Integrals of Standard Functions

Exponential

$$\int e^x \ dx = e^x + C$$

$$\int \frac{1}{x} \ dx = \ln(|x|) + C$$

$$\int a^x \ dx = \frac{a^x}{\ln(a)} + C$$

$$\int \ln(x) \ dx = x\ln(x) - x + C$$

$$\int \log_a(x) \ dx = \frac{x}{\ln(a)}(\ln(x) - 1) + C$$

Trigonometric

$$\int \sin(x) \ dx = -\cos(x) + C$$

$$\int \cos(x) \ dx = \sin(x) + C$$

$$\int \tan(x) \ dx = -\ln(|\cos(x)|) + C$$

$$\int \cot(x) \ dx = \ln(|\sin(x)|) + C$$

$$\int \sec^2(x) \ dx = \tan(x) + C$$

$$\int \sec(x) \ dx = \ln(|\sec(x) + \tan(x)|) + C$$

$$\int \csc(x) \ dx = -\ln(|\csc(x) + \cot(x)|) + C$$

$$\int \frac{1}{\sqrt{a^2 - x^2}} \ dx = \sin^{-1}\left(\frac{x}{a}\right) + C$$

$$\int \frac{1}{a^2 + x^2} \ dx = \frac{1}{a}\tan^{-1}\left(\frac{x}{a}\right) + C$$

Hyperbolic

$$\int \sinh(x) \ dx = \cosh(x) + C$$

$$\int \cosh(x) \ dx = \sinh(x) + C$$

$$\int \tanh(x) \ dx = \ln(\cosh(x)) + C$$

$$\int \frac{1}{\sqrt{x^2 + a^2}} \ dx = \sinh^{-1}\left(\frac{x}{a}\right) + C$$

$$\int \frac{1}{\sqrt{x^2 - a^2}} \ dx = \cosh^{-1}\left(\frac{x}{a}\right) + C$$

Reduction Formulas

$$\int \sec^n(x) \ dx = \frac{1}{n-1}\sec^{n-2}(x)\tan(x) + \frac{n-2}{n-1}\int \sec^{n-2}(x)\,dx$$

$$\int \tan^n(x) \ dx = \frac{1}{n-1}\tan^{n-1}(x) - \int \tan^{n-2}(x)\,dx$$