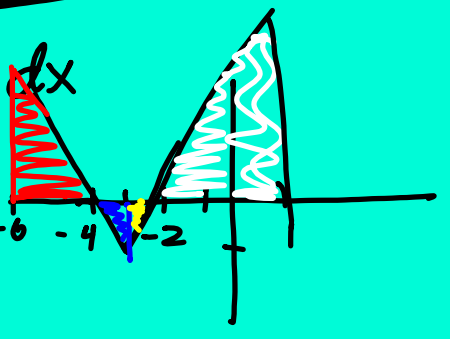
Area & Volume Review

$\text{Area} = \int [f(x) - g(x)]\,dx$

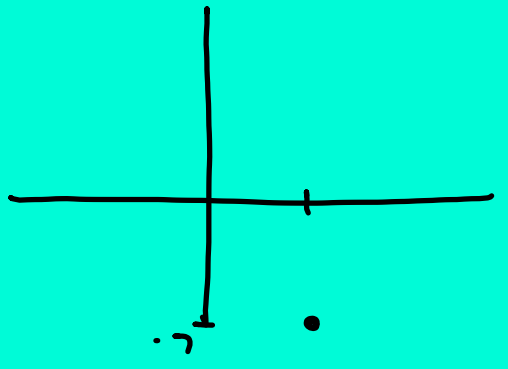


$f(x) = 2|x+3| - 1$

$2x+6-1 = 2x+5$

$-2x-6 = -2x-7$

$f(x) = \begin{cases} \\ \\ 2x^2-8x+1 \end{cases}$

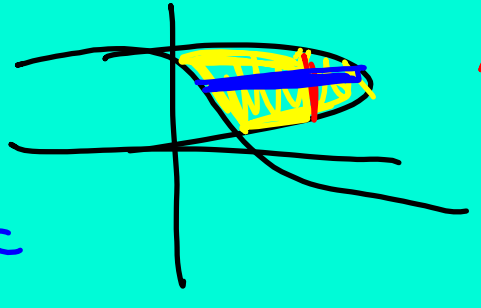


$x = \frac{-b}{2a} = \frac{8}{2(2)} = 2$

$y = 2(2)^2 - 8(2) + 1$

$= -7$

0	0
1	2
2	8
3	18



R - L

$x =$

Horiz

Vertical $y =$

Horiz $x =$

Volume

Disk

$$\pi \int_a^b \left(r_o^2 - r_i^2\right) dx$$

▯ is ⊥ to axis

x-axis: $y =$

y-axis: $x =$

Shell

$$2\pi \int_a^b r\,(f-g)\,dx$$

▯ is ∥ to axis

x-axis: $x =$

y-axis: $y =$

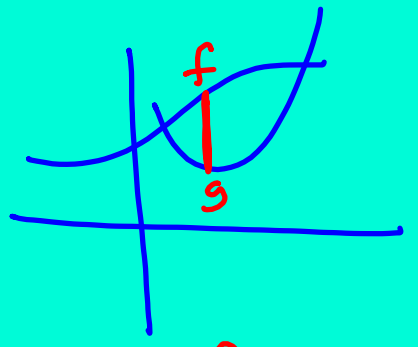
Slicing:

Square: $A = s^2$

Isosceles Right Δ: $\frac{1}{2}s^2$

Equilateral Δ's $A = \frac{\sqrt{3}}{4}s^2$

Semi Circles: $A = \frac{1}{2}\pi r^2$



$s = f - g$

$r = \frac{f-g}{2}$

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$y = x \quad y = (x-2)^2$

Disk Method around $x = -3$

$x = y \quad \sqrt{y} + 2 = x$

$$\pi \int_0^4 \left[(\sqrt{y} + 2 + 3)^2 - (y + 3)^2 \right] dy$$

Shell Method

$$2\pi \int_1^4 (x+3)\left(x - (x-2)^2\right) dx$$