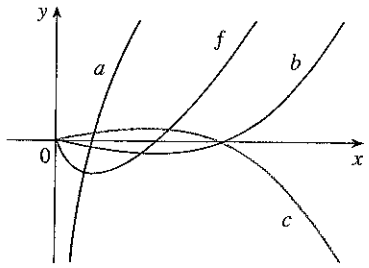
Board Problems for Day 8 for Real Analysis and Trigonometry

INSTRUCTIONS: Work these problems with several other people at your desks. After a while, we shall discuss them.

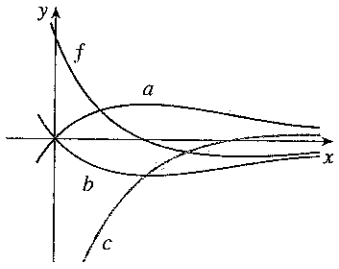
1. Use the Intermediate Value Theorem to show that there is a root of the equation $2x^3 + x^2 + 2 = 0$ in the interval $(-2, -1)$.

25–26 ■ The graph of a function f is shown. Which graph is an antiderivative of f and why?

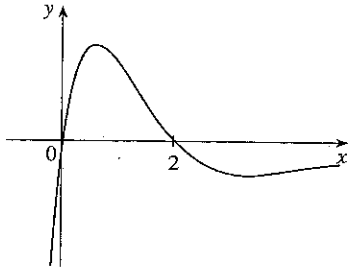
25.



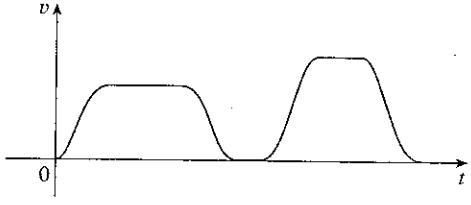
26.



27. The graph of a function is shown in the figure. Make a rough sketch of an antiderivative F, given that $F(0) = 0$.



28. The graph of the velocity function of a car is shown in the figure. Sketch the graph of the position function.



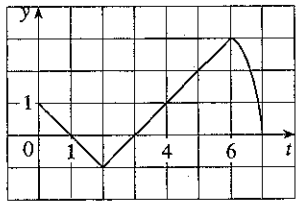
2. Let $g(x) = \int_0^x f(t)\,dt$, where f is the function whose graph is shown.

(a) Evaluate $g(x)$ for $x = 0, 1, 2, 3, 4, 5$, and 6.

(b) Estimate $g(7)$.

(c) Where does g have a maximum value? Where does it have a minimum value?

(d) Sketch a rough graph of g.



3. Let $g(x) = \int_0^x f(t)\,dt$, where f is the function whose graph is shown.

(a) Evaluate $g(0)$, $g(1)$, $g(2)$, $g(3)$, and $g(6)$.

(b) On what interval is g increasing?

(c) Where does g have a maximum value?

(d) Sketch a rough graph of g.