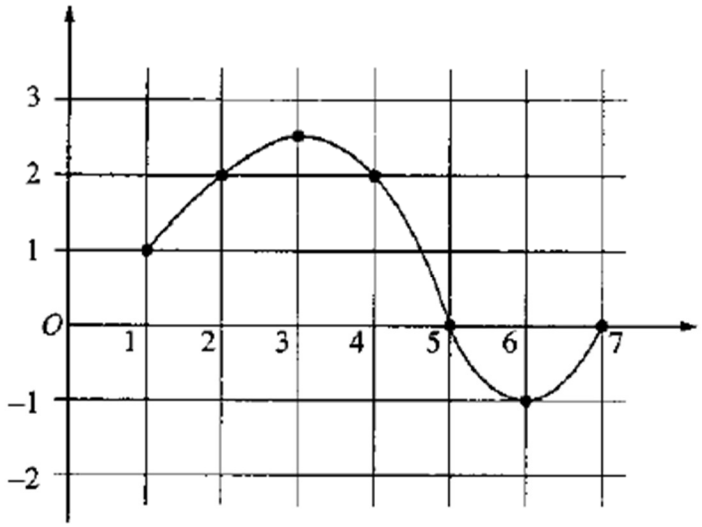
Name: _____ Derivative Graph Homework

1.



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

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

(a) Find $h(1)$.

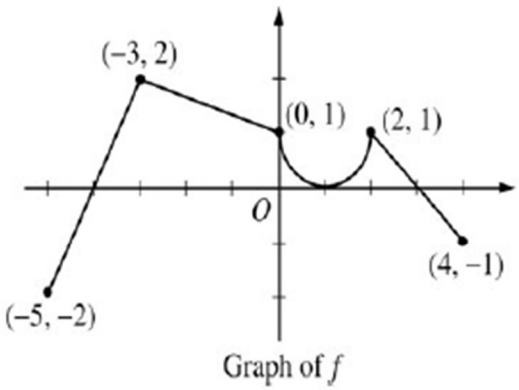
(b) Find $h'(4)$.

(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.

2.

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



Graph of f

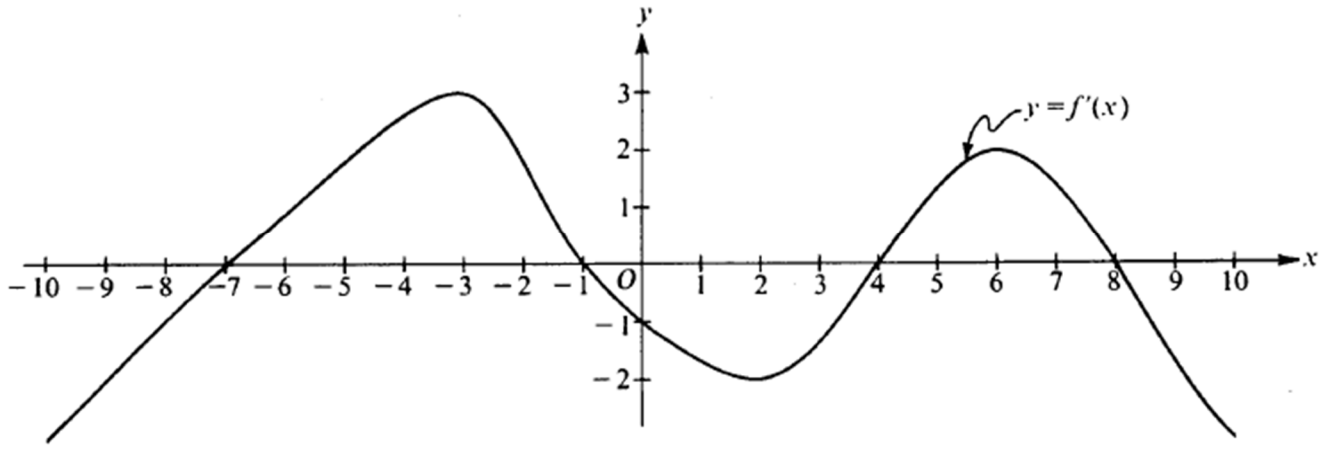
(a) Find $g(0)$ and $g'(0)$.

(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.

3.



Note: This is the graph of the derivative of f, not the graph of f.

The figure above shows the graph of f', the derivative of a function f. The domain of f is the set of all real numbers x such that $-10 \le x \le 10$.

(a) For what values of x does the graph of f have a horizontal tangent?

(b) For what values of x in the interval $(-10,10)$ does f have a relative maximum? Justify your answer.

(c) For value of x is the graph of f concave downward?