

Cross-section Hwk Ans. - DeMaia (7.3) #1-10

1. a) $\int_{-1}^1 \pi \left(\frac{\sqrt{1-x^2} - (-\sqrt{1-x^2})}{2} \right)^2 dx = \int_{-1}^1 \pi (1-x^2) dx$

b) $\int_{-1}^1 (2\sqrt{1-x^2})^2 dx$

c) $\int_{-1}^1 \left(\frac{2\sqrt{1-x^2}}{\sqrt{2}} \right)^2 dx = \int_{-1}^1 2(1-x^2) dx$

d) $\int_{-1}^1 \frac{\sqrt{3}}{4} (2\sqrt{1-x^2})^2 dx$

2. a) $\int_0^4 \pi \left(\frac{2\sqrt{x}}{2} \right)^2 dx$ b) $\int_0^4 (2\sqrt{x})^2 dx$ c) $\int_0^4 \left(\frac{2\sqrt{x}}{\sqrt{2}} \right)^2 dx$

d) $\int_0^4 \frac{\sqrt{3}}{4} (2\sqrt{x})^2 dx$

3. $\int_0^4 \left(\frac{2\sqrt{x}}{\sqrt{2}} \right)^2 dx = 16$ 4. $\pi \int_{-1}^1 \left(\frac{(2-x^2) - x^2}{2} \right)^2 dx = \frac{16}{15} \pi$

5. $\int_{-1}^1 (2\sqrt{1-x^2})^2 dx = \frac{16}{3}$ 6. $\int_{-1}^1 \left(\frac{2\sqrt{1-x^2}}{\sqrt{2}} \right)^2 dx = \frac{8}{3}$

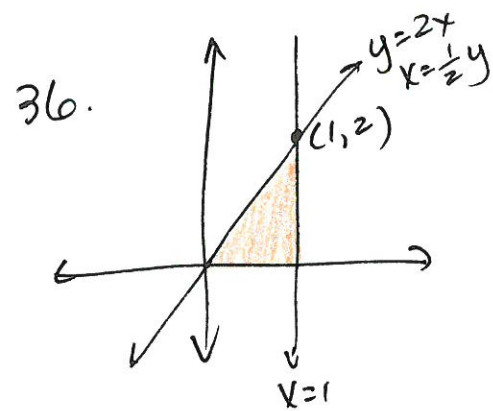
7. a) $\int_0^{\pi} \frac{\sqrt{3}}{4} (2\sqrt{\sin x})^2 dx = 2\sqrt{3}$ b) $\int_0^{\pi} (2\sqrt{\sin x})^2 dx = 8$

8. a) $\int_{-\pi/3}^{\pi/3} \pi \left(\frac{\sec x - \tan x}{2} \right)^2 dx = 3.796$ b) $\int_{-\pi/3}^{\pi/3} (\sec x - \tan x)^2 dx = 4.834$

9. $\int_0^2 \pi \left(\frac{\sqrt{5}y^2}{2} \right)^2 dy = 8\pi$

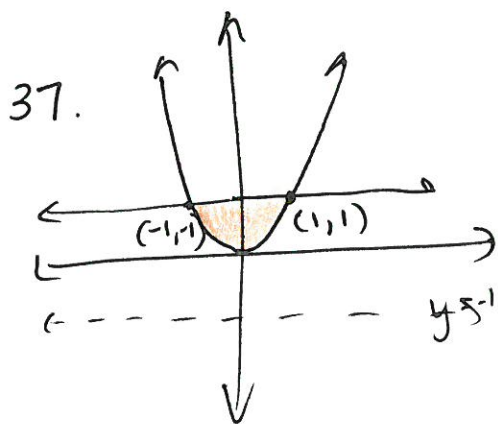
10. $\int_{-1}^1 \frac{1}{2} (2\sqrt{1-y^2})^2 dy = \frac{8}{3}$
 \uparrow
 $\sqrt{1-y^2} - (-\sqrt{1-y^2})$

35. a) $\pi \int_0^4 (2)^2 - (\sqrt{x})^2 dx = 8\pi$ b) $\pi \int_0^2 (y^2)^2 dy = \frac{32\pi}{5}$
 c) $\pi \int_0^4 (2 - \sqrt{x})^2 dx = \frac{8\pi}{3}$ d) $\pi \int_0^2 (4)^2 - (4 - y^2)^2 dy = \frac{224\pi}{15}$



a) (y) Disk $\pi \int_0^2 (1 - \frac{1}{2}y)^2 dy = \frac{2}{3}\pi$

b) (y) Washer $\pi \int_0^2 (2 - \frac{1}{2}y)^2 - (2 - 1)^2 dy = \frac{8\pi}{3}$



a) $y=1 \Rightarrow$ (x) Disk $\pi \int_{-1}^1 (1 - x^2)^2 dx = \frac{16\pi}{15}$

b) $y=2 \Rightarrow$ (x) Washer

$\pi \int_{-1}^1 (2 - x^2)^2 - (2 - 1)^2 dx = \frac{56\pi}{15}$

c) $y=-1 \Rightarrow$ (x) Washer

$\pi \int_{-1}^1 (1 - (-1))^2 - (x^2 - 1)^2 dx = \frac{64\pi}{15}$