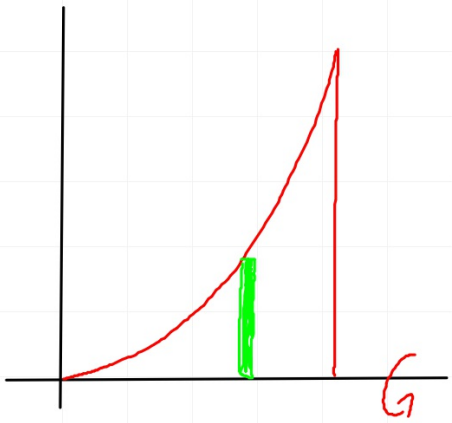
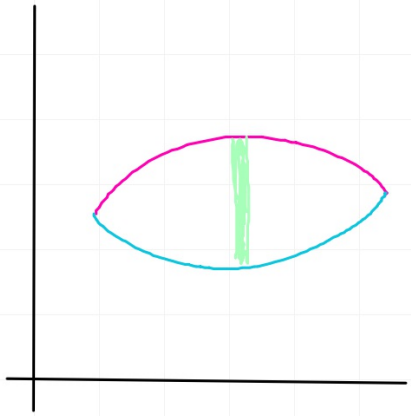
Volumes of Revolution--Disk/Washer Method



Disk

πr^2 thickness

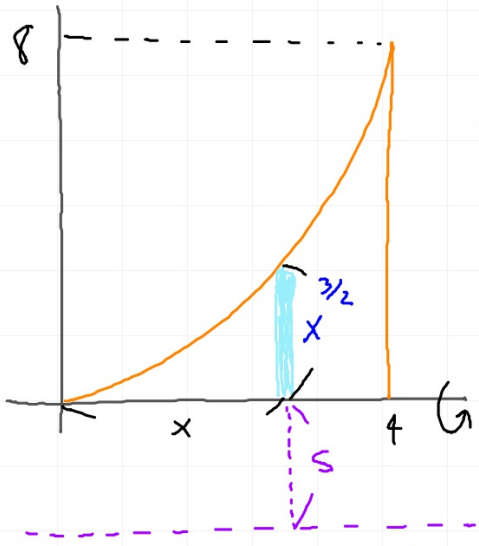
dx dy



Washer

$\pi \left[r_o^2 - r_i^2 \right]$ thickness

dx dy



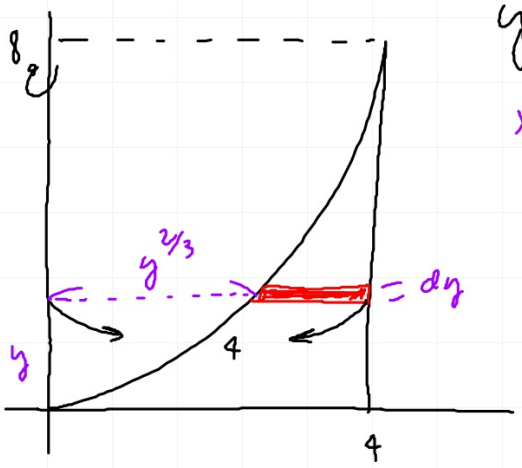
$y^2 = x^3$ ② x-axis

$y = x^{3/2}$

$$V_0 = \pi \int_0^4 \left(x^{3/2} \right)^2 dx$$

② $y=-5$

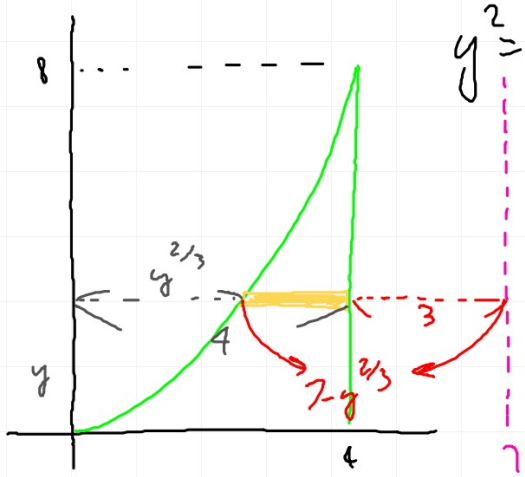
$$V_w = \pi \int_0^4 \left[\left(5 + x^{3/2} \right)^2 - \left(5 \right)^2 \right] dx$$



$y^2 = x^3$ @ y-axis

$x = y^{2/3}$

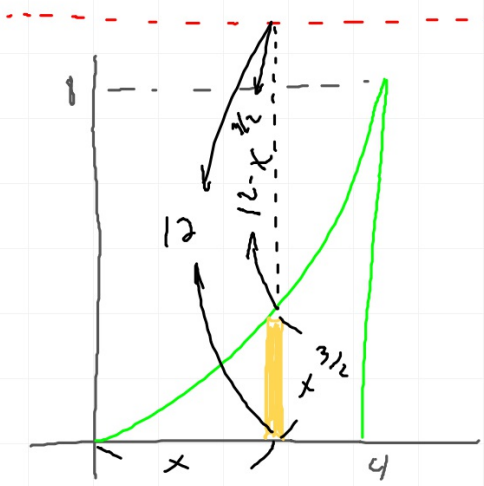
$$V_w = \pi \int_0^8 \left[(4)^2 - (y^{2/3})^2 \right] dy$$



$y^2 = x^3$ e $x = 7$

$x = y^{2/3}$

$$V_w = \pi \int_0^8 \left[(7 - y^{2/3})^2 - (\ 3\ )^2 \right] dy$$

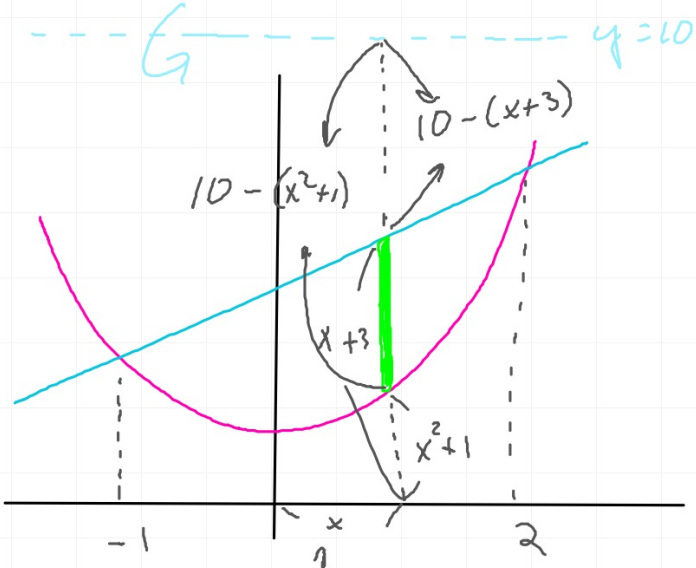


$y^2 = x^3$ & $y = 12$

$y = x^{3/2}$

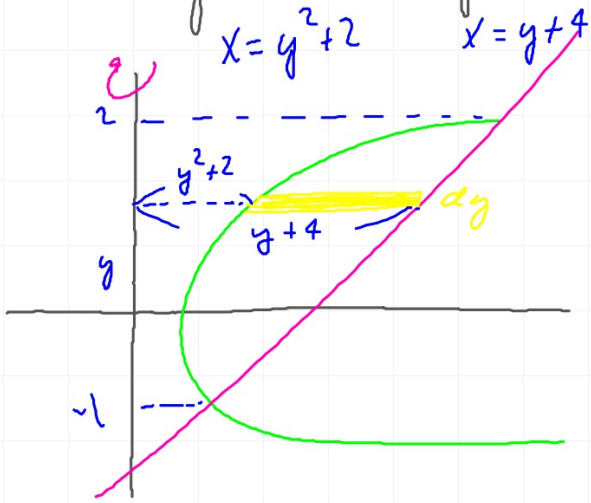
$$V_w = \pi \int_0^4 \left[(12)^2 - (12 - x^{3/2})^2 \right] dx$$

Bands: $y = x^2 + 1$ and $y = x + 3$ & $y = 10$.



$$V = \pi \int_{-1}^{2} \left[\left(10 - (x^2+1)\right)^2 - \left(10 - (x+3)\right)^2 \right] dx$$

Bands: $y^2 = x-2$ $y = x-4$ @ y-axis



$$V_w = \pi \int_{-1}^{2} \left[(y+4)^2 - (y^2+2)^2 \right] dy$$

$$= 101.788$$