

Answers to Worksheet 19 - Solids of Revolution with Washers

$$1) \pi \int_{\frac{2}{5}}^2 \left(\frac{2}{x}\right)^2 dx \qquad 2) \pi \int_0^2 (x^2 + 1)^2 dx \qquad 3) \pi \int_0^2 ((2x + 1)^2 - (x^2 + 1)^2) dx$$

$$= 8\pi \approx 25.133 \qquad = \frac{206}{15}\pi \approx 43.145 \qquad = \frac{104}{15}\pi \approx 21.782$$

$$4) \pi \int_{\frac{1}{3}}^2 \left(3^2 - \left(\frac{1}{x}\right)^2\right) dx \qquad 5) \pi \int_0^1 ((\sqrt{y} + 2)^2 - 2^2) dy$$

$$= \frac{25}{2}\pi \approx 39.27 \qquad = \frac{19}{6}\pi \approx 9.948$$

$$6) \pi \int_0^1 ((-y^2 + 6)^2 - (-y + 4)^2) dy \qquad 7) \pi \int_{-2}^2 ((-y^2 + 6)^2 - 2^2) dy$$

$$= \frac{298}{15}\pi \approx 62.413 \qquad = \frac{384}{5}\pi \approx 241.274$$

$$8) \pi \int_0^4 \left((\sqrt{y} + 1)^2 - \left(\frac{y}{2} + 1\right)^2\right) dy \qquad 9) \pi \int_0^1 ((x^2 + 2)^2 - 2^2) dx$$

$$= \frac{16}{3}\pi \approx 16.755 \qquad = \frac{23}{15}\pi \approx 4.817$$

$$10) \pi \int_0^2 ((x^2 + 2)^2 - 2^2) dx$$

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