

## Chapter 5.2 Worksheet Problems

**39–46. Definite integrals** Use geometry (not Riemann sums) to evaluate the following definite integrals. Sketch a graph of the integrand, show the region in question, and interpret your result.

44.  $\int_{-1}^3 \sqrt{4 - (x - 1)^2} dx$

46.  $\int_1^{10} g(x) dx$ , where  $g(x) = \begin{cases} 4x & \text{if } 0 \leq x \leq 2 \\ -8x + 16 & \text{if } 2 < x \leq 3 \\ -8 & \text{if } x > 3 \end{cases}$

**51. Properties of integrals** Use only the fact that  $\int_0^4 3x(4 - x) dx = 32$ , and the definitions and properties of integrals, to evaluate the following integrals, if possible.

a.  $\int_4^0 3x(4 - x) dx$

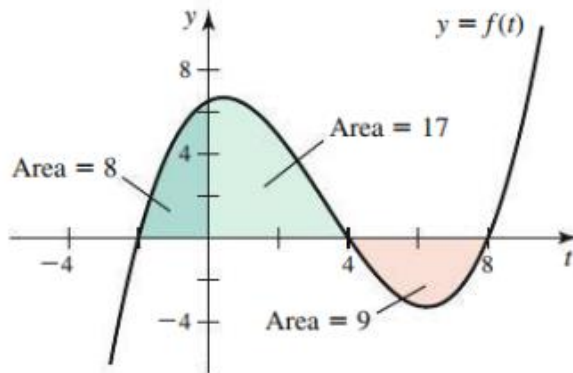
b.  $\int_0^4 x(x - 4) dx$

c.  $\int_4^0 6x(4 - x) dx$

d.  $\int_0^8 3x(4 - x) dx$

## Chapter 5.3 Worksheet Problems

- 13. Area functions** The graph of  $f$  is shown in the figure. Let  $A(x) = \int_{-2}^x f(t) dt$  and  $F(x) = \int_4^x f(t) dt$  be two area functions for  $f$ . Evaluate the following area functions.
- a.  $A(-2)$    b.  $F(8)$    c.  $A(4)$    d.  $F(4)$    e.  $A(8)$



Evaluate the following by using FTC:

49.  $\int_1^8 \sqrt[3]{y} dy$

50.  $\frac{1}{2} \int_0^{\ln 2} e^x dx$

51.  $\int_1^4 \frac{x-2}{\sqrt{x}} dx$

52.  $\int_1^2 \frac{2s^2 - 4}{s^3} ds$

**63–66. Area** Find (i) the net area and (ii) the area of the following regions. Graph the function and indicate the region in question.

- 63.** The region bounded by  $y = x^{1/2}$  and the  $x$ -axis between  $x = 1$  and  $x = 4$

Evaluate the definite integrals.

**69.**  $\int_0^2 x^3 \sqrt{16 - x^4} dx$

**70.**  $\int_{-1}^1 (x - 1)(x^2 - 2x)^7 dx$