Common Antiderivatives

1. Fixed Powers $n \neq -1$

$$\int x^n \, \mathrm{d}x = \frac{x^{n+1}}{n+1} + C, \qquad n \neq -1$$

2. Fixed Power $n = -1$

$$\int \frac{1}{x} \, \mathrm{d}x = \ln|x| + C$$

3. Exponentials

$$\int e^x \, \mathrm{d}x = e^x + C, \qquad \int e^{ax} \, \mathrm{d}x = \frac{e^{ax}}{a} + C, \quad a \neq 0$$

4. Trigonometric Functions

$$\int \cos x \, \mathrm{d}x = \sin x + C, \qquad \int \cos(ax) \, \mathrm{d}x = \frac{\sin(ax)}{a} + C, \quad a \neq 0$$

$$\int \sin x \, \mathrm{d}x = -\cos x + C, \qquad \int \sin(ax) \, \mathrm{d}x = -\frac{\cos(ax)}{a} + C, \quad a \neq 0$$

$$\int \sec^2 x \, \mathrm{d}x = \tan x + C, \qquad \int \csc^2 x \, \mathrm{d}x = -\cot x + C$$

$$\int \sec x \tan x \, \mathrm{d}x = \sec x + C, \qquad \int \csc x \cot x \, \mathrm{d}x = -\csc x + C$$

$$\int \tan x \, \mathrm{d}x = -\ln|\cos x| + C, \qquad \int \cot x \, \mathrm{d}x = \ln|\sin x| + C$$

5. Trigonometric Substitution

$$\int \frac{1}{\sqrt{a^2 - x^2}} \, \mathrm{d}x = \arcsin\left(\frac{x}{a}\right) + C$$

$$\int \frac{1}{a^2 + x^2} \, \mathrm{d}x = \frac{1}{a} \arctan\left(\frac{x}{a}\right) + C$$