Volumes of Revolution
Assignment # 1 (Solutions)

1. vertical-disks

$$V = \pi \int_0^4 (x^{3/2})^2 dx \approx 201.06$$

2. vertical-washers

$$V = \pi \int_0^4 \left[8^2 - (8 - x^{3/2})^2\right] dx = \pi \int_0^4 [64 - (64 - 16x^{3/2} + x^3)] dx = \pi \int_0^4 (16x^{3/2} - x^3) dx \approx 442.34$$

3. horizontal-washers

$$V = \pi \int_0^8 \left[4^2 - (y^{2/3})^2\right] dy = \pi \int_0^8 (16 - y^{4/3}) dy \approx 229.79$$

4. horizontal-disks

$$V = \pi \int_0^8 (4 - y^{2/3})^2 dy \approx 91.91$$

5. vertical-washers

$$V = \pi \int_0^4 \left[8^2 - (x^{3/2})^2\right] dx = \pi \int_0^4 (64 - x^3) dx \approx 603.19$$

6. vertical-disks

$$V = \pi \int_0^4 (8 - x^{3/2})^2 dx \approx 361.91$$

7. horizontal-disks

$$V = \pi \int_0^8 (y^{2/3})^2 dy \approx 172.34$$

8. horizontal-washers

$$V = \pi \int_0^8 \left[4^2 - (4 - y^{2/3})^2\right] dy = \pi \int_0^8 [16 - (16 - 8y^{2/3} + y^{4/3})] dy = \pi \int_0^8 (8y^{2/3} - y^{4/3}) dy \approx 310.21$$