EXERCÍCIOS 7.4 ▪ PÁGINA 454

1. (a) $\dfrac{A}{x+3} + \dfrac{B}{3x+1}$ (b) $\dfrac{A}{x} + \dfrac{B}{x+1} + \dfrac{C}{(x+1)^2}$

3. (a) $\dfrac{A}{x+4} + \dfrac{B}{x-1}$ (b) $\dfrac{A}{x-1} + \dfrac{Bx+C}{x^2+x+1}$

5. (a) $1 + \dfrac{A}{x-1} + \dfrac{B}{x+1} + \dfrac{Cx+D}{x^2+1}$

    (b) $\dfrac{At+B}{t^2+1} + \dfrac{Ct+D}{t^2+4} + \dfrac{Et+F}{(t^2+4)^2}$

7. $\frac{1}{2}x^2 - x + \ln|x+1| + C$

9. $2\ln|x+5| - \ln|x-2| + C$ 11. $\frac{1}{2}\ln\frac{3}{2}$

13. $a\ln|x-b| + C$ 15. $\frac{7}{6} + \ln\frac{2}{3}$

17. $\frac{27}{5}\ln 2 - \frac{9}{5}\ln 3 \left(\text{or } \frac{9}{5}\ln\frac{8}{3}\right)$

19. $-\frac{1}{36}\ln|x+5| + \frac{1}{6}\dfrac{1}{x+5} + \frac{1}{36}\ln|x-1| + C$

21. $\frac{1}{2}x^2 - 2\ln(x^2+4) + 2\,\mathrm{tg}^{-1}(x/2) + C$

23. $2\ln|x| + (1/x) + 3\ln|x+2| + C$

25. $\ln|x-1| - \frac{1}{2}\ln(x^2+9) - \frac{1}{3}\mathrm{tg}^{-1}(x/3) + C$

27. $\frac{1}{2}\ln(x^2+1) + (1/\sqrt{2})\,\mathrm{tg}^{-1}(x/\sqrt{2}) + C$

29. $\frac{1}{2}\ln(x^2+2x+5) + \frac{3}{2}\,\mathrm{tg}^{-1}\left(\dfrac{x+1}{2}\right) + C$

31. $\frac{1}{3}\ln|x-1| - \frac{1}{6}\ln(x^2+x+1) - \frac{1}{\sqrt{3}}\,\mathrm{tg}^{-1}\dfrac{2x+1}{\sqrt{3}} + C$

33. $\frac{1}{3}\ln\frac{17}{2}$ 35. $(1/x) + \frac{1}{2}\ln|(x-1)/(x+1)| + C$

37. $\frac{7}{8}\sqrt{2}\,\mathrm{tg}^{-1}\left(\dfrac{x-2}{\sqrt{2}}\right) + \dfrac{3x-8}{4(x^2-4x+6)} + C$

39. $\ln\left|\dfrac{\sqrt{x+1}-1}{\sqrt{x+1}+1}\right| + C$

41. $2 + \ln\frac{25}{9}$ 43. $\frac{3}{10}(x^2+1)^{5/3} - \frac{3}{4}(x^2+1)^{2/3} + C$

45. $2\sqrt{x} + 3\sqrt[3]{x} + 6\sqrt[6]{x} + 6\ln|\sqrt[6]{x}-1| + C$

47. $\ln\left[\dfrac{(e^x+2)^2}{e^x+1}\right] + C$

49. $\ln|\mathrm{tg}\,t+1| - \ln|\mathrm{tg}\,t+2| + C$

51. $(x-\frac{1}{2})\ln(x^2-x+2) - 2x + \sqrt{7}\,\mathrm{tg}^{-1}\left(\dfrac{2x-1}{\sqrt{7}}\right) + C$

53. $-\frac{1}{2}\ln 3 \approx -0{,}55$

55. $\frac{1}{2}\ln\left|\dfrac{x-2}{x}\right| + C$ 59. $\frac{1}{5}\ln\left|\dfrac{2\,\mathrm{tg}(x/2)-1}{\mathrm{tg}(x/2)+2}\right| + C$

61. $4\ln\frac{2}{3} + 2$ 63. $-1 + \frac{11}{3}\ln 2$

65. $t = -\ln P - \frac{1}{9}\ln(0{,}9P + 900) + C$, where $C \approx 10{,}23$

67. (a) $\dfrac{24\,110}{4\,879}\dfrac{1}{5x+2} - \dfrac{668}{323}\dfrac{1}{2x+1} - \dfrac{9\,438}{80\,155}\dfrac{1}{3x-7} +$

    $\dfrac{1}{260\,015}\dfrac{22\,098x + 48\,935}{x^2+x+5}$

    (b) $\dfrac{4\,822}{4\,879}\ln|5x+2| - \dfrac{334}{323}\ln|2x+1| - \dfrac{3\,146}{80\,155}\ln|3x-7|$

    $+ \dfrac{11\,049}{260\,015}\ln(x^2+x+5) + \dfrac{75\,772}{260\,015\sqrt{19}}\mathrm{tg}^{-1}\dfrac{2x+1}{\sqrt{19}} + C$

O SCA omite o sinal de valor absoluto e a constante de integração.

EXERCÍCIOS 7.5 ▪ PÁGINA 461

1. $\mathrm{sen}\,x + \frac{1}{3}\mathrm{sen}^3 x + C$

3. $\mathrm{tg}^{-1}(\mathrm{sen}\,x) + C$

5. $4 - \ln 9$ 7. $e^{\pi/4} - e^{-\pi/4}$

9. $\frac{243}{5}\ln 3 - \frac{242}{25}$ 11. $\frac{1}{2}\ln(x^2-4x+5) + \mathrm{tg}^{-1}(x-2) + C$

13. $\frac{1}{8}\cos^8\theta - \frac{1}{6}\cos^6\theta + C$ (ou $\frac{1}{4}\mathrm{sen}^4\theta - \frac{1}{3}\mathrm{sen}^6\theta + \frac{1}{8}\mathrm{sen}^8\theta + C$)

15. $x/\sqrt{1-x^2} + C$

17. $\frac{1}{4}x^2 - \frac{1}{2}x\,\mathrm{sen}\,x\cos x + \frac{1}{4}\mathrm{sen}^2 x + C$
    (ou $\frac{1}{4}x^2 - \frac{1}{4}x\,\mathrm{sen}\,2x - \frac{1}{8}\cos 2x + C$)

19. $e^{e^x} + C$ 21. $(x+1)\mathrm{arctg}\sqrt{x} - \sqrt{x} + C$

23. $\frac{4097}{45}$ 25. $3x + \frac{23}{3}\ln|x-4| - \frac{5}{3}\ln|x+2| + C$

27. $x - \ln(1+e^x) + C$ 29. $15 + 7\ln\frac{2}{7}$

31. $\mathrm{sen}^{-1}x - \sqrt{1-x^2} + C$

33. $2\,\mathrm{sen}^{-1}\left(\dfrac{x+1}{2}\right) + \dfrac{x+1}{2}\sqrt{3-2x-x^2} + C$

35. 0 37. $\pi/8 - \frac{1}{4}$ 39. $\ln|\sec\theta-1| - \ln|\sec\theta| + C$

41. $\theta\,\mathrm{tg}\,\theta - \frac{1}{2}\theta^2 - \ln|\sec\theta| + C$ 43. $\frac{2}{3}(1+e^x)^{3/2} + C$

45. $-\frac{1}{3}(x^3+1)e^{-x^3} + C$

47. $\ln|x-1| - 3(x-1)^{-1} - \frac{3}{2}(x-1)^{-2} - \frac{1}{3}(x-1)^{-3} + C$

49. $\ln\left|\dfrac{\sqrt{4x+1}-1}{\sqrt{4x+1}+1}\right| + C$ 51. $-\ln\left|\dfrac{\sqrt{4x^2+1}+1}{2x}\right| + C$

53. $\dfrac{1}{m}x^2\cosh(mx) - \dfrac{2}{m^2}x\,\mathrm{senh}(mx) + \dfrac{2}{m^3}\cosh(mx) + C$

55. $2\ln\sqrt{x} - 2\ln(1+\sqrt{x}) + C$

57. $\frac{3}{7}(x+c)^{7/3} - \frac{3}{4}c(x+c)^{4/3} + C$

59. $\mathrm{sen}(\mathrm{sen}\,x) - \frac{1}{3}\mathrm{sen}^3(\mathrm{sen}\,x) + C$ 61. $2(x - 2\sqrt{x} + 2)e^{\sqrt{x}} + C$

63. $-\mathrm{tg}^{-1}(\cos^2 x) + C$ 65. $\frac{2}{3}[(x+1)^{3/2} - x^{3/2}] + C$

67. $\sqrt{2} - 2/\sqrt{3} + \ln(2+\sqrt{3}) - \ln(1+\sqrt{2})$