



University of California, San Diego
Department of Mathematics

Instructions

1. Write your *Name*, *PID*, *Section*, and *Exam Version* on the front of your Blue Book.
2. No calculators or other electronic devices are allowed during this exam.
3. You may use one page of notes, but no books or other assistance during this exam.
4. Write your solutions clearly in your Blue Book.
 - (a) Carefully indicate the number and letter of each question and question part.
 - (b) Present your answers in the same order they appear in the exam.
 - (c) Start each problem on a new page.
5. Show all of your work. No credit will be given for unsupported answers.
6. Turn in your exam paper with your Blue Book.
7. NOTE: This exam has two sides.

0. (1 point) Carefully read and complete the instructions at the top of this exam sheet and any additional instructions written on the chalkboard during the exam.

1. (6 points) A toy rocket flies straight up. After t seconds in the air, the velocity of the rocket is $v(t)$ feet per second. The value of $v(t)$ for several values of t is given in the table below.

t	0	10	20	30
$v(t)$	0	1	4	9

- (a) Compute L_3 (the left sum with $N = 3$).
- (b) Compute R_3 (the right sum with $N = 3$).

2. (18 points) (a) Let f be an *odd* function such that $\int_{-2}^3 f(x) dx = 7$.

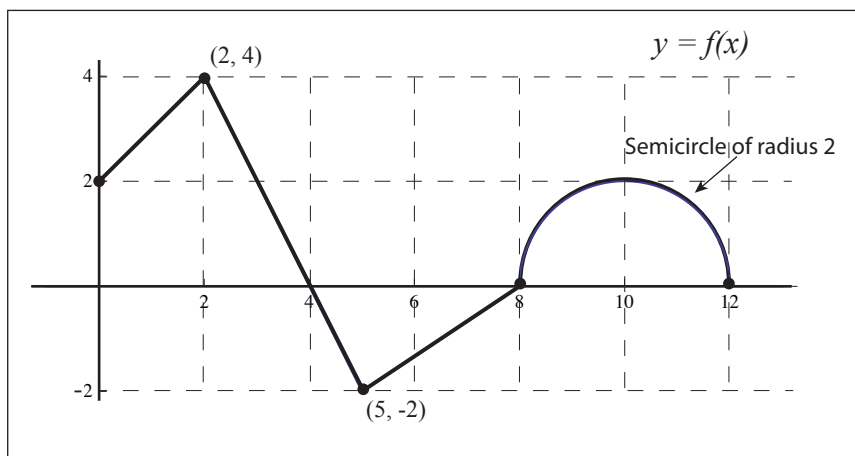
Compute $\int_2^3 [f(x) + 2] dx$.

(b) Let g be an *even* function such that $\int_{-2}^3 g(x) dx = 5$ and $\int_0^2 g(x) dx = 2$.

Compute $\int_2^3 [g(x) + 1] dx$.

(c) Find the *average value* of $2f(x) - g(x)$ over the interval $[2, 3]$.

3. (10 points) The following is the graph of $y = f(x)$.



- (a) Compute $\int_0^{12} f(x) dx$.
- (b) If $F'(x) = f(x)$ and $F(0) = 15$, what is $F(12)$?
- (c) If $F'(x) = f(x)$ and $F(0) = 0$, then find one value x_0 in the interval $[0, 8]$ for which $F(x_0) = 10$.
4. (15 points) Compute the given definite and indefinite integrals.

(a) $\int_0^1 (\sqrt{x} - 3e^x) dx$

(b) $\int (4 \cos(t) - 3) dt$

(c) $\int \frac{(u^2 - 3)^2}{u} du$