Answers to Worksheet 19 - Solids of Revolution with Washers

1)
$$\pi \int_{\frac{2}{5}}^{2} \left(\frac{2}{x}\right)^{2} dx$$
$$= 8\pi \approx 25.1$$

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

= $\frac{206}{15} \pi \approx 43.145$

1)
$$\pi \int_{\frac{2}{5}}^{2} \left(\frac{2}{x}\right)^{2} dx$$
 2) $\pi \int_{0}^{2} (x^{2} + 1)^{2} dx$ 3) $\pi \int_{0}^{2} ((2x + 1)^{2} - (x^{2} + 1)^{2}) dx$ $= 8\pi \approx 25.133$ $= \frac{206}{15}\pi \approx 43.145$ $= \frac{104}{15}\pi \approx 21.782$

4)
$$\pi \int_{\frac{1}{3}}^{2} \left(3^{2} - \left(\frac{1}{x}\right)^{2}\right) dx$$

$$= \frac{25}{2} \pi \approx 39.27$$

4)
$$\pi \int_{\frac{1}{3}}^{2} \left(3^{2} - \left(\frac{1}{x}\right)^{2}\right) dx$$
 5) $\pi \int_{0}^{1} \left(\left(\sqrt{y} + 2\right)^{2} - 2^{2}\right) dy$
= $\frac{25}{2} \pi \approx 39.27$ = $\frac{19}{6} \pi \approx 9.948$

6)
$$\pi \int_0^1 ((-y^2 + 6)^2 - (-y + 4)^2) dy$$

= $\frac{298}{15} \pi \approx 62.413$

$$= \frac{290}{15}\pi \approx 62.413$$
8) $\pi \int_0^4 \left((\sqrt{y} + 1)^2 - \left(\frac{y}{2} + 1 \right)^2 \right) dy$

$$= \frac{16}{2}\pi \approx 16.755$$

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

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

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

= $\frac{384}{5} \pi \approx 241.274$

9)
$$\pi \int_0^1 ((x^2 + 2)^2 - 2^2) dx$$

= $\frac{23}{15} \pi \approx 4.817$