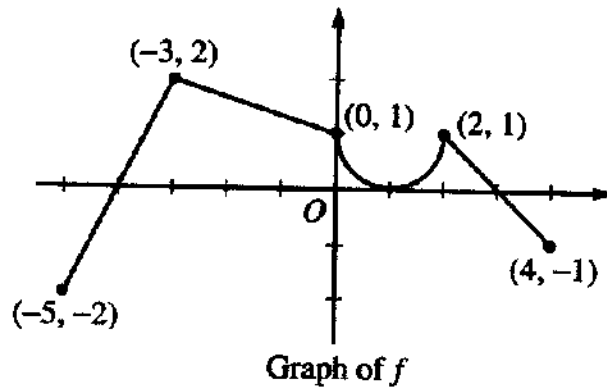


1.



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

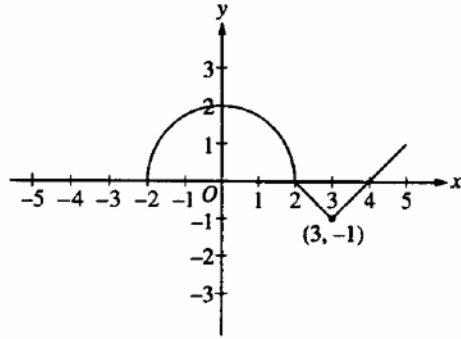
$$g(x) = \int_{-5}^x f(t) dt$$

- 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 (1<sup>st</sup> 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.

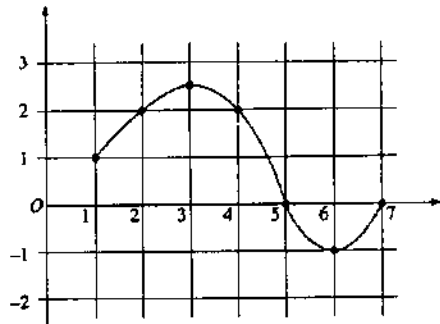
Topics (First Fundamental Theorem of Calculus/Concavity/Minimum Value of Function)

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  $1 \leq x \leq 7$ .



- Find  $h(1)$
- Find  $h'(4)$
- On what interval or intervals is the graph of  $h$  concave upward? Justify your answer.
- Find the value of  $x$  at which  $h$  has its minimum on the closed interval  $[1, 7]$ . Justify your answer.