Line Integrals

The Integrals

Suppose $C(t) = \langle x(t), y(t) \rangle$ for $t \in [a,b]$.

- $\displaystyle\int_C f(x,y)\,ds = \int_a^b f\big(x(t),y(t)\big) \cdot \sqrt{x'(t)^2 + y'(t)^2}\,dt$
- $\displaystyle\int_C f(x,y)\,dx = \int_a^b f\big(x(t),y(t)\big) \cdot x'(t)\,dt$
- $\displaystyle\int_C f(x,y)\,dy = \int_a^b f\big(x(t),y(t)\big) \cdot y'(t)\,dt$
- $\displaystyle\int_C f(x,y)\,dx + g(x,y)dy = \int_a^b \big[f\big(x(t),y(t)\big) \cdot x'(t) + g\big(x(t),y(t)\big) \cdot y'(t)\big]\,dt$