Section 11.5

#15.

a) 15% of 93500
\[ 0.15 \times 93500 = 14025 \] down pymt.

b) 93500 - 14025
\[ 79475 \] amount of mortgage

\[ 0.03 \times 79475 = 2384.25 \] amount for points
#21. cost of house $113,580
a) down payment = 28% of $113,580
   = 0.28(113,580) = $31,780

b) amt. of mortgage is
   $113,580 - 31,780 = 81,720
   amt. of points = 3% of 81,720
   = 0.03(81,720) = $2,451.60

c) AMI = GMI - (mo. pymts. more than 10 mos.)
   = 4750 - 420 = $4,330.

d) 28% of AMI = 0.28(4330)
   = $1,212.40 max. mo. pymt. for housing
e) 20 year loan; 10%
Use Table 11.4

<table>
<thead>
<tr>
<th>Rates</th>
<th>Years</th>
<th>mo. pymt per $1000 for principal + interest</th>
</tr>
</thead>
<tbody>
<tr>
<td>10%</td>
<td>20</td>
<td>9.66</td>
</tr>
</tbody>
</table>

\[
\frac{81720}{1000} \times 9.66 = 789.42
\]

\[
\text{Total monthly payment = mortgage + taxes + insurance = 789.42 + } \frac{1200}{12} + \frac{320}{12} = 916.09
\]

g) Since $916.09 < 1212.40 (max. mo. pymt), they can afford the house
h.) use \( i = \frac{p \cdot r \cdot t}{12} \)

\[
i = \left( 81720 \right) \left( \frac{10}{12} \right) \left( \frac{1}{12} \right)
\]

\[
i = 681.00
\]

\[
\text{am't. applied to principal} = \text{mort. - am't for pymt. interest}
\]

\[
= 789.42 - 681.00
\]

\[
= \$108.42
\]
1. (5% each) Solve the problem.

Enrollment in a business seminar increased from 49 people to 81 people. What was the percent of increase?

\[ \text{percent change} = \frac{\text{new} - \text{old}}{\text{old}} \times 100\% \]

\[ = \frac{(81-49)}{49} \times 100\% = 65.3\% \]
2. (5% each) Solve each problem. Round to the nearest hundredth.

a. 60% of what number is 96?
\[
\frac{96}{x} = \frac{60}{100} \\
96(100) = 60x \\
\frac{96(100)}{60} = \frac{60x}{60} \\
x = 160
\]

b. 60% of 96 is what number?
\[
\frac{x}{96} = \frac{60}{100} \\
\frac{x}{96} (96) = \frac{60(96)}{100} \\
x = 57.6
3. (5%) Solve the problem. Assume that simple interest is being calculated. Round your answer to the nearest cent.

Sasha borrowed $7500 from a bank for 15 months with interest of 5% per year. Find the total amount she repaid on the due date of the loan. (Use \( I = Prt \))

\[ P = 7500 \quad r = 0.05 \quad t = \frac{15}{12} \text{ years} \]

\[ 0.02 \frac{5}{4} \]

\[ I = 7500 \times 0.05 \times \left( \frac{15}{12} \right) = 468.75 \]

She repaid \( P + I \)

\[ = 7500 + 468.75 = 7968.75 \]
In #4 and #5, use the compound interest formula:

\[ A = p \left(1 + \frac{r}{n}\right)^{nt} \]

4. (5%) Use the compound interest formula to compute the total amount of the investment.

\[ n = 4 \]

$3000 \text{ at } 10\% \text{ compounded quarterly for } 3 \text{ years.} \]

\[ p = 3000 \quad r = 0.10 \quad t = 3 \]

\[ A = 3000 \left(1 + \frac{0.10}{4}\right)^{4(3)} \]

\[ = 3000 \left(1 + \frac{0.10}{4}\right)^{12} = \#4034.67 \]
5. (5%) Solve the problem.

Determine the effective annual yield for $1 invested for 1 year at 8.5% compounded monthly.

\[ A = 1, \quad t = 1, \quad n = 12 \]

\[
\text{eff. annual yield} = 1 \left(1 + \frac{r}{n}\right)^n - 1
\]

\[
= \left(1 + \frac{0.085}{12}\right)^{12} - 1
\]

\[
= 0.088\text{ or }8.8\%
\]
3000 \left(1 + \frac{.10}{4}\right)^{12}
\quad 4034.666473
(1 + \frac{.085}{12})^{12} - 1
\quad 0.0883909059
6. (5% each) In order to make some home improvements, a home owner spent $30,000. He paid 15% as a down payment and financed the balance of the purchase with a 36-month fixed installment loan with an APR of 7.5%. Determine the home owner’s a) total finance charge and b) monthly payment.

Down payment: $15(30,000)
= $4,500

Amount of loan = total cost - down payment
= $30,000 - $4,500
= $25,500
<table>
<thead>
<tr>
<th>Number of Payments</th>
<th>Annual percentage rate 7.00%</th>
<th>7.50%</th>
<th>8.00%</th>
<th>8.50%</th>
</tr>
</thead>
<tbody>
<tr>
<td>24</td>
<td>7.45</td>
<td>8.00</td>
<td>8.54</td>
<td>9.09</td>
</tr>
<tr>
<td>30</td>
<td>9.30</td>
<td>9.98</td>
<td>10.66</td>
<td>11.3</td>
</tr>
<tr>
<td>36</td>
<td>11.16</td>
<td>11.98</td>
<td>12.81</td>
<td>13.6</td>
</tr>
</tbody>
</table>

Each entry in the table represents monthly cost $100 at the given terms.

\[
\text{a.) } \frac{\text{amt. of loan}}{100} \times (\text{value from table}) = \frac{25500}{100} \times (11.98) = \$3054.90
\]

\[
\text{b.) total pymnts: prin. + fin. chg. after down pymnt.} = 25500 + 3054.90 = \$28554.90
\]

finance charge
6b. monthly payment

\[ \frac{28554.90}{36} = \$793.19 \]
7. (5% each) Solve the problem.

<table>
<thead>
<tr>
<th>Interest rate</th>
<th>15-year loan</th>
<th>20-year loan</th>
<th>25-year loan</th>
<th>30-year loan</th>
</tr>
</thead>
<tbody>
<tr>
<td>9.5%</td>
<td>$10.45</td>
<td>$9.33</td>
<td>$8.73</td>
<td>$8.41</td>
</tr>
<tr>
<td>10.0%</td>
<td>$10.75</td>
<td>$9.66</td>
<td>$9.09</td>
<td>$8.78</td>
</tr>
<tr>
<td><strong>10.5%</strong></td>
<td><strong>$11.06</strong></td>
<td><strong>$9.99</strong></td>
<td><strong>$9.45</strong></td>
<td><strong>$9.15</strong></td>
</tr>
<tr>
<td>11.0%</td>
<td>$11.37</td>
<td>$10.33</td>
<td>$9.81</td>
<td>$9.53</td>
</tr>
<tr>
<td>11.5%</td>
<td>$11.69</td>
<td>$10.66</td>
<td>$10.16</td>
<td>$9.90</td>
</tr>
</tbody>
</table>

*monthly payment per $1000.*
a. What is the monthly payment on a 30-year loan of $85,000 if the annual interest rate is 10.5%?

\[
\frac{85000}{1000} \times 9.15 = 777.75
\]

b. What are the total interest charges over the life of the loan?

\[
\text{total payments} = 777.75 \times (30 \times 12) = 279990
\]

\[
\text{interest charges} = 279990 - 85000 = 194990
\]
28554.90/36
793.1916667
85000/1000*9.15
777.75
777.75(30+12)
279990
279990-85000
8. (5%) The Weigels gross monthly income is $6900. They have 15 remaining payments of $310 on a new car. What maximum monthly payment does the bank’s loan officer feel that the Weigels can afford?

\[
\text{AMI} = 6900 - 310 = 6590
\]

Take 28% of 6590

\[
= 0.28 \times 6590 = \$1845.20
\]
9. (2% each) Use one of the following items in each of your answers: interest, personal note, simple interest, Bank’s Rule, discount note, compound interest, present value, total installment price, annual percentage rate, conventional loan, adjustable rate loan, one point, open-end installment, fixed-installment.

Fill in the correct word or words.

a. A _______ is a document that states the terms and conditions of the loan.

b. _______ is interest that is computed on the principal and any accumulated interest.

c. In a _______, the interest rate may change every period as specified in the loan.
d. **simple interest** is based on the entire amount of the loan for the total period of the loan.

**Banker's Rule** uses 360 as the number of days in a year.

e. The ___________ uses 360 as the number of days in a year.

f. In order to have an amount of money A in t years, the amount which needs to be invested now is called the ___________.

g. An **open-end installment** loan is a loan on which you can make variable payments each month.
h. **Interest** is money the borrower pays for the use of the lender’s money.

i. The **annual percentage rate** is the true rate of interest charged for the loan.

j. In a **discount note**, interest is paid at the time the borrower receives the loan.

**interest, personal note, simple interest, Banker’s rule, compound interest, present value, total installment price, conventional loan, adjustable rate loan, one point, open-ended installment, fixed installment, effective annual yield, annual percentage rate**.