3. [8 points] At a certain location in Lake Michigan, scientists are measuring water temperature. Let $W(d)$ be the temperature, in degrees Fahrenheit ($^\circ F$), of the water at a depth of $d$ meters (m). Shown below is a table of values of $W(d)$ and its derivative $W'(d)$, which are both defined and differentiable for all $d \geq 0$.

<table>
<thead>
<tr>
<th>$d$</th>
<th>10</th>
<th>18</th>
<th>20</th>
<th>36</th>
<th>78</th>
<th>95</th>
</tr>
</thead>
<tbody>
<tr>
<td>$W(d)$</td>
<td>62</td>
<td>56</td>
<td>55</td>
<td>50</td>
<td>43</td>
<td>41</td>
</tr>
<tr>
<td>$W'(d)$</td>
<td>-1.25</td>
<td>-0.60</td>
<td>-0.45</td>
<td>-0.28</td>
<td>-0.15</td>
<td>-0.10</td>
</tr>
</tbody>
</table>

Assume that between each pair of consecutive values of $d$ given in the table, each function $W(d)$ and $W'(d)$ is either always increasing or always decreasing. Throughout this problem, you do not need to include units or simplify numerical values.

a. [1 point] Use the table to approximate the value of $W''(19)$.

**Answer:** $W''(19) \approx \ldots$

b. [2 points] Write a formula for the linear approximation $L(d)$ of $W(d)$ near $d = 95$.

**Answer:** $L(d) =$

c. [1 point] Use your formula from part b. to approximate the water temperature, in $^\circ F$, of the water at a depth of 90 meters.

**Answer:**

d. [1 point] Is your estimate from part c. an overestimate, an underestimate, neither, or is there not enough information to decide? Circle your answer.

**Circle One:** OVERESTIMATE UNDERESTIMATE NEITHER NOT ENOUGH INFO

e. [3 points] The scientists are taking measurements using an underwater drone. The depth $d$, in meters, of the drone after $t$ minutes of taking measurements can be modeled by $d = 3\sqrt{t}$. Let $R(t) = W(3\sqrt{t})$ be the temperature in $^\circ F$ outside the drone $t$ minutes into the measurements. Write a formula for the linear approximation $K(t)$ of $R(t)$ near $t = 36$.

**Answer:** $K(t) =$