AP CALCULUS AB Dr. Paul L. Bailey

Homework 0508i Friday, May 8, 2020

Problem 1. The function g is defined on the closed interval [-4, 8]. The graph of g consists of two linear pieces and a semicircle, as show in the figure below.



Let f be the function defined by $f(x) = 3x + \int_0^x g(t) dt$.

(a) Find f(7) and f'(7).

(b) Find the value of x in the closed interval [-4,3] at which f attains its maximum value. Justify your answer.

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(c) For each of $\lim_{x\to 0^-} g'(x)$ and $\lim_{x\to 0^+} g'(x)$, find the value or state that it does not exist.

(d) Find $\lim_{x \to -2} \frac{f(x) + 7}{e^{3x+6} - 1}$.