,000, and the outstanding balance on his mortgage is $132,100. How much equity does Doug have?
   (b) If Doug is considering a second mortgage and the lender tells him the maximum Loan to Value Percent (LTV) is 90%, what is the largest amount that Doug can borrow with the second mortgage?

   a) Equity = 220,000 - 132,100 = 87,900

   b) LTV (Home value) = Mortgage + Mortgage

   (.90)(220,000) = 132,100 + Mortgage

   198,000 = 132,100 + Mortgage

   65,900 = Mortgage

   Doug can borrow max of $65,900

5. (2 points) Celia and Dean's homeowners insurance premium is $1,950 and their property taxes are $4,045. Find their monthly Escrow Payments.

   Escrow = \frac{1950 + 4045}{12} = 499.58

6. BONUS: (1 point each)
   (a) Explain what a 7/30 ARM is.
   (b) Explain how a home owner could have negative equity.