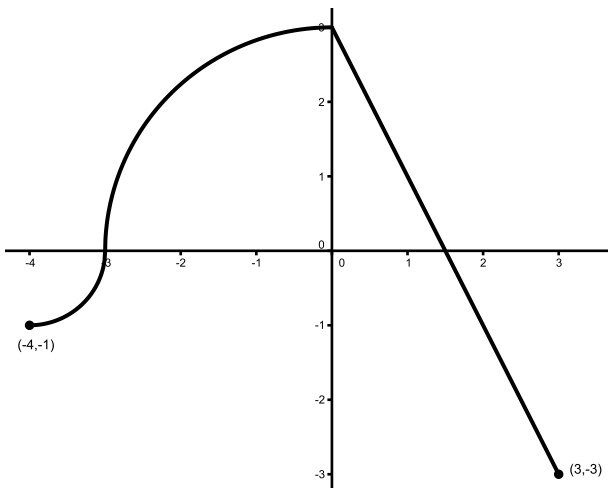


You *MAY NOT* use a calculator.



The continuous function f is defined on the interval $-4 \leq x \leq 3$. The graph of f consists of two quarter circles and one line segment, as shown in the figure above. Let $g(x) = 2x + \int_0^x f(t) dt$.

(a) Find $g(-3)$. Find $g'(x)$ and evaluate $g'(-3)$.

(b) Determine the x -coordinate of the point at which g has an absolute maximum on the interval $-4 \leq x \leq 3$.

(c) Find all values of x on the interval $-4 \leq x \leq 3$ for which the graph of g has a point of inflection. Give a reason for your answer.

(d) Find the average rate of change of f on the interval $-4 \leq x \leq 3$. There is no point c , $-4 \leq c \leq 3$, for which $f'(c)$ is equal to that average rate of change. Explain why this statement does not contradict the Mean Value Theorem.