

Integration — Practice makes perfect

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

4. $\int \frac{\csc x \cot x}{1 + \csc^2 x} dx$

7. $\int x \tan^2 x dx$

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

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

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

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

22. $\int \frac{x^7}{\sqrt{1 - x^4}} dx$

25. $\int \sqrt{x^2 + 9} dx$

28. $\int \frac{4x - 2}{x^3 - x} dx$

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

34. $\int \frac{\sec x}{\tan x} dx$

37. $\int x(\ln x)^3 dx$

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

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

46. $\int \frac{x^2 + x + 2}{(x + 1)^3} dx$

49. $\int \frac{1}{(x^3 - 1)^2} dx$

2. $\int \frac{\sec^2 x}{1 + \tan x} dx$

5. $\int \frac{\tan x}{\cos^2 x} dx$

8. $\int x^2 \cos^2 x dx$

11. $\int \frac{x^2}{\sqrt{25 + x^2}} dx$

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

17. $\int \sqrt{x^4 + x^7} dx$

20. $\int \frac{\cos 2x}{\cos x} dx$

23. $\int \ln(1 + x) dx$

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

29. $\int \frac{x^4}{x^2 - 2} dx$

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

35. $\int \sec^3 x \tan^3 x dx$

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

41. $\int \frac{1}{x^3\sqrt{x^2 - 9}} dx$

44. $\int \frac{4x^3 - x + 1}{x^3 + 1} dx$

47. $\int \frac{x^4 + 2x + 2}{x^5 + x^4} dx$

50. $\int \frac{x}{x^4 + 4x^2 + 8} dx$

3. $\int \sin x \sec x dx$

6. $\int \csc^4 x dx$

9. $\int x^5 \sqrt{2 - x^3} dx$

12. $\int \cos x \sqrt{4 - \sin^2 x} dx$

15. $\int \frac{5x + 31}{3x^2 - 4x + 11} dx$

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

21. $\int \frac{\tan x}{\ln(\cos x)} dx$

24. $\int x \operatorname{arcsec} x dx$

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

30. $\int \frac{\sec x \tan x}{\sec x + \sec^2 x} dx$

33. $\int \frac{dx}{1 + \cos 2x}$

36. $\int x^2 \arctan x dx$

39. $\int e^x \sqrt{1 + e^{2x}} dx$

42. $\int \frac{x}{(7x - 1)^{17}} dx$

45. $\int \tan^2 x \sec x dx$

48. $\int \frac{8x^2 - 4x + 7}{(x^2 + 3)(4x + 1)} dx$

51. $\int (\ln x)^6 dx$

52. $\int \frac{(1+x^{2/3})^{3/2}}{x^{1/3}} dx$ 53. $\int \frac{(\arcsin x)^2}{\sqrt{1-x^2}} dx$ 54. $\int \frac{dx}{x^{3/2}(1+x^{1/3})}$
55. $\int \tan^3 x dx$ 56. $\int \sin^2 x \cos^4 x dx$ 57. $\int \frac{xe^{x^2}}{1+e^{2x^2}} dx$
58. $\int \frac{\cos^3 x}{\sqrt{\sin x}} dx$ 59. $\int x^3 e^{-x^2} dx$ 60. $\int \sin \sqrt{x} dx$
61. $\int \frac{\arcsin x}{x^2} dx$ 62. $\int \sqrt{x^2-9} dx$ 63. $\int x^2 \sqrt{1-x^2} dx$
64. $\int x \sqrt{2x-x^2} dx$ 65. $\int \frac{x-2}{4x^2+4x+1} dx$ 66. $\int \frac{2x^2-5x-1}{x^3-2x^2-x+2} dx$
67. $\int \frac{e^{2x}}{e^{2x}-1} dx$ 68. $\int \frac{\cos x}{\sin^2 x-3\sin x+2} dx$ 69. $\int \frac{2x^3+3x^2+4}{(x+1)^4} dx$
70. $\int \frac{\sec^2 x}{\tan^2 x+2\tan x+2} dx$ 71. $\int \frac{x^3+x^2+2x+1}{x^4+2x^2+1} dx$ 72. $\int \sin x \cos 3x dx$
73. $\int x^5 \sqrt{x^3-1} dx$ 74. $\int \ln(x^2+2x) dx$ 75. $\int \frac{\sqrt{1+\sin x}}{\sec x} dx$
76. $\int \frac{dx}{x^{2/3}(1+x^{2/3})} dx$ 77. $\int \frac{\sin x}{\sin 2x} dx$ 78. $\int \sqrt{1+\cos x} dx$
79. $\int \sqrt{1+\sin x} dx$ 80. $\int \frac{\sec^2 x}{1-\tan^2 x} dx$ 81. $\int \ln(x^2+x+1) dx$
82. $\int e^x \arcsin(e^x) dx$ 83. $\int \frac{\arctan x}{x^2} dx$ 84. $\int \frac{x^2}{\sqrt{x^2-25}} dx$
85. $\int \frac{x^3}{(x^2+1)^2} dx$ 86. $\int \frac{1}{x\sqrt{6x-x^2}} dx$ 87. $\int \frac{3x+2}{(x^2+4)^{3/2}} dx$
88. $\int x^{3/2} \ln x dx$ 89. $\int \frac{\sqrt{1+\sin^2 x}}{\sec x \csc x} dx$ 90. $\int \frac{e^{\sqrt{\sin x}}}{\sec x \sqrt{\sin x}} dx$
91. $\int xe^x \sin x dx$ 92. $\int x^2 e^{x^{3/2}} dx$ 93. $\int \frac{\arctan x}{(x-1)^3} dx$
94. $\int \ln(1+\sqrt{x}) dx$ 95. $\int \frac{2x+3}{\sqrt{3+6x-9x^2}} dx$ 96. $\int \frac{dx}{\sqrt{e^{2x}-1}}$
97. $\int \frac{x^4}{(x-1)^2} dx$ 98. $\int x^{3/2} \arctan \sqrt{x} dx$ 99. $\int \operatorname{arcsec} \sqrt{x} dx$

Hints: 1. Let $x = u^2$. 18. Let $x = u^2$. 32. Let $x = u^{12}$. 52. Let $x = u^3$. 54. Let $x = u^6$.
97. Let $u = x - 1$.