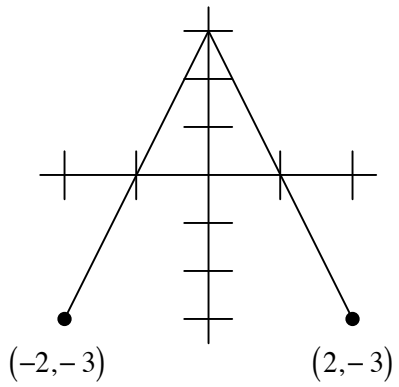
Integral as an accumulator HW

Name : _____



2002 (No Calculator)

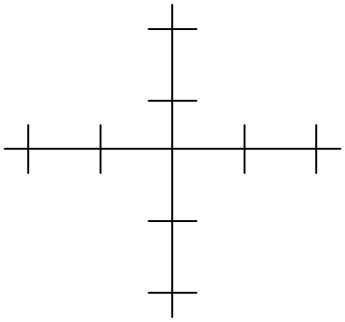
4) The graph of the function f shown above consists of two line segments. Let g be the function given by $g(x)=\int_0^x f(t)dt$.

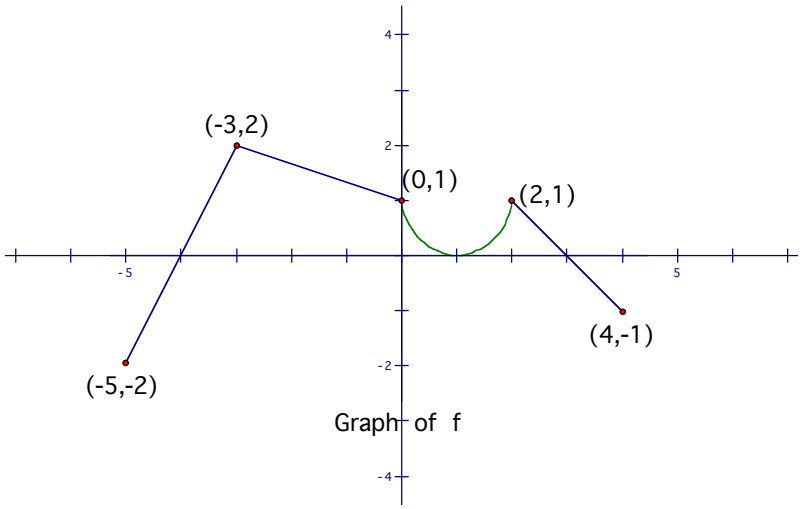
a) Find $g(-1)$, $g'(-1)$, and $g''(-1)$.

b) For what values of x in the open interval $(-2,2)$ is g increasing? Explain your reasoning.

c) For what values of x in the open interval $(-2,2)$ is the graph of g concave down? Explain your reasoning.

d) On the axes provided, sketch the graph of g on the closed interval $[-2,2]$.





2004 (No Calculator)

5) The graph of the function f shown above consists of a semicircle and three line segments. Let g be the function given by $g(x)=\int_{-3}^{x} f(t)\,dt$.

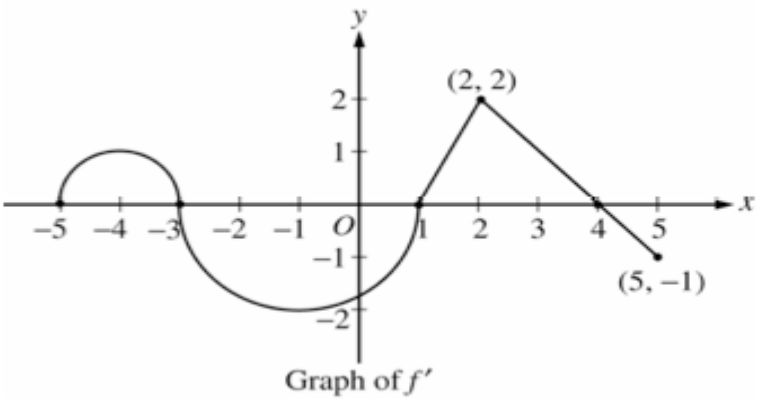
a) Find $g(0)$ and $g'(0)$.

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 your answer.

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

2007 #4 (Form B) (No Calculator)



Let f be a function defined on the closed interval $-5 \le x \le 5$ with $f(1) = 3$. The graph of f', the derivative of f, consists of two semicircles and two line segments, as shown above.

(a) For $-5 < x < 5$, find all values x at which f has a relative maximum. Justify your answer.

(b) For $-5 < x < 5$, find all values x at which the graph of f has a point of inflection. Justify your answer.

(c) Find all intervals on which the graph of f is concave up and also has positive slope. Explain your reasoning.

(d) Find the absolute minimum value of $f(x)$ over the closed interval $-5 \le x \le 5$. Explain your reasoning.