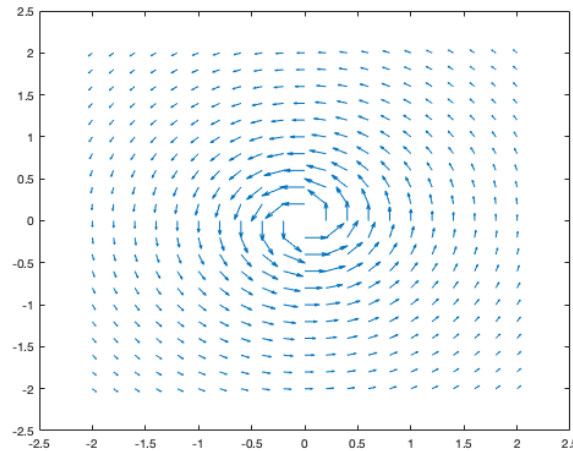


Repetition

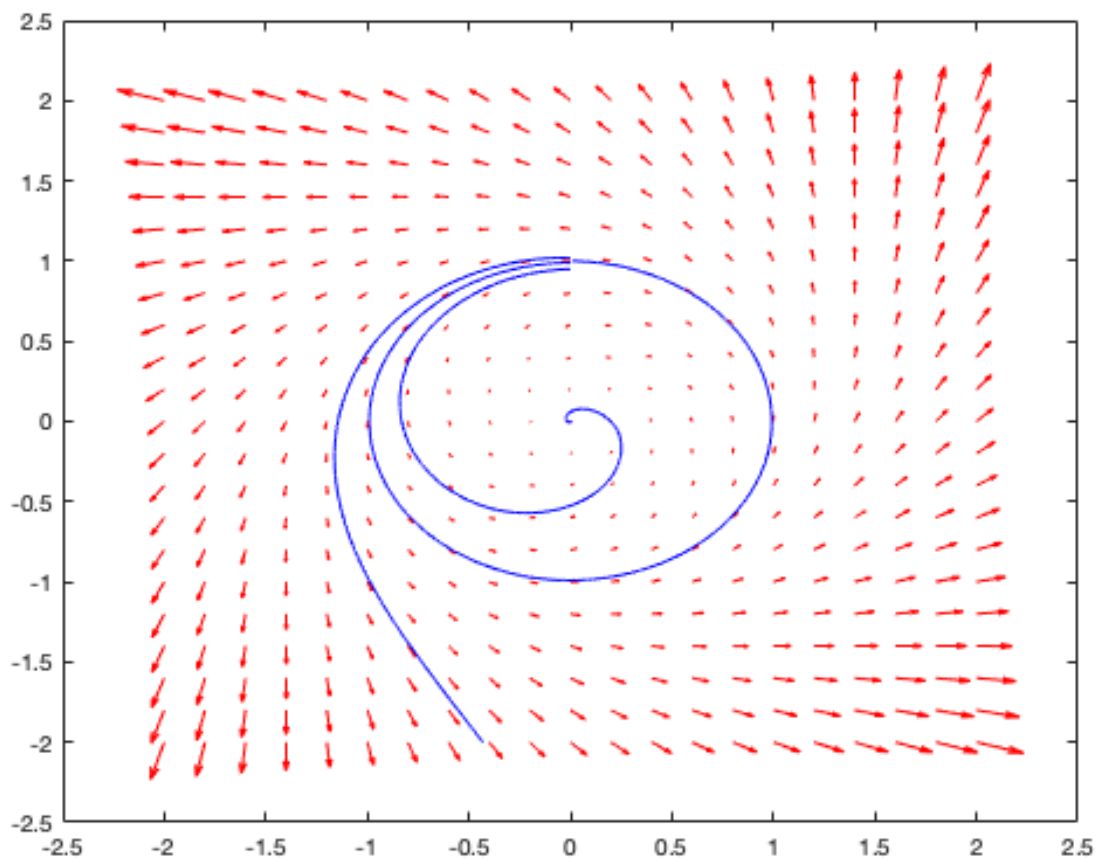
Vektorfeld: $F: \mathbb{R}^2 \rightarrow \mathbb{R}^2$

Tornado field: $F(x, y) = \left(\frac{-y}{x^2 + y^2 + 0.1}, \frac{x}{x^2 + y^2 + 0.1} \right)$



Lks.

$$F(x,y) = \left(-y + (\sqrt{x^2+y^2}-1)x, x + (\sqrt{x^2+y^2}-1)y \right)$$



Eks.

Gradientfelt : $\nabla f = \left(\frac{\partial f}{\partial x}, \frac{\partial f}{\partial y} \right)$
 $f(x, y)$

∇f peker i den retningen hvor
 f har størst endring, normalt
på nivåkurvene ($f(x, y) = \text{konstant}$)

KI

$\mathbb{R}^{1000000000000}$

$\ni V_1, \dots, V_m$
vektoren

w

$$F = F(\underbrace{a_1, \dots, a_m}_{\bar{a}}) = \sum_{i=1}^m \|a_i v_i - w\|$$

$$\nabla F \quad \bar{b} = \bar{a} - \varepsilon \nabla F(\bar{a})$$

$$F = (P, Q) \quad \text{curl}(F) = \frac{\partial Q}{\partial x} - \frac{\partial P}{\partial y}$$

$$F = \nabla \phi = \left(\frac{\partial \phi}{\partial x}, \frac{\partial \phi}{\partial y} \right)$$

$$\frac{\partial}{\partial x} \left(\frac{\partial \phi}{\partial y} \right) - \frac{\partial}{\partial y} \left(\frac{\partial \phi}{\partial x} \right) = 0$$

$$\text{curl}(F) = 0$$

F : konservativ

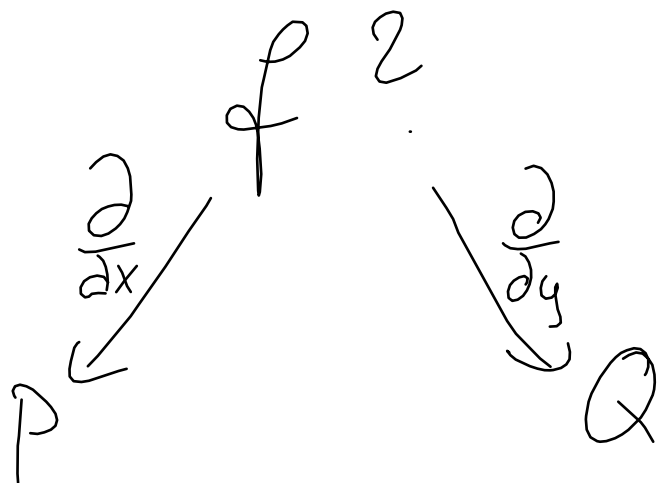
$$\text{curl}(F) \neq 0$$

Has vortice: feltet.

F oppfylle $\text{curl}(F) = 0$

$\Rightarrow$ Kan finne en potensialfunksjon ϕ
slik at $F = \nabla \phi$

$$F = (P, Q)$$
$$P = \frac{\partial \phi}{\partial x}, Q = \frac{\partial \phi}{\partial y}$$



Eks

$f(x, y) = ?$

$$\frac{\partial}{\partial x} \swarrow$$
$$2xy - y \sin(xy)$$

$$\searrow \frac{\partial}{\partial y}$$
$$x^2 - x \sin(xy) + 2y$$

$$f(x, y) = \int (2xy - y \sin(xy)) dx + g(y)$$
$$= x^2 y + \cos(xy) + g(y)$$

$$\frac{\partial f}{\partial y} = \underbrace{x^2 - x \sin(xy)} + g'(y) = \underbrace{x^2 - x \sin(xy) + 2y}$$

$$g(y) = y^2$$

~~$g(y)$~~

