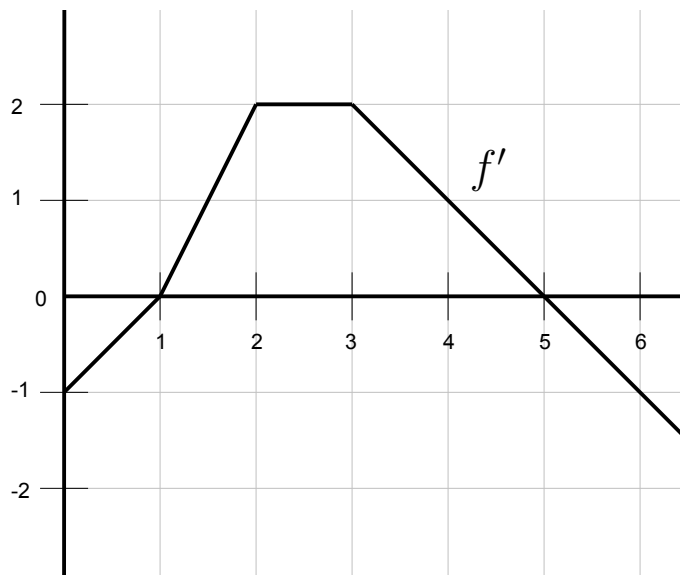


## Practice Midterm 1

1. (a) Suppose that  $f(x)$  is an even function and that  $\int_0^4 f(x)dx = 6$ , and that  $\int_{-2}^2 f(x)dx = 2$ . Find  $\int_2^4 f(x)dx$ .
- (b) Suppose that  $g(x)$  is an odd function and that  $\int_0^4 g(x)dx = 3$ , and  $\int_0^2 g(x)dx = 1$ . Find  $\int_{-2}^4 g(x)dx$ .
2. Draw an area that represents the definite integral  $\int_0^3 \sqrt{9-x^2} dx$ . Evaluate this integral.
3. Suppose  $f'(x)$  is given by the graph below, and that  $f(0) = \frac{3}{2}$ . Complete the table of values for  $f(x)$ .

$x$	0	1	3	5
$f(x)$	$\frac{3}{2}$			



4. Find the following indefinite integrals.

(a)  $\int \pi x^2 + \frac{1}{\pi x^2} dx$

(b)  $\int \sqrt{x} - \frac{1}{x\sqrt{x}} dx$

(c)  $\int e^t + e^3 dt$

(d)  $\int \frac{2}{x} + \frac{x}{2} dx$

5. Write down the left and right Riemann sums for three equal intervals for the integral

$$\int_1^2 \frac{1}{x} dx.$$

Without using your calculator explain why

$$\frac{47}{60} \geq \ln(2) \geq \frac{37}{60}.$$

6. Use the Fundamental Theorem of Calculus to compute the following definite integrals.

(a)  $\int_1^3 \frac{1}{t^2} dt$

(b)  $\int_0^\pi (3 \sin x + x + 5) dx$

7. Find the derivative of  $x \ln(x) - x$ . Calculate  $\int_2^3 \ln(x) dx$ .

8. Find the derivative of  $G(x) = \int_{\sin x}^{x^3} t\sqrt{t^4 + 1} dt$

9. The average value of a function  $f(x)$  for  $1 \leq x \leq 5$  is equal to 7, and the average value of the same function  $f(x)$  for  $5 \leq x \leq 8$  is equal to 3. What is the average value of  $f(x)$  for  $1 \leq x \leq 8$ ?