

Table of Integrals

ELEMENTARY FORMS

$$1. \int u \, dv = uv - \int v \, du$$

$$2. \int u^n \, du = \frac{1}{n+1} u^{n+1} + C \quad \text{if } n \neq -1$$

$$3. \int \frac{du}{u} = \ln |u| + C$$

$$4. \int e^u \, du = e^u + C$$

$$5. \int a^u \, du = \frac{a^u}{\ln a} + C$$

$$6. \int \sin u \, du = -\cos u + C$$

$$7. \int \cos u \, du = \sin u + C$$

$$8. \int \sec^2 u \, du = \tan u + C$$

$$9. \int \csc^2 u \, du = -\cot u + C$$

$$10. \int \sec u \tan u \, du = \sec u + C$$

$$11. \int \csc u \cot u \, du = -\csc u + C$$

$$12. \int \tan u \, du = \ln |\sec u| + C$$

$$13. \int \cot u \, du = \ln |\sin u| + C$$

$$14. \int \sec u \, du = \ln |\sec u + \tan u| + C$$

$$15. \int \csc u \, du = \ln |\csc u - \cot u| + C$$

$$16. \int \frac{du}{\sqrt{a^2 - u^2}} = \sin^{-1} \frac{u}{a} + C$$

$$17. \int \frac{du}{a^2 + u^2} = \frac{1}{a} \tan^{-1} \frac{u}{a} + C$$

$$18. \int \frac{du}{a^2 - u^2} = \frac{1}{2a} \ln \left| \frac{u+a}{u-a} \right| + C$$

TRIGONOMETRIC FORMS

$$19. \int \sin^2 u \, du = \frac{1}{2}u - \frac{1}{4}\sin 2u + C$$

$$20. \int \cos^2 u \, du = \frac{1}{2}u + \frac{1}{4}\sin 2u + C$$

$$21. \int \tan^2 u \, du = \tan u - u + C$$

$$22. \int \cot^2 u \, du = -\cot u - u + C$$

$$27. \int \sec^3 u \, du = \frac{1}{2} \sec u \tan u + \frac{1}{2} \ln |\sec u + \tan u| + C$$

$$28. \int \csc^3 u \, du = -\frac{1}{2} \csc u \cot u + \frac{1}{2} \ln |\csc u - \cot u| + C$$

$$29. \int \sin au \sin bu \, du = \frac{\sin(a-b)u}{2(a-b)} - \frac{\sin(a+b)u}{2(a+b)} + C \quad \text{if } a^2 \neq b^2$$

$$23. \int \sin^3 u \, du = -\frac{1}{3}(2 + \sin^2 u) \cos u + C$$

$$24. \int \cos^3 u \, du = \frac{1}{3}(2 + \cos^2 u) \sin u + C$$

$$25. \int \tan^3 u \, du = \frac{1}{2} \tan^2 u + \ln |\cos u| + C$$

$$26. \int \cot^3 u \, du = -\frac{1}{2} \cot^2 u - \ln |\sin u| + C$$

(Continued on Rear Enc)

Table of Integrals (cont.)

$$30. \int \cos au \cos bu \, du = \frac{\sin(a-b)u}{2(a-b)} + \frac{\sin(a+b)u}{2(a+b)} + C \quad \text{if } a^2 \neq b^2$$

$$31. \int \sin au \cos bu \, du = -\frac{\cos(a-b)u}{2(a-b)} - \frac{\cos(a+b)u}{2(a+b)} + C \quad \text{if } a^2 \neq b^2$$

$$32. \int \sin^n u \, du = -\frac{1}{n} \sin^{n-1} u \cos u + \frac{n-1}{n} \int \sin^{n-2} u \, du$$

$$33. \int \cos^n u \, du = \frac{1}{n} \cos^{n-1} u \sin u + \frac{n-1}{n} \int \cos^{n-2} u \, du$$

$$34. \int \tan^n u \, du = \frac{1}{n-1} \tan^{n-1} u - \int \tan^{n-2} u \, du \quad \text{if } n \neq 1$$

$$35. \int \cot^n u \, du = -\frac{1}{n-1} \cot^{n-1} u - \int \cot^{n-2} u \, du \quad \text{if } n \neq 1$$

$$36. \int \sec^n u \, du = \frac{1}{n-1} \sec^{n-2} u \tan u + \frac{n-2}{n-1} \int \sec^{n-2} u \, du \quad \text{if } n \neq 1$$

$$37. \int \csc^n u \, du = -\frac{1}{n-1} \csc^{n-2} u \cot u + \frac{n-2}{n-1} \int \csc^{n-2} u \, du \quad \text{if } n \neq 1$$

$$38. \int u \sin u \, du = \sin u - u \cos u + C$$

$$39. \int u \cos u \, du = \cos u + u \sin u + C$$

$$40. \int u^n \sin u \, du = -u^n \cos u + n \int u^{n-1} \cos u \, du$$

$$41. \int u^n \cos u \, du = u^n \sin u - n \int u^{n-1} \sin u \, du$$

FORMS INVOLVING $\sqrt{u^2 \pm a^2}$

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

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

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

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

$$45. \int \frac{\sqrt{a^2 - u^2}}{u} \, du = \sqrt{a^2 - u^2} - a \ln \left| \frac{a + \sqrt{a^2 - u^2}}{u} \right| + C$$