HW (4.4) p. 283 #5-21: odd; #25-29: odd;
#33-41: odd; #51-55: all

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#5) $\int_0^1 2x\,dx = \left[x^2\right]_0^1 = 1-0 = 1$

#7) $\int_{-1}^0 (x-2)\,dx$

$= \left[\frac{x^2}{2} - 2x\right]_{-1}^0 = (0-0) - (\frac{1}{2}+2)$

$= -\frac{5}{2}$

#9) $\int_{-1}^1 (t^2-2)\,dt = \left[\frac{t^3}{3} - 2t\right]_{-1}^1$

$= (\frac{1}{3}-2) - (-\frac{1}{3}+2) = -\frac{10}{3}$

#11) $\int_0^1 (2t-1)^2\,dt$

$= \int_0^1 (4t^2-4t+1)\,dt$

$= \left[\frac{4}{3}t^3 - 2t^2 + t\right]_0^1 = \frac{4}{3} - 2 + 1 = \frac{1}{3}$

#13) $\int_1^2 (\frac{3}{x^2} - 1)\,dx$

$= \left[-\frac{3}{x} - x\right]_1^2$

$= (-\frac{3}{2} - 2) - (-3-1)$

$= \frac{1}{2}$

#15) $\int_1^4 \frac{u-2}{\sqrt{u}}\,du = \int_1^4 (u^{1/2} - 2u^{-1/2})\,du$

$= \left[\frac{2}{3}u^{3/2} - 4u^{1/2}\right]_1^4$

$= \left[\frac{2}{3}(\sqrt{4})^3 - 4\sqrt{4}\right] - \left[\frac{2}{3} - 4\right] = \frac{2}{3}$

#17) $\int_{-1}^1 (\sqrt[3]{t} - 2)\,dt = \left[\frac{3}{4}t^{4/3} - 2t\right]_{-1}^1$

$= (\frac{3}{4} - 2) - (\frac{3}{4} + 2) = -4$

#19) $\int_0^1 \frac{x-\sqrt{x}}{3}\,dx = \frac{1}{3}\int_0^1 (x - x^{1/2})\,dx$

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

$= -\frac{1}{18}$

#21) $\int_{-1}^0 (t^{1/3} - t^{2/3})\,dt$

$= \left[\frac{3}{4}t^{4/3} - \frac{3}{5}t^{5/3}\right]_{-1}^0$

$= 0 - (\frac{3}{4} + \frac{3}{5}) = -\frac{27}{20}$

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#25. $\int_0^{\pi}(1+\sin x)dx = \left[x-\cos x\right]_0^{\pi}$

$= (\pi+1)-(0-1) = 2+\pi$

#27. $\int_{-\pi/6}^{\pi/6}\sec^2 x\,dx = \left[\tan x\right]_{-\pi/6}^{\pi/6}$

$= \frac{\sqrt{3}}{3} - \left(\frac{\sqrt{3}}{3}\right) = \frac{2\sqrt{3}}{3}$

#29. $\int_{-\pi/3}^{\pi/3} 4\sec\theta\tan\theta\,d\theta$

$= \left[4\sec\theta\right]_{-\pi/3}^{\pi/3} = 4(2)-4(2)$

$= 0$

#33. $A = \int_0^1 (x-x^2)dx$

$= \left[\frac{x^2}{2}-\frac{x^3}{3}\right]_0^1 = \frac{1}{6}$

#35. $A = \int_0^3 (3-x)\sqrt{x}\,dx$

$= \int_0^3 (3x^{1/2}-x^{3/2})dx = \left[2x^{3/2}-\frac{2}{5}x^{5/2}\right]_0^3$

$= \left[\frac{x\sqrt{x}}{5}(10-2x)\right]_0^3 = \frac{12\sqrt{3}}{5}$

#37. $A = \int_0^{\pi/2}\cos x\,dx$

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

#39. Since $y \geq 0$ on $[0,2]$

$A = \int_0^2 (3x^2+1)dx$

$= \left[x^3+x\right]_0^2 = 8+2 = 10$

#41. Since $y \geq 0$ on $[0,2]$

$A = \int_0^2 (x^3+x)dx$

$= \left[\frac{x^4}{4}+\frac{x^2}{2}\right]_0^2 = 4+2 = 6$

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#47 $\frac{1}{b-a}\int_a^b f(x)\,dx$ (Avg. Value of function)

$\frac{1}{2-(-2)}\int_{-2}^{2}(4-x^2)\,dx$

$= \frac{1}{4}\left[4x - \frac{1}{3}x^3\right]_{-2}^{2} = \frac{1}{4}\left[\left(8-\frac{8}{3}\right)-\left(-8+\frac{8}{3}\right)\right]$

$= \frac{8}{3}$

Avg. Value $= 8/3$

$\therefore$ $4-x^2 = \frac{8}{3}$ ~~[illegible]~~

$x = \pm\frac{2\sqrt{3}}{3} \approx \pm 1.155$

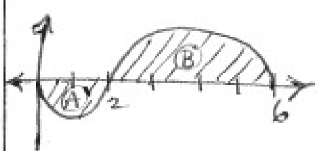
#49 $\frac{1}{\pi-0}\int_0^{\pi}\sin x\,dx$

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

Avg. Value $= \frac{2}{\pi}$

$\therefore$ $\sin x = \frac{2}{\pi}$

$x = 0.690, 2.451$



#51 $\int_0^2 f(x)\,dx = -$(area of Region A)

$= -1.5$

#52 $\int_2^6 f(x)\,dx =$ (area of Region B)

$= \int_0^6 f(x)\,dx - \int_0^2 f(x)\,dx$

$= 3.5 - (-1.5) = 5.0$

#53 $\int_0^6 |f(x)|\,dx$

$= -\int_0^2 f(x)\,dx + \int_2^6 f(x)\,dx$

$= -(-1.5) + 5.0 = 6.5$

#54 $\int_0^2 -2f(x)\,dx$

$= -2\int_0^2 f(x)\,dx = -2(-1.5) = 3.0$

#55 $\int_0^6 [2+f(x)]\,dx$

$= \int_0^6 2\,dx + \int_0^6 f(x)\,dx$

$= [2x]_0^6 + 3.5 = 12 + 3.5$

$= 15.5$