

TABLE OF INTEGRALS

BASIC FORMS

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|---|---|
| <p>1. $\int u \, dv = uv - \int v \, du$</p> <p>2. $\int u^n \, du = \frac{u^{n+1}}{n+1} + C, \quad n \neq -1$</p> <p>3. $\int \frac{du}{u} = \ln u + C$</p> <p>4. $\int e^u \, du = e^u + C$</p> <p>5. $\int a^u \, du = \frac{a^u}{\ln a} + C$</p> <p>6. $\int \sin u \, du = -\cos u + C$</p> <p>7. $\int \cos u \, du = \sin u + C$</p> <p>8. $\int \sec^2 u \, du = \tan u + C$</p> <p>9. $\int \csc^2 u \, du = -\cot u + C$</p> <p>10. $\int \sec u \tan u \, du = \sec u + C$</p> | <p>11. $\int \csc u \cot u \, du = -\csc u + C$</p> <p>12. $\int \tan u \, du = \ln \sec u + C$</p> <p>13. $\int \cot u \, du = \ln \sin u + C$</p> <p>14. $\int \sec u \, du = \ln \sec u + \tan u + C$</p> <p>15. $\int \csc u \, du = \ln \csc u - \cot u + C$</p> <p>16. $\int \frac{du}{\sqrt{a^2 - u^2}} = \sin^{-1} \frac{u}{a} + C$</p> <p>17. $\int \frac{du}{a^2 + u^2} = \frac{1}{a} \tan^{-1} \frac{u}{a} + C$</p> <p>18. $\int \frac{du}{u\sqrt{u^2 - a^2}} = \frac{1}{a} \sec^{-1} \frac{u}{a} + C$</p> <p>19. $\int \frac{du}{a^2 - u^2} = \frac{1}{2a} \ln \left \frac{u+a}{u-a} \right + C$</p> <p>20. $\int \frac{du}{u^2 - a^2} = \frac{1}{2a} \ln \left \frac{u-a}{u+a} \right + C$</p> |
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FORMS INVOLVING $\sqrt{a^2 + u^2}, \quad a > 0$

21. $\int \sqrt{a^2 + u^2} \, du = \frac{u}{2} \sqrt{a^2 + u^2} + \frac{a^2}{2} \ln(u + \sqrt{a^2 + u^2}) + C$
22. $\int u^2 \sqrt{a^2 + u^2} \, du = \frac{u}{8} (a^2 + 2u^2) \sqrt{a^2 + u^2} - \frac{a^4}{8} \ln(u + \sqrt{a^2 + u^2}) + C$
23. $\int \frac{\sqrt{a^2 + u^2}}{u} \, du = \sqrt{a^2 + u^2} - a \ln \left| \frac{a + \sqrt{a^2 + u^2}}{u} \right| + C$
24. $\int \frac{\sqrt{a^2 + u^2}}{u^2} \, du = -\frac{\sqrt{a^2 + u^2}}{u} + \ln(u + \sqrt{a^2 + u^2}) + C$
25. $\int \frac{du}{\sqrt{a^2 + u^2}} = \ln(u + \sqrt{a^2 + u^2}) + C$
26. $\int \frac{u^2 \, du}{\sqrt{a^2 + u^2}} = \frac{u}{2} \sqrt{a^2 + u^2} - \frac{a^2}{2} \ln(u + \sqrt{a^2 + u^2}) + C$
27. $\int \frac{du}{u\sqrt{a^2 + u^2}} = -\frac{1}{a} \ln \left| \frac{\sqrt{a^2 + u^2} + a}{u} \right| + C$
28. $\int \frac{du}{u^2 \sqrt{a^2 + u^2}} = -\frac{\sqrt{a^2 + u^2}}{a^2 u} + C$
29. $\int \frac{du}{(a^2 + u^2)^{3/2}} = \frac{u}{a^2 \sqrt{a^2 + u^2}} + C$

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

$$30. \int \sqrt{a^2 - u^2} du = \frac{u}{2} \sqrt{a^2 - u^2} + \frac{a^2}{2} \sin^{-1} \frac{u}{a} + C$$

$$31. \int u^2 \sqrt{a^2 - u^2} du = \frac{u}{8} (2u^2 - a^2) \sqrt{a^2 - u^2} + \frac{a^4}{8} \sin^{-1} \frac{u}{a} + C$$

$$32. \int \frac{\sqrt{a^2 - u^2}}{u} du = \sqrt{a^2 - u^2} - a \ln \left| \frac{a + \sqrt{a^2 - u^2}}{u} \right| + C$$

$$33. \int \frac{\sqrt{a^2 - u^2}}{u^2} du = -\frac{1}{u} \sqrt{a^2 - u^2} - \sin^{-1} \frac{u}{a} + C$$

$$34. \int \frac{u^2 du}{\sqrt{a^2 - u^2}} = -\frac{u}{2} \sqrt{a^2 - u^2} + \frac{a^2}{2} \sin^{-1} \frac{u}{a} + C$$

$$35. \int \frac{du}{u \sqrt{a^2 - u^2}} = -\frac{1}{a} \ln \left| \frac{a + \sqrt{a^2 - u^2}}{u} \right| + C$$

$$36. \int \frac{du}{u^2 \sqrt{a^2 - u^2}} = -\frac{1}{a^2 u} \sqrt{a^2 - u^2} + C$$

$$37. \int (a^2 - u^2)^{3/2} du = -\frac{u}{8} (2u^2 - 5a^2) \sqrt{a^2 - u^2} + \frac{3a^4}{8} \sin^{-1} \frac{u}{a} + C$$

$$38. \int \frac{du}{(a^2 - u^2)^{3/2}} = \frac{u}{a^2 \sqrt{a^2 - u^2}} + C$$

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

$$39. \int \sqrt{u^2 - a^2} du = \frac{u}{2} \sqrt{u^2 - a^2} - \frac{a^2}{2} \ln |u + \sqrt{u^2 - a^2}| + C$$

$$40. \int u^2 \sqrt{u^2 - a^2} du = \frac{u}{8} (2u^2 - a^2) \sqrt{u^2 - a^2} - \frac{a^4}{8} \ln |u + \sqrt{u^2 - a^2}| + C$$

$$41. \int \frac{\sqrt{u^2 - a^2}}{u} du = \sqrt{u^2 - a^2} - a \cos^{-1} \frac{a}{|u|} + C$$

$$42. \int \frac{\sqrt{u^2 - a^2}}{u^2} du = -\frac{\sqrt{u^2 - a^2}}{u} + \ln |u + \sqrt{u^2 - a^2}| + C$$

$$43. \int \frac{du}{\sqrt{u^2 - a^2}} = \ln |u + \sqrt{u^2 - a^2}| + C$$

$$44. \int \frac{u^2 du}{\sqrt{u^2 - a^2}} = \frac{u}{2} \sqrt{u^2 - a^2} + \frac{a^2}{2} \ln |u + \sqrt{u^2 - a^2}| + C$$

$$45. \int \frac{du}{u^2 \sqrt{u^2 - a^2}} = \frac{\sqrt{u^2 - a^2}}{a^2 u} + C$$

$$46. \int \frac{du}{(u^2 - a^2)^{3/2}} = -\frac{u}{a^2 \sqrt{u^2 - a^2}} + C$$

TABLE OF INTEGRALS

FORMS INVOLVING $a + bu$

$$47. \int \frac{u \, du}{a + bu} = \frac{1}{b^2} (a + bu - a \ln |a + bu|) + C$$

$$48. \int \frac{u^2 \, du}{a + bu} = \frac{1}{2b^3} [(a + bu)^2 - 4a(a + bu) + 2a^2 \ln |a + bu|] + C$$

$$49. \int \frac{du}{u(a + bu)} = \frac{1}{a} \ln \left| \frac{u}{a + bu} \right| + C$$

$$50. \int \frac{du}{u^2(a + bu)} = -\frac{1}{au} + \frac{b}{a^2} \ln \left| \frac{a + bu}{u} \right| + C$$

$$51. \int \frac{u \, du}{(a + bu)^2} = \frac{a}{b^2(a + bu)} + \frac{1}{b^2} \ln |a + bu| + C$$

$$52. \int \frac{du}{u(a + bu)^2} = \frac{1}{a(a + bu)} - \frac{1}{a^2} \ln \left| \frac{a + bu}{u} \right| + C$$

$$53. \int \frac{u^2 \, du}{(a + bu)^2} = \frac{1}{b^3} \left(a + bu - \frac{a^2}{a + bu} - 2a \ln |a + bu| \right) + C$$

$$54. \int u \sqrt{a + bu} \, du = \frac{2}{15b^2} (3bu - 2a)(a + bu)^{3/2} + C$$

$$55. \int \frac{u \, du}{\sqrt{a + bu}} = \frac{2}{3b^2} (bu - 2a)\sqrt{a + bu} + C$$

$$56. \int \frac{u^2 \, du}{\sqrt{a + bu}} = \frac{2}{15b^3} (8a^2 + 3b^2u^2 - 4abu)\sqrt{a + bu} + C$$

$$57. \int \frac{du}{u\sqrt{a + bu}} = \frac{1}{\sqrt{a}} \ln \left| \frac{\sqrt{a + bu} - \sqrt{a}}{\sqrt{a + bu} + \sqrt{a}} \right| + C, \quad \text{if } a > 0$$

$$= \frac{2}{\sqrt{-a}} \tan^{-1} \sqrt{\frac{a + bu}{-a}} + C, \quad \text{if } a < 0$$

$$58. \int \frac{\sqrt{a + bu}}{u} \, du = 2\sqrt{a + bu} + a \int \frac{du}{u\sqrt{a + bu}}$$

$$59. \int \frac{\sqrt{a + bu}}{u^2} \, du = -\frac{\sqrt{a + bu}}{u} + \frac{b}{2} \int \frac{du}{u\sqrt{a + bu}}$$

$$60. \int u^n \sqrt{a + bu} \, du = \frac{2}{b(2n + 3)} \left[u^n (a + bu)^{3/2} - na \int u^{n-1} \sqrt{a + bu} \, du \right]$$

$$61. \int \frac{u^n \, du}{\sqrt{a + bu}} = \frac{2u^n \sqrt{a + bu}}{b(2n + 1)} - \frac{2na}{b(2n + 1)} \int \frac{u^{n-1} \, du}{\sqrt{a + bu}}$$

$$62. \int \frac{du}{u^n \sqrt{a + bu}} = -\frac{\sqrt{a + bu}}{a(n-1)u^{n-1}} - \frac{b(2n-3)}{2a(n-1)} \int \frac{du}{u^{n-1} \sqrt{a + bu}}$$

TABLE OF INTEGRALS

TRIGONOMETRIC FORMS

$$63. \int \sin^2 u \, du = \frac{1}{2}u - \frac{1}{4}\sin 2u + C$$

$$64. \int \cos^2 u \, du = \frac{1}{2}u + \frac{1}{4}\sin 2u + C$$

$$65. \int \tan^2 u \, du = \tan u - u + C$$

$$66. \int \cot^2 u \, du = -\cot u - u + C$$

$$67. \int \sin^3 u \, du = -\frac{1}{3}(2 + \sin^2 u) \cos u + C$$

$$68. \int \cos^3 u \, du = \frac{1}{3}(2 + \cos^2 u) \sin u + C$$

$$69. \int \tan^3 u \, du = \frac{1}{2}\tan^2 u + \ln |\cos u| + C$$

$$70. \int \cot^3 u \, du = -\frac{1}{2}\cot^2 u - \ln |\sin u| + C$$

$$71. \int \sec^3 u \, du = \frac{1}{2}\sec u \tan u + \frac{1}{2}\ln |\sec u + \tan u| + C$$

$$72. \int \csc^3 u \, du = -\frac{1}{2}\csc u \cot u + \frac{1}{2}\ln |\csc u - \cot u| + C$$

$$73. \int \sin^n u \, du = -\frac{1}{n}\sin^{n-1}u \cos u + \frac{n-1}{n}\int \sin^{n-2}u \, du$$

$$74. \int \cos^n u \, du = \frac{1}{n}\cos^{n-1}u \sin u + \frac{n-1}{n}\int \cos^{n-2}u \, du$$

$$75. \int \tan^n u \, du = \frac{1}{n-1}\tan^{n-1}u - \int \tan^{n-2}u \, du$$

$$76. \int \cot^n u \, du = \frac{-1}{n-1}\cot^{n-1}u - \int \cot^{n-2}u \, du$$

$$77. \int \sec^n u \, du = \frac{1}{n-1}\tan u \sec^{n-2}u + \frac{n-2}{n-1}\int \sec^{n-2}u \, du$$

$$78. \int \csc^n u \, du = \frac{-1}{n-1}\cot u \csc^{n-2}u + \frac{n-2}{n-1}\int \csc^{n-2}u \, du$$

$$79. \int \sin au \sin bu \, du = \frac{\sin(a-b)u}{2(a-b)} - \frac{\sin(a+b)u}{2(a+b)} + C$$

$$80. \int \cos au \cos bu \, du = \frac{\sin(a-b)u}{2(a-b)} + \frac{\sin(a+b)u}{2(a+b)} + C$$

$$81. \int \sin au \cos bu \, du = -\frac{\cos(a-b)u}{2(a-b)} - \frac{\cos(a+b)u}{2(a+b)} + C$$

$$82. \int u \sin u \, du = \sin u - u \cos u + C$$

$$83. \int u \cos u \, du = \cos u + u \sin u + C$$

$$84. \int u^n \sin u \, du = -u^n \cos u + n \int u^{n-1} \cos u \, du$$

$$85. \int u^n \cos u \, du = u^n \sin u - n \int u^{n-1} \sin u \, du$$

$$86. \int \sin^n u \cos^m u \, du = -\frac{\sin^{n-1}u \cos^{m+1}u}{n+m} + \frac{n-1}{n+m}\int \sin^{n-2}u \cos^m u \, du \\ = \frac{\sin^{n+1}u \cos^{m-1}u}{n+m} + \frac{m-1}{n+m}\int \sin^n u \cos^{m-2}u \, du$$

INVERSE TRIGONOMETRIC FORMS

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

$$88. \int \cos^{-1}u \, du = u \cos^{-1}u - \sqrt{1-u^2} + C$$

$$89. \int \tan^{-1}u \, du = u \tan^{-1}u - \frac{1}{2}\ln(1+u^2) + C$$

$$90. \int u \sin^{-1}u \, du = \frac{2u^2-1}{4}\sin^{-1}u + \frac{u\sqrt{1-u^2}}{4} + C$$

$$91. \int u \cos^{-1}u \, du = \frac{2u^2-1}{4}\cos^{-1}u - \frac{u\sqrt{1-u^2}}{4} + C$$

$$92. \int u \tan^{-1}u \, du = \frac{u^2+1}{2}\tan^{-1}u - \frac{u}{2} + C$$

$$93. \int u^n \sin^{-1}u \, du = \frac{1}{n+1}\left[u^{n+1}\sin^{-1}u - \int \frac{u^{n+1}du}{\sqrt{1-u^2}}\right], \quad n \neq -1$$

$$94. \int u^n \cos^{-1}u \, du = \frac{1}{n+1}\left[u^{n+1}\cos^{-1}u + \int \frac{u^{n+1}du}{\sqrt{1-u^2}}\right], \quad n \neq -1$$

$$95. \int u^n \tan^{-1}u \, du = \frac{1}{n+1}\left[u^{n+1}\tan^{-1}u - \int \frac{u^{n+1}du}{1+u^2}\right], \quad n \neq -1$$

TABLE OF INTEGRALS

EXPONENTIAL AND LOGARITHMIC FORMS

$$96. \int u e^{au} du = \frac{1}{a^2} (au - 1)e^{au} + C$$

$$97. \int u^n e^{au} du = \frac{1}{a} u^n e^{au} - \frac{n}{a} \int u^{n-1} e^{au} du$$

$$98. \int e^{au} \sin bu du = \frac{e^{au}}{a^2 + b^2} (a \sin bu - b \cos bu) + C$$

$$99. \int e^{au} \cos bu du = \frac{e^{au}}{a^2 + b^2} (a \cos bu + b \sin bu) + C$$

$$100. \int \ln u du = u \ln u - u + C$$

$$101. \int u^n \ln u du = \frac{u^{n+1}}{(n+1)^2} [(n+1) \ln u - 1] + C$$

$$102. \int \frac{1}{u \ln u} du = \ln |\ln u| + C$$

HYPERBOLIC FORMS

$$103. \int \sinh u du = \cosh u + C$$

$$104. \int \cosh u du = \sinh u + C$$

$$105. \int \tanh u du = \ln \cosh u + C$$

$$106. \int \coth u du = \ln |\sinh u| + C$$

$$107. \int \operatorname{sech} u du = \tan^{-1} |\sinh u| + C$$

$$108. \int \operatorname{csch} u du = \ln \left| \tanh \frac{1}{2} u \right| + C$$

$$109. \int \operatorname{sech}^2 u du = \tanh u + C$$

$$110. \int \operatorname{csch}^2 u du = -\operatorname{coth} u + C$$

$$111. \int \operatorname{sech} u \tanh u du = -\operatorname{sech} u + C$$

$$112. \int \operatorname{csch} u \coth u du = -\operatorname{csch} u + C$$

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

$$113. \int \sqrt{2au - u^2} du = \frac{u-a}{2} \sqrt{2au - u^2} + \frac{a^2}{2} \cos^{-1} \left(\frac{a-u}{a} \right) + C$$

$$114. \int u \sqrt{2au - u^2} du = \frac{2u^2 - au - 3a^2}{6} \sqrt{2au - u^2} + \frac{a^3}{2} \cos^{-1} \left(\frac{a-u}{a} \right) + C$$

$$115. \int \frac{\sqrt{2au - u^2}}{u} du = \sqrt{2au - u^2} + a \cos^{-1} \left(\frac{a-u}{a} \right) + C$$

$$116. \int \frac{\sqrt{2au - u^2}}{u^2} du = -\frac{2\sqrt{2au - u^2}}{u} - \cos^{-1} \left(\frac{a-u}{a} \right) + C$$

$$117. \int \frac{du}{\sqrt{2au - u^2}} = \cos^{-1} \left(\frac{a-u}{a} \right) + C$$

$$118. \int \frac{u du}{\sqrt{2au - u^2}} = -\sqrt{2au - u^2} + a \cos^{-1} \left(\frac{a-u}{a} \right) + C$$

$$119. \int \frac{u^2 du}{\sqrt{2au - u^2}} = -\frac{(u+3a)}{2} \sqrt{2au - u^2} + \frac{3a^2}{2} \cos^{-1} \left(\frac{a-u}{a} \right) + C$$

$$120. \int \frac{du}{u \sqrt{2au - u^2}} = -\frac{\sqrt{2au - u^2}}{au} + C$$

Appendix B: Integration Tables

Forms Involving u^n

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

$$2. \int \frac{1}{u} du = \ln|u| + C$$

Forms Involving $a + bu$

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

$$4. \int \frac{u}{(a+bu)^2} du = \frac{1}{b^2}\left(\frac{a}{a+bu} + \ln|a+bu|\right) + C$$

$$5. \int \frac{u}{(a+bu)^n} du = \frac{1}{b^2}\left[\frac{-1}{(n-2)(a+bu)^{n-2}} + \frac{a}{(n-1)(a+bu)^{n-1}}\right] + C, n \neq 1, 2$$

$$6. \int \frac{u^2}{a+bu} du = \frac{1}{b^3}\left[-\frac{bu}{2}(2a-bu) + a^2 \ln|a+bu|\right] + C$$

$$7. \int \frac{u^2}{(a+bu)^2} du = \frac{1}{b^3}\left(bu - \frac{a^2}{a+bu} - 2a \ln|a+bu|\right) + C$$

$$8. \int \frac{u^2}{(a+bu)^3} du = \frac{1}{b^3}\left[\frac{2a}{a+bu} - \frac{a^2}{2(a+bu)^2} + \ln|a+bu|\right] + C$$

$$9. \int \frac{u^2}{(a+bu)^n} du = \frac{1}{b^3}\left[\frac{-1}{(n-3)(a+bu)^{n-3}} + \frac{2a}{(n-2)(a+bu)^{n-2}} - \frac{a^2}{(n-1)(a+bu)^{n-1}}\right] + C, n \neq 1, 2, 3$$

$$10. \int \frac{1}{u(a+bu)} du = \frac{1}{a} \ln\left|\frac{u}{a+bu}\right| + C$$

$$11. \int \frac{1}{u(a+bu)^2} du = \frac{1}{a}\left(\frac{1}{a+bu} + \frac{1}{a} \ln\left|\frac{u}{a+bu}\right|\right) + C$$

$$12. \int \frac{1}{u^2(a+bu)} du = -\frac{1}{a}\left(\frac{1}{u} + \frac{b}{a} \ln\left|\frac{u}{a+bu}\right|\right) + C$$

$$13. \int \frac{1}{u^2(a+bu)^2} du = -\frac{1}{a^2} \left[\frac{a+2bu}{u(a+bu)} + \frac{2b}{a} \ln \left| \frac{u}{a+bu} \right| \right] + C$$

Forms Involving $a+bu+cu^2, b^2 \neq 4ac$

$$14. \int \frac{1}{a+bu+cu^2} du = \begin{cases} \frac{2}{\sqrt{4ac-b^2}} \arctan \frac{2cu+b}{\sqrt{4ac-b^2}} + C, & b^2 < 4ac \\ \frac{1}{\sqrt{b^2-4ac}} \ln \left| \frac{2cu+b-\sqrt{b^2-4ac}}{2cu+b+\sqrt{b^2-4ac}} \right| + C, & b^2 > 4ac \end{cases}$$

$$15. \int \frac{u}{a+bu+cu^2} du = \frac{1}{2c} \left(\ln |a+bu+cu^2| - b \int \frac{1}{a+bu+cu^2} du \right)$$

Forms Involving $\sqrt{a+bu}$

$$16. \int u^n \sqrt{a+bu} du = \frac{2}{b(2n+3)} \left[u^n (a+bu)^{3/2} - na \int u^{n-1} \sqrt{a+bu} du \right]$$

$$17. \int \frac{1}{u\sqrt{a+bu}} du = \begin{cases} \frac{1}{\sqrt{a}} \ln \left| \frac{\sqrt{a+bu} - \sqrt{a}}{\sqrt{a+bu} + \sqrt{a}} \right| + C, & a > 0 \\ \frac{2}{\sqrt{-a}} \arctan \sqrt{\frac{a+bu}{-a}} + C, & a < 0 \end{cases}$$

$$18. \int \frac{1}{u^n \sqrt{a+bu}} du = \frac{-1}{a(n-1)} \left[\frac{\sqrt{a+bu}}{u^{n-1}} + \frac{(2n-3)b}{2} \int \frac{1}{u^{n-1} \sqrt{a+bu}} du \right], n \neq 1$$

$$19. \int \frac{\sqrt{a+bu}}{u} du = 2\sqrt{a+bu} + a \int \frac{1}{u\sqrt{a+bu}} du$$

$$20. \int \frac{\sqrt{a+bu}}{u^n} du = \frac{-1}{a(n-1)} \left[\frac{(a+bu)^{3/2}}{u^{n-1}} + \frac{(2n-5)b}{2} \int \frac{\sqrt{a+bu}}{u^{n-1}} du \right], n \neq 1$$

$$21. \int \frac{u}{\sqrt{a+bu}} du = \frac{-2(2a-bu)}{3b^2} \sqrt{a+bu} + C$$

$$22. \int \frac{u^n}{\sqrt{a+bu}} du = \frac{2}{(2n+1)b} \left(u^n \sqrt{a+bu} - na \int \frac{u^{n-1}}{\sqrt{a+bu}} du \right)$$

Forms Involving $a^2 \pm u^2, a > 0$

$$23. \int \frac{1}{a^2+u^2} du = \frac{1}{a} \arctan \frac{u}{a} + C$$

$$24. \int \frac{1}{u^2-a^2} du = - \int \frac{1}{a^2-u^2} du = \frac{1}{2a} \ln \left| \frac{u-a}{u+a} \right| + C$$

$$25. \int \frac{1}{(a^2 \pm u^2)^n} du = \frac{1}{2a^2(n-1)} \left[\frac{u}{(a^2 \pm u^2)^{n-1}} + (2n-3) \int \frac{1}{(a^2 \pm u^2)^{n-1}} du \right], n \neq 1$$

Forms Involving $\sqrt{u^2 \pm a^2}, a > 0$

$$26. \int \sqrt{u^2 \pm a^2} du = \frac{1}{2} \left(u \sqrt{u^2 \pm a^2} \pm a^2 \ln |u + \sqrt{u^2 \pm a^2}| \right) + C$$

$$27. \int u^2 \sqrt{u^2 \pm a^2} du = \frac{1}{8} \left[u(2u^2 \pm a^2) \sqrt{u^2 \pm a^2} - a^4 \ln |u + \sqrt{u^2 \pm a^2}| \right] + C$$

$$28. \int \frac{\sqrt{u^2+a^2}}{u} du = \sqrt{u^2+a^2} - a \ln \left| \frac{a + \sqrt{u^2+a^2}}{u} \right| + C$$

$$29. \int \frac{\sqrt{u^2-a^2}}{u} du = \sqrt{u^2-a^2} - a \operatorname{arcsec} \frac{|u|}{a} + C$$

$$30. \int \frac{\sqrt{u^2 \pm a^2}}{u^2} du = \frac{-\sqrt{u^2 \pm a^2}}{u} + \ln |u + \sqrt{u^2 \pm a^2}| + C$$

$$31. \int \frac{1}{\sqrt{u^2 \pm a^2}} du = \ln |u + \sqrt{u^2 \pm a^2}| + C$$

$$32. \int \frac{1}{u\sqrt{u^2+a^2}} du = \frac{-1}{a} \ln \left| \frac{a + \sqrt{u^2+a^2}}{u} \right| + C$$

$$33. \int \frac{1}{u\sqrt{u^2-a^2}} du = \frac{1}{a} \operatorname{arcsec} \frac{|u|}{a} + C$$

$$34. \int \frac{u^2}{\sqrt{u^2 \pm a^2}} du = \frac{1}{2} \left(u \sqrt{u^2 \pm a^2} \mp a^2 \ln |u + \sqrt{u^2 \pm a^2}| \right) + C$$

$$35. \int \frac{1}{u^2 \sqrt{u^2 \pm a^2}} du = \mp \frac{\sqrt{u^2 \pm a^2}}{a^2 u} + C$$

$$36. \int \frac{1}{(u^2 \pm a^2)^{3/2}} du = \frac{\pm u}{a^2 \sqrt{u^2 \pm a^2}} + C$$

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

$$37. \int \sqrt{a^2-u^2} du = \frac{1}{2} \left(u \sqrt{a^2-u^2} + a^2 \arcsin \frac{u}{a} \right) + C$$

$$38. \int u^2 \sqrt{a^2-u^2} du = \frac{1}{8} \left[u(2u^2-a^2) \sqrt{a^2-u^2} + a^4 \arcsin \frac{u}{a} \right] + C$$

$$39. \int \frac{\sqrt{a^2 - u^2}}{u} du = \sqrt{a^2 - u^2} - a \ln \left| \frac{a + \sqrt{a^2 - u^2}}{u} \right| + C$$

$$41. \int \frac{1}{\sqrt{a^2 - u^2}} du = \arcsin \frac{u}{a} + C$$

$$43. \int \frac{u^2}{\sqrt{a^2 - u^2}} du = \frac{1}{2} \left(-u\sqrt{a^2 - u^2} + a^2 \arcsin \frac{u}{a} \right) + C$$

$$45. \int \frac{1}{(a^2 - u^2)^{3/2}} du = \frac{u}{a^2 \sqrt{a^2 - u^2}} + C$$

$$40. \int \frac{\sqrt{a^2 - u^2}}{u^2} du = \frac{-\sqrt{a^2 - u^2}}{u} - \arcsin \frac{u}{a} + C$$

$$42. \int \frac{1}{u\sqrt{a^2 - u^2}} du = \frac{-1}{a} \ln \left| \frac{a + \sqrt{a^2 - u^2}}{u} \right| + C$$

$$44. \int \frac{1}{u^2 \sqrt{a^2 - u^2}} du = \frac{-\sqrt{a^2 - u^2}}{a^2 u} + C$$

Forms Involving sin u or cos u

$$46. \int \sin u du = -\cos u + C$$

$$48. \int \sin^2 u du = \frac{1}{2}(u - \sin u \cos u) + C$$

$$50. \int \sin^n u du = -\frac{\sin^{n-1} u \cos u}{n} + \frac{n-1}{n} \int \sin^{n-2} u du$$

$$51. \int \cos^n u du = \frac{\cos^{n-1} u \sin u}{n} + \frac{n-1}{n} \int \cos^{n-2} u du$$

$$52. \int u \sin u du = \sin u - u \cos u + C$$

$$54. \int u^n \sin u du = -u^n \cos u + n \int u^{n-1} \cos u du$$

$$56. \int \frac{1}{1 \pm \sin u} du = \tan u \mp \sec u + C$$

$$58. \int \frac{1}{\sin u \cos u} du = \ln |\tan u| + C$$

$$47. \int \cos u du = \sin u + C$$

$$49. \int \cos^2 u du = \frac{1}{2}(u + \sin u \cos u) + C$$

$$53. \int u \cos u du = \cos u + u \sin u + C$$

$$55. \int u^n \cos u du = u^n \sin u - n \int u^{n-1} \sin u du$$

$$57. \int \frac{1}{1 \pm \cos u} du = -\cot u \pm \csc u + C$$

Forms Involving tan u, cot u, sec u, or csc u

$$59. \int \tan u du = -\ln |\cos u| + C$$

$$61. \int \sec u du = \ln |\sec u + \tan u| + C$$

$$62. \int \csc u du = \ln |\csc u - \cot u| + C \quad \text{or} \quad \int \csc u du = -\ln |\csc u + \cot u| + C$$

$$63. \int \tan^2 u du = -u + \tan u + C$$

$$65. \int \sec^2 u du = \tan u + C$$

$$67. \int \tan^n u du = \frac{\tan^{n-1} u}{n-1} - \int \tan^{n-2} u du, \quad n \neq 1$$

$$68. \int \cot^n u du = -\frac{\cot^{n-1} u}{n-1} - \int (\cot^{n-2} u) du, \quad n \neq 1$$

$$69. \int \sec^n u du = \frac{\sec^{n-2} u \tan u}{n-1} + \frac{n-2}{n-1} \int \sec^{n-2} u du, \quad n \neq 1$$

$$70. \int \csc^n u du = -\frac{\csc^{n-2} u \cot u}{n-1} + \frac{n-2}{n-1} \int \csc^{n-2} u du, \quad n \neq 1$$

$$60. \int \cos u du = \ln |\sin u| + C$$

$$64. \int \cot^2 u du = -u - \cot u + C$$

$$66. \int \csc^2 u du = -\cot u + C$$

$$71. \int \frac{1}{1 \pm \tan u} du = \frac{1}{2} \left(u \pm \ln |\cos u \pm \sin u| \right) + C$$

$$72. \int \frac{1}{1 \pm \cot u} du = \frac{1}{2} \left(u \mp \ln |\sin u \pm \cos u| \right) + C$$

$$73. \int \frac{1}{1 \pm \sec u} du = u + \cot u \mp \csc u + C$$

$$74. \int \frac{1}{1 \pm \csc u} du = u - \tan u \pm \sec u + C$$

Forms Involving Inverse Trigonometric Functions

$$75. \int \arcsin u du = u \arcsin u + \sqrt{1 - u^2} + C$$

$$76. \int \arccos u du = u \arccos u - \sqrt{1 - u^2} + C$$

$$77. \int \arctan u du = u \arctan u - \ln \sqrt{1 + u^2} + C$$

$$78. \int \operatorname{arccot} u du = u \operatorname{arccot} u + \ln \sqrt{1 + u^2} + C$$

$$79. \int \operatorname{arcsec} u du = u \operatorname{arcsec} u - \ln \left| u + \sqrt{u^2 - 1} \right| + C$$

$$80. \int \operatorname{arccsc} u du = u \operatorname{arccsc} u + \ln \left| u + \sqrt{u^2 - 1} \right| + C$$

Forms Involving e^u

$$81. \int e^u du = e^u + C$$

$$82. \int ue^u du = (u - 1)e^u + C$$

$$83. \int u^n e^u du = u^n e^u - n \int u^{n-1} e^u du$$

$$84. \int \frac{1}{1 + e^u} du = u - \ln(1 + e^u) + C$$

$$85. \int e^{au} \sin bu du = \frac{e^{au}}{a^2 + b^2} (a \sin bu - b \cos bu) + C$$

$$86. \int e^{au} \cos bu du = \frac{e^{au}}{a^2 + b^2} (a \cos bu + b \sin bu) + C$$

Forms Involving $\ln u$

$$87. \int \ln u du = u(-1 + \ln u) + C$$

$$88. \int u \ln u du = \frac{u^2}{4} (-1 + 2 \ln u) + C$$

$$89. \int u^n \ln u du = \frac{u^{n+1}}{(n+1)^2} [-1 + (n+1) \ln u] + C, n \neq -1$$

$$90. \int (\ln u)^2 du = u[2 - 2 \ln u + (\ln u)^2] + C$$

$$91. \int (\ln u)^n du = u(\ln u)^n - n \int (\ln u)^{n-1} du$$