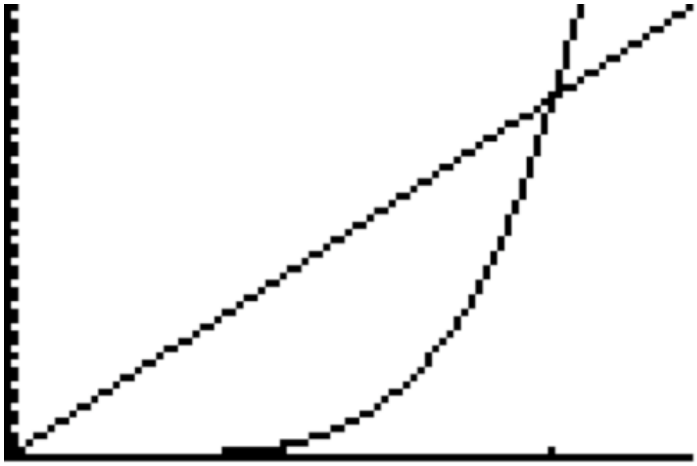
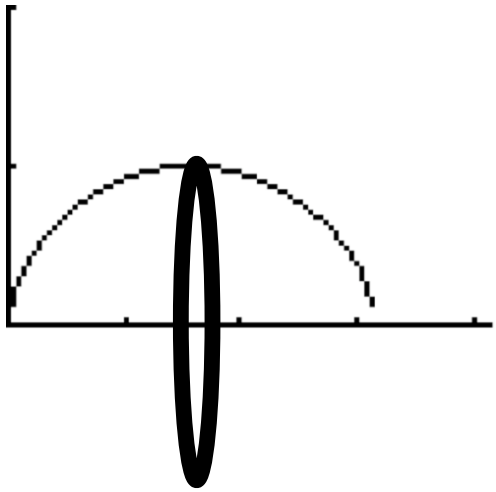
Answers to Chapter 6 Review

1.



$$\int_0^2 (16x - x^5)\,dx = \left[8x^2 - \frac{1}{6}x^6\right]_0^2 = 32 - \frac{64}{6} = \frac{128}{6} = \frac{64}{3}$$

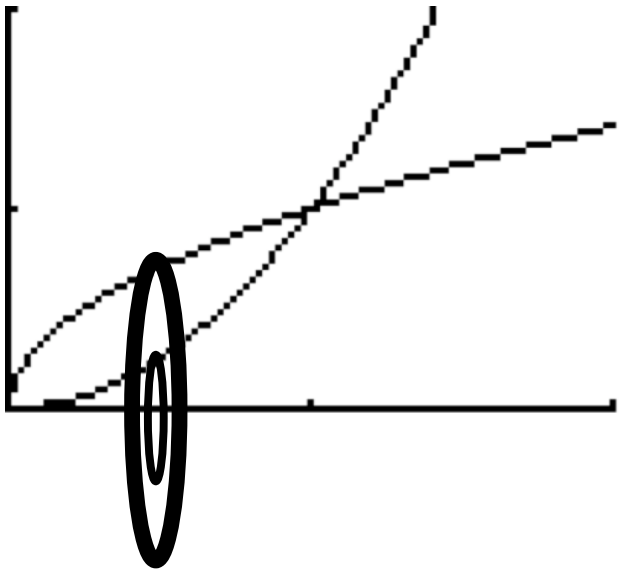
2.



$$\pi\int_0^{\pi}\left(\sqrt{\sin x}\right)^2 dx = \pi\int_0^{\pi}\sin x\,dx = -\pi\cos x\Big]_0^{\pi}$$

$$= -\pi(\cos\pi - \cos 0) = -\pi(-1-1) = 2\pi$$

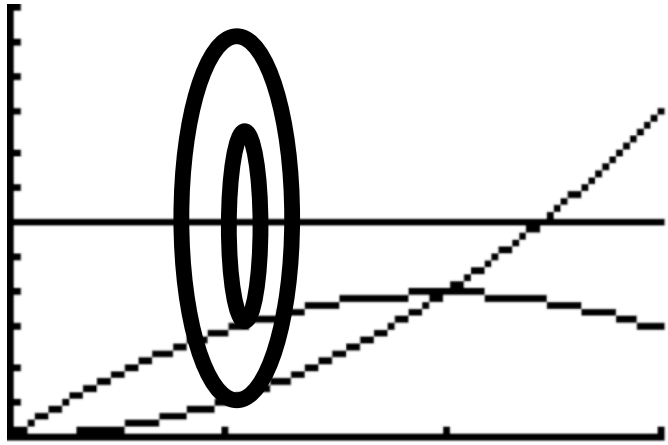
3.



$$\pi\int_0^1\left[\left(\sqrt{x}\right)^2-\left(x^2\right)^2\right]dx=\pi\int_0^1(x-x^4)\,dx$$

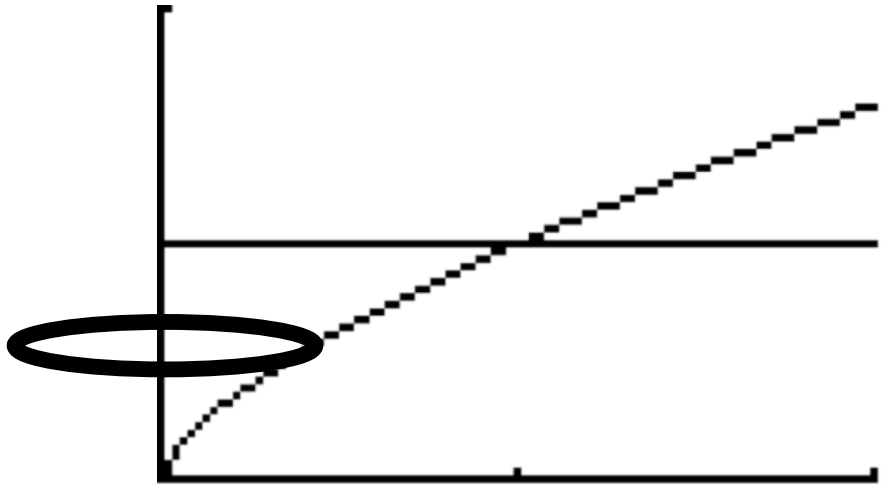
$$=\pi\left[\frac{1}{2}x^2-\frac{1}{5}x^5\right]_0^1=\pi\left(\frac{1}{2}-\frac{1}{5}\right)=\frac{3}{10}\pi$$

4.



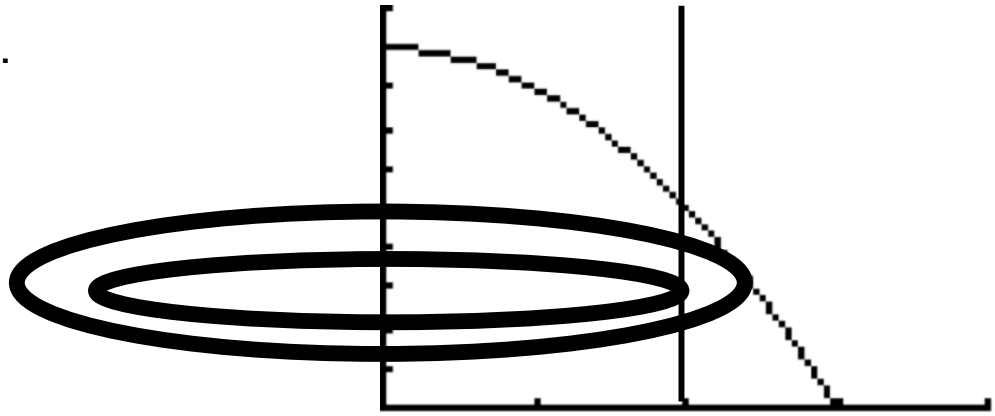
$$\pi\int_0^2\left([6-x^2]^2-[6-(4x-x^2)]^2\right)dx=\frac{64}{3}\pi\approx 67.020$$

5.



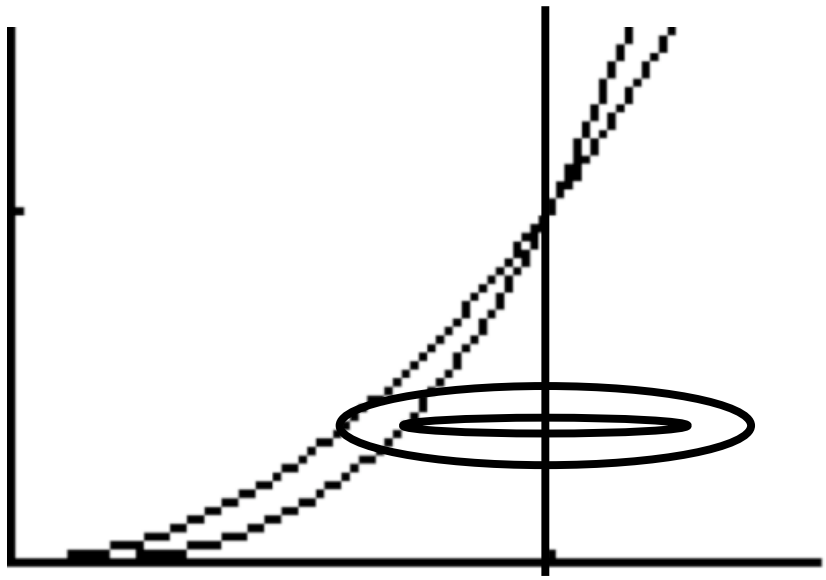
$$\pi\int_0^1 (y^{3/2})^2\,dy = \frac{\pi}{4} \approx 0.785$$

6.



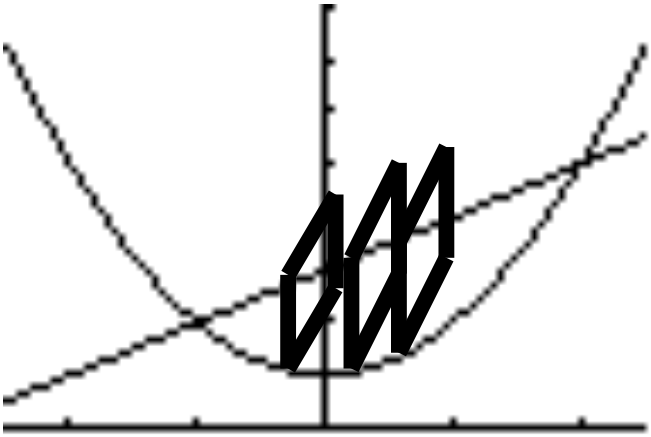
$$\pi\int_0^5\left[\left(\sqrt{9-y}\right)^2-2^2\right]dy=\frac{25\pi}{2}\approx 39.270$$

7.



$$\pi\int_0^1\left[(1-y^{1/2})^2-(1-y^{1/3})^2\right]dy=\frac{1}{15}\pi\approx 0.209$$

8.



$$\int_{-1}^{2}[(x+3)-(x^2+1)]^2\,dx = 8.1$$