7. (10 points) For this problem \( f \) is differentiable everywhere.

(a) Write the limit definition of the derivative of the function \( f \) at the point \( a \).

(b) On the graph below, show how the average rate of change of \( f \) between \( x = a \) and \( x = a + h \) is related to the derivative at the point \( a \). Give a brief explanation of your illustration including how the limit as \( h \to 0 \) is demonstrated in your picture.

(c) Write the limit definition for \( f'(2) \) if \( f(x) = e^{\sin 2x} \). [You do not need to find the limit or approximate \( f'(2) \).]