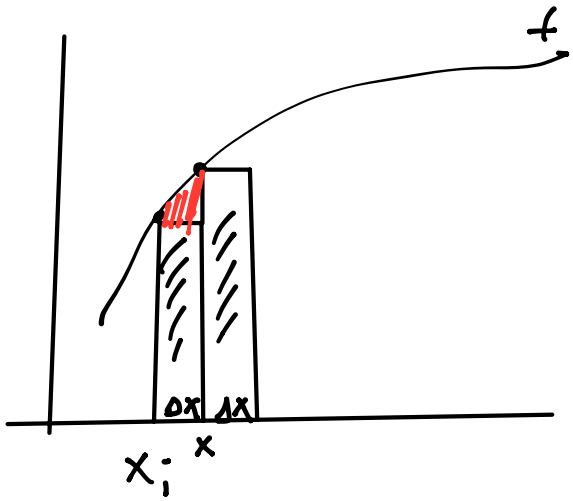
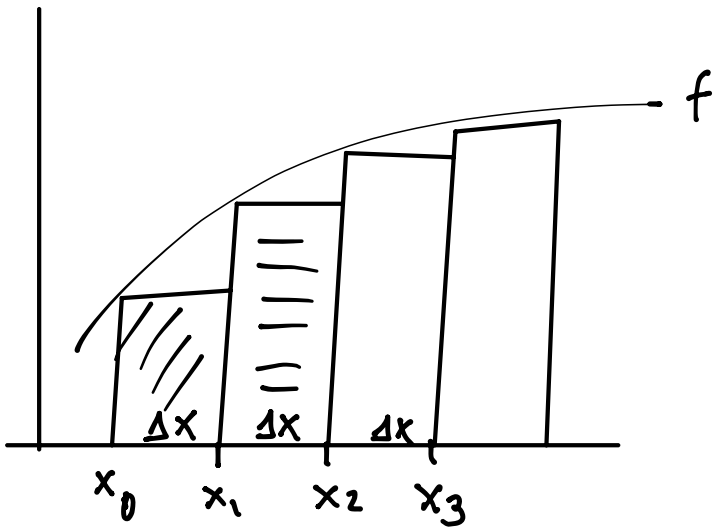
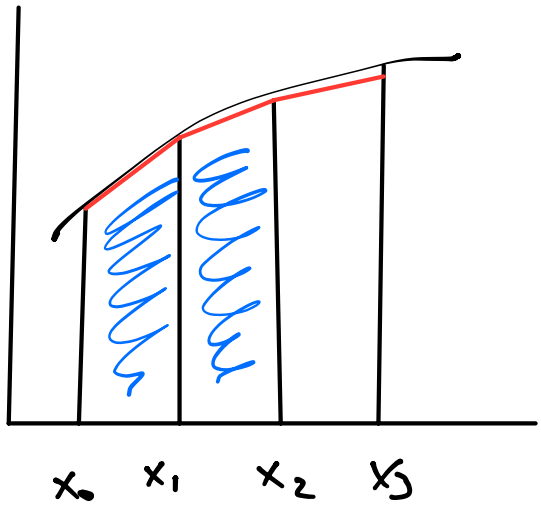
$$\int_a^b f(x)dx = \sum_i f(x_i)\Delta x_i$$







$$f(x_0)\Delta x + f(x_1)\Delta x + \cdots$$

$$\frac{f(x_0)+f(x_1)}{2}\Delta x + \frac{f(x_1)+f(x_2)}{2}\Delta x$$

$$+ \frac{f(x_2)+f(x_3)}{2}\Delta x \cdots$$

$$= \left(\frac{f(x_0)}{2} + f(x_1) + f(x_2) + \cdots \frac{f(x_n)}{2}\right)\Delta x$$

$$\int f\,dx \approx \sum_i w_i f(x_i) = \sum_i w_i f_i$$

$$\int_0^3 x^2 dx = \frac{x^3}{3}\Big]_0^3 = 9 - 0 = 9$$

$$\Delta h = \int_{T_1}^{T_2} C_p(T)\, dT \qquad \underline{I} \approx \sum_i w_i f_i$$

$$\int_{-1}^{1} f(x)dx \approx 0.88 \cdot f(0) + 0.55 \cdot f(-0.77) + 0.55\, f(0.77)$$

$$\int_0^5 f(x)dx \qquad \int_{x_1}^{x_2}$$

$$x = x_1 \frac{1}{2}(1-\xi) + x_2 \frac{1}{2}(1+\xi)$$

$$-1 < \xi < 1$$

$$\xi \to [-1, 1]$$

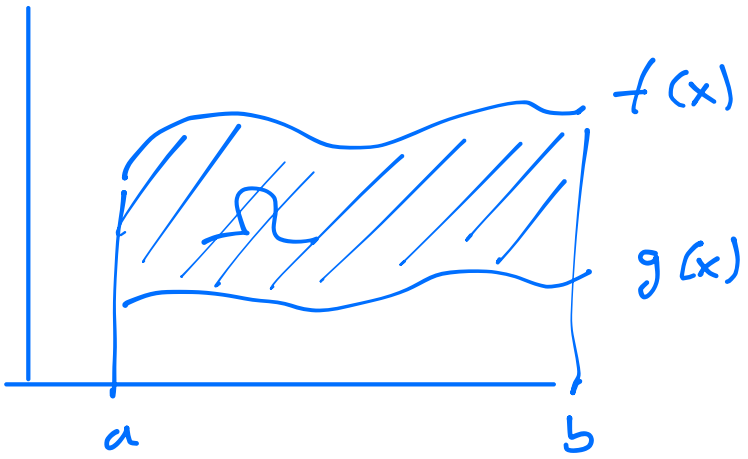
$$x \to [x_1, x_2]$$

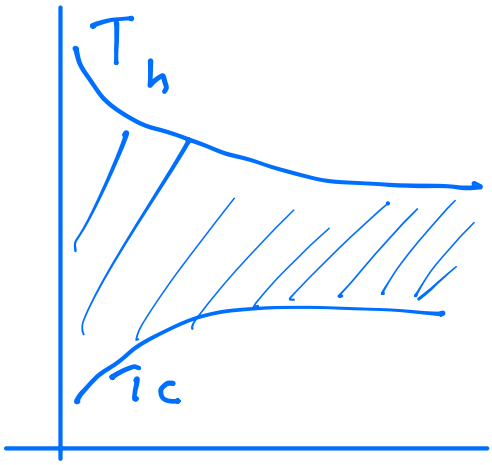
$$\xi = -1 \quad x = x_1$$

$$\xi = 1 \quad x = x_2$$

$$\frac{dx}{d\xi} = -\frac{1}{2}x_1 + \frac{1}{2}x_2$$

$$\int_a^b f(x)\, dx = \int_{-1}^{1} f(x(\xi)) \frac{dx}{d\xi} d\xi$$





$$\int_a^b \int_{g(x)}^{h(x)} f(x,y)\, dy\, dx = \int_\Omega f(x,y)\, d\underline{\underline{\Omega}}$$