

Integrals - Basic Rules for Calculus with Applications

	Indefinite Integrals- Basic Rules	Example
<i>Constant Rule</i>	$\int (k) dx = kx + C$	$\int (5) dx = 5x + C$
<i>Power Rule</i>	$\int x^n dx = \frac{x^{n+1}}{n+1} + C, n \neq -1$	$\int (x^5) dx = \frac{x^6}{6} + C$
<i>Constant Multiple Rule</i>	$\int k \cdot f(x) dx = k \int f(x) dx$, for any real number k	$\int 3x^6 dx = 3 \int x^6 dx = \frac{3x^7}{7} + C$
<i>Sum or Difference Rule</i>	$\int [f(x) \pm g(x)] dx = \int f(x) dx \pm \int g(x) dx$	$\int (x^2 + x^6) dx = \int x^2 dx + \int x^6 dx = \frac{1}{3}x^3 + \frac{1}{7}x^7 + C$
<i>Indefinite Integral of x^{-1}</i>	$\int x^{-1} dx = \int \frac{1}{x} dx = \ln x + C$	$\int x^{-1} dx = \ln x + C$
<i>Exponential Function</i>	$\int e^x dx = e^x + C$ $\int e^{kx} dx = \frac{e^{kx}}{k} + C, k \neq 0$ $\int a^x dx = \frac{a^x}{\ln a} + C$ $\int a^{kx} dx = \frac{a^{kx}}{k(\ln a)} + C, k \neq 0$	$\int e^x dx = e^x + C$ $\int e^{3x} dx = \frac{e^{3x}}{3} + C$ $\int 4^x dx = \frac{4^x}{\ln 4} + C$ $\int 4^{7x} dx = \frac{4^{7x}}{7 \ln 4} + C$