| 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.
1.

3.


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. $y=e^{x}, \quad y=x^{2}-1, \quad x=-1, \quad x=1$
7. $y=(x-2)^{2}, y=x$

13-28 Sketch the region enclosed by the given curves and find its area.
14. $y=x^{2}, \quad y=4 x-x^{2}$
19. $y=\cos \pi x, \quad y=4 x^{2}-1$
22. $y=x^{3}, \quad y=x$
24. $y=\cos x, \quad y=1-\cos x, \quad 0 \leqslant x \leqslant \pi$
25. $y=x^{4}, \quad y=2-|x|$
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
2. $y=\sqrt{x-1}, y=0, x=5 ; \quad$ about the $x$-axis
3. $y=x^{3}, y=x, x \geqslant 0$; about the $x$-axis
4. $y^{2}=x, x=2 y ; \quad$ about the $y$-axis
5. $y=1+\sec x, y=3$; about $y=1$
6. $y=x^{3}, y=0, x=1 ; \quad$ about $x=2$

39-42 Each integral represents the volume of a solid. Describe the solid.
41. $\pi \int_{0}^{1}\left(y^{4}-y^{8}\right) d y$
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 crosssections 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.

27. $\mathscr{R}_{3}$ about $O A$
28. $\mathscr{R}_{3}$ about $O C$
29. $\mathscr{R}_{3}$ about $A B$
30. $\mathscr{R}_{3}$ about $B C$
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 crosssections perpendicular to the $x$-axis are isosceles triangles with height equal to the base.

