

a) about x-axis

$$\pi \int_0^2 (2x)^2 - (x^2)^2 dx = 4.267\pi$$

b) about y-axis

$$\int_0^2 2\pi x (2x - x^2) dx = 8.378$$

e) about $x=4$

$$\int_0^2 2\pi (4-x) (2x-x^2) dx = 25.133$$

f) about $x=-2$

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

c) about $y=5$

$$\pi \int_0^2 (x^2-5)^2 - (2x-5)^2 dx = 9.067\pi$$

d) about $y=-1$

$$\pi \int_0^2 (2x+1)^2 - (x^2+1)^2 dx = 21.782$$

$$\approx 6.933\pi$$

p 463 #14b.



about $y = 3$

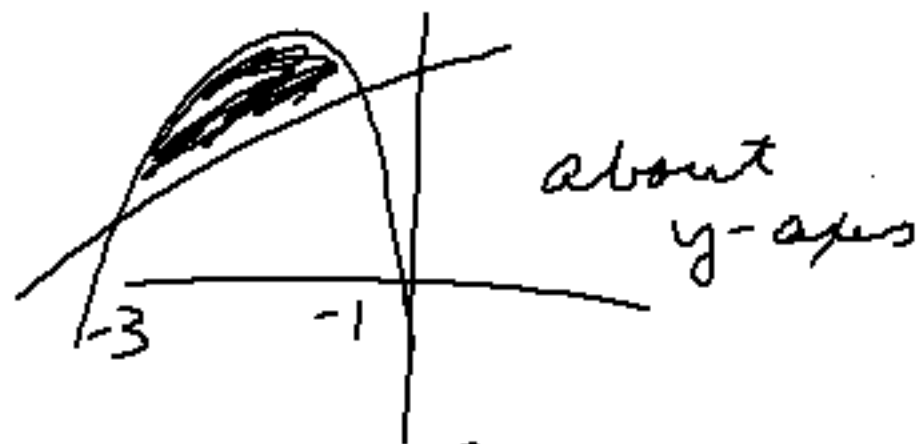
$$\pi \int_{-3}^0 (6 - 2x - x^2 - 3)^2 - (x + 6 - 3)^2 dx$$
$$= 21.6\pi$$

p 472 #24

$y = \sqrt{x}$ $y = 0$ $x = 4$ about $x = 6$



$$\int_0^4 2\pi (6-x) \sqrt{x} dx$$
$$= 120.637$$



$$\int 2\pi(6-x)(f-g) \quad \int 2\pi(0-x)$$

about y-axis $\int 2\pi(x-0)(f-g)$

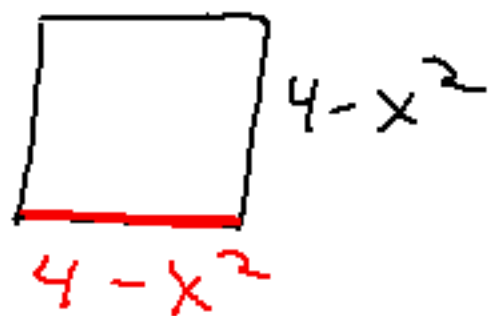
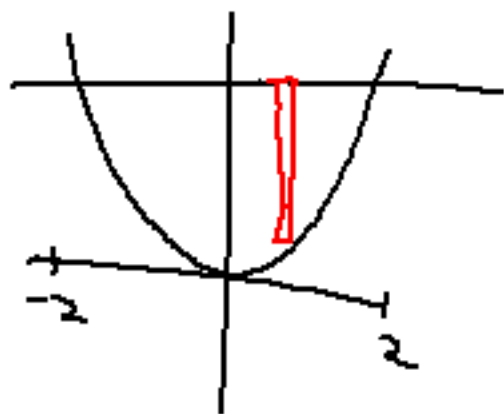
Cross Section

∫ Area

$$y = x^2$$

$$y = 4$$

squares \perp to x -axis.



$$\int_{-2}^2 (4-x^2)^2 dx = 34.133$$

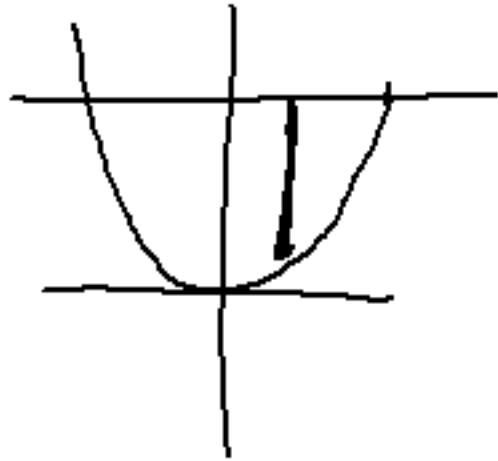
$$y = x^2$$
$$y = 4$$

⊥ x-axis

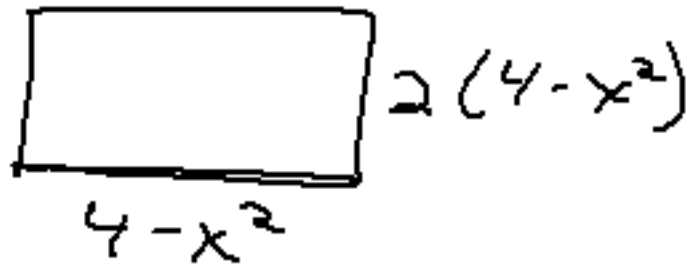
rectangle with a height of 2.



$$\int_{-2}^2 2(4 - x^2) dx = 21.333$$



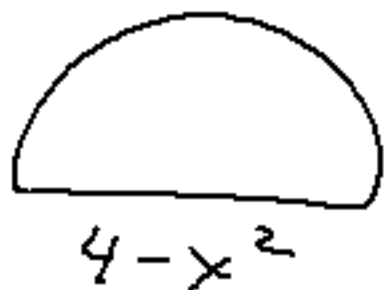
⊥ x-axis
rectangle with height
twice the base.



$$\int_{-2}^2 2(4 - x^2)^2 dx = 68.267$$



⊥ x-axis
semicircles



$$\frac{1}{2} \pi r^2$$

$$r = \frac{1}{2} (4 - x^2)$$

$$\int_{-2}^2 \frac{1}{2} \pi \left(\frac{1}{2} (4 - x^2) \right)^2 dx$$
$$= 13.404$$

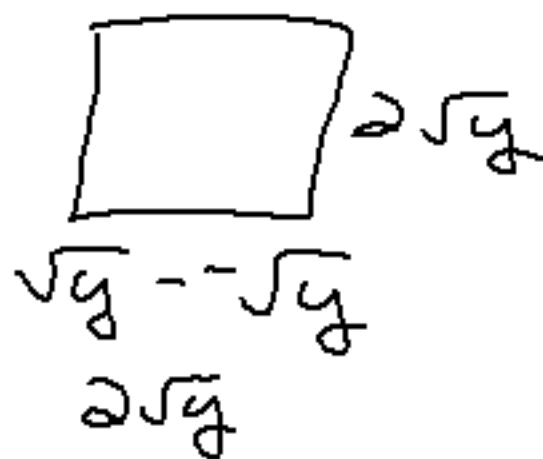


\perp to y -axis

square

$$y = x^2 \quad x = \pm\sqrt{y}$$

$$y = 4$$



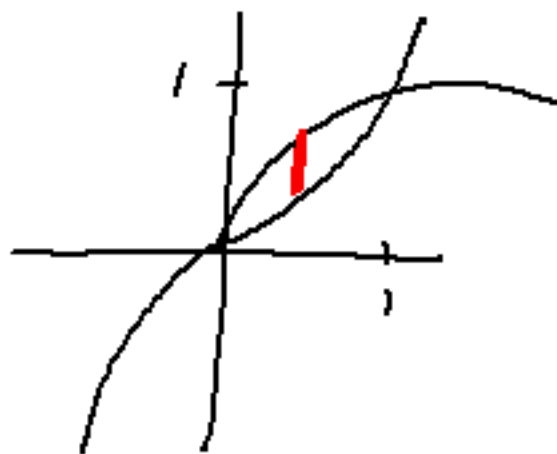
$$\int_0^4 (2\sqrt{y})^2 dy = 32$$

$(2\sqrt{x})^2$

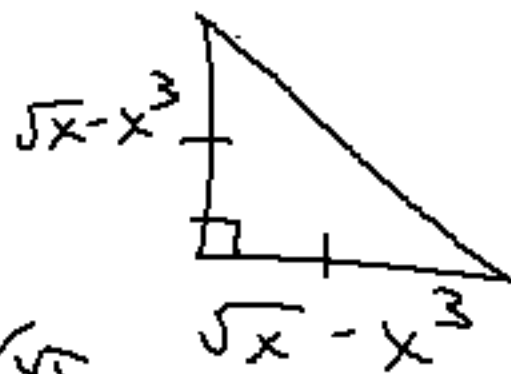
$$y = \sqrt{x}$$

$$y = x^3$$

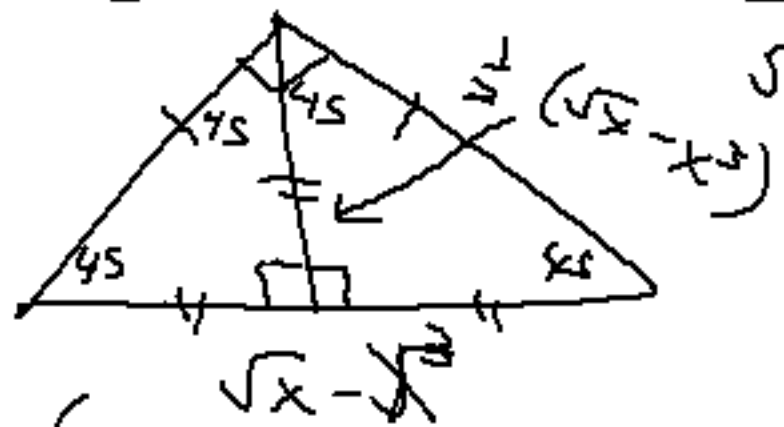
⊥ x-axis



isos r.t Δ with
leg in base.



$$A = \frac{1}{2} bh$$



$$\int \frac{1}{2} (\sqrt{x} - x^3) \frac{1}{2} (\sqrt{x} - x^3)$$

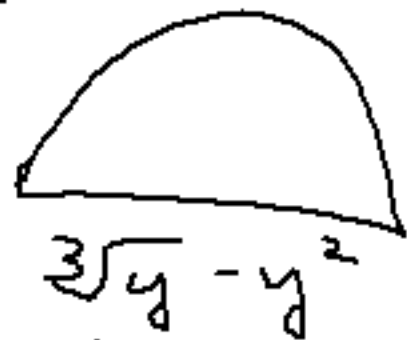
$$\int_0^1 (\sqrt{x} - x^3)^2 dx = .099$$

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

$$y = x^3 \quad x = \sqrt[3]{y}$$

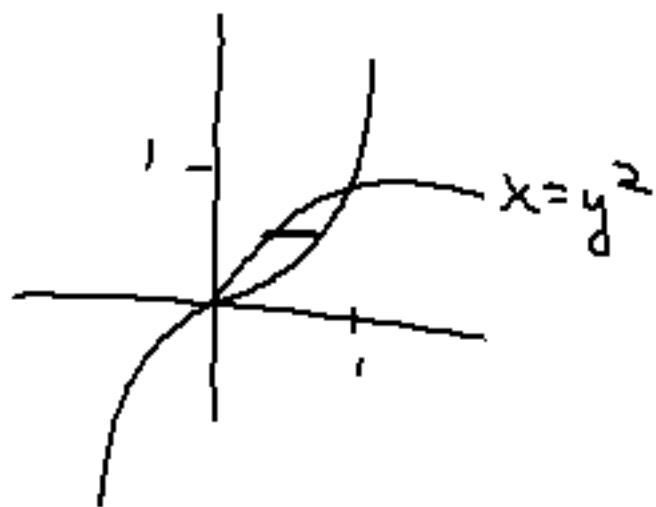
+ y-axis

Semicircles



$$r = \frac{1}{2} (\sqrt[3]{y} - y^2)$$

$$\int_0^1 \frac{1}{2} \pi \left(\frac{1}{2} (\sqrt[3]{y} - y^2) \right)^2 dy = .079$$



p 463 # 13b, 15

p 472 # 2)

p 465 # 61, 63a, b