1. Problem
What is the derivative of \( f(x) = x^8 e^{3.4x} \), evaluated at \( x = 0.7 \)?

Solution
Using the product rule for \( f(x) = g(x) \cdot h(x) \), where \( g(x) := x^8 \) and \( h(x) := e^{3.4x} \), we obtain

\[
\begin{align*}
  f'(x) &= [g(x) \cdot h(x)]' = g'(x) \cdot h(x) + g(x) \cdot h'(x) \\
  &= 8x^7 \cdot e^{3.4x} + x^8 \cdot e^{3.4x} \cdot 3.4 \\
  &= e^{3.4x} \cdot (8x^7 + 3.4x^8) \\
  &= e^{3.4x} \cdot x^7 \cdot (8 + 3.4x).
\end{align*}
\]

Evaluated at \( x = 0.7 \), the answer is

\[
e^{3.4 \cdot 0.7} \cdot 0.7^7 \cdot (8 + 3.4 \cdot 0.7) = 9.236438.
\]

Thus, rounded to two digits we have \( f'(0.7) = 9.24 \).