1. If we were going to model the relationship between the following quantities, which should we pick as the independent variable and which as the dependent variable? (I = independent, D = dependent)

___ total hours spent exercising in a week ___ % body fat
___ air pressure ___ elevation above sea level
___ number of people attending a theater production ___ amount of money spent on advertising

2. Shown below is a table of octaves (a unit of measurement in music) surrounding the special note “A220”. On the second row, I have listed the frequency associated with the number of octaves from A220.

<table>
<thead>
<tr>
<th>Octaves from A220</th>
<th>-3 octaves</th>
<th>-2 octaves</th>
<th>-1 octave</th>
<th>0 octaves (A220)</th>
<th>1 octave</th>
<th>2 octaves</th>
<th>3 octaves</th>
<th>4 octaves</th>
</tr>
</thead>
<tbody>
<tr>
<td>Frequency of the note (Hz.)</td>
<td>27.5</td>
<td>55</td>
<td>110</td>
<td>220</td>
<td>440</td>
<td>880</td>
<td>1760</td>
<td>3520</td>
</tr>
</tbody>
</table>

Is the relationship between “number of octaves from A220” and “frequency of the note” a linear relationship, an exponential relationship, or neither of these? Explain.

Is the relationship between “number of octaves from A220” and “frequency of the note” positively related, negatively related, or unrelated? Explain.

3. Match the following scatterplots with the corresponding correlation coefficients.

<table>
<thead>
<tr>
<th>Scatterplot</th>
<th>Correlation Coefficient</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>____ -.81</td>
</tr>
<tr>
<td>B</td>
<td>____ .35</td>
</tr>
<tr>
<td>C</td>
<td>____ .96</td>
</tr>
<tr>
<td>D</td>
<td>____ -.38</td>
</tr>
</tbody>
</table>
4. Viktor’s band, Konflikt, noticed that 300 people came to their show when they charged $10 at the door, but only 216 people came when they played a show where the tickets were $24. Assuming a linear relationship between the price to get in and the number of people who attend,

a) find a linear equation which describes this relationship.

b) What is the slope of your linear equation from part a and what does it mean in the context of this problem?

c) This weekend, Konflikt is playing a show which will cost $40. How many people can they expect will attend?

5. Konflikt has an album coming out soon, entitled To Sme My. They paid $880 for the studio time to record the album and they expect the packaging to cost $2.40 per CD. If they plan on selling the CDs for $8 each, how many must they sell to break even?
6. In order to lower the risk of uncontrolled forest fires, the U.S. Forest Service has implemented a plan which will clear 1.4% of the pine trees in the Coconino National Forest each year for the next several years. If there are currently 415,000 acres of pine forest and the goal is to reduce this coverage to 340,000 acres, how long must the Forest Service implement this plan?

7. A bacteria population grew from 0.8 mg to 2.3 mg in 6 hours. Assuming exponential growth, what was the average growth rate of this population?

8. April invested the $50 dollars she got for her 4th birthday into a savings account earning 3.4% compounded monthly. How much will be in the account on her 18th birthday?
9. Steve and Sarah plan on setting up a college fund for their son when he turns 6. They’ve found a savings account which offers 2.85% compounded monthly.

   a) How much do they need to deposit on their son’s 6th birthday in order to have $40,000 saved by his 17th birthday?

   b) If Steve and Sarah decide, instead, to deposit a fixed amount into the same account, how much must they deposit every month in order to reach their goal?

   c) Which option requires Steve and Sarah to invest more money?

10. Amanda purchased a new car for $14,450. She put $1200 down and financed the rest at 3.6% for 4 years.

   a) What is Amanda’s monthly payment?

   b) If she keeps her car for the entire life of the loan, how much will she have paid in total?