Seminari 6

Matematika za ekonomiste 2

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Sadržaj

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Parcijalne derivacije drugog reda – oznake

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deseti zadatak

Parcijalne derivacije – oznake

Oznake

- Funkcija dvije varijable: $z = z(x, y)$
- Parcijalna derivacija po varijabli x

$$z_x \qquad z'_x \qquad \frac{\partial z}{\partial x}$$

- Parcijalna derivacija po varijabli y

$$z_y \qquad z'_y \qquad \frac{\partial z}{\partial y}$$

prvi zadatak

Zadatak 1

Odredite parcijalne derivacije sljedećih funkcija:

a) $f(x, y) = x^2 + y^2$

b) $g(x, y) = 3x^2 + xy + \sqrt{y}$

c) $z = \dfrac{y}{x}$

Zadatak 1

$$\boxed{(x^n)' = nx^{n-1}}$$

Odredite parcijalne derivacije sljedećih funkcija:

a) $f(x, y) = x^2 + y^2$

b) $g(x, y) = 3x^2 + xy + \sqrt{y}$

c) $z = \dfrac{y}{x}$

Rješenje

a) $f_x =$

Zadatak 1

$$\boxed{(x^n)' = nx^{n-1}}$$

Odredite parcijalne derivacije sljedećih funkcija:

a) $f(x, y) = x^2 + y^2$

b) $g(x, y) = 3x^2 + xy + \sqrt{y}$

c) $z = \dfrac{y}{x}$

Rješenje

a) $f_x = 2x$

Zadatak 1

$$\boxed{(x^n)' = nx^{n-1}}$$

Odredite parcijalne derivacije sljedećih funkcija:

a) $f(x,y) = x^2 + y^2$

b) $g(x,y) = 3x^2 + xy + \sqrt{y}$

c) $z = \dfrac{y}{x}$

Rješenje

a) $f_x = 2x +$

Zadatak 1

$$\boxed{(x^n)' = nx^{n-1}}$$

Odredite parcijalne derivacije sljedećih funkcija:

a) $f(x, y) = x^2 + y^2$

b) $g(x, y) = 3x^2 + xy + \sqrt{y}$

c) $z = \dfrac{y}{x}$

Rješenje

a) $f_x = 2x + 0$

Zadatak 1

$$\boxed{(x^n)' = nx^{n-1}}$$

Odredite parcijalne derivacije sljedećih funkcija:

a) $f(x,y) = x^2 + y^2$

b) $g(x,y) = 3x^2 + xy + \sqrt{y}$

c) $z = \dfrac{y}{x}$

Rješenje

a) $f_x = 2x + 0 = 2x$

Zadatak 1

$$(x^n)' = nx^{n-1}$$

Odredite parcijalne derivacije sljedećih funkcija:

a) $f(x,y) = x^2 + y^2$

b) $g(x,y) = 3x^2 + xy + \sqrt{y}$

c) $z = \dfrac{y}{x}$

Rješenje

a) $f_x = 2x + 0 = 2x$ $\qquad f_y =$

Zadatak 1

$$\boxed{(x^n)' = nx^{n-1}}$$

Odredite parcijalne derivacije sljedećih funkcija:

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c) $z = \dfrac{y}{x}$

Rješenje

a) $f_x = 2x + 0 = 2x$ $\qquad f_y = 0$

Zadatak 1

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Odredite parcijalne derivacije sljedećih funkcija:

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Rješenje

a) $f_x = 2x + 0 = 2x$ $\qquad$ $f_y = 0 +$

Zadatak 1

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Odredite parcijalne derivacije sljedećih funkcija:

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c) $z = \dfrac{y}{x}$

Rješenje

a) $f_x = 2x + 0 = 2x$ $\qquad$ $f_y = 0 + 2y$

Zadatak 1

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Odredite parcijalne derivacije sljedećih funkcija:

a) $f(x,y) = x^2 + y^2$

b) $g(x,y) = 3x^2 + xy + \sqrt{y}$

c) $z = \dfrac{y}{x}$

Rješenje

a) $f_x = 2x + 0 = 2x$ $\qquad f_y = 0 + 2y = 2y$

Zadatak 1

$$\boxed{(x^n)' = nx^{n-1}}$$

$$\boxed{(cu)'(x) = c \cdot u'(x)}$$

Odredite parcijalne derivacije sljedećih funkcija:

a) $f(x, y) = x^2 + y^2$

b) $g(x, y) = 3x^2 + xy + \sqrt{y}$

c) $z = \dfrac{y}{x}$

Rješenje

a) $f_x = 2x + 0 = 2x$ $\qquad f_y = 0 + 2y = 2y$

b) $g_x =$

Zadatak 1

$$(x^n)' = nx^{n-1}$$

$$(cu)'(x) = c \cdot u'(x)$$

Odredite parcijalne derivacije sljedećih funkcija:

a) $f(x, y) = x^2 + y^2$

b) $g(x, y) = 3x^2 + xy + \sqrt{y}$

c) $z = \dfrac{y}{x}$

Rješenje

a) $f_x = 2x + 0 = 2x$ $\qquad$ $f_y = 0 + 2y = 2y$

b) $g_x = 6x$

Zadatak 1

$$(x^n)' = nx^{n-1}$$

$$(cu)'(x) = c \cdot u'(x)$$

Odredite parcijalne derivacije sljedećih funkcija:

a) $f(x,y) = x^2 + y^2$

b) $g(x,y) = 3x^2 + xy + \sqrt{y}$

c) $z = \dfrac{y}{x}$

Rješenje

a) $f_x = 2x + 0 = 2x$ $\quad$ $f_y = 0 + 2y = 2y$

b) $g_x = 6x +$

Zadatak 1

$$(x^n)' = nx^{n-1}$$

Odredite parcijalne derivacije sljedećih funkcija:

$$(cu)'(x) = c \cdot u'(x)$$

a) $f(x, y) = x^2 + y^2$

b) $g(x, y) = 3x^2 + xy + \sqrt{y}$

c) $z = \dfrac{y}{x}$

Rješenje

a) $f_x = 2x + 0 = 2x$ $\quad$ $f_y = 0 + 2y = 2y$

b) $g_x = 6x + y$

Zadatak 1

$$(x^n)' = nx^{n-1}$$

$$(cu)'(x) = c \cdot u'(x)$$

Odredite parcijalne derivacije sljedećih funkcija:

a) $f(x, y) = x^2 + y^2$

b) $g(x, y) = 3x^2 + xy + \sqrt{y}$

c) $z = \dfrac{y}{x}$

Rješenje

a) $f_x = 2x + 0 = 2x$ $\qquad f_y = 0 + 2y = 2y$

b) $g_x = 6x + y +$

Zadatak 1

$$(x^n)' = nx^{n-1}$$

$$(cu)'(x) = c \cdot u'(x)$$

Odredite parcijalne derivacije sljedećih funkcija:

a) $f(x, y) = x^2 + y^2$

b) $g(x, y) = 3x^2 + xy + \sqrt{y}$

c) $z = \frac{y}{x}$

Rješenje

a) $f_x = 2x + 0 = 2x$ $\qquad f_y = 0 + 2y = 2y$

b) $g_x = 6x + y + 0$

Zadatak 1

$$(x^n)' = nx^{n-1}$$

$$(cu)'(x) = c \cdot u'(x)$$

Odredite parcijalne derivacije sljedećih funkcija:

a) $f(x, y) = x^2 + y^2$

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c) $z = \dfrac{y}{x}$

Rješenje

a) $f_x = 2x + 0 = 2x$ $\qquad f_y = 0 + 2y = 2y$

b) $g_x = 6x + y + 0 = 6x + y$

Zadatak 1

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Rješenje

a) $f_x = 2x + 0 = 2x$ $\quad$ $f_y = 0 + 2y = 2y$

b) $g_x = 6x + y + 0 = 6x + y$ $\quad$ $g_y =$

Zadatak 1

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Rješenje

a) $f_x = 2x + 0 = 2x$ $\qquad f_y = 0 + 2y = 2y$

b) $g_x = 6x + y + 0 = 6x + y$ $\qquad g_y = 0$

Zadatak 1

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a) $f(x, y) = x^2 + y^2$

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c) $z = \dfrac{y}{x}$

Rješenje

a) $f_x = 2x + 0 = 2x$ $\qquad f_y = 0 + 2y = 2y$

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Zadatak 1

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c) $z = \dfrac{y}{x}$

Rješenje

a) $f_x = 2x + 0 = 2x$ $\qquad$ $f_y = 0 + 2y = 2y$

b) $g_x = 6x + y + 0 = 6x + y$ $\qquad$ $g_y = 0 + x$

Zadatak 1

Odredite parcijalne derivacije sljedećih funkcija:

$$\boxed{(x^n)' = nx^{n-1}}$$

$$\boxed{(cu)'(x) = c \cdot u'(x)}$$

$$\boxed{\left(\sqrt{x}\right)' = \frac{1}{2\sqrt{x}}}$$

a) $f(x, y) = x^2 + y^2$

b) $g(x, y) = 3x^2 + xy + \sqrt{y}$

c) $z = \dfrac{y}{x}$

Rješenje

a) $f_x = 2x + 0 = 2x$ $\qquad$ $f_y = 0 + 2y = 2y$

b) $g_x = 6x + y + 0 = 6x + y$ $\qquad$ $g_y = 0 + x +$

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b) $g(x,y) = 3x^2 + xy + \sqrt{y}$

c) $z = \dfrac{y}{x}$

Rješenje

a) $f_x = 2x + 0 = 2x$ $\qquad f_y = 0 + 2y = 2y$

b) $g_x = 6x + y + 0 = 6x + y$ $\qquad g_y = 0 + x + \dfrac{1}{2\sqrt{y}}$

Zadatak 1

$$(x^n)' = nx^{n-1}$$

$$(cu)'(x) = c \cdot u'(x)$$

$$\left(\sqrt{x}\right)' = \frac{1}{2\sqrt{x}}$$

Odredite parcijalne derivacije sljedećih funkcija:

a) $f(x, y) = x^2 + y^2$

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c) $z = \dfrac{y}{x}$

Rješenje

a) $f_x = 2x + 0 = 2x$ $\qquad$ $f_y = 0 + 2y = 2y$

b) $g_x = 6x + y + 0 = 6x + y$ $\qquad$ $g_y = 0 + x + \dfrac{1}{2\sqrt{y}} = x + \dfrac{1}{2\sqrt{y}}$

Zadatak 1

$$(x^n)' = nx^{n-1}$$

Odredite parcijalne derivacije sljedećih funkcija:

$$(cu)'(x) = c \cdot u'(x)$$

$$\left(\sqrt{x}\right)' = \frac{1}{2\sqrt{x}}$$

a) $f(x, y) = x^2 + y^2$

b) $g(x, y) = 3x^2 + xy + \sqrt{y}$

c) $z = \frac{y}{x}$

$z = yx^{-1}$

Rješenje

a) $f_x = 2x + 0 = 2x$ $\qquad$ $f_y = 0 + 2y = 2y$

b) $g_x = 6x + y + 0 = 6x + y$ $\qquad$ $g_y = 0 + x + \frac{1}{2\sqrt{y}} = x + \frac{1}{2\sqrt{y}}$

c) $z_x =$

Zadatak 1

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c) $z = \dfrac{y}{x}$

$z = yx^{-1}$

Rješenje

a) $f_x = 2x + 0 = 2x$ $\qquad f_y = 0 + 2y = 2y$

b) $g_x = 6x + y + 0 = 6x + y$ $\qquad g_y = 0 + x + \dfrac{1}{2\sqrt{y}} = x + \dfrac{1}{2\sqrt{y}}$

c) $z_x = y$

Zadatak 1

Odredite parcijalne derivacije sljedećih funkcija:

$$\boxed{(x^n)' = nx^{n-1}}$$

$$\boxed{(cu)'(x) = c \cdot u'(x)}$$

$$\boxed{\left(\sqrt{x}\right)' = \frac{1}{2\sqrt{x}}}$$

a) $f(x,y) = x^2 + y^2$

b) $g(x,y) = 3x^2 + xy + \sqrt{y}$

c) $z = \dfrac{y}{x}$

$z = yx^{-1}$

Rješenje

a) $f_x = 2x + 0 = 2x$ $\qquad f_y = 0 + 2y = 2y$

b) $g_x = 6x + y + 0 = 6x + y$ $\qquad g_y = 0 + x + \dfrac{1}{2\sqrt{y}} = x + \dfrac{1}{2\sqrt{y}}$

c) $z_x = y \cdot$

Zadatak 1

Odredite parcijalne derivacije sljedećih funkcija:

$$\boxed{(x^n)' = nx^{n-1}}$$

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c) $z = \dfrac{y}{x}$

$z = yx^{-1}$

Rješenje

a) $f_x = 2x + 0 = 2x$ $\qquad$ $f_y = 0 + 2y = 2y$

b) $g_x = 6x + y + 0 = 6x + y$ $\qquad$ $g_y = 0 + x + \dfrac{1}{2\sqrt{y}} = x + \dfrac{1}{2\sqrt{y}}$

c) $z_x = y \cdot \left(-x^{-2}\right)$

Zadatak 1

Odredite parcijalne derivacije sljedećih funkcija:

$$\boxed{(x^n)' = nx^{n-1}}$$

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b) $g(x,y) = 3x^2 + xy + \sqrt{y}$

c) $z = \dfrac{y}{x}$

$z = yx^{-1}$

Rješenje

a) $f_x = 2x + 0 = 2x$ $\qquad f_y = 0 + 2y = 2y$

b) $g_x = 6x + y + 0 = 6x + y$ $\qquad g_y = 0 + x + \dfrac{1}{2\sqrt{y}} = x + \dfrac{1}{2\sqrt{y}}$

c) $z_x = y \cdot \left(-x^{-2}\right) = -\dfrac{y}{x^2}$

Zadatak 1

Odredite parcijalne derivacije sljedećih funkcija:

$$\boxed{(x^n)' = nx^{n-1}}$$

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a) $f(x,y) = x^2 + y^2$

b) $g(x,y) = 3x^2 + xy + \sqrt{y}$

c) $z = \dfrac{y}{x}$

$z = yx^{-1}$

Rješenje

a) $f_x = 2x + 0 = 2x$ $\qquad f_y = 0 + 2y = 2y$

b) $g_x = 6x + y + 0 = 6x + y$ $\qquad g_y = 0 + x + \dfrac{1}{2\sqrt{y}} = x + \dfrac{1}{2\sqrt{y}}$

c) $z_x = y \cdot \left(-x^{-2}\right) = -\dfrac{y}{x^2}$ $\qquad z_y =$

Zadatak 1

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c) $z = \dfrac{y}{x}$

$z = yx^{-1}$

Rješenje

a) $f_x = 2x + 0 = 2x$ $\qquad f_y = 0 + 2y = 2y$

b) $g_x = 6x + y + 0 = 6x + y$ $\qquad g_y = 0 + x + \dfrac{1}{2\sqrt{y}} = x + \dfrac{1}{2\sqrt{y}}$

c) $z_x = y \cdot \left(-x^{-2}\right) = -\dfrac{y}{x^2}$ $\qquad z_y = x^{-1}$

Zadatak 1

$$\boxed{(x^n)' = nx^{n-1}}$$

$$\boxed{(cu)'(x) = c \cdot u'(x)}$$

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Odredite parcijalne derivacije sljedećih funkcija:

a) $f(x, y) = x^2 + y^2$

b) $g(x, y) = 3x^2 + xy + \sqrt{y}$

c) $z = \dfrac{y}{x}$

$z = yx^{-1}$

Rješenje

a) $f_x = 2x + 0 = 2x$ $\qquad f_y = 0 + 2y = 2y$

b) $g_x = 6x + y + 0 = 6x + y$ $\qquad g_y = 0 + x + \dfrac{1}{2\sqrt{y}} = x + \dfrac{1}{2\sqrt{y}}$

c) $z_x = y \cdot \left(-x^{-2}\right) = -\dfrac{y}{x^2}$ $\qquad z_y = x^{-1} \cdot$

Zadatak 1

Odredite parcijalne derivacije sljedećih funkcija:

$$\boxed{(x^n)' = nx^{n-1}}$$

$$\boxed{(cu)'(x) = c \cdot u'(x)}$$

$$\boxed{\left(\sqrt{x}\right)' = \frac{1}{2\sqrt{x}}}$$

a) $f(x, y) = x^2 + y^2$

b) $g(x, y) = 3x^2 + xy + \sqrt{y}$

c) $z = \dfrac{y}{x}$

$$z = yx^{-1}$$

Rješenje

a) $f_x = 2x + 0 = 2x$ $\qquad$ $f_y = 0 + 2y = 2y$

b) $g_x = 6x + y + 0 = 6x + y$ $\qquad$ $g_y = 0 + x + \dfrac{1}{2\sqrt{y}} = x + \dfrac{1}{2\sqrt{y}}$

c) $z_x = y \cdot \left(-x^{-2}\right) = -\dfrac{y}{x^2}$ $\qquad$ $z_y = x^{-1} \cdot 1$

Zadatak 1

Odredite parcijalne derivacije sljedećih funkcija:

$$\boxed{(x^n)' = nx^{n-1}}$$

$$\boxed{(cu)'(x) = c \cdot u'(x)}$$

$$\boxed{\left(\sqrt{x}\right)' = \frac{1}{2\sqrt{x}}}$$

a) $f(x,y) = x^2 + y^2$

b) $g(x,y) = 3x^2 + xy + \sqrt{y}$

c) $z = \dfrac{y}{x}$

$z = yx^{-1}$

Rješenje

a) $f_x = 2x + 0 = 2x$ $\qquad$ $f_y = 0 + 2y = 2y$

b) $g_x = 6x + y + 0 = 6x + y$ $\qquad$ $g_y = 0 + x + \dfrac{1}{2\sqrt{y}} = x + \dfrac{1}{2\sqrt{y}}$

c) $z_x = y \cdot \left(-x^{-2}\right) = -\dfrac{y}{x^2}$ $\qquad$ $z_y = x^{-1} \cdot 1 = \dfrac{1}{x}$

drugi zadatak

Zadatak 2

Odredite parcijalne derivacije sljedećih funkcija:

a) $z = xe^y$

b) $z = ye^y + \sqrt{x}$

c) $u(x, y) = \dfrac{2x - y}{x + y}$

Zadatak 2

Odredite parcijalne derivacije sljedećih funkcija:

a) $z = xe^y$

b) $z = ye^y + \sqrt{x}$

c) $u(x, y) = \dfrac{2x - y}{x + y}$

Rješenje

a) $z_x =$

$$\boxed{(cu)'(x) = c \cdot u'(x)}$$

Zadatak 2

Odredite parcijalne derivacije sljedećih funkcija:

a) $z = xe^y$ b) $z = ye^y + \sqrt{x}$ c) $u(x, y) = \dfrac{2x - y}{x + y}$

Rješenje

a) $z_x = e^y$

$$\boxed{(cu)'(x) = c \cdot u'(x)}$$

Zadatak 2

Odredite parcijalne derivacije sljedećih funkcija:

a) $z = xe^y$ b) $z = ye^y + \sqrt{x}$ c) $u(x, y) = \dfrac{2x - y}{x + y}$

Rješenje

a) $z_x = e^y \cdot$

$$\boxed{(cu)'(x) = c \cdot u'(x)}$$

Zadatak 2

Odredite parcijalne derivacije sljedećih funkcija:

a) $z = xe^y$ b) $z = ye^y + \sqrt{x}$ c) $u(x, y) = \dfrac{2x - y}{x + y}$

Rješenje

a) $z_x = e^y \cdot 1$

$$\boxed{(cu)'(x) = c \cdot u'(x)}$$

Zadatak 2

Odredite parcijalne derivacije sljedećih funkcija:

a) $z = xe^y$ b) $z = ye^y + \sqrt{x}$ c) $u(x, y) = \dfrac{2x - y}{x + y}$

Rješenje

a) $z_x = e^y \cdot 1 = e^y$

$$\boxed{(cu)'(x) = c \cdot u'(x)}$$

Zadatak 2

Odredite parcijalne derivacije sljedećih funkcija:

a) $z = xe^y$ b) $z = ye^y + \sqrt{x}$ c) $u(x, y) = \dfrac{2x - y}{x + y}$

Rješenje

a) $z_x = e^y \cdot 1 = e^y$ $z_y =$

$$\boxed{(cu)'(x) = c \cdot u'(x)}$$

Zadatak 2

Odredite parcijalne derivacije sljedećih funkcija:

a) $z = xe^y$ b) $z = ye^y + \sqrt{x}$ c) $u(x,y) = \dfrac{2x - y}{x + y}$

Rješenje

a) $z_x = e^y \cdot 1 = e^y$ $z_y = x$

$$\boxed{(cu)'(x) = c \cdot u'(x)}$$

Zadatak 2

Odredite parcijalne derivacije sljedećih funkcija:

a) $z = xe^y$ b) $z = ye^y + \sqrt{x}$ c) $u(x, y) = \dfrac{2x - y}{x + y}$

Rješenje

a) $z_x = e^y \cdot 1 = e^y$ $z_y = x \cdot$

$$\boxed{(cu)'(x) = c \cdot u'(x)}$$

$$\boxed{(e^x)' = e^x}$$

Zadatak 2

Odredite parcijalne derivacije sljedećih funkcija:

a) $z = xe^y$ b) $z = ye^y + \sqrt{x}$ c) $u(x,y) = \dfrac{2x - y}{x + y}$

Rješenje

a) $z_x = e^y \cdot 1 = e^y$ $z_y = x \cdot e^y$

$$\boxed{(cu)'(x) = c \cdot u'(x)}$$

$$\boxed{(e^x)' = e^x}$$

Zadatak 2

Odredite parcijalne derivacije sljedećih funkcija:

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Rješenje

a) $z_x = e^y \cdot 1 = e^y$ $z_y = x \cdot e^y = xe^y$ $\boxed{(cu)'(x) = c \cdot u'(x)}$

$\boxed{(e^x)' = e^x}$

Zadatak 2

Odredite parcijalne derivacije sljedećih funkcija:

a) $z = xe^y$ b) $z = ye^y + \sqrt{x}$ c) $u(x, y) = \dfrac{2x - y}{x + y}$

Rješenje

a) $z_x = e^y \cdot 1 = e^y$ $z_y = x \cdot e^y = xe^y$ $\boxed{(cu)'(x) = c \cdot u'(x)}$

b) $z_x =$

$\boxed{(e^x)' = e^x}$

Zadatak 2

Odredite parcijalne derivacije sljedećih funkcija:

a) $z = xe^y$ b) $z = ye^y + \sqrt{x}$ c) $u(x,y) = \dfrac{2x-y}{x+y}$

Rješenje

a) $z_x = e^y \cdot 1 = e^y$ $z_y = x \cdot e^y = xe^y$ $\boxed{(cu)'(x) = c \cdot u'(x)}$

b) $z_x = 0$

$\boxed{(e^x)' = e^x}$

Zadatak 2

Odredite parcijalne derivacije sljedećih funkcija:

a) $z = xe^y$ b) $z = ye^y + \sqrt{x}$ c) $u(x, y) = \dfrac{2x - y}{x + y}$

Rješenje

a) $z_x = e^y \cdot 1 = e^y$ $z_y = x \cdot e^y = xe^y$ $\boxed{(cu)'(x) = c \cdot u'(x)}$

b) $z_x = 0 +$

$\boxed{(e^x)' = e^x}$

$\boxed{\left(\sqrt{x}\right)' = \dfrac{1}{2\sqrt{x}}}$

Zadatak 2

Odredite parcijalne derivacije sljedećih funkcija:

a) $z = xe^y$ b) $z = ye^y + \sqrt{x}$ c) $u(x,y) = \dfrac{2x - y}{x + y}$

Rješenje

a) $z_x = e^y \cdot 1 = e^y$ $z_y = x \cdot e^y = xe^y$

$$\boxed{(cu)'(x) = c \cdot u'(x)}$$

b) $z_x = 0 + \dfrac{1}{2\sqrt{x}}$

$$\boxed{(e^x)' = e^x}$$

$$\boxed{\left(\sqrt{x}\right)' = \frac{1}{2\sqrt{x}}}$$

Zadatak 2

Odredite parcijalne derivacije sljedećih funkcija:

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Rješenje

a) $z_x = e^y \cdot 1 = e^y$ $z_y = x \cdot e^y = xe^y$ $\boxed{(cu)'(x) = c \cdot u'(x)}$

b) $z_x = 0 + \dfrac{1}{2\sqrt{x}} = \dfrac{1}{2\sqrt{x}}$

$\boxed{(e^x)' = e^x}$

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Zadatak 2

$$\boxed{(uv)'(x) = u'(x) \cdot v(x) + u(x) \cdot v'(x)}$$

Odredite parcijalne derivacije sljedećih funkcija:

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Rješenje

a) $z_x = e^y \cdot 1 = e^y$ $\quad z_y = x \cdot e^y = xe^y$

$$\boxed{(cu)'(x) = c \cdot u'(x)}$$

b) $z_x = 0 + \dfrac{1}{2\sqrt{x}} = \dfrac{1}{2\sqrt{x}}$ $\quad z_y =$

$$\boxed{(e^x)' = e^x}$$

$$\boxed{\left(\sqrt{x}\right)' = \frac{1}{2\sqrt{x}}}$$

Zadatak 2

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Rješenje

a) $z_x = e^y \cdot 1 = e^y$ $z_y = x \cdot e^y = xe^y$

$$\boxed{(cu)'(x) = c \cdot u'(x)}$$

b) $z_x = 0 + \dfrac{1}{2\sqrt{x}} = \dfrac{1}{2\sqrt{x}}$ $z_y = 1$

$$\boxed{(e^x)' = e^x}$$

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$$\boxed{(cu)'(x) = c\cdot u'(x)}$$

b) $z_x = 0 + \dfrac{1}{2\sqrt{x}} = \dfrac{1}{2\sqrt{x}}$ $z_y = 1\cdot$

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b) $z = ye^y + \sqrt{x}$

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Rješenje

a) $z_x = e^y \cdot 1 = e^y$ $\qquad z_y = x \cdot e^y = xe^y$

$$(cu)'(x) = c \cdot u'(x)$$

b) $z_x = 0 + \dfrac{1}{2\sqrt{x}} = \dfrac{1}{2\sqrt{x}}$ $\qquad z_y = 1 \cdot e^y + y$

$$(e^x)' = e^x$$

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$$\boxed{(e^x)' = e^x}$$

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Odredite parcijalne derivacije sljedećih funkcija:

a) $z = xe^y$ b) $z = ye^y + \sqrt{x}$ c) $u(x,y) = \dfrac{2x-y}{x+y}$

Rješenje

$$\boxed{\left(\frac{u}{v}\right)'(x) = \frac{u'(x)\cdot v(x) - u(x)\cdot v'(x)}{v(x)^2}}$$

a) $z_x = e^y \cdot 1 = e^y$ $z_y = x\cdot e^y = xe^y$ $\boxed{(cu)'(x) = c\cdot u'(x)}$

b) $z_x = 0 + \dfrac{1}{2\sqrt{x}} = \dfrac{1}{2\sqrt{x}}$ $z_y = 1\cdot e^y + y\cdot e^y + 0 = (1+y)e^y$

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$$\boxed{\left(\frac{u}{v}\right)'(x) = \frac{u'(x) \cdot v(x) - u(x) \cdot v'(x)}{v(x)^2}}$$

Rješenje

a) $z_x = e^y \cdot 1 = e^y$ $z_y = x \cdot e^y = xe^y$

$$\boxed{(cu)'(x) = c \cdot u'(x)}$$

b) $z_x = 0 + \dfrac{1}{2\sqrt{x}} = \dfrac{1}{2\sqrt{x}}$ $z_y = 1 \cdot e^y + y \cdot e^y + 0 = (1 + y)e^y$

$$\boxed{(e^x)' = e^x}$$

c) $u_x = \dfrac{}{}$

$$\boxed{\left(\sqrt{x}\right)' = \frac{1}{2\sqrt{x}}}$$

Zadatak 2

$$\boxed{(uv)'(x) = u'(x) \cdot v(x) + u(x) \cdot v'(x)}$$

Odredite parcijalne derivacije sljedećih funkcija:

a) $z = xe^y$ b) $z = ye^y + \sqrt{x}$ c) $u(x, y) = \dfrac{2x - y}{x + y}$

$$\boxed{\left(\frac{u}{v}\right)'(x) = \frac{u'(x) \cdot v(x) - u(x) \cdot v'(x)}{v(x)^2}}$$

Rješenje

a) $z_x = e^y \cdot 1 = e^y$ $z_y = x \cdot e^y = xe^y$

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b) $z_x = 0 + \dfrac{1}{2\sqrt{x}} = \dfrac{1}{2\sqrt{x}}$ $z_y = 1 \cdot e^y + y \cdot e^y + 0 = (1 + y)e^y$

$$\boxed{(e^x)' = e^x}$$

c) $u_x = \dfrac{\qquad}{(x + y)^2}$

$$\boxed{\left(\sqrt{x}\right)' = \frac{1}{2\sqrt{x}}}$$

Zadatak 2

$$\boxed{(uv)'(x) = u'(x) \cdot v(x) + u(x) \cdot v'(x)}$$

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b) $z_x = 0 + \dfrac{1}{2\sqrt{x}} = \dfrac{1}{2\sqrt{x}}$ $z_y = 1 \cdot e^y + y \cdot e^y + 0 = (1 + y)e^y$

$$\boxed{(e^x)' = e^x}$$

c) $u_x = \dfrac{2 \qquad\qquad\qquad}{(x + y)^2}$

$$\boxed{(\sqrt{x})' = \frac{1}{2\sqrt{x}}}$$

Zadatak 2

$$\boxed{(uv)'(x) = u'(x) \cdot v(x) + u(x) \cdot v'(x)}$$

Odredite parcijalne derivacije sljedećih funkcija:

a) $z = xe^y$ b) $z = ye^y + \sqrt{x}$ c) $u(x, y) = \dfrac{2x - y}{x + y}$

Rješenje

$$\boxed{\left(\frac{u}{v}\right)'(x) = \frac{u'(x) \cdot v(x) - u(x) \cdot v'(x)}{v(x)^2}}$$

a) $z_x = e^y \cdot 1 = e^y$ $z_y = x \cdot e^y = xe^y$

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$$\boxed{(e^x)' = e^x}$$

c) $u_x = \dfrac{2 \cdot}{(x + y)^2}$

$$\boxed{\left(\sqrt{x}\right)' = \frac{1}{2\sqrt{x}}}$$

Zadatak 2

$$\boxed{(uv)'(x) = u'(x)\cdot v(x) + u(x)\cdot v'(x)}$$

Odredite parcijalne derivacije sljedećih funkcija:

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Rješenje

a) $z_x = e^y \cdot 1 = e^y$ $z_y = x\cdot e^y = xe^y$

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$$\boxed{(e^x)' = e^x}$$

c) $u_x = \dfrac{2\cdot(x+y)\qquad\qquad\qquad}{(x+y)^2}$

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Zadatak 2

$$\boxed{(uv)'(x) = u'(x) \cdot v(x) + u(x) \cdot v'(x)}$$

Odredite parcijalne derivacije sljedećih funkcija:

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$$\boxed{(e^x)' = e^x}$$

c) $u_x = \dfrac{2 \cdot (x + y) -}{(x + y)^2}$

$$\boxed{(\sqrt{x})' = \frac{1}{2\sqrt{x}}}$$

Zadatak 2

$$\boxed{(uv)'(x) = u'(x) \cdot v(x) + u(x) \cdot v'(x)}$$

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c) $u_x = \dfrac{2 \cdot (x + y) - (2x - y) \cdot}{(x + y)^2}$

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c) $u_x = \dfrac{2 \cdot (x+y) - (2x-y) \cdot 1}{(x+y)^2} = \dfrac{}{(x+y)^2}$

$$\boxed{\left(\sqrt{x}\right)' = \frac{1}{2\sqrt{x}}}$$

Zadatak 2

$$\boxed{(uv)'(x) = u'(x)\cdot v(x) + u(x)\cdot v'(x)}$$

Odredite parcijalne derivacije sljedećih funkcija:

a) $z = xe^y$ b) $z = ye^y + \sqrt{x}$ c) $u(x,y) = \dfrac{2x-y}{x+y}$

$$\boxed{\left(\frac{u}{v}\right)'(x) = \frac{u'(x)\cdot v(x) - u(x)\cdot v'(x)}{v(x)^2}}$$

Rješenje

a) $z_x = e^y \cdot 1 = e^y$ $z_y = x \cdot e^y = xe^y$

$$\boxed{(cu)'(x) = c\cdot u'(x)}$$

b) $z_x = 0 + \dfrac{1}{2\sqrt{x}} = \dfrac{1}{2\sqrt{x}}$ $z_y = 1\cdot e^y + y\cdot e^y + 0 = (1+y)e^y$

$$\boxed{(e^x)' = e^x}$$

c) $u_x = \dfrac{2\cdot(x+y) - (2x-y)\cdot 1}{(x+y)^2} = \dfrac{3y}{(x+y)^2}$

$$\boxed{\left(\sqrt{x}\right)' = \frac{1}{2\sqrt{x}}}$$

Zadatak 2

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Rješenje

a) $z_x = e^y \cdot 1 = e^y$ $z_y = x \cdot e^y = xe^y$ $\boxed{(cu)'(x) = c\cdot u'(x)}$

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$$\boxed{(\sqrt{x})' = \frac{1}{2\sqrt{x}}}$$

$u_y =$

Zadatak 2

$$\boxed{(uv)'(x) = u'(x) \cdot v(x) + u(x) \cdot v'(x)}$$

Odredite parcijalne derivacije sljedećih funkcija:

a) $z = xe^y$ b) $z = ye^y + \sqrt{x}$ c) $u(x, y) = \dfrac{2x - y}{x + y}$

Rješenje

$$\boxed{\left(\frac{u}{v}\right)'(x) = \frac{u'(x) \cdot v(x) - u(x) \cdot v'(x)}{v(x)^2}}$$

a) $z_x = e^y \cdot 1 = e^y$ $z_y = x \cdot e^y = xe^y$

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$$\boxed{\left(\sqrt{x}\right)' = \frac{1}{2\sqrt{x}}}$$

$u_y =$ ____________________

Zadatak 2

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$u_y = \dfrac{}{(x + y)^2}$

Zadatak 2

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Rješenje

$$\boxed{\left(\frac{u}{v}\right)'(x) = \frac{u'(x) \cdot v(x) - u(x) \cdot v'(x)}{v(x)^2}}$$

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$u_y = \dfrac{-1}{(x + y)^2}$

Zadatak 2

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Rješenje

a) $z_x = e^y \cdot 1 = e^y$ $z_y = x \cdot e^y = xe^y$

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$u_y = \dfrac{-1\cdot}{(x+y)^2}$

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$u_y = \dfrac{-1\cdot(x+y)}{(x+y)^2}$

Zadatak 2

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$u_y = \dfrac{-1 \cdot (x + y) -}{(x + y)^2}$

Zadatak 2

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Rješenje

a) $z_x = e^y \cdot 1 = e^y$ $z_y = x \cdot e^y = xe^y$

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Zadatak 2

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Rješenje

a) $z_x = e^y \cdot 1 = e^y$ $z_y = x \cdot e^y = xe^y$ $\boxed{(cu)'(x) = c \cdot u'(x)}$

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$u_y = \dfrac{-1 \cdot (x + y) - (2x - y) \cdot}{(x + y)^2}$

Zadatak 2

$$(uv)'(x) = u'(x) \cdot v(x) + u(x) \cdot v'(x)$$

Odredite parcijalne derivacije sljedećih funkcija:

a) $z = xe^y$ b) $z = ye^y + \sqrt{x}$ c) $u(x,y) = \dfrac{2x - y}{x + y}$

Rješenje

$$\left(\frac{u}{v}\right)'(x) = \frac{u'(x) \cdot v(x) - u(x) \cdot v'(x)}{v(x)^2}$$

a) $z_x = e^y \cdot 1 = e^y$ $\quad z_y = x \cdot e^y = xe^y$

$$(cu)'(x) = c \cdot u'(x)$$

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$$u_y = \frac{-1 \cdot (x + y) - (2x - y) \cdot 1}{(x + y)^2}$$

Zadatak 2

$$\boxed{(uv)'(x) = u'(x) \cdot v(x) + u(x) \cdot v'(x)}$$

Odredite parcijalne derivacije sljedećih funkcija:

a) $z = xe^y$ b) $z = ye^y + \sqrt{x}$ c) $u(x,y) = \dfrac{2x - y}{x + y}$

Rješenje

$$\boxed{\left(\frac{u}{v}\right)'(x) = \frac{u'(x) \cdot v(x) - u(x) \cdot v'(x)}{v(x)^2}}$$

a) $z_x = e^y \cdot 1 = e^y$ $z_y = x \cdot e^y = xe^y$ $\boxed{(cu)'(x) = c \cdot u'(x)}$

b) $z_x = 0 + \dfrac{1}{2\sqrt{x}} = \dfrac{1}{2\sqrt{x}}$ $z_y = 1 \cdot e^y + y \cdot e^y + 0 = (1 + y)e^y$

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$u_y = \dfrac{-1 \cdot (x + y) - (2x - y) \cdot 1}{(x + y)^2} = \dfrac{}{(x + y)^2}$

Zadatak 2

$$(uv)'(x) = u'(x) \cdot v(x) + u(x) \cdot v'(x)$$

Odredite parcijalne derivacije sljedećih funkcija:

a) $z = xe^y$ b) $z = ye^y + \sqrt{x}$ c) $u(x,y) = \dfrac{2x-y}{x+y}$

Rješenje

$$\left(\frac{u}{v}\right)'(x) = \frac{u'(x) \cdot v(x) - u(x) \cdot v'(x)}{v(x)^2}$$

a) $z_x = e^y \cdot 1 = e^y$ $z_y = x \cdot e^y = xe^y$

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c) $$u_x = \frac{2 \cdot (x+y) - (2x-y) \cdot 1}{(x+y)^2} = \frac{3y}{(x+y)^2}$$

$$u_y = \frac{-1 \cdot (x+y) - (2x-y) \cdot 1}{(x+y)^2} = \frac{-3x}{(x+y)^2}$$

$$(\sqrt{x})' = \frac{1}{2\sqrt{x}}$$

treći zadatak

Zadatak 3

Odredite parcijalne derivacije sljedećih funkcija:

a) $z(x,y) = (x+2y)e^{x^2+y^3}$

b) $z = \dfrac{x}{\sqrt{x^2+y^2}}$

c) $z = 2^{\sin\frac{y}{x}}$

d) $z = x^y$

Rješenje

a) $z_x =$

$\boxed{(uv)'(x) = u'(x) \cdot v(x) + u(x) \cdot v'(x)}$ $\boxed{z = (x + 2y)e^{x^2+y^3}}$

Rješenje

a) $$z_x = (x + 2y)'_x$$

$$\boxed{(uv)'(x) = u'(x) \cdot v(x) + u(x) \cdot v'(x)}$$ $$\boxed{z = (x + 2y)e^{x^2+y^3}}$$

Rješenje

a) $$z_x = (x + 2y)'_x \cdot$$

$$\boxed{(uv)'(x) = u'(x) \cdot v(x) + u(x) \cdot v'(x)}$$ $$\boxed{z = (x + 2y)e^{x^2 + y^3}}$$

Rješenje

a) $$z_x = (x+2y)'_x \cdot e^{x^2+y^3}$$

$$\boxed{(uv)'(x) = u'(x) \cdot v(x) + u(x) \cdot v'(x)}$$ $$\boxed{z = (x+2y)e^{x^2+y^3}}$$

Rješenje

a) $$z_x = (x+2y)'_x \cdot e^{x^2+y^3} +$$

$$\boxed{(uv)'(x) = u'(x) \cdot v(x) + u(x) \cdot v'(x)}$$ $$\boxed{z = (x+2y)e^{x^2+y^3}}$$

Rješenje

a) $$z_x = (x+2y)'_x \cdot e^{x^2+y^3} + (x+2y)$$

$$\boxed{(uv)'(x) = u'(x) \cdot v(x) + u(x) \cdot v'(x)}$$

$$\boxed{z = (x+2y)e^{x^2+y^3}}$$

Rješenje

a) $$z_x = (x+2y)'_x \cdot e^{x^2+y^3} + (x+2y) \cdot$$

$$\boxed{(uv)'(x) = u'(x) \cdot v(x) + u(x) \cdot v'(x)}$$ $$\boxed{z = (x+2y)e^{x^2+y^3}}$$

Rješenje

a) $$z_x = (x+2y)'_x \cdot e^{x^2+y^3} + (x+2y) \cdot \left(e^{x^2+y^3}\right)'_x$$

$$\boxed{(uv)'(x) = u'(x) \cdot v(x) + u(x) \cdot v'(x)}$$ $$\boxed{z = (x+2y)e^{x^2+y^3}}$$

Rješenje

a) $$z_x = (x+2y)'_x \cdot e^{x^2+y^3} + (x+2y)\cdot\left(e^{x^2+y^3}\right)'_x =$$
$$= 1$$

$$\boxed{(uv)'(x) = u'(x)\cdot v(x) + u(x)\cdot v'(x)}$$ $$\boxed{z = (x+2y)e^{x^2+y^3}}$$

Rješenje

a)
$$z_x = (x+2y)'_x \cdot e^{x^2+y^3} + (x+2y) \cdot \left(e^{x^2+y^3}\right)'_x =$$
$$= 1 \cdot$$

$\boxed{(uv)'(x) = u'(x) \cdot v(x) + u(x) \cdot v'(x)}$ $\boxed{z = (x+2y)e^{x^2+y^3}}$

Rješenje

a) $$z_x = (x+2y)'_x \cdot e^{x^2+y^3} + (x+2y)\cdot \left(e^{x^2+y^3}\right)'_x =$$
$$= 1 \cdot e^{x^2+y^3}$$

$$\boxed{(uv)'(x) = u'(x)\cdot v(x) + u(x)\cdot v'(x)}$$ $$\boxed{z = (x+2y)e^{x^2+y^3}}$$

Rješenje

a) $$z_x = (x+2y)'_x \cdot e^{x^2+y^3} + (x+2y) \cdot \left(e^{x^2+y^3}\right)'_x =$$
$$= 1 \cdot e^{x^2+y^3} +$$

$$\boxed{(uv)'(x) = u'(x) \cdot v(x) + u(x) \cdot v'(x)}$$ $$\boxed{z = (x+2y)e^{x^2+y^3}}$$

Rješenje

$\boxed{(e^x)' = e^x}$ $\boxed{(e^{\text{nešto}})' = e^{\text{nešto}} \cdot (\text{nešto})'}$

a)
$$z_x = (x+2y)'_x \cdot e^{x^2+y^3} + (x+2y) \cdot \left(e^{x^2+y^3}\right)'_x =$$
$$= 1 \cdot e^{x^2+y^3} + (x+2y)$$

$\boxed{(uv)'(x) = u'(x) \cdot v(x) + u(x) \cdot v'(x)}$ $\boxed{z = (x+2y)e^{x^2+y^3}}$

Rješenje

$$\boxed{(e^x)' = e^x} \quad \boxed{(e^{\text{nešto}})' = e^{\text{nešto}} \cdot (\text{nešto})'}$$

a)

$$z_x = (x + 2y)'_x \cdot e^{x^2+y^3} + (x + 2y) \cdot \left(e^{x^2+y^3}\right)'_x =$$

$$= 1 \cdot e^{x^2+y^3} + (x + 2y)e^{x^2+y^3}$$

$$\boxed{(uv)'(x) = u'(x) \cdot v(x) + u(x) \cdot v'(x)} \quad \boxed{z = (x + 2y)e^{x^2+y^3}}$$

Rješenje

$\boxed{(e^x)' = e^x}$ $\boxed{(e^{\text{nešto}})' = e^{\text{nešto}} \cdot (\text{nešto})'}$

a)
$$z_x = (x+2y)'_x \cdot e^{x^2+y^3} + (x+2y) \cdot \left(e^{x^2+y^3}\right)'_x =$$
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$\boxed{(uv)'(x) = u'(x) \cdot v(x) + u(x) \cdot v'(x)}$ $\boxed{z = (x+2y)e^{x^2+y^3}}$

Rješenje

$\boxed{(e^x)' = e^x}$ $\boxed{(e^{\text{nešto}})' = e^{\text{nešto}} \cdot (\text{nešto})'}$

a)
$$z_x = (x+2y)'_x \cdot e^{x^2+y^3} + (x+2y)\cdot \left(e^{x^2+y^3}\right)'_x =$$
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$\boxed{(uv)'(x) = u'(x)\cdot v(x) + u(x)\cdot v'(x)}$ $\boxed{z = (x+2y)e^{x^2+y^3}}$

Rješenje

$\boxed{(e^x)' = e^x}$ $\boxed{(e^{\text{nešto}})' = e^{\text{nešto}} \cdot (\text{nešto})'}$

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$$z_x = (x+2y)'_x \cdot e^{x^2+y^3} + (x+2y) \cdot \left(e^{x^2+y^3}\right)'_x =$$
$$= 1 \cdot e^{x^2+y^3} + (x+2y)e^{x^2+y^3} \cdot (x^2+y^3)'_x =$$

$\boxed{(uv)'(x) = u'(x) \cdot v(x) + u(x) \cdot v'(x)}$ $\boxed{z = (x+2y)e^{x^2+y^3}}$

Rješenje $\boxed{(e^x)' = e^x}$ $\boxed{(e^{\text{nešto}})' = e^{\text{nešto}} \cdot (\text{nešto})'}$

a)

$$z_x = (x+2y)'_x \cdot e^{x^2+y^3} + (x+2y) \cdot \left(e^{x^2+y^3}\right)'_x =$$

$$= 1 \cdot e^{x^2+y^3} + (x+2y)e^{x^2+y^3} \cdot (x^2+y^3)'_x =$$

$$= e^{x^2+y^3}$$

$\boxed{(uv)'(x) = u'(x) \cdot v(x) + u(x) \cdot v'(x)}$ $\boxed{z = (x+2y)e^{x^2+y^3}}$

Rješenje

$$\boxed{(e^x)' = e^x} \quad \boxed{(e^{\text{nešto}})' = e^{\text{nešto}} \cdot (\text{nešto})'}$$

a)

$$z_x = (x+2y)'_x \cdot e^{x^2+y^3} + (x+2y) \cdot \left(e^{x^2+y^3}\right)'_x =$$

$$= 1 \cdot e^{x^2+y^3} + (x+2y)e^{x^2+y^3} \cdot (x^2+y^3)'_x =$$

$$= e^{x^2+y^3} +$$

$$\boxed{(uv)'(x) = u'(x) \cdot v(x) + u(x) \cdot v'(x)} \quad \boxed{z = (x+2y)e^{x^2+y^3}}$$

Rješenje

$\boxed{(e^x)' = e^x}$ $\boxed{(e^{\text{nešto}})' = e^{\text{nešto}} \cdot (\text{nešto})'}$

a)

$$
\begin{aligned}
z_x &= (x+2y)'_x \cdot e^{x^2+y^3} + (x+2y) \cdot \left(e^{x^2+y^3}\right)'_x = \\
&= 1 \cdot e^{x^2+y^3} + (x+2y)e^{x^2+y^3} \cdot (x^2+y^3)'_x = \\
&= e^{x^2+y^3} + (x+2y)e^{x^2+y^3}
\end{aligned}
$$

$\boxed{(uv)'(x) = u'(x) \cdot v(x) + u(x) \cdot v'(x)}$ $\boxed{z = (x+2y)e^{x^2+y^3}}$

Rješenje

$\boxed{(e^x)' = e^x}$ $\boxed{(e^{\text{nešto}})' = e^{\text{nešto}} \cdot (\text{nešto})'}$

a)
$$\begin{aligned} z_x &= (x+2y)'_x \cdot e^{x^2+y^3} + (x+2y) \cdot \left(e^{x^2+y^3}\right)'_x = \\ &= 1 \cdot e^{x^2+y^3} + (x+2y)e^{x^2+y^3} \cdot (x^2+y^3)'_x = \\ &= e^{x^2+y^3} + (x+2y)e^{x^2+y^3} \cdot \end{aligned}$$

$\boxed{(uv)'(x) = u'(x) \cdot v(x) + u(x) \cdot v'(x)}$ $\boxed{z = (x+2y)e^{x^2+y^3}}$

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Rješenje $\boxed{(e^x)' = e^x}$ $\boxed{(e^{\text{nešto}})' = e^{\text{nešto}} \cdot (\text{nešto})'}$

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$\boxed{(uv)'(x) = u'(x) \cdot v(x) + u(x) \cdot v'(x)}$ $\boxed{z = (x+2y)e^{x^2+y^3}}$

Rješenje $\boxed{(e^x)' = e^x}$ $\boxed{(e^{\text{nešto}})' = e^{\text{nešto}} \cdot (\text{nešto})'}$

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\end{aligned}
$$

$$
z_y = (x+2y)'_y
$$

$\boxed{(uv)'(x) = u'(x) \cdot v(x) + u(x) \cdot v'(x)}$ $\boxed{z = (x+2y)e^{x^2+y^3}}$

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$\boxed{(e^x)' = e^x}$ $\boxed{(e^{\text{nešto}})' = e^{\text{nešto}} \cdot (\text{nešto})'}$

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Rješenje $\boxed{(e^x)' = e^x}$ $\boxed{(e^{\text{nešto}})' = e^{\text{nešto}} \cdot (\text{nešto})'}$

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$$z_y = (x+2y)'_y \cdot e^{x^2+y^3} + (x+2y)$$

$\boxed{(uv)'(x) = u'(x) \cdot v(x) + u(x) \cdot v'(x)}$ $\boxed{z = (x+2y)e^{x^2+y^3}}$

Rješenje

$$\boxed{(e^x)' = e^x} \qquad \boxed{(e^{\text{nešto}})' = e^{\text{nešto}} \cdot (\text{nešto})'}$$

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$$\boxed{(uv)'(x) = u'(x) \cdot v(x) + u(x) \cdot v'(x)} \qquad \boxed{z = (x+2y)e^{x^2+y^3}}$$

Rješenje

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Rješenje $\boxed{(e^x)' = e^x}$ $\boxed{(e^{\text{nešto}})' = e^{\text{nešto}} \cdot (\text{nešto})'}$

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$$z_y = (x+2y)'_y \cdot e^{x^2+y^3} + (x+2y) \cdot \left(e^{x^2+y^3}\right)'_y =$$

$$= 2$$

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$$= 1 \cdot e^{x^2+y^3} + (x+2y)e^{x^2+y^3} \cdot (x^2+y^3)'_x =$$
$$= e^{x^2+y^3} + (x+2y)e^{x^2+y^3} \cdot 2x =$$
$$= e^{x^2+y^3} + (2x^2+4xy)e^{x^2+y^3} = (2x^2+4xy+1)e^{x^2+y^3}$$

$$z_y = (x+2y)'_y \cdot e^{x^2+y^3} + (x+2y) \cdot \left(e^{x^2+y^3}\right)'_y =$$
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$\boxed{(uv)'(x) = u'(x) \cdot v(x) + u(x) \cdot v'(x)}$ $\boxed{z = (x+2y)e^{x^2+y^3}}$

Rješenje $\boxed{(e^x)' = e^x}$ $\boxed{(e^{\text{nešto}})' = e^{\text{nešto}} \cdot (\text{nešto})'}$

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Rješenje

$\boxed{(e^x)' = e^x}$ $\boxed{(e^{\text{nešto}})' = e^{\text{nešto}} \cdot (\text{nešto})'}$

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$$

$\boxed{(uv)'(x) = u'(x)\cdot v(x) + u(x)\cdot v'(x)}$ $\boxed{z = (x+2y)e^{x^2+y^3}}$

Rješenje

$$\boxed{(e^x)' = e^x} \qquad \boxed{(e^{\text{nešto}})' = e^{\text{nešto}} \cdot (\text{nešto})'}$$

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Rješenje

$$\boxed{(e^x)' = e^x} \qquad \boxed{(e^{\text{nešto}})' = e^{\text{nešto}} \cdot (\text{nešto})'}$$

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$$\boxed{z = \frac{x}{\sqrt{x^2 + y^2}}}$$

b)

$$z_x =$$

$$\boxed{\left(\frac{u}{v}\right)'(x) = \frac{u'(x) \cdot v(x) - u(x) \cdot v'(x)}{v(x)^2}}$$

$$\boxed{z = \frac{x}{\sqrt{x^2 + y^2}}}$$

b)

$$z_x = \underline{\hspace{10cm}}$$

$$\boxed{\left(\frac{u}{v}\right)'(x) = \frac{u'(x) \cdot v(x) - u(x) \cdot v'(x)}{v(x)^2}}$$

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$$z_x = \frac{(x)'_x \cdot \sqrt{x^2 + y^2} - x}{\sqrt{x^2 + y^2}^{\,2}}$$

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b)
$$z_x = \frac{(x)'_x \cdot \sqrt{x^2+y^2} - x \cdot \left(\sqrt{x^2+y^2}\right)'_x}{\sqrt{x^2+y^2}^{\,2}} =$$

$$= \frac{\qquad}{\qquad}$$

$$\boxed{\left(\frac{u}{v}\right)'(x) = \frac{u'(x)\cdot v(x) - u(x)\cdot v'(x)}{v(x)^2}}$$

$$z = \frac{x}{\sqrt{x^2+y^2}}$$

b) $$z_x = \frac{(x)'_x \cdot \sqrt{x^2+y^2} - x \cdot \left(\sqrt{x^2+y^2}\,\right)'_x}{\sqrt{x^2+y^2}^{\,2}} =$$

$$= \frac{\qquad}{x^2+y^2}$$

$$\left(\frac{u}{v}\right)'(x) = \frac{u'(x)\cdot v(x) - u(x)\cdot v'(x)}{v(x)^2}$$

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$$z_x = \frac{(x)'_x \cdot \sqrt{x^2+y^2} - x \cdot \left(\sqrt{x^2+y^2}\,\right)'_x}{\sqrt{x^2+y^2}^{\,2}} =$$

$$= \frac{1}{x^2 + y^2}$$

$$\boxed{\left(\frac{u}{v}\right)'(x) = \frac{u'(x) \cdot v(x) - u(x) \cdot v'(x)}{v(x)^2}}$$

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b)
$$z_x = \frac{(x)'_x \cdot \sqrt{x^2 + y^2} - x \cdot \left(\sqrt{x^2 + y^2}\right)'_x}{\sqrt{x^2 + y^2}^{\,2}} =$$

$$= \frac{1 \cdot}{x^2 + y^2}$$

$$\left(\frac{u}{v}\right)'(x) = \frac{u'(x) \cdot v(x) - u(x) \cdot v'(x)}{v(x)^2}$$

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$$= \frac{1 \cdot \sqrt{x^2+y^2} -}{x^2+y^2}$$

$$\boxed{\left(\frac{u}{v}\right)'(x) = \frac{u'(x)\cdot v(x) - u(x)\cdot v'(x)}{v(x)^2}}$$

$$\boxed{z = \frac{x}{\sqrt{x^2+y^2}}}$$

b)

$$z_x = \frac{(x)'_x \cdot \sqrt{x^2+y^2} - x \cdot \left(\sqrt{x^2+y^2}\,\right)'_x}{\sqrt{x^2+y^2}^{\,2}} =$$

$$= \frac{1 \cdot \sqrt{x^2+y^2} - x}{x^2+y^2}$$

$$\boxed{\left(\frac{u}{v}\right)'(x) = \frac{u'(x) \cdot v(x) - u(x) \cdot v'(x)}{v(x)^2}}$$

$$\boxed{\left(\sqrt{\text{nešto}}\right)' = \frac{1}{2\sqrt{\text{nešto}}} \cdot (\text{nešto})'}$$

$$\boxed{z = \frac{x}{\sqrt{x^2+y^2}}}$$

b)

$$z_x = \frac{(x)'_x \cdot \sqrt{x^2+y^2} - x \cdot \left(\sqrt{x^2+y^2}\right)'_x}{\sqrt{x^2+y^2}^{\,2}} =$$

$$\boxed{\left(\sqrt{x}\right)' = \frac{1}{2\sqrt{x}}}$$

$$= \frac{1 \cdot \sqrt{x^2+y^2} - x \cdot}{x^2+y^2}$$

$$\boxed{\left(\frac{u}{v}\right)'(x) = \frac{u'(x) \cdot v(x) - u(x) \cdot v'(x)}{v(x)^2}}$$

$$\boxed{\left(\sqrt{\text{nešto}}\right)' = \frac{1}{2\sqrt{\text{nešto}}} \cdot (\text{nešto})'}$$

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$$\boxed{\left(\frac{u}{v}\right)'(x) = \frac{u'(x)\cdot v(x) - u(x)\cdot v'(x)}{v(x)^2}}$$

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$$\boxed{\left(\frac{u}{v}\right)'(x) = \frac{u'(x)\cdot v(x) - u(x)\cdot v'(x)}{v(x)^2}}$$

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$$= \frac{1 \cdot \sqrt{x^2+y^2} - x \cdot \dfrac{1}{2\sqrt{x^2+y^2}} \cdot (x^2+y^2)'_x}{x^2+y^2}$$

$$\boxed{\left(\frac{u}{v}\right)'(x) = \frac{u'(x)\cdot v(x) - u(x)\cdot v'(x)}{v(x)^2}}$$

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$$= \frac{1 \cdot \sqrt{x^2+y^2} - x \cdot \dfrac{1}{2\sqrt{x^2+y^2}} \cdot (x^2+y^2)'_x}{x^2+y^2} =$$

$$= \frac{}{}$$

$$\boxed{\left(\frac{u}{v}\right)'(x) = \frac{u'(x) \cdot v(x) - u(x) \cdot v'(x)}{v(x)^2}}$$

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$$= \frac{1 \cdot \sqrt{x^2+y^2} - x \cdot \dfrac{1}{2\sqrt{x^2+y^2}} \cdot (x^2+y^2)'_x}{x^2+y^2} =$$

$$= \frac{}{x^2+y^2}$$

$$\boxed{\left(\frac{u}{v}\right)'(x) = \frac{u'(x) \cdot v(x) - u(x) \cdot v'(x)}{v(x)^2}}$$

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$$= \frac{1 \cdot \sqrt{x^2+y^2} - x \cdot \dfrac{1}{2\sqrt{x^2+y^2}} \cdot (x^2+y^2)'_x}{x^2+y^2} =$$

$$= \frac{\sqrt{x^2+y^2}}{x^2+y^2}$$

$$\boxed{\left(\frac{u}{v}\right)'(x) = \frac{u'(x) \cdot v(x) - u(x) \cdot v'(x)}{v(x)^2}}$$

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$$= \frac{1 \cdot \sqrt{x^2+y^2} - x \cdot \frac{1}{2\sqrt{x^2+y^2}} \cdot (x^2+y^2)'_x}{x^2+y^2} =$$

$$= \frac{\sqrt{x^2+y^2} - }{x^2+y^2}$$

$$\boxed{\left(\frac{u}{v}\right)'(x) = \frac{u'(x) \cdot v(x) - u(x) \cdot v'(x)}{v(x)^2}}$$

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$$= \frac{\sqrt{x^2+y^2} - \dfrac{x}{2\sqrt{x^2+y^2}}}{x^2+y^2}$$

$$\boxed{\left(\frac{u}{v}\right)'(x) = \frac{u'(x) \cdot v(x) - u(x) \cdot v'(x)}{v(x)^2}}$$

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$$= \frac{\sqrt{x^2+y^2} - \dfrac{x}{2\sqrt{x^2+y^2}} \cdot}{x^2+y^2}$$

$$\boxed{\left(\frac{u}{v}\right)'(x) = \frac{u'(x) \cdot v(x) - u(x) \cdot v'(x)}{v(x)^2}}$$

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$$= \frac{\sqrt{x^2+y^2} - \dfrac{x}{2\sqrt{x^2+y^2}} \cdot 2x}{x^2+y^2}$$

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$$= \frac{1 \cdot \sqrt{x^2+y^2} - x \cdot \dfrac{1}{2\sqrt{x^2+y^2}} \cdot (x^2+y^2)'_x}{x^2+y^2} =$$

$$= \frac{\sqrt{x^2+y^2} - \dfrac{x}{2\sqrt{x^2+y^2}} \cdot 2x}{x^2+y^2} = \underline{\hspace{6cm}}$$

$$\boxed{\left(\frac{u}{v}\right)'(x) = \frac{u'(x)\cdot v(x) - u(x)\cdot v'(x)}{v(x)^2}}$$

$$\boxed{\left(\sqrt{\text{nešto}}\right)' = \frac{1}{2\sqrt{\text{nešto}}} \cdot (\text{nešto})'}$$

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$$= \frac{1 \cdot \sqrt{x^2+y^2} - x \cdot \dfrac{1}{2\sqrt{x^2+y^2}} \cdot (x^2+y^2)'_x}{x^2+y^2} =$$

$$= \frac{\sqrt{x^2+y^2} - \dfrac{x}{2\sqrt{x^2+y^2}} \cdot 2x}{x^2+y^2} = \frac{\qquad\qquad}{x^2+y^2}$$

$$\boxed{\left(\frac{u}{v}\right)'(x) = \frac{u'(x)\cdot v(x) - u(x)\cdot v'(x)}{v(x)^2}}$$

$$\boxed{\left(\sqrt{\text{nešto}}\right)' = \frac{1}{2\sqrt{\text{nešto}}} \cdot (\text{nešto})'}$$

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$$= \frac{1 \cdot \sqrt{x^2+y^2} - x \cdot \dfrac{1}{2\sqrt{x^2+y^2}} \cdot (x^2+y^2)'_x}{x^2+y^2} =$$

$$= \frac{\sqrt{x^2+y^2} - \dfrac{x}{2\sqrt{x^2+y^2}} \cdot 2x}{x^2+y^2} = \frac{\sqrt{x^2+y^2}}{x^2+y^2}$$

$$\boxed{\left(\frac{u}{v}\right)'(x) = \frac{u'(x) \cdot v(x) - u(x) \cdot v'(x)}{v(x)^2}}$$

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$$\boxed{\left(\sqrt{x}\right)' = \frac{1}{2\sqrt{x}}}$$

$$= \frac{1 \cdot \sqrt{x^2+y^2} - x \cdot \dfrac{1}{2\sqrt{x^2+y^2}} \cdot (x^2+y^2)'_x}{x^2+y^2} =$$

$$= \frac{\sqrt{x^2+y^2} - \dfrac{x}{2\sqrt{x^2+y^2}} \cdot 2x}{x^2+y^2} = \frac{\sqrt{x^2+y^2} -}{x^2+y^2}$$

$$\boxed{\left(\frac{u}{v}\right)'(x) = \frac{u'(x) \cdot v(x) - u(x) \cdot v'(x)}{v(x)^2}}$$

$$\boxed{\left(\sqrt{\text{nešto}}\right)' = \frac{1}{2\sqrt{\text{nešto}}} \cdot (\text{nešto})'}$$

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$$\boxed{\left(\sqrt{x}\right)' = \frac{1}{2\sqrt{x}}}$$

$$= \frac{1 \cdot \sqrt{x^2+y^2} - x \cdot \dfrac{1}{2\sqrt{x^2+y^2}} \cdot (x^2+y^2)'_x}{x^2+y^2} =$$

$$= \frac{\sqrt{x^2+y^2} - \dfrac{x}{2\sqrt{x^2+y^2}} \cdot 2x}{x^2+y^2} = \frac{\sqrt{x^2+y^2} - \dfrac{x^2}{\sqrt{x^2+y^2}}}{x^2+y^2}$$

$$\boxed{\left(\frac{u}{v}\right)'(x) = \frac{u'(x) \cdot v(x) - u(x) \cdot v'(x)}{v(x)^2}}$$

$$\boxed{\left(\sqrt{\text{nešto}}\right)' = \frac{1}{2\sqrt{\text{nešto}}} \cdot (\text{nešto})'}$$

$$\boxed{z = \frac{x}{\sqrt{x^2+y^2}}}$$

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$$= \frac{\sqrt{x^2+y^2} - \dfrac{x}{2\sqrt{x^2+y^2}} \cdot 2x}{x^2+y^2} = \frac{\sqrt{x^2+y^2} - \dfrac{x^2}{\sqrt{x^2+y^2}}}{x^2+y^2} =$$

$$= \frac{\qquad\qquad}{}$$

$$\boxed{\left(\frac{u}{v}\right)'(x) = \frac{u'(x) \cdot v(x) - u(x) \cdot v'(x)}{v(x)^2}}$$

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$$= \frac{\sqrt{x^2+y^2} - \dfrac{x}{2\sqrt{x^2+y^2}} \cdot 2x}{x^2+y^2} = \frac{\sqrt{x^2+y^2} - \dfrac{x^2}{\sqrt{x^2+y^2}}}{x^2+y^2} =$$

$$= \frac{}{(x^2+y^2)\sqrt{x^2+y^2}}$$

$$\boxed{\left(\frac{u}{v}\right)'(x) = \frac{u'(x) \cdot v(x) - u(x) \cdot v'(x)}{v(x)^2}}$$

$$\boxed{\left(\sqrt{\text{nešto}}\right)' = \frac{1}{2\sqrt{\text{nešto}}} \cdot (\text{nešto})'}$$

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$$= \frac{1 \cdot \sqrt{x^2+y^2} - x \cdot \dfrac{1}{2\sqrt{x^2+y^2}} \cdot (x^2+y^2)'_x}{x^2+y^2} =$$

$$= \frac{\sqrt{x^2+y^2} - \dfrac{x}{2\sqrt{x^2+y^2}} \cdot 2x}{x^2+y^2} = \frac{\sqrt{x^2+y^2} - \dfrac{x^2}{\sqrt{x^2+y^2}}}{x^2+y^2} =$$

$$= \frac{x^2+y^2}{(x^2+y^2)\sqrt{x^2+y^2}}$$

$$\boxed{\left(\frac{u}{v}\right)'(x) = \frac{u'(x) \cdot v(x) - u(x) \cdot v'(x)}{v(x)^2}}$$

$$\boxed{\left(\sqrt{\text{nešto}}\right)' = \frac{1}{2\sqrt{\text{nešto}}} \cdot (\text{nešto})'}$$

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$$\boxed{\left(\sqrt{x}\right)' = \frac{1}{2\sqrt{x}}}$$

$$= \frac{1 \cdot \sqrt{x^2+y^2} - x \cdot \dfrac{1}{2\sqrt{x^2+y^2}} \cdot (x^2+y^2)'_x}{x^2+y^2} =$$

$$= \frac{\sqrt{x^2+y^2} - \dfrac{x}{2\sqrt{x^2+y^2}} \cdot 2x}{x^2+y^2} = \frac{\sqrt{x^2+y^2} - \dfrac{x^2}{\sqrt{x^2+y^2}}}{x^2+y^2} =$$

$$= \frac{x^2+y^2-x^2}{(x^2+y^2)\sqrt{x^2+y^2}}$$

$$\boxed{\left(\frac{u}{v}\right)'(x) = \frac{u'(x) \cdot v(x) - u(x) \cdot v'(x)}{v(x)^2}}$$

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$$z_x = \frac{(x)'_x \cdot \sqrt{x^2+y^2} - x \cdot \left(\sqrt{x^2+y^2}\,\right)'_x}{\sqrt{x^2+y^2}^{\,2}} =$$

$$\boxed{\left(\sqrt{x}\right)' = \frac{1}{2\sqrt{x}}}$$

$$= \frac{1 \cdot \sqrt{x^2+y^2} - x \cdot \dfrac{1}{2\sqrt{x^2+y^2}} \cdot (x^2+y^2)'_x}{x^2+y^2} =$$

$$= \frac{\sqrt{x^2+y^2} - \dfrac{x}{2\sqrt{x^2+y^2}} \cdot 2x}{x^2+y^2} = \frac{\sqrt{x^2+y^2} - \dfrac{x^2}{\sqrt{x^2+y^2}}}{x^2+y^2} =$$

$$= \frac{x^2+y^2-x^2}{(x^2+y^2)\sqrt{x^2+y^2}} = \underline{\hspace{3cm}}$$

$$\boxed{\left(\frac{u}{v}\right)'(x) = \frac{u'(x)\cdot v(x) - u(x)\cdot v'(x)}{v(x)^2}}$$

$$\boxed{\left(\sqrt{\text{nešto}}\right)' = \frac{1}{2\sqrt{\text{nešto}}} \cdot (\text{nešto})'}$$

$$\boxed{z = \frac{x}{\sqrt{x^2+y^2}}}$$

b)

$$z_x = \frac{(x)'_x \cdot \sqrt{x^2+y^2} - x \cdot \left(\sqrt{x^2+y^2}\,\right)'_x}{\sqrt{x^2+y^2}^{\,2}} =$$

$$\boxed{\left(\sqrt{x}\right)' = \frac{1}{2\sqrt{x}}}$$

$$= \frac{1 \cdot \sqrt{x^2+y^2} - x \cdot \dfrac{1}{2\sqrt{x^2+y^2}} \cdot (x^2+y^2)'_x}{x^2+y^2} =$$

$$= \frac{\sqrt{x^2+y^2} - \dfrac{x}{2\sqrt{x^2+y^2}} \cdot 2x}{x^2+y^2} = \frac{\sqrt{x^2+y^2} - \dfrac{x^2}{\sqrt{x^2+y^2}}}{x^2+y^2} =$$

$$= \frac{x^2+y^2-x^2}{(x^2+y^2)\sqrt{x^2+y^2}} = \frac{}{(x^2+y^2)^{\frac{3}{2}}}$$

$$\boxed{\left(\frac{u}{v}\right)'(x) = \frac{u'(x)\cdot v(x) - u(x)\cdot v'(x)}{v(x)^2}}$$

$$\boxed{\left(\sqrt{\text{nešto}}\right)' = \frac{1}{2\sqrt{\text{nešto}}} \cdot (\text{nešto})'}$$

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$$= \frac{\sqrt{x^2+y^2} - \dfrac{x}{2\sqrt{x^2+y^2}} \cdot 2x}{x^2+y^2} = \frac{\sqrt{x^2+y^2} - \dfrac{x^2}{\sqrt{x^2+y^2}}}{x^2+y^2} =$$

$$= \frac{x^2+y^2-x^2}{(x^2+y^2)\sqrt{x^2+y^2}} = \frac{y^2}{(x^2+y^2)^{\frac{3}{2}}}$$

$$\boxed{\left(\frac{u}{v}\right)'(x) = \frac{u'(x) \cdot v(x) - u(x) \cdot v'(x)}{v(x)^2}}$$

$$\boxed{z = \frac{x}{\sqrt{x^2 + y^2}}}$$

$z_y =$

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$$z_y = \frac{(x)'_y \cdot \sqrt{x^2+y^2} -}{\sqrt{x^2+y^2}^{\,2}}$$

$$\boxed{\left(\frac{u}{v}\right)'(x) = \frac{u'(x)\cdot v(x) - u(x)\cdot v'(x)}{v(x)^2}}$$

$$\boxed{z = \frac{x}{\sqrt{x^2+y^2}}}$$

$$z_y = \frac{(x)'_y \cdot \sqrt{x^2+y^2} - x}{\sqrt{x^2+y^2}^{\,2}}$$

$$\boxed{\left(\frac{u}{v}\right)'(x) = \frac{u'(x)\cdot v(x) - u(x)\cdot v'(x)}{v(x)^2}}$$

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$$= \frac{}{x^2+y^2}$$

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$$z_y = \frac{(x)'_y \cdot \sqrt{x^2+y^2} - x \cdot \left(\sqrt{x^2+y^2}\,\right)'_y}{\sqrt{x^2+y^2}^{\,2}} =$$

$$= \frac{0 \qquad\qquad\qquad\qquad\qquad\qquad\qquad\qquad\qquad\qquad}{x^2+y^2}$$

$$\boxed{\left(\frac{u}{v}\right)'(x) = \frac{u'(x)\cdot v(x) - u(x)\cdot v'(x)}{v(x)^2}}$$

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$$z_y = \frac{(x)'_y \cdot \sqrt{x^2+y^2} - x \cdot \left(\sqrt{x^2+y^2}\right)'_y}{\sqrt{x^2+y^2}^{\,2}} =$$

$$= \frac{0 \cdot}{x^2+y^2}$$

$$\boxed{\left(\frac{u}{v}\right)'(x) = \frac{u'(x)\cdot v(x) - u(x)\cdot v'(x)}{v(x)^2}}$$

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$$= \frac{0 \cdot \sqrt{x^2+y^2}}{x^2+y^2}$$

$$\boxed{\left(\frac{u}{v}\right)'(x) = \frac{u'(x)\cdot v(x) - u(x)\cdot v'(x)}{v(x)^2}}$$

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$$= \frac{0 \cdot \sqrt{x^2+y^2} -}{x^2+y^2}$$

$$\boxed{\left(\frac{u}{v}\right)'(x) = \frac{u'(x) \cdot v(x) - u(x) \cdot v'(x)}{v(x)^2}}$$

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$$= \frac{0 \cdot \sqrt{x^2+y^2} - x}{x^2+y^2}$$

$$\boxed{\left(\frac{u}{v}\right)'(x) = \frac{u'(x)\cdot v(x) - u(x)\cdot v'(x)}{v(x)^2}}$$

$$\boxed{\left(\sqrt{\text{nešto}}\right)' = \frac{1}{2\sqrt{\text{nešto}}} \cdot (\text{nešto})'}$$

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$$z_y = \frac{(x)'_y \cdot \sqrt{x^2 + y^2} - x \cdot \left(\sqrt{x^2 + y^2}\,\right)'_y}{\sqrt{x^2 + y^2}^{\,2}} =$$

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$$= \frac{\qquad}{x^2+y^2}$$

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$$= \frac{-\dfrac{x}{2\sqrt{x^2+y^2}} \cdot}{x^2+y^2}$$

$$\boxed{\left(\frac{u}{v}\right)'(x) = \frac{u'(x)\cdot v(x) - u(x)\cdot v'(x)}{v(x)^2}}$$

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$$= \frac{-\dfrac{x}{2\sqrt{x^2+y^2}} \cdot 2y}{x^2+y^2}$$

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$$= \frac{0 \cdot \sqrt{x^2 + y^2} - x \cdot \dfrac{1}{2\sqrt{x^2 + y^2}} \cdot (x^2 + y^2)'_y}{x^2 + y^2} =$$

$$= \frac{-\dfrac{x}{2\sqrt{x^2 + y^2}} \cdot 2y}{x^2 + y^2} = \underline{\hspace{3cm}}$$

$$\boxed{\left(\frac{u}{v}\right)'(x) = \frac{u'(x) \cdot v(x) - u(x) \cdot v'(x)}{v(x)^2}}$$

$$\boxed{\left(\sqrt{\text{nešto}}\right)' = \frac{1}{2\sqrt{\text{nešto}}} \cdot (\text{nešto})'}$$

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$$= \frac{-\dfrac{x}{2\sqrt{x^2+y^2}} \cdot 2y}{x^2+y^2} = \frac{}{x^2+y^2}$$

$$\boxed{\left(\frac{u}{v}\right)'(x) = \frac{u'(x)\cdot v(x) - u(x)\cdot v'(x)}{v(x)^2}}$$

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$$= \frac{-\dfrac{x}{2\sqrt{x^2+y^2}} \cdot 2y}{x^2+y^2} = \frac{\dfrac{-xy}{\sqrt{x^2+y^2}}}{x^2+y^2}$$

$$\boxed{\left(\frac{u}{v}\right)'(x) = \frac{u'(x)\cdot v(x) - u(x)\cdot v'(x)}{v(x)^2}}$$

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$$= \frac{-\dfrac{x}{2\sqrt{x^2+y^2}} \cdot 2y}{x^2+y^2} = \frac{\dfrac{-xy}{\sqrt{x^2+y^2}}}{x^2+y^2} =$$

$$= \frac{\qquad}{\qquad}$$

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$$= \frac{-\dfrac{x}{2\sqrt{x^2+y^2}} \cdot 2y}{x^2+y^2} = \frac{\dfrac{-xy}{\sqrt{x^2+y^2}}}{x^2+y^2} =$$

$$= \frac{}{(x^2+y^2)\sqrt{x^2+y^2}}$$

$$\boxed{\left(\frac{u}{v}\right)'(x) = \frac{u'(x) \cdot v(x) - u(x) \cdot v'(x)}{v(x)^2}}$$

$$\boxed{\left(\sqrt{\text{nešto}}\right)' = \frac{1}{2\sqrt{\text{nešto}}} \cdot (\text{nešto})'}$$

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$$z_y = \frac{(x)'_y \cdot \sqrt{x^2+y^2} - x \cdot \left(\sqrt{x^2+y^2}\,\right)'_y}{\sqrt{x^2+y^2}^{\,2}} =$$

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$$= \frac{0 \cdot \sqrt{x^2+y^2} - x \cdot \dfrac{1}{2\sqrt{x^2+y^2}} \cdot (x^2+y^2)'_y}{x^2+y^2} =$$

$$= \frac{-\dfrac{x}{2\sqrt{x^2+y^2}} \cdot 2y}{x^2+y^2} = \frac{\dfrac{-xy}{\sqrt{x^2+y^2}}}{x^2+y^2} =$$

$$= \frac{-xy}{(x^2+y^2)\sqrt{x^2+y^2}}$$

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$$= \frac{-xy}{(x^2+y^2)\sqrt{x^2+y^2}} = \underline{\hphantom{xxxxxxxx}}$$

$$\boxed{\left(\frac{u}{v}\right)'(x) = \frac{u'(x)\cdot v(x) - u(x)\cdot v'(x)}{v(x)^2}}$$

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$$z_y = \frac{(x)'_y \cdot \sqrt{x^2+y^2} - x \cdot \left(\sqrt{x^2+y^2}\,\right)'_y}{\sqrt{x^2+y^2}^{\,2}} =$$

$$\boxed{\left(\sqrt{x}\right)' = \frac{1}{2\sqrt{x}}}$$

$$= \frac{0 \cdot \sqrt{x^2+y^2} - x \cdot \dfrac{1}{2\sqrt{x^2+y^2}} \cdot (x^2+y^2)'_y}{x^2+y^2} =$$

$$= \frac{-\dfrac{x}{2\sqrt{x^2+y^2}} \cdot 2y}{x^2+y^2} = \frac{\dfrac{-xy}{\sqrt{x^2+y^2}}}{x^2+y^2} =$$

$$= \frac{-xy}{(x^2+y^2)\sqrt{x^2+y^2}} = \frac{}{(x^2+y^2)^{\frac{3}{2}}}$$

$$\boxed{\left(\frac{u}{v}\right)'(x) = \frac{u'(x)\cdot v(x) - u(x)\cdot v'(x)}{v(x)^2}}$$

$$\boxed{\left(\sqrt{\text{nešto}}\right)' = \frac{1}{2\sqrt{\text{nešto}}} \cdot (\text{nešto})'}$$

$$\boxed{z = \frac{x}{\sqrt{x^2+y^2}}}$$

$$z_y = \frac{(x)'_y \cdot \sqrt{x^2+y^2} - x \cdot \left(\sqrt{x^2+y^2}\,\right)'_y}{\sqrt{x^2+y^2}^{\,2}} =$$

$$\boxed{\left(\sqrt{x}\right)' = \frac{1}{2\sqrt{x}}}$$

$$= \frac{0 \cdot \sqrt{x^2+y^2} - x \cdot \dfrac{1}{2\sqrt{x^2+y^2}} \cdot (x^2+y^2)'_y}{x^2+y^2} =$$

$$= \frac{-\dfrac{x}{2\sqrt{x^2+y^2}} \cdot 2y}{x^2+y^2} = \frac{\dfrac{-xy}{\sqrt{x^2+y^2}}}{x^2+y^2} =$$

$$= \frac{-xy}{(x^2+y^2)\sqrt{x^2+y^2}} = \frac{-xy}{(x^2+y^2)^{\frac{3}{2}}}$$

$$\boxed{\left(\frac{u}{v}\right)'(x) = \frac{u'(x) \cdot v(x) - u(x) \cdot v'(x)}{v(x)^2}}$$

$\boxed{(a^x)' = a^x \ln a}$ $\boxed{(a^{\text{nešto}})' = a^{\text{nešto}} \ln a \cdot (\text{nešto})'}$ $\boxed{z = 2^{\sin \frac{y}{x}}}$

c) $z_x =$

$\boxed{(a^x)' = a^x \ln a}$ $\boxed{(a^{\text{nešto}})' = a^{\text{nešto}} \ln a \cdot (\text{nešto})'}$ $\boxed{z = 2^{\sin \frac{y}{x}}}$

c) $$z_x = 2^{\sin \frac{y}{x}} \ln 2$$

$\boxed{(a^x)' = a^x \ln a}$ $\boxed{(a^{\text{nešto}})' = a^{\text{nešto}} \ln a \cdot (\text{nešto})'}$ $\boxed{z = 2^{\sin \frac{y}{x}}}$

c) $z_x = 2^{\sin \frac{y}{x}} \ln 2 \cdot$

$\boxed{(a^x)' = a^x \ln a}$ $\boxed{(a^{\text{nešto}})' = a^{\text{nešto}} \ln a \cdot (\text{nešto})'}$ $\boxed{z = 2^{\sin \frac{y}{x}}}$

c) $$z_x = 2^{\sin \frac{y}{x}} \ln 2 \cdot \left(\sin \frac{y}{x}\right)'_x$$

$\boxed{(a^x)' = a^x \ln a}$ $\boxed{(a^{\text{nešto}})' = a^{\text{nešto}} \ln a \cdot (\text{nešto})'}$ $\boxed{z = 2^{\sin \frac{y}{x}}}$

c) $$z_x = 2^{\sin \frac{y}{x}} \ln 2 \cdot \left(\sin \frac{y}{x}\right)'_x = 2^{\sin \frac{y}{x}} \ln 2$$

$$\boxed{(a^x)' = a^x \ln a} \quad \boxed{(a^{\text{nešto}})' = a^{\text{nešto}} \ln a \cdot (\text{nešto})'} \quad \boxed{z = 2^{\sin\frac{y}{x}}}$$

$$\boxed{(\sin x)' = \cos x} \quad \boxed{(\sin(\text{nešto}))' = \cos(\text{nešto}) \cdot (\text{nešto})'}$$

c) $$z_x = 2^{\sin\frac{y}{x}} \ln 2 \cdot \left(\sin\frac{y}{x}\right)'_x = 2^{\sin\frac{y}{x}} \ln 2 \cdot$$

$\boxed{(a^x)' = a^x \ln a}$ $\boxed{(a^{\text{nešto}})' = a^{\text{nešto}} \ln a \cdot (\text{nešto})'}$ $\boxed{z = 2^{\sin \frac{y}{x}}}$

$\boxed{(\sin x)' = \cos x}$ $\boxed{(\sin(\text{nešto}))' = \cos(\text{nešto}) \cdot (\text{nešto})'}$

c) $$z_x = 2^{\sin \frac{y}{x}} \ln 2 \cdot \left(\sin \frac{y}{x}\right)'_x = 2^{\sin \frac{y}{x}} \ln 2 \cdot \cos \frac{y}{x}$$

$\boxed{(a^x)' = a^x \ln a}$ $\boxed{(a^{\text{nešto}})' = a^{\text{nešto}} \ln a \cdot (\text{nešto})'}$ $\boxed{z = 2^{\sin \frac{y}{x}}}$

$\boxed{(\sin x)' = \cos x}$ $\boxed{(\sin(\text{nešto}))' = \cos(\text{nešto}) \cdot (\text{nešto})'}$

c) $$z_x = 2^{\sin \frac{y}{x}} \ln 2 \cdot \left(\sin \frac{y}{x}\right)'_x = 2^{\sin \frac{y}{x}} \ln 2 \cdot \cos \frac{y}{x} \cdot$$

$\boxed{(a^x)' = a^x \ln a}$ $\boxed{(a^{\text{nešto}})' = a^{\text{nešto}} \ln a \cdot (\text{nešto})'}$ $\boxed{z = 2^{\sin \frac{y}{x}}}$

$\boxed{(\sin x)' = \cos x}$ $\boxed{(\sin(\text{nešto}))' = \cos(\text{nešto}) \cdot (\text{nešto})'}$

c) $$z_x = 2^{\sin \frac{y}{x}} \ln 2 \cdot \left(\sin \frac{y}{x}\right)_x' = 2^{\sin \frac{y}{x}} \ln 2 \cdot \cos \frac{y}{x} \cdot \left(\frac{y}{x}\right)_x'$$

$\boxed{(a^x)' = a^x \ln a}$ $\boxed{(a^{\text{nešto}})' = a^{\text{nešto}} \ln a \cdot (\text{nešto})'}$ $\boxed{z = 2^{\sin \frac{y}{x}}}$

$\boxed{(\sin x)' = \cos x}$ $\boxed{(\sin(\text{nešto}))' = \cos(\text{nešto}) \cdot (\text{nešto})'}$

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$$= 2^{\sin \frac{y}{x}} \ln 2 \cdot \cos \frac{y}{x}$$

$\boxed{(a^x)' = a^x \ln a}$ $\boxed{(a^{\text{nešto}})' = a^{\text{nešto}} \ln a \cdot (\text{nešto})'}$ $\boxed{z = 2^{\sin \frac{y}{x}}}$

$\boxed{(\sin x)' = \cos x}$ $\boxed{(\sin(\text{nešto}))' = \cos(\text{nešto}) \cdot (\text{nešto})'}$

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$$= 2^{\sin \frac{y}{x}} \ln 2 \cdot \cos \frac{y}{x} \cdot$$

$$\boxed{(a^x)' = a^x \ln a} \quad \boxed{(a^{\text{nešto}})' = a^{\text{nešto}} \ln a \cdot (\text{nešto})'} \quad \boxed{z = 2^{\sin \frac{y}{x}}}$$

$$\boxed{(\sin x)' = \cos x} \quad \boxed{(\sin(\text{nešto}))' = \cos(\text{nešto}) \cdot (\text{nešto})'}$$

c) $$z_x = 2^{\sin \frac{y}{x}} \ln 2 \cdot \left(\sin \frac{y}{x}\right)'_x = 2^{\sin \frac{y}{x}} \ln 2 \cdot \cos \frac{y}{x} \cdot \left(\frac{y}{x}\right)'_x =$$

$$= 2^{\sin \frac{y}{x}} \ln 2 \cdot \cos \frac{y}{x} \cdot \frac{-y}{x^2}$$

$\boxed{(a^x)' = a^x \ln a}$ $\boxed{(a^{\text{nešto}})' = a^{\text{nešto}} \ln a \cdot (\text{nešto})'}$ $\boxed{z = 2^{\sin \frac{y}{x}}}$

$\boxed{(\sin x)' = \cos x}$ $\boxed{(\sin(\text{nešto}))' = \cos(\text{nešto}) \cdot (\text{nešto})'}$

c) $$z_x = 2^{\sin \frac{y}{x}} \ln 2 \cdot \left(\sin \frac{y}{x}\right)'_x = 2^{\sin \frac{y}{x}} \ln 2 \cdot \cos \frac{y}{x} \cdot \left(\frac{y}{x}\right)'_x =$$

$$= 2^{\sin \frac{y}{x}} \ln 2 \cdot \cos \frac{y}{x} \cdot \frac{-y}{x^2} = -\frac{y}{x^2} \cdot$$

$\boxed{(a^x)' = a^x \ln a}$ $\boxed{(a^{\text{nešto}})' = a^{\text{nešto}} \ln a \cdot (\text{nešto})'}$ $\boxed{z = 2^{\sin \frac{y}{x}}}$

$\boxed{(\sin x)' = \cos x}$ $\boxed{(\sin(\text{nešto}))' = \cos(\text{nešto}) \cdot (\text{nešto})'}$

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$$= 2^{\sin \frac{y}{x}} \ln 2 \cdot \cos \frac{y}{x} \cdot \frac{-y}{x^2} = -\frac{y}{x^2} \cdot 2^{\sin \frac{y}{x}} \ln 2 \cdot \cos \frac{y}{x}$$

$\boxed{(a^x)' = a^x \ln a}$ $\boxed{(a^{\text{nešto}})' = a^{\text{nešto}} \ln a \cdot (\text{nešto})'}$ $\boxed{z = 2^{\sin \frac{y}{x}}}$

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c)

$$z_x = 2^{\sin \frac{y}{x}} \ln 2 \cdot \left(\sin \frac{y}{x}\right)'_x = 2^{\sin \frac{y}{x}} \ln 2 \cdot \cos \frac{y}{x} \cdot \left(\frac{y}{x}\right)'_x =$$

$$= 2^{\sin \frac{y}{x}} \ln 2 \cdot \cos \frac{y}{x} \cdot \frac{-y}{x^2} = -\frac{y}{x^2} \cdot 2^{\sin \frac{y}{x}} \ln 2 \cdot \cos \frac{y}{x}$$

$$z_y =$$

$\boxed{(a^x)' = a^x \ln a}$ $\boxed{(a^{\text{nešto}})' = a^{\text{nešto}} \ln a \cdot (\text{nešto})'}$ $\boxed{z = 2^{\sin \frac{y}{x}}}$

$\boxed{(\sin x)' = \cos x}$ $\boxed{(\sin(\text{nešto}))' = \cos(\text{nešto}) \cdot (\text{nešto})'}$

c)

$$z_x = 2^{\sin \frac{y}{x}} \ln 2 \cdot \left(\sin \frac{y}{x}\right)_x' = 2^{\sin \frac{y}{x}} \ln 2 \cdot \cos \frac{y}{x} \cdot \left(\frac{y}{x}\right)_x' =$$

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$$z_y = 2^{\sin \frac{y}{x}} \ln 2$$

$\boxed{(a^x)' = a^x \ln a}$ $\boxed{(a^{\text{nešto}})' = a^{\text{nešto}} \ln a \cdot (\text{nešto})'}$ $\boxed{z = 2^{\sin \frac{y}{x}}}$

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$$z_x = 2^{\sin \frac{y}{x}} \ln 2 \cdot \left(\sin \frac{y}{x}\right)'_x = 2^{\sin \frac{y}{x}} \ln 2 \cdot \cos \frac{y}{x} \cdot \left(\frac{y}{x}\right)'_x =$$

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$\boxed{(a^x)' = a^x \ln a}$ $\boxed{(a^{\text{nešto}})' = a^{\text{nešto}} \ln a \cdot (\text{nešto})'}$ $\boxed{z = 2^{\sin \frac{y}{x}}}$

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$$z_y = 2^{\sin \frac{y}{x}} \ln 2 \cdot \left(\sin \frac{y}{x}\right)'_y$$

$\boxed{(a^x)' = a^x \ln a}$ $\boxed{(a^{\text{nešto}})' = a^{\text{nešto}} \ln a \cdot (\text{nešto})'}$ $\boxed{z = 2^{\sin\frac{y}{x}}}$

$\boxed{(\sin x)' = \cos x}$ $\boxed{(\sin(\text{nešto}))' = \cos(\text{nešto}) \cdot (\text{nešto})'}$

c) $$z_x = 2^{\sin\frac{y}{x}} \ln 2 \cdot \left(\sin \frac{y}{x}\right)'_x = 2^{\sin\frac{y}{x}} \ln 2 \cdot \cos\frac{y}{x} \cdot \left(\frac{y}{x}\right)'_x =$$

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$$z_y = 2^{\sin\frac{y}{x}} \ln 2 \cdot \left(\sin \frac{y}{x}\right)'_y = 2^{\sin\frac{y}{x}} \ln 2$$

$\boxed{(a^x)' = a^x \ln a}$ $\boxed{(a^{\text{nešto}})' = a^{\text{nešto}} \ln a \cdot (\text{nešto})'}$ $\boxed{z = 2^{\sin \frac{y}{x}}}$

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c) $$z_x = 2^{\sin \frac{y}{x}} \ln 2 \cdot \left(\sin \frac{y}{x}\right)'_x = 2^{\sin \frac{y}{x}} \ln 2 \cdot \cos \frac{y}{x} \cdot \left(\frac{y}{x}\right)'_x =$$

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$$z_y = 2^{\sin \frac{y}{x}} \ln 2 \cdot \left(\sin \frac{y}{x}\right)'_y = 2^{\sin \frac{y}{x}} \ln 2 \cdot$$

$(a^x)' = a^x \ln a$ $\quad$ $(a^{\text{nešto}})' = a^{\text{nešto}} \ln a \cdot (\text{nešto})'$ $\quad$ $z = 2^{\sin \frac{y}{x}}$

$(\sin x)' = \cos x$ $\quad$ $(\sin(\text{nešto}))' = \cos(\text{nešto}) \cdot (\text{nešto})'$

c)

$$z_x = 2^{\sin \frac{y}{x}} \ln 2 \cdot \left(\sin \frac{y}{x}\right)'_x = 2^{\sin \frac{y}{x}} \ln 2 \cdot \cos \frac{y}{x} \cdot \left(\frac{y}{x}\right)'_x =$$

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$$z_y = 2^{\sin \frac{y}{x}} \ln 2 \cdot \left(\sin \frac{y}{x}\right)'_y = 2^{\sin \frac{y}{x}} \ln 2 \cdot \cos \frac{y}{x}$$

$$\boxed{(a^x)' = a^x \ln a} \quad \boxed{(a^{\text{nešto}})' = a^{\text{nešto}} \ln a \cdot (\text{nešto})'} \quad \boxed{z = 2^{\sin \frac{y}{x}}}$$

$$\boxed{(\sin x)' = \cos x} \quad \boxed{(\sin(\text{nešto}))' = \cos(\text{nešto}) \cdot (\text{nešto})'}$$

c)

$$z_x = 2^{\sin \frac{y}{x}} \ln 2 \cdot \left(\sin \frac{y}{x}\right)'_x = 2^{\sin \frac{y}{x}} \ln 2 \cdot \cos \frac{y}{x} \cdot \left(\frac{y}{x}\right)'_x =$$

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$$z_y = 2^{\sin \frac{y}{x}} \ln 2 \cdot \left(\sin \frac{y}{x}\right)'_y = 2^{\sin \frac{y}{x}} \ln 2 \cdot \cos \frac{y}{x} \cdot$$

$\boxed{(a^x)' = a^x \ln a}$ $\boxed{(a^{\text{nešto}})' = a^{\text{nešto}} \ln a \cdot (\text{nešto})'}$ $\boxed{z = 2^{\sin \frac{y}{x}}}$

$\boxed{(\sin x)' = \cos x}$ $\boxed{(\sin(\text{nešto}))' = \cos(\text{nešto}) \cdot (\text{nešto})'}$

c)

$$z_x = 2^{\sin \frac{y}{x}} \ln 2 \cdot \left(\sin \frac{y}{x}\right)'_x = 2^{\sin \frac{y}{x}} \ln 2 \cdot \cos \frac{y}{x} \cdot \left(\frac{y}{x}\right)'_x =$$

$$= 2^{\sin \frac{y}{x}} \ln 2 \cdot \cos \frac{y}{x} \cdot \frac{-y}{x^2} = -\frac{y}{x^2} \cdot 2^{\sin \frac{y}{x}} \ln 2 \cdot \cos \frac{y}{x}$$

$$z_y = 2^{\sin \frac{y}{x}} \ln 2 \cdot \left(\sin \frac{y}{x}\right)'_y = 2^{\sin \frac{y}{x}} \ln 2 \cdot \cos \frac{y}{x} \cdot \left(\frac{y}{x}\right)'_y$$

$\boxed{(a^x)' = a^x \ln a}$ $\boxed{(a^{\text{nešto}})' = a^{\text{nešto}} \ln a \cdot (\text{nešto})'}$ $\boxed{z = 2^{\sin \frac{y}{x}}}$

$\boxed{(\sin x)' = \cos x}$ $\boxed{(\sin(\text{nešto}))' = \cos(\text{nešto}) \cdot (\text{nešto})'}$

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$$z_x = 2^{\sin \frac{y}{x}} \ln 2 \cdot \left(\sin \frac{y}{x}\right)'_x = 2^{\sin \frac{y}{x}} \ln 2 \cdot \cos \frac{y}{x} \cdot \left(\frac{y}{x}\right)'_x =$$

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$$z_y = 2^{\sin \frac{y}{x}} \ln 2 \cdot \left(\sin \frac{y}{x}\right)'_y = 2^{\sin \frac{y}{x}} \ln 2 \cdot \cos \frac{y}{x} \cdot \left(\frac{y}{x}\right)'_y =$$

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$\boxed{(a^x)' = a^x \ln a}$ $\boxed{(a^{\text{nešto}})' = a^{\text{nešto}} \ln a \cdot (\text{nešto})'}$ $\boxed{z = 2^{\sin \frac{y}{x}}}$

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$$= 2^{\sin \frac{y}{x}} \ln 2 \cdot \cos \frac{y}{x} \cdot \frac{-y}{x^2} = -\frac{y}{x^2} \cdot 2^{\sin \frac{y}{x}} \ln 2 \cdot \cos \frac{y}{x}$$

$$z_y = 2^{\sin \frac{y}{x}} \ln 2 \cdot \left(\sin \frac{y}{x}\right)'_y = 2^{\sin \frac{y}{x}} \ln 2 \cdot \cos \frac{y}{x} \cdot \left(\frac{y}{x}\right)'_y =$$

$$= 2^{\sin \frac{y}{x}} \ln 2 \cdot \cos \frac{y}{x} \cdot$$

$\boxed{(a^x)' = a^x \ln a}$ $\boxed{(a^{\text{nešto}})' = a^{\text{nešto}} \ln a \cdot (\text{nešto})'}$ $\boxed{z = 2^{\sin \frac{y}{x}}}$

$\boxed{(\sin x)' = \cos x}$ $\boxed{(\sin(\text{nešto}))' = \cos(\text{nešto}) \cdot (\text{nešto})'}$

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$$z_x = 2^{\sin \frac{y}{x}} \ln 2 \cdot \left(\sin \frac{y}{x}\right)'_x = 2^{\sin \frac{y}{x}} \ln 2 \cdot \cos \frac{y}{x} \cdot \left(\frac{y}{x}\right)'_x =$$

$$= 2^{\sin \frac{y}{x}} \ln 2 \cdot \cos \frac{y}{x} \cdot \frac{-y}{x^2} = -\frac{y}{x^2} \cdot 2^{\sin \frac{y}{x}} \ln 2 \cdot \cos \frac{y}{x}$$

$$z_y = 2^{\sin \frac{y}{x}} \ln 2 \cdot \left(\sin \frac{y}{x}\right)'_y = 2^{\sin \frac{y}{x}} \ln 2 \cdot \cos \frac{y}{x} \cdot \left(\frac{y}{x}\right)'_y =$$

$$= 2^{\sin \frac{y}{x}} \ln 2 \cdot \cos \frac{y}{x} \cdot \frac{1}{x}$$

$\boxed{(a^x)' = a^x \ln a}$ $\boxed{(a^{\text{nešto}})' = a^{\text{nešto}} \ln a \cdot (\text{nešto})'}$ $\boxed{z = 2^{\sin\frac{y}{x}}}$

$\boxed{(\sin x)' = \cos x}$ $\boxed{(\sin(\text{nešto}))' = \cos(\text{nešto}) \cdot (\text{nešto})'}$

c)

$$z_x = 2^{\sin\frac{y}{x}} \ln 2 \cdot \left(\sin\frac{y}{x}\right)'_x = 2^{\sin\frac{y}{x}} \ln 2 \cdot \cos\frac{y}{x} \cdot \left(\frac{y}{x}\right)'_x =$$

$$= 2^{\sin\frac{y}{x}} \ln 2 \cdot \cos\frac{y}{x} \cdot \frac{-y}{x^2} = -\frac{y}{x^2} \cdot 2^{\sin\frac{y}{x}} \ln 2 \cdot \cos\frac{y}{x}$$

$$z_y = 2^{\sin\frac{y}{x}} \ln 2 \cdot \left(\sin\frac{y}{x}\right)'_y = 2^{\sin\frac{y}{x}} \ln 2 \cdot \cos\frac{y}{x} \cdot \left(\frac{y}{x}\right)'_y =$$

$$= 2^{\sin\frac{y}{x}} \ln 2 \cdot \cos\frac{y}{x} \cdot \frac{1}{x} = \frac{1}{x} \cdot$$

$\boxed{(a^x)' = a^x \ln a}$ $\boxed{(a^{\text{nešto}})' = a^{\text{nešto}} \ln a \cdot (\text{nešto})'}$ $\boxed{z = 2^{\sin \frac{y}{x}}}$

$\boxed{(\sin x)' = \cos x}$ $\boxed{(\sin (\text{nešto}))' = \cos (\text{nešto}) \cdot (\text{nešto})'}$

c)

$$z_x = 2^{\sin \frac{y}{x}} \ln 2 \cdot \left(\sin \frac{y}{x}\right)'_x = 2^{\sin \frac{y}{x}} \ln 2 \cdot \cos \frac{y}{x} \cdot \left(\frac{y}{x}\right)'_x =$$

$$= 2^{\sin \frac{y}{x}} \ln 2 \cdot \cos \frac{y}{x} \cdot \frac{-y}{x^2} = -\frac{y}{x^2} \cdot 2^{\sin \frac{y}{x}} \ln 2 \cdot \cos \frac{y}{x}$$

$$z_y = 2^{\sin \frac{y}{x}} \ln 2 \cdot \left(\sin \frac{y}{x}\right)'_y = 2^{\sin \frac{y}{x}} \ln 2 \cdot \cos \frac{y}{x} \cdot \left(\frac{y}{x}\right)'_y =$$

$$= 2^{\sin \frac{y}{x}} \ln 2 \cdot \cos \frac{y}{x} \cdot \frac{1}{x} = \frac{1}{x} \cdot 2^{\sin \frac{y}{x}} \ln 2 \cdot \cos \frac{y}{x}$$

$\boxed{(a^x)' = a^x \ln a}$ $\boxed{(a^{\text{nešto}})' = a^{\text{nešto}} \ln a \cdot (\text{nešto})'}$ $\boxed{z = 2^{\sin \frac{y}{x}}}$

$\boxed{(x^n)' = nx^{n-1}}$ $\boxed{(\sin x)' = \cos x}$ $\boxed{(\sin(\text{nešto}))' = \cos(\text{nešto}) \cdot (\text{nešto})'}$

c)
$$z_x = 2^{\sin \frac{y}{x}} \ln 2 \cdot \left(\sin \frac{y}{x}\right)'_x = 2^{\sin \frac{y}{x}} \ln 2 \cdot \cos \frac{y}{x} \cdot \left(\frac{y}{x}\right)'_x =$$

$$= 2^{\sin \frac{y}{x}} \ln 2 \cdot \cos \frac{y}{x} \cdot \frac{-y}{x^2} = -\frac{y}{x^2} \cdot 2^{\sin \frac{y}{x}} \ln 2 \cdot \cos \frac{y}{x}$$

$$z_y = 2^{\sin \frac{y}{x}} \ln 2 \cdot \left(\sin \frac{y}{x}\right)'_y = 2^{\sin \frac{y}{x}} \ln 2 \cdot \cos \frac{y}{x} \cdot \left(\frac{y}{x}\right)'_y =$$

$$= 2^{\sin \frac{y}{x}} \ln 2 \cdot \cos \frac{y}{x} \cdot \frac{1}{x} = \frac{1}{x} \cdot 2^{\sin \frac{y}{x}} \ln 2 \cdot \cos \frac{y}{x}$$

$\boxed{z = x^y}$

d) z_x

$\boxed{(a^x)' = a^x \ln a}$ $\boxed{(a^{\text{nešto}})' = a^{\text{nešto}} \ln a \cdot (\text{nešto})'}$ $\boxed{z = 2^{\sin \frac{y}{x}}}$

$\boxed{(x^n)' = nx^{n-1}}$ $\boxed{(\sin x)' = \cos x}$ $\boxed{(\sin(\text{nešto}))' = \cos(\text{nešto}) \cdot (\text{nešto})'}$

c)

$$z_x = 2^{\sin \frac{y}{x}} \ln 2 \cdot \left(\sin \frac{y}{x}\right)'_x = 2^{\sin \frac{y}{x}} \ln 2 \cdot \cos \frac{y}{x} \cdot \left(\frac{y}{x}\right)'_x =$$

$$= 2^{\sin \frac{y}{x}} \ln 2 \cdot \cos \frac{y}{x} \cdot \frac{-y}{x^2} = -\frac{y}{x^2} \cdot 2^{\sin \frac{y}{x}} \ln 2 \cdot \cos \frac{y}{x}$$

$$z_y = 2^{\sin \frac{y}{x}} \ln 2 \cdot \left(\sin \frac{y}{x}\right)'_y = 2^{\sin \frac{y}{x}} \ln 2 \cdot \cos \frac{y}{x} \cdot \left(\frac{y}{x}\right)'_y =$$

$$= 2^{\sin \frac{y}{x}} \ln 2 \cdot \cos \frac{y}{x} \cdot \frac{1}{x} = \frac{1}{x} \cdot 2^{\sin \frac{y}{x}} \ln 2 \cdot \cos \frac{y}{x}$$

$\boxed{z = x^y}$

d) $z_x = yx^{y-1}$

$\boxed{(a^x)' = a^x \ln a}$ $\boxed{(a^{\text{nešto}})' = a^{\text{nešto}} \ln a \cdot (\text{nešto})'}$ $\boxed{z = 2^{\sin \frac{y}{x}}}$

$\boxed{(x^n)' = nx^{n-1}}$ $\boxed{(\sin x)' = \cos x}$ $\boxed{(\sin(\text{nešto}))' = \cos(\text{nešto}) \cdot (\text{nešto})'}$

c) $$z_x = 2^{\sin \frac{y}{x}} \ln 2 \cdot \left(\sin \frac{y}{x}\right)'_x = 2^{\sin \frac{y}{x}} \ln 2 \cdot \cos \frac{y}{x} \cdot \left(\frac{y}{x}\right)'_x =$$

$$= 2^{\sin \frac{y}{x}} \ln 2 \cdot \cos \frac{y}{x} \cdot \frac{-y}{x^2} = -\frac{y}{x^2} \cdot 2^{\sin \frac{y}{x}} \ln 2 \cdot \cos \frac{y}{x}$$

$$z_y = 2^{\sin \frac{y}{x}} \ln 2 \cdot \left(\sin \frac{y}{x}\right)'_y = 2^{\sin \frac{y}{x}} \ln 2 \cdot \cos \frac{y}{x} \cdot \left(\frac{y}{x}\right)'_y =$$

$$= 2^{\sin \frac{y}{x}} \ln 2 \cdot \cos \frac{y}{x} \cdot \frac{1}{x} = \frac{1}{x} \cdot 2^{\sin \frac{y}{x}} \ln 2 \cdot \cos \frac{y}{x}$$

$\boxed{z = x^y}$

d) $z_x = yx^{y-1}$ $\qquad z_y =$

$\boxed{(a^x)' = a^x \ln a}$ $\boxed{(a^{\text{nešto}})' = a^{\text{nešto}} \ln a \cdot (\text{nešto})'}$ $\boxed{z = 2^{\sin\frac{y}{x}}}$

$\boxed{(x^n)' = nx^{n-1}}$ $\boxed{(\sin x)' = \cos x}$ $\boxed{(\sin(\text{nešto}))' = \cos(\text{nešto}) \cdot (\text{nešto})'}$

c)
$$z_x = 2^{\sin\frac{y}{x}} \ln 2 \cdot \left(\sin \frac{y}{x}\right)'_x = 2^{\sin\frac{y}{x}} \ln 2 \cdot \cos \frac{y}{x} \cdot \left(\frac{y}{x}\right)'_x =$$

$$= 2^{\sin\frac{y}{x}} \ln 2 \cdot \cos \frac{y}{x} \cdot \frac{-y}{x^2} = -\frac{y}{x^2} \cdot 2^{\sin\frac{y}{x}} \ln 2 \cdot \cos \frac{y}{x}$$

$$z_y = 2^{\sin\frac{y}{x}} \ln 2 \cdot \left(\sin \frac{y}{x}\right)'_y = 2^{\sin\frac{y}{x}} \ln 2 \cdot \cos \frac{y}{x} \cdot \left(\frac{y}{x}\right)'_y =$$

$$= 2^{\sin\frac{y}{x}} \ln 2 \cdot \cos \frac{y}{x} \cdot \frac{1}{x} = \frac{1}{x} \cdot 2^{\sin\frac{y}{x}} \ln 2 \cdot \cos \frac{y}{x}$$

$\boxed{z = x^y}$

d) $z_x = yx^{y-1}$ $\qquad$ $z_y = x^y \ln x$

četvrti zadatak

Zadatak 4

Izračunajte vrijednosti parcijalnih derivacija funkcije

$$f(x,y,z) = e^{2xz} - \ln(yz) + 1$$

u točki $(0,2,1)$.

Zadatak 4

$\boxed{(e^{\text{nešto}})' = e^{\text{nešto}} \cdot (\text{nešto})'}$ $\boxed{(e^x)' = e^x}$

Izračunajte vrijednosti parcijalnih derivacija funkcije

$$f(x, y, z) = e^{2xz} - \ln(yz) + 1$$

u točki $(0, 2, 1)$.

Rješenje

$f_x =$

Zadatak 4

$$\boxed{\left(e^{\text{nešto}}\right)' = e^{\text{nešto}} \cdot (\text{nešto})'} \quad \boxed{(e^x)' = e^x}$$

Izračunajte vrijednosti parcijalnih derivacija funkcije

$$f(x, y, z) = e^{2xz} - \ln(yz) + 1$$

u točki $(0, 2, 1)$.

Rješenje

$f_x = e^{2xz}$

Zadatak 4

$\boxed{\left(e^{\text{nešto}}\right)' = e^{\text{nešto}} \cdot (\text{nešto})'}$ $\boxed{\left(e^{x}\right)' = e^{x}}$

Izračunajte vrijednosti parcijalnih derivacija funkcije

$$f(x, y, z) = e^{2xz} - \ln(yz) + 1$$

u točki $(0, 2, 1)$.

Rješenje

$$f_x = e^{2xz} \cdot (2xz)'_x$$

Zadatak 4

$$\boxed{(e^{\text{nešto}})' = e^{\text{nešto}} \cdot (\text{nešto})'} \quad \boxed{(e^x)' = e^x}$$

Izračunajte vrijednosti parcijalnih derivacija funkcije

$$f(x, y, z) = e^{2xz} - \ln(yz) + 1$$

u točki $(0, 2, 1)$.

Rješenje

$$f_x = e^{2xz} \cdot (2xz)'_x - 0$$

Zadatak 4

$$\boxed{\left(e^{\text{nešto}}\right)' = e^{\text{nešto}} \cdot (\text{nešto})'} \quad \boxed{(e^x)' = e^x}$$

Izračunajte vrijednosti parcijalnih derivacija funkcije

$$f(x, y, z) = e^{2xz} - \ln(yz) + 1$$

u točki $(0, 2, 1)$.

Rješenje

$$f_x = e^{2xz} \cdot (2xz)'_x - 0 + 0$$

Zadatak 4

$\boxed{(e^{\text{nešto}})' = e^{\text{nešto}} \cdot (\text{nešto})'}$ $\boxed{(e^x)' = e^x}$

Izračunajte vrijednosti parcijalnih derivacija funkcije

$$f(x, y, z) = e^{2xz} - \ln(yz) + 1$$

u točki $(0, 2, 1)$.

Rješenje

$$f_x = e^{2xz} \cdot (2xz)'_x - 0 + 0 = e^{2xz}$$

Zadatak 4

$\boxed{\left(e^{\text{nešto}}\right)' = e^{\text{nešto}} \cdot (\text{nešto})'}$ $\boxed{(e^x)' = e^x}$

Izračunajte vrijednosti parcijalnih derivacija funkcije

$$f(x, y, z) = e^{2xz} - \ln(yz) + 1$$

u točki $(0, 2, 1)$.

Rješenje

$$f_x = e^{2xz} \cdot (2xz)'_x - 0 + 0 = e^{2xz} \cdot$$

Zadatak 4

$\boxed{(e^{\text{nešto}})' = e^{\text{nešto}} \cdot (\text{nešto})'}$ $\boxed{(e^x)' = e^x}$

Izračunajte vrijednosti parcijalnih derivacija funkcije

$$f(x, y, z) = e^{2xz} - \ln(yz) + 1$$

u točki $(0, 2, 1)$.

Rješenje

$$f_x = e^{2xz} \cdot (2xz)'_x - 0 + 0 = e^{2xz} \cdot 2z$$

Zadatak 4

$$\boxed{\left(e^{\text{nešto}}\right)' = e^{\text{nešto}} \cdot (\text{nešto})'} \quad \boxed{(e^x)' = e^x}$$

Izračunajte vrijednosti parcijalnih derivacija funkcije

$$f(x, y, z) = e^{2xz} - \ln(yz) + 1$$

u točki $(0, 2, 1)$.

Rješenje

$$f_x = e^{2xz} \cdot (2xz)'_x - 0 + 0 = e^{2xz} \cdot 2z = 2ze^{2xz}$$

Zadatak 4

$\boxed{(e^{\text{nešto}})' = e^{\text{nešto}} \cdot (\text{nešto})'}$ $\boxed{(e^x)' = e^x}$

Izračunajte vrijednosti parcijalnih derivacija funkcije

$$f(x, y, z) = e^{2xz} - \ln(yz) + 1$$

u točki $(0, 2, 1)$.

Rješenje

$$f_x = e^{2xz} \cdot (2xz)'_x - 0 + 0 = e^{2xz} \cdot 2z = 2ze^{2xz}$$

$$f_y =$$

Zadatak 4

$\boxed{(e^{\text{nešto}})' = e^{\text{nešto}} \cdot (\text{nešto})'}$ $\boxed{(e^x)' = e^x}$

Izračunajte vrijednosti parcijalnih derivacija funkcije

$$f(x, y, z) = e^{2xz} - \ln(yz) + 1$$

u točki $(0, 2, 1)$.

Rješenje

$$f_x = e^{2xz} \cdot (2xz)'_x - 0 + 0 = e^{2xz} \cdot 2z = 2ze^{2xz}$$

$$f_y = 0$$

Zadatak 4

$$\left(e^{\text{nešto}}\right)' = e^{\text{nešto}} \cdot (\text{nešto})'$$

$$(e^x)' = e^x$$

Izračunajte vrijednosti parcijalnih derivacija funkcije

$$(\ln x)' = \frac{1}{x}$$

$$f(x, y, z) = e^{2xz} - \ln(yz) + 1$$

u točki $(0, 2, 1)$.

$$\big(\ln(\text{nešto})\big)' = \frac{1}{\text{nešto}} \cdot (\text{nešto})'$$

Rješenje

$$f_x = e^{2xz} \cdot (2xz)'_x - 0 + 0 = e^{2xz} \cdot 2z = 2ze^{2xz}$$

$$f_y = 0 -$$

Zadatak 4

$$\left(e^{\text{nešto}}\right)' = e^{\text{nešto}} \cdot (\text{nešto})'$$

$$(e^x)' = e^x$$

Izračunajte vrijednosti parcijalnih derivacija funkcije

$$(\ln x)' = \frac{1}{x}$$

$$f(x, y, z) = e^{2xz} - \ln(yz) + 1$$

u točki $(0, 2, 1)$.

$$\Big(\ln(\text{nešto})\Big)' = \frac{1}{\text{nešto}} \cdot (\text{nešto})'$$

Rješenje

$$f_x = e^{2xz} \cdot (2xz)'_x - 0 + 0 = e^{2xz} \cdot 2z = 2ze^{2xz}$$

$$f_y = 0 - \frac{1}{yz}$$

Zadatak 4

$$\boxed{(e^{\text{nešto}})' = e^{\text{nešto}} \cdot (\text{nešto})'}$$ $$\boxed{(e^x)' = e^x}$$

Izračunajte vrijednosti parcijalnih derivacija funkcije

$$\boxed{(\ln x)' = \frac{1}{x}}$$

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u točki $(0, 2, 1)$.

$$\boxed{\big(\ln(\text{nešto})\big)' = \frac{1}{\text{nešto}} \cdot (\text{nešto})'}$$

Rješenje

$$f_x = e^{2xz} \cdot (2xz)'_x - 0 + 0 = e^{2xz} \cdot 2z = 2ze^{2xz}$$

$$f_y = 0 - \frac{1}{yz} \cdot (yz)'_y$$

Zadatak 4

$$\boxed{\left(e^{\text{nešto}}\right)' = e^{\text{nešto}} \cdot (\text{nešto})'} \quad \boxed{(e^x)' = e^x}$$

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Rješenje

$$f_x = e^{2xz} \cdot (2xz)'_x - 0 + 0 = e^{2xz} \cdot 2z = 2ze^{2xz}$$

$$f_y = 0 - \frac{1}{yz} \cdot (yz)'_y + 0$$

Zadatak 4

$$\left(e^{\text{nešto}}\right)' = e^{\text{nešto}} \cdot (\text{nešto})'$$

$$(e^x)' = e^x$$

Izračunajte vrijednosti parcijalnih derivacija funkcije

$$(\ln x)' = \frac{1}{x}$$

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u točki $(0,2,1)$.

$$\Big(\ln(\text{nešto})\Big)' = \frac{1}{\text{nešto}} \cdot (\text{nešto})'$$

Rješenje

$$f_x = e^{2xz} \cdot (2xz)'_x - 0 + 0 = e^{2xz} \cdot 2z = 2ze^{2xz}$$

$$f_y = 0 - \frac{1}{yz} \cdot (yz)'_y + 0 = -\frac{1}{yz}$$

Zadatak 4

$$\left(e^{\text{nešto}}\right)' = e^{\text{nešto}} \cdot (\text{nešto})'$$

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Izračunajte vrijednosti parcijalnih derivacija funkcije

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$$f(x, y, z) = e^{2xz} - \ln(yz) + 1$$

u točki $(0, 2, 1)$.

$$\big(\ln(\text{nešto})\big)' = \frac{1}{\text{nešto}} \cdot (\text{nešto})'$$

Rješenje

$$f_x = e^{2xz} \cdot (2xz)'_x - 0 + 0 = e^{2xz} \cdot 2z = 2ze^{2xz}$$

$$f_y = 0 - \frac{1}{yz} \cdot (yz)'_y + 0 = -\frac{1}{yz} \cdot$$

Zadatak 4

$$\boxed{\left(e^{\text{nešto}}\right)' = e^{\text{nešto}} \cdot (\text{nešto})'} \qquad \boxed{(e^x)' = e^x}$$

Izračunajte vrijednosti parcijalnih derivacija funkcije

$$\boxed{(\ln x)' = \frac{1}{x}}$$

$$f(x, y, z) = e^{2xz} - \ln(yz) + 1$$

u točki $(0, 2, 1)$.

$$\boxed{\big(\ln(\text{nešto})\big)' = \frac{1}{\text{nešto}} \cdot (\text{nešto})'}$$

Rješenje

$$f_x = e^{2xz} \cdot (2xz)'_x - 0 + 0 = e^{2xz} \cdot 2z = 2ze^{2xz}$$

$$f_y = 0 - \frac{1}{yz} \cdot (yz)'_y + 0 = -\frac{1}{yz} \cdot z$$

Zadatak 4

$$\left(e^{\text{nešto}}\right)' = e^{\text{nešto}} \cdot (\text{nešto})'$$

$$(e^x)' = e^x$$

Izračunajte vrijednosti parcijalnih derivacija funkcije

$$(\ln x)' = \frac{1}{x}$$

$$f(x, y, z) = e^{2xz} - \ln(yz) + 1$$

u točki $(0, 2, 1)$.

$$\Big(\ln(\text{nešto})\Big)' = \frac{1}{\text{nešto}} \cdot (\text{nešto})'$$

Rješenje

$$f_x = e^{2xz} \cdot (2xz)'_x - 0 + 0 = e^{2xz} \cdot 2z = 2ze^{2xz}$$

$$f_y = 0 - \frac{1}{yz} \cdot (yz)'_y + 0 = -\frac{1}{yz} \cdot z = -\frac{1}{y}$$

Zadatak 4

$$\boxed{\left(e^{\text{nešto}}\right)' = e^{\text{nešto}} \cdot (\text{nešto})'}$$

$$\boxed{(e^x)' = e^x}$$

Izračunajte vrijednosti parcijalnih derivacija funkcije

$$\boxed{(\ln x)' = \frac{1}{x}}$$

$$f(x, y, z) = e^{2xz} - \ln(yz) + 1$$

u točki $(0, 2, 1)$.

$$\boxed{\big(\ln(\text{nešto})\big)' = \frac{1}{\text{nešto}} \cdot (\text{nešto})'}$$

Rješenje

$$f_x = e^{2xz} \cdot (2xz)'_x - 0 + 0 = e^{2xz} \cdot 2z = 2ze^{2xz}$$

$$f_y = 0 - \frac{1}{yz} \cdot (yz)'_y + 0 = -\frac{1}{yz} \cdot z = -\frac{1}{y}$$

$$f_z =$$

Zadatak 4

$$\left(e^{\text{nešto}}\right)' = e^{\text{nešto}} \cdot (\text{nešto})'$$

$$(e^x)' = e^x$$

Izračunajte vrijednosti parcijalnih derivacija funkcije

$$(\ln x)' = \frac{1}{x}$$

$$f(x, y, z) = e^{2xz} - \ln(yz) + 1$$

u točki $(0, 2, 1)$.

$$\big(\ln(\text{nešto})\big)' = \frac{1}{\text{nešto}} \cdot (\text{nešto})'$$

Rješenje

$$f_x = e^{2xz} \cdot (2xz)'_x - 0 + 0 = e^{2xz} \cdot 2z = 2ze^{2xz}$$

$$f_y = 0 - \frac{1}{yz} \cdot (yz)'_y + 0 = -\frac{1}{yz} \cdot z = -\frac{1}{y}$$

$$f_z = e^{2xz}$$

Zadatak 4

$$\left(e^{\text{nešto}}\right)' = e^{\text{nešto}} \cdot (\text{nešto})'$$

$$\left(e^{x}\right)' = e^{x}$$

Izračunajte vrijednosti parcijalnih derivacija funkcije

$$(\ln x)' = \frac{1}{x}$$

$$f(x, y, z) = e^{2xz} - \ln(yz) + 1$$

u točki $(0, 2, 1)$.

$$\big(\ln(\text{nešto})\big)' = \frac{1}{\text{nešto}} \cdot (\text{nešto})'$$

Rješenje

$$f_x = e^{2xz} \cdot (2xz)'_x - 0 + 0 = e^{2xz} \cdot 2z = 2ze^{2xz}$$

$$f_y = 0 - \frac{1}{yz} \cdot (yz)'_y + 0 = -\frac{1}{yz} \cdot z = -\frac{1}{y}$$

$$f_z = e^{2xz} \cdot (2xz)'_z$$

Zadatak 4

$$\boxed{\left(e^{\text{nešto}}\right)' = e^{\text{nešto}} \cdot (\text{nešto})'} \quad \boxed{(e^x)' = e^x}$$

Izračunajte vrijednosti parcijalnih derivacija funkcije

$$\boxed{(\ln x)' = \frac{1}{x}}$$

$$f(x, y, z) = e^{2xz} - \ln(yz) + 1$$

u točki $(0, 2, 1)$.

$$\boxed{\big(\ln(\text{nešto})\big)' = \frac{1}{\text{nešto}} \cdot (\text{nešto})'}$$

Rješenje

$$f_x = e^{2xz} \cdot (2xz)'_x - 0 + 0 = e^{2xz} \cdot 2z = 2ze^{2xz}$$

$$f_y = 0 - \frac{1}{yz} \cdot (yz)'_y + 0 = -\frac{1}{yz} \cdot z = -\frac{1}{y}$$

$$f_z = e^{2xz} \cdot (2xz)'_z -$$

Zadatak 4

$$\left(e^{\text{nešto}}\right)' = e^{\text{nešto}} \cdot (\text{nešto})'$$

$$(e^x)' = e^x$$

Izračunajte vrijednosti parcijalnih derivacija funkcije

$$(\ln x)' = \frac{1}{x}$$

$$f(x, y, z) = e^{2xz} - \ln(yz) + 1$$

u točki $(0, 2, 1)$.

$$\big(\ln(\text{nešto})\big)' = \frac{1}{\text{nešto}} \cdot (\text{nešto})'$$

Rješenje

$$f_x = e^{2xz} \cdot (2xz)'_x - 0 + 0 = e^{2xz} \cdot 2z = 2ze^{2xz}$$

$$f_y = 0 - \frac{1}{yz} \cdot (yz)'_y + 0 = -\frac{1}{yz} \cdot z = -\frac{1}{y}$$

$$f_z = e^{2xz} \cdot (2xz)'_z - \frac{1}{yz}$$

Zadatak 4

$$\left(e^{\text{nešto}}\right)' = e^{\text{nešto}} \cdot (\text{nešto})'$$

$$(e^x)' = e^x$$

Izračunajte vrijednosti parcijalnih derivacija funkcije

$$(\ln x)' = \frac{1}{x}$$

$$f(x, y, z) = e^{2xz} - \ln(yz) + 1$$

u točki $(0, 2, 1)$.

$$\big(\ln(\text{nešto})\big)' = \frac{1}{\text{nešto}} \cdot (\text{nešto})'$$

Rješenje

$$f_x = e^{2xz} \cdot (2xz)'_x - 0 + 0 = e^{2xz} \cdot 2z = 2ze^{2xz}$$

$$f_y = 0 - \frac{1}{yz} \cdot (yz)'_y + 0 = -\frac{1}{yz} \cdot z = -\frac{1}{y}$$

$$f_z = e^{2xz} \cdot (2xz)'_z - \frac{1}{yz} \cdot (yz)'_z$$

Zadatak 4

$$\left(e^{\text{nešto}}\right)' = e^{\text{nešto}} \cdot (\text{nešto})'$$

$$\left(e^{x}\right)' = e^{x}$$

Izračunajte vrijednosti parcijalnih derivacija funkcije

$$(\ln x)' = \frac{1}{x}$$

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u točki $(0, 2, 1)$.

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Rješenje

$$f_x = e^{2xz} \cdot (2xz)'_x - 0 + 0 = e^{2xz} \cdot 2z = 2ze^{2xz}$$

$$f_y = 0 - \frac{1}{yz} \cdot (yz)'_y + 0 = -\frac{1}{yz} \cdot z = -\frac{1}{y}$$

$$f_z = e^{2xz} \cdot (2xz)'_z - \frac{1}{yz} \cdot (yz)'_z + 0$$

Zadatak 4

$$\left(e^{\text{nešto}}\right)' = e^{\text{nešto}} \cdot (\text{nešto})'$$

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Izračunajte vrijednosti parcijalnih derivacija funkcije

$$(\ln x)' = \frac{1}{x}$$

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Rješenje

$$f_x = e^{2xz} \cdot (2xz)'_x - 0 + 0 = e^{2xz} \cdot 2z = 2ze^{2xz}$$

$$f_y = 0 - \frac{1}{yz} \cdot (yz)'_y + 0 = -\frac{1}{yz} \cdot z = -\frac{1}{y}$$

$$f_z = e^{2xz} \cdot (2xz)'_z - \frac{1}{yz} \cdot (yz)'_z + 0 = e^{2xz}$$

Zadatak 4

$$\left(e^{\text{nešto}}\right)' = e^{\text{nešto}} \cdot (\text{nešto})'$$

$$(e^x)' = e^x$$

Izračunajte vrijednosti parcijalnih derivacija funkcije

$$(\ln x)' = \frac{1}{x}$$

$$f(x, y, z) = e^{2xz} - \ln(yz) + 1$$

u točki $(0, 2, 1)$.

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Rješenje

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Parcijalne derivacije drugog reda – oznake

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- Funkcija dvije varijable: $z = z(x, y)$

$$
\begin{array}{ccc}
z_{xx} & z'_{xx} & \dfrac{\partial^2 z}{\partial x^2} \\[2ex]
z_{xy} & z'_{xy} & \dfrac{\partial^2 z}{\partial x \partial y} \\[2ex]
z_{yx} & z'_{yx} & \dfrac{\partial^2 z}{\partial y \partial x} \\[2ex]
z_{yy} & z'_{yy} & \dfrac{\partial^2 z}{\partial y^2}
\end{array}
$$

peti zadatak

Zadatak 5

Odredite parcijalne derivacije drugog reda funkcije $z(x, y) = y^2 \cdot 2^x$.

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Rješenje

$$\boxed{(a^x)' = a^x \ln a}$$

$$\boxed{(x^n)' = nx^{n-1}}$$

$$z_x =$$

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$$\boxed{(a^x)' = a^x \ln a}$$

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Rješenje

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$$z_x = \boxed{y^2 \cdot 2^x \ln 2}$$

$$z_y = 2^x \cdot 2y = y \cdot 2^{x+1}$$

$$z_{xx} = (z_x)_x$$

Zadatak 5

Odredite parcijalne derivacije drugog reda funkcije $z(x,y) = y^2 \cdot 2^x$.

Rješenje

$$(a^x)' = a^x \ln a$$

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Zadatak 5

Odredite parcijalne derivacije drugog reda funkcije $z(x,y) = y^2 \cdot 2^x$.

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Zadatak 5

Odredite parcijalne derivacije drugog reda funkcije $z(x,y) = y^2 \cdot 2^x$.

Rješenje

$$\boxed{(a^x)' = a^x \ln a}$$

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$$z_{yy} =$$

Zadatak 5

Odredite parcijalne derivacije drugog reda funkcije $z(x,y) = y^2 \cdot 2^x$.

Rješenje

$$\boxed{(a^x)' = a^x \ln a}$$

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$$z_{yy} = (z_y)_y$$

Zadatak 5

Odredite parcijalne derivacije drugog reda funkcije $z(x, y) = y^2 \cdot 2^x$.

Rješenje

$$\boxed{(a^x)' = a^x \ln a}$$

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Zadatak 5

Odredite parcijalne derivacije drugog reda funkcije $z(x,y) = y^2 \cdot 2^x$.

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$$\boxed{(a^x)' = a^x \ln a}$$

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$$z_{yy} = (z_y)_y = 2^{x+1} \cdot 1$$

Zadatak 5

Odredite parcijalne derivacije drugog reda funkcije $z(x,y) = y^2 \cdot 2^x$.

Rješenje

$$\boxed{(a^x)' = a^x \ln a}$$

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$$\boxed{(a^x)' = a^x \ln a}$$

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$$z_{yy} = (z_y)_y = 2^{x+1} \cdot 1 = 2^{x+1}$$

šesti zadatak

Zadatak 6

Zadana je funkcija $f(x, y, z) = z \cdot y^x$. *Odredite* $\dfrac{\partial^3 f}{\partial x \partial y \partial z}$.

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Rješenje

$$\boxed{\frac{\partial^3 f}{\partial x \partial y \partial z} \ \rightarrow \ f_{xyz}}$$

Zadatak 6

Zadana je funkcija $f(x, y, z) = z \cdot y^x$. *Odredite* $\dfrac{\partial^3 f}{\partial x \partial y \partial z}$.

Rješenje

$$\boxed{\frac{\partial^3 f}{\partial x \partial y \partial z} \;\rightarrow\; f_{xyz}}$$

$$f_x =$$

Zadatak 6

Zadana je funkcija $f(x,y,z) = z \cdot y^x$. *Odredite* $\dfrac{\partial^3 f}{\partial x \partial y \partial z}$.

Rješenje

$$\boxed{\frac{\partial^3 f}{\partial x \partial y \partial z} \;\rightarrow\; f_{xyz}}$$

$$f_x = z \cdot$$

$$\boxed{(a^x)' = a^x \ln a}$$

Zadatak 6

Zadana je funkcija $f(x, y, z) = z \cdot y^x$. *Odredite* $\dfrac{\partial^3 f}{\partial x \partial y \partial z}$.

Rješenje

$$\boxed{\frac{\partial^3 f}{\partial x \partial y \partial z} \;\to\; f_{xyz}}$$

$$f_x = z \cdot y^x \ln y$$

$$\boxed{(a^x)' = a^x \ln a}$$

Zadatak 6

Zadana je funkcija $f(x,y,z) = z \cdot y^x$. *Odredite* $\dfrac{\partial^3 f}{\partial x \partial y \partial z}$.

Rješenje

$$\boxed{\frac{\partial^3 f}{\partial x \partial y \partial z} \;\rightarrow\; f_{xyz}}$$

$$f_x = z \cdot y^x \ln y = zy^x \ln y$$

$$\boxed{(a^x)' = a^x \ln a}$$

Zadatak 6

Zadana je funkcija $f(x, y, z) = z \cdot y^x$. *Odredite* $\dfrac{\partial^3 f}{\partial x \partial y \partial z}$.

Rješenje

$$\boxed{\frac{\partial^3 f}{\partial x \partial y \partial z} \;\rightarrow\; f_{xyz}}$$

$$f_x = z \cdot y^x \ln y = zy^x \ln y$$

$$f_{xy} =$$

$$\boxed{(a^x)' = a^x \ln a}$$

$$\boxed{(uv)'(x) = u'(x) \cdot v(x) + u(x) \cdot v'(x)}$$

Zadatak 6

Zadana je funkcija $f(x, y, z) = z \cdot y^x$. *Odredite* $\dfrac{\partial^3 f}{\partial x \partial y \partial z}$.

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$$f_x = z \cdot y^x \ln y = zy^x \ln y$$

$$f_{xy} = (f_x)_y$$

$$\boxed{(a^x)' = a^x \ln a}$$

$$\boxed{(uv)'(x) = u'(x) \cdot v(x) + u(x) \cdot v'(x)}$$

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Rješenje

$$\boxed{\frac{\partial^3 f}{\partial x \partial y \partial z} \rightarrow f_{xyz}}$$

$$f_x = z \cdot y^x \ln y = zy^x \ln y$$

$$f_{xy} = (f_x)_y = z$$

$$\boxed{(a^x)' = a^x \ln a} \quad \boxed{(x^n)' = nx^{n-1}}$$

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Rješenje

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Rješenje

$$\frac{\partial^3 f}{\partial x \partial y \partial z} \rightarrow f_{xyz}$$

$$f_x = z \cdot y^x \ln y = zy^x \ln y$$

$$f_{xy} = (f_x)_y = zxy^{x-1} \cdot \ln y$$

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Zadana je funkcija $f(x,y,z) = z\cdot y^x$. *Odredite* $\dfrac{\partial^3 f}{\partial x \partial y \partial z}$.

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Rješenje

$$\boxed{\frac{\partial^3 f}{\partial x \partial y \partial z} \to f_{xyz}}$$

$$f_x = z \cdot y^x \ln y = zy^x \ln y$$

$$f_{xy} = (f_x)_y = zxy^{x-1} \cdot \ln y + zy^x$$

$$\boxed{(a^x)' = a^x \ln a} \quad \boxed{(x^n)' = nx^{n-1}}$$

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Rješenje

$$\boxed{\frac{\partial^3 f}{\partial x \partial y \partial z} \rightarrow f_{xyz}}$$

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$$f_{xy} = (f_x)_y = zxy^{x-1}\cdot \ln y + zy^x \cdot$$

$$\boxed{(a^x)' = a^x \ln a} \quad \boxed{(x^n)' = nx^{n-1}} \quad \boxed{(\ln x)' = \frac{1}{x}}$$

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Zadatak 6

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Rješenje

$$\boxed{\frac{\partial^3 f}{\partial x \partial y \partial z} \;\rightarrow\; f_{xyz}}$$

$$f_x = z \cdot y^x \ln y = zy^x \ln y$$

$$f_{xy} = (f_x)_y = zxy^{x-1} \cdot \ln y + zy^x \cdot \frac{1}{y}$$

$$\boxed{(a^x)' = a^x \ln a} \quad \boxed{(x^n)' = nx^{n-1}} \quad \boxed{(\ln x)' = \frac{1}{x}}$$

$$\boxed{(uv)'(x) = u'(x)\cdot v(x) + u(x)\cdot v'(x)}$$

Zadatak 6

Zadana je funkcija $f(x,y,z) = z\cdot y^x$. *Odredite* $\dfrac{\partial^3 f}{\partial x\partial y\partial z}$.

Rješenje

$$\boxed{\frac{\partial^3 f}{\partial x\partial y\partial z} \;\rightarrow\; f_{xyz}}$$

$$f_x = z\cdot y^x \ln y = zy^x \ln y$$

$$f_{xy} = (f_x)_y = zxy^{x-1}\cdot \ln y + zy^x\cdot\frac{1}{y} = xzy^{x-1}\ln y$$

$$\boxed{(a^x)' = a^x \ln a} \quad \boxed{(x^n)' = nx^{n-1}} \quad \boxed{(\ln x)' = \frac{1}{x}}$$

$$(uv)'(x) = u'(x) \cdot v(x) + u(x) \cdot v'(x)$$

Zadatak 6

Zadana je funkcija $f(x, y, z) = z \cdot y^x$. *Odredite* $\dfrac{\partial^3 f}{\partial x \partial y \partial z}$.

Rješenje

$$\frac{\partial^3 f}{\partial x \partial y \partial z} \rightarrow f_{xyz}$$

$$f_x = z \cdot y^x \ln y = zy^x \ln y$$

$$f_{xy} = (f_x)_y = zxy^{x-1} \cdot \ln y + zy^x \cdot \frac{1}{y} = xzy^{x-1} \ln y +$$

$$(a^x)' = a^x \ln a \qquad (x^n)' = nx^{n-1} \qquad (\ln x)' = \frac{1}{x}$$

$$(uv)'(x) = u'(x) \cdot v(x) + u(x) \cdot v'(x)$$

Zadatak 6

Zadana je funkcija $f(x, y, z) = z \cdot y^x$. *Odredite* $\dfrac{\partial^3 f}{\partial x \partial y \partial z}$.

Rješenje

$$\frac{\partial^3 f}{\partial x \partial y \partial z} \rightarrow f_{xyz}$$

$$f_x = z \cdot y^x \ln y = zy^x \ln y$$

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Zadatak 6

Zadana je funkcija $f(x, y, z) = z \cdot y^x$. *Odredite* $\dfrac{\partial^3 f}{\partial x \partial y \partial z}$.

Rješenje

$$\frac{\partial^3 f}{\partial x \partial y \partial z} \;\rightarrow\; f_{xyz}$$

$$f_x = z \cdot y^x \ln y = zy^x \ln y$$

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$$f_{xyz} =$$

$$(a^x)' = a^x \ln a \qquad (x^n)' = nx^{n-1} \qquad (\ln x)' = \frac{1}{x}$$

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Zadatak 6

Zadana je funkcija $f(x, y, z) = z \cdot y^x$. *Odredite* $\dfrac{\partial^3 f}{\partial x \partial y \partial z}$.

Rješenje

$$\frac{\partial^3 f}{\partial x \partial y \partial z} \rightarrow f_{xyz}$$

$$f_x = z \cdot y^x \ln y = zy^x \ln y$$

$$f_{xy} = (f_x)_y = zxy^{x-1} \cdot \ln y + zy^x \cdot \frac{1}{y} = xzy^{x-1} \ln y + zy^{x-1}$$

$$f_{xyz} = (f_{xy})_z$$

$$(a^x)' = a^x \ln a \qquad (x^n)' = nx^{n-1} \qquad (\ln x)' = \frac{1}{x}$$

$$\boxed{(uv)'(x) = u'(x)\cdot v(x) + u(x)\cdot v'(x)}$$

Zadatak 6

Zadana je funkcija $f(x, y, z) = z \cdot y^x$*. Odredite* $\dfrac{\partial^3 f}{\partial x \partial y \partial z}$.

Rješenje

$$\boxed{\frac{\partial^3 f}{\partial x \partial y \partial z} \;\to\; f_{xyz}}$$

$$f_x = z \cdot y^x \ln y = zy^x \ln y$$

$$f_{xy} = (f_x)_y = zxy^{x-1} \cdot \ln y + zy^x \cdot \frac{1}{y} = xzy^{x-1} \ln y + zy^{x-1}$$

$$f_{xyz} = (f_{xy})_z = xy^{x-1} \ln y$$

$$\boxed{(a^x)' = a^x \ln a} \quad \boxed{(x^n)' = nx^{n-1}} \quad \boxed{(\ln x)' = \frac{1}{x}}$$

$$\boxed{(uv)'(x) = u'(x) \cdot v(x) + u(x) \cdot v'(x)}$$

Zadatak 6

Zadana je funkcija $f(x, y, z) = z \cdot y^x$. *Odredite* $\dfrac{\partial^3 f}{\partial x \partial y \partial z}$.

Rješenje

$$\boxed{\frac{\partial^3 f}{\partial x \partial y \partial z} \rightarrow f_{xyz}}$$

$$f_x = z \cdot y^x \ln y = zy^x \ln y$$

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$$\boxed{(a^x)' = a^x \ln a} \quad \boxed{(x^n)' = nx^{n-1}} \quad \boxed{(\ln x)' = \frac{1}{x}}$$

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Zadatak 6

Zadana je funkcija $f(x,y,z) = z\cdot y^x$. *Odredite* $\dfrac{\partial^3 f}{\partial x \partial y \partial z}$.

Rješenje

$$\boxed{\frac{\partial^3 f}{\partial x \partial y \partial z} \;\to\; f_{xyz}}$$

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$$f_{xyz} = (f_{xy})_z = xy^{x-1}\ln y + y^{x-1}$$

$\boxed{(a^x)' = a^x \ln a}$ $\boxed{(x^n)' = nx^{n-1}}$ $\boxed{(\ln x)' = \dfrac{1}{x}}$

sedmi zadatak

Zadatak 7

Odredite lokalne ekstreme funkcije $f(x,y) = 80 - y^2 + x^3 + 12y - 3x$.

Zadatak 7

Odredite lokalne ekstreme funkcije $f(x, y) = 80 - y^2 + x^3 + 12y - 3x$.

Rješenje

$f_x =$

Zadatak 7

Odredite lokalne ekstreme funkcije $f(x,y) = 80 - y^2 + x^3 + 12y - 3x$.

Rješenje

$$f_x = 3x^2 - 3$$

Zadatak 7

Odredite lokalne ekstreme funkcije $f(x, y) = 80 - y^2 + x^3 + 12y - 3x.$

Rješenje

$$f_x = 3x^2 - 3$$

$$f_y =$$

Zadatak 7

Odredite lokalne ekstreme funkcije $f(x, y) = 80 - y^2 + x^3 + 12y - 3x.$

Rješenje

$$f_x = 3x^2 - 3$$

$$f_y = -2y + 12$$

Zadatak 7

Odredite lokalne ekstreme funkcije $f(x,y) = 80 - y^2 + x^3 + 12y - 3x$.

Rješenje

$$\begin{array}{l|r} f_x = 3x^2 - 3 & 3x^2 - 3 = 0 \\ f_y = -2y + 12 & -2y + 12 = 0 \end{array}$$

Zadatak 7

Odredite lokalne ekstreme funkcije $f(x,y) = 80 - y^2 + x^3 + 12y - 3x.$

Rješenje

$$\begin{array}{l|r} f_x = 3x^2 - 3 & 3x^2 - 3 = 0 \longrightarrow x^2 = 1 \\ f_y = -2y + 12 & -2y + 12 = 0 \end{array}$$

Zadatak 7

Odredite lokalne ekstreme funkcije $f(x, y) = 80 - y^2 + x^3 + 12y - 3x$.

Rješenje

$$\begin{array}{l|r}
f_x = 3x^2 - 3 & 3x^2 - 3 = 0 \longrightarrow x^2 = 1 \longrightarrow x_1 = 1,\ x_2 = -1 \\
f_y = -2y + 12 & -2y + 12 = 0 \qquad\qquad\qquad\qquad\qquad\qquad\qquad\qquad
\end{array}$$

Zadatak 7

Odredite lokalne ekstreme funkcije $f(x,y) = 80 - y^2 + x^3 + 12y - 3x$.

Rješenje

$$
\begin{array}{l|r}
f_x = 3x^2 - 3 & 3x^2 - 3 = 0 \longrightarrow x^2 = 1 \longrightarrow x_1 = 1,\ x_2 = -1 \\
f_y = -2y + 12 & -2y + 12 = 0 \longrightarrow y = 6
\end{array}
$$

Zadatak 7

Odredite lokalne ekstreme funkcije $f(x, y) = 80 - y^2 + x^3 + 12y - 3x.$

Rješenje

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Stacionarne točke:

Zadatak 7

Odredite lokalne ekstreme funkcije $f(x,y) = 80 - y^2 + x^3 + 12y - 3x.$

Rješenje

$$\begin{array}{l|r} f_x = 3x^2 - 3 & 3x^2 - 3 = 0 \longrightarrow x^2 = 1 \longrightarrow x_1 = 1,\ x_2 = -1 \\ f_y = -2y + 12 & -2y + 12 = 0 \longrightarrow y = 6 \end{array}$$

$x_1 \quad y$

Stacionarne točke: $(1,6)$

Zadatak 7

Odredite lokalne ekstreme funkcije $f(x,y) = 80 - y^2 + x^3 + 12y - 3x.$

Rješenje

$$
\begin{array}{l|r}
f_x = 3x^2 - 3 & 3x^2 - 3 = 0 \longrightarrow x^2 = 1 \longrightarrow x_1 = 1,\ x_2 = -1 \\
f_y = -2y + 12 & -2y + 12 = 0 \longrightarrow y = 6 \qquad\qquad\qquad\qquad
\end{array}
$$

Stacionarne točke: $(\overset{x_1}{1}, \overset{y}{6}),\ (\overset{x_2}{-1}, \overset{y}{6})$

Zadatak 7

Odredite lokalne ekstreme funkcije $f(x,y) = 80 - y^2 + x^3 + 12y - 3x$.

Rješenje

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\begin{array}{l|r}
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Stacionarne točke: $(\overset{x_1}{1}, \overset{y}{6}),\ (\overset{x_2}{-1}, \overset{y}{6})$

$f_{xx} =$

Zadatak 7

Odredite lokalne ekstreme funkcije $f(x,y) = 80 - y^2 + x^3 + 12y - 3x.$

Rješenje

$$\begin{array}{l|r} f_x = 3x^2 - 3 & 3x^2 - 3 = 0 \longrightarrow x^2 = 1 \longrightarrow x_1 = 1,\ x_2 = -1 \\ f_y = -2y + 12 & -2y + 12 = 0 \longrightarrow y = 6 \end{array}$$

Stacionarne točke: $(\overset{x_1}{1}, \overset{y}{6}),\ (\overset{x_2}{-1}, \overset{y}{6})$

$f_{xx} = 6x$

Zadatak 7

Odredite lokalne ekstreme funkcije $f(x,y) = 80 - y^2 + x^3 + 12y - 3x$.

Rješenje

$$\left.\begin{aligned} f_x &= 3x^2 - 3 \\ f_y &= -2y + 12 \end{aligned}\right| \quad \begin{aligned} 3x^2 - 3 = 0 &\longrightarrow x^2 = 1 \longrightarrow x_1 = 1,\ x_2 = -1 \\ -2y + 12 = 0 &\longrightarrow y = 6 \end{aligned}$$

Stacionarne točke: $(\overset{x_1}{1}, \overset{y}{6}),\ (\overset{x_2}{-1}, \overset{y}{6})$

$f_{xx} = 6x, \quad f_{xy} =$

Zadatak 7

Odredite lokalne ekstreme funkcije $f(x,y) = 80 - y^2 + x^3 + 12y - 3x$.

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Stacionarne točke: $(\overset{x_1}{1}, \overset{y}{6}),\ (\overset{x_2}{-1}, \overset{y}{6})$

$f_{xx} = 6x, \quad f_{xy} = 0$

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Stacionarne točke: $(\overset{x_1}{1}, \overset{y}{6}),\ (\overset{x_2}{-1}, \overset{y}{6})$

$f_{xx} = 6x, \quad f_{xy} = 0, \quad f_{yy} =$

Zadatak 7

Odredite lokalne ekstreme funkcije $f(x,y) = 80 - y^2 + x^3 + 12y - 3x$.

Rješenje

$$\left.\begin{aligned} f_x &= 3x^2 - 3 \\ f_y &= -2y + 12 \end{aligned}\;\right|\quad \begin{aligned} 3x^2 - 3 = 0 &\longrightarrow x^2 = 1 \longrightarrow x_1 = 1,\; x_2 = -1 \\ -2y + 12 = 0 &\longrightarrow y = 6 \end{aligned}$$

Stacionarne točke: $(\overset{x_1}{1}, \overset{y}{6}),\; (\overset{x_2}{-1}, \overset{y}{6})$

$f_{xx} = 6x, \quad f_{xy} = 0, \quad f_{yy} = -2$

Zadatak 7

Odredite lokalne ekstreme funkcije $f(x,y) = 80 - y^2 + x^3 + 12y - 3x.$

Rješenje

$$\left.\begin{aligned} f_x &= 3x^2 - 3 \\ f_y &= -2y + 12 \end{aligned}\;\right|\quad \begin{aligned} 3x^2 - 3 = 0 &\longrightarrow x^2 = 1 \longrightarrow x_1 = 1,\ x_2 = -1 \\ -2y + 12 = 0 &\longrightarrow y = 6 \end{aligned}$$

Stacionarne točke: $(\overset{x_1}{1}, \overset{y}{6}),\ (\overset{x_2}{-1}, \overset{y}{6})$

$$H(x,y) = \begin{vmatrix} f_{xx} & f_{xy} \\ f_{xy} & f_{yy} \end{vmatrix}$$

$f_{xx} = 6x, \quad f_{xy} = 0, \quad f_{yy} = -2$

Zadatak 7

Odredite lokalne ekstreme funkcije $f(x,y) = 80 - y^2 + x^3 + 12y - 3x.$

Rješenje

$$
\begin{array}{l|l}
f_x = 3x^2 - 3 & 3x^2 - 3 = 0 \longrightarrow x^2 = 1 \longrightarrow x_1 = 1,\ x_2 = -1 \\
f_y = -2y + 12 & -2y + 12 = 0 \longrightarrow y = 6
\end{array}
$$

Stacionarne točke: $(\overset{x_1}{1}, \overset{y}{6}),\ (\overset{x_2}{-1}, \overset{y}{6})$

$f_{xx} = 6x, \quad f_{xy} = 0, \quad f_{yy} = -2$

$$H(x,y) = \begin{vmatrix} f_{xx} & f_{xy} \\ f_{xy} & f_{yy} \end{vmatrix} = \begin{vmatrix} 6x & 0 \\ 0 & -2 \end{vmatrix}$$

Zadatak 7

Odredite lokalne ekstreme funkcije $f(x,y) = 80 - y^2 + x^3 + 12y - 3x$.

Rješenje

$$
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f_y = -2y + 12 & -2y + 12 = 0 \longrightarrow y = 6
\end{array}
$$

Stacionarne točke: $(\overset{x_1}{1}, \overset{y}{6}),\ (\overset{x_2}{-1}, \overset{y}{6})$

$f_{xx} = 6x, \quad f_{xy} = 0, \quad f_{yy} = -2$

$$H(x,y) = \begin{vmatrix} f_{xx} & f_{xy} \\ f_{xy} & f_{yy} \end{vmatrix} = \begin{vmatrix} 6x & 0 \\ 0 & -2 \end{vmatrix}$$

$H(1,6) =$

Zadatak 7

Odredite lokalne ekstreme funkcije $f(x,y) = 80 - y^2 + x^3 + 12y - 3x.$

Rješenje

$$\begin{array}{l|l} f_x = 3x^2 - 3 & 3x^2 - 3 = 0 \longrightarrow x^2 = 1 \longrightarrow x_1 = 1,\ x_2 = -1 \\ f_y = -2y + 12 & -2y + 12 = 0 \longrightarrow y = 6 \end{array}$$

Stacionarne točke: $(\overset{x_1}{1}, \overset{y}{6}),\ (\overset{x_2}{-1}, \overset{y}{6})$

$$H(x,y) = \begin{vmatrix} f_{xx} & f_{xy} \\ f_{xy} & f_{yy} \end{vmatrix} = \begin{vmatrix} 6x & 0 \\ 0 & -2 \end{vmatrix}$$

$$f_{xx} = 6x, \quad f_{xy} = 0, \quad f_{yy} = -2$$

$$H(\overset{x}{1}, \overset{y}{6}) = \begin{vmatrix} 6 & 0 \\ 0 & -2 \end{vmatrix}$$

Zadatak 7

Odredite lokalne ekstreme funkcije $f(x,y) = 80 - y^2 + x^3 + 12y - 3x$.

Rješenje

$$\begin{array}{l|l} f_x = 3x^2 - 3 & 3x^2 - 3 = 0 \longrightarrow x^2 = 1 \longrightarrow x_1 = 1,\ x_2 = -1 \\ f_y = -2y + 12 & -2y + 12 = 0 \longrightarrow y = 6 \end{array}$$

Stacionarne točke: $(\overset{x_1}{1}, \overset{y}{6}),\ (\overset{x_2}{-1}, \overset{y}{6})$

$$H(x,y) = \begin{vmatrix} f_{xx} & f_{xy} \\ f_{xy} & f_{yy} \end{vmatrix} = \begin{vmatrix} 6x & 0 \\ 0 & -2 \end{vmatrix}$$

$f_{xx} = 6x, \quad f_{xy} = 0, \quad f_{yy} = -2$

$$H(\overset{x}{1}, \overset{y}{6}) = \begin{vmatrix} 6 & 0 \\ 0 & -2 \end{vmatrix} = -12$$

Zadatak 7

Odredite lokalne ekstreme funkcije $f(x,y) = 80 - y^2 + x^3 + 12y - 3x$.

Rješenje

$$\begin{array}{l|r}
f_x = 3x^2 - 3 & 3x^2 - 3 = 0 \longrightarrow x^2 = 1 \longrightarrow x_1 = 1,\ x_2 = -1 \\
f_y = -2y + 12 & -2y + 12 = 0 \longrightarrow y = 6
\end{array}$$

Stacionarne točke: $(\overset{x_1}{1}, \overset{y}{6}),\ (\overset{x_2}{-1}, \overset{y}{6})$

$$H(x,y) = \begin{vmatrix} f_{xx} & f_{xy} \\ f_{xy} & f_{yy} \end{vmatrix} = \begin{vmatrix} 6x & 0 \\ 0 & -2 \end{vmatrix}$$

$f_{xx} = 6x, \quad f_{xy} = 0, \quad f_{yy} = -2$

$$H(\overset{x}{1}, \overset{y}{6}) = \begin{vmatrix} 6 & 0 \\ 0 & -2 \end{vmatrix} = -12 < 0$$

Zadatak 7

Odredite lokalne ekstreme funkcije $f(x,y) = 80 - y^2 + x^3 + 12y - 3x$.

Rješenje

$$
\begin{array}{l|l}
f_x = 3x^2 - 3 & 3x^2 - 3 = 0 \longrightarrow x^2 = 1 \longrightarrow x_1 = 1,\ x_2 = -1 \\
f_y = -2y + 12 & -2y + 12 = 0 \longrightarrow y = 6
\end{array}
$$

Stacionarne točke: $(\overset{x_1}{1}, \overset{y}{6}),\ (\overset{x_2}{-1}, \overset{y}{6})$

$f_{xx} = 6x, \quad f_{xy} = 0, \quad f_{yy} = -2$

$$H(x,y) = \begin{vmatrix} f_{xx} & f_{xy} \\ f_{xy} & f_{yy} \end{vmatrix} = \begin{vmatrix} 6x & 0 \\ 0 & -2 \end{vmatrix}$$

$$H(\overset{x}{1}, \overset{y}{6}) = \begin{vmatrix} 6 & 0 \\ 0 & -2 \end{vmatrix} = -12 < 0 \longrightarrow \text{sedlasta točka}$$

Zadatak 7

Odredite lokalne ekstreme funkcije $f(x,y) = 80 - y^2 + x^3 + 12y - 3x.$

Rješenje

$$
\begin{array}{l|l}
f_x = 3x^2 - 3 & 3x^2 - 3 = 0 \longrightarrow x^2 = 1 \longrightarrow x_1 = 1,\ x_2 = -1 \\
f_y = -2y + 12 & -2y + 12 = 0 \longrightarrow y = 6
\end{array}
$$

Stacionarne točke: $(\overset{x_1}{1}, \overset{y}{6}),\ (\overset{x_2}{-1}, \overset{y}{6})$

$$H(x,y) = \begin{vmatrix} f_{xx} & f_{xy} \\ f_{xy} & f_{yy} \end{vmatrix} = \begin{vmatrix} 6x & 0 \\ 0 & -2 \end{vmatrix}$$

$f_{xx} = 6x, \quad f_{xy} = 0, \quad f_{yy} = -2$

$$H(\overset{x}{1}, \overset{y}{6}) = \begin{vmatrix} 6 & 0 \\ 0 & -2 \end{vmatrix} = -12 < 0 \longrightarrow \text{sedlasta točka}$$

$$H(-1,6) =$$

Zadatak 7

Odredite lokalne ekstreme funkcije $f(x,y) = 80 - y^2 + x^3 + 12y - 3x$.

Rješenje

$$
\begin{array}{l|l}
f_x = 3x^2 - 3 & 3x^2 - 3 = 0 \longrightarrow x^2 = 1 \longrightarrow x_1 = 1,\ x_2 = -1 \\
f_y = -2y + 12 & -2y + 12 = 0 \longrightarrow y = 6
\end{array}
$$

Stacionarne točke: $(\overset{x_1}{1}, \overset{y}{6}),\ (\overset{x_2}{-1}, \overset{y}{6})$

$$f_{xx} = 6x, \quad f_{xy} = 0, \quad f_{yy} = -2$$

$$H(x,y) = \begin{vmatrix} f_{xx} & f_{xy} \\ f_{xy} & f_{yy} \end{vmatrix} = \begin{vmatrix} 6x & 0 \\ 0 & -2 \end{vmatrix}$$

$$H(\overset{x}{1}, \overset{y}{6}) = \begin{vmatrix} 6 & 0 \\ 0 & -2 \end{vmatrix} = -12 < 0 \longrightarrow \text{sedlasta točka}$$

$$H(\overset{x}{-1}, \overset{y}{6}) = \begin{vmatrix} -6 & 0 \\ 0 & -2 \end{vmatrix}$$

Zadatak 7

Odredite lokalne ekstreme funkcije $f(x, y) = 80 - y^2 + x^3 + 12y - 3x.$

Rješenje

$$\left.\begin{aligned} f_x &= 3x^2 - 3 \\ f_y &= -2y + 12 \end{aligned}\right| \quad \begin{aligned} 3x^2 - 3 = 0 &\longrightarrow x^2 = 1 \longrightarrow x_1 = 1,\ x_2 = -1 \\ -2y + 12 = 0 &\longrightarrow y = 6 \end{aligned}$$

Stacionarne točke: $(\overset{x_1}{1}, \overset{y}{6}),\ (\overset{x_2}{-1}, \overset{y}{6})$

$$f_{xx} = 6x, \quad f_{xy} = 0, \quad f_{yy} = -2$$

$$H(x, y) = \begin{vmatrix} f_{xx} & f_{xy} \\ f_{xy} & f_{yy} \end{vmatrix} = \begin{vmatrix} 6x & 0 \\ 0 & -2 \end{vmatrix}$$

$$H(\overset{x}{1}, \overset{y}{6}) = \begin{vmatrix} 6 & 0 \\ 0 & -2 \end{vmatrix} = -12 < 0 \longrightarrow \text{sedlasta točka}$$

$$H(\overset{x}{-1}, \overset{y}{6}) = \begin{vmatrix} -6 & 0 \\ 0 & -2 \end{vmatrix} = 12$$

Zadatak 7

Odredite lokalne ekstreme funkcije $f(x,y) = 80 - y^2 + x^3 + 12y - 3x$.

Rješenje

$$\begin{array}{l|l} f_x = 3x^2 - 3 & 3x^2 - 3 = 0 \longrightarrow x^2 = 1 \longrightarrow x_1 = 1,\ x_2 = -1 \\ f_y = -2y + 12 & -2y + 12 = 0 \longrightarrow y = 6 \end{array}$$

Stacionarne točke: $\overset{x_1\ \ y}{(1,6)},\ \overset{x_2\ \ y}{(-1,6)}$

$$H(x,y) = \begin{vmatrix} f_{xx} & f_{xy} \\ f_{xy} & f_{yy} \end{vmatrix} = \begin{vmatrix} 6x & 0 \\ 0 & -2 \end{vmatrix}$$

$f_{xx} = 6x, \quad f_{xy} = 0, \quad f_{yy} = -2$

$$H(\overset{x}{1},\overset{y}{6}) = \begin{vmatrix} 6 & 0 \\ 0 & -2 \end{vmatrix} = -12 < 0 \longrightarrow \text{sedlasta točka}$$

$$H(\overset{x}{-1},\overset{y}{6}) = \begin{vmatrix} -6 & 0 \\ 0 & -2 \end{vmatrix} = 12 > 0$$

Zadatak 7

Odredite lokalne ekstreme funkcije $f(x,y) = 80 - y^2 + x^3 + 12y - 3x$.

Rješenje

$$
\begin{array}{l|r}
f_x = 3x^2 - 3 & 3x^2 - 3 = 0 \longrightarrow x^2 = 1 \longrightarrow x_1 = 1,\ x_2 = -1 \\
f_y = -2y + 12 & -2y + 12 = 0 \longrightarrow y = 6
\end{array}
$$

Stacionarne točke: $(\overset{x_1}{1}, \overset{y}{6}),\ (\overset{x_2}{-1}, \overset{y}{6})$

$f_{xx} = 6x, \quad f_{xy} = 0, \quad f_{yy} = -2$

$$H(x,y) = \begin{vmatrix} f_{xx} & f_{xy} \\ f_{xy} & f_{yy} \end{vmatrix} = \begin{vmatrix} 6x & 0 \\ 0 & -2 \end{vmatrix}$$

$$H(\overset{x}{1}, \overset{y}{6}) = \begin{vmatrix} 6 & 0 \\ 0 & -2 \end{vmatrix} = -12 < 0 \longrightarrow \text{sedlasta točka}$$

$$H(\overset{x}{-1}, \overset{y}{6}) = \begin{vmatrix} \overset{<0}{-6} & 0 \\ 0 & -2 \end{vmatrix} = 12 > 0$$

Zadatak 7

Odredite lokalne ekstreme funkcije $f(x,y) = 80 - y^2 + x^3 + 12y - 3x$.

Rješenje

$$\begin{array}{l|l} f_x = 3x^2 - 3 & 3x^2 - 3 = 0 \longrightarrow x^2 = 1 \longrightarrow x_1 = 1,\ x_2 = -1 \\ f_y = -2y + 12 & -2y + 12 = 0 \longrightarrow y = 6 \end{array}$$

Stacionarne točke: $\overset{x_1}{(1}, \overset{y}{6)}, \ \overset{x_2}{(-1}, \overset{y}{6)}$

$f_{xx} = 6x, \quad f_{xy} = 0, \quad f_{yy} = -2$

$$H(x,y) = \begin{vmatrix} f_{xx} & f_{xy} \\ f_{xy} & f_{yy} \end{vmatrix} = \begin{vmatrix} 6x & 0 \\ 0 & -2 \end{vmatrix}$$

$$H(\overset{x}{1}, \overset{y}{6}) = \begin{vmatrix} 6 & 0 \\ 0 & -2 \end{vmatrix} = -12 < 0 \longrightarrow \text{sedlasta točka}$$

$$H(\overset{x}{-1}, \overset{y}{6}) = \begin{vmatrix} \overset{<0}{-6} & 0 \\ 0 & -2 \end{vmatrix} = 12 > 0 \longrightarrow \text{točka lokalnog maksimuma}$$

Zadatak 7

Odredite lokalne ekstreme funkcije $f(x,y) = 80 - y^2 + x^3 + 12y - 3x$.

Rješenje

$$\begin{array}{l|l} f_x = 3x^2 - 3 & 3x^2 - 3 = 0 \longrightarrow x^2 = 1 \longrightarrow x_1 = 1,\ x_2 = -1 \\ f_y = -2y + 12 & -2y + 12 = 0 \longrightarrow y = 6 \end{array}$$

Stacionarne točke: $\overset{x_1\ y}{(1,6)}$, $\overset{x_2\ y}{(-1,6)}$

$f_{xx} = 6x, \quad f_{xy} = 0, \quad f_{yy} = -2$

$$H(x,y) = \begin{vmatrix} f_{xx} & f_{xy} \\ f_{xy} & f_{yy} \end{vmatrix} = \begin{vmatrix} 6x & 0 \\ 0 & -2 \end{vmatrix}$$

$$H(\overset{x}{1}, \overset{y}{6}) = \begin{vmatrix} 6 & 0 \\ 0 & -2 \end{vmatrix} = -12 < 0 \longrightarrow \text{sedlasta točka}$$

$$H(\overset{x}{-1}, \overset{y}{6}) = \begin{vmatrix} \overset{<0}{-6} & 0 \\ 0 & -2 \end{vmatrix} = 12 > 0 \longrightarrow \text{točka lokalnog maksimuma}$$

$$f(-1,6) =$$

Zadatak 7

Odredite lokalne ekstreme funkcije $f(x,y) = 80 - y^2 + x^3 + 12y - 3x.$

Rješenje

$$\begin{array}{l|l} f_x = 3x^2 - 3 & 3x^2 - 3 = 0 \longrightarrow x^2 = 1 \longrightarrow x_1 = 1,\ x_2 = -1 \\ f_y = -2y + 12 & -2y + 12 = 0 \longrightarrow y = 6 \end{array}$$

Stacionarne točke: $(\overset{x_1}{1}, \overset{y}{6}),\ (\overset{x_2}{-1}, \overset{y}{6})$

$f_{xx} = 6x, \quad f_{xy} = 0, \quad f_{yy} = -2$

$$H(x,y) = \begin{vmatrix} f_{xx} & f_{xy} \\ f_{xy} & f_{yy} \end{vmatrix} = \begin{vmatrix} 6x & 0 \\ 0 & -2 \end{vmatrix}$$

$$H(\overset{x}{1}, \overset{y}{6}) = \begin{vmatrix} 6 & 0 \\ 0 & -2 \end{vmatrix} = -12 < 0 \longrightarrow \text{sedlasta točka}$$

$$H(\overset{x}{-1}, \overset{y}{6}) = \begin{vmatrix} \overset{<0}{-6} & 0 \\ 0 & -2 \end{vmatrix} = 12 > 0 \longrightarrow \text{točka lokalnog maksimuma}$$

$$f(\overset{x}{-1}, \overset{y}{6}) =$$

Zadatak 7

Odredite lokalne ekstreme funkcije $f(x,y) = 80 - y^2 + x^3 + 12y - 3x$.

Rješenje

$$\begin{array}{l|l} f_x = 3x^2 - 3 & 3x^2 - 3 = 0 \longrightarrow x^2 = 1 \longrightarrow x_1 = 1,\ x_2 = -1 \\ f_y = -2y + 12 & -2y + 12 = 0 \longrightarrow y = 6 \end{array}$$

Stacionarne točke: $(\overset{x_1}{1}, \overset{y}{6}),\ (\overset{x_2}{-1}, \overset{y}{6})$

$$f_{xx} = 6x, \quad f_{xy} = 0, \quad f_{yy} = -2$$

$$H(x,y) = \begin{vmatrix} f_{xx} & f_{xy} \\ f_{xy} & f_{yy} \end{vmatrix} = \begin{vmatrix} 6x & 0 \\ 0 & -2 \end{vmatrix}$$

$$H(\overset{x}{1}, \overset{y}{6}) = \begin{vmatrix} 6 & 0 \\ 0 & -2 \end{vmatrix} = -12 < 0 \longrightarrow \text{sedlasta točka}$$

$$H(\overset{x}{-1}, \overset{y}{6}) = \begin{vmatrix} \overset{<0}{-6} & 0 \\ 0 & -2 \end{vmatrix} = 12 > 0 \longrightarrow \text{točka lokalnog maksimuma}$$

$$f(\overset{x}{-1}, \overset{y}{6}) = 80 - 6^2 + (-1)^3 + 12 \cdot 6 - 3 \cdot (-1)$$

Zadatak 7

Odredite lokalne ekstreme funkcije $f(x,y) = 80 - y^2 + x^3 + 12y - 3x$.

Rješenje

$$
\begin{array}{l|l}
f_x = 3x^2 - 3 & 3x^2 - 3 = 0 \longrightarrow x^2 = 1 \longrightarrow x_1 = 1,\ x_2 = -1 \\
f_y = -2y + 12 & -2y + 12 = 0 \longrightarrow y = 6
\end{array}
$$

Stacionarne točke: $(\overset{x_1}{1}, \overset{y}{6}),\ (\overset{x_2}{-1}, \overset{y}{6})$

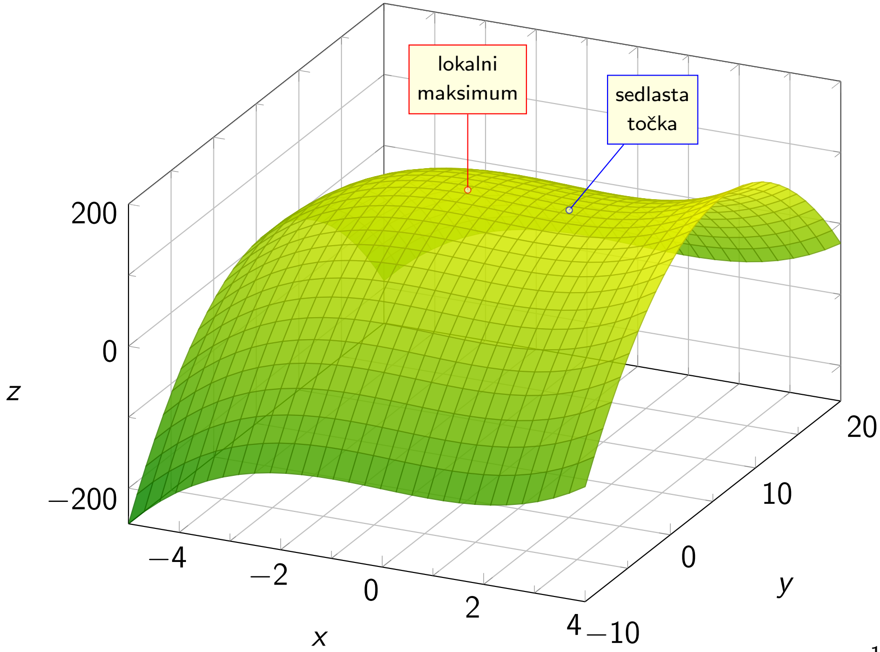
$$
H(x,y) = \begin{vmatrix} f_{xx} & f_{xy} \\ f_{xy} & f_{yy} \end{vmatrix} = \begin{vmatrix} 6x & 0 \\ 0 & -2 \end{vmatrix}
$$

$$f_{xx} = 6x, \quad f_{xy} = 0, \quad f_{yy} = -2$$

$$
H(\overset{x}{1}, \overset{y}{6}) = \begin{vmatrix} 6 & 0 \\ 0 & -2 \end{vmatrix} = -12 < 0 \longrightarrow \text{sedlasta točka}
$$

$$
H(\overset{x}{-1}, \overset{y}{6}) = \begin{vmatrix} \overset{<0}{-6} & 0 \\ 0 & -2 \end{vmatrix} = 12 > 0 \longrightarrow \text{točka lokalnog maksimuma}
$$

$$
f(\overset{x}{-1}, \overset{y}{6}) = 80 - 6^2 + (-1)^3 + 12 \cdot 6 - 3 \cdot (-1) = 118
$$


lokalni maksimum
sedlasta točka
200
0
−200
z
−4
−2
0
2
4
x
−10
0
10
20
y

osmi zadatak

Zadatak 8

Odredite lokalne ekstreme funkcije

$$z(x, y) = \frac{8}{x} + \frac{x}{y} + y.$$

Zadatak 8

Odredite lokalne ekstreme funkcije

$$z(x, y) = \frac{8}{x} + \frac{x}{y} + y.$$

Rješenje

- $x \neq 0, \; y \neq 0$

Zadatak 8

Odredite lokalne ekstreme funkcije

$$z(x,y) = \frac{8}{x} + \frac{x}{y} + y.$$

Rješenje

$$z(x,y) = 8x^{-1} + xy^{-1} + y$$

- $x \neq 0,\ y \neq 0$

Zadatak 8

Odredite lokalne ekstreme funkcije

$$z(x,y) = \frac{8}{x} + \frac{x}{y} + y.$$

Rješenje

$$z(x,y) = 8x^{-1} + xy^{-1} + y$$

- $x \neq 0, \; y \neq 0$

$$z_x =$$

Zadatak 8

Odredite lokalne ekstreme funkcije

$$z(x, y) = \frac{8}{x} + \frac{x}{y} + y.$$

Rješenje

$$z(x, y) = 8x^{-1} + xy^{-1} + y$$

- $x \neq 0, \; y \neq 0$

$$z_x = -8x^{-2}$$

Zadatak 8

Odredite lokalne ekstreme funkcije

$$z(x,y) = \frac{8}{x} + \frac{x}{y} + y.$$

Rješenje

$$z(x,y) = 8x^{-1} + xy^{-1} + y$$

- $x \neq 0,\ y \neq 0$

$$z_x = -8x^{-2} + y^{-1}$$

Zadatak 8

Odredite lokalne ekstreme funkcije

$$z(x,y) = \frac{8}{x} + \frac{x}{y} + y.$$

Rješenje

$$z(x,y) = 8x^{-1} + xy^{-1} + y$$

- $x \neq 0, \; y \neq 0$

$$z_x = -8x^{-2} + y^{-1}$$

$$z_y =$$

Zadatak 8

Odredite lokalne ekstreme funkcije

$$z(x,y)=\frac{8}{x}+\frac{x}{y}+y.$$

Rješenje

$$z(x,y)=8x^{-1}+xy^{-1}+y$$

- $x\neq 0,\ y\neq 0$

$$z_x=-8x^{-2}+y^{-1}$$

$$z_y=-xy^{-2}$$

Zadatak 8

Odredite lokalne ekstreme funkcije

$$z(x, y) = \frac{8}{x} + \frac{x}{y} + y.$$

Rješenje

$$z(x, y) = 8x^{-1} + xy^{-1} + y$$

- $x \neq 0, \;\; y \neq 0$

$$z_x = -8x^{-2} + y^{-1}$$

$$z_y = -xy^{-2} + 1$$

Zadatak 8

Odredite lokalne ekstreme funkcije

$$z(x,y) = \frac{8}{x} + \frac{x}{y} + y.$$

Rješenje

$$z(x,y) = 8x^{-1} + xy^{-1} + y$$

- $x \neq 0, \; y \neq 0$

$$z_x = -8x^{-2} + y^{-1} \qquad -8x^{-2} + y^{-1} = 0$$

$$z_y = -xy^{-2} + 1 \qquad -xy^{-2} + 1 = 0$$

$$
\begin{aligned}
-8x^{-2} + y^{-1} &= 0 \\
-xy^{-2} + 1 &= 0
\end{aligned}
$$

$$
\begin{array}{r}
-8x^{-2} + y^{-1} = 0 \\
-xy^{-2} + 1 = 0 \\
\hline
-\dfrac{8}{x^2} + \dfrac{1}{y} = 0
\end{array}
$$

$$\begin{aligned} -8x^{-2} + y^{-1} &= 0 \\ -xy^{-2} + 1 &= 0 \end{aligned}$$

$$\begin{aligned} -\frac{8}{x^2} + \frac{1}{y} &= 0 \\ -\frac{x}{y^2} + 1 &= 0 \end{aligned}$$

$$
\begin{aligned}
-8x^{-2} + y^{-1} &= 0 \\
-xy^{-2} + 1 &= 0
\end{aligned}
$$

$$
\begin{aligned}
-\frac{8}{x^2} + \frac{1}{y} &= 0 \\
-\frac{x}{y^2} + 1 &= 0
\end{aligned}
$$

$$
\begin{aligned}
-8x^{-2} + y^{-1} &= 0 \\
-xy^{-2} + 1 &= 0
\end{aligned}
$$

$$
\begin{aligned}
-\frac{8}{x^2} + \frac{1}{y} &= 0 \\
-\frac{x}{y^2} + 1 &= 0
\end{aligned}
$$

$$
\begin{aligned}
-8x^{-2} + y^{-1} &= 0 \\
-xy^{-2} + 1 &= 0 \\
\hline
-\frac{8}{x^2} + \frac{1}{y} &= 0 \\
-\frac{x}{y^2} + 1 &= 0 \\
\hline
\end{aligned}
$$

$$
\frac{\qquad\qquad}{x^2 y}
$$

$$-8x^{-2} + y^{-1} = 0$$
$$-xy^{-2} + 1 = 0$$

$$-\frac{8}{x^2} + \frac{1}{y} = 0$$
$$-\frac{x}{y^2} + 1 = 0$$

$$\frac{-8y}{x^2 y}$$

$$
\begin{aligned}
-8x^{-2} + y^{-1} &= 0 \\
-xy^{-2} + 1 &= 0 \\
\hline
-\frac{8}{x^2} + \frac{1}{y} &= 0 \\
-\frac{x}{y^2} + 1 &= 0 \\
\hline
\end{aligned}
$$

$$\frac{-8y +}{x^2 y}$$

$$
\begin{aligned}
-8x^{-2} + y^{-1} &= 0 \\
-xy^{-2} + 1 &= 0
\end{aligned}
$$

$$
\begin{aligned}
-\frac{8}{x^2} + \frac{1}{y} &= 0 \\
-\frac{x}{y^2} + 1 &= 0
\end{aligned}
$$

$$
\frac{-8y + x^2}{x^2 y}
$$

$$
\begin{array}{r}
-8x^{-2} + y^{-1} = 0 \\
-xy^{-2} + 1 = 0 \\
\hline
-\dfrac{8}{x^2} + \dfrac{1}{y} = 0 \\
-\dfrac{x}{y^2} + 1 = 0 \\
\hline
\dfrac{-8y + x^2}{x^2 y} = 0
\end{array}
$$

$$
\begin{aligned}
-8x^{-2} + y^{-1} &= 0 \\
-xy^{-2} + 1 &= 0 \\
\hline
-\frac{8}{x^2} + \frac{1}{y} &= 0 \\
-\frac{x}{y^2} + 1 &= 0 \\
\hline
\frac{-8y + x^2}{x^2 y} &= 0
\end{aligned}
$$

$$
\begin{aligned}
-8x^{-2} + y^{-1} &= 0 \\
-xy^{-2} + 1 &= 0
\end{aligned}
$$

$$
\begin{aligned}
-\frac{8}{x^2} + \frac{1}{y} &= 0 \\
-\frac{x}{y^2} + 1 &= 0
\end{aligned}
$$

$$
\frac{-8y + x^2}{x^2 y} = 0
$$

$$
\frac{}{y^2}
$$

$$\begin{aligned} -8x^{-2} + y^{-1} &= 0 \\ -xy^{-2} + 1 &= 0 \end{aligned}$$

$$\begin{aligned} -\frac{8}{x^2} + \frac{1}{y} &= 0 \\ -\frac{x}{y^2} + 1 &= 0 \end{aligned}$$

$$\frac{-8y + x^2}{x^2 y} = 0$$

$$\frac{-x}{y^2}$$

$$\begin{aligned} -8x^{-2} + y^{-1} &= 0 \\ -xy^{-2} + 1 &= 0 \end{aligned}$$

$$\begin{aligned} -\frac{8}{x^2} + \frac{1}{y} &= 0 \\ -\frac{x}{y^2} + 1 &= 0 \end{aligned}$$

$$\frac{-8y + x^2}{x^2 y} = 0$$

$$\frac{-x +}{y^2}$$

$$\begin{aligned} -8x^{-2} + y^{-1} &= 0 \\ -xy^{-2} + 1 &= 0 \end{aligned}$$

$$\begin{aligned} -\frac{8}{x^2} + \frac{1}{y} &= 0 \\ -\frac{x}{y^2} + 1 &= 0 \end{aligned}$$

$$\frac{-8y + x^2}{x^2 y} = 0$$

$$\frac{-x + y^2}{y^2}$$

$$
\begin{aligned}
-8x^{-2} + y^{-1} &= 0 \\
-xy^{-2} + 1 &= 0 \\
\hline
-\frac{8}{x^2} + \frac{1}{y} &= 0 \\
-\frac{x}{y^2} + 1 &= 0 \\
\hline
\frac{-8y + x^2}{x^2 y} &= 0 \\
\frac{-x + y^2}{y^2} &= 0
\end{aligned}
$$

$$
\begin{aligned}
-8x^{-2} + y^{-1} &= 0 \\
-xy^{-2} + 1 &= 0
\end{aligned}
$$

$$
\begin{aligned}
-\frac{8}{x^2} + \frac{1}{y} &= 0 \\
-\frac{x}{y^2} + 1 &= 0
\end{aligned}
$$

$$
\begin{aligned}
\frac{-8y + x^2}{x^2 y} &= 0 \\
\frac{-x + y^2}{y^2} &= 0
\end{aligned}
$$

$$
\begin{aligned}
-8x^{-2} + y^{-1} &= 0 \\
-xy^{-2} + 1 &= 0 \\
\hline
-\frac{8}{x^2} + \frac{1}{y} &= 0 \\
-\frac{x}{y^2} + 1 &= 0 \\
\hline
\frac{-8y + x^2}{x^2 y} &= 0 \\
\frac{-x + y^2}{y^2} &= 0 \\
\hline
\end{aligned}
$$

$$-8y + x^2 = 0$$

$$\begin{aligned} -8x^{-2} + y^{-1} &= 0 \\ -xy^{-2} + 1 &= 0 \end{aligned}$$

$$\begin{aligned} -\frac{8}{x^2} + \frac{1}{y} &= 0 \\ -\frac{x}{y^2} + 1 &= 0 \end{aligned}$$

$$\begin{aligned} \frac{-8y + x^2}{x^2 y} &= 0 \\ \frac{-x + y^2}{y^2} &= 0 \end{aligned}$$

$$\begin{aligned} -8y + x^2 &= 0 \\ -x + y^2 &= 0 \end{aligned}$$

$$
\begin{aligned}
-8x^{-2} + y^{-1} &= 0 \\
-xy^{-2} + 1 &= 0
\end{aligned}
$$

$$
\begin{aligned}
-\frac{8}{x^2} + \frac{1}{y} &= 0 \\
-\frac{x}{y^2} + 1 &= 0
\end{aligned}
$$

$$
\begin{aligned}
\frac{-8y + x^2}{x^2 y} &= 0 \\
\frac{-x + y^2}{y^2} &= 0
\end{aligned}
$$

$$
\begin{aligned}
-8y + x^2 &= 0 \\
-x + y^2 &= 0
\end{aligned}
$$

$$\begin{aligned} -8x^{-2} + y^{-1} &= 0 \\ -xy^{-2} + 1 &= 0 \end{aligned}$$

$$\begin{aligned} -\frac{8}{x^2} + \frac{1}{y} &= 0 \\ -\frac{x}{y^2} + 1 &= 0 \end{aligned}$$

$$\begin{aligned} \frac{-8y + x^2}{x^2 y} &= 0 \\ \frac{-x + y^2}{y^2} &= 0 \end{aligned}$$

$$\begin{aligned} -8y + x^2 &= 0 \\ -x + y^2 &= 0 \end{aligned}$$

$$\boxed{x = y^2}$$

$$
\begin{aligned}
-8x^{-2} + y^{-1} &= 0 \\
-xy^{-2} + 1 &= 0 \\
\hline
-\frac{8}{x^2} + \frac{1}{y} &= 0 \\
-\frac{x}{y^2} + 1 &= 0 \\
\hline
\frac{-8y + x^2}{x^2 y} &= 0 \\
\frac{-x + y^2}{y^2} &= 0 \\
\hline
\end{aligned}
$$

$$
\begin{aligned}
-8y + x^2 &= 0 \\
-x + y^2 &= 0 \\
\hline
\end{aligned}
$$

$$\boxed{x = y^2}$$

$$
\begin{aligned}
-8x^{-2} + y^{-1} &= 0 \\
-xy^{-2} + 1 &= 0
\end{aligned}
$$

$$
\begin{aligned}
-\frac{8}{x^2} + \frac{1}{y} &= 0 \\
-\frac{x}{y^2} + 1 &= 0
\end{aligned}
$$

$$
\begin{aligned}
\frac{-8y + x^2}{x^2 y} &= 0 \\
\frac{-x + y^2}{y^2} &= 0
\end{aligned}
$$

$$
\begin{aligned}
-8y + x^2 &= 0 \\
-x + y^2 &= 0
\end{aligned}
$$

$$\boxed{x = y^2}$$

$$-8y + \left(y^2\right)^2 = 0$$

$$-8x^{-2} + y^{-1} = 0$$
$$-xy^{-2} + 1 = 0$$

$$-\frac{8}{x^2} + \frac{1}{y} = 0$$
$$-\frac{x}{y^2} + 1 = 0$$

$$\frac{-8y + x^2}{x^2 y} = 0$$
$$\frac{-x + y^2}{y^2} = 0$$

$$-8y + x^2 = 0$$
$$-x + y^2 = 0$$

$$\boxed{x = y^2}$$

$$-8y + \left(y^2\right)^2 = 0$$
$$-8y + y^4 = 0$$

$$\begin{aligned} -8x^{-2} + y^{-1} &= 0 \\ -xy^{-2} + 1 &= 0 \end{aligned}$$

$$\begin{aligned} -\frac{8}{x^2} + \frac{1}{y} &= 0 \\ -\frac{x}{y^2} + 1 &= 0 \end{aligned}$$

$$\begin{aligned} \frac{-8y + x^2}{x^2 y} &= 0 \\ \frac{-x + y^2}{y^2} &= 0 \end{aligned}$$

$$\begin{aligned} -8y + x^2 &= 0 \\ -x + y^2 &= 0 \end{aligned}$$

$$\boxed{x = y^2}$$

$$\begin{aligned} -8y + \left(y^2\right)^2 &= 0 \\ -8y + y^4 &= 0 \\ y\left(y^3 - 8\right) &= 0 \end{aligned}$$

$$
\begin{aligned}
-8x^{-2} + y^{-1} &= 0 \\
-xy^{-2} + 1 &= 0
\end{aligned}
$$

$$
\begin{aligned}
-\frac{8}{x^2} + \frac{1}{y} &= 0 \\
-\frac{x}{y^2} + 1 &= 0
\end{aligned}
$$

$$
\begin{aligned}
\frac{-8y + x^2}{x^2 y} &= 0 \\
\frac{-x + y^2}{y^2} &= 0
\end{aligned}
$$

$$
\begin{aligned}
-8y + x^2 &= 0 \\
-x + y^2 &= 0
\end{aligned}
$$

$$\boxed{x = y^2}$$

$$
\begin{aligned}
-8y + \left(y^2\right)^2 &= 0 \\
-8y + y^4 &= 0 \\
y\left(y^3 - 8\right) &= 0
\end{aligned}
$$

$$y = 0$$

$$-8x^{-2} + y^{-1} = 0$$
$$-xy^{-2} + 1 = 0$$

$$-\frac{8}{x^2} + \frac{1}{y} = 0$$
$$-\frac{x}{y^2} + 1 = 0$$

$$\frac{-8y + x^2}{x^2 y} = 0$$
$$\frac{-x + y^2}{y^2} = 0$$

$$-8y + x^2 = 0$$
$$-x + y^2 = 0$$

$$\boxed{x = y^2}$$

$$-8y + \left(y^2\right)^2 = 0$$
$$-8y + y^4 = 0$$
$$y\left(y^3 - 8\right) = 0$$

$$y = 0 \qquad\qquad y^3 - 8 = 0$$

$$-8x^{-2} + y^{-1} = 0$$
$$-xy^{-2} + 1 = 0$$

$$-\frac{8}{x^2} + \frac{1}{y} = 0$$
$$-\frac{x}{y^2} + 1 = 0$$

$$\frac{-8y + x^2}{x^2 y} = 0$$
$$\frac{-x + y^2}{y^2} = 0$$

$$-8y + x^2 = 0$$
$$-x + y^2 = 0$$

$$\boxed{x = y^2}$$

$$-8y + \left(y^2\right)^2 = 0$$
$$-8y + y^4 = 0$$
$$y\left(y^3 - 8\right) = 0$$

$\cancel{y = 0}$ $\qquad$ $y^3 - 8 = 0$

nije u domeni

$$
\begin{aligned}
-8x^{-2} + y^{-1} &= 0\\
-xy^{-2} + 1 &= 0
\end{aligned}
$$

$$
\begin{aligned}
-\frac{8}{x^2} + \frac{1}{y} &= 0\\
-\frac{x}{y^2} + 1 &= 0
\end{aligned}
$$

$$
\begin{aligned}
\frac{-8y + x^2}{x^2 y} &= 0\\
\frac{-x + y^2}{y^2} &= 0
\end{aligned}
$$

$$
\begin{aligned}
-8y + x^2 &= 0\\
-x + y^2 &= 0
\end{aligned}
$$

$$\boxed{x = y^2}$$

$$
\begin{aligned}
-8y + \left(y^2\right)^2 &= 0\\
-8y + y^4 &= 0\\
y\left(y^3 - 8\right) &= 0
\end{aligned}
$$

$\cancel{y = 0}$

nije u domeni

$$
\begin{aligned}
y^3 - 8 &= 0\\
y &= 2
\end{aligned}
$$

$$\begin{aligned} -8x^{-2} + y^{-1} &= 0 \\ -xy^{-2} + 1 &= 0 \end{aligned}$$

$$\begin{aligned} -\frac{8}{x^2} + \frac{1}{y} &= 0 \\ -\frac{x}{y^2} + 1 &= 0 \end{aligned}$$

$$\begin{aligned} \frac{-8y + x^2}{x^2 y} &= 0 \\ \frac{-x + y^2}{y^2} &= 0 \end{aligned}$$

$$\begin{aligned} -8y + x^2 &= 0 \\ -x + y^2 &= 0 \end{aligned}$$

$$\boxed{x = y^2}$$

$$\begin{aligned} -8y + \left(y^2\right)^2 &= 0 \\ -8y + y^4 &= 0 \\ y\left(y^3 - 8\right) &= 0 \end{aligned}$$

$\cancel{y = 0}$ nije u domeni

$y^3 - 8 = 0$

$$\boxed{y = 2}$$

$$\begin{aligned} -8x^{-2} + y^{-1} &= 0 \\ -xy^{-2} + 1 &= 0 \end{aligned}$$

$$\begin{aligned} -\frac{8}{x^2} + \frac{1}{y} &= 0 \\ -\frac{x}{y^2} + 1 &= 0 \end{aligned}$$

$$\begin{aligned} \frac{-8y + x^2}{x^2 y} &= 0 \\ \frac{-x + y^2}{y^2} &= 0 \end{aligned}$$

$$\begin{aligned} -8y + x^2 &= 0 \\ -x + y^2 &= 0 \end{aligned}$$

$$\boxed{x = y^2}$$

$$\begin{aligned} -8y + \left(y^2\right)^2 &= 0 \\ -8y + y^4 &= 0 \\ y\left(y^3 - 8\right) &= 0 \end{aligned}$$

$\cancel{y = 0}$

nije u domeni

$y^3 - 8 = 0$

$$\boxed{y = 2}$$

$$\begin{aligned} -8x^{-2} + y^{-1} &= 0 \\ -xy^{-2} + 1 &= 0 \end{aligned}$$

$$\begin{aligned} -\frac{8}{x^2} + \frac{1}{y} &= 0 \\ -\frac{x}{y^2} + 1 &= 0 \end{aligned}$$

$$\begin{aligned} \frac{-8y + x^2}{x^2 y} &= 0 \\ \frac{-x + y^2}{y^2} &= 0 \end{aligned}$$

$$\begin{aligned} -8y + x^2 &= 0 \\ -x + y^2 &= 0 \end{aligned}$$

$$\boxed{x = y^2}$$

$$\begin{aligned} -8y + \left(y^2\right)^2 &= 0 \\ -8y + y^4 &= 0 \\ y\left(y^3 - 8\right) &= 0 \end{aligned}$$

$\cancel{y = 0}$

nije u domeni

$y^3 - 8 = 0$

$$\boxed{y = 2}$$

$x = 4$

$$\begin{aligned} -8x^{-2} + y^{-1} &= 0 \\ -xy^{-2} + 1 &= 0 \end{aligned}$$

$$\begin{aligned} -\frac{8}{x^2} + \frac{1}{y} &= 0 \\ -\frac{x}{y^2} + 1 &= 0 \end{aligned}$$

$$\begin{aligned} \frac{-8y + x^2}{x^2 y} &= 0 \\ \frac{-x + y^2}{y^2} &= 0 \end{aligned}$$

$$\begin{aligned} -8y + x^2 &= 0 \\ -x + y^2 &= 0 \end{aligned}$$

$$\boxed{x = y^2}$$

$$\begin{aligned} -8y + \left(y^2\right)^2 &= 0 \\ -8y + y^4 &= 0 \\ y\left(y^3 - 8\right) &= 0 \end{aligned}$$

$\cancel{y = 0}$

nije u domeni

$y^3 - 8 = 0$

$$\boxed{y = 2}$$

$$\boxed{x = 4}$$

$$
\begin{aligned}
-8x^{-2}+y^{-1} &= 0\\
-xy^{-2}+1 &= 0
\end{aligned}
$$

$$
\begin{aligned}
-\frac{8}{x^2}+\frac{1}{y} &= 0\\
-\frac{x}{y^2}+1 &= 0
\end{aligned}
$$

$$
\begin{aligned}
\frac{-8y+x^2}{x^2y} &= 0\\
\frac{-x+y^2}{y^2} &= 0
\end{aligned}
$$

$$
\begin{aligned}
-8y+x^2 &= 0\\
-x+y^2 &= 0
\end{aligned}
$$

$$\boxed{x=y^2}$$

$$
\begin{aligned}
-8y+\left(y^2\right)^2 &= 0\\
-8y+y^4 &= 0\\
y\left(y^3-8\right) &= 0
\end{aligned}
$$

$\cancel{y=0}$ nije u domeni

$y^3-8=0$

$\boxed{y=2}$

$\boxed{x=4}$

Stacionarna točka:

$$
\begin{aligned}
-8x^{-2} + y^{-1} &= 0\\
-xy^{-2} + 1 &= 0
\end{aligned}
$$

$$
\begin{aligned}
-\frac{8}{x^2} + \frac{1}{y} &= 0\\
-\frac{x}{y^2} + 1 &= 0
\end{aligned}
$$

$$
\begin{aligned}
\frac{-8y + x^2}{x^2 y} &= 0\\
\frac{-x + y^2}{y^2} &= 0
\end{aligned}
$$

$$
\begin{aligned}
-8y + x^2 &= 0\\
-x + y^2 &= 0
\end{aligned}
$$

$$\boxed{x = y^2}$$

$$
\begin{aligned}
-8y + \left(y^2\right)^2 &= 0\\
-8y + y^4 &= 0\\
y\left(y^3 - 8\right) &= 0
\end{aligned}
$$

$\cancel{y = 0}$ nije u domeni

$y^3 - 8 = 0$

$\boxed{y = 2}$

$\boxed{x = 4}$

Stacionarna točka: $(4, 2)$

$$\boxed{z_x = -8x^{-2} + y^{-1}} \quad \boxed{z_y = -xy^{-2} + 1}$$

$$\boxed{z = \frac{8}{x} + \frac{x}{y} + y}$$

$$z_{xx} =$$

$\boxed{z_x = -8x^{-2} + y^{-1}}$ $\boxed{z_y = -xy^{-2} + 1}$

$$\boxed{z = \frac{8}{x} + \frac{x}{y} + y}$$

$$z_{xx} = -8 \cdot$$

$$\boxed{z_x = -8x^{-2} + y^{-1}}$$ $$\boxed{z_y = -xy^{-2} + 1}$$

$$\boxed{z = \frac{8}{x} + \frac{x}{y} + y}$$

$$z_{xx} = -8 \cdot (-2)x^{-3}$$

$\boxed{z_x = -8x^{-2} + y^{-1}}$ $\boxed{z_y = -xy^{-2} + 1}$

$$\boxed{z = \frac{8}{x} + \frac{x}{y} + y}$$

$$z_{xx} = -8 \cdot (-2)x^{-3} = \frac{16}{x^3}$$

$\boxed{z_x = -8x^{-2} + y^{-1}}$ $\boxed{z_y = -xy^{-2} + 1}$

$$\boxed{z = \frac{8}{x} + \frac{x}{y} + y}$$

$$z_{xx} = -8 \cdot (-2)x^{-3} = \frac{16}{x^3}$$

$$z_{xy} =$$

$$\boxed{z_x = -8x^{-2} + y^{-1}} \quad \boxed{z_y = -xy^{-2} + 1}$$

$$\boxed{z = \frac{8}{x} + \frac{x}{y} + y}$$

$$z_{xx} = -8 \cdot (-2)x^{-3} = \frac{16}{x^3}$$

$$z_{xy} = -1 \cdot y^{-2}$$

$$\boxed{z_x = -8x^{-2} + y^{-1}} \quad \boxed{z_y = -xy^{-2} + 1}$$

$$\boxed{z = \frac{8}{x} + \frac{x}{y} + y}$$

$$z_{xx} = -8 \cdot (-2)x^{-3} = \frac{16}{x^3}$$

$$z_{xy} = -1 \cdot y^{-2} = -\frac{1}{y^2}$$

$\boxed{z_x = -8x^{-2} + y^{-1}}$ $\boxed{z_y = -xy^{-2} + 1}$

$$\boxed{z = \frac{8}{x} + \frac{x}{y} + y}$$

$$z_{xx} = -8 \cdot (-2)x^{-3} = \frac{16}{x^3}$$

$$z_{xy} = -1 \cdot y^{-2} = -\frac{1}{y^2}$$

$$z_{yy} =$$

$$\boxed{z_x = -8x^{-2} + y^{-1}} \quad \boxed{z_y = -xy^{-2} + 1}$$

$$\boxed{z = \frac{8}{x} + \frac{x}{y} + y}$$

$$z_{xx} = -8 \cdot (-2)x^{-3} = \frac{16}{x^3}$$

$$z_{xy} = -1 \cdot y^{-2} = -\frac{1}{y^2}$$

$$z_{yy} = -x \cdot$$

$$\boxed{z_x = -8x^{-2} + y^{-1}} \quad \boxed{z_y = -xy^{-2} + 1}$$

$$\boxed{z = \frac{8}{x} + \frac{x}{y} + y}$$

$$z_{xx} = -8 \cdot (-2)x^{-3} = \frac{16}{x^3}$$

$$z_{xy} = -1 \cdot y^{-2} = -\frac{1}{y^2}$$

$$z_{yy} = -x \cdot (-2)y^{-3}$$

$\boxed{z_x = -8x^{-2} + y^{-1}}$ $\boxed{z_y = -xy^{-2} + 1}$ $\boxed{z = \dfrac{8}{x} + \dfrac{x}{y} + y}$

$$z_{xx} = -8 \cdot (-2)x^{-3} = \frac{16}{x^3}$$

$$z_{xy} = -1 \cdot y^{-2} = -\frac{1}{y^2}$$

$$z_{yy} = -x \cdot (-2)y^{-3} = \frac{2x}{y^3}$$

$\boxed{z_x = -8x^{-2} + y^{-1}}$ $\boxed{z_y = -xy^{-2} + 1}$

$$\boxed{z = \frac{8}{x} + \frac{x}{y} + y}$$

$$z_{xx} = -8 \cdot (-2)x^{-3} = \frac{16}{x^3}$$

$$z_{xy} = -1 \cdot y^{-2} = -\frac{1}{y^2}$$

$$z_{yy} = -x \cdot (-2)y^{-3} = \frac{2x}{y^3}$$

$$H(x,y) = \begin{vmatrix} \frac{16}{x^3} & -\frac{1}{y^2} \\ -\frac{1}{y^2} & \frac{2x}{y^3} \end{vmatrix}$$

$\boxed{z_x = -8x^{-2} + y^{-1}}$ $\boxed{z_y = -xy^{-2} + 1}$ $\boxed{z = \dfrac{8}{x} + \dfrac{x}{y} + y}$

$$z_{xx} = -8 \cdot (-2)x^{-3} = \frac{16}{x^3}$$

$$z_{xy} = -1 \cdot y^{-2} = -\frac{1}{y^2}$$

$$z_{yy} = -x \cdot (-2)y^{-3} = \frac{2x}{y^3}$$

$$H(x,y) = \begin{vmatrix} \dfrac{16}{x^3} & -\dfrac{1}{y^2} \\ -\dfrac{1}{y^2} & \dfrac{2x}{y^3} \end{vmatrix}$$

$H(4,2) =$

$\boxed{z_x = -8x^{-2} + y^{-1}}$ $\boxed{z_y = -xy^{-2} + 1}$

$$\boxed{z = \frac{8}{x} + \frac{x}{y} + y}$$

$$z_{xx} = -8 \cdot (-2)x^{-3} = \frac{16}{x^3}$$

$$z_{xy} = -1 \cdot y^{-2} = -\frac{1}{y^2}$$

$$z_{yy} = -x \cdot (-2)y^{-3} = \frac{2x}{y^3}$$

$$H(x, y) = \begin{vmatrix} \frac{16}{x^3} & -\frac{1}{y^2} \\ -\frac{1}{y^2} & \frac{2x}{y^3} \end{vmatrix}$$

$$H(\overset{x}{4}, \overset{y}{2}) =$$

$\boxed{z_x = -8x^{-2} + y^{-1}}$ $\boxed{z_y = -xy^{-2} + 1}$

$$\boxed{z = \frac{8}{x} + \frac{x}{y} + y}$$

$$z_{xx} = -8 \cdot (-2)x^{-3} = \frac{16}{x^3}$$

$$z_{xy} = -1 \cdot y^{-2} = -\frac{1}{y^2}$$

$$z_{yy} = -x \cdot (-2)y^{-3} = \frac{2x}{y^3}$$

$$H(x,y) = \begin{vmatrix} \frac{16}{x^3} & -\frac{1}{y^2} \\ -\frac{1}{y^2} & \frac{2x}{y^3} \end{vmatrix}$$

$$H(\overset{x}{4}, \overset{y}{2}) = \begin{vmatrix} \frac{1}{4} & -\frac{1}{4} \\ -\frac{1}{4} & 1 \end{vmatrix}$$

$$\boxed{z_x = -8x^{-2} + y^{-1}} \quad \boxed{z_y = -xy^{-2} + 1} \qquad \boxed{z = \frac{8}{x} + \frac{x}{y} + y}$$

$$z_{xx} = -8 \cdot (-2)x^{-3} = \frac{16}{x^3}$$

$$z_{xy} = -1 \cdot y^{-2} = -\frac{1}{y^2}$$

$$z_{yy} = -x \cdot (-2)y^{-3} = \frac{2x}{y^3}$$

$$H(x,y) = \begin{vmatrix} \frac{16}{x^3} & -\frac{1}{y^2} \\ -\frac{1}{y^2} & \frac{2x}{y^3} \end{vmatrix}$$

$$H(\overset{x}{4}, \overset{y}{2}) = \begin{vmatrix} \frac{1}{4} & -\frac{1}{4} \\ -\frac{1}{4} & 1 \end{vmatrix} = \frac{1}{4} - \frac{1}{16}$$

$$\boxed{z_x = -8x^{-2} + y^{-1}} \quad \boxed{z_y = -xy^{-2} + 1}$$

$$\boxed{z = \frac{8}{x} + \frac{x}{y} + y}$$

$$z_{xx} = -8 \cdot (-2)x^{-3} = \frac{16}{x^3}$$

$$z_{xy} = -1 \cdot y^{-2} = -\frac{1}{y^2}$$

$$z_{yy} = -x \cdot (-2)y^{-3} = \frac{2x}{y^3}$$

$$H(x,y) = \begin{vmatrix} \frac{16}{x^3} & -\frac{1}{y^2} \\ -\frac{1}{y^2} & \frac{2x}{y^3} \end{vmatrix}$$

$$H(\overset{x}{4}, \overset{y}{2}) = \begin{vmatrix} \frac{1}{4} & -\frac{1}{4} \\ -\frac{1}{4} & 1 \end{vmatrix} = \frac{1}{4} - \frac{1}{16} = \frac{3}{16}$$

$$\boxed{z_x = -8x^{-2} + y^{-1}} \quad \boxed{z_y = -xy^{-2} + 1}$$

$$\boxed{z = \frac{8}{x} + \frac{x}{y} + y}$$

$$z_{xx} = -8 \cdot (-2)x^{-3} = \frac{16}{x^3}$$

$$z_{xy} = -1 \cdot y^{-2} = -\frac{1}{y^2}$$

$$z_{yy} = -x \cdot (-2)y^{-3} = \frac{2x}{y^3}$$

$$H(x,y) = \begin{vmatrix} \frac{16}{x^3} & -\frac{1}{y^2} \\ -\frac{1}{y^2} & \frac{2x}{y^3} \end{vmatrix}$$

$$H(\overset{x}{4}, \overset{y}{2}) = \begin{vmatrix} \frac{1}{4} & -\frac{1}{4} \\ -\frac{1}{4} & 1 \end{vmatrix} = \frac{1}{4} - \frac{1}{16} = \frac{3}{16} > 0$$

$$\boxed{z_x = -8x^{-2} + y^{-1}} \quad \boxed{z_y = -xy^{-2} + 1} \qquad \boxed{z = \frac{8}{x} + \frac{x}{y} + y}$$

$$z_{xx} = -8 \cdot (-2)x^{-3} = \frac{16}{x^3}$$

$$z_{xy} = -1 \cdot y^{-2} = -\frac{1}{y^2}$$

$$z_{yy} = -x \cdot (-2)y^{-3} = \frac{2x}{y^3}$$

$$H(x,y) = \begin{vmatrix} \frac{16}{x^3} & -\frac{1}{y^2} \\ -\frac{1}{y^2} & \frac{2x}{y^3} \end{vmatrix}$$

$$H(\overset{x}{4}, \overset{y}{2}) = \begin{vmatrix} \overset{>0}{\frac{1}{4}} & -\frac{1}{4} \\ -\frac{1}{4} & 1 \end{vmatrix} = \frac{1}{4} - \frac{1}{16} = \frac{3}{16} > 0$$

$$\boxed{z_x = -8x^{-2} + y^{-1}} \quad \boxed{z_y = -xy^{-2} + 1} \qquad \boxed{z = \frac{8}{x} + \frac{x}{y} + y}$$

$$z_{xx} = -8 \cdot (-2)x^{-3} = \frac{16}{x^3}$$

$$z_{xy} = -1 \cdot y^{-2} = -\frac{1}{y^2}$$

$$z_{yy} = -x \cdot (-2)y^{-3} = \frac{2x}{y^3}$$

$$H(x, y) = \begin{vmatrix} \frac{16}{x^3} & -\frac{1}{y^2} \\ -\frac{1}{y^2} & \frac{2x}{y^3} \end{vmatrix}$$

$$H(\overset{x}{4}, \overset{y}{2}) = \begin{vmatrix} \overset{>0}{\frac{1}{4}} & -\frac{1}{4} \\ -\frac{1}{4} & 1 \end{vmatrix} = \frac{1}{4} - \frac{1}{16} = \frac{3}{16} > 0 \longrightarrow \text{točka lokalnog minimuma}$$

$$\boxed{z_x = -8x^{-2} + y^{-1}} \quad \boxed{z_y = -xy^{-2} + 1} \qquad \boxed{z = \frac{8}{x} + \frac{x}{y} + y}$$

$$z_{xx} = -8 \cdot (-2)x^{-3} = \frac{16}{x^3}$$

$$z_{xy} = -1 \cdot y^{-2} = -\frac{1}{y^2}$$

$$z_{yy} = -x \cdot (-2)y^{-3} = \frac{2x}{y^3}$$

$$H(x,y) = \begin{vmatrix} \frac{16}{x^3} & -\frac{1}{y^2} \\ -\frac{1}{y^2} & \frac{2x}{y^3} \end{vmatrix}$$

$$H(\overset{x}{4}, \overset{y}{2}) = \begin{vmatrix} \overset{>0}{\frac{1}{4}} & -\frac{1}{4} \\ -\frac{1}{4} & 1 \end{vmatrix} = \frac{1}{4} - \frac{1}{16} = \frac{3}{16} > 0 \longrightarrow \text{točka lokalnog minimuma}$$

$$z(4,2) =$$

$$\boxed{z_x = -8x^{-2} + y^{-1}} \quad \boxed{z_y = -xy^{-2} + 1} \qquad \boxed{z = \frac{8}{x} + \frac{x}{y} + y}$$

$$z_{xx} = -8 \cdot (-2)x^{-3} = \frac{16}{x^3}$$

$$z_{xy} = -1 \cdot y^{-2} = -\frac{1}{y^2}$$

$$z_{yy} = -x \cdot (-2)y^{-3} = \frac{2x}{y^3}$$

$$H(x,y) = \begin{vmatrix} \frac{16}{x^3} & -\frac{1}{y^2} \\ -\frac{1}{y^2} & \frac{2x}{y^3} \end{vmatrix}$$

$$H(\overset{x}{4}, \overset{y}{2}) = \begin{vmatrix} \frac{1}{4} & -\frac{1}{4} \\ -\frac{1}{4} & 1 \end{vmatrix} = \frac{1}{4} - \frac{1}{16} = \frac{3}{16} > 0 \longrightarrow \text{točka lokalnog minimuma}$$

$\frac{1}{4} > 0$

$$z(\overset{x}{4}, \overset{y}{2}) =$$

$$\boxed{z_x = -8x^{-2} + y^{-1}} \qquad \boxed{z_y = -xy^{-2} + 1} \qquad \boxed{z = \frac{8}{x} + \frac{x}{y} + y}$$

$$z_{xx} = -8 \cdot (-2)x^{-3} = \frac{16}{x^3}$$

$$z_{xy} = -1 \cdot y^{-2} = -\frac{1}{y^2}$$

$$z_{yy} = -x \cdot (-2)y^{-3} = \frac{2x}{y^3}$$

$$H(x,y) = \begin{vmatrix} \frac{16}{x^3} & -\frac{1}{y^2} \\ -\frac{1}{y^2} & \frac{2x}{y^3} \end{vmatrix}$$

$$H(\overset{x}{4}, \overset{y}{2}) = \begin{vmatrix} \frac{1}{4} > 0 & -\frac{1}{4} \\ -\frac{1}{4} & 1 \end{vmatrix} = \frac{1}{4} - \frac{1}{16} = \frac{3}{16} > 0 \longrightarrow$$ točka lokalnog minimuma

$$z(\overset{x}{4}, \overset{y}{2}) = \frac{8}{4} + \frac{4}{2} + 2$$

$\boxed{z_x = -8x^{-2} + y^{-1}}$ $\boxed{z_y = -xy^{-2} + 1}$ $\boxed{z = \frac{8}{x} + \frac{x}{y} + y}$

$$z_{xx} = -8 \cdot (-2)x^{-3} = \frac{16}{x^3}$$

$$z_{xy} = -1 \cdot y^{-2} = -\frac{1}{y^2}$$

$$z_{yy} = -x \cdot (-2)y^{-3} = \frac{2x}{y^3}$$

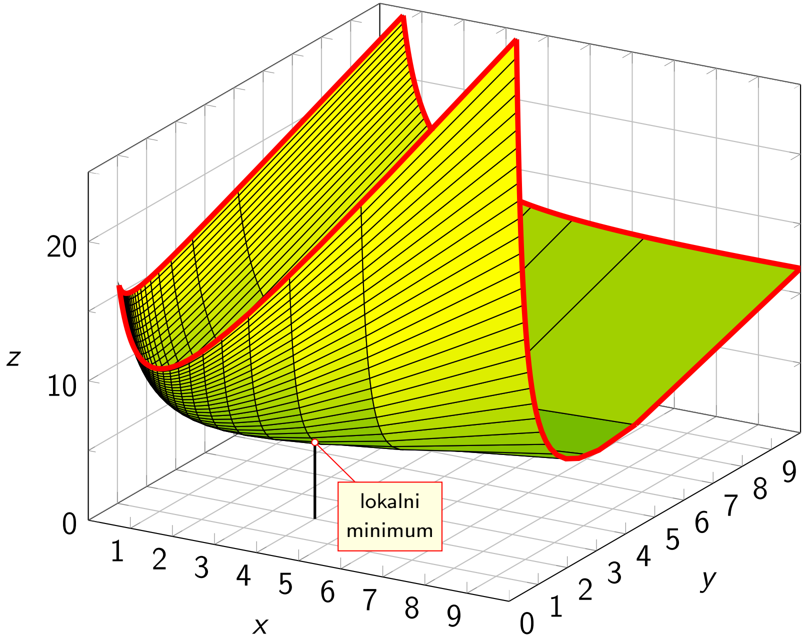
$$H(x, y) = \begin{vmatrix} \frac{16}{x^3} & -\frac{1}{y^2} \\ -\frac{1}{y^2} & \frac{2x}{y^3} \end{vmatrix}$$

$$H(\overset{x}{4}, \overset{y}{2}) = \begin{vmatrix} \frac{1}{4} & -\frac{1}{4} \\ -\frac{1}{4} & 1 \end{vmatrix} = \frac{1}{4} - \frac{1}{16} = \frac{3}{16} > 0 \longrightarrow$$

> 0

točka lokalnog minimuma

$$z(\overset{x}{4}, \overset{y}{2}) = \frac{8}{4} + \frac{4}{2} + 2 = 6$$



20
10
0
z
1
2
3
4
5
6
7
8
9
x
0
1
2
3
4
5
6
7
8
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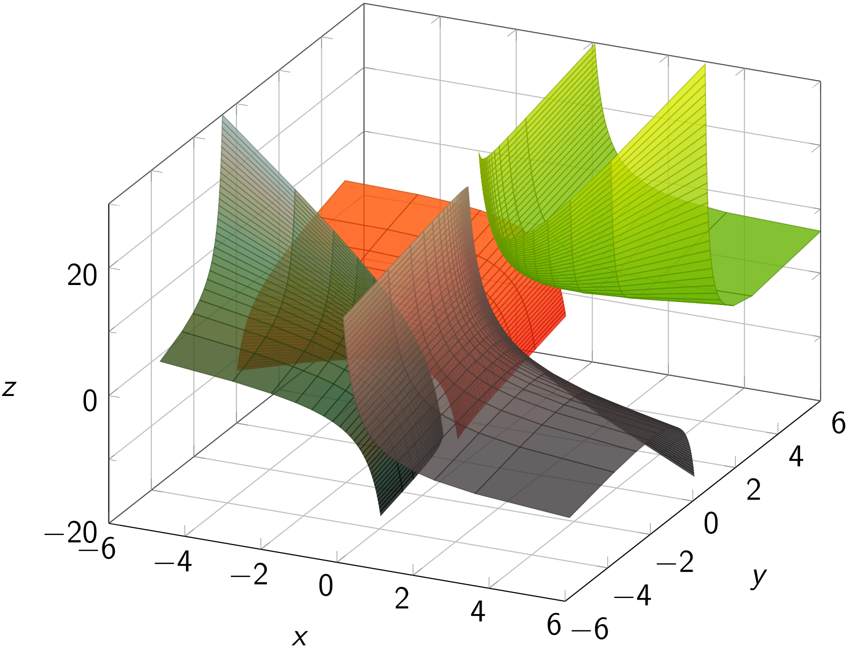
y
lokalni
minimum



20
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x
6
4
2
0
−2
−4
−6
y

deveti zadatak

Zadatak 9

Odredite ekstreme funkcije $z(x, y) = e^{xy}$ *uz uvjet* $x + y = 4$.

Zadatak 9

Odredite ekstreme funkcije $z(x, y) = e^{xy}$ *uz uvjet* $x + y = 4$.

Rješenje

$$x + y = 4$$

Zadatak 9

Odredite ekstreme funkcije $z(x, y) = e^{xy}$ *uz uvjet* $x + y = 4$.

Rješenje

$$x + y = 4 \quad \Longrightarrow \quad y = 4 - x$$

Zadatak 9

Odredite ekstreme funkcije $z(x,y) = e^{xy}$ *uz uvjet* $x + y = 4$.

Rješenje

$$x + y = 4 \quad \Longrightarrow \quad \boxed{y = 4 - x}$$

Zadatak 9

Odredite ekstreme funkcije $z(x, y) = e^{xy}$ *uz uvjet* $x + y = 4$.

Rješenje

$$x + y = 4 \quad \Longrightarrow \quad \boxed{y = 4 - x}$$

$$z(x, 4 - x) =$$

Zadatak 9

Odredite ekstreme funkcije $z(x, y) = e^{xy}$ *uz uvjet* $x + y = 4$.

Rješenje

$$x + y = 4 \quad \Longrightarrow \quad \boxed{y = 4 - x}$$

$$z(x, 4 - x) = e^{x \cdot (4-x)}$$

Zadatak 9

Odredite ekstreme funkcije $z(x, y) = e^{xy}$ *uz uvjet* $x + y = 4$.

Rješenje

$$x + y = 4 \quad \Longrightarrow \quad \boxed{y = 4 - x}$$

$$z(x, 4 - x) = e^{x\cdot(4-x)} = e^{4x-x^2}$$

Zadatak 9

Odredite ekstreme funkcije $z(x,y) = e^{xy}$ *uz uvjet* $x + y = 4$.

Rješenje

$$x + y = 4 \quad \Longrightarrow \quad \boxed{y = 4 - x}$$

$$z(x, 4-x) = e^{x\cdot(4-x)} = e^{4x-x^2} \longrightarrow f(x) = e^{4x-x^2}$$

Zadatak 9

Odredite ekstreme funkcije $z(x, y) = e^{xy}$ *uz uvjet* $x + y = 4$.

Rješenje

$$x + y = 4 \implies \boxed{\boxed{y = 4 - x}}$$

$$z(x, 4 - x) = e^{x \cdot (4-x)} = e^{4x - x^2} \longrightarrow f(x) = e^{4x-x^2}$$

$$f'(x) =$$

Zadatak 9

Odredite ekstreme funkcije $z(x,y) = e^{xy}$ *uz uvjet* $x + y = 4$.

Rješenje

$$x + y = 4 \quad \Longrightarrow \quad \boxed{y = 4 - x}$$

$$z(x, 4 - x) = e^{x\cdot(4-x)} = e^{4x-x^2} \longrightarrow f(x) = e^{4x-x^2}$$

$$f'(x) = e^{4x-x^2}$$

Zadatak 9

Odredite ekstreme funkcije $z(x,y) = e^{xy}$ *uz uvjet* $x + y = 4$.

Rješenje

$$x + y = 4 \quad \Longrightarrow \quad \boxed{y = 4 - x}$$

$$z(x, 4-x) = e^{x\cdot(4-x)} = e^{4x-x^2} \longrightarrow f(x) = e^{4x-x^2}$$

$$f'(x) = e^{4x-x^2} \cdot$$

Zadatak 9

Odredite ekstreme funkcije $z(x,y) = e^{xy}$ *uz uvjet* $x + y = 4$.

Rješenje

$$x + y = 4 \quad \Longrightarrow \quad \boxed{y = 4 - x}$$

$$z(x, 4-x) = e^{x\cdot(4-x)} = e^{4x-x^2} \longrightarrow f(x) = e^{4x-x^2}$$

$$f'(x) = e^{4x-x^2} \cdot (4x - x^2)'$$

Zadatak 9

Odredite ekstreme funkcije $z(x,y) = e^{xy}$ *uz uvjet* $x + y = 4$.

Rješenje

$$x + y = 4 \quad \Longrightarrow \quad \boxed{y = 4 - x}$$

$$z(x, 4-x) = e^{x\cdot(4-x)} = e^{4x-x^2} \longrightarrow f(x) = e^{4x-x^2}$$

$$f'(x) = e^{4x-x^2} \cdot (4x - x^2)' = (4-2x)e^{4x-x^2}$$

Zadatak 9

Odredite ekstreme funkcije $z(x,y) = e^{xy}$ *uz uvjet* $x + y = 4$.

Rješenje

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$$4-2x=0$$

$$x=2$$

Zadatak 9

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$$(4-2x)e^{4x-x^2} = 0$$

$$4 - 2x = 0$$

$$\boxed{x = 2}$$

	$-\infty$		2		$+\infty$
f'					
f					

Zadatak 9

Odredite ekstreme funkcije $z(x,y)=e^{xy}$ *uz uvjet* $x+y=4$.

Rješenje

$$x+y=4 \quad \Longrightarrow \quad \boxed{y=4-x}$$

$$z(x,4-x)=e^{x\cdot(4-x)}=e^{4x-x^2} \longrightarrow f(x)=e^{4x-x^2}$$

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$$(4-2x)e^{4x-x^2}=0$$

$$4-2x=0$$

$$\boxed{x=2}$$

	$-\infty$	2	$+\infty$
f'	$+$		
f			

Zadatak 9

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Rješenje

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$$(4-2x)e^{4x-x^2} = 0$$

$$4 - 2x = 0$$

$$\boxed{x = 2}$$

	$-\infty$		2		$+\infty$
f'		$+$		$-$	
f					

Zadatak 9

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$$\boxed{x = 2}$$

	$-\infty$		2		$+\infty$
f'		$+$		$-$	
f		$\nearrow$			

Zadatak 9

Odredite ekstreme funkcije $z(x, y) = e^{xy}$ *uz uvjet* $x + y = 4$.

Rješenje

$$x + y = 4 \implies \boxed{y = 4 - x}$$

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$$(4 - 2x)e^{4x-x^2} = 0$$

$$4 - 2x = 0$$

$$\boxed{x = 2}$$

	$-\infty$		2		$+\infty$
f'		$+$		$-$	
f		$\nearrow$		$\searrow$	

Zadatak 9

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$$(4-2x)e^{4x-x^2} = 0$$

$$4 - 2x = 0$$

$$\boxed{x = 2}$$

globalni maksimum

	$-\infty$	2	$+\infty$
f'	$+$	$-$	
f	$\nearrow$	$\searrow$	

Zadatak 9

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$f(2) = e^4$

globalni maksimum

	$-\infty$	2	$+\infty$
f'	$+$	$-$	
f	$\nearrow$	$\searrow$	

Zadatak 9

Odredite ekstreme funkcije $z(x, y) = e^{xy}$ *uz uvjet* $x + y = 4$.

Rješenje

$$x + y = 4 \quad \Longrightarrow \quad \boxed{y = 4 - x}$$

$$z(x, 4 - x) = e^{x\cdot(4-x)} = e^{4x-x^2} \longrightarrow f(x) = e^{4x-x^2}$$

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globalni maksimum

$$(4 - 2x)e^{4x-x^2} = 0$$

$$4 - 2x = 0$$

$$\boxed{x = 2}$$

	$-\infty$	2	$+\infty$
f'	$+$		$-$
f	$\nearrow$		$\searrow$

$$y = 4 - x$$

Zadatak 9

Odredite ekstreme funkcije $z(x,y) = e^{xy}$ *uz uvjet* $x + y = 4$.

Rješenje

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$$\boxed{x = 2}$$

$$y = 4 - x = 4 - 2 = 2$$

$$f(2) = e^4$$

globalni maksimum

	$-\infty$		2		$+\infty$
f'		$+$		$-$	
f		$\nearrow$		$\searrow$	

Zadatak 9

Odredite ekstreme funkcije $z(x,y) = e^{xy}$ *uz uvjet* $x + y = 4$.

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$$\boxed{x = 2}$$

	$-\infty$	2	$+\infty$
f'	$+$		$-$
f	$\nearrow$		$\searrow$

$f(2) = e^4$

globalni maksimum

$$y = 4 - x = 4 - 2 = 2 \qquad \boxed{y = 2}$$

Zadatak 9

Odredite ekstreme funkcije $z(x,y)=e^{xy}$ *uz uvjet* $x+y=4$.

Rješenje

$$x+y=4 \quad \Longrightarrow \quad \boxed{y=4-x}$$

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$$4-2x=0$$

$$\boxed{x=2}$$

$$y=4-x=4-2=2 \qquad \boxed{y=2}$$

stacionarna točka:

	$-\infty$	2	$+\infty$
f'	$+$	$-$	
f	$\nearrow$	$\searrow$	

$f(2)=e^4$

globalni maksimum

Zadatak 9

Odredite ekstreme funkcije $z(x,y)=e^{xy}$ *uz uvjet* $x+y=4$.

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$$\boxed{x=2}$$

$$y=4-x=4-2=2 \qquad \boxed{y=2}$$

$f(2)=e^4$

globalni maksimum

	$-\infty$	2	$+\infty$
f'	$+$	$-$	
f	$\nearrow$	$\searrow$	

stacionarna točka: $(\overset{x}{2},\overset{y}{2})$

Zadatak 9

Odredite ekstreme funkcije $z(x,y)=e^{xy}$ *uz uvjet* $x+y=4$.

Rješenje

$$x+y=4 \quad \Longrightarrow \quad \boxed{y=4-x}$$

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$$\boxed{x=2}$$

$$y=4-x=4-2=2 \qquad \boxed{y=2}$$

$f(2)=e^4$

globalni maksimum

	$-\infty$	2	$+\infty$
f'	$+$	$-$	
f	$\nearrow$	$\searrow$	

stacionarna točka: $(2,2)$

Funkcija z postiže globalni maksimum uz uvjet $x+y=4$ u točki $(2,2)$

Zadatak 9

Odredite ekstreme funkcije $z(x,y)=e^{xy}$ *uz uvjet* $x+y=4$.

Rješenje

$$x+y=4 \quad\Longrightarrow\quad \boxed{y=4-x}$$

$$z(x,4-x)=e^{x\cdot(4-x)}=e^{4x-x^2} \longrightarrow f(x)=e^{4x-x^2}$$

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$$4-2x=0$$

$$\boxed{x=2}$$

$f(2)=e^4$

globalni maksimum

	$-\infty$		2		$+\infty$
f'		$+$		$-$	
f		$\nearrow$		$\searrow$	

$$y=4-x=4-2=2 \qquad \boxed{y=2}$$

stacionarna točka: $(\overset{x}{2},\overset{y}{2})$

Funkcija z postiže globalni maksimum uz uvjet $x+y=4$ u točki $(2,2)$ i taj maksimum je jednak

Zadatak 9

Odredite ekstreme funkcije $z(x,y) = e^{xy}$ *uz uvjet* $x + y = 4$.

Rješenje

$$x + y = 4 \quad \Longrightarrow \quad \boxed{y = 4 - x}$$

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$$4 - 2x = 0$$

$$\boxed{x = 2}$$

$f(2) = e^4$

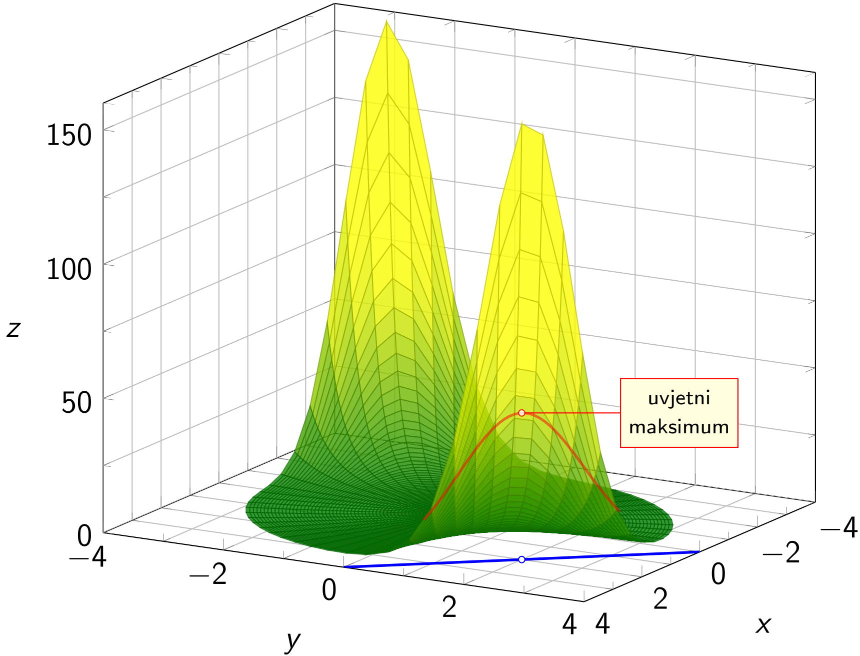
globalni maksimum

	$-\infty$		2		$+\infty$
f'		$+$		$-$	
f		$\nearrow$		$\searrow$	

$$y = 4 - x = 4 - 2 = 2 \qquad \boxed{y = 2}$$

stacionarna točka: $(\overset{x}{2}, \overset{y}{2})$

Funkcija z postiže globalni maksimum uz uvjet $x + y = 4$ u točki $(2,2)$ i taj maksimum je jednak $z(2,2) = e^4$.


150
100
50
0
z
−4
−2
0
2
4
y
4
2
0
−2
−4
x
uvjetni
maksimum

deseti zadatak

Zadatak 10

Odredite ekstreme funkcije $f(x, y) = -x - y$ *uz uvjet* $x^2 + y^2 = 2$.

Zadatak 10

Odredite ekstreme funkcije $f(x, y) = -x - y$ *uz uvjet* $x^2 + y^2 = 2$.

Rješenje

$$x^2 + y^2 = 2$$

Zadatak 10

Odredite ekstreme funkcije $f(x,y) = -x - y$ *uz uvjet* $x^2 + y^2 = 2$.

Rješenje

$$x^2 + y^2 = 2 \longrightarrow x^2 + y^2 - 2 = 0$$

Zadatak 10

Odredite ekstreme funkcije $f(x,y) = -x - y$ *uz uvjet* $x^2 + y^2 = 2$.

Rješenje

$$x^2 + y^2 = 2 \longrightarrow x^2 + y^2 - 2 = 0$$

- Lagrangeova funkcija

Zadatak 10

Odredite ekstreme funkcije $f(x,y) = -x - y$ uz uvjet $x^2 + y^2 = 2$.

Rješenje

$$x^2 + y^2 = 2 \longrightarrow x^2 + y^2 - 2 = 0$$

- Lagrangeova funkcija

$$L(x, y, \lambda) = \text{funkcija} + \lambda \cdot \text{uvjet}$$

Zadatak 10

Odredite ekstreme funkcije $f(x,y) = \underbrace{\boxed{-x-y}}_{\text{funkcija}}$ *uz uvjet* $x^2+y^2=2$.

Rješenje

$$x^2+y^2=2 \longrightarrow x^2+y^2-2=0$$

- Lagrangeova funkcija

$$L(x,y,\lambda) = \text{funkcija} + \lambda \cdot \text{uvjet}$$

Zadatak 10

Odredite ekstreme funkcije $f(x,y) = \boxed{-x-y}$ *uz uvjet* $x^2+y^2=2$.

funkcija

Rješenje

$$x^2+y^2=2 \longrightarrow \boxed{x^2+y^2-2} = 0$$

uvjet

- Lagrangeova funkcija

$$L(x,y,\lambda) = \text{funkcija} + \lambda \cdot \text{uvjet}$$

Zadatak 10

Odredite ekstreme funkcije $f(x,y) = \boxed{-x-y}$ *uz uvjet* $x^2+y^2=2$.

funkcija

Rješenje

$x^2+y^2=2 \longrightarrow \boxed{x^2+y^2-2} = 0$

uvjet

- Lagrangeova funkcija

$$L(x,y,\lambda) = \text{funkcija} + \lambda \cdot \text{uvjet}$$

$$L(x,y,\lambda) = -x-y+\lambda\big(x^2+y^2-2\big)$$

Zadatak 10

Odredite ekstreme funkcije $f(x,y) = \boxed{-x-y}$ *uz uvjet* $x^2+y^2=2$.

funkcija

Rješenje

$$x^2+y^2=2 \longrightarrow \boxed{x^2+y^2-2} = 0$$

uvjet

- Lagrangeova funkcija

$$L(x,y,\lambda) = \text{funkcija} + \lambda \cdot \text{uvjet}$$

$$L(x,y,\lambda) = -x-y+\lambda\left(x^2+y^2-2\right)$$

- Parcijalne derivacije Lagrangeove funkcije

$$L_x =$$

Zadatak 10

Odredite ekstreme funkcije $f(x,y) = \boxed{-x-y}$ *uz uvjet* $x^2+y^2=2$.

funkcija

Rješenje

$$x^2+y^2=2 \longrightarrow \boxed{x^2+y^2-2} = 0$$

uvjet

- Lagrangeova funkcija

$$L(x,y,\lambda) = \text{funkcija} + \lambda \cdot \text{uvjet}$$

$$L(x,y,\lambda) = -x-y+\lambda\big(x^2+y^2-2\big)$$

- Parcijalne derivacije Lagrangeove funkcije

$$L_x = -1 + 2\lambda x$$

Zadatak 10

Odredite ekstreme funkcije $f(x,y) = \boxed{-x-y}$ *uz uvjet* $x^2+y^2=2$.

funkcija

Rješenje

$$x^2+y^2=2 \longrightarrow \boxed{x^2+y^2-2} = 0$$

uvjet

- Lagrangeova funkcija

$$L(x,y,\lambda) = \text{funkcija} + \lambda \cdot \text{uvjet}$$

$$L(x,y,\lambda) = -x-y+\lambda\big(x^2+y^2-2\big)$$

- Parcijalne derivacije Lagrangeove funkcije

$$L_x = -1+2\lambda x$$

$$L_y =$$

Zadatak 10

Odredite ekstreme funkcije $f(x,y) = \underbrace{\boxed{-x-y}}_{\text{funkcija}}$ *uz uvjet* $x^2+y^2=2$.

Rješenje

$$x^2+y^2=2 \longrightarrow \underbrace{\boxed{x^2+y^2-2}}_{\text{uvjet}} = 0$$

- Lagrangeova funkcija

$$L(x,y,\lambda) = \text{funkcija} + \lambda \cdot \text{uvjet}$$

$$L(x,y,\lambda) = -x-y+\lambda\big(x^2+y^2-2\big)$$

- Parcijalne derivacije Lagrangeove funkcije

$$L_x = -1+2\lambda x$$

$$L_y = -1+2\lambda y$$

Zadatak 10

Odredite ekstreme funkcije $f(x,y) = \boxed{-x-y}$ *uz uvjet* $x^2+y^2=2$.

funkcija

Rješenje

$$x^2+y^2=2 \longrightarrow \boxed{x^2+y^2-2} = 0$$

uvjet

- Lagrangeova funkcija

$$L(x,y,\lambda) = \text{funkcija} + \lambda \cdot \text{uvjet}$$

$$L(x,y,\lambda) = -x-y+\lambda\left(x^2+y^2-2\right)$$

- Parcijalne derivacije Lagrangeove funkcije

$$L_x = -1+2\lambda x$$

$$L_y = -1+2\lambda y$$

$$L_\lambda =$$

Zadatak 10

Odredite ekstreme funkcije $f(x,y) = \boxed{-x-y}$ *uz uvjet* $x^2+y^2=2$.

funkcija

Rješenje

$$x^2+y^2=2 \longrightarrow \boxed{x^2+y^2-2} = 0$$

uvjet

- Lagrangeova funkcija

$$L(x,y,\lambda) = \text{funkcija} + \lambda \cdot \text{uvjet}$$

$$L(x,y,\lambda) = -x-y+\lambda\big(x^2+y^2-2\big)$$

- Parcijalne derivacije Lagrangeove funkcije

$$L_x = -1 + 2\lambda x$$

$$L_y = -1 + 2\lambda y$$

$$L_\lambda = x^2+y^2-2$$

Zadatak 10

Odredite ekstreme funkcije $f(x,y) = \boxed{-x-y}$ *uz uvjet* $x^2+y^2=2$.

funkcija

Rješenje

$$x^2+y^2=2 \longrightarrow \boxed{x^2+y^2-2}=0$$

uvjet

- Lagrangeova funkcija

$$L(x,y,\lambda) = \text{funkcija} + \lambda \cdot \text{uvjet}$$

$$L(x,y,\lambda) = -x-y+\lambda\left(x^2+y^2-2\right)$$

- Parcijalne derivacije Lagrangeove funkcije

$$L_x = -1+2\lambda x \qquad -1+2\lambda x = 0$$

$$L_y = -1+2\lambda y \qquad -1+2\lambda y = 0$$

$$L_\lambda = x^2+y^2-2 \qquad x^2+y^2-2=0$$

$$
\begin{aligned}
-1 + 2\lambda x &= 0 \\
-1 + 2\lambda y &= 0 \\
x^2 + y^2 - 2 &= 0
\end{aligned}
$$

$$
\begin{aligned}
-1 + 2\lambda x &= 0 \quad {\color{blue}\longrightarrow} \quad 2\lambda x = 1 \\
-1 + 2\lambda y &= 0 \\
x^2 + y^2 - 2 &= 0 \\
\hline
\end{aligned}
$$

$$\begin{aligned} -1 + 2\lambda x &= 0 \longrightarrow 2\lambda x = 1 \longrightarrow \lambda = \frac{1}{2x} \\ -1 + 2\lambda y &= 0 \\ x^2 + y^2 - 2 &= 0 \end{aligned}$$

$$
\begin{aligned}
-1 + 2\lambda x &= 0 \;\longrightarrow\; 2\lambda x = 1 \;\longrightarrow\; \lambda = \frac{1}{2x} \\
-1 + 2\lambda y &= 0 \;\longrightarrow\; 2\lambda y = 1 \\
x^2 + y^2 - 2 &= 0
\end{aligned}
$$

$$
\begin{aligned}
-1 + 2\lambda x &= 0 \longrightarrow 2\lambda x = 1 \longrightarrow \lambda = \frac{1}{2x} \\
-1 + 2\lambda y &= 0 \longrightarrow 2\lambda y = 1 \longrightarrow \lambda = \frac{1}{2y} \\
x^2 + y^2 - 2 &= 0
\end{aligned}
$$

$$\begin{aligned} -1 + 2\lambda x &= 0 &\longrightarrow\quad 2\lambda x &= 1 &\quad \lambda &= \frac{1}{2x} \\ -1 + 2\lambda y &= 0 &\longrightarrow\quad 2\lambda y &= 1 &\quad \lambda &= \frac{1}{2y} \\ x^2 + y^2 - 2 &= 0 \end{aligned} \quad \Bigg\} \implies \quad \frac{1}{2x} = \frac{1}{2y}$$

$$\begin{aligned}
-1 + 2\lambda x &= 0 \longrightarrow 2\lambda x = 1 \longrightarrow \lambda = \frac{1}{2x} \\
-1 + 2\lambda y &= 0 \longrightarrow 2\lambda y = 1 \longrightarrow \lambda = \frac{1}{2y} \\
x^2 + y^2 - 2 &= 0
\end{aligned}
\quad \Bigg\} \Longrightarrow \quad
\begin{aligned}
\frac{1}{2x} &= \frac{1}{2y} \\
x &= y
\end{aligned}$$

$$\begin{aligned} -1+2\lambda x &= 0 \longrightarrow 2\lambda x = 1 \longrightarrow \lambda = \frac{1}{2x} \\ -1+2\lambda y &= 0 \longrightarrow 2\lambda y = 1 \longrightarrow \lambda = \frac{1}{2y} \\ x^2+y^2-2 &= 0 \end{aligned}$$

$$\left.\begin{matrix} \lambda = \dfrac{1}{2x} \\ \lambda = \dfrac{1}{2y} \end{matrix}\right\} \Longrightarrow \frac{1}{2x} = \frac{1}{2y} \qquad \boxed{x = y}$$

$$
\left.
\begin{array}{rcl}
-1 + 2\lambda x = 0 & \longrightarrow & 2\lambda x = 1 \longrightarrow \lambda = \dfrac{1}{2x} \\
-1 + 2\lambda y = 0 & \longrightarrow & 2\lambda y = 1 \longrightarrow \lambda = \dfrac{1}{2y} \\
x^2 + y^2 - 2 = 0 & &
\end{array}
\right\} \Longrightarrow \quad
\begin{array}{c}
\dfrac{1}{2x} = \dfrac{1}{2y} \\
\boxed{x = y}
\end{array}
$$

$$
\begin{aligned}
-1 + 2\lambda x &= 0 \longrightarrow 2\lambda x = 1 \longrightarrow \lambda = \frac{1}{2x} \\
-1 + 2\lambda y &= 0 \longrightarrow 2\lambda y = 1 \longrightarrow \lambda = \frac{1}{2y} \\
x^2 + y^2 - 2 &= 0
\end{aligned}
\quad \Longrightarrow \quad \frac{1}{2x} = \frac{1}{2y}, \quad \boxed{x = y}
$$

$$x^2 + x^2 - 2 = 0$$

$$-1 + 2\lambda x = 0 \longrightarrow 2\lambda x = 1 \longrightarrow \lambda = \frac{1}{2x}$$

$$-1 + 2\lambda y = 0 \longrightarrow 2\lambda y = 1 \longrightarrow \lambda = \frac{1}{2y}$$

$$\left.\begin{array}{l} \lambda = \frac{1}{2x} \\ \lambda = \frac{1}{2y} \end{array}\right\} \Longrightarrow \frac{1}{2x} = \frac{1}{2y}$$

$$\boxed{x = y}$$

$$x^2 + y^2 - 2 = 0$$

$$x^2 + x^2 - 2 = 0$$

$$2x^2 = 2$$

$$
\begin{aligned}
-1 + 2\lambda x &= 0 \longrightarrow 2\lambda x = 1 \longrightarrow \lambda = \frac{1}{2x} \\
-1 + 2\lambda y &= 0 \longrightarrow 2\lambda y = 1 \longrightarrow \lambda = \frac{1}{2y} \\
x^2 + y^2 - 2 &= 0
\end{aligned}
\quad \Longrightarrow \quad \frac{1}{2x} = \frac{1}{2y}, \quad \boxed{x = y}
$$

$$
\begin{aligned}
x^2 + x^2 - 2 &= 0 \\
2x^2 &= 2 \\
x^2 &= 1
\end{aligned}
$$

$$
\begin{aligned}
-1 + 2\lambda x &= 0 \longrightarrow 2\lambda x = 1 \longrightarrow \lambda = \frac{1}{2x} \\
-1 + 2\lambda y &= 0 \longrightarrow 2\lambda y = 1 \longrightarrow \lambda = \frac{1}{2y} \\
x^2 + y^2 - 2 &= 0
\end{aligned}
\quad \Bigg\} \implies \frac{1}{2x} = \frac{1}{2y} \qquad \boxed{x = y}
$$

$$
\begin{aligned}
x^2 + x^2 - 2 &= 0 \\
2x^2 &= 2 \\
x^2 &= 1 \\
x_1 = 1, &\quad x_2 = -1
\end{aligned}
$$

$$\begin{aligned} -1+2\lambda x &= 0 &\longrightarrow\quad 2\lambda x &= 1 &\longrightarrow\quad \lambda &= \frac{1}{2x} \\ -1+2\lambda y &= 0 &\longrightarrow\quad 2\lambda y &= 1 &\longrightarrow\quad \lambda &= \frac{1}{2y} \\ x^2+y^2-2 &= 0 \end{aligned}$$

$$\left.\begin{aligned} \lambda &= \frac{1}{2x} \\ \lambda &= \frac{1}{2y} \end{aligned}\right\} \Longrightarrow \quad \frac{1}{2x} = \frac{1}{2y}, \qquad \boxed{x = y}$$

$$\begin{aligned} x^2+x^2-2 &= 0 \\ 2x^2 &= 2 \\ x^2 &= 1 \\ x_1 = 1, &\quad x_2 = -1 \\ y_1 = 1, &\quad y_2 = -1 \end{aligned}$$

$$\begin{aligned} -1 + 2\lambda x &= 0 \longrightarrow 2\lambda x = 1 \longrightarrow \lambda = \frac{1}{2x} \\ -1 + 2\lambda y &= 0 \longrightarrow 2\lambda y = 1 \longrightarrow \lambda = \frac{1}{2y} \\ x^2 + y^2 - 2 &= 0 \end{aligned}$$

$$\left.\begin{aligned} \lambda &= \frac{1}{2x} \\ \lambda &= \frac{1}{2y} \end{aligned}\right\} \Longrightarrow \frac{1}{2x} = \frac{1}{2y}$$

$$\boxed{x = y}$$

$$\begin{aligned} x^2 + x^2 - 2 &= 0 \\ 2x^2 &= 2 \\ x^2 &= 1 \\ x_1 = 1, &\quad x_2 = -1 \\ y_1 = 1, &\quad y_2 = -1 \end{aligned}$$

Stacionarne točke:

$$\begin{aligned} -1 + 2\lambda x &= 0 \longrightarrow 2\lambda x = 1 \longrightarrow \lambda = \frac{1}{2x} \\ -1 + 2\lambda y &= 0 \longrightarrow 2\lambda y = 1 \longrightarrow \lambda = \frac{1}{2y} \\ x^2 + y^2 - 2 &= 0 \end{aligned} \quad \Longrightarrow \quad \frac{1}{2x} = \frac{1}{2y}, \quad \boxed{x = y}$$

$$x^2 + x^2 - 2 = 0$$

$$2x^2 = 2$$

$$x^2 = 1$$

$$x_1 = 1, \quad x_2 = -1$$

$$y_1 = 1, \quad y_2 = -1$$

Stacionarne točke: $\underset{x_1\ y_1}{(1, 1)},\ \underset{x_2\ \ y_2}{(-1, -1)}$

$$
\begin{aligned}
-1 + 2\lambda x &= 0 \longrightarrow 2\lambda x = 1 \longrightarrow \lambda = \frac{1}{2x} \\
-1 + 2\lambda y &= 0 \longrightarrow 2\lambda y = 1 \longrightarrow \lambda = \frac{1}{2y} \\
x^2 + y^2 - 2 &= 0
\end{aligned}
\quad \Longrightarrow \quad \frac{1}{2x} = \frac{1}{2y}, \quad \boxed{x = y}
$$

$$
\begin{aligned}
x^2 + x^2 - 2 &= 0 \\
2x^2 &= 2 \\
x^2 &= 1 \\
x_1 = 1, &\quad x_2 = -1 \\
y_1 = 1, &\quad y_2 = -1
\end{aligned}
$$

Stacionarne točke: $\underset{x_1}{(1}, \underset{y_1}{1)}, \ (\underset{x_2}{-1}, \underset{y_2}{-1)}$

$$\boxed{f(x, y) = -x - y}$$

- Neprekidna funkcija na kompaktnom skupu (konkretno, omeđenoj krivulji) postiže globalni minimum i globalni maksimum.

$$
\begin{array}{rcl}
-1 + 2\lambda x = 0 & \longrightarrow & 2\lambda x = 1 \longrightarrow \lambda = \dfrac{1}{2x} \\
-1 + 2\lambda y = 0 & \longrightarrow & 2\lambda y = 1 \longrightarrow \lambda = \dfrac{1}{2y} \\
x^2 + y^2 - 2 = 0 & &
\end{array}
\Bigg\} \Longrightarrow \frac{1}{2x} = \frac{1}{2y}
$$

$$\boxed{x = y}$$

$$
\begin{gathered}
x^2 + x^2 - 2 = 0 \\
2x^2 = 2 \\
x^2 = 1 \\
x_1 = 1, \quad x_2 = -1 \\
y_1 = 1, \quad y_2 = -1
\end{gathered}
$$

Stacionarne točke: $(\overset{x_1}{1}, \overset{y_1}{1}), \ (\overset{x_2}{-1}, \overset{y_2}{-1})$

$$\boxed{f(x, y) = -x - y}$$

- Neprekidna funkcija na kompaktnom skupu (konkretno, omeđenoj krivulji) postiže globalni minimum i globalni maksimum.

$$f(1, 1) =$$

$$\begin{aligned} -1+2\lambda x &= 0 \longrightarrow 2\lambda x = 1 \longrightarrow \lambda = \frac{1}{2x} \\ -1+2\lambda y &= 0 \longrightarrow 2\lambda y = 1 \longrightarrow \lambda = \frac{1}{2y} \\ x^2+y^2-2 &= 0 \end{aligned} \quad \Longrightarrow \quad \frac{1}{2x} = \frac{1}{2y}, \quad \boxed{x = y}$$

$$x^2 + x^2 - 2 = 0$$

$$2x^2 = 2$$

$$x^2 = 1$$

$$x_1 = 1, \quad x_2 = -1$$

$$y_1 = 1, \quad y_2 = -1$$

Stacionarne točke: $(\overset{x_1}{1}, \overset{y_1}{1}),\ (\overset{x_2}{-1}, \overset{y_2}{-1})$

$$\boxed{f(x,y) = -x - y}$$

- Neprekidna funkcija na kompaktnom skupu (konkretno, omeđenoj krivulji) postiže globalni minimum i globalni maksimum.

$$f(1,1) = -1 - 1 = -2$$

$$\begin{aligned} -1 + 2\lambda x &= 0 \longrightarrow 2\lambda x = 1 \longrightarrow \lambda = \frac{1}{2x} \\ -1 + 2\lambda y &= 0 \longrightarrow 2\lambda y = 1 \longrightarrow \lambda = \frac{1}{2y} \\ x^2 + y^2 - 2 &= 0 \end{aligned} \Bigg\} \Longrightarrow \frac{1}{2x} = \frac{1}{2y}, \quad \boxed{x = y}$$

$$x^2 + x^2 - 2 = 0$$
$$2x^2 = 2$$
$$x^2 = 1$$
$$x_1 = 1, \quad x_2 = -1$$
$$y_1 = 1, \quad y_2 = -1$$

Stacionarne točke: $(\overset{x_1}{1}, \overset{y_1}{1}),\ (\overset{x_2}{-1}, \overset{y_2}{-1})$

$$\boxed{f(x, y) = -x - y}$$

- Neprekidna funkcija na kompaktnom skupu (konkretno, omeđenoj krivulji) postiže globalni minimum i globalni maksimum.

$$f(1, 1) = -1 - 1 = -2$$

$$f(-1, -1) =$$

$$
\begin{aligned}
-1 + 2\lambda x &= 0 \longrightarrow 2\lambda x = 1 \longrightarrow \lambda = \frac{1}{2x} \\
-1 + 2\lambda y &= 0 \longrightarrow 2\lambda y = 1 \longrightarrow \lambda = \frac{1}{2y} \\
x^2 + y^2 - 2 &= 0
\end{aligned}
\qquad \Longrightarrow \qquad \frac{1}{2x} = \frac{1}{2y}, \quad \boxed{x = y}
$$

$$
\begin{aligned}
x^2 + x^2 - 2 &= 0 \\
2x^2 &= 2 \\
x^2 &= 1 \\
x_1 = 1, &\quad x_2 = -1 \\
y_1 = 1, &\quad y_2 = -1
\end{aligned}
$$

Stacionarne točke: $(\underset{x_1}{1}, \underset{y_1}{1}),\ (\underset{x_2}{-1}, \underset{y_2}{-1})$

$$\boxed{f(x,y) = -x - y}$$

- Neprekidna funkcija na kompaktnom skupu (konkretno, omeđenoj krivulji) postiže globalni minimum i globalni maksimum.

$$f(1,1) = -1 - 1 = -2$$

$$f(-1,-1) = -(-1) - (-1) = 2$$

$$\begin{aligned} -1+2\lambda x &= 0 \longrightarrow 2\lambda x = 1 \longrightarrow \lambda = \frac{1}{2x} \\ -1+2\lambda y &= 0 \longrightarrow 2\lambda y = 1 \longrightarrow \lambda = \frac{1}{2y} \\ x^2+y^2-2 &= 0 \end{aligned} \quad \Bigg\} \Longrightarrow \quad \frac{1}{2x} = \frac{1}{2y}, \quad \boxed{x = y}$$

$$\begin{aligned} x^2+x^2-2 &= 0 \\ 2x^2 &= 2 \\ x^2 &= 1 \\ x_1 = 1, &\quad x_2 = -1 \\ y_1 = 1, &\quad y_2 = -1 \end{aligned}$$

Stacionarne točke: $(\overset{x_1}{1}, \overset{y_1}{1}),\ (\overset{x_2}{-1}, \overset{y_2}{-1})$

$$\boxed{f(x,y) = -x-y}$$

- Neprekidna funkcija na kompaktnom skupu (konkretno, omeđenoj krivulji) postiže globalni minimum i globalni maksimum.

$$f(1,1) = -1-1 = -2 \longleftarrow \boxed{\text{minimum}}$$

$$f(-1,-1) = -(-1)-(-1) = 2$$

$$
\begin{array}{rcl}
-1+2\lambda x=0 & \longrightarrow & 2\lambda x=1 \longrightarrow \lambda=\dfrac{1}{2x} \\
-1+2\lambda y=0 & \longrightarrow & 2\lambda y=1 \longrightarrow \lambda=\dfrac{1}{2y} \\
x^2+y^2-2=0 & &
\end{array}
\left.\vphantom{\begin{array}{c}\dfrac{1}{2x}\\ \dfrac{1}{2y}\end{array}}\right\} \Longrightarrow \frac{1}{2x}=\frac{1}{2y}
$$

$$\boxed{x=y}$$

$$x^2+x^2-2=0$$

$$2x^2=2$$

$$x^2=1$$

$$x_1=1, \quad x_2=-1$$

$$y_1=1, \quad y_2=-1$$

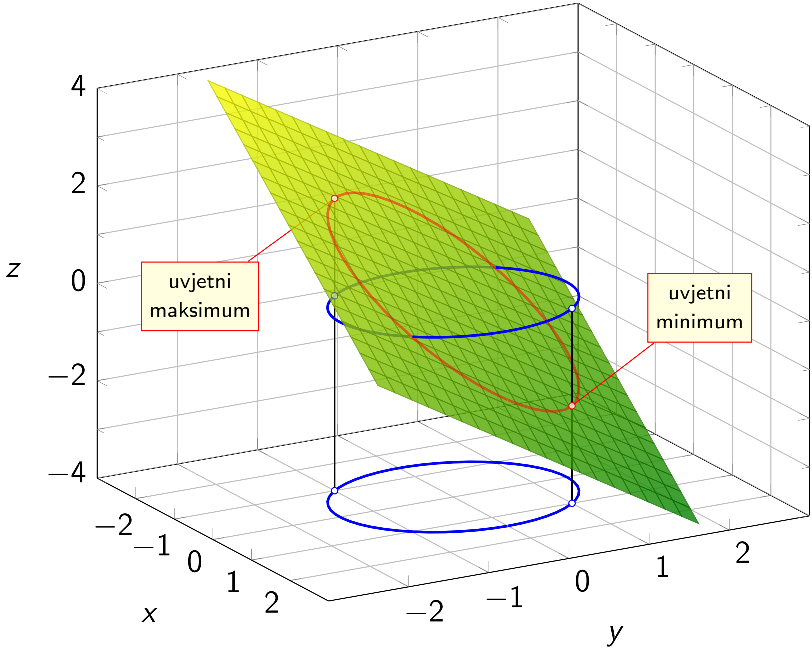
Stacionarne točke: $\overset{x_1}{(1}, \overset{y_1}{1)}, \ \overset{x_2}{(-1}, \overset{y_2}{-1)}$

$$\boxed{f(x,y)=-x-y}$$

- Neprekidna funkcija na kompaktnom skupu (konkretno, omeđenoj krivulji) postiže globalni minimum i globalni maksimum.

$$f(1,1)=-1-1=-2 \longleftarrow \boxed{\text{minimum}}$$

$$f(-1,-1)=-(-1)-(-1)=2 \longleftarrow \boxed{\text{maksimum}}$$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