Define the following as limits:

(1) The derivative of $f(z)$.

\[ f'(z) = \]

(2) The partial derivative \( \frac{\partial u}{\partial x}(x, y) \)

\[ \frac{\partial u}{\partial x}(x, y) = \]

(3) The partial derivative \( \frac{\partial u}{\partial y}(x, y) \)

\[ \frac{\partial u}{\partial y}(x, y) = \]