

Name: \_\_\_\_\_ Section Number: \_\_\_\_\_

TA Name: \_\_\_\_\_ Section Time: \_\_\_\_\_

**Math 10B.**  
**Midterm Exam 1**  
**January 30, 2006**

*Turn off and put away your cell phone.*

*Read each question carefully, and answer each question completely.*

*Show all of your work. No credit will be given for unsupported answers.*

*Write your solutions clearly and legibly. No credit will be given for illegible solutions.*

1. (4 points) Suppose that  $f$  and  $g$  are continuous functions such that

$$\int_0^5 f(x) dx = 5, \quad \int_4^5 f(x) dx = 11, \quad \int_0^5 g(x) dx = 3, \quad \text{and} \quad \int_4^5 g(x) dx = -3.$$

Find the value of each of the following definite integrals:

(a)  $\int_0^4 f(x) dx$

(b)  $\int_4^5 [g(x) - f(x)] dx$

(c)  $\int_{-5}^5 f(x) dx$ , given that  $f$  is an even function

(d)  $\int_{-4}^4 g(x) dx$ , given that  $g$  is an odd function

#	Score
1	
2	
3	
4	
$\Sigma$	

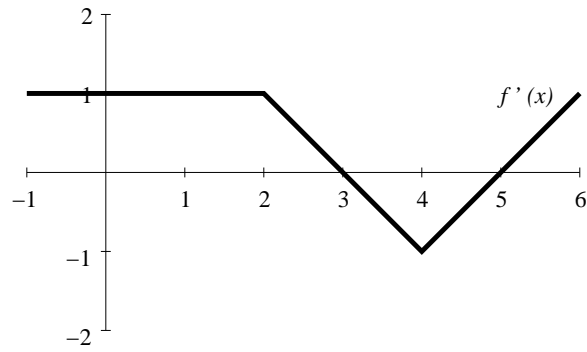
2. (4 points) Values of a function  $f$  for  $0 \leq x \leq 16$  are tabulated below.

$x$	0	2	4	6	8	10	12	14	16
$f(x)$	80	52	40	31	23	17	11	5	0

(a) Find an upper estimate for  $\int_0^{16} f(x) dx$  using 4 subintervals ( $n = 4$ ).

(b) Find an upper estimate for  $\int_0^{16} f(x) dx$  using 8 subintervals ( $n = 8$ ).

3. (4 points) Let  $f(x)$  be a function whose *derivative* is graphed below.



(a) At what value(s) of  $x$  does the graph of  $f$  (not shown) have a local minimum?

(b) Suppose  $f(0) = 3$ . Use the graph to compute the value of  $f(5)$ .

4. (4 points) Find the area of the region between the curves  $y = 3 \cos(x)$  and  $y = 3 \sin(x)$  for  $\frac{\pi}{4} \leq x \leq \frac{\pi}{2}$ .