Problem 1: A quantity changes from a value of $m$ to a value of $n$ over a certain interval from $a$ to $b$. Given this information, fill in the following change table for the following:

<table>
<thead>
<tr>
<th>Type of Change</th>
<th>Formula</th>
<th>Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>Change</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Percent Change</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Average Rate of Change</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Problem 2: Write down the following interest formulas, and then fill in the blanks for what each of the variables in the formula represent:

Interest compounded $n$ times per year: Continuously compounded interest:

\[ A = \text{____________________________} \quad P = \text{____________________________} \]

\[ r = \text{____________________________} \quad t = \text{____________________________} \]

Problem 3: Write down the following formulas for APR and APY:

a. APR (also known as the _________________ rate):

   annually:

   per compounding period:

b. APY (also known as the _________________ rate):

   for $n$ compoundings per year:

   for continuous compounding:
Problem 4: In order to offset college expenses, at the beginning of your freshman year you obtained a nonsubsidized student loan for $15,000. Interest on this loan accrues at a rate of .739% each month. However, you do not have to make any payments against either the principal or the interest until after you graduate.

a. Write a function giving the total amount you will owe after $t$ years in college.

b. What is the nominal rate?

c. What is the effective rate?

Problem 5: Find the change and the percent change for the following situation: The national ACT college test composite average for females was 20.7 in 2002 and 20.9 in 2008. Be sure to give a complete change answer.

a. change:

b. percent change:

c. average rate of change:

Problem 6: How long would it take an investment to double if the interest rate is 6.3%, compounded monthly?