For the first two problems, consider the graph to the right.

1. (2 points) Suppose that the graph shows a function \( f(x) \) and a line tangent to the curve \( y = f(x) \) (the solid line). If the equation of the line is \( y = 3 - x \), fill in the following blanks:
   \[
   f(\square) = \_
   
   f'(\square) = \_
   \]

2. (4 points) Now suppose that the curve graphed is \( g'(x) \) for some function \( g \). The indicated line is still \( y = 3 - x \), and is tangent to the graph of \( y = g'(x) \). Assume that \( g(x) \) and its derivatives are defined only for \( \frac{1}{2} \leq x \leq 2\frac{1}{2} \). Where (for what \( x \)-value) is
   \[
   g(x) \text{ smallest?} \quad g'(x) \text{ smallest?} \quad g''(x) \text{ smallest?} \\
   g(x) \text{ largest?} \quad g'(x) \text{ largest?} \quad g''(x) \text{ largest?}
   \]
   Are the largest values of \( g'(x) \) and \( g''(x) \) greater than 1? Greater than 2? Greater than 3? (How do you know?)

3. (4 points) A Purple-Headed Uniquely Nocturnal Chartreuse And Luridly Colored wombat is sighted moving across the diag. Its position, measured in feet from the West Engineering arch, is given as a function of time (in minutes past midnight) in the following table.

<table>
<thead>
<tr>
<th>( t )</th>
<th>( 0 )</th>
<th>( 5 )</th>
<th>( 10 )</th>
<th>( 15 )</th>
<th>( 20 )</th>
<th>( 25 )</th>
<th>( 30 )</th>
</tr>
</thead>
<tbody>
<tr>
<td>position</td>
<td>( 0 )</td>
<td>( 7 )</td>
<td>( 15 )</td>
<td>( 27 )</td>
<td>( 30 )</td>
<td>( 31 )</td>
<td>( 218 )</td>
</tr>
</tbody>
</table>

   a. Estimate the wombat’s velocity at \( t = 0 \), \( t = 5 \), \( t = 10 \) and \( t = 15 \).
   b. Estimate the wombat’s acceleration at \( t = 5 \) and \( t = 10 \).
   c. What do you think happened between \( t = 25 \) and \( t = 30 \)?