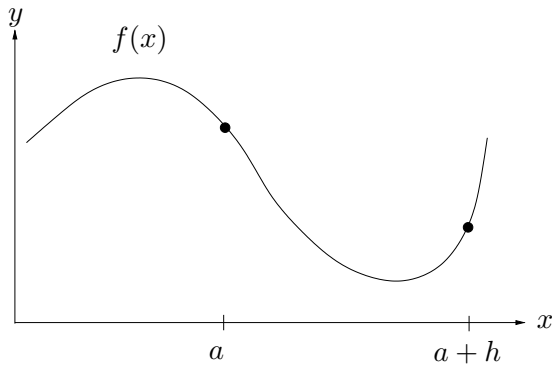
7. (10 points) For this problem f is differentiable everywhere.

(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 $f'(2)$.]