

REGOLE DI INTEGRAZIONE DELLE FUNZIONI COMPOSITE

$$\int [f(x)]^\alpha \underbrace{f'(x)}_{d(f(x))} dx = \frac{[f(x)]^{\alpha+1}}{\alpha+1} + k \quad k \in \mathbb{R} \quad \alpha \neq -1$$

ESEMPIO

$$\int (3x)^5 \underbrace{3 dx}_{d(3x)} = \frac{(3x)^{5+1}}{5+1} + k \quad k \in \mathbb{R}$$

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

$$\int f'(x) \operatorname{sen} f(x) dx = -\cos f(x) + k$$

$$\int f'(x) \cos f(x) dx = \operatorname{sen} f(x) + k$$

$$\int \frac{f'(x)}{\cos^2 f(x)} dx = \operatorname{Tg}(f(x)) + k$$

$$\int \frac{f'(x)}{\operatorname{sen}^2 f(x)} dx = -\operatorname{cTg} f(x) + k$$

$$\int f'(x) e^{f(x)} dx = e^{f(x)} + k$$

$$\int f'(x) a^{f(x)} dx = a^{f(x)} \frac{1}{\ln a} + k$$

$$\int \frac{f'(x)}{\sqrt{1-[f(x)]^2}} dx = \operatorname{arccos} f(x) + k$$

$$\int \frac{f'(x)}{1+[f(x)]^2} dx = \operatorname{arctg} f(x) + k$$

ESEMPLI

$$\int -\operatorname{sen} x \cos^4 x dx = -\frac{[\cos x]^5}{5} + k \quad k \in \mathbb{R}$$

$$\int 2 \sqrt{2x+1} dx = \int (2x+1)^{\frac{1}{2}} d(2x+1) = \frac{(2x+1)^{\frac{1}{2}+1}}{\frac{3}{2}} + k$$

ESERCIZI

$$\int \operatorname{Tg} x dx; \quad \int \frac{1}{2x+1} dx; \quad \int \cos 2x dx; \quad \int \frac{1}{\cos^2 3x} dx;$$

$$\int \frac{1}{\operatorname{sen}^2(3-x)} dx$$