Section 7.2 (page 465)

1. $\pi\int_0^1 (-x+1)^2\,dx = \frac{\pi}{3}$ **3.** $\pi\int_1^4 \left(\sqrt{x}\right)^2 dx = \frac{15\pi}{2}$

5. $\pi\int_0^1 [(x^2)^2 - (x^5)^2]\,dx = \frac{6\pi}{55}$ **7.** $\pi\int_0^4 \left(\sqrt{y}\right)^2 dy = 8\pi$

9. $\pi\int_0^1 (y^{3/2})^2\,dy = \frac{\pi}{4}$

11. (a) $9\pi/2$ (b) $\left(36\pi\sqrt{3}\right)/5$ (c) $\left(24\pi\sqrt{3}\right)/5$
(d) $\left(84\pi\sqrt{3}\right)/5$

13. (a) $32\pi/3$ (b) $64\pi/3$ **15.** 18π

17. $\pi\left(48\ln 2 - \frac{27}{4}\right) \approx 83.318$ **19.** $124\pi/3$ **21.** $832\pi/15$

23. $\pi \ln 5$ **25.** $2\pi/3$ **27.** $(\pi/2)(1 - 1/e^2) \approx 1.358$

29. $277\pi/3$ **31.** 8π **33.** $\pi^2/2 \approx 4.935$

35. $(\pi/2)(e^2 - 1) \approx 10.036$ **37.** 1.969 **39.** 15.4115

41. $\pi/3$ **43.** $2\pi/15$ **45.** $\pi/2$ **47.** $\pi/6$

49. (a) The area appears to be close to 1 and therefore the volume (area squared $\times\ \pi$) is near 3.

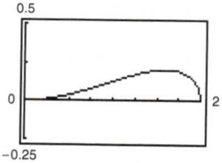
51. A sine curve on $[0, \pi/2]$ revolved about the x-axis

53. The parabola $y = 4x - x^2$ is a horizontal translation of the parabola $y = 4 - x^2$. Therefore, their volumes are equal.

55. (a) This statement is true. Explanations will vary.
(b) This statement is false. Explanations will vary.

57. 18π **59.** Proof **61.** $\pi r^2 h[1 - (h/H) + h^2/(3H^2)]$

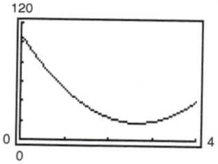
63.



$\pi/30$

65. (a) 60π (b) 50π

67. (a) $V = \pi\left(4b^2 - \frac{64}{3}b + \frac{512}{15}\right)$
(b)



$b \approx 2.67$

(c) $b = \frac{8}{3} \approx 2.67$

69. (a) ii; right circular cylinder of radius r and height h
(b) iv; ellipsoid whose underlying ellipse has the equation $(x/b)^2 + (y/a)^2 = 1$
(c) iii; sphere of radius r
(d) i; right circular cone of radius r and height h
(e) v; torus of cross-sectional radius r and other radius R

71. (a) $\frac{81}{10}$ (b) $\frac{9}{2}$ **73.** $\frac{16}{3}r^3$ **75.** $V = \frac{4}{3}\pi(R^2 - r^2)^{3/2}$

77. 19.7443 **79.** (a) $\frac{2}{3}r^3$ (b) $\frac{2}{3}r^3 \tan\theta$; As $\theta \to 90°$, $V \to \infty$.