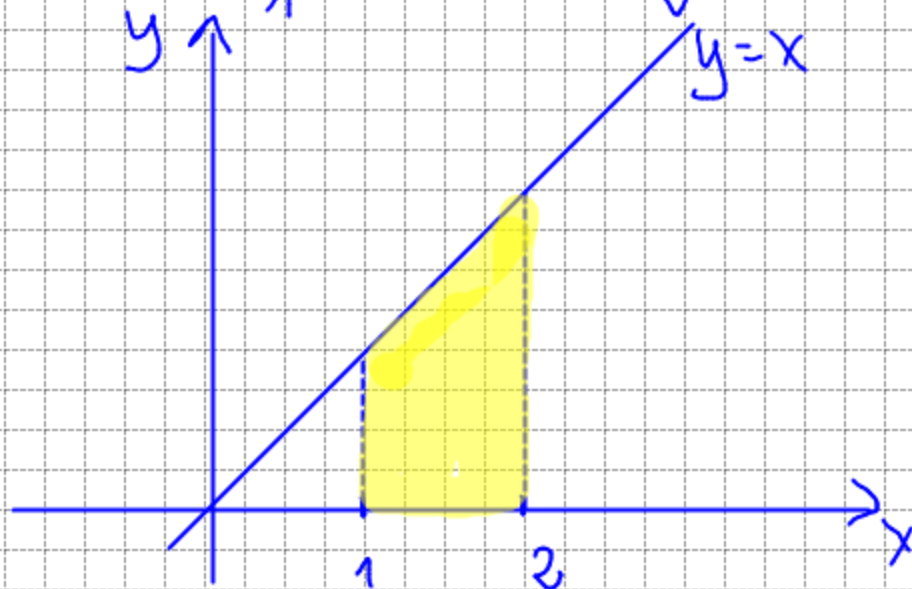


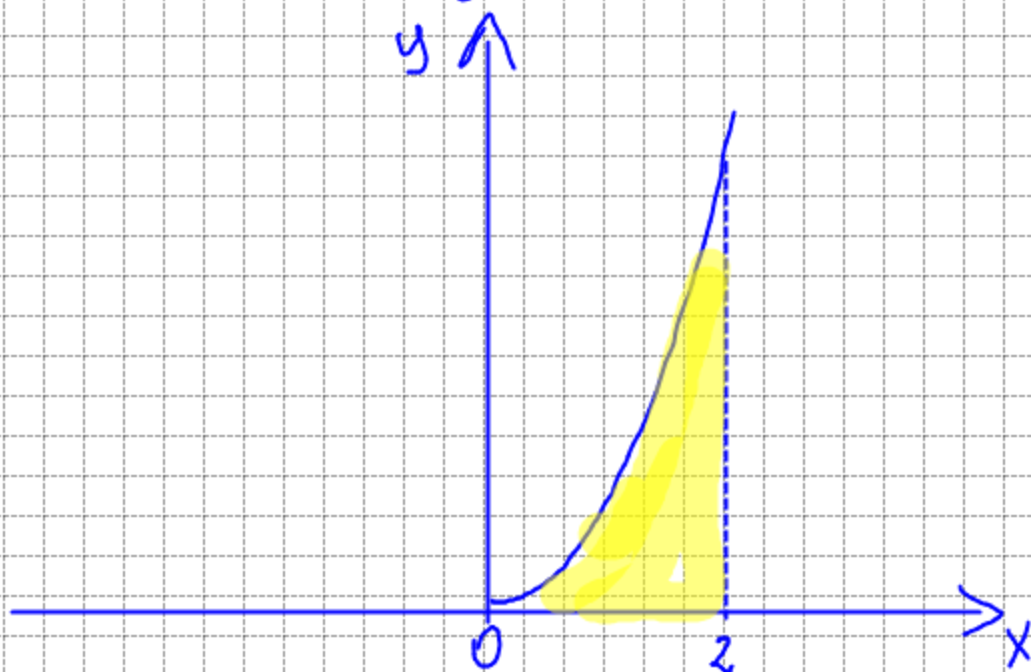
ESEMPIO

$$\int_1^2 x dx = \frac{x^2}{2} \Big|_1^2 = \frac{2^2}{2} - \frac{1^2}{2} = 2 - \frac{1}{2} = \frac{3}{2}$$



ESEMPIO

$$\int_0^2 x^2 dx = \frac{x^3}{3} \Big|_0^2 = \frac{2^3}{3} - \frac{0^3}{3} = \frac{8}{3} - 0 = \frac{8}{3}$$



PROPRIETÀ

Sia $y = f(x)$ una funzione , se $a > b$.

$$1) \int_a^b f(x) dx = - \int_b^a f(x) dx$$

$$2) \int_a^a f(x) dx = 0$$

$$3) \int_a^b k f(x) dx = k \int_a^b f(x) dx \quad k \in \mathbb{R}$$

$$4) \int_a^b [f_1(x) + f_2(x)] dx = \int_a^b f_1(x) dx + \int_a^b f_2(x) dx$$

$$5) c \in [a, b] \quad a, b, c \in \mathbb{R}$$

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

$$6) \text{ Se } a \leq b \text{ e } f(x) \leq g(x)$$

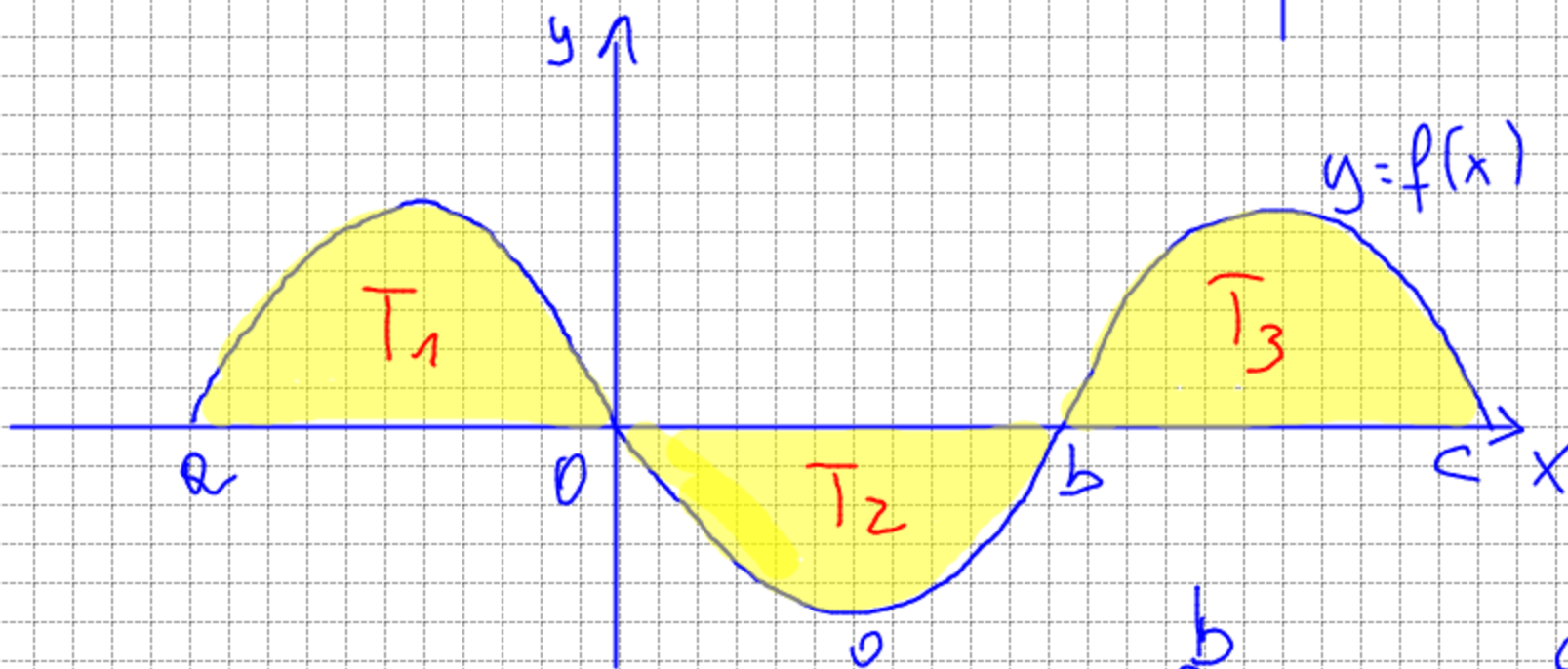
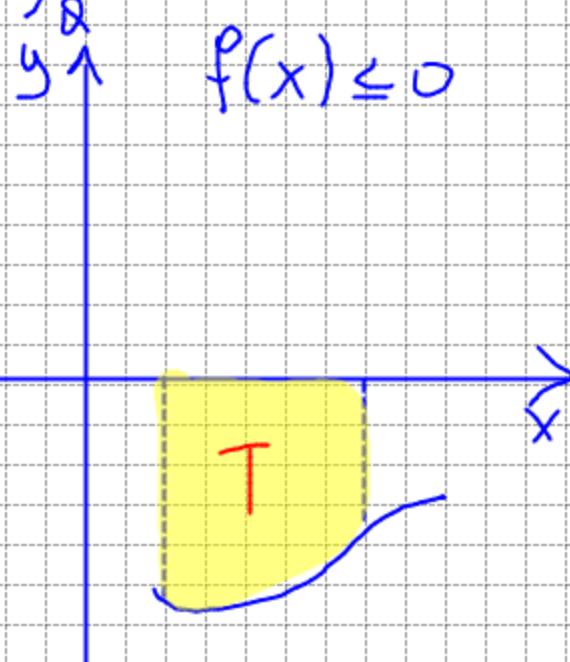
$$\int_a^b f(x) dx \leq \int_a^b g(x) dx$$

SIGNIFICATO GEOMETRICO DI ALCUNI CONCETTI

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



$$T = - \int_a^b f(x) dx$$



$$Q = T_1 + T_2 + T_3 = \int_a^0 f(x) dx - \int_0^b f(x) dx + \int_b^c f(x) dx =$$

$$= \int_a^c |f(x)| dx$$

perché $|f(x)| = \begin{cases} f(x) & \text{se } f(x) \geq 0 \\ -f(x) & \text{se } f(x) < 0 \end{cases}$

TEOREMA DELLA MEDIA

Se $y=f(x)$ è una funzione continua in $[a,b]$, esiste almeno un punto $c \in [a,b]$ tale che:

valor
medio

$$f(c) = \frac{\int_a^b f(x) dx}{b-a}$$

Dim