7.5 EXERCISES

1–80 Evaluate the integral.

1. $\int \cos x\,(1 + \sin^2 x)\,dx$

2. $\int \dfrac{\sin^3 x}{\cos x}\,dx$

3. $\int \dfrac{\sin x + \sec x}{\tan x}\,dx$

4. $\int \tan^3\theta\,d\theta$

5. $\int_0^2 \dfrac{2t}{(t-3)^2}\,dt$

6. $\int \dfrac{x}{\sqrt{3 - x^4}}\,dx$

7. $\int_{-1}^{1} \dfrac{e^{\arctan y}}{1 + y^2}\,dy$

8. $\int x \csc x \cot x\,dx$

9. $\int_1^3 r^4 \ln r\,dr$

10. $\int_0^4 \dfrac{x-1}{x^2 - 4x - 5}\,dx$

11. $\int \dfrac{x-1}{x^2 - 4x + 5}\,dx$

12. $\int \dfrac{x}{x^4 + x^2 + 1}\,dx$

13. $\int \sin^3\theta\,\cos^5\theta\,d\theta$

14. $\int \dfrac{x^3}{\sqrt{1 + x^2}}\,dx$

15. $\int \dfrac{dx}{(1 - x^2)^{3/2}}$

16. $\int_0^{\sqrt{2}/2} \dfrac{x^2}{\sqrt{1 - x^2}}\,dx$

17. $\int x \sin^2 x\,dx$

18. $\int \dfrac{e^{2t}}{1 + e^{4t}}\,dt$

19. $\int e^{x + e^x}\,dx$

20. $\int e^2\,dx$

21. $\int \arctan\sqrt{x}\,dx$

22. $\int \dfrac{\ln x}{x\sqrt{1 + (\ln x)^2}}\,dx$

23. $\int_0^1 \left(1 + \sqrt{x}\right)^8\,dx$

24. $\int \ln(x^2 - 1)\,dx$

25. $\int \dfrac{3x^2 - 2}{x^2 - 2x - 8}\,dx$

26. $\int \dfrac{3x^2 - 2}{x^3 - 2x - 8}\,dx$

27. $\int \dfrac{dx}{1 + e^x}$

28. $\int \sin\sqrt{at}\,dt$

29. $\int_0^5 \dfrac{3w - 1}{w + 2}\,dw$

30. $\int_{-2}^{2} |x^2 - 4x|\,dx$

31. $\int \sqrt{\dfrac{1 + x}{1 - x}}\,dx$

32. $\int \dfrac{\sqrt{2x - 1}}{2x + 3}\,dx$

33. $\int \sqrt{3 - 2x - x^2}\,dx$

34. $\int_{\pi/4}^{\pi/2} \dfrac{1 + 4\cot x}{4 - \cot x}\,dx$

35. $\int_{-1}^{1} x^8 \sin x\,dx$

36. $\int \sin 4x \cos 3x\,dx$

37. $\int_0^{\pi/4} \cos^2\theta \tan^2\theta\,d\theta$

38. $\int_0^{\pi/4} \tan^5\theta\,\sec^3\theta\,d\theta$

39. $\int \dfrac{\sec\theta \tan\theta}{\sec^2\theta - \sec\theta}\,d\theta$

40. $\int \dfrac{1}{\sqrt{4y^2 - 4y - 3}}\,dy$

41. $\int \theta \tan^2\theta\,d\theta$

42. $\int \dfrac{\tan^{-1} x}{x^2}\,dx$

43. $\int e^x\sqrt{1 + e^x}\,dx$

44. $\int \sqrt{1 + e^x}\,dx$

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

46. $\int \dfrac{1 + \sin x}{1 - \sin x}\,dx$

47. $\int x^3(x-1)^{-4}\,dx$

48. $\int \dfrac{x}{x^4 - a^4}\,dx$

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

50. $\int \frac{1}{x^2\sqrt{4x+1}}\,dx$

51. $\int \frac{1}{x\sqrt{4x^2+1}}\,dx$

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

53. $\int x^2 \sinh mx\,dx$

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

55. $\int \frac{dx}{x+x\sqrt{x}}$

56. $\int \frac{dx}{\sqrt{x}+x\sqrt{x}}$

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

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

59. $\int \cos x \cos^3(\sin x)\,dx$

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

61. $\int \sqrt{x}\,e^{\sqrt{x}}\,dx$

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

63. $\int \frac{\sin 2x}{1+\cos^4 x}\,dx$

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

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

66. $\int_2^3 \frac{u^3+1}{u^3-u^2}\,du$

67. $\int_1^{\sqrt{3}} \frac{\sqrt{1+x^2}}{x^2}\,dx$

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

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

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

71. $\int \frac{x+\arcsin x}{\sqrt{1-x^2}}\,dx$

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

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

74. $\int \frac{dx}{\sqrt{x}\left(2+\sqrt{x}\right)^4}$

75. $\int \frac{xe^x}{\sqrt{1+e^x}}\,dx$

76. $\int (x^2-bx)\sin 2x\,dx$

77. $\int \frac{\sqrt{x}}{1+x^3}\,dx$

78. $\int \frac{\sec x \cos 2x}{\sin x+\sec x}\,dx$

79. $\int x\sin^2 x \cos x\,dx$

80. $\int \frac{\sin x \cos x}{\sin^4 x+\cos^4 x}\,dx$

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81. The functions $y = e^{x^2}$ and $y = x^2e^{x^2}$ don't have elementary antiderivatives, but $y = (2x^2+1)e^{x^2}$ does. Evaluate $\int (2x^2+1)e^{x^2}\,dx$.