INTEGRALI FONDAMENTALI

M5033

INTEGRALE DI UNA POTENZA

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

$\int x^4 \, dx = \frac{1}{5} x^5 + C$; $\int dx = \int x^0 \, dx = x + C$

ATTENZIONE ! SE $n = -1$ AVREMMO $\frac{1}{-1+1} x^{-1+1} + C \Rightarrow \frac{1}{0}$! impossibile

- $\int x^{-1} \, dx = \int \frac{1}{x} \, dx = \ln|x| + C$ così facendo il dominio resta $x \neq 0$

- $\int \sqrt{x} \, dx = \int x^{\frac{1}{2}} \, dx = \frac{1}{\frac{1}{2}+1} x^{\frac{1}{2}+1} + C = \frac{2}{3}\sqrt{x^3} + C = \frac{2}{3}|x|\sqrt{x} + C$

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

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

- $\int \frac{1}{\cos^2 x} \, dx = \tan x + C$; $\int \frac{1}{\sin^2 x} \, dx = -\cot\tan x + C$

• $\int \frac{1}{\sqrt{1-x^2}}\,dx = \arcsen x + c$; • $\int \frac{1}{1+x^2}\,dx = \arctg x + c$

ESEMPI

58	$\int (3x+1)\,dx$	$\left[\frac{3}{2}x^2 + x + c\right]$
59	$\int (x^2+2x)\,dx$	$\left[\frac{x^3}{3} + x^2 + c\right]$
60	$\int (x+\sqrt{x})\,dx$	$\left[\frac{x^2}{2} + \frac{2}{3}x\sqrt{x} + c\right]$
61	$\int x^2(4x-6)\,dx$	$[x^4 - 2x^3 + c]$
62	$\int (x^2+x+10)\,dx$	$\left[\frac{x^3}{3} + \frac{x^2}{2} + 10x + c\right]$
63	$\int (x^3 - 3x^2 - 8)\,dx$	$\left[\frac{x^4}{4} - x^3 - 8x + c\right]$
64	$\int \left(\frac{1}{x^3} + \frac{3}{x^2}\right)dx$	$\left[-\frac{1}{2x^2} - \frac{3}{x} + c\right]$
65	$\int \left(3x^2 - \frac{6}{x^2}\right)dx$	$\left[x^3 + \frac{6}{x} + c\right]$
66	$\int \left(\frac{5}{x^4} - \frac{4}{x^3} + \frac{3}{x^2}\right)dx$	$\left[-\frac{5}{3x^3} + \frac{2}{x^2} - \frac{3}{x} + c\right]$
67	$\int \left(x + \frac{1}{x} + 1\right)dx$	$\left[\frac{x^2}{2} + \ln\lvert x\rvert + x + c\right]$
68	$\int \left(3x^2 - 2x + \frac{3}{x}\right)dx$	$[x^3 - x^2 + 3\ln\lvert x\rvert + c]$
69	$\int \left(\frac{2}{x^3} - x^2 - \frac{1}{x}\right)dx$	$\left[-\frac{1}{x^2} - \frac{x^3}{3} - \ln\lvert x\rvert + c\right]$
70	$\int \sqrt{x}(2-\sqrt{x})\,dx$	$\left[\frac{4}{3}x\sqrt{x} - \frac{x^2}{2} + c\right]$
71	$\int (3\sqrt{x} + \sqrt[4]{x^3})\,dx$	$\left[2x\sqrt{x} + \frac{4}{7}x\sqrt[4]{x^3} + c\right]$
72	$\int \left(\frac{2}{\sqrt{x}} - \frac{3}{\sqrt[3]{x}}\right)dx$	$\left[4\sqrt{x} - \frac{9}{2}\sqrt[3]{x^2} + c\right]$
73	$\int \left(\sqrt{x} + \frac{2}{\sqrt{x}}\right)dx$	$\left[\frac{2}{3}x\sqrt{x} + 4\sqrt{x} + c\right]$
74	$\int \left(x + \frac{5x^2}{\sqrt{x}} - \frac{2}{x^3}\right)dx$	$\left[\frac{x^2}{2} + 2\sqrt{x^5} + \frac{1}{x^2} + c\right]$
75	$\int (\sqrt{x} - 2)^2\,dx$	$\left[\frac{x^2}{2} - \frac{8}{3}\sqrt{x^3} + 4x + c\right]$
76	$\int (x+1)^2\,dx$	$\left[\frac{x^3}{3} + x^2 + x + c\right]$
77	$\int (x-3)(x+3)\,dx$	$\left[\frac{x^3}{3} - 9x + c\right]$
78	$\int [x^2 - (2-x)^2]\,dx$	$[2x^2 - 4x + c]$
79	$\int \frac{1}{\sqrt{x}}(x - \sqrt{x\sqrt{x}})\,dx$	$\left[\frac{2}{3}x\sqrt{x} - \frac{4}{5}x\sqrt[4]{x} + c\right]$