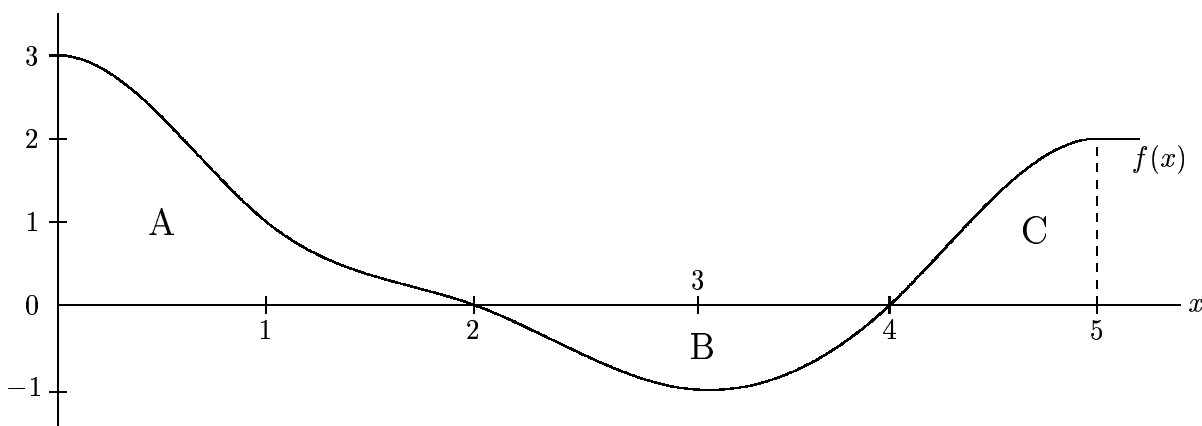**1.** (15 pts.) For $0 \le x \le 5$, let $g(x) = \int_0^x f(t)\,dt$, where f is the function whose graph is shown in the figure. The areas of the regions bounded by the graph of f and the x-axis, and labeled A, B, C are equal to 2.5, 1, and 1, respectively.

(a) Find, as accurately as you can...

(i) the values of:

$$g(2) = \underline{\hspace{1cm}}, \qquad g(4) = \underline{\hspace{1cm}}, \qquad g'(5) = \underline{\hspace{1cm}}.$$

(ii) the interval(s) on which g is decreasing.

(iii) the interval(s) on which g is concave up.

(iv) the value(s) of x and $g(x)$ for the value(s) of $0 \le x \le 5$ where $g(x)$ is largest.

(b) On the above figure, sketch as accurately as you can the graph of g. Make sure...
- that your graph is consistent with your answers to parts (a)-(d);
- to label any points on the graph where you know the coordinates of the point $(x, g(x))$.