1. For the function \( f(x) = x^2 \), find the value of the difference quotient \( \frac{f(2+h) - f(2)}{h} \) at \( h = 1 \).

2. Estimate the value of the derivative of \( f(x) \) at \( x = 2 \) given the following table of values:

<table>
<thead>
<tr>
<th>( x )</th>
<th>1.997</th>
<th>1.999</th>
<th>2.001</th>
<th>2.003</th>
</tr>
</thead>
<tbody>
<tr>
<td>( f(x) )</td>
<td>5.2309</td>
<td>5.1106</td>
<td>4.9904</td>
<td>4.8703</td>
</tr>
</tbody>
</table>

3. At a distance of \( x \) units from a bottle of ant poison, the number of ants is \( f(x) \). The derivative, \( f'(x) \), of the function has units ants/centimeter. What are the units for the distance variable, \( x \)?

4.5. The derivative \( f'(x) \) of a given function is positive for \( x < 3 \) and negative for \( x > 3 \). Make a possible sketch of the graph of this function in the space to the right.

6. Find the tangent line of a function at \( x = 3 \) if \( f'(3) = 2 \) and \( f(3) = 4 \).

7. Estimate the value of \( f(3.001) \) given that \( f(3) = 2.752 \) and \( f'(3) = 2 \).

For the graph to the right, indicate the points where the derivative of \( f(x) \) is

8. positive

9. negative

10. zero