Jagged Line FRQ

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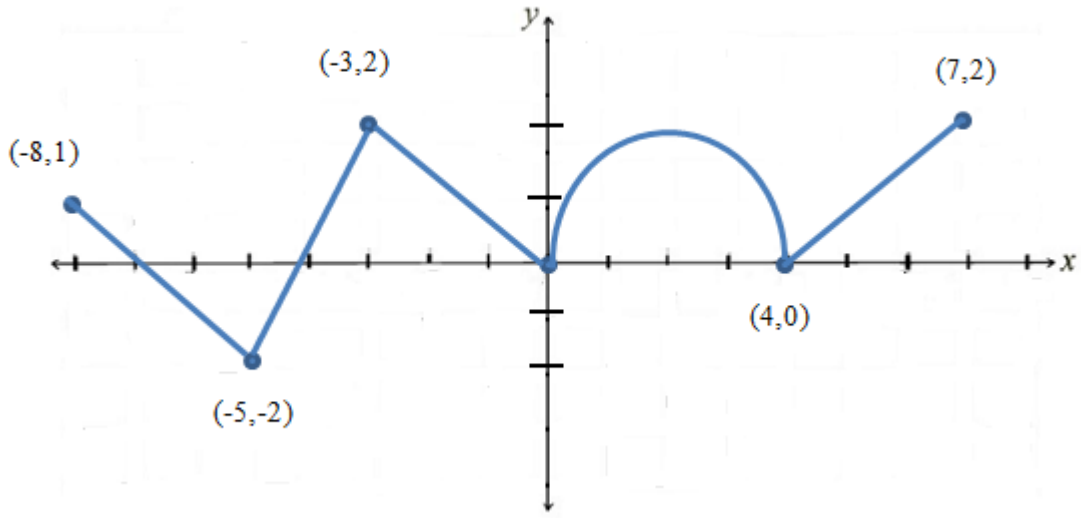
The function f is defined on the closed interval $[-8, 7]$. The graph of f, given below, consists of four line segments and one semicircle of radius 2. Let h be the function given by

$$h(x) = \int_{-3}^{x} f(t)\, dt$$



(a) Find $h(4)$ and $h'(2)$.

(b) On what open interval(s) in $(-8, 7)$ is the graph of h both increasing and convcave down? Justify your answer.

(c) At what value(s) of x does h have a point of inflection? Justify your answer.

(d) Find the value(s) of x where $h(x) = 0$. Justify your answer.

(e) The function g is defined by $g(x) = h(x)/3x^2$. Find $g'(2)$.

(f) The function p is defined by $p(x) = f(x^3 + x^2 - 6)$. Find the slope of the line tangent to the graph of p at the point where $x = -1$.