

Tabella degli integrali

$\int f(x)$ integrale	$F(x)$ primitiva	$\int f(x)$ integrale	$F(x)$ primitiva
$\int x dx$	$\frac{x^2}{2} + c$	$\int \frac{\pm 1}{\sqrt{1-x^2}} dx$	$\begin{cases} \pm \arcsin x + c \\ \mp \arccos x + c \end{cases}$
$\int a dx$	$ax + c$	$\int \frac{1}{\sqrt{x^2-1}} dx$	$\log x+\sqrt{x^2-1} + c$
$\int a^x dx$	$\frac{a^x}{\log a} + c$	$\int \frac{1}{a^x} dx$	$-\frac{a^{-x}}{\log a} + c$
$\int \frac{x}{x^2+1} dx$	$\frac{1}{2} \log x^2+1 + c$	$\int \frac{1}{x^n} dx$	$-\frac{n-1}{x^{n-1}} + c$
$\int a \cdot x^n dx$	$\frac{a \cdot x^{n+1}}{n+1} + c$	$\int \frac{1}{a+x^2} dx \quad a>0$	$\frac{1}{\sqrt{a}} \arctan \frac{x}{\sqrt{a}} + c$
$\int \frac{1}{x} dx$	$\log x + c$	$\int \frac{1}{1-x^2} dx$	$\frac{1}{2} \log \left \frac{1+x}{1-x} \right + c$
$\int \frac{1}{\sqrt{x}} dx$	$2\sqrt{x} + c$	$\int \frac{1}{\sqrt{1+x^2}} dx$	$\begin{cases} \operatorname{arcSh} x + c \\ \log(x+\sqrt{1+x^2}) + c \end{cases}$
$\int \sin x dx$	$-\cos x + c$	$\int \sin^2 x dx$	$\frac{1}{2} x - \sin x \cos x + c$
$\int \cos x dx$	$\sin x + c$	$\int \cos^2 x dx$	$\frac{1}{2} x + \sin x \cos x + c$
$\int \tan x dx$	$-\log(\cos x) + c$	$\int \frac{1}{\tan x} dx$	$\log \sin x + c$
$\int \arcsin x dx$	$\sqrt{1-x^2} + x \arcsin x + c$	$\int \frac{1}{\sqrt{x^2 \pm a^2}} dx$	$\log x+\sqrt{x^2 \pm a^2} + c$
$\int \arccos x dx$	$x \arccos x - \sqrt{1-x^2} + c$	$\int \sqrt{x^2 \pm a^2} dx$	$\frac{x}{2} \sqrt{x^2 \pm a^2} \pm \frac{a^2}{2} \log x+\sqrt{x^2 \pm a^2} + c$
$\int e^{\pm kx} dx$	$\pm \frac{e^{\pm kx}}{k} + c$	$\int \frac{1}{e^{kx}} dx$	$-\frac{e^{-kx}}{k} + c$
$\int (1+\tan^2 x) dx = \int \frac{1}{\cos^2 x} dx$	$\tan x + c$	$\int \frac{1}{\cos x} dx$	$\log \left \tan \left(\frac{x}{2} + \frac{\pi}{4} \right) \right + c$
$\int (1+\operatorname{ctg}^2 x) dx = \int \frac{1}{\sin^2 x} dx$	$-\operatorname{ctg} x + c$	$\int \frac{1}{\sin x} dx$	$\log \left \tan \frac{x}{2} \right + c$
$\int \operatorname{Sh} x dx$	$\operatorname{Ch} x + c$	$\int \sqrt{a^2-x^2} dx$	$\frac{1}{2} \left(a^2 \arcsin \frac{x}{a} + x \sqrt{a^2-x^2} \right) + c$
$\int \operatorname{Ch} x dx$	$\operatorname{Sh} x + c$	$\int \frac{1}{\operatorname{Ch}^2 x} dx = \int (1-\operatorname{Th}^2 x) dx + c$	$\operatorname{Th} x + c$
$\int \frac{2x}{x^2+1} dx$	$\log(x^2+1) + c$	$\int \frac{1}{x^2+a^2} dx$	$\frac{1}{a} \arctan \frac{x}{a} + c$

Proprietà

$\int k \cdot f(x) dx = k \cdot \int f(x) dx$
$\int f(x) + g(x) + \dots + f_n(x) dx = \int f(x) dx + \int g(x) dx + \dots + \int f_n(x) dx$
$\int f(x) dx = a \int \frac{1}{a} f(x) dx = \frac{1}{a} \int a f(x) dx = \int \frac{a}{a} f(x) dx \quad a \in \mathbb{R}$

Integrali indefiniti riconducibili ad elementari

$\int f(x)$ integrale	$F(x)$ primitiva
$\int f^n(x) \cdot f'(x) dx$	$\frac{f^{n+1}(x)}{n+1} + c$
$\int \frac{f'(x)}{f(x)} dx$	$\log f(x) + c$
$\int f'(x) \cdot \cos f(x) dx$	$\sin f(x) + c$
$\int f'(x) \cdot \sin f(x) dx$	$-\cos f(x) + c$
$\int e^{f(x)} \cdot f'(x) dx$	$e^{f(x)} + c$
$\int a^{f(x)} \cdot f'(x) dx$	$\frac{a^{f(x)}}{\ln a} + c$
$\int \frac{f'(x)}{\sqrt{1-f^2(x)}} dx$	$\begin{cases} \arcsin f(x) + c \\ -\arccos f(x) + c \end{cases}$
$\int \frac{f'(x)}{1+f^2(x)} dx$	$\arctan f(x) + c$

Integrale definito

$$\int_a^b f(x) dx = F(b) - F(a) = [F(x)]_a^b$$

dove F è la primitiva di f(x)

Integrazione per parti

Integrale indefinito	$\int f(x) g'(x) dx = f(x) g(x) - \int f'(x) g(x) dx$ <i>f(x) va derivata e g'(x) va integrata</i>
Integrale definito	$\int_a^b f(x) g'(x) dx = [f(b) \cdot g(b) - f(a) \cdot g(a)] - \int_a^b f'(x) g(x) dx$

Si integrano per parti funzioni del tipo:

$$P(x) \cdot e^x \quad P(x) \cdot \sin x \quad P(x) \cdot \cos x \quad e^{\alpha x} \cdot \sin \beta x \quad e^{\alpha x} \cdot \cos \beta x$$

dove P(x) è un polinomio

Integrazione per sostituzione

Integrale indefinito	$\int f(h(x)) h'(x) dx = \int f(y) dy_{y=h(x)}$
Integrale definito	$\int_a^b f(h(x)) h'(x) dx = \int_{h(a)}^{h(b)} f(y) dy$