Basic Integration Rules

1. $\int kf(u)du = k\int f(u)du$

2. $\int [f(u) \pm g(u)]du = \int f(u)du \pm \int g(u)du$

3. $\int k\,du = k\int 1du = ku + C$

4. $\int u^n du = \frac{u^{n+1}}{n+1} + C$

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

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

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

8. $\int \sin(u)\,du = -\cos(u) + C$

9. $\int \cos(u)\,du = \sin(u) + C$

10. $\int \tan(u)\,du = -\ln|cos(u)| + C$

11. $\int \cot(u)\,du = \ln|sin(u)| + C$

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

13. $\int \csc(u)\,du = -\ln|\csc(u) + cot(u)| + C$

14. $\int \sec^2(u)du = \tan(u) + C$

15. $\int \csc^2(u)du = -\cot(u) + C$

16. $\int \sec(u)\tan(u)\,du = \sec(u) + C$

17. $\int \csc(u)\cot(u)\,du = -\csc(u) + C$

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

19. $\int \frac{du}{a^2+u^2} = \int \frac{1}{a^2+u^2}du = \frac{1}{a}\arctan\left(\frac{u}{a}\right) + C$

20. $\int \frac{du}{u\sqrt{u^2-a^2}} = \int \frac{1}{u\sqrt{u^2-a^2}}du = \frac{1}{a}\text{arcsec}\left(\frac{|u|}{a}\right) + C$