9. [7 points] The graph of \( h'(x) \) (the derivative of \( h(x) \)) is shown below.

\[
y = h'(x)
\]

\[\begin{array}{ll}
\textbf{a. [3 points]} & \text{Find a formula for the tangent line approximation } L(x) \text{ to the function } h(x) \text{ near } x = 2 \text{ if the point } (2, -3) \text{ lies on the graph of } y = h(x). \text{ Your answer should not include the letter } h. \\
\hline
\textbf{Solution:} & h(2) = -3 \text{ and } h'(2) = 1. \\
\textbf{Answer:} & L(x) = -3 + (x - 2)
\end{array}\]

\[\begin{array}{ll}
\textbf{b. [1 point]} & \text{Use the tangent line approximation to the function } h(x) \text{ near } x = 2 \text{ to approximate the value of } h(1.6). \\
\hline
\textbf{Solution:} & \text{Answer: } h(1.6) \text{ is approximately } L(1.6) = -3 + (1.6 - 2) = -3.4.
\end{array}\]

\[\begin{array}{ll}
\textbf{c. [3 points]} & \text{Is your approximation in part b an overestimate or an underestimate? Circle your answer and give a justification of your answer.} \\
\hline
\textbf{Solution:} & \text{OVERESTIMATE UNDERESTIMATE NOT ENOUGH INFORMATION}
\end{array}\]

\textbf{Justification:}

Since \( h'(x) \) is decreasing on \([1.6, 2]\), \( h(x) \) is concave down on \([1.6, 2]\). Hence the approximation is an overestimate.