Show all work, clearly and legibly, to receive full credit. Correct spelling, organization of your solution, and proper use of mathematical notation all count. You may use a calculator, but no notes, books, or other resources. Good luck!

1.) (4 pts.) To compute the derivative of a function \( f(x) \) at the point \( x = 5 \), we compute

\[
\lim_{h \to 0} \frac{f(5 + h) - f(5)}{h}
\]

In this expression, what does the difference quotient \( \frac{f(5+h)-f(5)}{h} \) represent graphically?

The slope of the secant line through \((5, f(5))\) and \((5+h, f(5+h))\)

2.) (4 pts.) Let \( f(x) = \begin{cases} 
  x^2 & \text{if } x \neq 3 \\
  0 & \text{if } x = 3
\end{cases} \)

a.) Evaluate \( \lim_{x \to 3} f(x) \).

\( q \)

b.) Does \( \lim_{x \to 3} f(x) = f(3) \)? \( \text{No} \)

3.) (2 pts.) Simplify \( \sqrt{e^{2x}} \).

\( e^x \)