6.1	1, 3, 5, 7, 14, 19, 22, 24, 25, 57
6.2	1, 3, 7, 9, 13, 15, 27-30, 41, 43, 48, 49, 54, 58, 59

1–4 Find the area of the shaded region.



5–12 Sketch the region enclosed by the given curves. Decide whether to integrate with respect to x or y. Draw a typical approximating rectangle and label its height and width. Then find the area of the region.

5. $y = e^x$, $y = x^2 - 1$, x = -1, x = 1

7. $y = (x - 2)^2$, y = x

13–28 Sketch the region enclosed by the given curves and find its area.

14.
$$y = x^2$$
, $y = 4x - x^2$ **22.** $y = x^3$, $y = x$ **24.** $y = \cos x$, $y = 1 - \cos x$, $0 \le x \le \pi$ **19.** $y = \cos \pi x$, $y = 4x^2 - 1$ **25.** $y = x^4$, $y = 2 - |x|$

57. Find the number *b* such that the line y = b divides the region bounded by the curves $y = x^2$ and y = 4 into two regions with equal area.

1–18 Find the volume of the solid obtained by rotating the region bounded by the given curves about the specified line. Sketch the region, the solid, and a typical disk or washer.

1. y = x + 1, y = 0, x = 0, x = 2; about the *x*-axis **3.** $y = \sqrt{x - 1}$, y = 0, x = 5; about the *x*-axis **7.** $y = x^3$, y = x, $x \ge 0$; about the *x*-axis **9.** $y^2 = x$, x = 2y; about the *y*-axis **13.** $y = 1 + \sec x$, y = 3; about y = 1**15.** $y = x^3$, y = 0, x = 1; about x = 2

39–42 Each integral represents the volume of a solid. Describe the solid.

41.
$$\pi \int_0^1 (y^4 - y^8) \, dy$$

- **43.** A CAT scan produces equally spaced cross-sectional views of a human organ that provide information about the organ otherwise obtained only by surgery. Suppose that a CAT scan of a human liver shows cross-sections spaced 1.5 cm apart. The liver is 15 cm long and the cross-sectional areas, in square centimeters, are 0, 18, 58, 79, 94, 106, 117, 128, 63, 39, and 0. Use the Midpoint Rule to estimate the volume of the liver.
- **54.** The base of *S* is a circular disk with radius *r*. Parallel cross-sections perpendicular to the base are squares.



19–30 Refer to the figure and find the volume generated by rotating the given region about the specified line.



48. A frustum of a right circular cone with height *h*, lower base radius *R*, and top radius *r*



49. A cap of a sphere with radius *r* and height *h*



- **58.** The base of *S* is the region enclosed by the parabola $y = 1 x^2$ and the *x*-axis. Cross-sections perpendicular to the *y*-axis are squares.
- **59.** The base of *S* is the same base as in Exercise 58, but cross-sections perpendicular to the *x*-axis are isosceles triangles with height equal to the base.