

EXERCISES 7.6

1-80 ■ Evaluate the integral.

1. $\int \frac{2x+5}{x-3} dx$

3. $\int \sin^2 x \cos^3 x dx$

5. $\int_0^{1/2} \frac{x}{\sqrt{1-x^2}} dx$

7. $\int \frac{\sqrt{x-2}}{x+2} dx$

9. $\int \ln(1+x^2) dx$

11. $\int_0^1 (1+\sqrt{x})^8 dx$

13. $\int \frac{x}{x^2-2x+2} dx$

15. $\int \frac{\sqrt{9-x^2}}{x} dx$

17. $\int x^2 \cosh x dx$

19. $\int \frac{\cos x}{1+\sin^2 x} dx$

21. $\int_0^1 \cos \pi x \tan \pi x dx$

23. $\int e^{3x} \cos 5x dx$

25. $\int \frac{dx}{x^3+x^2+x+1}$

27. $\int x^5 e^{-x^3} dx$

29. $\int \frac{1}{\sqrt{9x^2+12x-5}} dx$

31. $\int \sqrt[3]{x}(1-\sqrt{x}) dx$

33. $\int \frac{x}{x^4+2x^2+10} dx$

35. $\int \sin^2 x \cos^4 x dx$

37. $\int \frac{x}{1-x^2+\sqrt{1-x^2}} dx$

39. $\int \frac{e^x}{e^{2x}-1} dx$

2. $\int e^{x+e^x} dx$

4. $\int \frac{\sin x - \cos x}{\sin x + \cos x} dx$

6. $\int_1^2 x^3 \ln x dx$

8. $\int \frac{x}{(x+2)^2} dx$

10. $\int \frac{\sqrt{1+\ln x}}{x \ln x} dx$

12. $\int_0^{\pi/4} \tan^3 x \sec^4 x dx$

14. $\int x \sin^{-1} x dx$

16. $\int \frac{x}{x^2+3x+2} dx$

18. $\int \frac{x^3+x+1}{x^4+2x^2+4x} dx$

20. $\int \cos \sqrt{x} dx$

22. $\int \frac{e^{2x}}{1+e^x} dx$

24. $\int \cos 3x \cos 5x dx$

26. $\int x^2 \ln(1+x) dx$

28. $\int \tan^2 4x dx$

30. $\int x^2 \tan^{-1} x dx$

32. $\int \frac{dx}{e^x - e^{-x}}$

34. $\int \frac{1}{x+\sqrt[3]{x}} dx$

36. $\int \frac{1}{\sqrt{5-4x-x^2}} dx$

38. $\int \frac{1+\cos x}{\sin x} dx$

40. $\int \frac{1}{x^3-8} dx$

41. $\int_{-1}^1 x^5 \cosh x dx$

43. $\int_{-3}^3 |x^3+x^2-2x| dx$

45. $\int \cot x \ln(\sin x) dx$

47. $\int \frac{x}{(x^2+1)(x^2+4)} dx$

49. $\int x \sqrt[3]{x+c} dx$

51. $\int \frac{1}{x+4+4\sqrt{x+1}} dx$

53. $\int (x^2+4x-3) \sin 2x dx$

55. $\int \frac{x}{\sqrt{16-x^4}} dx$

57. $\int \cot^3 2x \csc^3 2x dx$

59. $\int \frac{e^{\arctan x}}{1+x^2} dx$

61. $\int t^3 e^{-2t} dt$

63. $\int \sin x \sin 2x \sin 3x dx$

65. $\int \sqrt{\frac{1+x}{1-x}} dx$

67. $\int \frac{x+a}{x^2+a^2} dx$

69. $\int \frac{x^4}{x^{10}+16} dx$

71. $\int x \sec x \tan x dx$

73. $\int \frac{1}{\sqrt{x+1}+\sqrt{x}} dx$

75. $\int \frac{\arctan \sqrt{x}}{\sqrt{x}} dx$

77. $\int \frac{1}{e^{3x}-e^x} dx$

79. $\int \frac{dx}{x\sqrt{2x-25}}$

42. $\int_{\pi/4}^{\pi/3} \frac{\ln(\tan x)}{\sin x \cos x} dx$

44. $\int_0^{\pi/4} \cos^5 \theta d\theta$

46. $\int \frac{1+e^x}{1-e^x} dx$

48. $\int \frac{dx}{4-5\sin x}$

50. $\int e^{\sqrt[3]{x}} dx$

52. $\int \frac{x^3+1}{x^3-x^2} dx$

54. $\int \sin x \cos(\cos x) dx$

56. $\int \frac{x^3}{(x+1)^{10}} dx$

58. $\int (x+\sin x)^2 dx$

60. $\int \frac{dx}{x(x^4+1)}$

62. $\int \frac{\sqrt{t}}{1+\sqrt[3]{t}} dt$

64. $\int_1^3 |\ln(x/2)| dx$

66. $\int \frac{x \ln x}{\sqrt{x^2-1}} dx$

68. $\int \sqrt{1+x-x^2} dx$

70. $\int \frac{x+2}{x^2+x+2} dx$

72. $\int \frac{x}{x^4-a^4} dx$

74. $\int \frac{1}{1+2e^x-e^{-x}} dx$

76. $\int \frac{\ln(x+1)}{x^2} dx$

78. $\int \frac{1+\cos^2 x}{1-\cos^2 x} dx$

80. $\int \frac{\sin 2x}{\sqrt{9-\cos^4 x}} dx$

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1. $2x + 11 \ln|x - 3| + C$ 3. $\frac{1}{3} \sin^3 x - \frac{1}{5} \sin^5 x + C$
 5. $1 - (\sqrt{3}/2)$ 7. $2\sqrt{x-2} - 4 \tan^{-1}(\sqrt{x-2}/2) + C$
 9. $x \ln(1+x^2) - 2x + 2 \tan^{-1} x + C$
 11. $\frac{4097}{45}$ 13. $\frac{1}{2} \ln(x^2 - 2x + 2) + \tan^{-1}(x-1) + C$
 15. $3 \ln|(3 - \sqrt{9-x^2})/x| + \sqrt{9-x^2} + C$
 17. $(x^2 + 2) \sinh x - 2x \cosh x + C$ 19. $\tan^{-1}(\sin x) + C$
 21. $2/\pi$ 23. $e^{3x}(5 \sin 5x + 3 \cos 5x)/34 + C$
 25. $\frac{1}{2} [\ln|x+1| - \frac{1}{2} \ln(x^2+1) + \tan^{-1} x] + C$
 27. $-\frac{1}{3}(x^3+1)e^{-x^3} + C$
 29. $\frac{1}{3} \ln|3x+2+\sqrt{9x^2+12x-5}| + C$
 31. $\frac{3}{4}x^{4/3} - \frac{6}{11}x^{11/6} + C$
 33. $\frac{1}{6} \tan^{-1}[(x^2+1)/3] + C$
 35. $\frac{1}{16}(x - \frac{1}{4} \sin 4x + \frac{1}{3} \sin^3 2x) + C$
 37. $-\ln(1 + \sqrt{1-x^2}) + C$
 39. $\frac{1}{2} \ln|(e^x-1)/(e^x+1)| + C$ 41. 0 43. $\frac{86}{3}$
 45. $\frac{1}{2} (\ln \sin x)^2 + C$ 47. $\frac{1}{8} \ln[(x^2+1)/(x^2+4)] + C$
 49. $\frac{3}{7}(x+c)^{7/3} - \frac{3}{4}c(x+c)^{4/3} + C$
 51. $3 \ln(\sqrt{x+1}+3) - \ln(\sqrt{x+1}+1) + C$
 53. $\frac{1}{2}(x+2) \sin 2x - \frac{1}{4}(2x^2+8x-7) \cos 2x + C$
 55. $\frac{1}{2} \sin^{-1}(x^2/4) + C$ 57. $\frac{1}{6} \csc^3 2x - \frac{1}{10} \csc^5 2x + C$
 59. $e^{\arctan x} + C$
 61. $-\frac{1}{8} e^{-2t}(4t^3+6t^2+6t+3) + C$
 63. $\frac{1}{24} \cos 6x - \frac{1}{16} \cos 4x - \frac{1}{8} \cos 2x + C$
 65. $\sin^{-1} x - \sqrt{1-x^2} + C$
 67. $\ln \sqrt{x^2+a^2} + \tan^{-1}(x/a) + C$ 69. $\frac{1}{20} \tan^{-1}(x^5/4) + C$
 71. $x \sec x - \ln|\sec x + \tan x| + C$
 73. $\frac{2}{3} [(x+1)^{3/2} - x^{3/2}] + C$
 75. $2\sqrt{x} \tan^{-1} \sqrt{x} - \ln(1+x) + C$
 77. $e^{-x} + \frac{1}{2} \ln|(e^x-1)/(e^x+1)| + C$
 79. $\frac{2}{5} \tan^{-1}(\sqrt{2x-25}/5) + C$