

Lecture 26: Line integrals

- 1 What is the line integral of

$$\vec{F}(x, y) = [x^2 + y, x - y]$$

along the ellipse $x^2 + y^2/4 = 1$ parametrized counter clockwise.

- 2 Find the line integral of a force field

$$\vec{F} = [-y, -4, 1]$$

along the path $\vec{r}(t) = [t, 3t, t]$ from $t = 0$ to $t = 1$.

- 3 Can you see intuitively, why the line integral along a closed curve is zero, if \vec{F} is a constant vector field.

- 4 For which closed curves is the line integral along the vector field $\vec{F} = [-y, x]$ positive?