Answers to Worksheet 17 - Solids of Revolution with Disks

1)
$$\pi \int_{-1}^{0} (x^2 + 2)^2 dx$$

= $\frac{83}{15} \pi \approx 17.383$

2)
$$\pi \int_0^1 (\sqrt[3]{x})^2 dx$$

= $\frac{3}{5}\pi \approx 1.885$

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

= $\frac{1}{7} \pi \approx 0.449$

1)
$$\pi \int_{-1}^{0} (x^{2} + 2)^{2} dx$$
 2) $\pi \int_{0}^{1} (\sqrt[3]{x})^{2} dx$ 3) $\pi \int_{0}^{1} (y^{3})^{2} dy$ 4) $\pi \int_{0}^{1} (\sqrt{y})^{2} dy$ 5) $\pi \int_{0}^{1} (y^{3})^{2} dy$ 6) $\pi \int_{-1}^{1} (x^{2} + 3)^{2} dx$ 7) $\pi \int_{-1}^{1} (-x^{2} + 1)^{2} dx$ 8) $\pi \int_{0}^{1} (-x^{2} + 1)^{2} dx$

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

= $\frac{1}{7} \pi \approx 0.449$

$$\pi \int_{0}^{1} (y^{3})^{2} dy \qquad 6) \ \pi \int_{-1}^{1} (x^{2} + 3)^{2} dx \qquad 7) \ \pi \int_{-1}^{1} (-x^{2} + 1)^{2} dx \qquad 8) \ \pi \int_{0}^{1} (-x^{2} + 1)^{2} dx \qquad = \frac{1}{7} \pi \approx 0.449 \qquad = \frac{112}{5} \pi \approx 70.372 \qquad = \frac{16}{15} \pi \approx 3.351 \qquad = \frac{8}{15} \pi \approx 1.676$$

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

= $\frac{16}{15} \pi \approx 3.351$

8)
$$\pi \int_0^1 (-x^2 + 1)^2 dx$$

= $\frac{8}{15} \pi \approx 1.676$

9)
$$\pi \int_{-2}^{2} (-y^2 + 4)^2 dy$$
 10) $\pi \int_{0}^{2} (y^2 + 3)^2 dy$
= $\frac{512}{15} \pi \approx 107.233$ = $\frac{202}{5} \pi \approx 126.9$

$$\pi \int_{-2}^{2} (-y^2 + 4)^2 dy \qquad 10) \ \pi \int_{0}^{2} (y^2 + 3)^2 dy$$
$$= \frac{512}{15} \pi \approx 107.233 \qquad = \frac{202}{5} \pi \approx 126.92$$