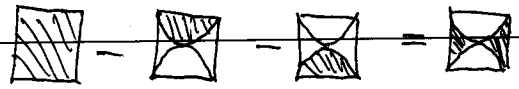
7.5-46

All of the three method could be used to find the volume.

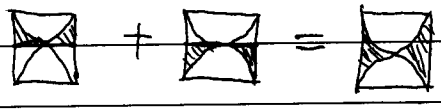
(i) disk:



(three integrals)

$$\int_{-1}^{1} \pi \cdot 1^2 \, dy - \int_{0}^{1} \pi \cdot (\sqrt{y}-0)^2 \, dy - \int_{-1}^{0} \pi \cdot (\sqrt[4]{-y}-0)^2 \, dy = 2\pi - \frac{\pi}{2} - \frac{2}{3}\pi = \frac{5}{6}\pi$$

(ii) washer:



(two integrals)

$$\int_{0}^{1} \pi \left(1^2 - (\sqrt{y}-0)^2\right) dy + \int_{-1}^{0} \pi \left(1^2 - (\sqrt[4]{-y}-0)^2\right) dy = \frac{\pi}{2} + \frac{\pi}{3} = \frac{5}{6}\pi$$

(iii) Shell:

one integral

$$\int_{0}^{1} 2\pi x \left(x^2 - (-x^4)\right) dx = \int_{0}^{1} 2\pi \left(x^3 + x^5\right) dx = \frac{5}{6}\pi$$