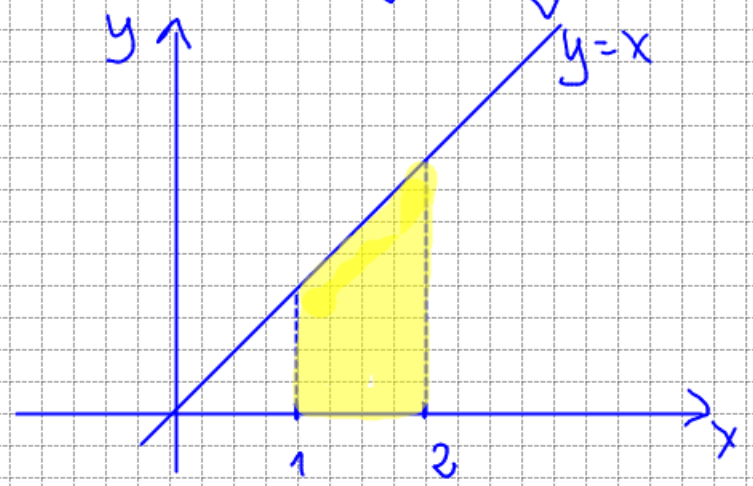
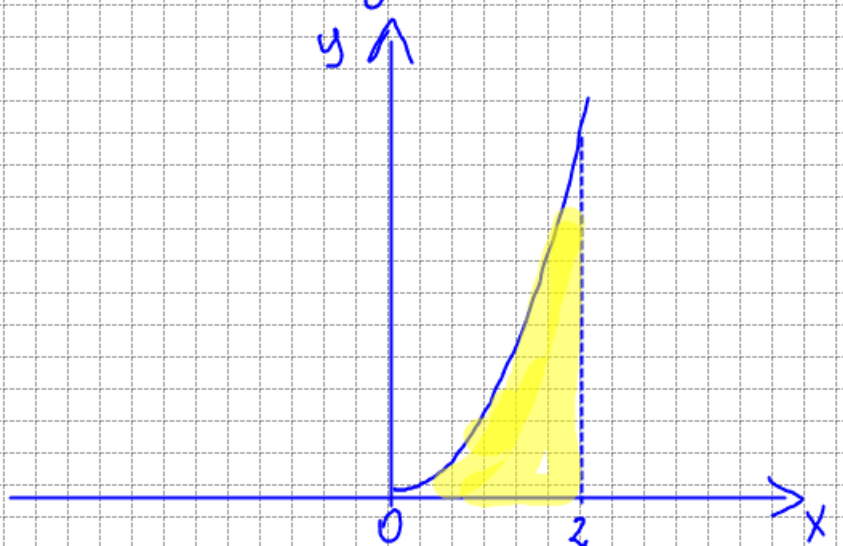
ESEMPIO

$$\int_1^2 x\,dx = \left[\frac{x^2}{2}\right]_1^2 = \frac{2^2}{2} - \frac{1^2}{2} = 2 - \frac{1}{2} = \frac{3}{2}$$



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

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

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

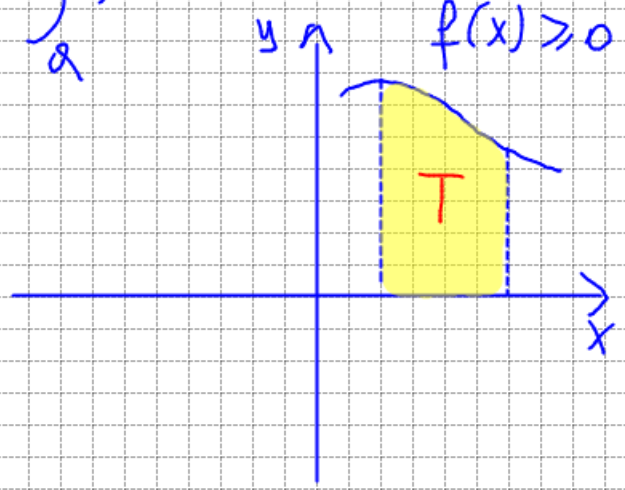
6) Se $a \le b$ e $f(x) \le g(x)$

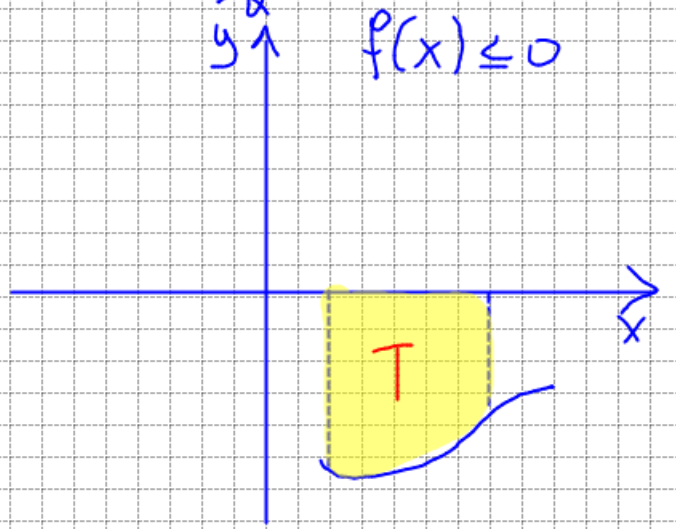
$$\int_a^b f(x)\,dx \le \int_a^b g(x)\,dx$$

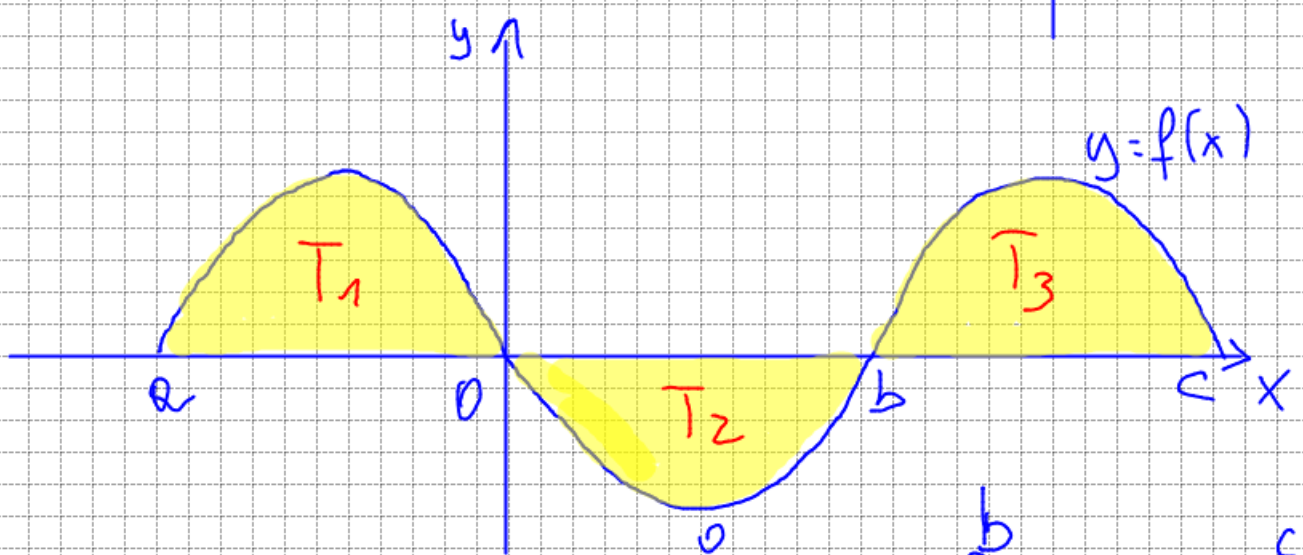
SIGNIFICATO GEOMETRICO DI ALCUNI CONCETTI

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

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







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

$$= \int_a^c |f(x)|\,dx \qquad \text{perché } |f(x)| = \begin{cases} f(x) & \text{se } f(x) \geq 0 \\ -f(x) & \text{se } f(x) < 0 \end{cases}$$

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

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

Dim