Do not write in the boxes immediately below.

Question:	1	2	3	4	5	6	Total
Points:	36	10	10	10	16	18	100
Score:							

MATH 2250 Exam 4

April 24, 2008

Name:_____

1. (36 points) Evaluate the following:

   (a) $\displaystyle\int \left(\frac{x^2+1}{4} - \frac{4}{x^2+1} \right) dx$

   (b) $\displaystyle\int_0^{\pi/16} \sec^2(4x)\, dx$

(c) $\displaystyle\int_1^2 2x\left(\frac{x^2+3}{x^2}\right)\,dx$

2. (10 points) For each of the following, answer True or False:

(a) $\displaystyle\lim_{x\to 3}\left(\frac{x-3}{x^2-3}\right) = \lim_{x\to 3}\left(\frac{1}{2x}\right) = \frac{1}{6}.$

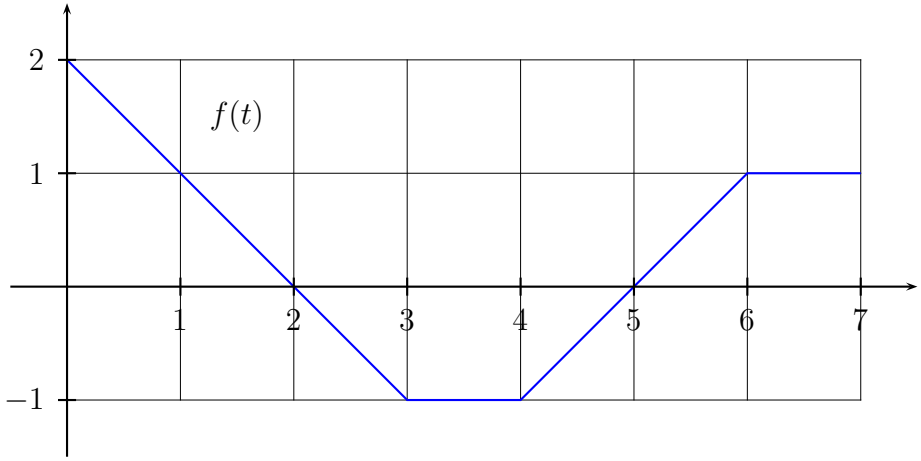
(b) For any function $f(x)$, there is at most one function $F(x)$ such that $F'(x) = f(x)$.

3. (10 points) Let $f(x) = \displaystyle\int_2^{\ln x} (t+1)\cos(t^2)\,dt$. Find $f'(x)$.

4. (10 points) Approximate $\displaystyle\int_{-1}^{1} x^3\,dx$ by using a Riemann sum with $n = 4$ and left endpoints.

5. (16 points) Evaluate $\lim_{x \to 0} (\cos x - \sin x)^{2/\sin x}$.

6. (18 points) Let $f(t)$ be the function whose graph is shown below, and let $g(x) = \int_1^x f(t)\,dt$.



Compute the following:

(a) $\int_1^6 f(t)\,dt$

(b) $\int_1^0 f(t)\,dt$

(c) $g'(2)$

(d) $g'(4)$