Basic Integration Formulas

1. \( \int u^n \, du = \frac{u^{n+1}}{n+1} + c, \quad n \neq -1 \)

2. \( \int \frac{1}{u} \, du = \ln |u| + c \)

3. \( \int e^u \, du = e^u + c \)

4. \( \int \sin u \, du = -\cos u + c \)

5. \( \int \cos u \, du = \sin u + c \)

6. \( \int \tan u \, du = \ln |\sec u| + c \)

7. \( \int \sec u \, du = \ln |\sec u + \tan u| + c \)

8. \( \int \sec^2 u \, du = \tan u + c \)

9. \( \int \sec u \tan u \, du = \sec u + c \)

10. \( \int \cot u \, du = \ln |\sin u| + c \)

11. \( \int \csc u = -\ln |\csc u + \cot u| + c \)

12. \( \int \csc^2 u \, du = -\cot u + c \)

13. \( \int \frac{du}{\sqrt{a^2 - u^2}} = \arcsin \frac{u}{a} + c \)

14. \( \int \frac{du}{u \sqrt{u^2 - a^2}} = \frac{1}{a} \text{arcsec} \frac{|u|}{a} + c \)

15. \( \int \frac{du}{a^2 + u^2} = \frac{1}{a} \arctan \frac{u}{a} + c \)

16. \( \int u \, dv = uv - \int v \, du \)