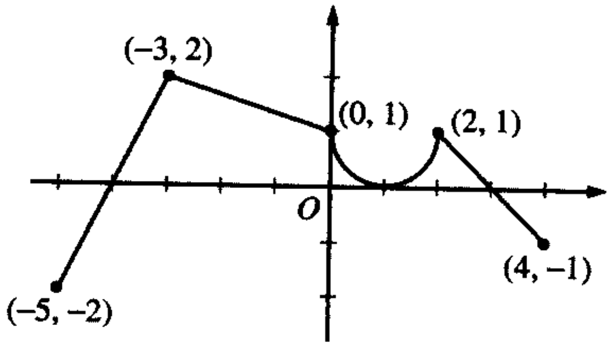
2004 AB 5 (First Fundamental Theorem of Calculus/Relative Extrema) No Calculator

1.



Graph of f

The graph of the function f shown above consists of a semicircle and three line segments. Let g be the function given by

$$g(x) = \int_{-5}^{x} f(t)\,dt$$

A) Find g(0) and $g'(0)$

B) Find all values of x in the open interval (-5,4) at which g attains a relative maximum. Justify your answer.

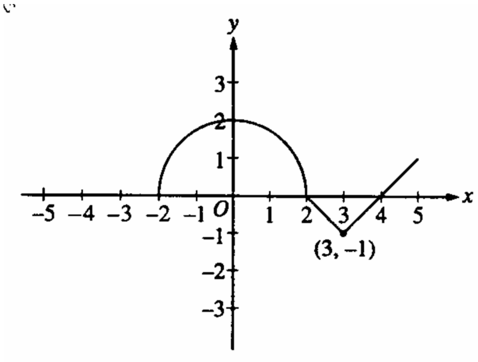
C) Find the absolute minimum value of g on the closed interval [-5,4]. Justify.

D) Find all values of x in the open interval (-5,4) at which the graph of g has a point of inflection.

1997 AB4 p.115 (1st Fund Thm of Calc/Relative Extrema/Tangent Line/Inflection Pts)

No Calculator

11. The graph of a function f consists of a semicircle and two line segments as shown. Let g be the function given by $g(x) = \int_0^x f(t)dt$



a) Find g(3)

b) Find all values of x on the open interval (-2, 5) at which g has a relative maximum. Justify your answer

c) Write an equation for the line tangent to the graph of g at x = 3

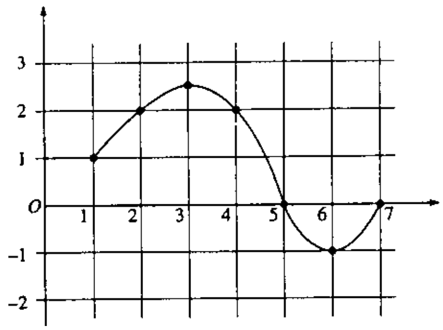
d) Find the x-coordinate of each point of inflection of the graph of g on the open interval (-2, 5). Justify your answer.

Topics (First Fundamental Theorem of Calculus/Concavity/Minimum Value of Function)

Free Response 1995 AB6 (page 96) No Calculator

12. The graph of a differentiable function f on the closed interval [1, 7] is shown.

Let $h(x)=\int_1^x f(t)\ dt$ for $1 \le x \le 7$.



a) Find h(1)

b) Find $h'(4)$

c) On what interval or intervals is the graph of h concave upward? Justify your answer.

d) Find the value of x at which h has its minimum on the closed interval [1,7]. Justify your answer.