9. [9 points] The graphs of $u(r)$ and $u'(r)$ are shown below. The graphs also show tangent lines to both functions at $r = 5$.

![Graphs](image)

The table below shows some values of $h(s)$ and $h'(s)$. Both $h$ and $h'$ are differentiable.

<table>
<thead>
<tr>
<th>$s$</th>
<th>$-6$</th>
<th>$-4$</th>
<th>$-2$</th>
<th>$0$</th>
<th>$2$</th>
<th>$4$</th>
<th>$6$</th>
</tr>
</thead>
<tbody>
<tr>
<td>$h(s)$</td>
<td>$1$</td>
<td>$4$</td>
<td>$5$</td>
<td>$-1$</td>
<td>$-3$</td>
<td>$4$</td>
<td>$7$</td>
</tr>
<tr>
<td>$h'(s)$</td>
<td>$3$</td>
<td>$2$</td>
<td>$-4$</td>
<td>$-1$</td>
<td>$0$</td>
<td>$2$</td>
<td>$1$</td>
</tr>
</tbody>
</table>

a. [5 points] Let $g(t) = u(h(t))$. Find a formula for $\ell(t)$, the local linearization of $g(t)$ near $t = -2$, and use this to approximate a solution to $g(t) = 6.14$.

Answer: $\ell(t) = \ldots$

Answer: $g(t) = 6.14$ when $t \approx \ldots$

b. [2 points] Write a formula for $c(r)$, the quadratic approximation of $u(r)$ at $r = 5$.

(Recall that a formula for the quadratic approximation $Q(x)$ of a function $f(x)$ at $x = a$ is $Q(x) = f(a) + f'(a)(x - a) + \frac{f''(a)}{2}(x - a)^2$.)

Answer: $c(r) = \ldots$

c. [2 points] Use the data provided to estimate $h''(-5)$.

Answer: $h''(-5) \approx \ldots$