

---

# TABLES OF INTEGRALS

---

## POWERS

$$1. \int u^n du = \frac{u^{n+1}}{n+1} + C, n \neq -1$$

$$2. \int \frac{du}{u} = \ln |u| + C$$

## EXPONENTIALS AND LOGARITHMS

$$3. \int e^u du = e^u + C$$

$$4. \int p^u du = \frac{p^u}{\ln p} + C$$

$$5. \int ue^u du = ue^u - e^u + C$$

$$6. \int u^2 e^u du = u^2 e^u - 2ue^u + 2e^u + C$$

$$7. \int u^n e^u du = u^n e^u - n \int u^{n-1} e^u du$$

$$8. \int \ln u du = u \ln u - u + C$$

$$9. \int (\ln u)^2 du = u (\ln u)^2 - 2u \ln u + 2u + C$$

$$10. \int u \ln u du = \frac{1}{2}u^2 \ln u - \frac{1}{4}u^2 + C$$

$$11. \int u^n \ln u du = u^{n+1} \left[ \frac{\ln u}{n+1} - \frac{1}{(n+1)^2} \right] + C$$

$$12. \int \frac{du}{u \ln u} = \ln |\ln u| + c$$

## SINES AND COSINES

$$13. \int \sin u du = -\cos u + C$$

$$14. \int \cos u du = \sin u + C$$

$$15. \int \sin^2 u du = \frac{1}{2}u - \frac{1}{4} \sin 2u + C$$

$$16. \int \cos^2 u du = \frac{1}{2}u + \frac{1}{4} \sin 2u + C$$

$$17. \int \sin^3 u du = \frac{1}{3} \cos^3 u - \cos u + C$$

$$18. \int \cos^3 u du = \sin u - \frac{1}{3} \sin^3 u + C$$

$$19. \int \sin^n u du = -\frac{\sin^{n-1} u \cos u}{n} + \frac{n-1}{n} \int \sin^{n-2} u du$$

$$20. \int \cos^n u du = \frac{\cos^{n-1} u \sin u}{n} + \frac{n-1}{n} \int \cos^{n-2} u du$$

$$21. \int u \sin u du = -u \cos u + \sin u + C$$

$$22. \int u \cos u du = u \sin u + \cos u + C$$

$$23. \int u^n \sin u du = -u^n \cos u + n \int u^{n-1} \cos u du$$

$$24. \int u^n \cos u du = u^n \sin u - n \int u^{n-1} \sin u du$$

$$25. \int \sin mu \sin nu du = -\frac{\sin [(m+n)u]}{2(m+n)} + \frac{\sin [(m-n)u]}{2(m-n)} + C, m^2 \neq n^2$$

$$26. \int \cos mu \cos nu du = -\frac{\sin [(m+n)u]}{2(m+n)} + \frac{\sin [(m-n)u]}{2(m-n)} + C, m^2 \neq n^2$$

$$27. \int \sin mu \cos nu du = -\frac{\cos [(m+n)u]}{2(m+n)} + \frac{\cos [(m-n)u]}{2(m-n)} + C, m^2 \neq n^2$$

$$28. \int e^{au} \sin bu du = \frac{e^{au}}{a^2 + b^2} (a \sin bu - b \cos bu) + C$$

$$29. \int e^{au} \cos bu du = \frac{e^{au}}{a^2 + b^2} (a \cos bu + b \sin bu) + C$$

## TANGENTS AND SECANTS

$$30. \int \tan u \, du = \ln |\sec u| + C$$

$$32. \int \tan^2 u \, du = \tan u - u + C$$

$$34. \int \sec u \tan u \, du = \sec u + C$$

$$36. \int \sec^3 u \, du = \frac{1}{2} \sec u \tan u + \frac{1}{2} \ln |\sec u + \tan u| + C$$

$$37. \int \tan^n u \, du = \frac{\tan^{n-1} u}{n-1} - \int \tan^{n-2} u \, du$$

$$31. \int \sec u \, du = \ln |\sec u + \tan u| + C$$

$$33. \int \sec^2 u \, du = \tan u + C$$

$$35. \int \tan^3 u \, du = \frac{1}{2} \tan^2 u + \ln |\cos u| + C$$

$$38. \int \sec^n u \, du = \frac{\sec^{n-2} u \tan u}{n-1} + \frac{n-2}{n-1} \int \sec^{n-2} u \, du$$

## COTANGENTS AND COSECANTS

$$39. \int \cot u \, du = \ln |\sin u| + C$$

$$41. \int \cot^2 u \, du = -\cot u - u + C$$

$$43. \int \csc u \cot u \, du = -\csc u + C$$

$$45. \int \csc^3 u \, du = -\frac{1}{2} \csc u \cot u + \frac{1}{2} \ln |\csc u - \cot u| + C$$

$$46. \int \cot^n u \, du = -\frac{\cot^{n-1} u}{n-1} - \int \cot^{n-2} u \, du$$

$$47. \int \csc^n u \, du = -\frac{\csc^{n-2} u \cot u}{n-1} + \frac{n-2}{n-1} \int \csc^{n-2} u \, du + C$$

$$40. \int \csc u \, du = \ln |\csc u - \cot u| + C$$

$$42. \int \csc^2 u \, du = -\cot u + C$$

$$44. \int \cot^3 u \, du = -\frac{1}{2} \cot^2 u - \ln |\sin u| + C$$

## HYPERBOLIC FUNCTIONS

$$48. \int \sinh u \, du = \cosh u + C$$

$$50. \int \tanh u \, du = \ln (\cosh u) + C$$

$$52. \int \operatorname{sech} u \, du = \tan^{-1}(\sinh u) + C$$

$$54. \int \operatorname{sech}^2 u \, du = \tanh u + C$$

$$56. \int \operatorname{sech} u \tanh u \, du = -\operatorname{sech} u + C$$

$$58. \int \sinh^2 u \, du = \frac{1}{4} \sinh 2u - \frac{1}{2}u + C$$

$$60. \int \tanh^2 u \, du = u - \tanh u + C$$

$$62. \int u \sinh u \, du = u \cosh u - \sinh u + C$$

$$49. \int \cosh u \, du = \sinh u + C$$

$$51. \int \operatorname{coth} u \, du = \ln |\sinh u| + C$$

$$53. \int \operatorname{csch} u \, du = \ln \left| \tanh \frac{1}{2}u \right| + C$$

$$55. \int \operatorname{csch}^2 u \, du = -\operatorname{coth} u + C$$

$$57. \int \operatorname{csch} u \operatorname{coth} u \, du = -\operatorname{csch} u + C$$

$$59. \int \operatorname{coth}^2 u \, du = \frac{1}{4} \sinh 2u + \frac{1}{2}u + C$$

$$61. \int \operatorname{coth}^2 u \, du = u - \operatorname{coth} u - C$$

$$63. \int u \cosh u \, du = u \sinh u - \cosh u + C$$

(table continued at the back)

(continued from the front)

## INVERSE TRIGONOMETRIC FUNCTIONS

$$64. \int \sin^{-1} u \, du = \sin^{-1} u + \sqrt{1-u^2} + C$$

$$66. \int \tan^{-1} u \, du = u \tan^{-1} u - \frac{1}{2} \ln(1+u^2) + C$$

$$68. \int \sec^{-1} u \, du = u \sec^{-1} u - \ln|u + \sqrt{u^2-1}| + C$$

$$70. \int u \sin^{-1} u \, du = \frac{1}{4}(2u^2-1) \sin^{-1} u + u\sqrt{1-u^2} + C$$

$$72. \int u \cos^{-1} u \, du = \frac{1}{4}(2u^2-1) \cos^{-1} u - u\sqrt{1-u^2} + C$$

$$73. \int u^n \sin^{-1} u \, du = \frac{1}{n+1} \left[ u^{n+1} \sin^{-1} u - \int \frac{u^{n+1} du}{\sqrt{1-u^2}} \right], n \neq -1$$

$$74. \int u^n \cos^{-1} u \, du = \frac{1}{n+1} \left[ u^{n+1} \cos^{-1} u - \int \frac{u^{n+1} du}{\sqrt{1-u^2}} \right], n \neq -1$$

$$75. \int u^n \tan^{-1} u \, du = \frac{1}{n+1} \left[ u^{n+1} \tan^{-1} u - \int \frac{u^{n+1} du}{\sqrt{1-u^2}} \right], n \neq -1$$

$$\sqrt{a^2+u^2}, a > 0$$

$$76. \int \frac{du}{a^2+u^2} = \frac{1}{a} \tan^{-1} \frac{u}{a} + C$$

$$77. \int \frac{du}{\sqrt{a^2+u^2}} = \ln|u + \sqrt{a^2+u^2}| + C$$

$$78. \int \sqrt{a^2+u^2} \, du = \frac{u}{2} \sqrt{a^2+u^2} + \frac{a^2}{2} \ln|u + \sqrt{a^2+u^2}| + C$$

$$79. \int u^2 \sqrt{a^2+u^2} \, du = \frac{u}{8}(a^2+2u^2) \sqrt{a^2+u^2} - \frac{a^4}{8} \ln|u + \sqrt{a^2+u^2}| + C$$

$$80. \int \frac{\sqrt{a^2+u^2}}{u} \, du = \sqrt{a^2+u^2} - a \ln \left| \frac{a + \sqrt{a^2+u^2}}{u} \right| + C$$

$$81. \int \frac{\sqrt{a^2+u^2}}{u^2} \, du = -\frac{\sqrt{a^2+u^2}}{u} + \ln|u + \sqrt{a^2+u^2}| + C$$

$$82. \int \frac{u^2 \, du}{\sqrt{a^2+u^2}} = \frac{u}{2} \sqrt{a^2+u^2} - \frac{a^2}{2} \ln|u + \sqrt{a^2+u^2}| + C$$

$$83. \int \frac{du}{u\sqrt{a^2+u^2}} = -\frac{1}{a} \ln \left| \frac{a + \sqrt{a^2+u^2}}{u} \right| + C$$

$$84. \int \frac{du}{u^2 \sqrt{a^2+u^2}} = -\frac{\sqrt{a^2+u^2}}{a^2 u} + C$$

$$85. \int \frac{du}{(a^2+u^2)^{3/2}} = \frac{u}{a^2 \sqrt{a^2+u^2}} + C$$

$$\sqrt{a^2-u^2}, a > 0$$

$$86. \int \frac{du}{\sqrt{a^2-u^2}} = \sin^{-1} \frac{u}{a} + C$$

$$87. \int \sqrt{a^2-u^2} \, du = \frac{u}{2} \sqrt{a^2-u^2} + \frac{a^2}{2} \sin^{-1} \frac{u}{a} + C$$

$$88. \int u^2 \sqrt{a^2-u^2} \, du = \frac{u}{8}(2u^2-a^2) \sqrt{a^2-u^2} + \frac{a^4}{8} \sin^{-1} \frac{u}{a} + C$$

$$89. \int \frac{\sqrt{a^2 - u^2}}{u} du = \sqrt{a^2 - u^2} - a \ln \left| \frac{a + \sqrt{a^2 - u^2}}{u} \right| + C$$

$$90. \int \frac{\sqrt{a^2 - u^2}}{u^2} du = -\frac{1}{u} \sqrt{a^2 - u^2} - \sin^{-1} \frac{u}{a} + C$$

$$92. \int \frac{du}{u\sqrt{a^2 - u^2}} = -\frac{1}{a} \ln \left| \frac{a + \sqrt{a^2 - u^2}}{u} \right| + C$$

$$94. \int (a^2 - u^2)^{3/2} du = -\frac{u}{8}(2u^2 - 5a^2)\sqrt{a^2 - u^2} + \frac{3a^4}{8} \sin^{-1} \frac{u}{a} + C$$

$$95. \int \frac{du}{(a^2 - u^2)^{3/2}} = \frac{u}{a^2 \sqrt{a^2 - u^2}} + C$$

$$91. \int \frac{u^2 du}{\sqrt{a^2 - u^2}} = -\frac{u}{2} \sqrt{a^2 - u^2} + \frac{a^2}{2} \sin^{-1} \frac{u}{a} + C$$

$$93. \int \frac{du}{u^2 \sqrt{a^2 - u^2}} = -\frac{1}{a^2 u} \sqrt{a^2 - u^2} + C$$

$$96. \int \frac{du}{a^2 - u^2} = \frac{1}{2a} \ln \left| \frac{u+a}{u-a} \right| + C$$

$\sqrt{u^2 - a^2}, a > 0$

$$97. \int \frac{du}{u\sqrt{u^2 - a^2}} = \frac{1}{a} \sec^{-1} \frac{|u|}{a} + C$$

$$98. \int \frac{\sqrt{u^2 - a^2}}{u} du = \sqrt{u^2 - a^2} - a \sec^{-1} \frac{u}{a} + C$$

$$99. \int \sqrt{u^2 - a^2} du = \frac{u}{2} \sqrt{u^2 - a^2} - \frac{a^2}{2} \ln |u + \sqrt{u^2 - a^2}| + C$$

$$100. \int u^2 \sqrt{u^2 - a^2} du = \frac{u}{8}(2u^2 - a^2)\sqrt{u^2 - a^2} - \frac{a^4}{8} \ln |u + \sqrt{u^2 - a^2}| + C$$

$$101. \int \frac{\sqrt{u^2 - a^2}}{u^2} du = -\frac{\sqrt{u^2 - a^2}}{u} + \ln |u + \sqrt{u^2 - a^2}| + C$$

$$102. \int \frac{u^2 du}{\sqrt{u^2 - a^2}} = \frac{u}{2} \sqrt{u^2 - a^2} + \frac{a^2}{2} \ln |u + \sqrt{u^2 - a^2}| + C$$

$$103. \int \frac{du}{u^2 \sqrt{u^2 - a^2}} = \frac{\sqrt{u^2 - a^2}}{a^2 u} + C$$

$$104. \int \frac{du}{(u^2 - a^2)^{3/2}} = -\frac{u}{a^2 \sqrt{u^2 - a^2}} + C$$

$$105. \int \frac{u^2 du}{(u^2 - a^2)^{3/2}} = \frac{-u}{\sqrt{u^2 - a^2}} + \ln |u + \sqrt{u^2 - a^2}| + C$$

$a + bu, \sqrt{a + bu}$

$$106. \int \frac{u du}{a + bu} = \frac{1}{b^2} (a + bu - a \ln |a + bu|) + C$$

$$107. \int \frac{u^2 du}{a + bu} = \frac{1}{2b^3} [(a + bu)^2 - 4a(a + bu) + 2a^2 \ln |a + bu|] + C$$

$$108. \int \frac{du}{u(a + bu)} = \frac{1}{a} \ln \left| \frac{u}{a + bu} \right| + C$$

$$109. \int \frac{du}{u^2(a + bu)} = -\frac{1}{au} + \frac{b}{a^2} \ln \left| \frac{a + bu}{u} \right| + C$$

$$110. \int \frac{u du}{(a + bu)^2} = \frac{a}{b^2(a + bu)} + \frac{1}{b^2} \ln |a + bu| + C$$

$$111. \int \frac{du}{u(a + bu)^2} = \frac{1}{a(a + bu)} = \frac{1}{a^2} \ln \left| \frac{a + bu}{u} \right| + C$$

$$112. \int \frac{u^2 du}{(a + bu)^2} = \frac{1}{b^3} \left( a + bu - \frac{a^2}{a + bu} - 2a \ln |a + bu| \right) + C$$

$$113. \int \frac{u du}{\sqrt{a + bu}} = \frac{2}{3b^2} (bu - 2a)\sqrt{a + bu} + C$$

$$114. \int u\sqrt{a + bu} du = \frac{2}{15b^2} (3bu - 2a)(a + bu)^{3/2} + C$$