

Answers to 7.3: Disk and Washer Method for Volumes

$$1) \pi \int_0^2 ((x^2 + 1)^2 - 1) dx$$

$$= \frac{176}{15}\pi \approx 36.861$$

$$2) \pi \int_{\frac{1}{2}}^4 \left(2^2 - \left(\frac{1}{x} \right)^2 \right) dx$$

$$= \frac{49}{4}\pi \approx 38.485$$

$$3) \pi \int_0^2 ((-y^2 + 5)^2 - 1) dy$$

$$= \frac{416}{15}\pi \approx 87.127$$

$$4) \pi \int_0^4 ((\sqrt{x} + 1)^2 - 1) dx$$

$$= \frac{56}{3}\pi \approx 58.643$$

$$5) \pi \int_{\frac{1}{5}}^2 \left(5^2 - \left(\frac{1}{y} \right)^2 \right) dy$$

$$= \frac{81}{2}\pi \approx 127.235$$

$$6) \pi \int_0^1 (1 - (y^3)^2) dy$$

$$= \frac{6}{7}\pi \approx 2.693$$

$$7) \pi \int_{-1}^1 ((-x^2 + 3)^2 - 2^2) dx$$

$$= \frac{32}{5}\pi \approx 20.106$$

$$8) \pi \int_0^2 ((y^2 + 2)^2 - 2^2) dy$$

$$= \frac{256}{15}\pi \approx 53.617$$

$$9) \pi \int_{\frac{\pi}{4}}^{\frac{\pi}{3}} ((2\csc x)^2 - \csc^2 x) dx$$

$$= (3 - \sqrt{3})\pi \approx 3.983$$

$$10) \pi \int_{\frac{\pi}{4}}^{\frac{\pi}{3}} ((2\csc y)^2 - \csc^2 y) dy$$

$$= (3 - \sqrt{3})\pi \approx 3.983$$