

$$19) y = x+1 \quad x=-1, x=2$$

$$V = \int_{-1}^2 (x+1) dx = \left[\frac{x^2}{2} + x \right]_{-1}^2 = \left[\left(\frac{4}{2} + 2 \right) - \left(\frac{1}{2} - 1 \right) \right] = 4 - \left(-\frac{1}{2} \right) = \frac{9}{2}$$

$$20) y = 50 \sqrt{1 + \frac{x^2}{22500}} \quad -150 \leq x \leq 150$$

$$V = \int_{-150}^{150} 50 \sqrt{1 + \frac{x^2}{150^2}} dx \quad 50 \int \left(1 + \frac{x^2}{150^2} \right)^{1/2} = \pi \int \left(2500 \left(1 + \frac{x^2}{22500} \right) \right) dx$$

$$V = \int_0^{150} \pi \left[50 \sqrt{1 + \frac{x^2}{22500}} \right] dx = \pi \int \left[2500 - .9x^2 \right] dx$$

$$= \pi \left[2500x - \frac{.9x^3}{3} \right]_0^{150} = \pi \left[2500(150) - \frac{(150)^3}{27} \right] = 125000$$

$$= \pi (250,000)$$

$$= 785398.16 \text{ ft}^3$$

$$1 \text{ ft}^3 = 7.48 \text{ gal} \quad = \underline{5,874,778.26 \text{ gal}}$$

$$21) f(x) = -.116x^3 + 3.5 \quad -5.5 \leq x \leq 5.5$$

$$V = \pi \int_{-5.5}^{5.5} \sqrt{3.5 - .116x^2} dx$$

$$\pi \int_{-5.5}^{5.5}$$

$$\int_0^{\pi} 30.25(3.5) - 3.5x^2$$

$$\pi \left(105.9x - \frac{3.5x^3}{3} \right) \bigg|_0^{5.5} = 582.5 - 194 = \pi(388.4) \text{ in}^2$$

$$\underline{(776.8)\pi}$$

