Show all work and solutions in the space provided.

1. Use the compound interest formula to determine the best investment return.
   Option A: Invest $8000 in an account paying 5% interest compounded monthly for 5 years.
   Option B: Invest $8000 in an account paying 5.75% interest compounded quarterly for 5 years.

   a. What is the future value of Option A.
   b. What is the future value of Option B.
   c. Which is the best investment option?

2. The following data represent mile per gallon of gasoline consumption (highway) for a random sample of 56 makes and models of passenger cars. (Source: Environmental Protection Agency)

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<thead>
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<th>10</th>
<th>13</th>
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</tbody>
</table>

Construct a frequency table with 5 classes to represent the given data.

3. Using the following diagram, determine x.

4. Given the following set of data, determine each of the following:
   2, 13, 4, 15, 16, 12, 2, 11

   a. mean
   b. median
   c. mode
   d. range
   e. standard deviation

   (Round all values to the nearest tenth, if necessary.)
5. In addition to income tax, we are required to pay the federal government FICA taxes that are used for Social Security and Medicare benefits. For people who are not self-employed, the 2005 FICA tax rates were as follows:

- 7.65% on the first $90,000 from wages and tips
- 1.45% on income in excess of $90,000

People who are self-employed pay double the rates shown above. Taxpayers are not permitted to subtract adjustments, exemptions, or deductions when determining FICA tax. If you are not self-employed and earn $119,000, what are your FICA taxes?

6. Determine the perimeter and area of the following shape with the given dimensions.

7. Given the following sets: $U = \{1,2,3,4,5,6,7,8,9,10\}$, $A = \{2,4,6,8,10\}$, $B = \{1,3,5,7\}$, and $C = \{1,4,7,10\}$

   a. Construct a Venn diagram showing the above sets.
   b. Determine from the Venn diagram $A \cap C'$

8. The table shows the estimated number (in thousands) of earned degrees conferred in the United States in the year 2004 by level and gender. (Source: National Center for Education Statistics)

<table>
<thead>
<tr>
<th>Level of Degree</th>
<th>Male</th>
<th>Female</th>
<th>Total</th>
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</thead>
<tbody>
<tr>
<td>Associate Degree</td>
<td>231</td>
<td>401</td>
<td>632</td>
</tr>
<tr>
<td>Bachelor’s Degree</td>
<td>553</td>
<td>769</td>
<td>1322</td>
</tr>
<tr>
<td>Master’s Degree</td>
<td>197</td>
<td>270</td>
<td>467</td>
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<tr>
<td>Doctorate Degree</td>
<td>25</td>
<td>20</td>
<td>45</td>
</tr>
<tr>
<td>Total</td>
<td>1006</td>
<td>1460</td>
<td>2466</td>
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</tbody>
</table>

A person who earned a degree in the year 2004 is randomly selected. Find the probability of selecting someone who:

   a. earned bachelor’s degree.
   b. earned an associate degree, given that the person is female.
   c. earned a doctorate degree, given that the person is male.
   d. earned an associate degree and is a male.
   e. is female, given that the person earned a doctorate’s degree.
9. A pizza can be ordered with three choices of size (small, medium and large), four choices of crust (thin, thick, crispy, or regular) and six choices of toppings (ground beef, sausage, pepperoni, bacon, mushrooms, or onions). How many one-topping pizzas can be ordered?

10. Let p and q represent the following statements:

   p: It is cold  
   q: We will use the pool

   Using the p and q above, write the following symbolic statement in words:  \( p \leftrightarrow \sim q \)