3. [13 points] Let $f$ be a function such that $f''(x)$ is defined for all real numbers. A table of some values of $f'$ is given below.

<table>
<thead>
<tr>
<th>$x$</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>6</th>
<th>9</th>
<th>11</th>
</tr>
</thead>
<tbody>
<tr>
<td>$f'(x)$</td>
<td>4</td>
<td>1</td>
<td>0</td>
<td>2</td>
<td>0</td>
<td>-4</td>
</tr>
</tbody>
</table>

Assume that $f'$ is continuous and either always decreasing or always increasing between consecutive values of $x$ shown in the table.

a. [2 points] Using the table above, estimate $f''(11)$. Show your work.

**Solution:** Since $f''$ is the derivative of $f'$, $f''(11) \approx \frac{f'(11) - f'(9)}{11 - 9} = \frac{-4 - 0}{11 - 9} = -2$.

**Answer:** $f''(11) \approx -2$

For parts (b) through (e) below, find the indicated values. Write NONE if there are no such values of $x$. Write NOT ENOUGH INFO if there is not sufficient information to determine a value. You do not need to explain your reasoning.

b. [3 points] Find the $x$-coordinates of all critical points of $f(x)$ on the interval $2 < x < 11$.

**Answer:** critical point(s) at $x =$ 4, 9

c. [3 points] Find the $x$-coordinates of all local minima of $f(x)$ on the interval $2 < x < 11$.

**Answer:** local min(s) at $x =$ NONE

d. [3 points] Find the $x$-coordinates of all inflection points of $f(x)$ on the interval $2 < x < 11$.

**Answer:** inflection point(s) at $x =$ 4, 6

e. [2 points] Find all values of $x$ at which $f(x)$ attains its global maximum on the interval $2 \leq x \leq 11$.

**Answer:** global max(es) at $x =$ 9