p. 454: 9-17 odd, 21-49 odd, 51-53, 70-71

9. $\int \left(x^{1.3}+7x^{2.5}\right)dx = \frac{1}{2.3}x^{2.3}+\frac{7}{3.5}x^{3.5}+C = \frac{1}{2.3}x^{2.3}+2x^{3.5}+C$

11. $\int \left(5+\frac{2}{3}x^2+\frac{3}{4}x^3\right)dx = 5x+\frac{2}{3}\cdot\frac{1}{3}x^3+\frac{3}{4}\cdot\frac{1}{4}x^4+C = 5x+\frac{2}{9}x^3+\frac{3}{16}x^4+C$

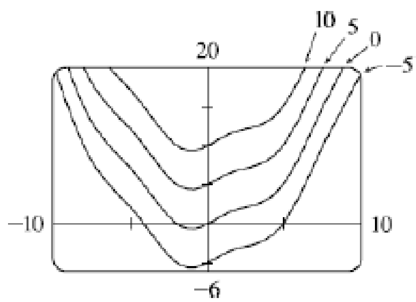
13. $\int (u+4)(2u+1)\,du = \int\left(2u^2+9u+4\right)du = 2\frac{u^3}{3}+9\frac{u^2}{2}+4u+C = \frac{2}{3}u^3+\frac{9}{2}u^2+4u+C$

15. $\int \frac{1+\sqrt{x}+x}{x}dx = \int\left(\frac{1}{x}+\frac{\sqrt{x}}{x}+\frac{x}{x}\right)dx = \int\left(\frac{1}{x}+x^{-1/2}+1\right)dx = \ln|x|+2x^{1/2}+x+C = \ln|x|+2\sqrt{x}+x+C$

17. $\int \frac{1+r}{r}dr = \int\left(\frac{1}{r}+1\right)dr = \int\left(r^{-1}+1\right)dr = \ln|r|+r+C = \ln|r|+r+C$

21. $\int 2^t(1+5^t)\,dt = \int (2^t+2^t\cdot 5^t)\,dt = \int (2^t+10^t)\,dt = \frac{2^t}{\ln 2}+\frac{10^t}{\ln 10}+C$

23. $\int\left(\cos x+\frac{1}{2}x\right)dx = \sin x+\frac{1}{4}x^2+C$. The members of the family in the figure correspond to $C=-5,0,5,$ and 10.




25. $\int_{-2}^{3}(x^2-3)\,dx = \left[\frac{1}{3}x^3-3x\right]_{-2}^{3} = (9-9)-(-\frac{8}{3}+6) = \frac{8}{3}-\frac{18}{3} = -\frac{10}{3}$

27. $\int_{-2}^{0}\left(\frac{1}{2}t^4+\frac{1}{4}t^3-t\right)dt = \left[\frac{1}{10}t^5+\frac{1}{16}t^4-\frac{1}{2}t^2\right]_{-2}^{0} = 0-\left[\frac{1}{10}(-32)+\frac{1}{16}(16)-\frac{1}{2}(4)\right] = -\left(-\frac{16}{5}+1-2\right) = \frac{21}{5}$

29. $\int_{0}^{2}(2x-3)\left(4x^2+1\right)dx = \int_0^2\left(8x^3-12x^2+2x-3\right)dx = \left[2x^4-4x^3+x^2-3x\right]_0^2 = (32-32+4-6)-0 = -2$

31. $\int_0^{\pi}\left(5e^x+3\sin x\right)dx = \left[5e^x-3\cos x\right]_0^{\pi} = \left[5e^{\pi}-3(-1)\right]-\left[5(1)-3(1)\right] = 5e^{\pi}+1$

33. $\int_1^4\left(\frac{4+6u}{\sqrt{u}}\right)du = \int_1^4\left(\frac{4}{\sqrt{u}}+\frac{6u}{\sqrt{u}}\right)du = \int_1^4\left(4u^{-1/2}+6u^{1/2}\right)du = \left[8u^{1/2}+4u^{3/2}\right]_1^4 = (16+32)-(8+4) = 36$

35. $\int_0^1 x\left(\sqrt[3]{x}+\sqrt[4]{x}\right)dx = \int_0^1\left(x^{4/3}+x^{5/4}\right)dx = \left[\frac{3}{7}x^{7/3}+\frac{4}{9}x^{9/4}\right]_0^1 = \left(\frac{3}{7}+\frac{4}{9}\right)-0 = \frac{55}{63}$

37. $\int_1^2\left(\frac{x}{2}-\frac{2}{x}\right)dx = \left[\frac{1}{4}x^2-2\ln|x|\right]_1^2 = (1-2\ln 2)-\left(\frac{1}{4}-2\ln 1\right) = \frac{3}{4}-2\ln 2$

39. $\int_0^1\left(x^{10}+10^x\right)dx = \left[\frac{x^{11}}{11}+\frac{10^x}{\ln 10}\right]_0^1 = \left(\frac{1}{11}+\frac{10}{\ln 10}\right)-\left(0+\frac{1}{\ln 10}\right) = \frac{1}{11}+\frac{9}{\ln 10}$

41. $\int_0^{\pi/4} \frac{1+\cos^2\theta}{\cos^2\theta}\,d\theta = \int_0^{\pi/4}\left(\frac{1}{\cos^2\theta}+\frac{\cos^2\theta}{\cos^2\theta}\right)d\theta = \int_0^{\pi/4}\left(\sec^2\theta+1\right)d\theta$

$= \left[\tan\theta+\theta\right]_0^{\pi/4} = \tan\frac{\pi}{4}+\frac{\pi}{4}-(0+0) = 1+\frac{\pi}{4}$

43. $\int_1^8 \frac{2+t}{\sqrt[3]{t^2}}\,dt = \int_1^8\left(\frac{2}{t^{2/3}}+\frac{t}{t^{2/3}}\right)dt = \int_1^8\left(2t^{-2/3}+t^{1/3}\right)dt = \left[2\cdot 3t^{1/3}+\frac{3}{4}t^{4/3}\right]_1^8 = (12+12)-(6-\frac{3}{4}) = \frac{69}{4}$

45. $\int_0^{\sqrt{3}/2} \frac{dr}{\sqrt{1-r^2}} = \arcsin r\Big]_0^{\sqrt{3}/2} = \arcsin\left(\sqrt{3}/2\right)-\arcsin 0 = \frac{\pi}{3}-0 = \frac{\pi}{3}$

47. $\int_0^{1/\sqrt{3}} \frac{t^2-1}{t^4-1}\,dt = \int_0^{1/\sqrt{3}} \frac{t^2-1}{\left(t^2-1\right)\left(t^2+1\right)}\,dt = \int_0^{1/\sqrt{3}} \frac{1}{t^2+1}\,dt = \left[\arctan t\right]_0^{1/\sqrt{3}} = \arctan\left(1/\sqrt{3}\right)-\arctan 0$

$= \frac{\pi}{6}-0 = \frac{\pi}{6}$

49. $\int_{-1}^{2}\left(x-2|x|\right)dx = \int_{-1}^{0}\left[x-2(-x)\right]dx + \int_0^2\left[x-2(x)\right]dx = \int_{-1}^{0}3x\,dx + \int_0^2(-x)\,dx = 3\left[\frac{1}{2}x^2\right]_{-1}^{0} - \left[\frac{1}{2}x^2\right]_0^2$

$= 3\left(0-\frac{1}{2}\right)-(2-0) = -\frac{7}{2} = -3.5$

51. $\int\left(3t^2+\frac{2}{t^2}\right)dt = \int\left(3t^2+2t^{-2}\right)dt = t^3-2t^{-1}+C = t^3-\frac{2}{t}+C,$ option (**C**).

52. $\int_4^9 \frac{x+1}{\sqrt{x}}\,dx = \int_4^9\left(\sqrt{x}+\frac{1}{\sqrt{x}}\right)dx = \int_4^9\left(x^{1/2}+x^{-1/2}\right)dx = \left[\frac{2}{3}x^{3/2}+2x^{1/2}\right]_4^9 = \left[\frac{2}{3}(27)+2(3)\right]-\left[\frac{2}{3}(8)+2(2)\right]$

$= 18+6-\frac{16}{3}-4 = \frac{44}{3}$, option (**B**).

53. $\int_0^{\pi/4}(\cos x-\sin x)\,dx = \left[\sin x+\cos x\right]_0^{\pi/4} = \left(\sin\frac{\pi}{4}+\cos\frac{\pi}{4}\right)-\left(\sin 0+\cos 0\right) = \left(\frac{\sqrt{2}}{2}+\frac{\sqrt{2}}{2}\right)-(0+1) = \sqrt{2}-1.$

This is option (**B**).

70. (a) $v'(t) = a(t) = t+4 \Rightarrow v(t) = \frac{1}{2}t^2+4t+C \Rightarrow v(0) = C = 5 \Rightarrow v(t) = \frac{1}{2}t^2+4t+5$ m/s.

(b) Distance traveled = $\int_0^{10}|v(t)|\,dt = \int_0^{10}\left|\frac{1}{2}t^2+4t+5\right|dt = \int_0^{10}\left(\frac{1}{2}t^2+4t+5\right)dt = \left[\frac{1}{6}t^3+2t^2+5t\right]_0^{10}$

$= \frac{500}{3}+200+50 = 416\frac{2}{3}$ m.

71. (a) $v'(t) = a(t) = 2t+3 \Rightarrow v(t) = t^2+3t+C \Rightarrow v(0) = C = -4 \Rightarrow v(t) = t^2+3t-4$

(b) Distance traveled =

$\int_0^3|v(t)|\,dt = \int_0^3\left|t^2+3t-4\right|dt = \int_0^3|(t+4)(t-1)|\,dt = \int_0^1\left(-t^2-3t+4\right)dt + \int_1^3\left(t^2+3t-4\right)dt$

$= \left[-\frac{1}{3}t^3-\frac{3}{2}t^2+4t\right]_0^1 + \left[\frac{1}{3}t^3+\frac{3}{2}t^2-4t\right]_1^3$

$= \left(-\frac{1}{3}-\frac{3}{2}+4\right)+\left(9+\frac{27}{2}-12\right)-\left(\frac{1}{3}+\frac{3}{2}-4\right) = \frac{89}{6}$ m