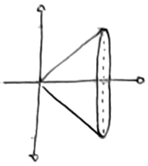
James Ding

Math Homework 5.2C

19.



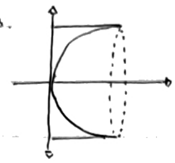
$\int_0^1 \pi x^2\,dx$

$= \pi\int_0^1 x^2\,dx$

$= \pi\left[\frac{1}{3}x^3\right]_0^1$

$\boxed{= \frac{\pi}{3}}$

23.



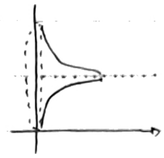
$\int_0^1 \pi\left(1^2-(\sqrt[4]{x})^2\right)dx$

$= \pi\int_0^1 (1-\sqrt{x})\,dx$

$= \pi\left[x-\frac{2}{3}x^{3/2}\right]_0^1$

$\boxed{= \frac{\pi}{3}}$

26.



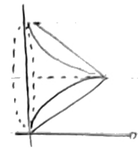
$\int_0^1 \pi\left(-\sqrt[4]{x}+1\right)^2dx$

$= \pi\int_0^1 (1-2\sqrt[4]{x}+\sqrt{x})\,dx$

$= \pi\left[x-\frac{8}{5}x^{5/4}+\frac{2}{3}x^{3/2}\right]_0^1$

$\boxed{= \frac{\pi}{15}}$

30.



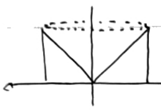
$\int_0^1 \pi\left((1-x)^2-(1-\sqrt[4]{x})^2\right)dx$

$= \pi\int_0^1 (-2x+x^2+2\sqrt[4]{x}-\sqrt{x})\,dx$

$= \pi\left[-x^2+\frac{1}{3}x^3+\frac{8}{5}x^{5/4}-\frac{2}{3}x^{3/2}\right]_0^1$

$\boxed{= \frac{4\pi}{15}}$

20.



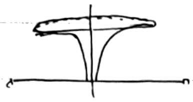
$\int_0^1 \pi(1^2-y^2)\,dy$

$= \pi\int_0^1 (1-y^2)\,dy$

$= \pi\left[y-\frac{1}{3}y^3\right]_0^1$

$\boxed{= \frac{2\pi}{3}}$

24.



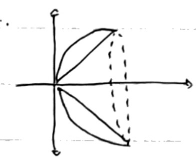
$\int_0^1 \pi(y^4)\,dy$

$= \pi\int_0^1 y^4\,dy$

$= \pi\left[\frac{1}{5}y^5\right]_0^1$

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

27.



$\int_0^1 \pi\left((\sqrt[4]{x})^2-x^2\right)dx$

$= \pi\int_0^1 (\sqrt{x}-x^2)\,dx$

$= \pi\left[\frac{2}{3}x^{3/2}-\frac{1}{3}x^3\right]_0^1$

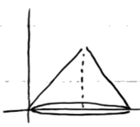
$\boxed{= \frac{\pi}{3}}$

40. $x=y^2$ from $[-1,1]$ around $x=1$

42. $y=\sqrt{x}$ from $[1,4]$ about $y=3$

This is the top portion.

21.



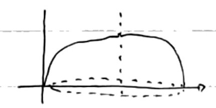
$\int_0^1 \pi(-y+1)^2\,dy$

$= \pi\int_0^1 (y^2-2y+1)\,dy$

$= \pi\left[\frac{1}{3}y^3-y^2+y\right]_0^1$

$\boxed{= \frac{\pi}{3}}$

25.



$\int_0^1 \pi\left(1^2-(-y^4+1)^2\right)dy$

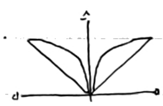
$= \pi\int_0^1 (1-y^8+2y^4-1)\,dy$

$= \pi\int_0^1 (-y^8+2y^4)$

$= \pi\left[-\frac{1}{9}y^9+\frac{2}{5}y^5\right]_0^1$

$\boxed{= \frac{13\pi}{45}}$

28.



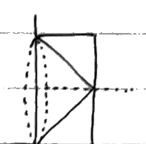
$\int_0^1 \pi\left(y^2-{y^4}^2\right)dy$

$= \pi\int_0^1 (y^2-y^8)\,dy$

$= \pi\left[\frac{1}{3}y^3-\frac{1}{9}y^9\right]_0^1$

$\boxed{= \frac{2\pi}{9}}$

22.



$\int_0^1 \pi\left(1^2-(-x+1)^2\right)dx$

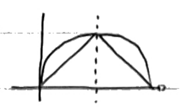
$= \pi\int_0^1 \left(1^2-(x^2-2x+1)\right)dx$

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

$= \pi\left[-\frac{1}{3}x^3+x^2\right]_0^1$

$\boxed{= \frac{2\pi}{3}}$

29.



$\int_0^1 \pi\left((-y^4+1)^2-(-y+1)^2\right)dy$

$= \pi\int_0^1 (y^8+2y-y^2-2y^4)\,dy$

$= \pi\left[y^2-\frac{1}{3}y^3-\frac{2}{5}y^5+\frac{1}{9}y^9\right]_0^1$

$\boxed{= \frac{17\pi}{45}}$