Basic Integration Formulas

Constant Rule: $\int k\,dx = kx + C$

Special Cases of Constant Rule:

$$\int 0\,dx = C \qquad \int dx = x + C$$

Power Rules:

$$\int x^n\,dx = \frac{x^{n+1}}{n+1} + C,\ n \neq -1 \qquad \int \frac{1}{x}\,dx = \ln|x| + C$$

Constant Multiple Rule: $\int kf(x)\,dx = k\int f(x)\,dx$

Sum and Difference Rules: $\int [f(x) \pm g(x)]\,dx = \int f(x)\,dx \pm \int g(x)\,dx$

Trigonometric Integrals:

$$\int \sin x\,dx = -\cos x + C \qquad \int \cos x\,dx = \sin x + C$$

$$\int \tan x\,dx = -\ln|\cos x| + C \text{ or } \ln|\sec x| + C \qquad \int \cot x\,dx = \ln|\sin x| + C \text{ or } -\ln|\csc x| + C$$

$$\int \sec x\,dx = \ln|\sec x + \tan x| + C \qquad \int \csc x\,dx = -\ln|\csc x + \cot x| + C$$

$$\int \sec^2 x\,dx = \tan x + C \qquad \int \csc^2 x\,dx = -\cot x + C$$

$$\int \sec x \tan x\,dx = \sec x + C \qquad \int \csc x \cot x\,dx = -\csc x + C$$

Exponential Integrals:

$$\int e^x\,dx = e^x + C \qquad \int a^x\,dx = \left(\frac{1}{\ln a}\right)a^x + C$$