1. The data shows the average brain weight as a % of body weight of average weight humans for different ages.

<table>
<thead>
<tr>
<th>x</th>
<th>0</th>
<th>2</th>
<th>4</th>
<th>6</th>
<th>8</th>
<th>10</th>
<th>12</th>
<th>14</th>
<th>16</th>
</tr>
</thead>
<tbody>
<tr>
<td>y1</td>
<td>11</td>
<td>8</td>
<td>7</td>
<td>6</td>
<td>5</td>
<td>4.5</td>
<td>4</td>
<td>3.5</td>
<td>3.25</td>
</tr>
</tbody>
</table>

Round all answers to 4 decimal places.

Find the cubic regression equation for y1(x). You do not need to write the formula.

What is the leading coefficient?_______________

What does this model predict for y1(25)?_____________________

Find the zero of y1 in the interval [0, 25]. ______________________

At what age does the model cease to be useful if the average % of body weight for an adult’s brain is 3%?  _______________________

2. Write the function for the given transformation of \( f(x) \). Sketch \( f(x) \) and its transformation, \( g(x) \).

a) \( f(x) = x^2 \) is shifted to the left 1 unit, stretched vertically by a factor of 3, reflected across the x-axis and lastly, shifted up 24 units.

b) \( f(x) = x^2 \) is shifted up 2 units, shifted to the left 1 unit, reflected across the x-axis and stretched vertically by a factor of 3.

c) \( f(x) = \sin(x) \) is shifted right \( \frac{\pi}{2} \) units, stretched vertically by a factor of 4 and shifted up 2 units. Graph \( f(x) \) in \( [0, 4\pi] \) and \( g(x) \) in \( [\frac{\pi}{2}, 4\pi + \frac{\pi}{2}] \)

Put your graphs on graph paper and staple the graph paper to your quiz as page 2 of your quiz.
3. A person invests $10,000 in an account so that the amount of money in the account grows at the continuous rate of 5% per year.
   a) Write a formula for $A(t)$, the amount in the account at the end of $t$ years.

   b) Find $A(20)$.

4. A drug has a half life in the body of 4 days. (After 4 days, the amount in the body is half the original amount and the amount decreases continuously.) A person takes 15mg of this drug on day 0.
   a) Write a formula for the amount in the body after $t$ days. Write the formula with base 0.5 and also with base $e$.

   b) In how many days will the amount be $\frac{15}{8}$ mg? Give an exact answer.

   c) Using the base $e$ formula for $y_1$ and $y_2=5$, find the number of days until the amount in the body is 5mg.
   Round the number of days to 3 decimal places. ________________

   Convert the number of days to $n$ days+$m$ hours. ________________
   Round to the nearest hour.