FORMULARIO DERIVATE E INTEGRALI

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Derivate

$$Dk = 0$$
$$Dx = 1$$
$$Dx^n = nx^{n-1}$$
$$D\sqrt[n]{x} = \frac{1}{n\sqrt[n]{x^{n-1}}}$$
$$D\sin x = \cos x$$
$$D\cos x = -\sin x$$
$$Da^x = a^x \ln a$$
$$De^x = e^x$$
$$D\ln x = \frac{1}{x}$$

$$D\,tg\,x = \frac{1}{\cos^2 x} = 1 + tg^2 x$$
$$D\,cotg\,x = -\frac{1}{\sin^2 x}$$
$$D\arcsin x = \frac{1}{\sqrt{1-x^2}}$$
$$D\arccos x = -\frac{1}{\sqrt{1-x^2}}$$
$$D\,arctg = \frac{1}{1+x^2}$$
$$D|x| = \frac{|x|}{x}$$

$$D[f(x)+g(x)] = f'(x)+g'(x)$$
$$D[f(x)\cdot g(x)] = f'(x)g(x) + f(x)g'(x)$$
$$D\left[\frac{f(x)}{g(x)}\right] = \frac{f'(x)g(x) - f(x)g'(x)}{g^2(x)}$$
$$D\left[\frac{1}{f(x)}\right] = -\frac{f'(x)}{f^2(x)}$$
$$D[f(g(x))] = f'(z)\cdot g'(x) \quad z = g(x)$$
$$D[f(x)]^n = n[f(x)]^{n-1}\cdot f'(x)$$
$$D[a^{f(x)}] = a^{f(x)}\cdot f'(x)\ln a$$
$$D[e^{f(x)}] = e^{f(x)}\cdot f'(x)$$
$$D[k\cdot f(x)] = k\cdot f'(x)$$
$$D[\ln f(x)] = \frac{f'(x)}{f(x)}$$
$$D|f(x)| = \frac{|f(x)|}{f(x)}\cdot f'(x)$$

Integrali immediati

$$\int x^b \, dx = \frac{x^{b+1}}{b+1} + c \quad (b \neq -1)$$

$$\int \frac{1}{x} \, dx = \ln|x| + c$$

$$\int e^x \, dx = e^x + c$$

$$\int a^x \, dx = \frac{a^x}{\ln a} + c$$

$$\int \sin x \, dx = -\cos x + c$$

$$\int \cos x \, dx = \sin x + c$$

$$\int \frac{1}{\cos^2 x} \, dx = \operatorname{tg} x + c$$

$$\int \frac{1}{\sin^2 x} \, dx = -\operatorname{cotg} x + c$$

$$\int \frac{1}{\sqrt{1-x^2}} \, dx = \arcsin x + c$$

$$\int \frac{1}{1+x^2} \, dx = \operatorname{arctg} x + c$$

$$\int \sinh x \, dx = \cosh x + c$$

$$\int \cosh x \, dx = \sinh x + c$$

Integrali di funzioni composte

$$\int [f(x)]^b \cdot f'(x)\,dx = \frac{[f(x)]^{b+1}}{b+1} + c \quad (b \neq -1)$$

$$\int \frac{f'(x)}{f(x)}\,dx = \ln|f(x)| + c$$

$$\int e^{f(x)} \cdot f'(x)\,dx = e^{f(x)} + c$$

$$\int a^{f(x)} f'(x)\,dx = \frac{a^{f(x)}}{\ln a} + c$$

$$\int [\sin f(x)]\, f'(x)\,dx = -\cos f(x) + c$$

$$\int [\cos f(x)] \cdot f'(x)\,dx = \sin f(x) + c$$

$$\int \frac{f'(x)}{\cos^2 f(x)}\,dx = \operatorname{tg} f(x) + c$$

$$\int \frac{f'(x)}{\sin^2 f(x)}\,dx = -\operatorname{cotg} f(x) + c$$

$$\int \frac{f'(x)}{\sqrt{1-f^2(x)}}\,dx = \arcsin f(x) + c$$

$$\int \frac{f'(x)}{1+f^2(x)}\,dx = \operatorname{arctg} f(x) + c$$

$$\int [\operatorname{senh} f(x)] \cdot f'(x)\,dx = \cosh f(x) + c$$

$$\int [\cosh f(x)] \cdot f'(x)\,dx = \sinh f(x) + c$$

Formula integrazione per parti

$$\int f(x) g'(x)\,dx = f(x) g(x) - \int f'(x) g(x)\,dx$$