

Answer the questions below. Incorporate your work, with additional explanations, into a written format on a separate sheet of paper or two. Write with complete sentences. Most of the grade will be determined by the clarity of your work and correctness of your written explanations. Look at the examples in our text for good ideas about expository style. Notice how the author mixes the necessary mathematical equations with sentences of logic and explanation. Notice that the exposition is almost always in present tense. And, the author frequently uses we referring to the reader and author working together on the steps of solution. These are all standard conventions in mathematical writing.

Assume the audience for your paper is someone who is familiar with Calculus terminology, but may have taken the course several years ago. Thus, you should clearly explain all of your steps.

You are allowed to work on this assignment with a partner. If you work with a partner the two of you should only hand in one copy and it should be signed by each of you.

A continuous function f is defined on $[0, 6]$ and its graph is given below. If $g(x) = \int_0^x f(t) dt$, for $0 \leq x \leq 6$, answer the following questions.

- (a) Is $g(0)$ negative, positive or zero?
Is $g(6)$ negative, positive or zero?
- (b) Find all x where $g'(x) = 0$.
- (c) Determine the intervals where g is increasing and where decreasing.
- (d) Does g have an absolute maximum and an absolute minimum?
- (e) If there are absolute extreme values for g determine the x -coordinate(s) of the place(s) where they occur and explain your answer.
- (f) Determine where the graph of g is concave up and where concave down.
- (g) Sketch a possible graph of g incorporating the properties discussed in (a) – (f) above.
- (h) If $h(x) = g(\sqrt{x})$, find $h'(4)$.

