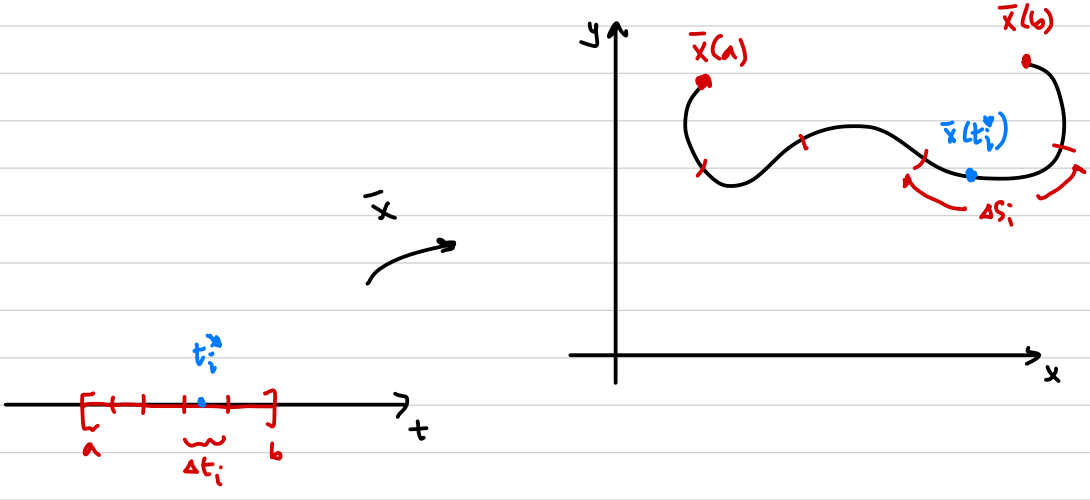
GOAL: Integrate (scalar) function f along C.

Follow the pattern of integrals:



- Divide $[a, b]$ (in t-axis) into subintervals, length Δt_i
- this divides C into subintervals, length Δs_i ← arc length.
- Pick a test point t_i^* in each t-subinterval. Corresponds to a point $\bar{x}(t_i^*)$ in each C-subinterval.

- Defin:

$$\int_C f(x,y)\,ds = \lim_{\Delta s_i \to 0} \sum f(\bar{x}(t_i^*))\,\Delta s_i$$

Riemann sum.

notation

ds says: integrate w.r.t. arc length. Later, we'll see other options...

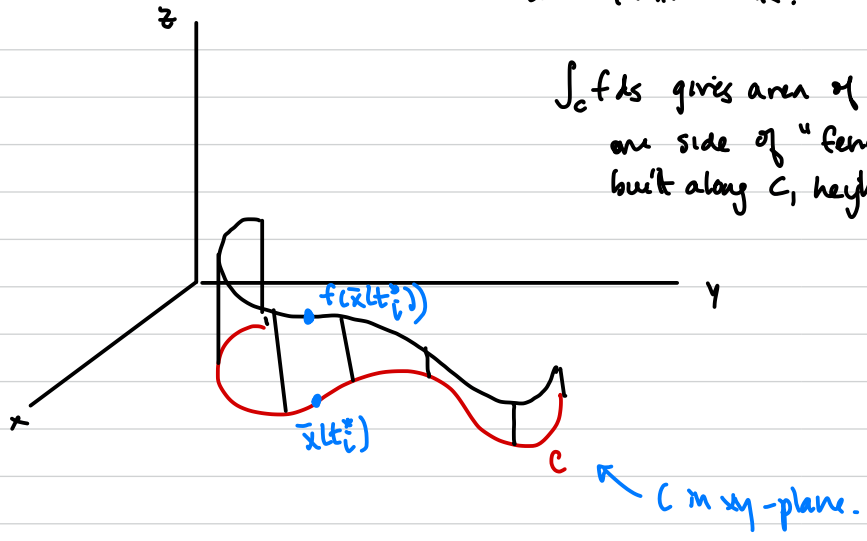
Calculus!

"height" → function value

measurement in domain... ie C

Here: $f: \mathbb{R}^2 \to \mathbb{R}$.

$\int_C f\,ds$ gives area of one side of "fence" built along C, height f.



C in xy-plane.