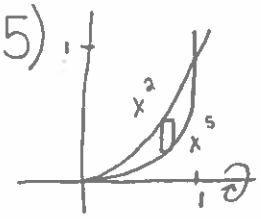
7.2 Volume by Washer Method

Pg. 453 #'s 5, 6, 11-14, 54

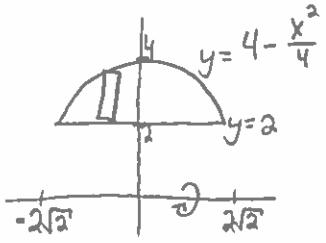
5)



$$V = \pi \int_0^1 (x^2)^2\,dx - \pi \int_0^1 (x^5)^2\,dx$$

$V = .1\overline{09}\pi$

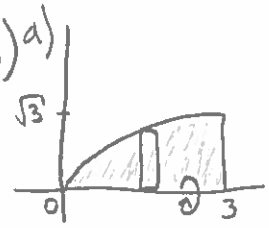
6)



$$V = \pi \int_{-2\sqrt{2}}^{2\sqrt{2}} \left(4 - \frac{x^2}{4}\right)^2 dx - \pi \int_{-2\sqrt{2}}^{2\sqrt{2}} (2)^2\,dx$$

$V = 42.237\pi$

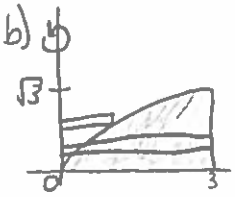
11) a)



$$V = \pi \int_0^3 (\sqrt{x})^2\,dx$$

$V = 4.5\pi$

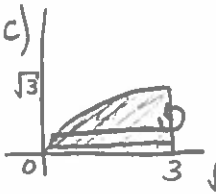
b)



$$V = \pi \int_0^{\sqrt{3}} 3^2\,dy - \pi \int_0^{\sqrt{3}} (y^2)^2\,dy$$

$V = 12.471\pi$

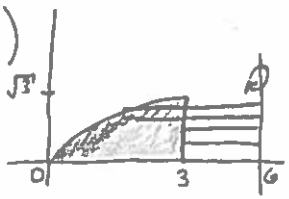
c)



$$V = \pi \int_0^{\sqrt{3}} (3 - y^2)^2\,dy$$

$V = 8.314\pi$

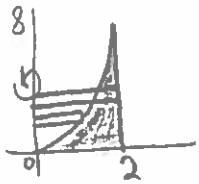
d)



$$V = \pi \int_0^{\sqrt{3}} (6 - y^2)^2\,dy - \pi \int_0^{\sqrt{3}} 3^2\,dy$$

$V = 29.098\pi$

12) a)



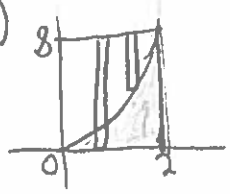
$$V = \pi \int_0^8 2^2\,dy - \pi \int_0^8 (\sqrt{\tfrac{1}{2}y})^2\,dy$$

$V = 16\pi$

b)

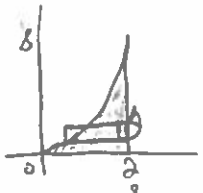
$$V = \pi \int_0^2 (2x^2)^2\,dx$$

$V = 25.6\pi$

12) c) 

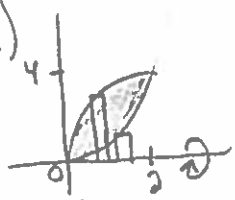
$V = \pi \int_0^2 8^2\,dx - \pi \int_0^2 (8-2x^2)^2\,dx$

$\boxed{V = 59.7\bar{3}\pi}$

d) 

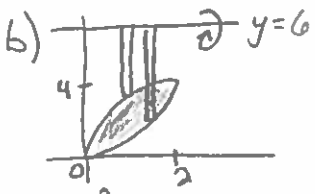
$V = \pi \int_0^8 (2-\sqrt{\tfrac{1}{2}y})^2\,dy$

$\boxed{V = 5.333\pi}$

13) a) 

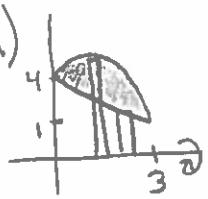
$V = \pi \int_0^2 (4x-x^2)^2\,dx - \pi \int_0^2 (x^2)^2\,dx$

$\boxed{V = 10.\bar{6}\pi}$

b) 

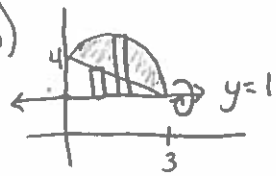
$V = \pi \int_0^2 (6-x^2)^2\,dx - \pi \int_0^2 (6-(4x-x^2))^2\,dx$

$\boxed{V = 21.\bar{3}\pi}$

14a) 

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

$\boxed{V = 27\pi}$

b) 

$V = \pi \int_0^3 ((4+2x-x^2)-1)^2\,dx - \pi \int_0^3 ((4-x)-1)^2\,dx$

$\boxed{V = 9\pi}$

54) a) II y-axis

b) IV y=b

c) I x-axis

d) III x=a