SYMBOLIC DERIVATIVE AP STYLE QUESTION **Name:**
AP Calculus

Try this fun problem!

g(x) and f(x) are both thrice-differentiable functions where $g(x) = e^{ax} + f'(x)$ where a is a constant and

$f(0) = 2$	$f'(0) = -2$	$f''(0) = 3$	$f'''(0) = -4$
$f'(-1) = 4$	$f'(1) = e^2$	$f''(1) = 2$	$f'''(1) = -3$

a) Calculate $g'(0)$ in terms of **a**
b) Calculate $g''(1)$ in terms of **e** and **a**
c) Write the equation of the line tangent to g(x) at x = 0 in terms of **a**
d) Knowing g(x) has an inflection point at x = 0 find the positive value of **a**
e) Using that value of **a**, compute the average rate of change of g(x) on the interval [0,1] in terms of **e**
f) Using that value of **a**, and h(x) = f(g(x)) compute $h'(0)$