Volume of a Spheroid

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11/8/25

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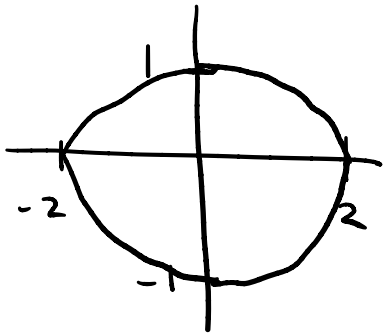

$$x^2 + (2y)^2 = 2^2$$

$$\Rightarrow \quad x^2 = 4 - 4y^2$$

$$\int_{-1}^{1} \pi x^2 \, dy$$

$$= \int_{-1}^{1} \pi (4 - 4y^2) \, dy$$

$$= \pi \left(4y - \frac{4y^3}{3} \right) \Big|_{-1}^{1}$$

$$= \pi \left(\left(4 - \frac{4}{3} \right) - \left(-4 + \frac{4}{3} \right) \right)$$

$$= \pi \left(\frac{8}{3} + \frac{8}{3} \right)$$

$$= \frac{16}{3} \pi$$