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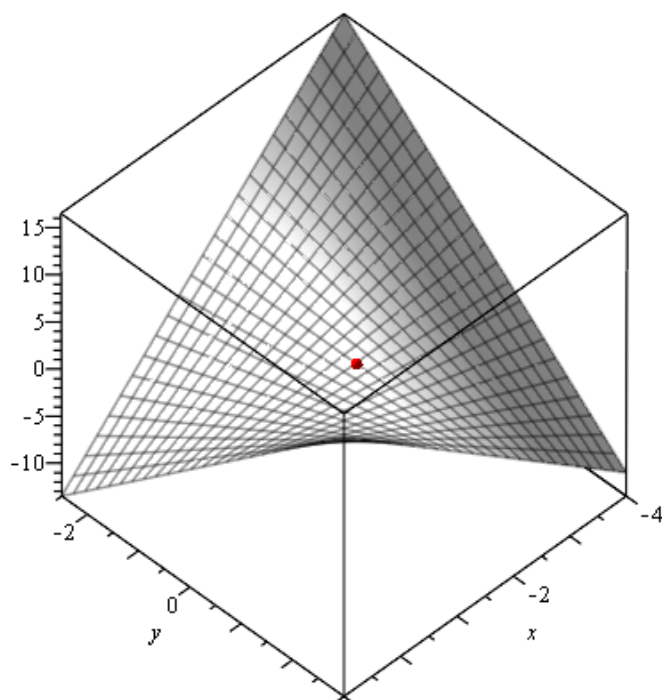
Příklady z přednášky

Pr. 0, soustava dvou lin. rovnic, jeden stacionární bod

$$z_0 := 2xy - x + 3y$$

$$x = -\frac{3}{2}, y = \frac{1}{2}, \textit{sedlo}$$

$$A := \left[ -\frac{3}{2}, \frac{1}{2}, \frac{3}{2} \right]$$

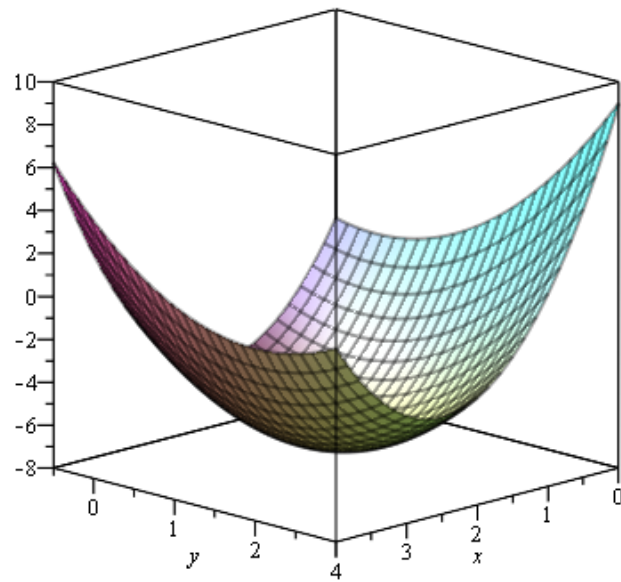


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Pr. 1, soustava dvou lin. rovnic, jeden stacionarni bod

$$z1 := 2x^2 + y^2 - xy - 7x$$

$$x = 2, y = 1, f_{\min} = -7$$

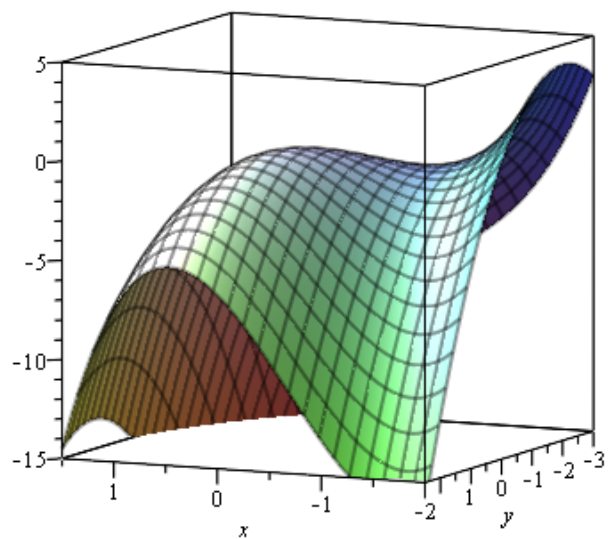


Pr. 2, soustava lin. a kvadr.rovnice, bez absol.clenu, dva stacion. body

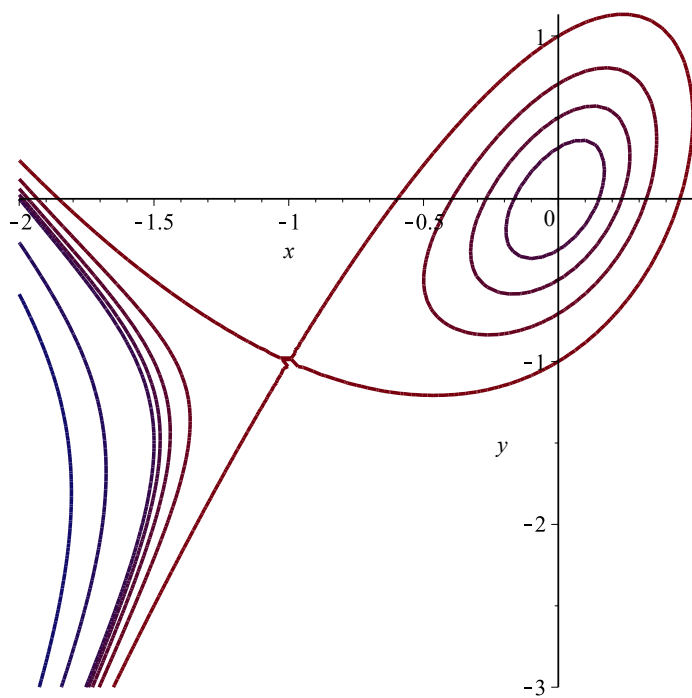
$$z := 2xy - 2x^3 - 4x^2 - y^2$$

$$x = 0, y = 0, f_{\max} = 0$$

$$x = -1, y = -1, \textit{sedlo}$$



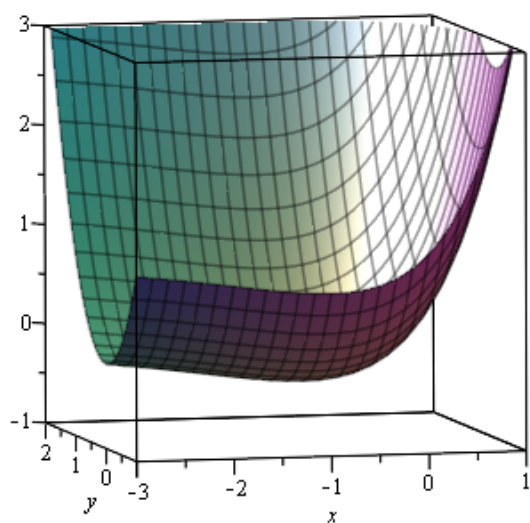
Izokrivky



Pr. 3, dve samostatné rovnice (jedna lin., jedna s exp.), jeden stac. bod

$$z3 := x e^x + y^2$$

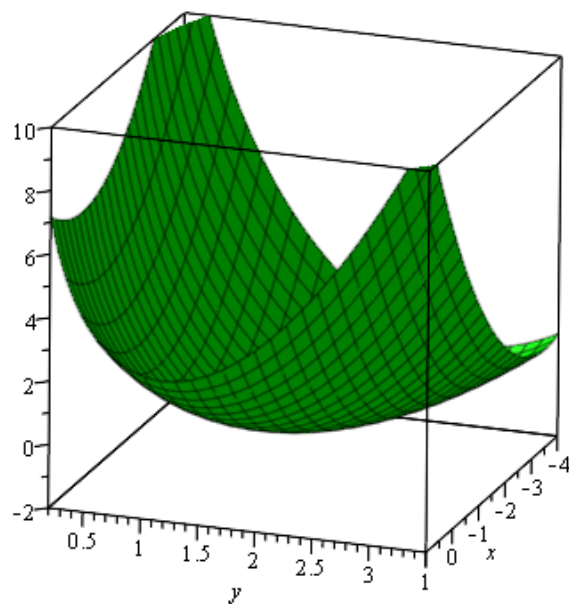
$$x = -1, y = 0, f_{\min} = -\frac{1}{e}$$



Pr. 4, jeden stacionární bod, POZOR: [2,-2] nepatri do def. oboru !

$$z_{ZkA} := 0.5 x^2 + x y + y^2 - 4 \ln(y)$$

$$x = -2, y = 2, f_{\min} = 2 - 4 \ln(2)$$

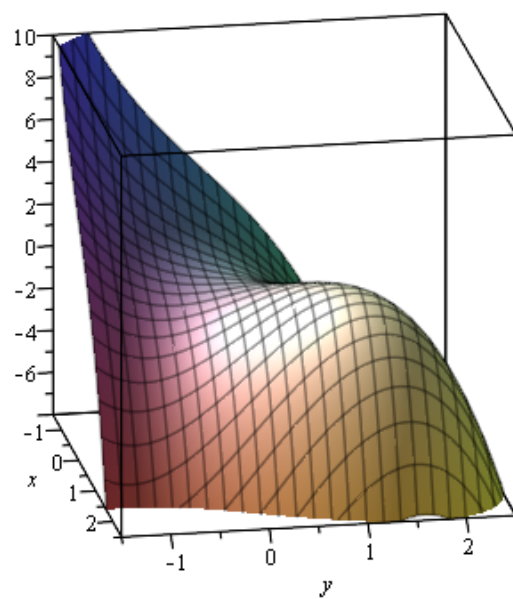


Pr. 5, soustava dvou kvadratických rovnic, dva stacion. body

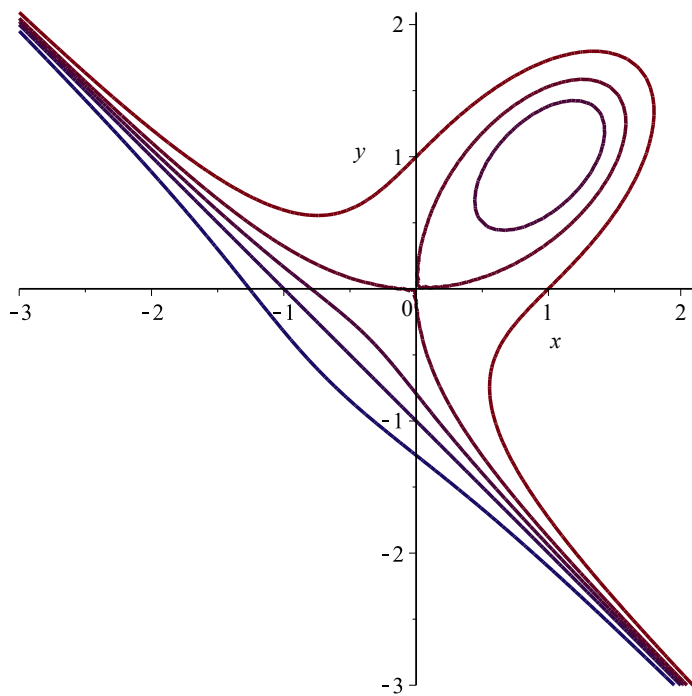
$$z_{ZKA} := 3xy - x^3 - y^3$$

$$x = 1, y = 1, f_{\max} = 1$$

$$x = 0, y = 0, \text{sedlo}$$



# Izokrivky



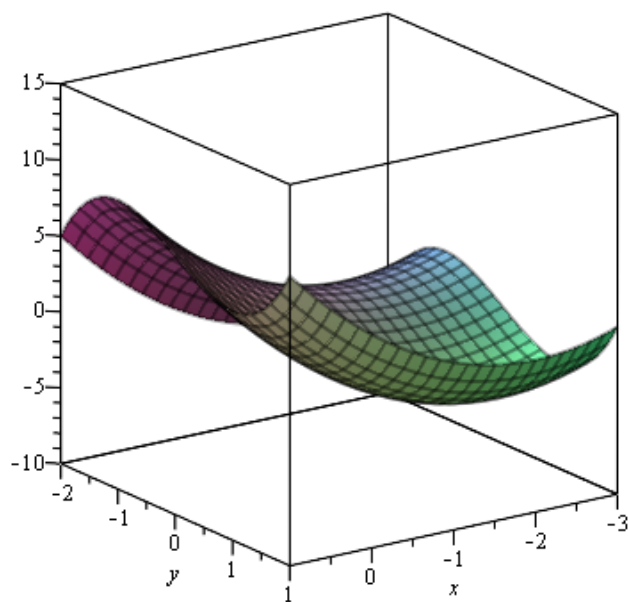


Pr. 6, dve samost. rovnice (linearni, kvadr.), dva stacion. body

$$z6 := x^2 + y^3 + 4x - 3y + 2$$

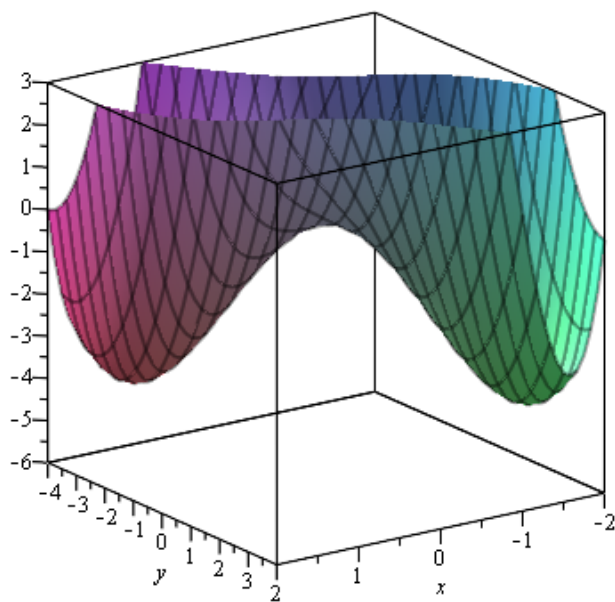
$$x = -2, y = 1, f_{\min} = -4$$

$$x = -2, y = -1, \textit{sedlo}$$



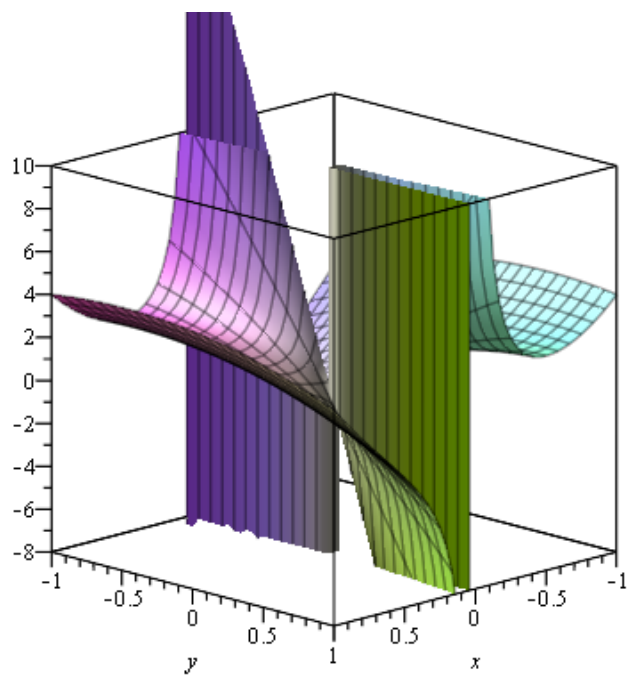
Pr. 7, tri stacionárni body

$$z7 := x^4 + 4xy + y^2$$
$$x = \sqrt{2}, y = -2\sqrt{2}, f_{\min} = -4$$
$$x = -\sqrt{2}, y = 2\sqrt{2}, f_{\min} = -4$$
$$x = 0, y = 0, \textit{sedlo}$$



Pr. 8, dva stacion. body:  $[1/2, -1]$ ,  $[-1/2, 1]$ . Oba jsou sedlové body, žádný extrém.

$$z_8 := 4x^2 - y^2 - \frac{y}{x}$$



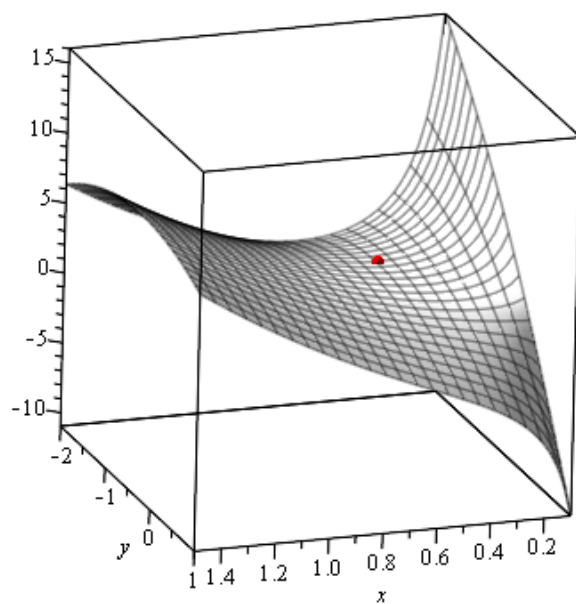
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Pr. 8, dva stacion. body:  $[1/2, -1]$ ,  $[-1/2, 1]$ . Oba jsou sedlové body, žádný extrém.

$$z_8 := 4x^2 - y^2 - \frac{y}{x}$$

$$f(-x, -y) = f(x, y)$$

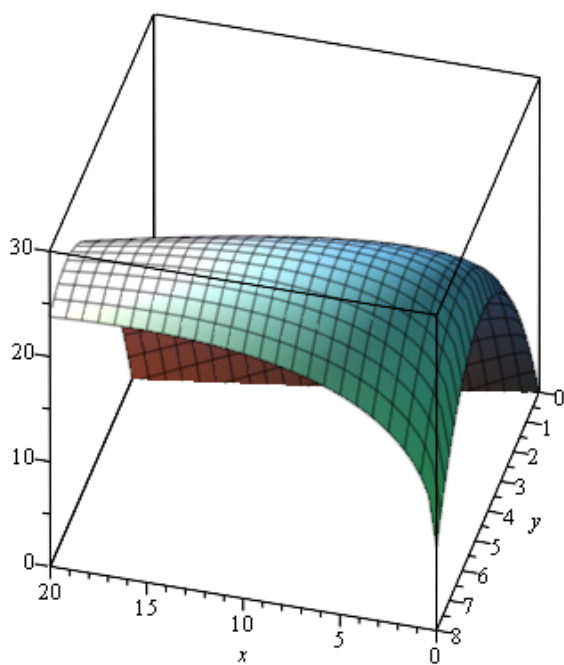
$$A := \left[ \frac{1}{2}, -1, 2 \right]$$



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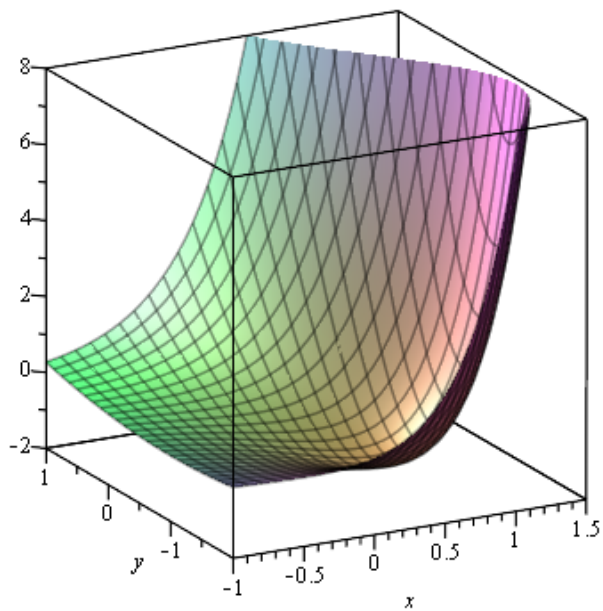
Pr. 9, jeden stacionární bod

$$z_9 := y\sqrt{x} - y^2 - x + 9y$$
$$x = 9, y = 6, f_{\max} = 27$$



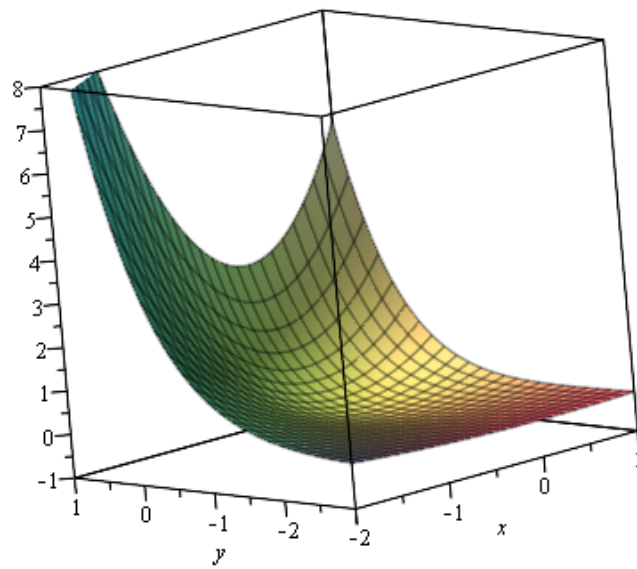
Pr. 10, jeden stacion. bod

$$z_{10} := e^{2x} (x + y^2 + 2y)$$
$$x = \frac{1}{2}, y = -1, f_{\min} = -\frac{1}{2} e$$



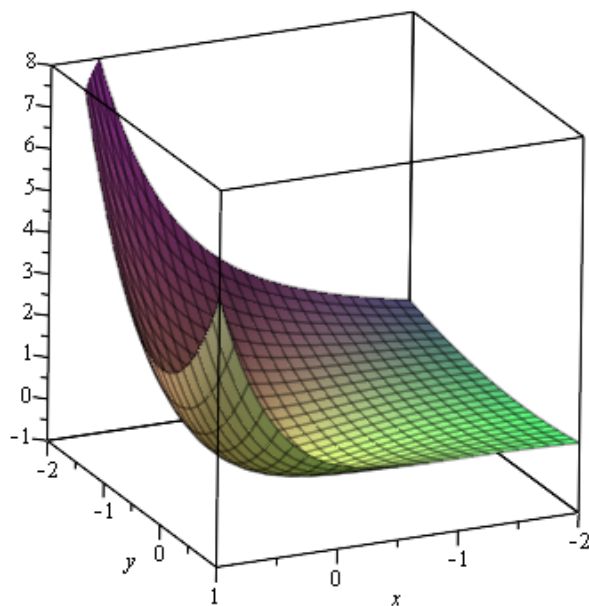
Pr.11, jeden stacion. bod

$$z_{11} := e^y (x^2 + y)$$
$$x_{Min} = 0, y = -1, f_{min} = -\frac{1}{e}$$



Pr.12, dva stacion. body

$$z_{12} := e^x (x^2 + y^2)$$
$$x_{\text{Min}} = 0, y = 0, f = 0$$



$[-2, 0]$  není extrém (sedlový bod)

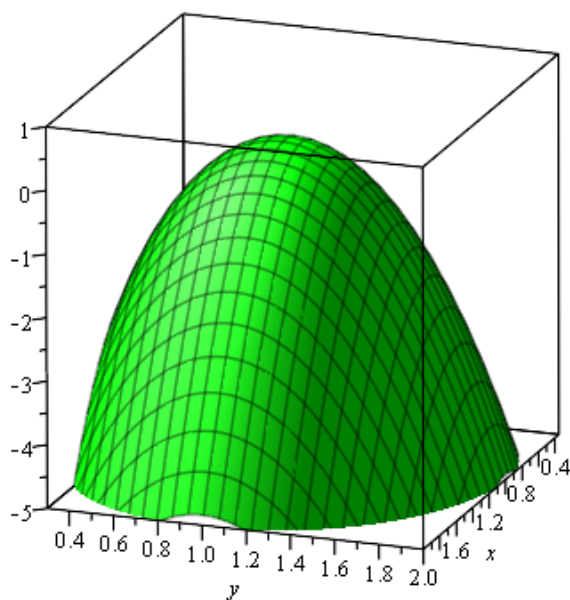


Pr. 13, soustava dvou samostatných rovnic, dva stac. body

$$z_{ZkA} := 3 \ln(x^2 y) - y^3 - 3x^2 + 4$$

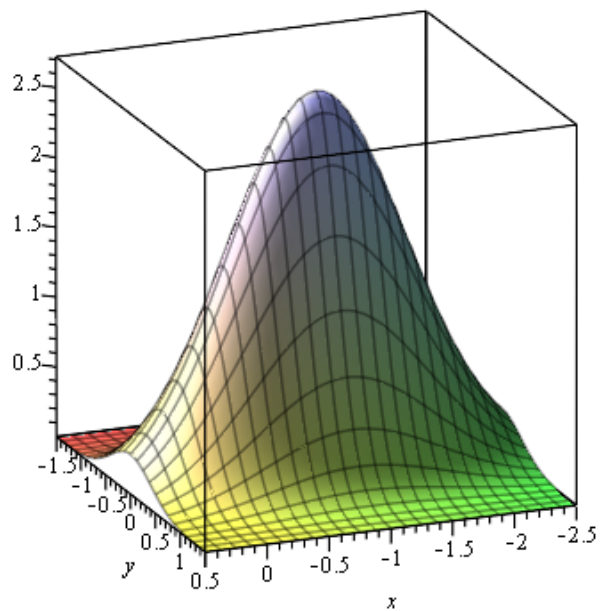
$$x = 1, y = 1, x = -1, y = 1, f_{\max} = 0$$

$$f(-x, y) = f(x, y)$$



Pr.14, jeden stacion. bod

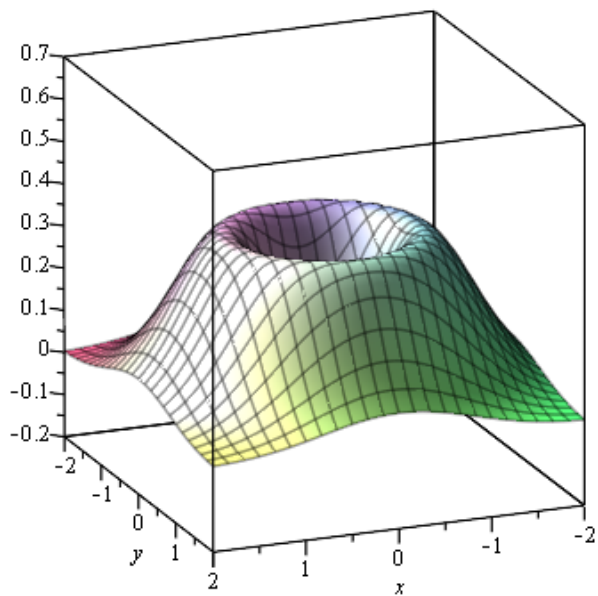
$$z_{14} := e^{-x^2 - 2x - 3y^2}$$
$$x_{Max} = -1, y = 0, f = e$$



Pr.15, nekonecne mnoho stacion. bodu

$$z_{14} := e^{-x^2 - y^2} (x^2 + y^2)$$

$$x_{Min} = 0, y = 0, f = 0$$



Neostre lok. max. v bodech  $[x,y]: x^2 + y^2 = 1$  (jednotkova kruznice)