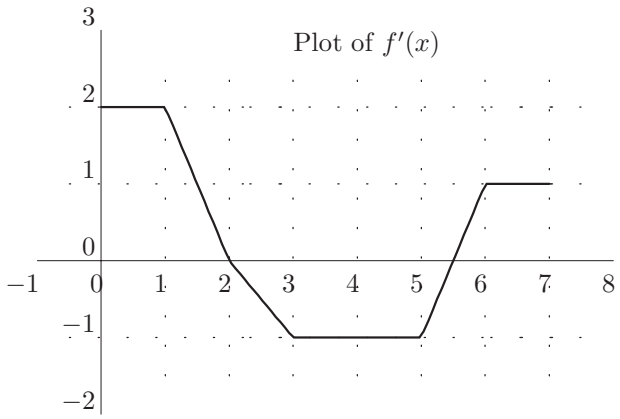
MAC 2311 Calculus 1 **Test 5** 9 Nov 2004

Directions: Show **ALL** work for credit; Give **EXACT** answers when possible; Start each problem on a **SEPARATE** page; Use only **ONE** side of each page; Be neat; Leave margins on the left and top for the **STAPLE**; Calculators can be used for graphing and calculating only; Nothing written on this page will be graded;

1. The graph (below left) is of the function $g(x)$. Let $f(x) = \int_0^x g(t)\,dt$, find the values of f to fill a table like the one below (right). Then sketch the graph of $f(x)$ carefully showing the concavity.



x	0	1	2	3	4	5	6	7
$f(x)$								

2. Compute these integrals (Hint: the Fundamental Theorem of Calculus)

$$(A) \quad \int_{-1}^{1} x^2(x+4)^2\,dx \qquad\qquad (B) \quad \int_0^{\pi} e^x + \sin x\,dx$$

3. Approximate $\int_3^5 x\cos(\pi x)\,dx$ by the left sum L_4 and the right sum R_4 and the middle point rule M_4. (Exact answers only please.)

4. A particle traveling towards a brick wall is deaccelerating so $a(t) = -10$. At time $t = 0$ the particle is 100 units from the wall and has velocity $v(0) = 60$ units/time and $s(0) = 0$ How fast is the particle going when it slams into the brick wall? That is, what is $v(t_0)$, when $s(t_0) = 100$?

5. Find the maximal area that a trapezoid inscribed into a semi-circle of radius R can have.