

b) $A = \int_0^4 (18 - x^2) - (10 - 2x) dx$

$A = \int_0^4 (8 + 2x - x^2) dx = \frac{80}{3}$

$h(x)$ in the shell questions

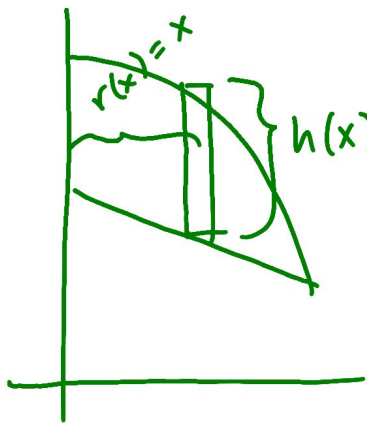
c) x-axis

Horizontal axis of rotation
 \Rightarrow washers

$V = \pi \int_a^b [(R(x))^2 - (r(x))^2] dx$

$V = \pi \int_0^4 [(18 - x^2)^2 - (10 - 2x)^2] dx = \frac{8512\pi}{15}$

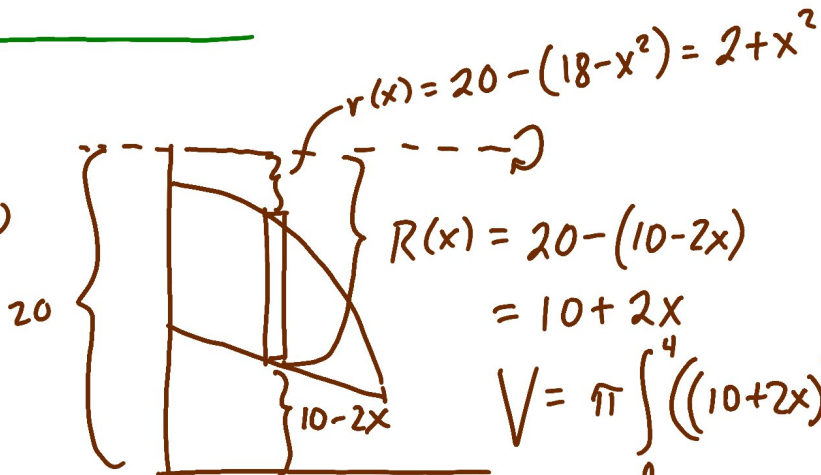
d) y-axis



Vertical axis of rotation

Shells $V = 2\pi \int_a^b r(x) h(x) dx$
 $V = 2\pi \int_0^4 x (8 + 2x - x^2) dx$
 $V = \frac{256\pi}{3}$

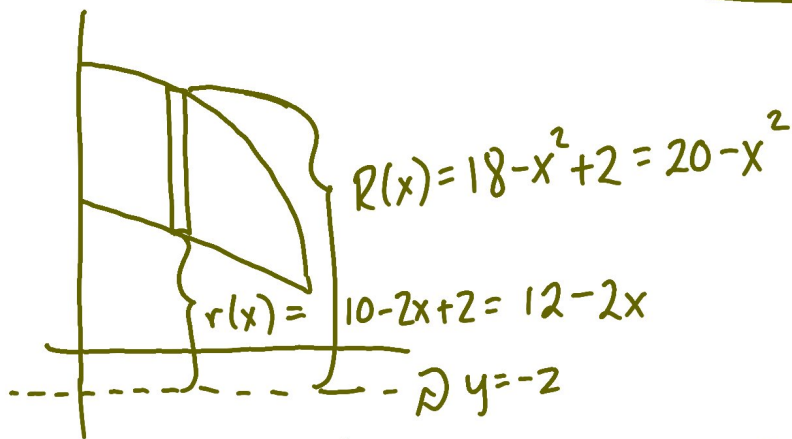
e) $y = 20$



$V = \pi \int_0^4 ((10 + 2x)^2 - (2 + x^2)^2) dx$

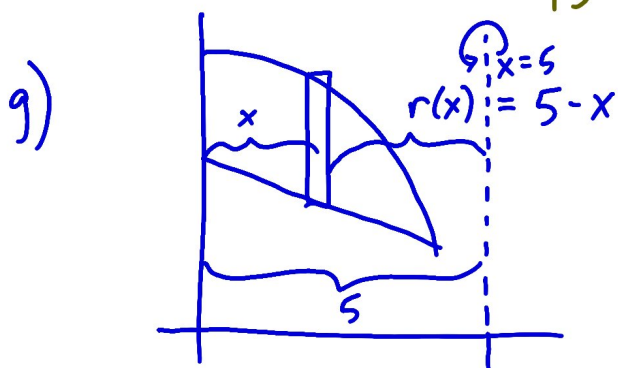
f) $y = -2$

$= \frac{2496\pi}{5}$



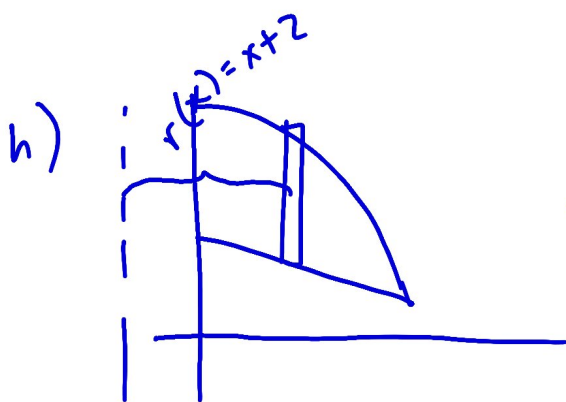
$$V = \pi \int_0^4 \left((20 - x^2)^2 - (12 - 2x)^2 \right) dx$$

$$V = \frac{10112\pi}{15}$$



$$V = 2\pi \int_0^4 (5 - x)(8 + 2x - x^2) dx$$

$$V = \frac{544\pi}{3}$$



$$V = 2\pi \int_0^4 (x + 2)(8 + 2x - x^2) dx$$

$$V = 192\pi$$

$$y = 2x^2 + 1, \quad y = 5x + 4, \quad y\text{-axis} \quad \text{in } \mathbb{Q} \text{I}$$

Area

$$\text{Area} = \int_0^3 ((5x+4) - (2x^2+1)) dx$$

Volume about x-axis

$$= \int_0^3 (-2x^2 + 5x + 3) dx = \frac{27}{2}$$

y-axis

$$V = \pi \int_0^3 ((5x+4)^2 - (2x^2+1)^2) dx = \frac{1098\pi}{5}$$

y=25

$$V = 2\pi \int_0^3 x(-2x^2 + 5x + 3) dx = 36\pi$$

y=-3

x=4

x=-3

$$V = \pi \int_0^3 ((24-2x^2)^2 - (21-5x)^2) dx = \frac{2277\pi}{5}$$

$$V = \pi \int_0^3 ((5x+7)^2 - (2x^2+4)^2) dx = \frac{1503\pi}{5}$$

$$V = 2\pi \int_0^3 (4-x)(-2x^2 + 5x + 3) dx = 72\pi$$

$$V = 2\pi \int_0^3 (x+3)(-2x^2 + 5x + 3) dx = 117\pi$$