

Indefinite Integration Rules

In all the rules below x is the independent variable, k and α are fixed constants, and C represents an arbitrary constant.

Basic Rules

- $\int k \, dx = kx + C$
- $\int x^n \, dx = \frac{x^{n+1}}{n+1} + C$ (for $n \neq -1$)
- $\int e^x \, dx = e^x + C$
- $\int a^x \, dx = \frac{a^x}{\ln a} + C$ (for $a > 0$ and $a \neq 1$)
- $\int \frac{1}{x} \, dx = \ln |x| + C$
- $\int \sin x \, dx = -\cos x + C$
- $\int \cos x \, dx = \sin x + C$

Rules for sums, multiples, and compositions of functions

- $\int [f(x) \pm g(x)] \, dx = \int f(x) \, dx \pm \int g(x) \, dx$
- $\int \alpha f(x) \, dx = \alpha \int f(x) \, dx$ (for $\alpha \neq 0$)
- $\int f'(g(x))g'(x) \, dx = f(g(x)) + C$

Other Rules

- $\int e^{kx} \, dx = \frac{1}{k}e^{kx} + C$ (for $k \neq 0$)
- $\int \sin(kx) \, dx = -\frac{1}{k}\cos(kx) + C$ (for $k \neq 0$)
- $\int \cos(kx) \, dx = \frac{1}{k}\sin(kx) + C$ (for $k \neq 0$)