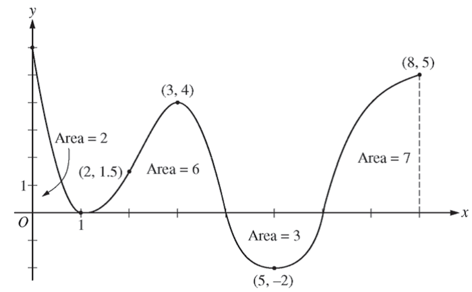
AP Calculus AB — Homework 0421

Dr. Paul L. Bailey — Tuesday, April 21, 2020

Problem 1. The figure below shows the graph of f', the derivative of a twice-differentiable function f, on the closed interval $0 \le x \le 8$.



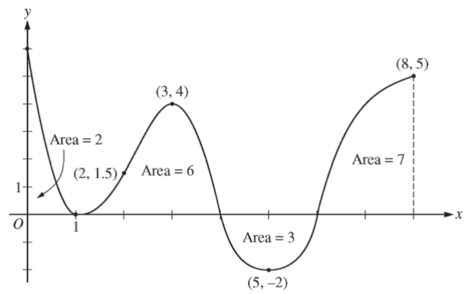
Graph of f'

The graph of f' has horizonal tangent lines at $x = 1$, $x = 3$, and $x = 5$. The areas of the regions between the graph of f' and the x-axis are labeled in the figure. The function f is defined for all real numbers and satisfies $f(8) = 4$.

(a) Find all values of x on the open interval $0 < x < 8$ for which the function f has a local minimum Justify your answer.

(b) Determine the absolute minimum value of f on the closed interval $0 \le x \le 8$. Justify your answer.

Problem 1 ((continued))**.** The figure below shows the graph of f', the derivative of a twice-differentiable function f, on the closed interval $0 \leq x \leq 8$.



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(c) On what open intervals contained in $0 < x < 8$ is the graph of f both concave down and increasing? Explain your reasoning.

(d) The function g is defined by $g(x) = (f(x))^3$. If $f(3) = -\dfrac{5}{2}$, find the slope of the line tangent to the graph of g at $x = 3$.