Sample Test

1. (8% each) Solve the problem.

Sales volume for a particular company increased from $110 million to $132 million. What was the percent of increase?

\[
\text{percent change} = \frac{\text{new} - \text{old}}{\text{old}} \times 100% \\
= \frac{132 - 110}{110} \times 100% \\
= \frac{22}{110} \times 100% \\
= 20\%
\]
(8% each) Solve each problem. Round to the nearest hundredth.

a. 35 is what percent of 105?

\[
\frac{35}{105} = \frac{P}{100} \quad P = \left(\frac{35}{105}\right) \times 100
\]

\[= 33.33\%
\]

b. 40% of what number is 80?

\[
\frac{80}{x} = \frac{40}{100} \iff 80 \times 100 = 40x
\]

\[80 \times 100 = 40x \quad x = \frac{80}{40}
\]

\[x = 20
\]
3. (6% each) Solve the problem. Assume that simple interest is being calculated. Round your answer to the nearest cent.

\[ P \quad t=1.5 \text{ yrs.} \quad r=.06 \]

Andrea borrowed \$5500 from a bank for 18 months with interest of 6% per year. Use \( i = prt \).

a. Find the interest she must repay on the due date of the loan.

\[
i = prt = 5500(.06)(1.5) = 495.\]

3a. \#495.

b. Find the total amount she must repay on the due date of the loan.

\[
p+i = 5500+495 = 5995\]

3b. \#5995.
In #4 and #5, use the compound interest formula:

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

4. (3%) Use the compound interest formula to compute the total amount of the investment.

\[\text{\$12000 at 6\% compounded monthly for 5 years.}\]

\[
P = 12000, \quad r = 0.06, \quad n = 12, \quad t = 5
\]

\[
A = 12000 \left(1 + \frac{0.06}{12}\right)^{12(5)}
\]

\[= 12000 \left(1 + \frac{0.06}{12}\right)^{60}
\]

\[= 16186.20
\]
5. (6%) Solve the problem.

Determine the effective annual yield for $1 invested for 1 year at 8% compounded quarterly.

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

\[
1 \cdot \left(1 + \frac{0.08}{4}\right)^{4} - 1 = 0.082432\ldots; \text{ convert to percent}
\]

\[
0.082432\ldots \times 100 = 8.24\%
\]
6. (8%) Each in order to make some home improvements, a home owner spent $40,000. He paid 20% as a down payment and financed the balance of the purchase with a 30-month fixed installment loan with an APR of 7.50%. Determine the home owner’s: a) total finance charge and b) monthly payment.

Use this partial APR table for monthly payment plans:

<table>
<thead>
<tr>
<th>Number of Payments</th>
<th>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>9.05</td>
</tr>
<tr>
<td>36</td>
<td>9.30</td>
<td>9.88</td>
<td>10.46</td>
<td>11.06</td>
</tr>
<tr>
<td>36</td>
<td>11.16</td>
<td>11.93</td>
<td>12.71</td>
<td>13.54</td>
</tr>
</tbody>
</table>

Each entry in the table represents the finance charge $000 at the given rates.

a) $3193.60
b) $1173.12 (see next page)

down payment = 20% of 40000 = .20(40000) = 8000

amount financed = 40000 - 8000 = 32000

total finance charge = \( \frac{32000 \times 9.98}{100} = 3193.60 \)

total to be repaid = amount financed + total finance charge = 32000 + 3193.60 = 35193.60
\[ = 35793.60 \] (total to be repaid)

\[
\text{monthly payment} = \frac{35793.60}{30}
\]

\[ = 1173.12 \]
7. (6% each) Solve the problem.

Amortization of a $1000 Loan

<table>
<thead>
<tr>
<th>Interest rate</th>
<th>Monthly payment</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>15-year loan</td>
</tr>
<tr>
<td>9.5%</td>
<td>$10.45</td>
</tr>
<tr>
<td>10.0%</td>
<td>$10.75</td>
</tr>
<tr>
<td>10.5%</td>
<td>$11.08</td>
</tr>
<tr>
<td>11.0%</td>
<td>$11.37</td>
</tr>
<tr>
<td>11.5%</td>
<td>$11.69</td>
</tr>
<tr>
<td>12.0%</td>
<td>$12.01</td>
</tr>
<tr>
<td>12.5%</td>
<td>$12.33</td>
</tr>
<tr>
<td>13.0%</td>
<td>$12.68</td>
</tr>
</tbody>
</table>

a. What is the monthly payment on a 25-year loan of $150,000 if the annual interest is 10.5%?

\[
\frac{150000}{1680} \times 9.45 = 1417.50
\]

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

Total repaid = 1417.50(25)
= 425250

Amount financed = 150000

Total interest = 275250
8. (6%) The Smiths' gross monthly income is $4800. They have 18 remaining payments of $420 on a new car. What maximum monthly payment does the bank's loan officer feel that the Smiths can afford?

1. Gross income - monthly payments (more than 10 months)

\[ 4800 - 420 = 4380 \]

2. Take 28% of that:

\[ .28(4380) = 1226.40 \]

3. Subtract any taxes or insurance (none here)
9. (6%) The Wilsons' bank will charge them 3 points for a $170,000 mortgage. What is the amount of money they will pay for the points?

\[
\text{3\% of 170,000} = .03(170,000) = 5100
\]

9. $5100.$