

STEWART

6.2

1-12 ■ 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.”

- $y = 1/x$, $x = 1$, $x = 2$, $y = 0$; about the x -axis
- $y = e^x$, $y = 0$, $x = 0$, $x = 1$; about the x -axis
- $y = x^2$, $0 \leq x \leq 2$, $y = 4$, $x = 0$; about the y -axis
- $x = y - y^2$, $x = 0$; about the y -axis
- $y = x^2$, $y^2 = x$; about the x -axis
- $y = \sec x$, $y = 1$, $x = -1$, $x = 1$; about the x -axis
- $y^2 = x$, $x = 2y$; about the y -axis
- $y = x^{2/3}$, $x = 1$, $y = 0$; about the y -axis
- $y = x$, $y = \sqrt{x}$; about $y = 1$
- $y = 1/x$, $y = 0$, $x = 1$, $x = 3$; about $y = -1$
- $y = x^2$, $x = y^2$; about $x = -1$
- $y = x$, $y = \sqrt{x}$; about $x = 2$

- The region enclosed by the curves $x = 4y$ and $y = \sqrt[3]{x}$ in the first quadrant is rotated about the line $x = 8$. Find the volume of the resulting solid.
- Find the volume of the solid obtained by rotating the region in Exercise 13 about the line $y = 2$.

15-16 ■ Use a graph to find approximate x -coordinates of the points of intersection of the given curves. Then find (approximately) the volume of the solid obtained by rotating about the x -axis the region bounded by these curves.

- $y = x^2$, $y = \ln(x + 1)$
- $y = 3 \sin(x^2)$, $y = e^{x/2} + e^{-2x}$

17-18 ■ Each integral represents the volume of a solid. Describe the solid.

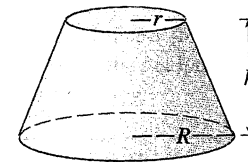
- (a) $\pi \int_0^{\pi/2} \cos^2 x \, dx$ (b) $\pi \int_0^1 (y^4 - y^8) \, dy$
- (a) $\pi \int_2^5 y \, dy$ (b) $\pi \int_0^{\pi/2} [(1 + \cos x)^2 - 1^2] \, dx$

- 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.
- A log 10 m long is cut at 1-meter intervals and its cross-sectional areas A (at a distance x from the end of the log) are listed in the table. Use the Midpoint Rule with $n = 5$ to estimate the volume of the log.

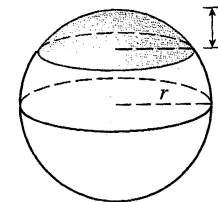
x (m)	A (m ²)	x (m)	A (m ²)
0	0.68	6	0.53
1	0.65	7	0.55
2	0.64	8	0.52
3	0.61	9	0.50
4	0.58	10	0.48
5	0.59		

21-23 ■ Find the volume of the described solid S .

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



- A cap of a sphere with radius r and height h



- A frustum of a pyramid with square base of side b , square top of side a , and height h

