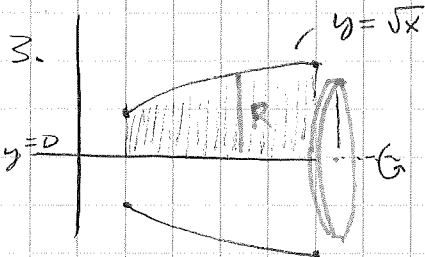


7-#3: p. 463: 3, 5, 7, 10, 11b, 12ab, 25, 32, 33, 38, 47 and Homework



$$R = \sqrt{x}$$

$$A = \pi (\sqrt{x})^2$$

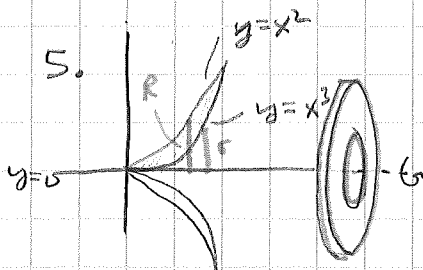
$$= \pi x$$

$$V = \pi \int_0^4 x \, dx$$

$$= \pi \left[\frac{1}{2} x^2 \right]_0^4$$

$$= \frac{\pi}{2} [4^2 - 0]$$

$$= \frac{\pi}{2} [16 - 0] = \boxed{8\pi}$$



$$R = x^2$$

$$r = x^3$$

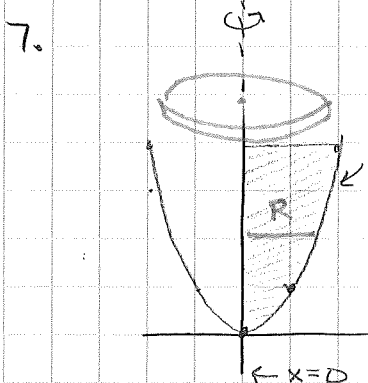
$$A = \pi (x^2)^2 - \pi (x^3)^2$$

$$= \pi [x^4 - x^6]$$

$$V = \pi \int_0^1 x^4 - x^6 \, dx$$

$$= \pi \left[\frac{1}{5} x^5 - \frac{1}{7} x^7 \right]_0^1$$

$$= \pi \left[\frac{1}{5} - \frac{1}{7} \right] = \boxed{\frac{2\pi}{35}}$$



$$R = \sqrt{y}$$

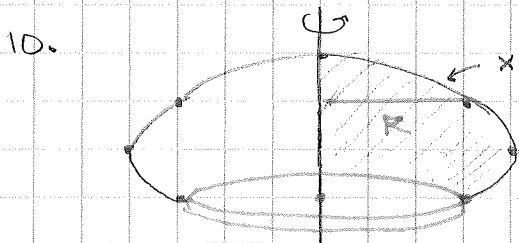
$$A = \pi (\sqrt{y})^2$$

$$= \pi y$$

$$V = \pi \int_0^8 y \, dy$$

$$= \pi \left[\frac{1}{2} y^2 \right]_0^8$$

$$= \pi [8^2 - 0] = \boxed{64\pi}$$



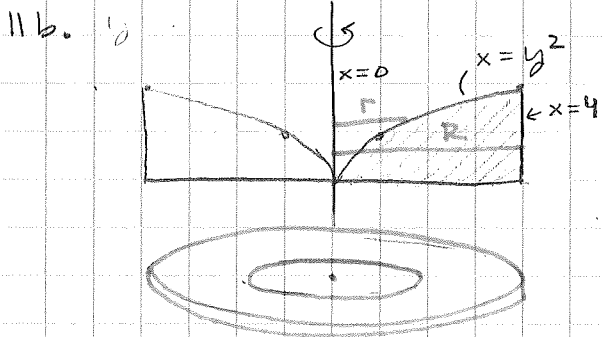
$$R = -y^2 + 4y$$

$$A = \pi (-y^2 + 4y)^2$$

$$A = \pi (y^4 - 8y^3 + 16y^2)$$

$$V = \int_0^4 \pi (y^4 - 8y^3 + 16y^2) \, dy$$

$$= \boxed{\frac{153\pi}{5}}$$



$$R = 4$$

$$r = y^2$$

$$A = \pi (4)^2 - \pi (y^2)^2$$

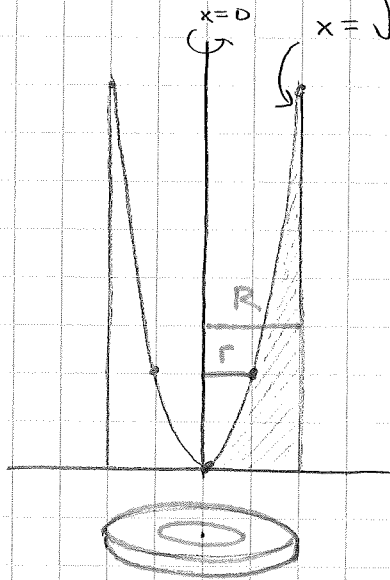
$$= \pi (16 - y^4)$$

$$V = \pi \int_0^2 16 - y^4 \, dy$$

$$= \pi \left[16y - \frac{1}{5} y^5 \right]_0^2$$

$$= \pi \left[32 - \frac{32}{5} \right] = \boxed{\frac{128\pi}{5}}$$

12 a.



$$y = 2x^2$$

$$y/2 = x^2$$

$$x = \sqrt{y/2}$$

$$R = 2$$

$$r = \sqrt{y/2}$$

$$A = \pi(2)^2 - \pi(\sqrt{y/2})^2$$

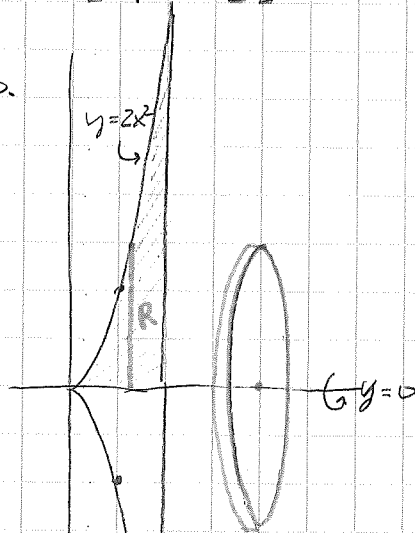
$$= \pi[4 - y/2]$$

$$V = \pi \int_0^8 4 - \frac{1}{2}y \, dy$$

$$\pi [4y - \frac{1}{4}y^2]_0^8$$

$$\pi [32 - 16] = \boxed{16\pi}$$

b.



$$R = 2x^2$$

$$A = \pi(2x^2)^2$$

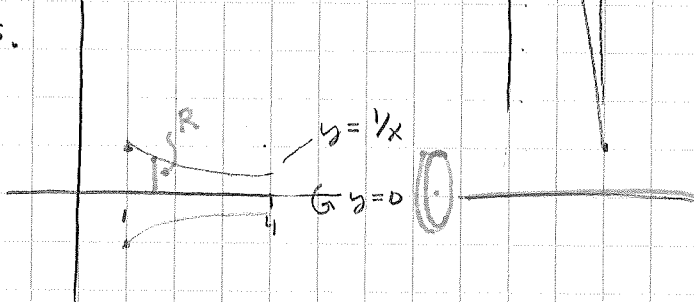
$$= 4\pi x^4$$

$$V = 4\pi \int_0^2 x^4 \, dx$$

$$4\pi [\frac{1}{5}x^5]_0^2$$

$$\frac{4\pi}{5} [2^5] = \boxed{\frac{128\pi}{5}}$$

25.



$$R = 1/x$$

$$A = \pi(1/x)^2$$

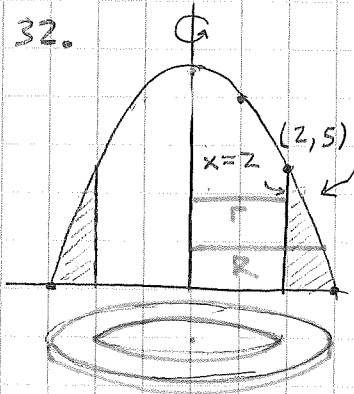
$$A = \pi \frac{1}{x^2}$$

$$V = \pi \int_1^4 x^{-2} \, dx$$

$$= \pi [-x^{-1}]_1^4$$

$$= -\pi [1/4 - 1] = \boxed{3\pi/4}$$

32.



$$y = 9 - x^2$$

$$y - 9 = -x^2$$

$$9 - y = x^2$$

$$x = \sqrt{9 - y}$$

$$R = \sqrt{9 - y}$$

$$r = 2$$

$$A = \pi(\sqrt{9 - y})^2 - \pi(2)^2$$

$$= \pi(9 - y - 4)$$

$$= \pi(5 - y)$$

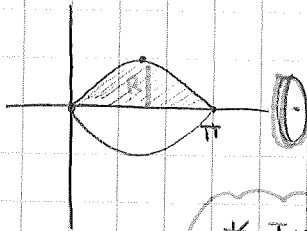
$$V = \pi \int_0^5 5 - y \, dy$$

$$\pi [5y - \frac{1}{2}y^2]_0^5$$

$$\pi [25 - 25/2]$$

$$\boxed{25\pi/2}$$

33.



$$R = \sin x$$

$$A = \pi (\sin x)^2$$

$$= \pi \sin^2 x$$

* Trig Identity

$$\sin^2 \theta = \frac{1 - \cos(2\theta)}{2}$$

$$V = \pi \int_0^{\pi} \sin^2 x \, dx$$

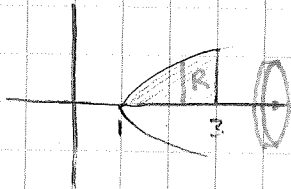
$$= \pi \int_0^{\pi} \frac{1 - \cos(2x)}{2} \, dx$$

$$= \frac{\pi}{2} \int_0^{\pi} 1 - \cos(2x) \, dx$$

$$= \frac{\pi}{2} [x - \frac{1}{2} \sin(2x)]_0^{\pi}$$

$$= \frac{\pi}{2} [(\pi - 0) - (0 - 0)] = \boxed{\frac{\pi^2}{2}}$$

38.

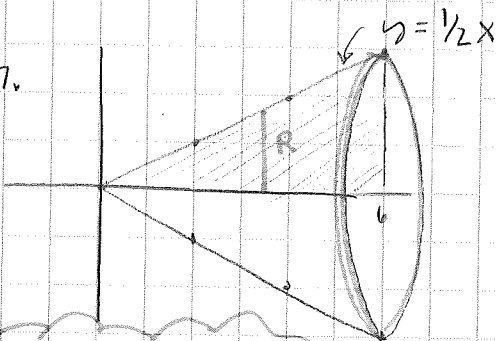


$$R = \ln(x)$$

$$A = \pi \ln^2(x)$$

$$V = \pi \int_1^3 \ln^2(x) \, dx = \boxed{3.233}$$

47.



$$R = \frac{1}{2}x$$

$$A = \pi \left(\frac{1}{2}x\right)^2$$

$$= \frac{\pi}{4}x^2$$

$$V = \int_0^6$$

$$V = \frac{\pi}{4} \int_0^6 x^2 \, dx$$

$$= \frac{\pi}{4} \left[\frac{1}{3}x^3 \right]_0^6$$

$$= \frac{\pi}{4} \cdot \frac{1}{3} [6^3 - 0]$$

$$= \frac{216\pi}{12} = \boxed{18\pi}$$

Geometry

$$\text{Cone: } V = \frac{1}{3}\pi r^2 h \quad r = 3 \quad h = 6$$

$$V = \frac{1}{3}\pi (3^2)(6)$$

$$= \frac{1}{3}\pi (9)(6)$$

$$= 18\pi \quad \ddot{\smile}$$