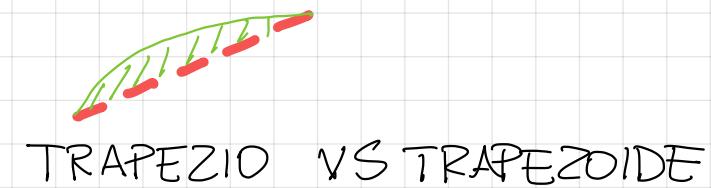
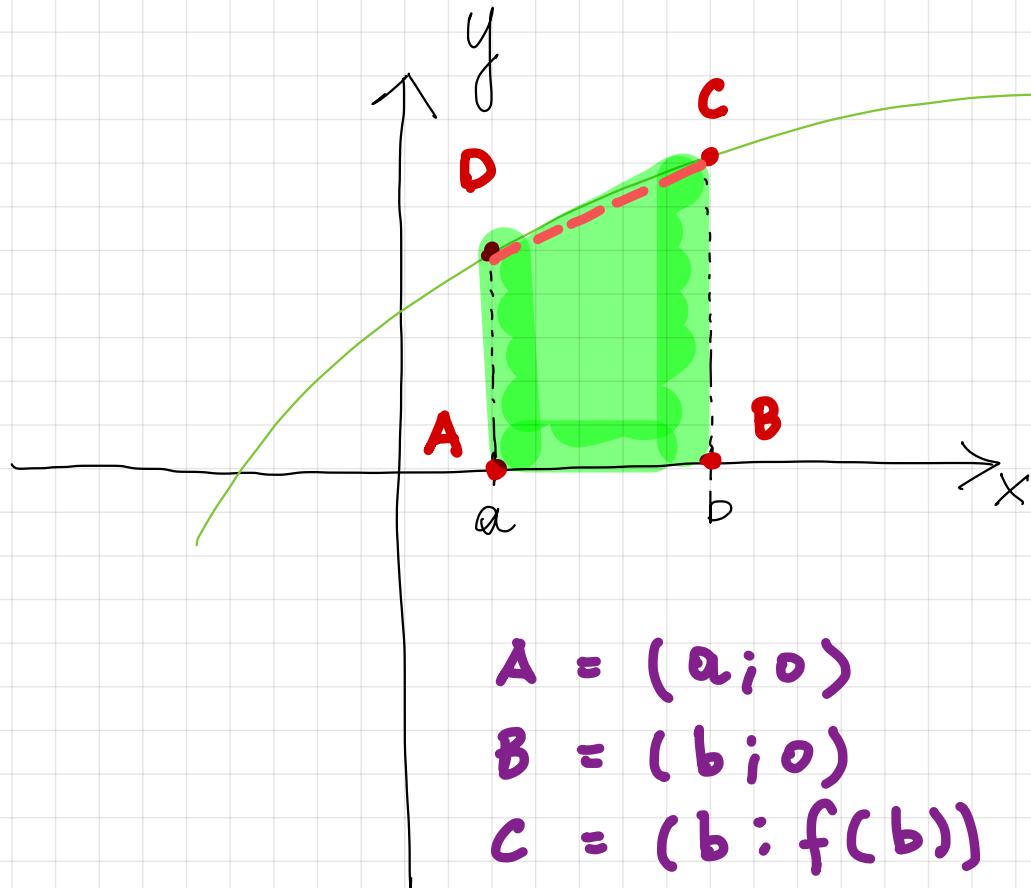


INTEGRALE DEFINITO

M5038

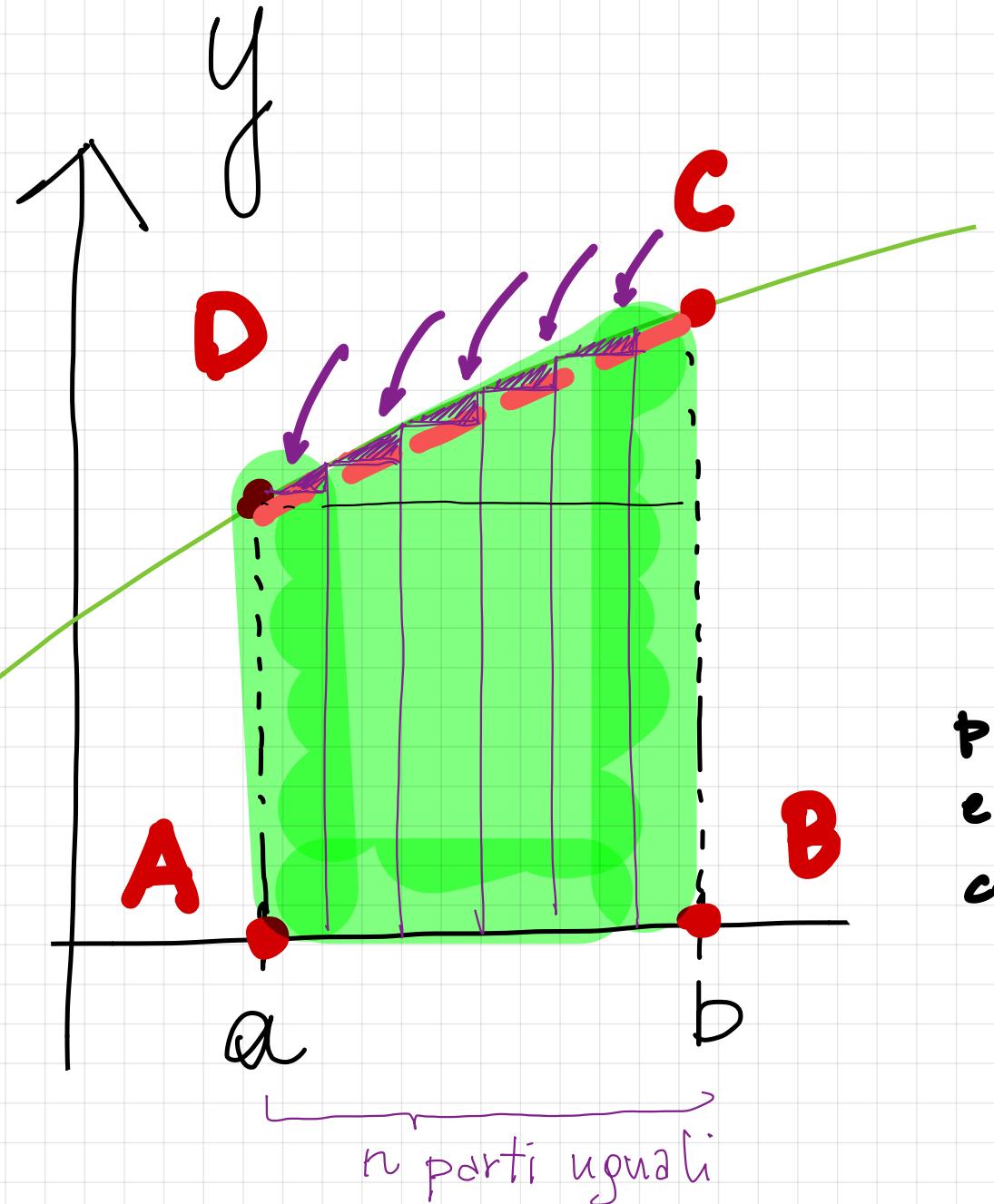


DATA UNA FUNZIONE $y = f(x)$ definiamo il
TRAPEZOIDE



AREA TRAPEZIO
$$\frac{(\overline{CB} + \overline{AD}) \cdot \overline{AB}}{2}$$

TRAPEZOIDE ?



DIVIDO $[a; b]$ in
n parti uguali di base

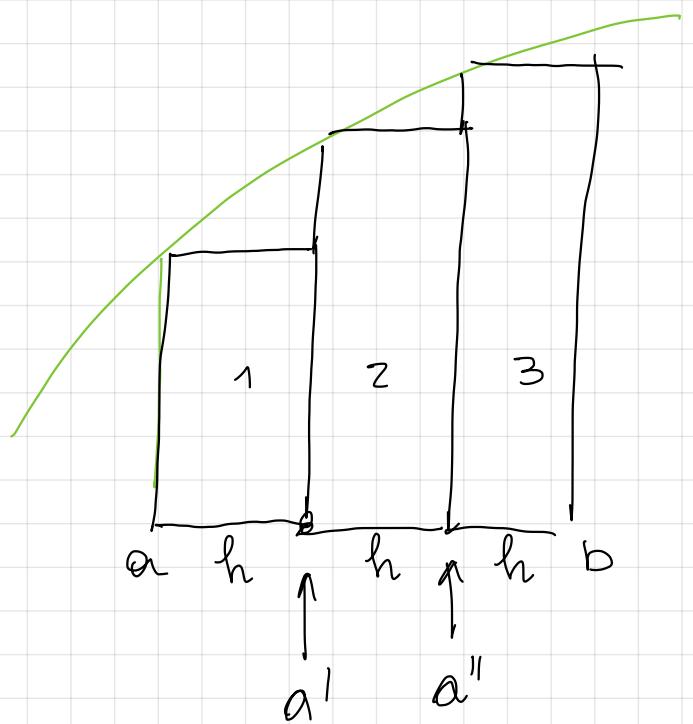
$$h = \frac{(b-a)}{n}$$

es: $a=1$ $b=9$
divido in 8 parti ($n=8$)

$$\frac{9-1}{8} = 1$$

più piccoli sono i rettangoli
e più piccolo è l'errore che
commetto





ESEMPIO

$n=3$

$$h = \frac{b-a}{3}$$

$$\text{Area 1} = h \cdot f(a)$$

$$\text{Area 2} = h \cdot f(a')$$

$$\text{Area 3} = h \cdot f(a'')$$

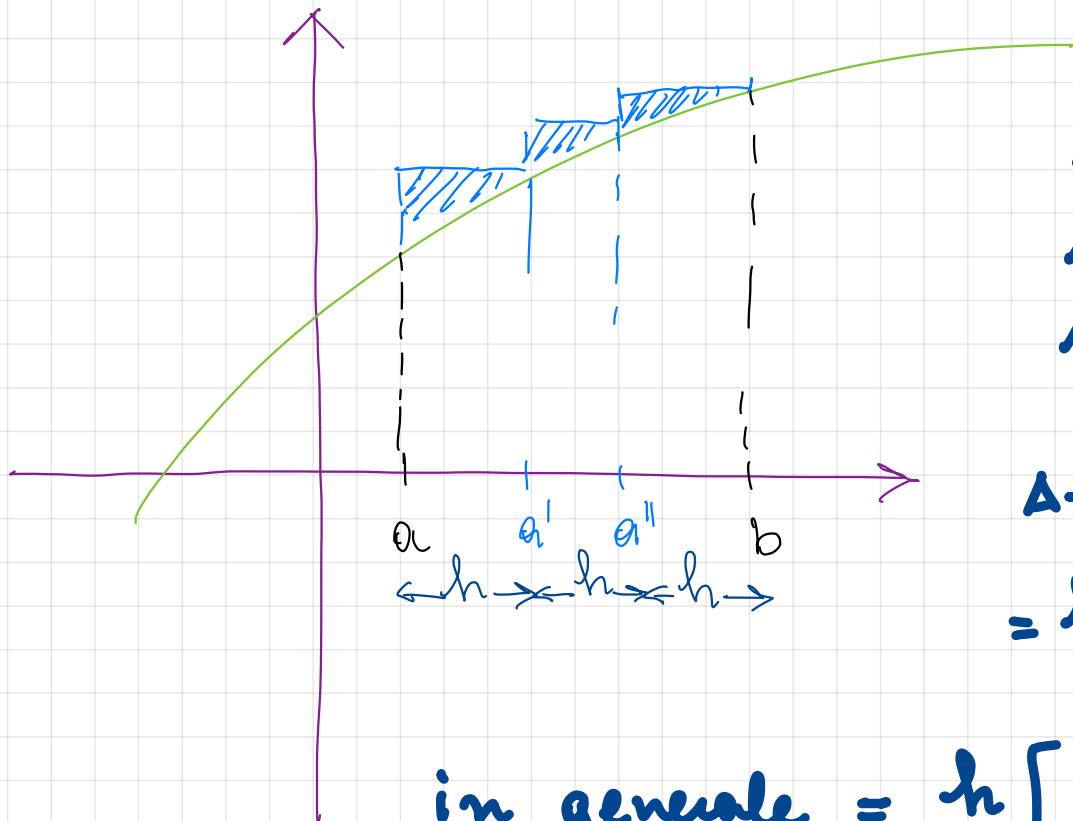
$$A_{\text{TOT}} = A_1 + A_2 + A_3 < A \text{ reale}$$

$$= h [f(a) + f(a') + f(a'')]$$

in generale $S_n = h [f(a) + f(a') + \dots + f(a^{n-1})]$

SOMMA INFRIORE

APPROSSIMAZIONE PER DIFETTO



ESEMPIO $n = 3$

$$\text{Area 1} = h \cdot f(a')$$

$$\text{Area 2} = h \cdot f(a'')$$

$$\text{Area 3} = h \cdot f(b)$$

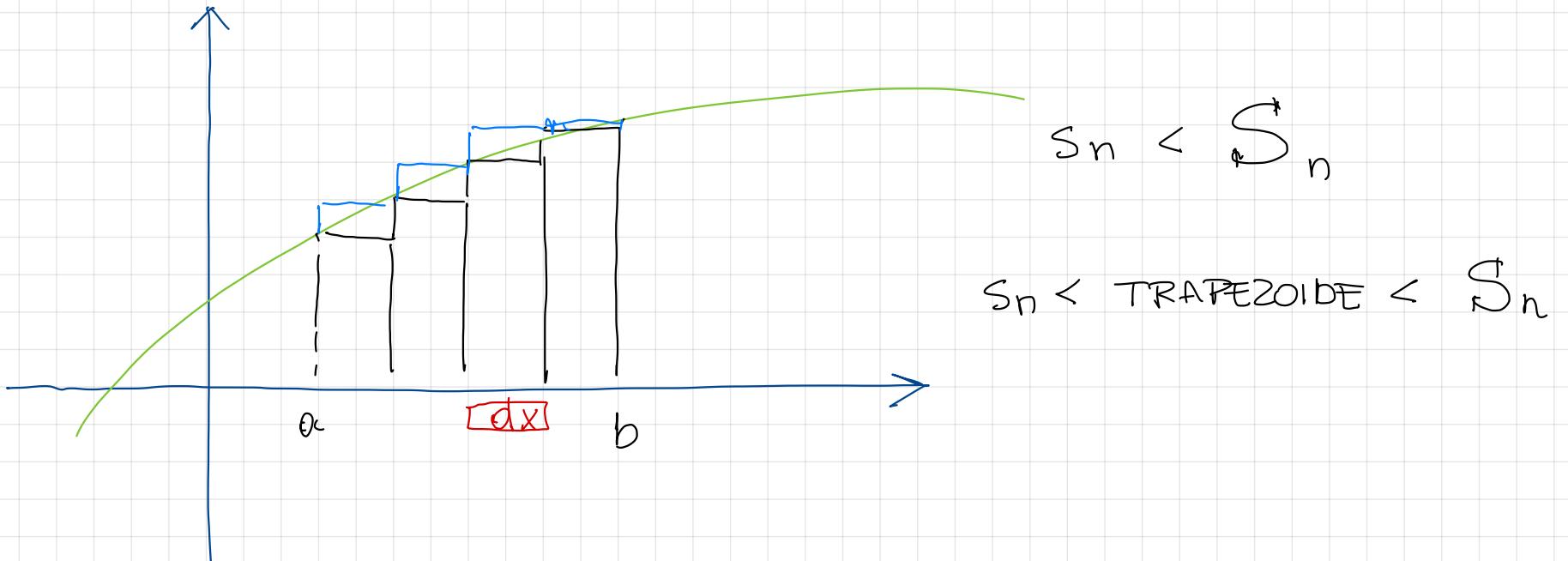
$$\Delta_{TOT} = A_1 + A_2 + A_3$$

$$= h [f(a') + f(a'') + f(b)]$$

$$\text{in generale} = h [f(a') + f(a'') + \dots + f(a^n)]$$

S_n

SOMMA SUPERIORE APPROSSIMA PER ECESSO
L'AREA DEL TRAPEZOIDE.

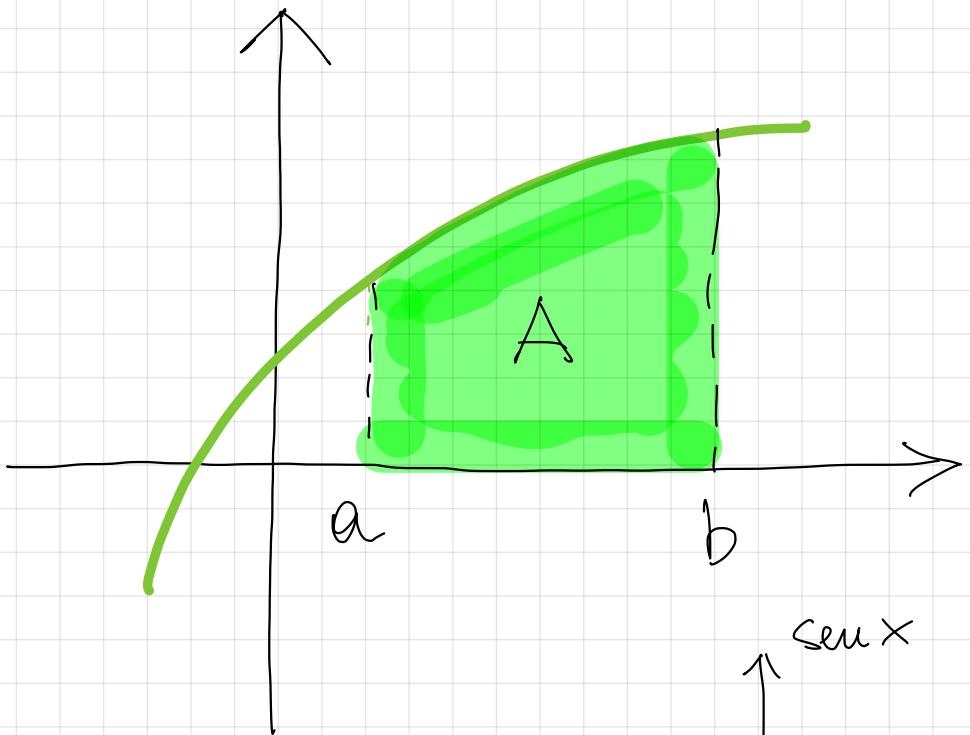


$$\lim_{n \rightarrow \infty} S_n = \lim_{n \rightarrow \infty} S'_n = \text{TRAPEZOIDE}$$

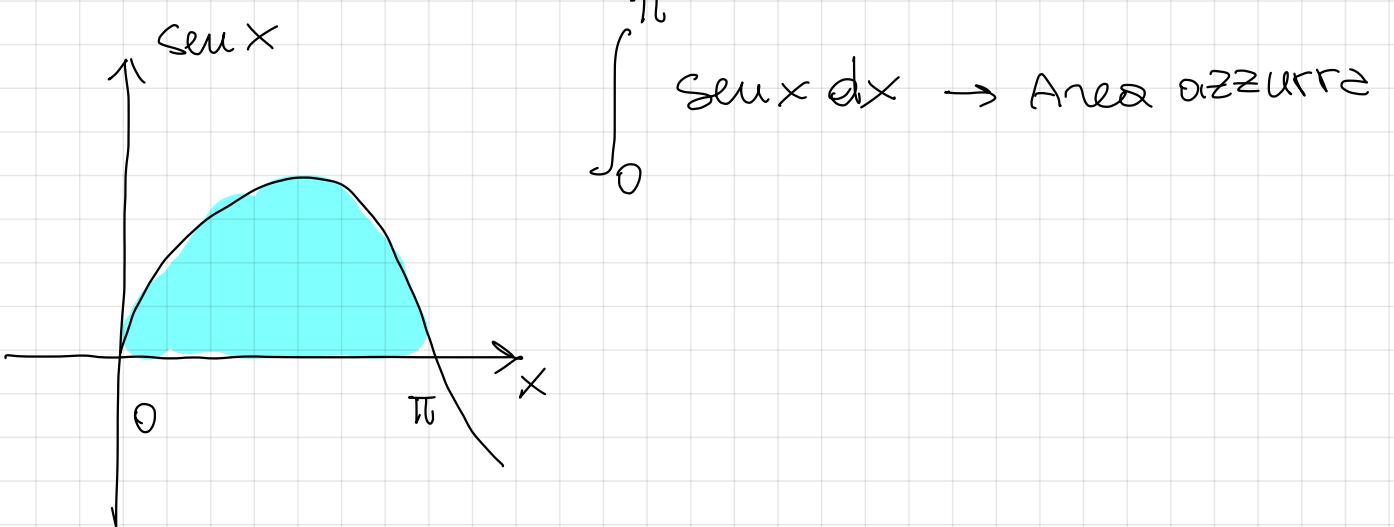
$$\int_a^b f(x) dx$$

L h J

h è dx ovvero Δx piccolo → dx



$$\int_a^b f(x) dx \rightarrow \text{AREA } A$$

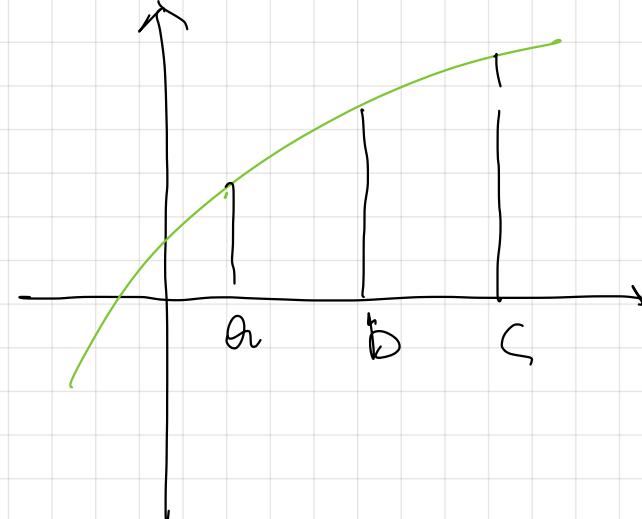


ESEMPIO

PROPRIETA` :

i) ADDITIVA

$$\int_a^c f(x) dx = \int_a^b f(x) dx + \int_b^c f(x) dx$$



ii) SOMMA

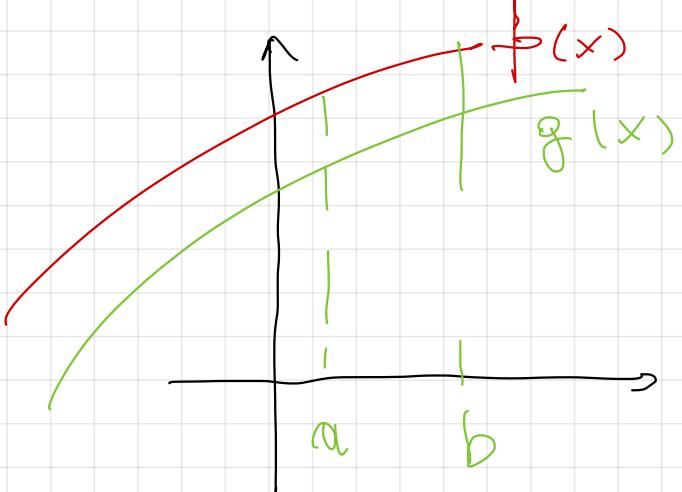
$$\int_a^b [f(x) + g(x)] dx = \int_a^b f(x) dx + \int_a^b g(x) dx$$

iii) PRODOTTO DI UNA COSTANTE

$$\int_a^b k f(x) dx = k \int_a^b f(x) dx$$

iv) CONFRONTO SE $g(x) \leq f(x)$

$$\int_a^b g(x) dx \leq \int_a^b f(x) dx$$



v) VALORE ASSOLUTO

$$\left| \int_a^b f(x) dx \right| \leq \int_a^b |f(x)| dx$$

vi) $\int_a^b k dx = k(b-a)$

