1. Suppose that \( \lim_{x \to 1} f(x) = 3 \), \( \lim_{x \to 1} h(x) = 2 \), and \( \lim_{x \to 1} g(x) = 4 \). Evaluate \( \lim_{x \to 1} (h(x)f(x) + g(x)^2) \).

2. Consider the function

\[
f(x) = \begin{cases} 
-x^3 & \text{for } x \leq 0, \\
x^2 + 1 & \text{for } 0 < x < 2, \\
x + 3 & \text{for } x \geq 2.
\end{cases}
\]

(a) Is \( f(x) \) continuous at \( x = 0 \)? Why or why not?
(b) Is \( f(x) \) continuous at \( x = 2 \)? Why or why not?