Quiz 4

Show all work: unjustified answers may receive less than full credit.

1. Find the derivative of the function \( G(t) = \frac{4t}{t+1} \) using the definition of the derivative.

\[
G'(t) = \lim_{h \to 0} \frac{G(t+h) - G(t)}{h} = \lim_{h \to 0} \frac{4(t+h)(t+1) - 4t(t+1)}{(t+h+1)(t+1)(t+1)}
\]

\[
= \lim_{h \to 0} \frac{4th + 4h^2 + 4h - 4th - 4h^2 - 4h}{(t+h+1)(t+1)} = \lim_{h \to 0} \frac{4h}{(t+h+1)(t+1)} \cdot \frac{1}{h}
\]

\[
= \frac{4}{(t+1)^2}
\]

2. Sketch the graph of a function that satisfies the following conditions: \( f'(0) = f''(2)f'(4) = 0, f'(x) > 0 \) if \( x < 0 \) or \( 2 < x < 4 \), \( f'(x) \leq 0 \) if \( 0 < x < 2 \) or \( x > 4 \). \( f''(x) > 0 \) if \( 1 < x < 3 \). \( f''(x) < 0 \) if \( x < 1 \) or \( x > 3 \).