

1999 CALCULUS AB

4. Suppose that the function f has a continuous second derivative for all x , and that $f(0) = 2$, $f'(0) = -3$, and $f''(0) = 0$. Let g be a function whose derivative is given by $g'(x) = e^{-2x}(3f(x) + 2f'(x))$ for all x .
- (a) Write an equation of the line tangent to the graph of f at the point where $x = 0$.
 - (b) Is there sufficient information to determine whether or not the graph of f has a point of inflection when $x = 0$? Explain your answer.
 - (c) Given that $g(0) = 4$, write an equation of the line tangent to the graph of g at the point where $x = 0$.
 - (d) Show that $g''(x) = e^{-2x}(-6f(x) - f'(x) + 2f''(x))$. Does g have a local maximum at $x = 0$? Justify your answer.
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