1. (a) (3 pts.) Find the one-sided limits \( \lim_{x \to 3^-} f(x) \) and \( \lim_{x \to 3^+} f(x) \) where 
\[
f(x) = \begin{cases} 
  x^2 + 1 & \text{if } x \leq 3 \\
  2x + 4 & \text{if } x > 3.
\end{cases}
\]
(b) (2 pts.) Is \( f(x) \) given in part (a) continuous at \( x = 3 \)? Why or why not?

2. Let \( f(x) = \frac{2}{x} \).

(a) (3 pts.) Write down and simplify the difference quotient \( \frac{f(x + h) - f(x)}{h} \).

(b) (2 pts.) Find \( f'(x) \) by computing \( \lim_{h \to 0} \frac{f(x + h) - f(x)}{h} \).