0.1 Line integral of vector fields

We may wish to integrate along a curve in a vector field.

We previously showed that we can write a curve as a function on the real line:

$r : [a, b] \to C$

The integral is therefore the sum of the function at all points, with some weighting. We write this:

$\int_C f(r)ds = \lim_{\Delta srightarrow 0} \sum_{i=0}^{n} f(r(t_i))\Delta s_i$

In a vector field we use

$\int_C f(r)ds = \int_a^b f(r(t)).r'(t)dt$