

Selected Integral Formulas**Basic forms.**

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

$$2. \int e^{au} du = \frac{1}{a} e^{au} + C.$$

$$3. \int a \cdot f(u) + b \cdot g(u) du = a \cdot \int f(u) du + b \cdot \int g(u) du.$$

Rational forms containing $(a + bu)$.

$$4. \int \frac{du}{a + bu} = \frac{1}{b} \ln |a + bu| + C.$$

$$5. \int \frac{u du}{a + bu} = \frac{u}{b} - \frac{a}{b^2} \ln |a + bu| + C.$$

$$6. \int \frac{u^2 du}{a + bu} = \frac{u^2}{2b} - \frac{au}{b^2} + \frac{a^2}{b^3} \ln |a + bu| + C.$$

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

Forms containing $\sqrt{a + bu}$.

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

$$9. \int \frac{u du}{\sqrt{a + bu}} = \frac{2(bu - 2a)\sqrt{a + bu}}{3b^2} + C.$$

$$10. \int \frac{u^2 du}{\sqrt{a + bu}} = \frac{2(3b^2u^2 - 4abu + 8a^2)\sqrt{a + bu}}{15b^3} + C.$$

Forms containing $\sqrt{a^2 - u^2}$

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

$$12. \int \frac{\sqrt{a^2 - u^2} du}{u} = \sqrt{a^2 - u^2} - a \ln \left| \frac{a + \sqrt{a^2 - u^2}}{u} \right| + C, \quad a > 0.$$

Exponential and logarithmic forms.

$$13. \int e^{au} du = \frac{e^{au}}{a} + C.$$

$$14. \int ue^{au} du = \frac{e^{au}}{a^2} (au - 1) + C.$$

$$15. \int u^n e^{au} du = \frac{u^n e^{au}}{a} - \frac{n}{a} \int u^{n-1} e^{au} du.$$

$$16. \int u^n \ln u du = \frac{u^{n+1} \ln u}{n+1} - \frac{u^{n+1}}{(n+1)^2} + C, \quad n \neq -1.$$