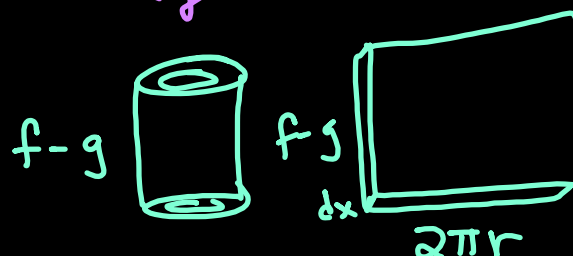
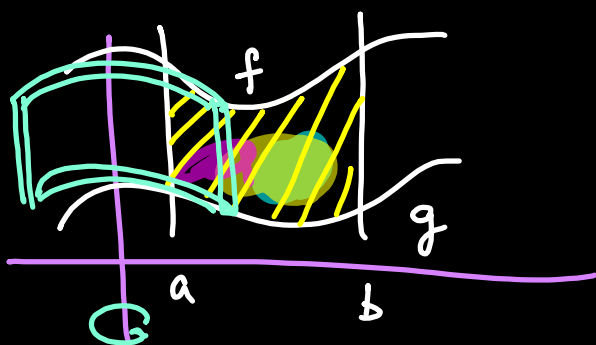


# SHELL METHOD - Volume by Cylindrical Shells



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

$\square$  is parallel to axis of rev.

x-axis:  $x =$

y-axis:  $y =$

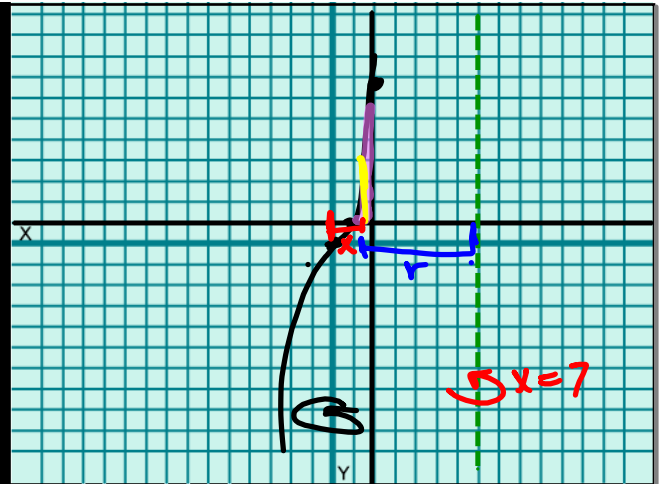
$$y = x^3 \quad y = 1 \quad x = 2$$

around y-axis

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

$$2\pi \int_1^2 x (x^3 - 1) dx$$

$$= \frac{47\pi}{5} \text{ units}^3$$



around  $x = 7$

$$2\pi \int_1^2 (7-x)(x^3-1) dx$$

R-L    T-B

$$y = x^2 + 1 \quad y = 1 \quad x = 3$$

around x-axis

$$\sqrt{y-1} = \sqrt{x^2}$$

$$2\pi \int_1^9 y (3 - \sqrt{y-1}) dy$$

$$2\pi \int_1^9 (y+4) (3 - \sqrt{y-1}) dy$$

