

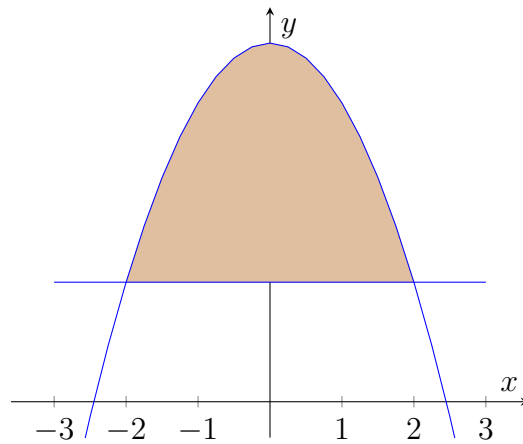
Section 6.2

Alvin Lin

Calculus II: August 2016 - December 2016

Exercise 8

$$y = 6 - x^2 \quad y = 2$$



$$V = \int A \, dx$$

$$V = \int \pi(R1)^2 - (R2)^2 \, dx$$

$$V = \pi \int_{-2}^2 (6 - x^2)^2 - (2)^2 \, dx$$

$$V = \pi \int_{-2}^2 36 - 12x^2 + x^4 - 4 \, dx$$

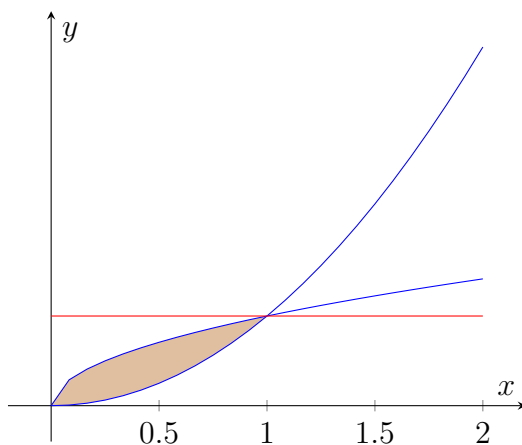
$$V = \pi \int_{-2}^2 x^4 - 12x^2 + 32 \, dx$$

$$V = \pi \left[\frac{x^5}{5} - \frac{12x^3}{3} + 32x \right]_{-2}^2$$

$$V = \frac{384\pi}{5}$$

Exercise 11

$$y = x^2 \quad x = y^2$$



$$V = \int A \, dx$$

$$V = \int \pi(R1)^2 - (R2)^2 \, dx$$

$$V = \pi \int_0^1 (1 - x^2)^2 - (1 - \sqrt{x})^2 \, dx$$

$$V = \pi \int_0^1 (1 - 2x^2 + x^4) - (1 - 2\sqrt{x} + x) \, dx$$

$$V = \pi \int_0^1 x^4 - 2x^2 - x + 2\sqrt{x} \, dx$$

$$V = \pi \left[\frac{x^5}{5} - \frac{2x^3}{3} - \frac{x^2}{2} + \frac{4x^{3/2}}{3} \right]_0^1$$

$$V = \frac{11\pi}{30}$$

Exercise 17

$$x = y^2 \quad x = 1 - y^2$$

about $x = 3$.

$$V = \int A \, dy$$

$$V = \int \pi(R1)^2 - (R2)^2 \, dy$$

$$V = \pi \int_{-2\sqrt{2}}^{2\sqrt{2}} (3 - y^2)^2 - (3 - (1 - y^2))^2 \, dy$$

$$V = \pi \int_{-2\sqrt{2}}^{2\sqrt{2}} (9 - 6y^2 + y^4) - (y^4 + 4y^2 + 4)^2 dy$$

$$V = \pi \int_{-2\sqrt{2}}^{2\sqrt{2}} 5 - 10y^2 dy$$

$$V = \pi \left[10y - \frac{10y^3}{3} \right]_{-2\sqrt{2}}^{2\sqrt{2}}$$

$$V = \frac{10\pi\sqrt{2}}{3}$$

Exercise 29

$$x = 1 - y^2 \quad x = 1 - y$$

$$V = \int A dy$$

$$V = \int \pi(R1)^2 - (R2)^2 dy$$

$$V = \pi \int_0^1 (1 - y^2)^2 - (1 - y)^2 dy$$

$$V = \pi \int_0^1 1 - 2y^4 + y^8 - (1 - 2y + y^2) \text{diffy}$$

$$V = \pi \int_0^1 y^8 - 2y^4 - y^2 + 2y dy$$

$$V = \pi \left[\frac{y^9}{9} - \frac{2y^5}{5} - \frac{y^3}{3} - \frac{2y^2}{2} \right]_0^1$$

$$V = \frac{17\pi}{45}$$

Exercise 55

$$\frac{x^2}{2} + \frac{y^2}{9} = 1$$

$$y = \sqrt{36 - 9x^2}$$

$$V = \int A dx$$

$$V = \int \pi r^2 dx$$

$$V = \pi \int_{-2}^2 (\sqrt{36 - 9x^2})^2 dx$$

$$V = \pi \int_{-2}^2 36 - 9x^2 \, dx$$

$$V = \pi \left[36x - \frac{9x^3}{3} \right]_{-2}^2$$

$$V = 24\pi$$

If you have any questions, comments, or concerns, please contact me at alvin@omgimanagerd.tech