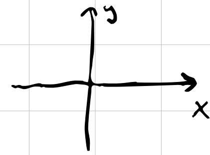
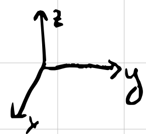
$f: \mathbb{R} \to \mathbb{R}$



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



gradient - smer najhitrejšega naraščanja funkcije

$f(x, y, z) = x^2 y + e^y \cos(z)$

Parcialni odvodi: $f_x = \frac{\partial f}{\partial x} = 2xy$

$f_y = \frac{\partial f}{\partial y} = x^2 + e^y \cos(z)$

$f_z = \frac{\partial f}{\partial z} = e^y(-\sin(z))$

gradient:

$(\mathrm{grad}\, f)(x, y, z) = (2xy,\ x^2 + e^y \cos(z),\ -e^y \sin(z))$

$T(3, 0, 0)$ točka

$(\mathrm{grad}\, f)(3, 0, 0) = (0, 10, 0)$ narašča v točki T v tej smeri

Hessejeva matrika 2. odvodov

$$H_f = \begin{bmatrix} 2y & 2x & 0 \\ 2x & e^y \cos z & -e^y \sin z \\ 0 & -e^y \sin z & -e^y \cos z \end{bmatrix}$$

Če $\frac{\partial^2 f}{\partial x_i \partial x_j}$, $i \neq j$ zvezna, potem je

$$\frac{\partial^2 f}{\partial x_i \partial x_j} = \frac{\partial^2 f}{\partial x_j \partial x_i} \quad (f_{x_i x_j} = f_{x_j x_i})$$

Če zgornje velja za vse $i \neq j$, potem H_f simetrična.