

Siano $f, g: [a, b] \rightarrow \mathbb{R}$ e $f, g \in C^1([a, b])$

$$\text{Allora } \int_a^b f' g \, dt = - \int_a^b f g' \, dt + f(b)g(b) - f(a)g(a)$$

DIMOSTRAZIONE

$$(fg)'(x) = f'(x)g(x) + f(x)g'(x) \quad \forall x \in [a, b]$$

$$\Rightarrow \int_a^b (fg)' \, dt = \int_a^b f' g \, dt + \int_a^b f g' \, dt$$

$$\begin{array}{l} \parallel \\ f(b)g(b) - f(a)g(a) \end{array} \quad \int_a^b f'(t) \, dt = f(b) - f(a)$$