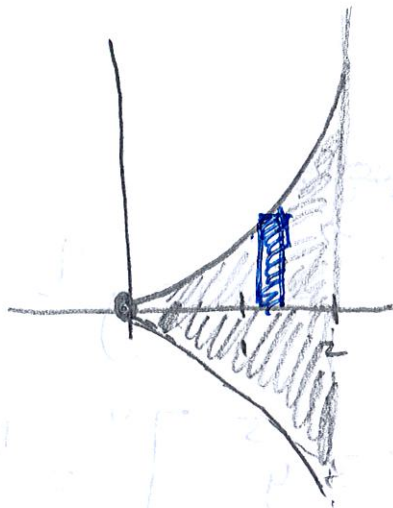


Ex!  $y = x^2$  bounded with  $y = 0$   $x = 2$



about x-axis

$$r = x^2$$

$$A = \pi r^2$$

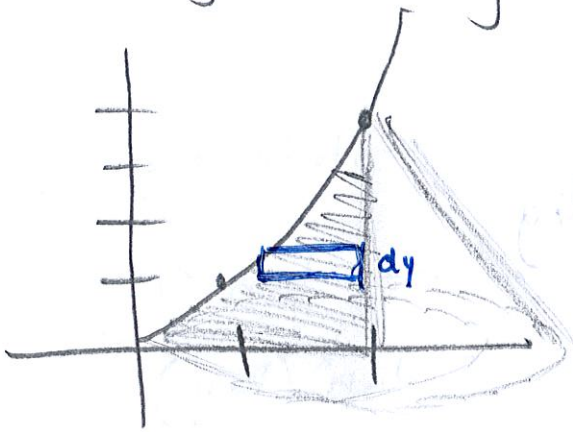
$$A = \pi x^4$$

$$\pi \int_0^2 x^4 \cdot dx$$

$$\pi \cdot \frac{1}{5} x^5 \Big|_0^2$$

$$= 32 \frac{\pi}{5}$$

Ex!  $y = x^2$   $y = 0$   $x = 2$  about  $x = 2$



$$x = \sqrt{y}$$

$$r = 2 - \sqrt{y}$$

$$A = \pi r^2 = \pi (2 - \sqrt{y})^2$$

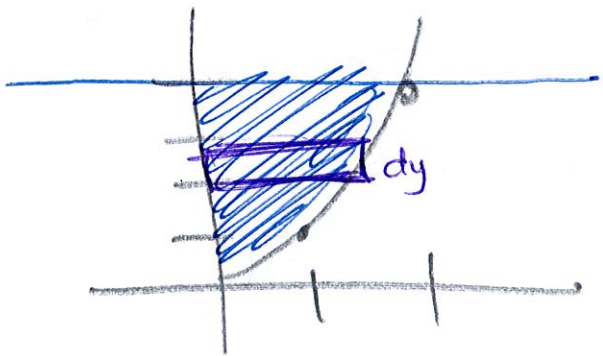
$$\pi \int_0^4 (2 - \sqrt{y})^2 dy$$

$$= \pi \int_0^4 (4 - 4y^{1/2} + y) dy$$

$$= \pi \left[ 4y - \frac{8}{3} y^{3/2} + \frac{1}{2} y^2 \right]_0^4$$

$$= \frac{8}{3} \pi$$

Ex!  $y = x^2$   $y = 4$   $x = 0$  about y-axis



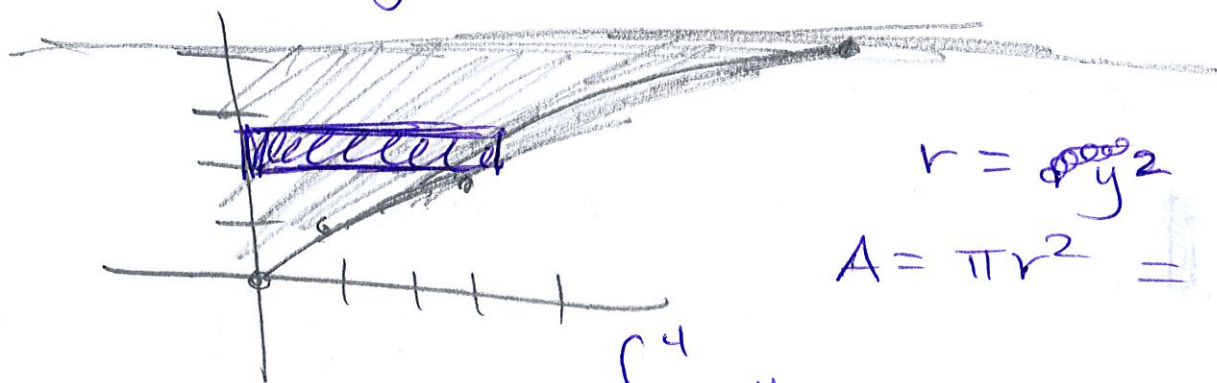
$$r = \sqrt{y} \quad A = \pi r^2 = \pi y$$

$$\pi \int_0^4 (\sqrt{y})^2 dy$$

$$\frac{1}{2} y^2 \Big|_0^4 = 8\pi$$

$$y = \sqrt{x} \quad y = 4 \quad x = 0 \quad \text{about } y\text{-axis}$$

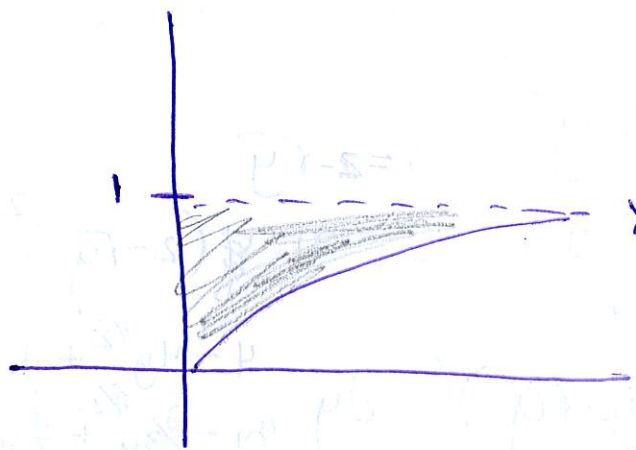
$$x = y^2$$



$$r = y^2$$

$$A = \pi r^2 = \pi y^4$$

$$\pi \int_0^4 y^4 dy = \pi \left[ \frac{1}{5} y^5 \right]_0^4 = \frac{1024\pi}{5}$$



rotate about y-axis

$$x = \tan^2 \frac{\pi}{4} y$$

$$r = \tan \frac{\pi}{4} y$$

$$r^2 = \tan^2 \left( \frac{\pi}{4} y \right)$$

$$\pi \int_0^1 \tan^2 \left( \frac{\pi}{4} y \right) dy$$

$$\pi \int_0^1 \sec^2 \left( \frac{\pi}{4} y \right) - 1 dy$$

$$\pi \cdot \frac{4}{\pi} \left[ \tan \frac{\pi}{4} y - y \right]_0^1$$

$$u = \frac{\pi}{4} y$$

$$du = \frac{\pi}{4} dy$$

$$\pi \left[ \frac{4}{\pi} - 1 \right] = 4 - \pi$$