

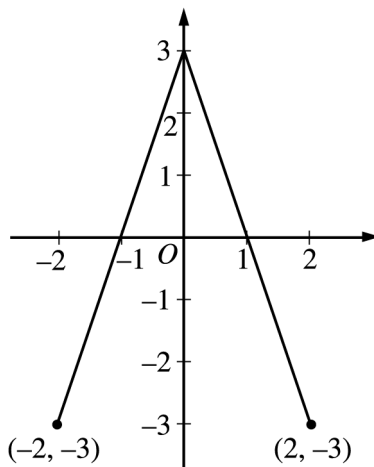
# 2002 AP<sup>®</sup> CALCULUS AB FREE-RESPONSE QUESTIONS

## CALCULUS AB SECTION II, Part B

Time—45 minutes

Number of problems—3

No calculator is allowed for these problems.



Graph of  $f$

4. The graph of the function  $f$  shown above consists of two line segments. Let  $g$  be the function given by  $g(x) = \int_0^x f(t) dt$ .
- (a) Find  $g(-1)$ ,  $g'(-1)$ , and  $g''(-1)$ .
  - (b) For what values of  $x$  in the open interval  $(-2, 2)$  is  $g$  increasing? Explain your reasoning.
  - (c) For what values of  $x$  in the open interval  $(-2, 2)$  is the graph of  $g$  concave down? Explain your reasoning.
  - (d) On the axes provided, sketch the graph of  $g$  on the closed interval  $[-2, 2]$ .  
(Note: The axes are provided in the pink test booklet only.)