8. [9 points] Given below is a table of values for a function \( g(x) \) and its derivative \( g'(x) \). The functions \( g(x) \), \( g'(x) \), and \( g''(x) \) are all defined and continuous for all real numbers.

<table>
<thead>
<tr>
<th>( x )</th>
<th>(-3)</th>
<th>(-2)</th>
<th>0</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>6</th>
<th>8</th>
</tr>
</thead>
<tbody>
<tr>
<td>( g(x) )</td>
<td>2</td>
<td>3</td>
<td>7</td>
<td>9</td>
<td>5</td>
<td>1</td>
<td>-5</td>
<td>-7</td>
</tr>
<tr>
<td>( g'(x) )</td>
<td>0</td>
<td>4</td>
<td>1</td>
<td>0</td>
<td>-2</td>
<td>-4</td>
<td>-1</td>
<td>-3</td>
</tr>
</tbody>
</table>

Assume that between consecutive values of \( x \) given in the table above, \( g(x) \) is either **always increasing** or **always decreasing**.

Find the quantities in a.–c. exactly, or write NEI if there is not enough information provided to do so. You do not need to show work, but limited partial credit may be awarded for work shown.

a. [1 point] \( \int_{3}^{6} g(x) \, dx \)

Answer: _________________

b. [2 points] \( \int_{-2}^{2} 3g'(x) \, dx \)

Answer: _________________

c. [3 points] \( \int_{0}^{4} \left(g''(x) + x\right) \, dx \)

Answer: _________________

d. [2 points] Use a right-hand Riemann sum with three equal subdivisions to estimate \( \int_{2}^{8} g(x) \, dx \).
Write out all the terms in your sum.

\[
\begin{align*}
\frac{8-2}{3} & \cdot [g(2) + g(4) + g(6)] \\
& = \frac{6}{3} [g(2) + g(4) + g(6)] \\
& = 2[g(2) + g(4) + g(6)]
\end{align*}
\]

e. [1 point] Does the answer to part d. overestimate, underestimate, or equal the value of \( \int_{2}^{8} g(x) \, dx \)? Circle your answer. If there is not enough information, circle NEI.

Answer: OVERESTIMATE UNDERESTIMATE EQUAL NEI