AP CALCULUS AB Dr. Paul L. Bailey

Homework 0421a 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  $0 \le x \le 8$ .



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  $0 \le x \le 8$ .



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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  $f(3) = -\frac{5}{2}$ , find the slope of the line tangent to the graph of g at x = 3.