Seminari 6

Matematika za ekonomiste 2

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Sadržaj

Parcijalne derivacije – oznake

prvi zadatak

drugi zadatak

treći zadatak

četvrti zadatak

Parcijalne derivacije drugog reda - oznake

peti zadatak

šesti zadatak

sedmi zadatak

osmi zadatak

deveti zadatak

deseti zadatak

Parcijalne derivacije – oznake

Oznake

• Funkcija dvije varijable:
$$z = z(x, y)$$

Parcijalna derivacija po varijabli x

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

• Parcijalna derivacija po varijabli y

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

prvi zadatak

Odredite parcijalne derivacije sljedećih funkcija:

a)
$$f(x,y) = x^2 + y^2$$
 c) $z = \frac{y}{x}$
b) $g(x,y) = 3x^2 + xy + \sqrt{y}$

 $(x^n)' = nx^{n-1}$ Odredite parcijalne derivacije sljedećih funkcija:

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

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

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

a)
$$f_x =$$

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) $f_x = 2x$

$$a_1 I_X - Z$$

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

 $(x^n)' = nx^{n-1}$ Odredite parcijalne derivacije sljedećih funkcija:

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

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

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

Rješenje

a)
$$f_x = 2x +$$

$$a_j i_{\chi} - 2\chi$$

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) $f_x = 2x + 0$

 $a_j = 2x_j$

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

Odredite parcijalne derivacije sljedećih funkcija:

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

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

$$x^2 + xy + \sqrt{y}$$

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

Rješenje

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

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

Odredite parcijalne derivacije sljedećih funkcija:

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

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

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

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

Rješenje

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

Odredite parcijalne derivacije sljedećih funkcija:

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

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

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

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

Rješenje

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

Odredite parcijalne derivacije sljedećih funkcija:

a)
$$f(x,y) = x^2 + y^2$$
 c) $z = \frac{y}{x}$
b) $g(x,y) = 3x^2 + xy + \sqrt{y}$

Rješenje

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

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

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

Odredite parcijalne derivacije sljedećih funkcija:

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

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

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

Rješenje

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

Odredite parcijalne derivacije sljedećih funkcija:

a)
$$f(x,y) = x^2 + y^2$$
 c) $z = \frac{y}{x}$

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

Rješenje

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

$$f_y = 0 + 2y = 2y$$

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

Odredite parcijalne derivacije sljedećih funkcija:

c) $z = \frac{y}{x}$ a) $f(x, y) = x^2 + y^2$

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

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

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

Rješenje

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

$$f_y=0+2y=2y$$

b)
$$g_x =$$

Odredite parcijalne derivacije sljedećih funkcija:

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

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

Rješenje

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

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

$$f_y = 0 + 2y = 2y$$

b) $g_x = 6x$

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

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

Odredite parcijalne derivacije sljedećih funkcija:

c) $z = \frac{y}{y}$ a) $f(x, y) = x^2 + y^2$

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

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

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

 $f_{v} = 0 + 2v = 2v$

Rješenje

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

b) $g_x = 6x +$

2/24

Odredite parcijalne derivacije sljedećih funkcija:

a)
$$f(x,y) = x^2 + y^2$$
 c) $z = \frac{y}{x}$

 $f_{v} = 0 + 2v = 2v$

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

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

b)
$$g_x = 6x +$$

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

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

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

Odredite parcijalne derivacije sljedećih funkcija:

a)
$$f(x,y) = x^2 + y^2$$
 c) $z = \frac{y}{x}$
b) $g(x,y) = 3x^2 + xy + \sqrt{y}$

 $f_{v} = 0 + 2v = 2v$

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

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

Rješenje

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

b)
$$\sigma = 6x + y$$

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

Odredite parcijalne derivacije sljedećih funkcija:

c) $z = \frac{y}{y}$ a) $f(x, y) = x^2 + y^2$

 $f_{v} = 0 + 2v = 2v$

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

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

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

Rješenje

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

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

Odredite parcijalne derivacije sljedećih funkcija:

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

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

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

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

Rješenje

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

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

$$f_y=0+2y=2y$$

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

2/24

Odredite parcijalne derivacije sljedećih funkcija:

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

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

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

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

 $g_v =$

Rješenje

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

$$y = 0 + 2y = 2$$

$$i_{y} = 2x + 0 = 2x$$

$$i_{y} = 0 + 2y = 2y$$

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

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

Odredite parcijalne derivacije sljedećih funkcija: c) $z = \frac{y}{z}$ $(cu)'(x) = c \cdot u'(x)$

a)
$$f(x, y) = x^2 + y^2$$
 c) $z = \frac{y}{2}$

Rješenje

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

$$=2x$$

$$f_y = 0 + 2y = 2y$$

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

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

$$g_y = 0$$

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

Odredite parcijalne derivacije sljedećih funkcija:

a) $f(x, y) = x^2 + y^2$ c) z = 3

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

c)
$$z = \frac{y}{x}$$
 $(cu)'(x) = c \cdot u'(x)$

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

Diočonio

Rješenje

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

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

Odredite parcijalne derivacije sljedećih funkcija:

a)
$$f(x,y) = x^2 + y^2$$
 c) $z = \frac{y}{x}$

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

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

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

Rješenje

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

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

Odredite parcijalne derivacije sljedećih funkcija:

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

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

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

$$2\sqrt{x}$$

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

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

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

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

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

 $g_{v} = 0 + x +$

Odredite parcijalne derivacije sljedećih funkcija:

a)
$$f(x, y) = x^2 + y^2$$
 c) $z = \frac{y}{2}$

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

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

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

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

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

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

$$f_y = 0 + 2y = 2y$$

$$g_y = 0 + x + \frac{1}{2\sqrt{y}}$$

Odredite parcijalne derivacije sljedećih funkcija:

a)
$$f(x, y) = x^2 + y^2$$
 c) $z = 3$

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

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

a)
$$f(x,y) = x^2 + y^2$$
 c) $z = \frac{y}{x}$
b) $g(x,y) = 3x^2 + xy + \sqrt{y}$

Rješenje

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

a)
$$f_x = 2x$$

$$y = 0 + 2y = 2y$$

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

Odredite parcijalne derivacije sljedećih funkcija:

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

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

Riešenje

c)
$$z =$$

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

$$=2x$$

$$f_y=0+2y=2y$$

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

$$g_y = 0 + x + \frac{1}{2\sqrt{y}} = x + \frac{1}{2\sqrt{y}}$$

c) $z_x =$

$$g_y = 0$$

$$=6x+y$$

$$z \stackrel{\checkmark}{=} yx^-$$

$$z = vx^{-}$$

c)
$$z =$$

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

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

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

2/24

Odredite parcijalne derivacije sljedećih funkcija:

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

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

c)
$$z =$$

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

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

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

$$f_y=0+2y=2y$$

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

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

c)
$$z_x = y$$

Odredite parcijalne derivacije sljedećih funkcija:

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

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

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

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

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

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

Rješenje

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

 $f_{v} = 0 + 2v = 2v$

c) $z_x = y$.

b)
$$\sigma_{v} = 6x + v + 0$$

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

$$6x + y$$

$$g_y = 0 + x + \frac{1}{2\sqrt{y}} = x + \frac{1}{2\sqrt{y}}$$

Odredite parcijalne derivacije sljedećih funkcija:

a)
$$f(x, y) = x^2 + y^2$$
 c) $z = \frac{y}{2}$

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

Rješenje

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

$$f_y =$$

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

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

$$0 = 6x +$$

$$f_y=0+2y=2y$$

$$g_y = 0 + x + \frac{1}{2\sqrt{y}} = x + \frac{1}{2\sqrt{y}}$$

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

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

a)
$$f_x$$

Odredite parcijalne derivacije sljedećih funkcija:

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

a)
$$f(x,y) = x^2 + y^2$$
 c) $z = \frac{1}{2}$
b) $g(x,y) = 3x^2 + xy + \sqrt{y}$

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

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

Rješenje

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

$$5x + y$$

$$f_y = 0 + 2y = 2y$$

$$5x + y$$

$$g_y = 0 + x + \frac{1}{2\sqrt{y}} = x + \frac{1}{2\sqrt{y}}$$

$$y + 0 = 6x + y$$

$$= 6x + y$$
 $g_y =$

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

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

Odredite parcijalne derivacije sljedećih funkcija:

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

a)
$$f(x, y) = x^2 + y^2$$
 c) $z = 0$
b) $g(x, y) = 3x^2 + xy + \sqrt{y}$



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

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

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

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

$$f_y=0+2y=2y$$

a)
$$T_{x}$$

$$+0=6x+y$$

$$g_y = 0 + x + \frac{1}{2\sqrt{y}} = x + \frac{1}{2\sqrt{y}}$$

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

Odredite parcijalne derivacije sljedećih funkcija:

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

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

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

$$2x + 0 = 2x$$

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

$$f_y =$$

$$f_y=0+2y=2y$$

$$(\sqrt{x})'$$

$$(\sqrt{x}) =$$

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

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

$$x^{-1}$$

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

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

$$0=6x+y g_y=0$$

$$z_y = x^{-1}$$

Odredite parcijalne derivacije sljedećih funkcija:

a)
$$f(x,y) = x^2 + y^2$$
 c) $z = \frac{y}{2}$

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

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

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

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

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

 $f_{v} = 0 + 2v = 2v$

$$\sigma x + v$$
 $\sigma x = 0 + x$

b)
$$\sigma_{x} = 6x + y - 6x + y -$$

$$6x + y$$

$$g_y = 0 + x + \frac{1}{2\sqrt{y}} = x + \frac{1}{2\sqrt{y}}$$

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

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

$$x + \frac{1}{2\sqrt{y}}$$

 $z_v = x^{-1}$.

Odredite parcijalne derivacije sljedećih funkcija:

a)
$$f(x,y) = x^2 + y^2$$
 c) $z = \frac{1}{2}$

a)
$$f(x, y) = x^2 + y^2$$
 c) $z = \frac{3}{2}$
b) $g(x, y) = 3x^2 + xy + \sqrt{y}$

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

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

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

Rješenje

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

$$f_y=0+2y=2y$$

a)
$$f_x$$

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

$$5x + y$$

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

$$x_{\nu} = 0 + x - 1$$

$$g_y = 0 + x + \frac{1}{2\sqrt{y}} = x + \frac{1}{2\sqrt{y}}$$

$$= x +$$

$$z_y = x^{-1} \cdot 1$$

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

Odredite parcijalne derivacije sljedećih funkcija:

a)
$$f(x, y) = x^2 + y^2$$
 c) $z = 3$

$$z = \frac{y}{1}$$

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

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

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

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

$$f_y=0+2y=2y$$

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

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

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

$$0 + 2$$

$$g_y = 0 + x + \frac{1}{2\sqrt{y}} = x + \frac{1}{2\sqrt{y}}$$

$$^{2}\sqrt{}$$

2/24

$$z_y = x^{-1} \cdot 1 = \frac{1}{x}$$

drugi zadatak

a) $z = xe^y$

Odredite parcijalne derivacije sljedećih funkcija:

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

a) $z = xe^y$

Odredite parcijalne derivacije sljedećih funkcija:

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

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

a)
$$z_x =$$

Odredite parcijalne derivacije sljedećih funkcija:

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

a)
$$z_x = e^y$$

a)
$$z_x = e^{x}$$

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

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

Odredite parcijalne derivacije sljedećih funkcija:

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

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

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

a) $z_x = e^y$.

a) $z = xe^y$

3/24

Odredite parcijalne derivacije sljedećih funkcija:

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

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

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

$$z_{y}=e^{y}$$

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

a) $z = xe^y$

a) $z = xe^y$

Odredite parcijalne derivacije sljedećih funkcija:

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

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

Rjesenje

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

Odredite parcijalne derivacije sljedećih funkcija:

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

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

a) $z = xe^y$

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

$$z_y =$$

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

Odredite parcijalne derivacije sljedećih funkcija:

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

$$z_y = x$$

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

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

Odredite parcijalne derivacije sljedećih funkcija:

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

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

3/24

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

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

$$z_y = x$$
.

$$z_y = x$$
.

$$z_y = x$$
.

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

Odredite parcijalne derivacije sljedećih funkcija:

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

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

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

 $z_v = x \cdot e^y$

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

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

Odredite parcijalne derivacije sljedećih funkcija:

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

Rješenje

a)
$$z_x$$

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

$$z_y = x \cdot e^y = xe^y$$
 $(cu)'(x) = c \cdot u'(x)$

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

Odredite parcijalne derivacije sljedećih funkcija:

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

$$z_y = x \cdot e^y = xe^y$$
 $(cu)'(x) = c \cdot u'(x)$

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

3/24

b) $z_x =$

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

$$Z_y =$$

$$z_y = x$$
.

$$z_y = x \cdot \epsilon$$

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

Odredite parcijalne derivacije sljedećih funkcija:

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

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

3/24

Rješenje

b) $z_{x} = 0$

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

$$z_y = \lambda$$

$$z_y = x \cdot e^y = xe^y$$
 $(cu)'(x) = c \cdot u'(x)$

$$\cdot e^y = x$$

Zadatak 2 Odredite parcijalne derivacije sljedećih funkcija:

Rješenje

a) $z = xe^y$

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

b)
$$z_x = 0 +$$

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

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

$$z_y = x \cdot e^y = xe^y$$
 $(cu)'(x) = c \cdot u'(x)$

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

Zadatak 2 Odredite parcijalne derivacije sljedećih funkcija:

Rješenje

a) $z = xe^y$

$$1 = e^y$$

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

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

$$\frac{1}{2\sqrt{x}}$$

$$z_y = x \cdot e^y = xe^y$$
 $(cu)'(x) = c \cdot u'(x)$

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

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

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

a) $z = xe^y$

Rješenje

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

Odredite parcijalne derivacije sljedećih funkcija:

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

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

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

$$z_v = x \cdot e^y = xe^y$$
 $(cu)'(x) = c \cdot u'(x)$

$$\frac{1}{1}$$

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

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

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

a) $z = xe^y$

Odredite parcijalne derivacije sljedećih funkcija:

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

Rješenje

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

$$z_y = x \cdot e^y = xe^y$$
 $(cu)'(x) = c \cdot u'(x)$

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

$$+\frac{1}{2\sqrt{x}}=\frac{1}{2\sqrt{x}}$$

$$z_y =$$

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

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

$$(e^{x})' = 0$$

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

$$(e^x)'$$

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

a) $z = xe^y$

Odredite parcijalne derivacije sljedećih funkcija:

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

Rješenje

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

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

 $z_v = x \cdot e^y = xe^y$ $(cu)'(x) = c \cdot u'(x)$

$$z_y = 1$$

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

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

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

Odredite parcijalne derivacije sljedećih funkcija:

a)
$$z = xe^y$$

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

Rješenje

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

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

$$Z_y$$

$$z_y = x \cdot e^y = xe^y$$
 $(cu)'(x) = c \cdot u'(x)$

$$z_y=1$$
 ·

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

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

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

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

a) $z = xe^y$

Odredite parcijalne derivacije sljedećih funkcija:

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

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

Rješenje

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

$$z_y = x \cdot \epsilon$$

$$z_y = 1 \cdot e^y$$

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

$$z_y = 1$$

$$=1\cdot e^y$$

$$z_y = x \cdot e^y = xe^y$$
 $(cu)'(x) = c \cdot u'(x)$

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

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

Odredite parcijalne derivacije sljedećih funkcija:

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

$$z = ye^y + \sqrt{x}$$
 c) $u(x, y) = \frac{2x - y}{x + y}$

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

Rješenje

$$z_y = x \cdot e^y = xe^y$$
 $(cu)'(x) = c \cdot u'(x)$

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

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

$$z_y = 1 \cdot e^y +$$

b)
$$z_x = 0 + \frac{1}{2}$$

$$z_y = 1 \cdot e^y +$$

b)
$$z_x = 0 +$$

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

$$2\sqrt{x}$$

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

$$\frac{2\sqrt{x}}{3/24}$$

a) $z = xe^y$

Odredite parcijalne derivacije sljedećih funkcija:

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

Rješenje

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

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

$$z_y = x \cdot e^y = 1$$

$$= xe^y$$

 $z_v = 1 \cdot e^y + y$

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

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

$$(u)'(x) = c$$

$$z_y = x \cdot e^y = xe^y$$
 $(cu)'(x) = c \cdot u'(x)$

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

3/24

Odredite parcijalne derivacije sljedećih funkcija:

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

Rješenje

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

$$1=e^y$$

$$= e^{y}$$

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

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

$$z_y = x \cdot e^y = xe^y$$
 $(cu)'(x) = c \cdot u'(x)$

$$=1\cdot e^y$$

$$z_y = 1 \cdot e^y + y \cdot$$

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

$$(x) =$$

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

3/24

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

a) $z = xe^y$

Odredite parcijalne derivacije sljedećih funkcija:

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

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

$$=e^{y}$$

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

$$z_v = x \cdot e^{y}$$

$$z_y = x \cdot e^y = xe^y$$
 $(cu)'(x) = c \cdot u'(x)$

 $z_v = 1 \cdot e^y + y \cdot e^y$

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

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

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

3/24

Odredite parcijalne derivacije sljedećih funkcija:

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

Rješenje

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

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

$$z_v = 1$$

$$z_y = 1 \cdot e^y + y \cdot e^y +$$

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

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

$$z_y = x \cdot e^y = xe^y$$
 $(cu)'(x) = c \cdot u'(x)$

$$\cdot u'(x)$$

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

$$\frac{3/24}{4}$$

Odredite parcijalne derivacije sljedećih funkcija:

a) $z = xe^y$

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

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

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

$$2y - \chi$$

$$y = xe^y$$

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

$$z_y = 1 \cdot e^y + y \cdot e^y + 0$$

$$z_y = x \cdot e^y = xe^y$$
 $(cu)'(x) = c \cdot u'(x)$

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

3/24

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

$$u)'(x)=c$$

Odredite parcijalne derivacije sljedećih funkcija:

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

Rješenje

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

$$1 = e^y$$

$$1 = e^y$$

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

$$z_y = x \cdot e^y = xe^y$$
 $(cu)'(x) = c \cdot u'(x)$

$$z_y = 1 \cdot e^y + y \cdot e^y + 0 = (1+y)e^y$$

$$1 \cdot e^y + y$$

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

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

3/24

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

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

Odredite parcijalne derivacije sljedećih funkcija:

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

a)
$$z = xe^y$$

$$\int_{0}^{1}(x)=\frac{u}{u}$$

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

b)
$$z_x = 0 +$$

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

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

$$z_v = 1 \cdot e^y$$

$$z_y = 1 \cdot e^y + y \cdot e^y + 0 = (1+y)e^y$$

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

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

$$z_y = x \cdot e^y = xe^y$$
 $(cu)'(x) = c \cdot u'(x)$

$$\frac{1}{2\sqrt{x}}$$



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

3/24

Odredite parcijalne derivacije sljedećih funkcija:

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

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

$$v(x)^2$$

$$z_x = x \cdot e^y = xe^y$$

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

c) $u_x = -$

$$\frac{1}{z}$$
 z_{v}

$$z_y = 1 \cdot e^y + y \cdot e^y + 0 = (1+y)e^y$$

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

$$\frac{1}{2\sqrt{x}} = \frac{1}{2\sqrt{x}}$$

$$z_y = x \cdot e^y = xe^y$$
 $(cu)'(x) = c \cdot u'(x)$

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

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

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

$$'=e^{i}$$

$$= e^{\lambda}$$
 $\frac{1}{2\sqrt{v}}$

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



Odredite parcijalne derivacije sljedećih funkcija:

a)
$$z = xe^y$$

$$\left(x\right)^{\prime}(x)=\frac{u}{u}$$

a)
$$z = xe^y$$
 b) $z = ye^y + \sqrt{x}$
$$\left(\frac{u}{v}\right)'(x) = \frac{u'(x) \cdot v(x) - u(x) \cdot v'(x)}{v(x)^2}$$

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

c) $u_x = --$

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

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

$$z_y = x$$

$$z_y = 1$$

$$1 \cdot e^y + y$$

$$z_y = x \cdot e^y = xe^y$$
 $(cu)'(x) = c \cdot u'(x)$

$$+y)e^{y}$$

$$=\frac{1}{2\sqrt{x}}$$

3/24

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

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

$$z_y = 1 \cdot e^y + y \cdot e^y + 0 = (1+y)e^y$$

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

$$\frac{1}{2\sqrt{}}$$

 $(x+y)^2$

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

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

Odredite parcijalne derivacije sljedećih funkcija:

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

a)
$$z = xe^y$$

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

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

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

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

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

$$z_v = 1 \cdot e^y + y \cdot e^y + 0 = (1+y)e^y$$

$$z_y = x \cdot e^y = xe^y$$
 $(cu)'(x) = c \cdot u'(x)$

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

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

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

3/24

Odredite parcijalne derivacije sljedećih funkcija:

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

a)
$$z = xe^y$$

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

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

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

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

$$z_y =$$

$$z_y = 1 \cdot e^y + y \cdot e^y + 0 = (1+y)e^y$$

$$a \cdot e^y + y$$

$$z_y = x \cdot e^y = xe^y$$
 $(cu)'(x) = c \cdot u'(x)$

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

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

$$=\frac{1}{2\sqrt{x}}$$

3/24

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

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

Odredite parcijalne derivacije sljedećih funkcija:

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

a)
$$z = xe^y$$

$$\left(x\right)^{\prime}(x)=\frac{u}{a}$$

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

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

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

a)
$$z_x = e^y \cdot 1 = e^y$$
 $z_y = x \cdot e^y = xe^y$ $(cu)'(x) = c \cdot u'(x)$
b) $z_x = 0 + \frac{1}{2\sqrt{x}} = \frac{1}{2\sqrt{x}}$ $z_y = 1 \cdot e^y + y \cdot e^y + 0 = (1+y)e^y$

$$z_y =$$

$$u=1\cdot e^y$$

$$z_y = 1 \cdot e^y + y \cdot e^y + 0 = (1+y)e^y$$

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

3/24

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

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

Odredite parcijalne derivacije sljedećih funkcija:

a)
$$z = xe^y$$

$$\int_{0}^{1}(x)=\frac{d}{dx}$$

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

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

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

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

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

$$z_y - x$$

$$z_y =$$

$$z_y = 1$$

$$z_y = 1 \cdot e^y + y \cdot e^y + 0 = (1+y)e^y$$

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

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

$$z_{y} = x \cdot e^{y} = xe^{y} \qquad (cu)'(x) = c \cdot u'(x)$$

$$\frac{1}{2\sqrt{x}}$$

c) $u_x = \frac{2 \cdot (x+y) - (x+y)^2}{(x+y)^2}$ $\left(\sqrt{x}\right)' = \frac{1}{2\sqrt{x}}$

Odredite parcijalne derivacije sljedećih funkcija:

a) $z = xe^y$

$$\left(x\right) = \frac{u}{2}$$

b) $z = ye^y + \sqrt{x}$ Rješenje $\left(\frac{u}{v}\right)'(x) = \frac{u'(x) \cdot v(x) - u(x) \cdot v'(x)}{v(x)^2}$

a)
$$z_{\scriptscriptstyle X}=e^{\scriptscriptstyle y}\cdot 1=e^{\scriptscriptstyle y}$$

$$x = x \cdot e^y = x$$

$$z_y = 1 \cdot e^y + y \cdot e^y + 0 = (1+y)e^y$$

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

$$z_v = 1 \cdot e^y$$

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

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

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

$$z_y = x \cdot e^y = xe^y$$
 $(cu)'(x) = c \cdot u'(x)$

3/24

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

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

Odredite parcijalne derivacije sljedećih funkcija:

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

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

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

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

$$L=e^y$$

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

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

$$z_y = x \cdot e^y = xe^y$$
 $(cu)'(x) = c \cdot u'(x)$

$$z_{ii} = 1 \cdot \epsilon$$

$$z_y = 1$$
.

$$z_y =$$

$$=1\cdot e^{y}$$

$$z_y = 1 \cdot e^y + y \cdot e^y + 0 = (1+y)e^y$$

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

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

$$u(x,y) = y$$

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

3/24

Odredite parcijalne derivacije sljedećih funkcija:

a)
$$z = xe^y$$

$$(x) = \frac{u}{1}$$

a)
$$z = xe^y$$
 b) $z = ye^y + \sqrt{x}$
$$\left(\frac{u}{v}\right)'(x) = \frac{u'(x) \cdot v(x) - u(x) \cdot v'(x)}{v(x)^2}$$

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

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

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

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

$$z_y = x \cdot e^y = xe^y$$
 $(cu)'(x) = c \cdot u'(x)$

$$Z_y$$

$$Z_{y}$$

$$z_y = 1 \cdot e^y + y \cdot e^y + 0 = (1+y)e^y$$

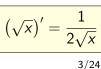
 $(uv)'(x) = u'(x) \cdot v(x) + u(x) \cdot v'(x)$

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

$$y)e^y$$









Odredite parcijalne derivacije sljedećih funkcija:

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

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

$$e^y = xe^y$$

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

$$\frac{1}{\sqrt{x}}$$

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

$$z_y = 1 \cdot e^{-\frac{1}{2}}$$

$$z_y = 1 \cdot e$$

$$u)'(x) =$$

$$z_y = x \cdot e^y = xe^y$$
 $(cu)'(x) = c \cdot u'(x)$



3/24

$$z_y = 1 \cdot e^y + y \cdot e^y + 0 = (1+y)e^y$$

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

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

Odredite parcijalne derivacije sljedećih funkcija:

a) $z = xe^y$

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

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

$$z_y = x \cdot e^y = xe^y$$
 $(cu)'(x) = c \cdot u'(x)$

$$\mathsf{L} = e^y$$

$$=x\cdot e^y=x$$

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

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

$$\cdot \cdot e^y + y \cdot$$

$$z_y = 1 \cdot e^y + y \cdot e^y + 0 = (1+y)e^y$$

$$e^y + y$$

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

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

3/24

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

Odredite parcijalne derivacije sljedećih funkcija:

a)
$$z = xe^y$$

$$\int_{0}^{1}(x)=\frac{u}{u}$$

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$$z = xe^y$$
 b) $z = ye^y + \sqrt{x}$
$$\left(\frac{u}{v}\right)'(x) = \frac{u'(x) \cdot v(x) - u(x) \cdot v'(x)}{v(x)^2}$$

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

 $u_v =$

$$1=e^y$$

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

$$z_y = x \cdot e^y = xe^y$$
 $(cu)'(x) = c \cdot u'(x)$

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

$$z_y = 1 \cdot e^y + y \cdot e^y + 0 = (1+y)e^y$$

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

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

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

3/24

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



Odredite parcijalne derivacije sljedećih funkcija:

a) $z = xe^y$

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

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

Rješenje $\left| \left(\frac{u}{v} \right)'(x) = \frac{u'(x) \cdot v(x) - u(x) \cdot v'(x)}{v(x)^2} \right|$ a) $z_x = e^y \cdot 1 = e^y$

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

$$= xe^y$$

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

$$z_y = x \cdot e^y = xe^y$$
 $(cu)'(x) = c \cdot u'(x)$

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

$$y)e^{y}$$

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

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

3/24

$$z_y = 1 \cdot e^y + y \cdot e^y + 0 = (1+y)e^y$$

Odredite parcijalne derivacije sljedećih funkcija:

a)
$$z = xe^y$$

$$\int_{0}^{1} (x) = \frac{u}{u}$$

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

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

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

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$$z_x = 0 + \frac{1}{2\sqrt{x}} = \frac{1}{2\sqrt{x}}$$

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

 $(x + y)^2$

$$z_y = x \cdot e^y = xe^y \qquad \boxed{(cu)'(x) = c \cdot u'(x)}$$
$$z_y = 1 \cdot e^y + y \cdot e^y + 0 = (1 + y)e^y$$

$$z_y = 1 \cdot e^y + y \cdot e^y + 0 = (1+y)e^y$$

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

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

3/24

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

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

Odredite parcijalne derivacije sljedećih funkcija:

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

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

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

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

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

$$z_y = x \cdot e^y = xe^y$$
 $(cu)'(x) = c \cdot u'(x)$

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

$$z_y =$$

b)
$$z_x = 0 + \frac{1}{2\sqrt{x}} = \frac{1}{2\sqrt{x}}$$
 $z_y = 1 \cdot e^y + \frac{1}{2\sqrt{x}}$
c) $u_x = \frac{2 \cdot (x+y) - (2x-y) \cdot 1}{(x+y)^2} = \frac{3y}{(x+y)^2}$

$$z_y = 1 \cdot e^y + y \cdot e^y + 0 = (1+y)e^y$$

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

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

3/24

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

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

Odredite parcijalne derivacije sljedećih funkcija:

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

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

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

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

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

$$z_y = x \cdot e^y = xe^y$$
 $(cu)'(x) = c \cdot u'(x)$

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

$$z_y = 1$$

$$z_y = 1 \cdot e^{-z}$$

$$z_y = 1 \cdot e^y + y \cdot e^y + 0 = (1+y)e^y$$

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

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

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

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

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

3/24

Odredite parcijalne derivacije sljedećih funkcija:

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

a)
$$z = xe^y$$

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

$$v(x)^{2}$$

$$z_{y} = x \cdot e^{y} = xe^{y} \qquad (cu)'(x) = c \cdot u'(x)$$

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

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

a)
$$z_x = e^y \cdot 1 = e^y$$
 z
b) $z_x = 0 + \frac{1}{2\sqrt{x}} = \frac{1}{2\sqrt{x}}$

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

$$z_y =$$

$$z_y = 1$$

$$1 \cdot e^y +$$

$$z_y = 1 \cdot e^y + y \cdot e^y + 0 = (1+y)e^y$$

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

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

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

3/24

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

Odredite parcijalne derivacije sljedećih funkcija:

a)
$$z = xe^y$$

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

$$(x) = \frac{u}{x}$$

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

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

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

$$z_y = 1$$

$$1 \cdot e^y +$$

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

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

a)
$$z = xe^y$$
 b) $z = ye^y + \sqrt{x}$
$$\left(\frac{u}{v}\right)'(x) = \frac{u'(x) \cdot v(x) - u(x) \cdot v'(x)}{v(x)^2}$$

$$z_y = x \cdot e^y = xe^y$$
 $(cu)'(x) = c \cdot u'(x)$

$$z_y = 1 \cdot e^y + y \cdot e^y + 0 = (1+y)e^y$$

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

$$)'=e^{-}$$

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

3/24

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

$$\frac{\cdot 1}{\cdot} = \frac{3y}{(x+1)}$$

Odredite parcijalne derivacije sljedećih funkcija:

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

a)
$$z = xe^y$$

$$\int '(x)=\frac{u}{x}$$

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

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

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

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

$$z_y = 1 \cdot e^y + y \cdot e^y + 0 = (1+y)e^y$$

$$e^y + y$$

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

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

$$z_y = x \cdot e^y = xe^y \qquad (cu)'(x) = c \cdot u'(x)$$

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

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

3/24

Odredite parcijalne derivacije sljedećih funkcija:

a)
$$z = xe^y$$

$$\int'(x)=\frac{\iota}{\iota}$$

b) $z = ye^y + \sqrt{x}$ Rješenje $\left| \left(\frac{u}{v} \right)'(x) = \frac{u'(x) \cdot v(x) - u(x) \cdot v'(x)}{v(x)^2} \right|$

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

$$z_y = \lambda$$

$$z_{\scriptscriptstyle V}=1\cdot {
m e}^{\scriptscriptstyle
m y}$$
 -

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

$$2\sqrt{x} - 2\sqrt{x}$$

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

$$z_y = 1 \cdot e^y + y \cdot e^y + 0 = (1+y)e^y$$

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

$$z_y = x \cdot e^y = xe^y$$
 $(cu)'(x) = c \cdot u'(x)$

$$y'=xe^y$$

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

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

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

3/24

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

Odredite parcijalne derivacije sljedećih funkcija:

a)
$$z = xe^y$$

b) $z = ye^y + \sqrt{x}$ Rješenje $\left| \left(\frac{u}{v} \right)'(x) = \frac{u'(x) \cdot v(x) - u(x) \cdot v'(x)}{v(x)^2} \right|$

a) $z_x = e^y \cdot 1 = e^y$ b) $z_x = 0 + \frac{1}{2\sqrt{x}} = \frac{1}{2\sqrt{x}}$

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

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

 $z_y = x \cdot e^y = xe^y$ $(cu)'(x) = c \cdot u'(x)$

 $z_y = 1 \cdot e^y + y \cdot e^y + 0 = (1+y)e^y$

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

3/24

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

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

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

Odredite parcijalne derivacije sljedećih funkcija:

a) $z = xe^y$

$$\int_{0}^{1} (x) = \frac{u}{2}$$

b) $z = ye^y + \sqrt{x}$ Rješenje $\frac{\left(\frac{u}{v}\right)'(x) = \frac{u'(x) \cdot v(x) - u(x) \cdot v'(x)}{v(x)^2} }{v(x)^2}$

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

b)
$$z_x = e^{y} \cdot 1 = e^{y}$$

$$z_y = 1 \cdot \epsilon$$

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

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

$$z_y = 1 \cdot e^y$$

$$z_y = 1 \cdot e^y + y \cdot e^y + 0 = (1+y)e^y$$

$$y \cdot e^{y}$$

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

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

$$z_y = x \cdot e^y = xe^y$$
 $(cu)'(x) = c \cdot u'(x)$



$$=e^{x}$$

$$\frac{1}{2\sqrt{x}}$$

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

Odredite parcijalne derivacije sljedećih funkcija:

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

a) $z = xe^y$

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

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

 $z_y = x \cdot e^y = xe^y$ $(cu)'(x) = c \cdot u'(x)$ b) $z_x = 0 + \frac{1}{2\sqrt{x}} = \frac{1}{2\sqrt{x}}$

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

 $z_y = 1 \cdot e^y + y \cdot e^y + 0 = (1+y)e^y$

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

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

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

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

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

treći zadatak

Odredite parcijalne derivacije sljedećih funkcija:

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

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

$$z_x =$$

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

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

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

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

$$z = (x + 2y)e^{x^2 + y^3}$$
5/24

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

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

$$z = (x + 2y)e^{x^2 + y^3}$$
5/24

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

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

$$z = (x + 2y)e^{x^2 + y^3}$$
5/24

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

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

$$z = (x + 2y)e^{x^2 + y^3}$$
5/24

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

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

$$z = (x + 2y)e^{x^2 + y^3}$$
5/24

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

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

$$z = (x + 2y)e^{x^2 + y^3}$$
5/24

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

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

$$z = (x + 2y)e^{x^2 + y^3}$$
 5/24

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

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

$$z = (x + 2y)e^{x^2 + y^3}$$
5/24

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

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

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

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

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

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

$$z = (x + 2y)e^{x^2 + y^3}$$
5/24

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

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

a)
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a)
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a)
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5/24

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5/24

Rješenje
$$(e^{x})' = e^{x}$$
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 5/24

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

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

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

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

$$(uv)'(x) = u'(x) \cdot v(x) + u(x) \cdot v'(x)$$
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$$z_{x} = (x + 2y)'_{x} \cdot e^{x^{2} + y^{3}} + (x + 2y) \cdot (e^{x^{2} + y^{3}})'_{x} = 1 \cdot e^{x^{2} + y^{3}} + (x + 2y)e^{x^{2} + y^{3}} \cdot (x^{2} + y^{3})'_{x} = 0$$

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

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

$$z = (x + 2y)e^{x^2 + y^3}$$
 5/24

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

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

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

$$z = (x + 2y)e^{x^2 + y^3}$$
 5/24

Rješenje
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$$z_{x} = (x + 2y)'_{x} \cdot e^{x^{2} + y^{3}} + (x + 2y) \cdot (e^{x^{2} + y^{3}})'_{x} =$$

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

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

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

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

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

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

$$= e^{x^2+y^3} + (2x^2+4xy)$$

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

$$= e^{x^2 + y^3} + (2x^2 + 4xy)e^{x^2 + y^3}$$

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

$$e^{x^2}$$

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

 $=e^{x^2+y^3}+(2x^2+4xy)e^{x^2+y^3}=($

$$(\cdot)'_{\times} \cdot e$$

$$(y)_x'$$

$$(2y)_x'$$

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

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

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

5/24

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

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

$$x^2 + v^3 + t$$

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

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

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

$$(x + 2y)e^{x}$$
 $\therefore 2x =$

$$+(2x^2+4xy)e^{x^2+y^3}=(2x^2+y^2)e^{x^2+y^3}$$

$$= e^{x^2+y^3} + (2x^2+4xy)e^{x^2+y^3} = (2x^2+4xy)e^{x^2+y^3}$$

$$+(2x^2+4xy)e^{x^2+y^3}=(2$$

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

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

$$)_{x}^{\prime}\cdot e$$

$$(2y)'_{\downarrow}$$

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

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

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

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

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Rješenje
$$(e^{x})' = e^{x}$$

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

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

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

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

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

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

$$z_{y} =$$

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

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

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

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

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

$$(2x^2 + 4xy)e^{x^2+y^3} =$$

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

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

$$x^2 + 4xy)e^{-x}$$

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

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

 $z_y = (x + 2y)_v' \cdot$

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

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

$$(2y)^{\circ}$$

$$'_{x}$$
 .

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

$$(2x^2 + 4xy)e^{x^2+y^3} = 0$$

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

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

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

$$x^{2}+v^{3}+(x^{2}+v^{3}+y^{4}+y^{$$

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

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

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$$(...+2..)' = x^2 + y^3 + (...+2..)$$

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

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

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

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

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

= 2

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

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

$$e^{x^2}$$

$$e^{x^2}$$

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

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

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

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

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

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

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

$$= e^{x^2 + y^3} + (2x^2 + 4xy)e^{x^2 + y^3} - (2x^2 + 4xy)e^{x^2 + y^3} = (2x^2 +$$

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

$$= e^{x} + (2x^{2} + e^{x^{2} + y})$$

 $z_{y} = (x + 2y)'_{y} \cdot e^{x^{2} + y}$

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

= 2 \cdot

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

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

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

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

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

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

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

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

$$)_{x}^{\prime}$$
 .

$$\cdot e^{x}$$

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

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

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

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

$$a^{x^2}$$

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

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

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

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

$$()'_{x}$$

$$')'_{x}$$
 ·

$$x^2 \dashv$$

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

$$e^{\lambda}$$

$$x^2$$

$$x^2$$

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

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

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

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

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

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

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

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

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

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

$$x^2+y$$

$$x^2 + y^3$$
 _

$$x^2 + y^3$$

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

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

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

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

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

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

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

$$(2x^2 + 4xy)$$

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

$$(2x + 4xy)e$$

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

$$-y^3 + (x + 2y)$$

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

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

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

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

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

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

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

$$')'_{x}$$

$$)_{\times}^{\prime}$$

$$e^{x^2}$$

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

$$)_{x}^{\prime}\cdot e$$

$$(y)'_{\times}$$

$$x^2 +$$

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

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

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

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

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

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

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

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

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

$$(2y)^{\circ}$$

$$')'_{x}$$

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

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

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

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

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

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

Rješenje
$$(e^{x})' = e^{x}$$

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

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

$$2v^{\frac{1}{2}}$$

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

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

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

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

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

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

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

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

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

$$z = (x + 2y)e^{x^2 + y^3}$$
 5/24

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

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

$$(2y)'_{j}$$

$$e^{x^2}$$

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

 $=2e^{x^2+y^3}+(x+2y)e^{x^2+y^3}.$

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

$$e^{\lambda}$$

$$(\cdot e^{i})$$

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

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

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

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

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

Rješenje
$$(e^{x})' = e^{x}$$

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

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

$$(2y)^{t}$$

$$(2y)^{\prime}_{2}$$

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



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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

$$= 2e^{x^{2} + y^{3}} + (3xy^{2})$$

$$= 2e^{x^2+y^3} + (3xy^2)$$

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

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

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

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

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

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

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

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

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

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

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

$$8xy^2 +$$

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

$$= 2e^{-v} + (3xy^{2} + (3xy^{2}$$

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

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

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

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

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

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

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

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

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

$$=2e^{x^2+y^3}+(3xy^2+6y^3)$$

$$=2e^{x^2+y^3}+(3xy^2+6y^3)$$

 $(uv)'(x) = u'(x) \cdot v(x) + u(x) \cdot v'(x)$ $z = (x + 2y)e^{x^2 + y^3}$ 5/24

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

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

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

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

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

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

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

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

$$=2e^{x^2+y^3}+(3xy^2+6y^3)e^{x^2+y^3}$$

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

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

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

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

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

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

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

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

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

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

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

$$= 2e^{x^2+y^3} + (3xy^2+6y^3)e^{x^2+y^3} = ($$

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

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

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

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

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

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

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

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

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

b)

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

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b) $z_x = \frac{(x)_x'}{}$

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

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

b) $z_x = \frac{(x)_x' \cdot}{}$

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

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

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

6/24

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

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

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

6/24

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

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

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

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

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

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

6/24

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

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

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

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 $x^2 + y^2$

$$\left(\frac{u}{v}\right)'(x) = \frac{u'(x) \cdot v(x) - u(x) \cdot v'(x)}{v(x)^2}$$

$$x^2 + y^2$$

b) $z_x = \frac{(x)'_x \cdot \sqrt{x^2 + y^2} - x \cdot (\sqrt{x^2 + y^2})'_x}{\sqrt{x^2 + y^2}^2} =$

 $\left(\frac{u}{v}\right)'(x) = \frac{u'(x) \cdot v(x) - u(x) \cdot v'(x)}{v(x)^2}$

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 $x^2 + y^2$

b) $z_x = \frac{(x)'_x \cdot \sqrt{x^2 + y^2} - x \cdot (\sqrt{x^2 + y^2})'_x}{\sqrt{x^2 + y^2}^2} =$

1 ·

b) $z_x = \frac{(x)'_x \cdot \sqrt{x^2 + y^2} - x \cdot (\sqrt{x^2 + y^2})'_x}{\sqrt{x^2 + y^2}^2} =$

 $1 \cdot \sqrt{x^2 + y^2}$

 $\left(\frac{u}{v}\right)'(x) = \frac{u'(x) \cdot v(x) - u(x) \cdot v'(x)}{v(x)^2}$

b) $z_x = \frac{(x)'_x \cdot \sqrt{x^2 + y^2} - x \cdot (\sqrt{x^2 + y^2})'_x}{\sqrt{x^2 + y^2}^2} =$

 $1 \cdot \sqrt{x^2 + y^2} -$

 $\left(\frac{u}{v}\right)'(x) = \frac{u'(x) \cdot v(x) - u(x) \cdot v'(x)}{v(x)^2}$

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b) $z_x = \frac{(x)'_x \cdot \sqrt{x^2 + y^2} - x \cdot (\sqrt{x^2 + y^2})'_x}{\sqrt{x^2 + y^2}^2} =$

 $1 \cdot \sqrt{x^2 + y^2} - x$

b)
$$z_{x} = \frac{(x)'_{x} \cdot \sqrt{x^{2} + y^{2}} - x \cdot (\sqrt{x^{2} + y^{2}})'_{x}}{\sqrt{x^{2} + y^{2}}^{2}} = \frac{1}{\sqrt{x^{2} + y^{2}}} = \frac{1}{2\sqrt{x}}$$

$$= \frac{1 \cdot \sqrt{x^{2} + y^{2}} - x \cdot }{x^{2} + y^{2}} = \frac{1}{\sqrt{x^{2} + y^{2}}} = \frac{1}{\sqrt$$

$$\left(\frac{u}{v}\right)'(x) = \frac{u'(x) \cdot v(x) - u(x) \cdot v'(x)}{v(x)^2}$$

b)
$$z_{x} = \frac{(x)'_{x} \cdot \sqrt{x^{2} + y^{2}} - x \cdot (\sqrt{x^{2} + y^{2}})'_{x}}{\sqrt{x^{2} + y^{2}}^{2}} = \frac{1}{\sqrt{x^{2} + y^{2}}} = \frac{1}{2\sqrt{x}}$$

$$= \frac{1 \cdot \sqrt{x^{2} + y^{2}} - x \cdot \frac{1}{2\sqrt{x^{2} + y^{2}}}}{x^{2} + y^{2}} = \frac{1}{\sqrt{x^{2} + y^{2}}} = \frac{1}{\sqrt{x$$

$$\left(\frac{u}{v}\right)'(x) = \frac{u'(x) \cdot v(x) - u(x) \cdot v'(x)}{v(x)^2}$$

b)
$$z_{x} = \frac{(x)_{x}' \cdot \sqrt{x^{2} + y^{2}} - x \cdot (\sqrt{x^{2} + y^{2}})_{x}'}{\sqrt{x^{2} + y^{2}}^{2}} = \frac{1 \cdot \sqrt{x^{2} + y^{2}} - x \cdot \frac{1}{2\sqrt{x^{2} + y^{2}}}}{x^{2} + y^{2}} = \frac{1 \cdot \sqrt{x^{2} + y^{2}} - x \cdot \frac{1}{2\sqrt{x^{2} + y^{2}}}}{x^{2} + y^{2}} = \frac{1}{2\sqrt{x}}$$

$$\left(\frac{u}{v}\right)'(x) = \frac{u'(x) \cdot v(x) - u(x) \cdot v'(x)}{v(x)^2}$$

b)
$$z_{x} = \frac{(x)'_{x} \cdot \sqrt{x^{2} + y^{2}} - x \cdot (\sqrt{x^{2} + y^{2}})'_{x}}{\sqrt{x^{2} + y^{2}}^{2}} = \frac{1}{\sqrt{x^{2} + y^{2}}} \cdot (x^{2} + y^{2})'_{x}} = \frac{1 \cdot \sqrt{x^{2} + y^{2}} - x \cdot \frac{1}{2\sqrt{x^{2} + y^{2}}} \cdot (x^{2} + y^{2})'_{x}}{x^{2} + y^{2}}$$

 $\left(\sqrt{x}\right)' = \frac{1}{2\sqrt{x}}$

$$\frac{\left(\frac{u}{v}\right)'(x) = \frac{u'(x) \cdot v(x) - u(x) \cdot v'(x)}{v(x)^2}}{v(x)^2}$$

b)
$$z_{x} = \frac{(x)'_{x} \cdot \sqrt{x^{2} + y^{2}} - x \cdot (\sqrt{x^{2} + y^{2}})'_{x}}{\sqrt{x^{2} + y^{2}}^{2}} = \frac{1}{\sqrt{x^{2} + y^{2}}} \cdot (\sqrt{x^{2} + y^{2}})'_{x}} = \frac{1 \cdot \sqrt{x^{2} + y^{2}} - x \cdot \frac{1}{2\sqrt{x^{2} + y^{2}}} \cdot (x^{2} + y^{2})'_{x}}}{x^{2} + y^{2}} = \frac{1}{x^{2} + y^{2}} \cdot (x^{2} + y^{2})'_{x}} = \frac{1}{x$$

$$\left(\frac{u}{v}\right)'(x) = \frac{u'(x) \cdot v(x) - u(x) \cdot v'(x)}{v(x)^2}$$

b)
$$z_{x} = \frac{(x)'_{x} \cdot \sqrt{x^{2} + y^{2}} - x \cdot (\sqrt{x^{2} + y^{2}})'_{x}}{\sqrt{x^{2} + y^{2}}^{2}} = \frac{1}{\sqrt{x^{2} + y^{2}}} \cdot (\sqrt{x^{2} + y^{2}})'_{x}} = \frac{1 \cdot \sqrt{x^{2} + y^{2}} - x \cdot \frac{1}{2\sqrt{x^{2} + y^{2}}} \cdot (x^{2} + y^{2})'_{x}}}{x^{2} + y^{2}} = \frac{1}{\sqrt{x^{2} + y^{2}}} \cdot (x^{2} + y^{2})'_{x}} = \frac{1}{\sqrt{x^{2} + y^{2}}} \cdot (x^{2} + y^$$

$$x^2 + y^2$$

 $\left(\sqrt{\text{nešto}}\right)' = \frac{1}{2\sqrt{\text{nešto}}} \cdot (\text{nešto})'$

 $\left(\frac{u}{v}\right)'(x) = \frac{u'(x) \cdot v(x) - u(x) \cdot v'(x)}{v(x)^2}$

b)
$$z_{x} = \frac{(x)'_{x} \cdot \sqrt{x^{2} + y^{2}} - x \cdot (\sqrt{x^{2} + y^{2}})'_{x}}{\sqrt{x^{2} + y^{2}}^{2}} = \frac{1}{\sqrt{x^{2} + y^{2}}} \frac{1}{2\sqrt{x}}$$

$$= \frac{1 \cdot \sqrt{x^{2} + y^{2}} - x \cdot \frac{1}{2\sqrt{x^{2} + y^{2}}} \cdot (x^{2} + y^{2})'_{x}}{x^{2} + y^{2}} =$$

$$x^2 + y^2$$

$$\left(\frac{u}{v}\right)'(x) = \frac{u'(x) \cdot v(x) - u(x) \cdot v'(x)}{v(x)^2}$$

 $\sqrt{x^2 + y^2}$

b)
$$z_{x} = \frac{(x)'_{x} \cdot \sqrt{x^{2} + y^{2}} - x \cdot (\sqrt{x^{2} + y^{2}})'_{x}}{\sqrt{x^{2} + y^{2}}^{2}} = \frac{1}{\sqrt{x^{2} + y^{2}}} \left[(\sqrt{x})' = \frac{1}{2\sqrt{x}} \right]$$

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 $\sqrt{x^2 + y^2} -$

 $\left(\frac{u}{v}\right)'(x) = \frac{u'(x) \cdot v(x) - u(x) \cdot v'(x)}{v(x)^2}$ 6/24

b)
$$z_{x} = \frac{(x)'_{x} \cdot \sqrt{x^{2} + y^{2}} - x \cdot (\sqrt{x^{2} + y^{2}})'_{x}}{\sqrt{x^{2} + y^{2}}^{2}} = \left[(\sqrt{x})' = \frac{1}{2\sqrt{x}} \right]$$

$$= \frac{1 \cdot \sqrt{x^{2} + y^{2}} - x \cdot \frac{1}{2\sqrt{x^{2} + y^{2}}} \cdot (x^{2} + y^{2})'_{x}}{x^{2} + y^{2}} =$$

$$=\frac{1}{x^2+1}$$

$$=\frac{\sqrt{x^2+y^2}-\frac{x}{2\sqrt{x^2+y^2}}}{x^2+y^2}$$

$$\left(\frac{u}{v}\right)'(x) = \frac{u'(x) \cdot v(x) - u(x) \cdot v'(x)}{v(x)^2}$$

b)
$$z_{x} = \frac{(x)'_{x} \cdot \sqrt{x^{2} + y^{2}} - x \cdot (\sqrt{x^{2} + y^{2}})'_{x}}{\sqrt{x^{2} + y^{2}}^{2}} = \frac{1}{\sqrt{x^{2} + y^{2}}} \left(\sqrt{x^{2} + y^{2}}\right)'_{x}} = \frac{1 \cdot \sqrt{x^{2} + y^{2}} - x \cdot \frac{1}{2\sqrt{x^{2} + y^{2}}} \cdot (x^{2} + y^{2})'_{x}}}{x^{2} + y^{2}} = \frac{1}{2\sqrt{x^{2} + y^{2}}} = \frac{1}{2\sqrt{x^{2} + y^{2}}} = \frac{1}{2\sqrt{x^{2} + y^{2}}} \cdot (x^{2} + y^{2})'_{x}}{x^{2} + y^{2}} = \frac{1}{2\sqrt{x^{2} + y^{2}}} = \frac{1}{2\sqrt{x^{2} + y^{2$$

$$= \frac{1}{x^2 + y^2}$$

 $\sqrt{x^2+y^2}-\frac{x}{2\sqrt{x^2+y^2}}$

$$\left(\frac{u}{v}\right)'(x) = \frac{u'(x) \cdot v(x) - u(x) \cdot v'(x)}{v(x)^2}$$

b)
$$z_{x} = \frac{(x)'_{x} \cdot \sqrt{x^{2} + y^{2}} - x \cdot (\sqrt{x^{2} + y^{2}})'_{x}}{\sqrt{x^{2} + y^{2}}^{2}} = \frac{1}{\sqrt{x^{2} + y^{2}}} \left[(\sqrt{x})' = \frac{1}{2\sqrt{x}} \right]$$

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 $z = \frac{x}{\sqrt{x^2 + y^2}}$

 $\left(\sqrt{\text{nešto}}\right)' = \frac{1}{2\sqrt{\text{nešto}}} \cdot (\text{nešto})'$

$$=\frac{\sqrt{x^2+y^2}-\frac{x}{2\sqrt{x^2+y^2}}\cdot 2x}{x^2+y^2}$$

$$\left(\frac{u}{v}\right)'(x) = \frac{u'(x) \cdot v(x) - u(x) \cdot v'(x)}{v(x)^2}$$

b)
$$z_{x} = \frac{(x)'_{x} \cdot \sqrt{x^{2} + y^{2}} - x \cdot (\sqrt{x^{2} + y^{2}})'_{x}}{\sqrt{x^{2} + y^{2}}^{2}} = \frac{1}{2\sqrt{x}}$$

$$= \frac{1 \cdot \sqrt{x^{2} + y^{2}} - x \cdot \frac{1}{2\sqrt{x^{2} + y^{2}}} \cdot (x^{2} + y^{2})'_{x}}{x^{2} + y^{2}} = \frac{\sqrt{x^{2} + y^{2}} - \frac{x}{2\sqrt{x^{2} + y^{2}}} \cdot 2x}{x^{2} + y^{2}} = \frac{1}{x^{2} + y^{2}}$$

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 $(\sqrt{\text{nešto}})' = \frac{1}{2\sqrt{\text{nešto}}} \cdot (\text{nešto})'$

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$$z_{x} = \frac{(x)_{x}' \cdot \sqrt{x^{2} + y^{2}} - x \cdot (\sqrt{x^{2} + y^{2}})_{x}'}{\sqrt{x^{2} + y^{2}}^{2}} = \frac{1}{\sqrt{x^{2} + y^{2}}} \cdot (x^{2} + y^{2})_{x}' = \frac{1}{2\sqrt{x}}$$

$$= \frac{1 \cdot \sqrt{x^{2} + y^{2}} - x \cdot \frac{1}{2\sqrt{x^{2} + y^{2}}} \cdot (x^{2} + y^{2})_{x}'}{x^{2} + y^{2}} = \frac{\sqrt{x^{2} + y^{2}} - \frac{x}{2\sqrt{x^{2} + y^{2}}} \cdot 2x}{x^{2} + y^{2}} = \frac{x}{x^{2} + y^{2}}$$

 $\left(\sqrt{\text{nešto}}\right)' = \frac{1}{2\sqrt{\text{nešto}}} \cdot (\text{nešto})'$

$$x^2 + y^2 \qquad x^2 + y^2$$

$$\left(\frac{u}{v}\right)'(x) = \frac{u'(x) \cdot v(x) - u(x) \cdot v'(x)}{v(x)^2}$$

b)
$$z_{x} = \frac{(x)_{x}' \cdot \sqrt{x^{2} + y^{2}} - x \cdot (\sqrt{x^{2} + y^{2}})_{x}'}{\sqrt{x^{2} + y^{2}}^{2}} = \frac{1}{\sqrt{x^{2} + y^{2}}} \cdot (\sqrt{x^{2} + y^{2}})_{x}' = \frac{1}{2\sqrt{x}}$$

$$= \frac{1 \cdot \sqrt{x^{2} + y^{2}} - x \cdot \frac{1}{2\sqrt{x^{2} + y^{2}}} \cdot (x^{2} + y^{2})_{x}'}{x^{2} + y^{2}} = \frac{1}{x^{2} + y^{2}}$$

$$=\frac{\sqrt{x^2+y^2}-\frac{x}{2\sqrt{x^2+y^2}}\cdot 2x}{x^2+y^2}=\frac{\sqrt{x^2+y^2}}{x^2+y^2}$$

$$\left(\frac{u}{v}\right)'(x) = \frac{u'(x) \cdot v(x) - u(x) \cdot v'(x)}{v(x)^2}$$

 $(\sqrt{\text{nešto}})' = \frac{1}{2\sqrt{\text{nešto}}} \cdot (\text{nešto})'$

6/24

 $z = \frac{x}{\sqrt{x^2 + y^2}}$

b)
$$z_{x} = \frac{(x)'_{x} \cdot \sqrt{x^{2} + y^{2}} - x \cdot (\sqrt{x^{2} + y^{2}})'_{x}}{\sqrt{x^{2} + y^{2}}^{2}} = \frac{1}{\sqrt{x^{2} + y^{2}}} \cdot (x^{2} + y^{2})'_{x}} = \frac{1 \cdot \sqrt{x^{2} + y^{2}} - x \cdot \frac{1}{2\sqrt{x^{2} + y^{2}}} \cdot (x^{2} + y^{2})'_{x}}}{x^{2} + y^{2}} = \frac{\sqrt{x^{2} + y^{2}} - \frac{x}{2\sqrt{x^{2} + y^{2}}} \cdot 2x}}{x^{2} + y^{2}} = \frac{\sqrt{x^{2} + y^{2}} - \frac{x}{2\sqrt{x^{2} + y^{2}}}}{x^{2} + y^{2}} = \frac{\sqrt{x^{2} + y^{2}} - \frac{x}{2\sqrt{x^{2} + y^{2}}}}{x^{2} + y^{2}} = \frac{\sqrt{x^{2} + y^{2}} - \frac{x}{2\sqrt{x^{2} + y^{2}}}}{x^{2} + y^{2}} = \frac{\sqrt{x^{2} + y^{2}} - \frac{x}{2\sqrt{x^{2} + y^{2}}}}{x^{2} + y^{2}} = \frac{\sqrt{x^{2} + y^{2}} - \frac{x}{2\sqrt{x^{2} + y^{2}}}}{x^{2} + y^{2}} = \frac{\sqrt{x^{2} + y^{2}} - \frac{x}{2\sqrt{x^{2} + y^{2}}}}{x^{2} + y^{2}} = \frac{\sqrt{x^{2} + y^{2}} - \frac{x}{2\sqrt{x^{2} + y^{2}}}}{x^{2} + y^{2}} = \frac{\sqrt{x^{2} + y^{2}} - \frac{x}{2\sqrt{x^{2} + y^{2}}}}{x^{2} + y^{2}} = \frac{\sqrt{x^{2} + y^{2}} - \frac{x}{2\sqrt{x^{2} + y^{2}}}}{x^{2} + y^{2}} = \frac{\sqrt{x^{2} + y^{2}} - \frac{x}{2\sqrt{x^{2} + y^{2}}}}{x^{2} + y^{2}} = \frac{\sqrt{x^{2} + y^{2}} - \frac{x}{2\sqrt{x^{2} + y^{2}}}}{x^{2} + y^{2}} = \frac{\sqrt{x^{2} + y^{2}} - \frac{x}{2\sqrt{x^{2} + y^{2}}}}{x^{2} + y^{2}} = \frac{\sqrt{x^{2} + y^{2}} - \frac{x}{2\sqrt{x^{2} + y^{2}}}}}{x^{2} + y^{2}} = \frac{\sqrt{x^{2} + y^{2}} - \frac{x}{2\sqrt{x^{2} + y^{2}}}}}{x^{2} + y^{2}} = \frac{\sqrt{x^{2} + y^{2}} - \frac{x}{2\sqrt{x^{2} + y^{2}}}}}{x^{2} + y^{2}} = \frac{\sqrt{x^{2} + y^{2}} - \frac{x}{2\sqrt{x^{2} + y^{2}}}}}{x^{2} + y^{2}} = \frac{\sqrt{x^{2} + y^{2}} - \frac{x}{2\sqrt{x^{2} + y^{2}}}}}{x^{2} + y^{2}} = \frac{\sqrt{x^{2} + y^{2}}}{x^{2} + y^{2}}}$$

 $z = \frac{x}{\sqrt{x^2 + y^2}}$

 $(\sqrt{\text{nešto}})' = \frac{1}{2\sqrt{\text{nešto}}} \cdot (\text{nešto})'$

$$x^2 + y^2 \qquad \qquad x^2 + y^2$$

$$\left(\frac{u}{v}\right)'(x) = \frac{u'(x) \cdot v(x) - u(x) \cdot v'(x)}{v(x)^2}$$
6/24

b)
$$z_{x} = \frac{(x)_{x}' \cdot \sqrt{x^{2} + y^{2}} - x \cdot (\sqrt{x^{2} + y^{2}})_{x}'}{\sqrt{x^{2} + y^{2}}^{2}} = \frac{1}{\sqrt{x^{2} + y^{2}}} \cdot (\sqrt{x^{2} + y^{2}})_{x}' = \frac{1}{2\sqrt{x}}$$

$$= \frac{1 \cdot \sqrt{x^{2} + y^{2}} - x \cdot \frac{1}{2\sqrt{x^{2} + y^{2}}} \cdot (x^{2} + y^{2})_{x}'}{x^{2} + y^{2}} = \frac{\sqrt{x^{2} + y^{2}} - \frac{x^{2}}{\sqrt{x^{2} + y^{2}}}}{x^{2} + y^{2}}$$

$$= \frac{\sqrt{x^{2} + y^{2}} - \frac{x}{2\sqrt{x^{2} + y^{2}}} \cdot 2x}{x^{2} + y^{2}} = \frac{\sqrt{x^{2} + y^{2}} - \frac{x^{2}}{\sqrt{x^{2} + y^{2}}}}{x^{2} + y^{2}}$$

 $(\sqrt{\text{nešto}})' = \frac{1}{2\sqrt{\text{nešto}}} \cdot (\text{nešto})'$

$$\left(\frac{u}{v}\right)'(x) = \frac{u'(x) \cdot v(x) - u(x) \cdot v'(x)}{v(x)^2}$$

6/24

 $z = \frac{\lambda}{\sqrt{x^2 + y^2}}$

b)
$$z_{x} = \frac{(x)'_{x} \cdot \sqrt{x^{2} + y^{2}} - x \cdot (\sqrt{x^{2} + y^{2}})'_{x}}{\sqrt{x^{2} + y^{2}}^{2}} = \frac{1}{\sqrt{x^{2} + y^{2}}} \cdot (\sqrt{x^{2} + y^{2}})'_{x}} = \frac{1 \cdot \sqrt{x^{2} + y^{2}} - x \cdot \frac{1}{2\sqrt{x^{2} + y^{2}}} \cdot (x^{2} + y^{2})'_{x}}}{x^{2} + y^{2}} = \frac{1}{\sqrt{x^{2} + y^{2}}} \cdot (x^{2} + y^{2})'_{x}} = \frac{1}{\sqrt{x^{2} + y^{2}}} \cdot (x^{2} + y^$$

 $z = \frac{x}{\sqrt{x^2 + y^2}}$

6/24

 $(\sqrt{\text{nešto}})' = \frac{1}{2\sqrt{\text{nešto}}} \cdot (\text{nešto})'$

 $\frac{\sqrt{x^2 + y^2} - \frac{x}{2\sqrt{x^2 + y^2}} \cdot 2x}{x^2 + y^2} = \frac{\sqrt{x^2 + y^2} - \frac{x^2}{\sqrt{x^2 + y^2}}}{x^2 + y^2} = \frac{x^2}{x^2 + y^2}$

$$= \frac{1}{x^2 + y^2}$$

$$= \frac{1}{x^2 + y^2}$$

$$= \frac{\left(\frac{u}{v}\right)'(x) = \frac{u'(x) \cdot v(x) - u(x) \cdot v'(x)}{v(x)^2}$$
6/24

b)
$$z_{x} = \frac{(x)'_{x} \cdot \sqrt{x^{2} + y^{2}} - x \cdot (\sqrt{x^{2} + y^{2}})'_{x}}{\sqrt{x^{2} + y^{2}}^{2}} = \frac{1}{\sqrt{x^{2} + y^{2}}} \cdot (\sqrt{x^{2} + y^{2}})'_{x} = \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}} - \frac{x^{2}}{\sqrt{x^{2} + y^{2}}}}{x^{2} + y^{2}} = \frac{\sqrt{x^{2} + y^{2}} - \frac{x^{2}}{\sqrt{x^{2} + y^{2}}}}{x^{2} + y^{2}} = \frac{\sqrt{x^{2} + y^{2}} - \frac{x^{2}}{\sqrt{x^{2} + y^{2}}}}{x^{2} + y^{2}} = \frac{\sqrt{x^{2} + y^{2}} - \frac{x^{2}}{\sqrt{x^{2} + y^{2}}}}{x^{2} + y^{2}} = \frac{\sqrt{x^{2} + y^{2}} - \frac{x^{2}}{\sqrt{x^{2} + y^{2}}}}{x^{2} + y^{2}} = \frac{\sqrt{x^{2} + y^{2}} - \frac{x^{2}}{\sqrt{x^{2} + y^{2}}}}{x^{2} + y^{2}} = \frac{\sqrt{x^{2} + y^{2}} - \frac{x^{2}}{\sqrt{x^{2} + y^{2}}}}{x^{2} + y^{2}} = \frac{\sqrt{x^{2} + y^{2}} - \frac{x^{2}}{\sqrt{x^{2} + y^{2}}}}{x^{2} + y^{2}} = \frac{\sqrt{x^{2} + y^{2}} - \frac{x^{2}}{\sqrt{x^{2} + y^{2}}}}{x^{2} + y^{2}} = \frac{\sqrt{x^{2} + y^{2}} - \frac{x^{2}}{\sqrt{x^{2} + y^{2}}}}{x^{2} + y^{2}} = \frac{\sqrt{x^{2} + y^{2}} - \frac{x^{2}}{\sqrt{x^{2} + y^{2}}}}{x^{2} + y^{2}} = \frac{\sqrt{x^{2} + y^{2}} - \frac{x^{2}}{\sqrt{x^{2} + y^{2}}}}{x^{2} + y^{2}} = \frac{\sqrt{x^{2} + y^{2}} - \frac{x^{2}}{\sqrt{x^{2} + y^{2}}}}{x^{2} + y^{2}} = \frac{\sqrt{x^{2} + y^{2}} - \frac{x^{2}}{\sqrt{x^{2} + y^{2}}}}{x^{2} + y^{2}} = \frac{\sqrt{x^{2} + y^{2}} - \frac{x^{2}}{\sqrt{x^{2} + y^{2}}}}{x^{2} + y^{2}} = \frac{\sqrt{x^{2} + y^{2}} - \frac{x^{2}}{\sqrt{x^{2} + y^{2}}}}{x^{2} + y^{2}} = \frac{\sqrt{x^{2} + y^{2}} - \frac{x^{2}}{\sqrt{x^{2} + y^{2}}}}{x^{2} + y^{2}} = \frac{\sqrt{x^{2} + y^{2}} - \frac{x^{2}}{\sqrt{x^{2} + y^{2}}}}{x^{2} + y^{2}} = \frac{\sqrt{x^{2} + y^{2}} - \frac{x^{2}}{\sqrt{x^{2} + y^{2}}}}{x^{2} + y^{2}} = \frac{\sqrt{x^{2} + y^{2}} - \frac{x^{2}}{\sqrt{x^{2} + y^{2}}}}{x^{2} + y^{2}} = \frac{\sqrt{x^{2} + y^{2}} - \frac{x^{2}}{\sqrt{x^{2} + y^{2}}}}{x^{2} + y^{2}} = \frac{\sqrt{x^{2} + y^{2}}}{x^{2} + y^{2}} = \frac{\sqrt{x^{2} + y^{2}}}{x^{2} + y^{2}}}$$

 $(\sqrt{\text{nešto}})' = \frac{1}{2\sqrt{\text{nešto}}} \cdot (\text{nešto})'$

$$=\frac{1}{(x^2+y^2)\sqrt{x^2+y^2}}$$

$$= \frac{1}{(x^2 + y^2)\sqrt{x^2 + y^2}}$$

$$\frac{\left(\frac{u}{v}\right)'(x) = \frac{u'(x) \cdot v(x) - u(x) \cdot v'(x)}{v(x)^2}}{(x^2 + y^2)\sqrt{x^2 + y^2}}$$

6/24

b)
$$z_{x} = \frac{(x)'_{x} \cdot \sqrt{x^{2} + y^{2}} - x \cdot (\sqrt{x^{2} + y^{2}})'_{x}}{\sqrt{x^{2} + y^{2}}^{2}} = \frac{1}{\sqrt{x^{2} + y^{2}}} \cdot (\sqrt{x^{2} + y^{2}})'_{x} = \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}} - \frac{x^{2}}{\sqrt{x^{2} + y^{2}}}}{x^{2} + y^{2}} = \frac{\sqrt{x^{2} + y^{2}} - \frac{x^{2}}{\sqrt{x^{2} + y^{2}}}}{x^{2} + y^{2}} = \frac{\sqrt{x^{2} + y^{2}} - \frac{x^{2}}{\sqrt{x^{2} + y^{2}}}}{x^{2} + y^{2}} = \frac{\sqrt{x^{2} + y^{2}} - \frac{x^{2}}{\sqrt{x^{2} + y^{2}}}}{x^{2} + y^{2}} = \frac{\sqrt{x^{2} + y^{2}} - \frac{x^{2}}{\sqrt{x^{2} + y^{2}}}}{x^{2} + y^{2}} = \frac{\sqrt{x^{2} + y^{2}} - \frac{x^{2}}{\sqrt{x^{2} + y^{2}}}}{x^{2} + y^{2}} = \frac{\sqrt{x^{2} + y^{2}} - \frac{x^{2}}{\sqrt{x^{2} + y^{2}}}}{x^{2} + y^{2}} = \frac{\sqrt{x^{2} + y^{2}} - \frac{x^{2}}{\sqrt{x^{2} + y^{2}}}}{x^{2} + y^{2}} = \frac{\sqrt{x^{2} + y^{2}} - \frac{x^{2}}{\sqrt{x^{2} + y^{2}}}}{x^{2} + y^{2}} = \frac{\sqrt{x^{2} + y^{2}} - \frac{x^{2}}{\sqrt{x^{2} + y^{2}}}}{x^{2} + y^{2}} = \frac{\sqrt{x^{2} + y^{2}} - \frac{x^{2}}{\sqrt{x^{2} + y^{2}}}}{x^{2} + y^{2}} = \frac{\sqrt{x^{2} + y^{2}} - \frac{x^{2}}{\sqrt{x^{2} + y^{2}}}}{x^{2} + y^{2}} = \frac{\sqrt{x^{2} + y^{2}} - \frac{x^{2}}{\sqrt{x^{2} + y^{2}}}}{x^{2} + y^{2}} = \frac{\sqrt{x^{2} + y^{2}} - \frac{x^{2}}{\sqrt{x^{2} + y^{2}}}}{x^{2} + y^{2}} = \frac{\sqrt{x^{2} + y^{2}} - \frac{x^{2}}{\sqrt{x^{2} + y^{2}}}}{x^{2} + y^{2}} = \frac{\sqrt{x^{2} + y^{2}} - \frac{x^{2}}{\sqrt{x^{2} + y^{2}}}}{x^{2} + y^{2}} = \frac{\sqrt{x^{2} + y^{2}} - \frac{x^{2}}{\sqrt{x^{2} + y^{2}}}}{x^{2} + y^{2}} = \frac{\sqrt{x^{2} + y^{2}} - \frac{x^{2}}{\sqrt{x^{2} + y^{2}}}}{x^{2} + y^{2}} = \frac{\sqrt{x^{2} + y^{2}} - \frac{x^{2}}{\sqrt{x^{2} + y^{2}}}}{x^{2} + y^{2}} = \frac{\sqrt{x^{2} + y^{2}} - \frac{x^{2}}{\sqrt{x^{2} + y^{2}}}}{x^{2} + y^{2}} = \frac{\sqrt{x^{2} + y^{2}} - \frac{x^{2}}{\sqrt{x^{2} + y^{2}}}}{x^{2} + y^{2}} = \frac{\sqrt{x^{2} + y^{2}}}{x^{2} + y^{2}} = \frac{\sqrt{x^{2} + y^{2}}}{x^{2} + y^{2}}}$$

 $z = \frac{x}{\sqrt{x^2 + y^2}}$

 $=\frac{x^2+y^2}{(x^2+y^2)\sqrt{x^2+y^2}}$

$$=\frac{x^2+y^2}{(x^2+y^2)\sqrt{x^2+y^2}}$$

 $(\sqrt{\text{nešto}})' = \frac{1}{2\sqrt{\text{nešto}}} \cdot (\text{nešto})'$

b)
$$z_{x} = \frac{(x)'_{x} \cdot \sqrt{x^{2} + y^{2}} - x \cdot (\sqrt{x^{2} + y^{2}})'_{x}}{\sqrt{x^{2} + y^{2}}^{2}} = \frac{1}{\sqrt{x^{2} + y^{2}}} \cdot (\sqrt{x^{2} + y^{2}})'_{x} = \frac{1 \cdot \sqrt{x^{2} + y^{2}} - x \cdot \frac{1}{2\sqrt{x^{2} + y^{2}}} \cdot (x^{2} + y^{2})'_{x}}{x^{2} + y^{2}} = \frac{1}{\sqrt{x^{2} + y^{2}}} \cdot \frac{x^{2} + y^{2}}{\sqrt{x^{2} + y^{2}}} = \frac{x^{2}}{\sqrt{x^{2} + y^{2}}} \cdot 2x = \frac{x^{2}}{\sqrt{x^{2} + y^{2}}} = \frac{x^{2}}{\sqrt{x^{2} + y^{2}$$

 $(\sqrt{\text{nešto}})' = \frac{1}{2\sqrt{\text{nešto}}} \cdot (\text{nešto})'$

$$= \frac{\sqrt{x^2 + y^2} - \frac{x}{2\sqrt{x^2 + y^2}} \cdot 2x}{x^2 + y^2} = \frac{\sqrt{x^2 + y^2} - \frac{x^2}{\sqrt{x^2 + y^2}}}{x^2 + y^2}$$

$$= \frac{x^2 + y^2 - x^2}{\sqrt{x^2 + y^2}}$$

$$= \frac{x^2 + y^2}{x^2 + y^2} = \frac{x^2 + y^2 - x^2}{(x^2 + y^2)\sqrt{x^2 + y^2}}$$

$$= \frac{x^2 + y^2 - x^2}{(x^2 + y^2)\sqrt{x^2 + y^2}}$$

$$\frac{\left(\frac{u}{v}\right)'(x) = \frac{u'(x) \cdot v(x) - u(x) \cdot v'(x)}{v(x)^2}}{(x^2 + y^2)\sqrt{x^2 + y^2}}$$

6/24

b)
$$z_{x} = \frac{(x)'_{x} \cdot \sqrt{x^{2} + y^{2}} - x \cdot (\sqrt{x^{2} + y^{2}})'_{x}}{\sqrt{x^{2} + y^{2}}^{2}} = \frac{1}{\sqrt{x^{2} + y^{2}}} \left(\sqrt{x}\right)' = \frac{1}{2\sqrt{x}} \right]$$

$$= \frac{1 \cdot \sqrt{x^{2} + y^{2}} - x \cdot \frac{1}{2\sqrt{x^{2} + y^{2}}} \cdot (x^{2} + y^{2})'_{x}}{x^{2} + y^{2}} = \frac{\sqrt{x^{2} + y^{2}} - \frac{x^{2}}{\sqrt{x^{2} + y^{2}}}}{x^{2} + y^{2}} = \frac{\sqrt{x^{2} + y^{2}} - \frac{x^{2}}{\sqrt{x^{2} + y^{2}}}}{x^{2} + y^{2}} = \frac{\sqrt{x^{2} + y^{2}} - \frac{x^{2}}{\sqrt{x^{2} + y^{2}}}}{x^{2} + y^{2}} = \frac{\sqrt{x^{2} + y^{2}} - \frac{x^{2}}{\sqrt{x^{2} + y^{2}}}}{x^{2} + y^{2}} = \frac{\sqrt{x^{2} + y^{2}} - \frac{x^{2}}{\sqrt{x^{2} + y^{2}}}}{x^{2} + y^{2}} = \frac{\sqrt{x^{2} + y^{2}} - \frac{x^{2}}{\sqrt{x^{2} + y^{2}}}}{x^{2} + y^{2}} = \frac{\sqrt{x^{2} + y^{2}} - \frac{x^{2}}{\sqrt{x^{2} + y^{2}}}}{x^{2} + y^{2}} = \frac{\sqrt{x^{2} + y^{2}} - \frac{x^{2}}{\sqrt{x^{2} + y^{2}}}}{x^{2} + y^{2}} = \frac{\sqrt{x^{2} + y^{2}} - \frac{x^{2}}{\sqrt{x^{2} + y^{2}}}}{x^{2} + y^{2}} = \frac{\sqrt{x^{2} + y^{2}} - \frac{x^{2}}{\sqrt{x^{2} + y^{2}}}}{x^{2} + y^{2}} = \frac{\sqrt{x^{2} + y^{2}} - \frac{x^{2}}{\sqrt{x^{2} + y^{2}}}}{x^{2} + y^{2}} = \frac{\sqrt{x^{2} + y^{2}} - \frac{x^{2}}{\sqrt{x^{2} + y^{2}}}}{x^{2} + y^{2}} = \frac{\sqrt{x^{2} + y^{2}} - \frac{x^{2}}{\sqrt{x^{2} + y^{2}}}}{x^{2} + y^{2}} = \frac{\sqrt{x^{2} + y^{2}} - \frac{x^{2}}{\sqrt{x^{2} + y^{2}}}}{x^{2} + y^{2}} = \frac{\sqrt{x^{2} + y^{2}} - \frac{x^{2}}{\sqrt{x^{2} + y^{2}}}}{x^{2} + y^{2}} = \frac{\sqrt{x^{2} + y^{2}} - \frac{x^{2}}{\sqrt{x^{2} + y^{2}}}}{x^{2} + y^{2}} = \frac{\sqrt{x^{2} + y^{2}} - \frac{x^{2}}{\sqrt{x^{2} + y^{2}}}}{x^{2} + y^{2}} = \frac{\sqrt{x^{2} + y^{2}} - \frac{x^{2}}{\sqrt{x^{2} + y^{2}}}}{x^{2} + y^{2}} = \frac{\sqrt{x^{2} + y^{2}} - \frac{x^{2}}{\sqrt{x^{2} + y^{2}}}}{x^{2} + y^{2}} = \frac{\sqrt{x^{2} + y^{2}} - \frac{x^{2}}{\sqrt{x^{2} + y^{2}}}}{x^{2} + y^{2}} = \frac{\sqrt{x^{2} + y^{2}} - \frac{x^{2}}{\sqrt{x^{2} + y^{2}}}}{x^{2} + y^{2}} = \frac{\sqrt{x^{2} + y^{2}}}{x^{2} + y^{2}} = \frac{\sqrt{$$

 $z = \frac{x}{\sqrt{x^2 + y^2}}$

6/24

$$=\frac{x^2+y^2-x^2}{(x^2+y^2)\sqrt{x^2+y^2}}=----$$

$$=\frac{x^2+y^2-x^2}{(x^2+y^2)\sqrt{x^2+y^2}}=$$

 $(\sqrt{\text{nešto}})' = \frac{1}{2\sqrt{\text{nešto}}} \cdot (\text{nešto})'$

$$= \frac{1}{(x^2 + y^2)\sqrt{x^2 + y^2}} = \frac{1}{(x^2 + y^2)\sqrt{x^2 + y^$$

b)
$$z_{x} = \frac{(x)'_{x} \cdot \sqrt{x^{2} + y^{2}} - x \cdot (\sqrt{x^{2} + y^{2}})'_{x}}{\sqrt{x^{2} + y^{2}}^{2}} = \frac{1}{\sqrt{x^{2} + y^{2}}} \frac{1}{\sqrt{x^{2} + y^{2}}} = \frac{1 \cdot \sqrt{x^{2} + y^{2}} - x \cdot \frac{1}{2\sqrt{x^{2} + y^{2}}} \cdot (x^{2} + y^{2})'_{x}}{x^{2} + y^{2}} = \frac{1}{\sqrt{x^{2} + y^{2}}} \frac{1}{\sqrt{x^{2} + y^{2}}} = \frac{1}{\sqrt{x^{2} + y^{2}}} \frac{1}{\sqrt{x^{2} + y^{2}}} \frac{1}{\sqrt{x^{2} + y^{2}}} \frac{1}{\sqrt{x^{2} + y^{2}}} = \frac{1}{\sqrt{x^{2} + y^{2}}} \frac{1}{\sqrt{$$

 $(\sqrt{\text{nešto}})' = \frac{1}{2\sqrt{\text{nešto}}} \cdot (\text{nešto})'$

 $\frac{\sqrt{x^2 + y^2} - \frac{x}{2\sqrt{x^2 + y^2}} \cdot 2x}{x^2 + y^2} = \frac{\sqrt{x^2 + y^2} - \frac{x^2}{\sqrt{x^2 + y^2}}}{x^2 + y^2}$

$$\frac{x^2 + y^2}{(x^2 + y^2)\sqrt{x^2 + y^2}} = \frac{x^2 + y^2}{(x^2 + y^2)^{\frac{3}{2}}}$$

$$=\frac{x^2+y^2-x^2}{(x^2+y^2)\sqrt{x^2+y^2}}=\frac{1}{(x^2+y^2)^{\frac{3}{2}}}$$

$$-\frac{1}{(x^2+y^2)\sqrt{x^2+y^2}} - \frac{1}{(x^2+y^2)^{\frac{3}{2}}}$$

$$\left(\frac{u}{v}\right)'(x) = \frac{u'(x)\cdot v(x) - u(x)\cdot v'(x)}{v(x)^2}$$

6/24

b)
$$z_{x} = \frac{(x)'_{x} \cdot \sqrt{x^{2} + y^{2}} - x \cdot (\sqrt{x^{2} + y^{2}})'_{x}}{\sqrt{x^{2} + y^{2}}^{2}} = \frac{1}{\sqrt{x^{2} + y^{2}}} \cdot (\sqrt{x^{2} + y^{2}})'_{x} = \frac{1 \cdot \sqrt{x^{2} + y^{2}} - x \cdot \frac{1}{2\sqrt{x^{2} + y^{2}}} \cdot (x^{2} + y^{2})'_{x}}{x^{2} + y^{2}} = \frac{1}{\sqrt{x^{2} + y^{2}} - \frac{x}{\sqrt{x^{2} + y^{2}}} - \frac{x^{2}}{\sqrt{x^{2} + y^{2}}}}$$

 $\frac{\sqrt{x^2 + y^2} - \frac{x}{2\sqrt{x^2 + y^2}} \cdot 2x}{\frac{x^2 + y^2}{x^2 + y^2}} = \frac{\sqrt{x^2 + y^2} - \frac{x^2}{\sqrt{x^2 + y^2}}}{\frac{x^2 + y^2}{x^2 + y^2}}$

$$=\frac{x^2+y^2-x^2}{(x^2+y^2)\sqrt{x^2+y^2}}=\frac{y^2}{(x^2+y^2)^{\frac{3}{2}}}$$

 $(\sqrt{\text{nešto}})' = \frac{1}{2\sqrt{\text{nešto}}} \cdot (\text{nešto})'$

$$=\frac{x^2+y^2-x^2}{(x^2+y^2)\sqrt{x^2+y^2}}=\frac{y^2}{(x^2+y^2)^{\frac{3}{2}}}$$

 $z_{v} =$

 $\left| \left(\frac{u}{v} \right)'(x) = \frac{u'(x) \cdot v(x) - u(x) \cdot v'(x)}{v(x)^2} \right|$

7/24

 $\left(\frac{u}{v}\right)'(x) = \frac{u'(x) \cdot v(x) - u(x) \cdot v'(x)}{v(x)^2}$

 $z_y =$

 $\sqrt{x^2+y^2}^2$

 $\left| \left(\frac{u}{v} \right)'(x) = \frac{u'(x) \cdot v(x) - u(x) \cdot v'(x)}{v(x)^2} \right|$

 $z_{v} =$

 $\sqrt{x^2+y^2}^2$

 $\left(\frac{u}{v}\right)'(x) = \frac{u'(x) \cdot v(x) - u(x) \cdot v'(x)}{v(x)^2}$

 $z_y = \frac{(x)_y'}{}$

 $z_y = \frac{(x)_y' \cdot}{}$

 $\sqrt{x^2+y^2}^2$

 $z_{y} = \frac{(x)'_{y} \cdot \sqrt{x^{2} + y^{2}}}{\sqrt{x^{2} + y^{2}}^{2}}$

 $z = \frac{x}{\sqrt{x^2 + y^2}}$

 $z_y = \frac{(x)'_y \cdot \sqrt{x^2 + y^2} - \sqrt{x^2 + y^2}^2}{\sqrt{x^2 + y^2}^2}$

 $z_y = \frac{(x)'_y \cdot \sqrt{x^2 + y^2} - x}{\sqrt{x^2 + y^2}^2}$

$$\left(\frac{u}{v}\right)'(x) = \frac{u'(x) \cdot v(x) - u(x) \cdot v'(x)}{v(x)^2}$$

 $z_y = \frac{(x)'_y \cdot \sqrt{x^2 + y^2} - x \cdot \sqrt{x^2 + y^2}}{\sqrt{x^2 + y^2}}$

 $z_{y} = \frac{(x)'_{y} \cdot \sqrt{x^{2} + y^{2}} - x \cdot (\sqrt{x^{2} + y^{2}})'_{y}}{\sqrt{x^{2} + y^{2}}^{2}}$

 $z_y = rac{(x)_y' \cdot \sqrt{x^2 + y^2} - x \cdot \left(\sqrt{x^2 + y^2}\,\right)_y'}{\sqrt{x^2 + y^2}^2} =$

 $z_y = rac{(x)_y' \cdot \sqrt{x^2 + y^2} - x \cdot \left(\sqrt{x^2 + y^2}\,\right)_y'}{\sqrt{x^2 + y^2}^2} =$

 $\left(\frac{u}{v}\right)'(x) = \frac{u'(x) \cdot v(x) - u(x) \cdot v'(x)}{v(x)^2}$

 $x^2 + v^2$

 $z_y = rac{(x)_y' \cdot \sqrt{x^2 + y^2} - x \cdot \left(\sqrt{x^2 + y^2}\,\right)_y'}{\sqrt{x^2 + y^2}^2} =$

 $\left(\frac{u}{v}\right)'(x) = \frac{u'(x) \cdot v(x) - u(x) \cdot v'(x)}{v(x)^2}$

 $x^2 + v^2$

0

 $z_y = rac{(x)'_y \cdot \sqrt{x^2 + y^2} - x \cdot \left(\sqrt{x^2 + y^2}\,\right)'_y}{\sqrt{x^2 + y^2}^2} =$

 $\left(\frac{u}{v}\right)'(x) = \frac{u'(x) \cdot v(x) - u(x) \cdot v'(x)}{v(x)^2}$

 $x^2 + v^2$

0 .

 $z_y = rac{(x)'_y \cdot \sqrt{x^2 + y^2} - x \cdot (\sqrt{x^2 + y^2})'_y}{\sqrt{x^2 + y^2}^2} =$

 $x^2 + y^2$

 $0 \cdot \sqrt{x^2 + y^2}$

$$\left(\frac{u}{v}\right)'(x) = \frac{u'(x) \cdot v(x) - u(x) \cdot v'(x)}{v(x)^2}$$

 $z_y = rac{(x)_y' \cdot \sqrt{x^2 + y^2} - x \cdot \left(\sqrt{x^2 + y^2}\,\right)_y'}{\sqrt{x^2 + y^2}^2} =$

 $x^2 + y^2$

 $0 \cdot \sqrt{x^2 + y^2} -$

 $z_y = rac{(x)'_y \cdot \sqrt{x^2 + y^2} - x \cdot (\sqrt{x^2 + y^2})'_y}{\sqrt{x^2 + y^2}^2} =$

 $x^2 + v^2$

 $0 \cdot \sqrt{x^2 + y^2} - x$

$$=\frac{0\cdot\sqrt{x^2+y^2}-x\cdot}{x^2+y^2}$$

7/24

 $(\sqrt{\text{nešto}})' = \frac{1}{2\sqrt{\text{nešto}}} \cdot (\text{nešto})'$

 $\left(\frac{u}{v}\right)'(x) = \frac{u'(x) \cdot v(x) - u(x) \cdot v'(x)}{v(x)^2}$

 $z_y = rac{\left(x
ight)_y' \cdot \sqrt{x^2 + y^2} - x \cdot \left(\sqrt{x^2 + y^2}
ight)_y'}{\sqrt{x^2 + y^2}^2} =$

$$= \frac{0 \cdot \sqrt{x^2 + y^2} - x \cdot \frac{1}{2\sqrt{x^2 + y^2}}}{x^2 + y^2}$$

 $(\sqrt{\text{nešto}})' = \frac{1}{2\sqrt{\text{nešto}}} \cdot (\text{nešto})'$

 $z_y = rac{(x)_y' \cdot \sqrt{x^2 + y^2} - x \cdot \left(\sqrt{x^2 + y^2}\,\right)_y'}{\sqrt{x^2 + y^2}^2} =$

 $\left(\frac{u}{v}\right)'(x) = \frac{u'(x) \cdot v(x) - u(x) \cdot v'(x)}{v(x)^2}$

7/24

 $\left(\sqrt{x}\right)' = \frac{1}{2\sqrt{x}}$

$$= \frac{0 \cdot \sqrt{x^2 + y^2} - x \cdot \frac{1}{2\sqrt{x^2 + y^2}}}{x^2 + y^2}$$

7/24

 $\left(\sqrt{\text{nešto}}\right)' = \frac{1}{2\sqrt{\text{nešto}}} \cdot (\text{nešto})'$

 $\left(\frac{u}{v}\right)'(x) = \frac{u'(x) \cdot v(x) - u(x) \cdot v'(x)}{v(x)^2}$

 $z_y = rac{(x)_y' \cdot \sqrt{x^2 + y^2} - x \cdot \left(\sqrt{x^2 + y^2}\,\right)_y'}{\sqrt{x^2 + y^2}^2} =$

$$= \frac{0 \cdot \sqrt{x^2 + y^2} - x \cdot \frac{1}{2\sqrt{x^2 + y^2}} \cdot (x^2 + y^2)'_y}{x^2 + y^2}$$

7/24

 $\left(\sqrt{\text{nešto}}\right)' = \frac{1}{2\sqrt{\text{nešto}}} \cdot (\text{nešto})'$

 $\left(\frac{u}{v}\right)'(x) = \frac{u'(x) \cdot v(x) - u(x) \cdot v'(x)}{v(x)^2}$

 $z_y = rac{(x)_y' \cdot \sqrt{x^2 + y^2} - x \cdot \left(\sqrt{x^2 + y^2}\,\right)_y'}{\sqrt{x^2 + y^2}^2} =$

$$= \frac{0 \cdot \sqrt{x^2 + y^2} - x \cdot \frac{1}{2\sqrt{x^2 + y^2}} \cdot (x^2 + y^2)'_{y}}{x^2 + y^2} =$$

$$= \frac{1}{x^2 + y^2} \cdot (x^2 + y^2)'_{y} = \frac{1}{x^2 + y^2} \cdot (x^2 + y^2)'_{y} =$$

7/24

 $(\sqrt{\text{nešto}})' = \frac{1}{2\sqrt{\text{nešto}}} \cdot (\text{nešto})'$

 $\left(\frac{u}{v}\right)'(x) = \frac{u'(x) \cdot v(x) - u(x) \cdot v'(x)}{v(x)^2}$

 $z_y = rac{(x)_y' \cdot \sqrt{x^2 + y^2} - x \cdot \left(\sqrt{x^2 + y^2}\,\right)_y'}{\sqrt{x^2 + y^2}^2} =$

$$z_{y} = \frac{(x)'_{y} \cdot \sqrt{x^{2} + y^{2}} - x \cdot (\sqrt{x^{2} + y^{2}})'_{y}}{\sqrt{x^{2} + y^{2}}^{2}} = \frac{1}{\sqrt{x^{2} + y^{2}}}$$

$$= \frac{0 \cdot \sqrt{x^{2} + y^{2}} - x \cdot \frac{1}{2\sqrt{x^{2} + y^{2}}} \cdot (x^{2} + y^{2})'_{y}}{x^{2} + y^{2}} = \frac{1}{x^{2} + y^{2}}$$

$$= \frac{1}{x^{2} + y^{2}}$$

7/24

 $\left(\sqrt{\text{nešto}}\right)' = \frac{1}{2\sqrt{\text{nešto}}} \cdot (\text{nešto})'$

$$= \frac{0 \cdot \sqrt{x^2 + y^2} - x \cdot \frac{1}{2\sqrt{x^2 + y^2}} \cdot (x^2 + y^2)'_y}{x^2 + y^2} =$$

$$= \frac{-\frac{x}{2\sqrt{x^2 + y^2}}}{x^2 + y^2}$$

 $\left(\sqrt{x}\right)' = \frac{1}{2\sqrt{x}}$

7/24

 $(\sqrt{\text{nešto}})' = \frac{1}{2\sqrt{\text{nešto}}} \cdot (\text{nešto})'$

 $z_y = \frac{(x)'_y \cdot \sqrt{x^2 + y^2} - x \cdot (\sqrt{x^2 + y^2})'_y}{\sqrt{x^2 + y^2}^2} =$

$$= \frac{0 \cdot \sqrt{x^2 + y^2} - x \cdot \frac{1}{2\sqrt{x^2 + y^2}} \cdot (x^2 + y^2)'_{y}}{x^2 + y^2} =$$

$$= \frac{-\frac{x}{2\sqrt{x^2 + y^2}}}{x^2 + y^2}$$

 $(\sqrt{\text{nešto}})' = \frac{1}{2\sqrt{\text{nešto}}} \cdot (\text{nešto})'$

 $z_y = \frac{(x)'_y \cdot \sqrt{x^2 + y^2} - x \cdot (\sqrt{x^2 + y^2})'_y}{\sqrt{x^2 + y^2}^2} =$

 $\left(\frac{u}{v}\right)'(x) = \frac{u'(x) \cdot v(x) - u(x) \cdot v'(x)}{v(x)^2}$

7/24

 $\left(\sqrt{x}\right)' = \frac{1}{2\sqrt{x}}$

$$= \frac{0 \cdot \sqrt{x^2 + y^2} - x \cdot \frac{1}{2\sqrt{x^2 + y^2}} \cdot (x^2 + y^2)'_y}{x^2 + y^2} =$$

$$= \frac{-\frac{x}{2\sqrt{x^2 + y^2}} \cdot 2y}{x^2 + y^2}$$

 $(\sqrt{\text{nešto}})' = \frac{1}{2\sqrt{\text{nešto}}} \cdot (\text{nešto})'$

 $z_y = \frac{(x)'_y \cdot \sqrt{x^2 + y^2} - x \cdot (\sqrt{x^2 + y^2})'_y}{\sqrt{x^2 + y^2}^2} =$

 $\left(\frac{u}{v}\right)'(x) = \frac{u'(x) \cdot v(x) - u(x) \cdot v'(x)}{v(x)^2}$

7/24

 $\left(\sqrt{x}\right)' = \frac{1}{2\sqrt{x}}$

$$z_{y} = \frac{(x)'_{y} \cdot \sqrt{x^{2} + y^{2}} - x \cdot (\sqrt{x^{2} + y^{2}})'_{y}}{\sqrt{x^{2} + y^{2}}^{2}} = \frac{1}{\sqrt{x^{2} + y^{2}}}$$

$$= \frac{0 \cdot \sqrt{x^{2} + y^{2}} - x \cdot \frac{1}{2\sqrt{x^{2} + y^{2}}} \cdot (x^{2} + y^{2})'_{y}}{x^{2} + y^{2}} = \frac{1}{x^{2} + y^{2}}$$

$$= \frac{-\frac{x}{2\sqrt{x^{2} + y^{2}}} \cdot 2y}{x^{2} + y^{2}} = \frac{1}{x^{2} + y^{2}}$$

 $\left(\sqrt{x}\right)' = \frac{1}{2\sqrt{x}}$

7/24

 $(\sqrt{\text{nešto}})' = \frac{1}{2\sqrt{\text{nešto}}} \cdot (\text{nešto})'$

$$z_{y} = \frac{(x)'_{y} \cdot \sqrt{x^{2} + y^{2}} - x \cdot (\sqrt{x^{2} + y^{2}})'_{y}}{\sqrt{x^{2} + y^{2}}^{2}} = \frac{1}{2\sqrt{x}}$$

$$= \frac{0 \cdot \sqrt{x^{2} + y^{2}} - x \cdot \frac{1}{2\sqrt{x^{2} + y^{2}}} \cdot (x^{2} + y^{2})'_{y}}{x^{2} + y^{2}} = \frac{1}{x^{2} + y^{2}}$$

$$= \frac{-\frac{x}{2\sqrt{x^{2} + y^{2}}} \cdot 2y}{x^{2} + y^{2}} = \frac{1}{x^{2} + y^{2}}$$

 $(\sqrt{\text{nešto}})' = \frac{1}{2\sqrt{\text{nešto}}} \cdot (\text{nešto})'$

 $\left(\frac{u}{v}\right)'(x) = \frac{u'(x) \cdot v(x) - u(x) \cdot v'(x)}{v(x)^2}$

7/24

 $\left(\sqrt{x}\right)' = \frac{1}{2\sqrt{x}}$

$$= \frac{0 \cdot \sqrt{x^2 + y^2} - x \cdot \frac{1}{2\sqrt{x^2 + y^2}} \cdot (x^2 + y^2)'_y}{x^2 + y^2} = \frac{-\frac{x}{2\sqrt{x^2 + y^2}} \cdot 2y}{x^2 + y^2} = \frac{\frac{-xy}{\sqrt{x^2 + y^2}}}{x^2 + y^2}$$

 $(\sqrt{\text{nešto}})' = \frac{1}{2\sqrt{\text{nešto}}} \cdot (\text{nešto})'$

 $z_y = rac{(x)_y' \cdot \sqrt{x^2 + y^2} - x \cdot \left(\sqrt{x^2 + y^2}\,\right)_y'}{\sqrt{x^2 + y^2}^2} =$

 $\left(\frac{u}{v}\right)'(x) = \frac{u'(x) \cdot v(x) - u(x) \cdot v'(x)}{v(x)^2}$

7/24

 $\left(\sqrt{x}\right)' = \frac{1}{2\sqrt{x}}$

$$z_{y} = \frac{(x)'_{y} \cdot \sqrt{x^{2} + y^{2}} - x \cdot (\sqrt{x^{2} + y^{2}})'_{y}}{\sqrt{x^{2} + y^{2}}^{2}} = \frac{1}{\sqrt{x^{2} + y^{2}}}$$

$$= \frac{0 \cdot \sqrt{x^{2} + y^{2}} - x \cdot \frac{1}{2\sqrt{x^{2} + y^{2}}} \cdot (x^{2} + y^{2})'_{y}}{x^{2} + y^{2}} = \frac{-\frac{x}{2\sqrt{x^{2} + y^{2}}} \cdot 2y}{x^{2} + y^{2}} = \frac{-\frac{xy}{\sqrt{x^{2} + y^{2}}}}{x^{2} + y^{2}} = \frac{-\frac{xy}{\sqrt{x^{2} + y^{2}}$$

7/24

 $(\sqrt{\text{nešto}})' = \frac{1}{2\sqrt{\text{nešto}}} \cdot (\text{nešto})'$

$$z_{y} = \frac{(x)'_{y} \cdot \sqrt{x^{2} + y^{2}} - x \cdot (\sqrt{x^{2} + y^{2}})'_{y}}{\sqrt{x^{2} + y^{2}}^{2}} = \frac{1}{\sqrt{x^{2} + y^{2}}}$$

$$= \frac{0 \cdot \sqrt{x^{2} + y^{2}} - x \cdot \frac{1}{2\sqrt{x^{2} + y^{2}}} \cdot (x^{2} + y^{2})'_{y}}{x^{2} + y^{2}} = \frac{-\frac{x}{2\sqrt{x^{2} + y^{2}}} \cdot 2y}{x^{2} + y^{2}} = \frac{-\frac{xy}{\sqrt{x^{2} + y^{2}}}}{x^{2} + y^{2}} = \frac{-\frac{xy}{\sqrt{x^{2} + y^{2}}$$

7/24

 $(\sqrt{\text{nešto}})' = \frac{1}{2\sqrt{\text{nešto}}} \cdot (\text{nešto})'$

$$z_{y} = \frac{(x)'_{y} \cdot \sqrt{x^{2} + y^{2}} - x \cdot (\sqrt{x^{2} + y^{2}})'_{y}}{\sqrt{x^{2} + y^{2}}^{2}} = \frac{1}{\sqrt{x^{2} + y^{2}}}$$

$$= \frac{0 \cdot \sqrt{x^{2} + y^{2}} - x \cdot \frac{1}{2\sqrt{x^{2} + y^{2}}} \cdot (x^{2} + y^{2})'_{y}}{x^{2} + y^{2}} = \frac{-xy}{x^{2} + y^{2}}$$

$$= \frac{-xy}{(x^{2} + y^{2})\sqrt{x^{2} + y^{2}}} = \frac{-xy}{(x^{2} + y^{2})\sqrt{x^{2} + y^{2}}} = \frac{-xy}{(x^{2} + y^{2})\sqrt{x^{2} + y^{2}}}$$

7/24

 $(\sqrt{\text{nešto}})' = \frac{1}{2\sqrt{\text{nešto}}} \cdot (\text{nešto})'$

$$z_{y} = \frac{(x)'_{y} \cdot \sqrt{x^{2} + y^{2}} - x \cdot (\sqrt{x^{2} + y^{2}})'_{y}}{\sqrt{x^{2} + y^{2}}^{2}} = \frac{1}{\sqrt{x^{2} + y^{2}}}$$

$$= \frac{0 \cdot \sqrt{x^{2} + y^{2}} - x \cdot \frac{1}{2\sqrt{x^{2} + y^{2}}} \cdot (x^{2} + y^{2})'_{y}}{x^{2} + y^{2}} = \frac{-xy}{x^{2} + y^{2}}$$

$$= \frac{-xy}{(x^{2} + y^{2})\sqrt{x^{2} + y^{2}}} = \frac{-xy}{x^{2} + y^{2}} = \frac{-xy}{(x^{2} + y^{2})\sqrt{x^{2} + y^{2}}} = \frac{-xy}{(x^{2} + y^{2})\sqrt{x^{2} + y^{2}}}$$

7/24

 $(\sqrt{\text{nešto}})' = \frac{1}{2\sqrt{\text{nešto}}} \cdot (\text{nešto})'$

$$z_{y} = \frac{(x)'_{y} \cdot \sqrt{x^{2} + y^{2}} - x \cdot (\sqrt{x^{2} + y^{2}})'_{y}}{\sqrt{x^{2} + y^{2}}^{2}} = \frac{1}{\sqrt{x^{2} + y^{2}}}$$

$$= \frac{0 \cdot \sqrt{x^{2} + y^{2}} - x \cdot \frac{1}{2\sqrt{x^{2} + y^{2}}} \cdot (x^{2} + y^{2})'_{y}}{x^{2} + y^{2}} = \frac{-xy}{x^{2} + y^{2}}$$

$$= \frac{-xy}{(x^{2} + y^{2})\sqrt{x^{2} + y^{2}}} = \frac{-xy}{(x^{2} + y^{2})^{\frac{3}{2}}}$$

7/24

 $(\sqrt{\text{nešto}})' = \frac{1}{2\sqrt{\text{nešto}}} \cdot (\text{nešto})'$

$$z_{y} = \frac{(x)'_{y} \cdot \sqrt{x^{2} + y^{2}} - x \cdot (\sqrt{x^{2} + y^{2}})'_{y}}{\sqrt{x^{2} + y^{2}}^{2}} = \frac{1}{\sqrt{x^{2} + y^{2}}}$$

$$= \frac{0 \cdot \sqrt{x^{2} + y^{2}} - x \cdot \frac{1}{2\sqrt{x^{2} + y^{2}}} \cdot (x^{2} + y^{2})'_{y}}{x^{2} + y^{2}} = \frac{-xy}{x^{2} + y^{2}}$$

$$= \frac{-\frac{x}{2\sqrt{x^{2} + y^{2}}} \cdot 2y}{x^{2} + y^{2}} = \frac{-xy}{x^{2} + y^{2}} = \frac{-xy}{(x^{2} + y^{2})\sqrt{x^{2} + y^{2}}} = \frac{-xy}{(x^{2} + y^{2})\sqrt[3]{x^{2} + y^{2}}}$$

$$= \frac{-xy}{(x^{2} + y^{2})\sqrt{x^{2} + y^{2}}} = \frac{-xy}{(x^{2} + y^{2})^{\frac{3}{2}}}$$

7/24

 $(\sqrt{\text{nešto}})' = \frac{1}{2\sqrt{\text{nešto}}} \cdot (\text{nešto})'$

c)
$$z_x =$$

$$(a^{x})' = a^{x} \ln a$$

$$(a^{\text{nešto}})' = a^{\text{nešto}} \ln a \cdot (\text{nešto})'$$

c) $z_x = 2^{\sin \frac{y}{x}} \ln 2$

$$(a^{x})' = a^{x} \ln a$$

$$(a^{\text{nešto}})' = a^{\text{nešto}} \ln a \cdot (\text{nešto})'$$

c)
$$z_x = 2^{\sin \frac{y}{x}} \ln 2$$
.

$$= a^x$$

$$(a^{x})' = a^{x} \ln a$$

$$z=2^{\sin\frac{y}{x}}$$

c)
$$z_x = 2^{\sin \frac{y}{x}} \ln 2 \cdot \left(\sin \frac{y}{x}\right)_x'$$

$$= a^x$$

c)

$$= a^x$$

$$(a^{x})' = a^{x} \ln a$$

$$(a^{\text{nešto}})' = a^{\text{nešto}} \ln a \cdot (\text{nešto})'$$

 $z_x = 2^{\sin \frac{y}{x}} \ln 2 \cdot \left(\sin \frac{y}{x}\right)_x' = 2^{\sin \frac{y}{x}} \ln 2$

8/24

$$\frac{(\sin x)' = \cos x}{(\sin (\text{nešto}))' = \cos (\text{nešto}) \cdot (\text{nešto})'}$$

$$z_x = 2^{\sin \frac{y}{x}} \ln 2 \cdot \left(\sin \frac{y}{x}\right)' = 2^{\sin \frac{y}{x}} \ln 2 \cdot$$

 $(a^x)' = a^x \ln a$

8/24

$$\frac{(\sin x)' = \cos x}{(\sin (\text{nešto}))' = \cos (\text{nešto}) \cdot (\text{nešto})'}$$

$$z_x = 2^{\sin \frac{y}{x}} \ln 2 \cdot \left(\sin \frac{y}{x}\right)_x' = 2^{\sin \frac{y}{x}} \ln 2 \cdot \cos \frac{y}{x}$$

 $(a^x)' = a^x \ln a$

$$\frac{(\sin x)' = \cos x}{(\sin (\text{nešto}))' = \cos (\text{nešto}) \cdot (\text{nešto})'}$$

$$z_x = 2^{\sin \frac{y}{x}} \ln 2 \cdot \left(\sin \frac{y}{x}\right)'_x = 2^{\sin \frac{y}{x}} \ln 2 \cdot \cos \frac{y}{x} \cdot$$

 $(a^x)' = a^x \ln a$

$$\frac{(\sin x)' = \cos x}{(\sin (\text{nešto}))' = \cos (\text{nešto}) \cdot (\text{nešto})'}$$

$$z_x = 2^{\sin \frac{y}{x}} \ln 2 \cdot \left(\sin \frac{y}{x}\right)'_x = 2^{\sin \frac{y}{x}} \ln 2 \cdot \cos \frac{y}{x} \cdot \left(\frac{y}{x}\right)'_x$$

 $(a^x)' = a^x \ln a$

$$\frac{(\sin x)' = \cos x}{(\sin (\text{nešto}))' = \cos (\text{nešto}) \cdot (\text{nešto})'}$$

$$z_x = 2^{\sin \frac{y}{x}} \ln 2 \cdot \left(\sin \frac{y}{x}\right)' = 2^{\sin \frac{y}{x}} \ln 2 \cdot \cos \frac{y}{x} \cdot \left(\frac{y}{x}\right)' =$$

 $=2^{\sin\frac{y}{x}}\ln 2\cdot\cos\frac{y}{x}$

 $(a^x)' = a^x \ln a$

c)

$$\frac{(\sin x)' = \cos x}{(\sin (\text{nešto}))' = \cos (\text{nešto}) \cdot (\text{nešto})'}$$

$$z_x = 2^{\sin \frac{y}{x}} \ln 2 \cdot \left(\sin \frac{y}{x}\right)' = 2^{\sin \frac{y}{x}} \ln 2 \cdot \cos \frac{y}{x} \cdot \left(\frac{y}{x}\right)' =$$

 $=2^{\sin\frac{y}{x}}\ln 2\cdot\cos\frac{y}{x}$

 $(a^x)' = a^x \ln a$

c)

$$\frac{(\sin x)' = \cos x}{(\sin (\text{nešto}))' = \cos (\text{nešto}) \cdot (\text{nešto})'}$$

$$z_x = 2^{\sin \frac{y}{x}} \ln 2 \cdot \left(\sin \frac{y}{x}\right)' = 2^{\sin \frac{y}{x}} \ln 2 \cdot \cos \frac{y}{x} \cdot \left(\frac{y}{x}\right)' =$$

 $=2^{\sin\frac{y}{x}}\ln 2\cdot\cos\frac{y}{x}\cdot\frac{-y}{x^2}$

 $(a^x)' = a^x \ln a$

c)

$$\frac{(\sin x)' = \cos x}{(\sin (\text{nešto}))' = \cos (\text{nešto}) \cdot (\text{nešto})'}$$

$$z_x = 2^{\sin \frac{y}{x}} \ln 2 \cdot \left(\sin \frac{y}{x}\right)' = 2^{\sin \frac{y}{x}} \ln 2 \cdot \cos \frac{y}{x} \cdot \left(\frac{y}{x}\right)' =$$

 $= 2^{\sin\frac{y}{x}} \ln 2 \cdot \cos\frac{y}{x} \cdot \frac{-y}{x^2} = -\frac{y}{x^2} \cdot$

c)

$$\frac{(\sin x)' = \cos x}{(\sin (\text{nešto}))' = \cos (\text{nešto}) \cdot (\text{nešto})'}$$

$$z_x = 2^{\sin \frac{y}{x}} \ln 2 \cdot \left(\sin \frac{y}{x}\right)' = 2^{\sin \frac{y}{x}} \ln 2 \cdot \cos \frac{y}{x} \cdot \left(\frac{y}{x}\right)' =$$

$$= 2^{\sin\frac{y}{x}} \ln 2 \cdot \cos\frac{y}{x} \cdot \frac{-y}{x^2} = -\frac{y}{x^2} \cdot 2^{\sin\frac{y}{x}} \ln 2 \cdot \cos\frac{y}{x}$$

c)

$$\frac{(\sin x)' = \cos x}{(\sin (\text{nešto}))' = \cos (\text{nešto}) \cdot (\text{nešto})'}$$

$$z_x = 2^{\sin \frac{y}{x}} \ln 2 \cdot \left(\sin \frac{y}{x}\right)' = 2^{\sin \frac{y}{x}} \ln 2 \cdot \cos \frac{y}{x} \cdot \left(\frac{y}{x}\right)' =$$

$$= 2^{\sin\frac{y}{x}} \ln 2 \cdot \cos\frac{y}{x} \cdot \frac{-y}{x^2} = -\frac{y}{x^2} \cdot 2^{\sin\frac{y}{x}} \ln 2 \cdot \cos\frac{y}{x}$$

$$z_y =$$

 $(a^x)' = a^x \ln a$

c)

$$\frac{(\sin x)' = \cos x}{(\sin (\text{nešto}))' = \cos (\text{nešto}) \cdot (\text{nešto})'}$$

c)
$$z_{x} = 2^{\sin\frac{y}{x}} \ln 2 \cdot \left(\sin\frac{y}{x}\right)_{x}' = 2^{\sin\frac{y}{x}} \ln 2 \cdot \cos\frac{y}{x} \cdot \left(\frac{y}{x}\right)_{x}' =$$
$$= 2^{\sin\frac{y}{x}} \ln 2 \cdot \cos\frac{y}{x} \cdot \frac{-y}{x^{2}} = -\frac{y}{x^{2}} \cdot 2^{\sin\frac{y}{x}} \ln 2 \cdot \cos\frac{y}{x}$$

 $z_v = 2^{\sin \frac{y}{x}} \ln 2$

 $(a^{x})' = a^{x} \ln a$ $(a^{\text{nešto}})' = a^{\text{nešto}} \ln a \cdot (\text{nešto})'$

$$\frac{(\sin x)' = \cos x}{(\sin (\text{nešto}))' = \cos (\text{nešto}) \cdot (\text{nešto})'}$$

$$z_x = 2^{\sin \frac{y}{x}} \ln 2 \cdot \left(\sin \frac{y}{x}\right)' = 2^{\sin \frac{y}{x}} \ln 2 \cdot \cos \frac{y}{x} \cdot \left(\frac{y}{x}\right)' =$$

c)

$$z_y = 2^{\sinrac{y}{x}} \ln 2$$
 ·

 $=2^{\sin\frac{y}{x}}\ln 2\cdot\cos\frac{y}{x}\cdot\frac{-y}{x^2}=-\frac{y}{x^2}\cdot2^{\sin\frac{y}{x}}\ln 2\cdot\cos\frac{y}{x}$

$$\frac{(\sin x)' = \cos x}{(\sin (\text{nešto}))' = \cos (\text{nešto}) \cdot (\text{nešto})'}$$

$$z_x = 2^{\sin \frac{y}{x}} \ln 2 \cdot \left(\sin \frac{y}{x}\right)' = 2^{\sin \frac{y}{x}} \ln 2 \cdot \cos \frac{y}{x} \cdot \left(\frac{y}{x}\right)' =$$

 $(a^x)' = a^x \ln a$

c)

$$z_y = 2^{\sin\frac{y}{x}} \ln 2 \cdot \left(\sin\frac{y}{x}\right)_y'$$

 $=2^{\sin\frac{y}{x}}\ln 2\cdot\cos\frac{y}{x}\cdot\frac{-y}{x^2}=-\frac{y}{x^2}\cdot2^{\sin\frac{y}{x}}\ln 2\cdot\cos\frac{y}{x}$

$$\frac{(\sin x)' = \cos x}{(\sin (\text{nešto}))' = \cos (\text{nešto}) \cdot (\text{nešto})'}$$

$$z_x = 2^{\sin \frac{y}{x}} \ln 2 \cdot \left(\sin \frac{y}{x}\right)' = 2^{\sin \frac{y}{x}} \ln 2 \cdot \cos \frac{y}{x} \cdot \left(\frac{y}{x}\right)' =$$

c)
$$z_{x} = 2^{\sin\frac{y}{x}} \ln 2 \cdot \left(\sin\frac{y}{x}\right)_{x}^{y} = 2^{\sin\frac{y}{x}} \ln 2 \cdot \cos\frac{y}{x} \cdot \left(\frac{y}{x}\right)_{x}^{y}$$
$$= 2^{\sin\frac{y}{x}} \ln 2 \cdot \cos\frac{y}{x} \cdot \frac{-y}{x^{2}} = -\frac{y}{x^{2}} \cdot 2^{\sin\frac{y}{x}} \ln 2 \cdot \cos\frac{y}{x}$$

$$z_y = 2^{\sin \frac{y}{x}} \ln 2 \cdot \left(\sin \frac{y}{x}\right)' = 2^{\sin \frac{y}{x}} \ln 2$$

$$\frac{(\sin x)' = \cos x}{(\sin (\text{nešto}))' = \cos (\text{nešto}) \cdot (\text{nešto})'}$$

$$z_x = 2^{\sin \frac{y}{x}} \ln 2 \cdot \left(\sin \frac{y}{x}\right)' = 2^{\sin \frac{y}{x}} \ln 2 \cdot \cos \frac{y}{x} \cdot \left(\frac{y}{x}\right)' =$$

$$= 2^{\sin\frac{y}{x}} \ln 2 \cdot \cos\frac{y}{x} \cdot \frac{-y}{x^2} = -\frac{y}{x^2} \cdot 2^{\sin\frac{y}{x}} \ln 2 \cdot \cos\frac{y}{x}$$

$$z_y = 2^{\sin\frac{y}{x}} \ln 2 \cdot \left(\sin\frac{y}{x}\right)_x' = 2^{\sin\frac{y}{x}} \ln 2 \cdot$$

c)

$$\frac{(\sin x)' = \cos x}{(\sin (\text{nešto}))' = \cos (\text{nešto}) \cdot (\text{nešto})'}$$

c)
$$z_{x} = 2^{\sin\frac{y}{x}} \ln 2 \cdot \left(\sin\frac{y}{x}\right)_{x}' = 2^{\sin\frac{y}{x}} \ln 2 \cdot \cos\frac{y}{x} \cdot \left(\frac{y}{x}\right)_{x}' =$$
$$= 2^{\sin\frac{y}{x}} \ln 2 \cdot \cos\frac{y}{x} \cdot \frac{-y}{x^{2}} = -\frac{y}{x^{2}} \cdot 2^{\sin\frac{y}{x}} \ln 2 \cdot \cos\frac{y}{x}$$

$$z_y = 2^{\sin\frac{y}{x}} \ln 2 \cdot \left(\sin\frac{y}{x}\right)' = 2^{\sin\frac{y}{x}} \ln 2 \cdot \cos\frac{y}{x}$$

$$\frac{(\sin x)' = \cos x}{(\sin (\text{nešto}))' = \cos (\text{nešto}) \cdot (\text{nešto})'}$$

$$z_x = 2^{\sin \frac{y}{x}} \ln 2 \cdot \left(\sin \frac{y}{x}\right)' = 2^{\sin \frac{y}{x}} \ln 2 \cdot \cos \frac{y}{x} \cdot \left(\frac{y}{x}\right)' =$$

$$= 2^{\sin\frac{y}{x}} \ln 2 \cdot \cos\frac{y}{x} \cdot \frac{-y}{x^2} = -\frac{y}{x^2} \cdot 2^{\sin\frac{y}{x}} \ln 2 \cdot \cos\frac{y}{x}$$

$$z_y = 2^{\sin\frac{y}{x}} \ln 2 \cdot \left(\sin\frac{y}{x}\right)_y' = 2^{\sin\frac{y}{x}} \ln 2 \cdot \cos\frac{y}{x}$$

c)

$$\frac{(\sin x)' = \cos x}{(\sin (\text{nešto}))' = \cos (\text{nešto}) \cdot (\text{nešto})'}$$

c)
$$z_{x} = 2^{\sin\frac{y}{x}} \ln 2 \cdot \left(\sin\frac{y}{x}\right)_{x}' = 2^{\sin\frac{y}{x}} \ln 2 \cdot \cos\frac{y}{x} \cdot \left(\frac{y}{x}\right)_{x}' =$$

$$= 2^{\sin\frac{y}{x}} \ln 2 \cdot \cos\frac{y}{x} \cdot \frac{-y}{x^{2}} = -\frac{y}{x^{2}} \cdot 2^{\sin\frac{y}{x}} \ln 2 \cdot \cos\frac{y}{x}$$

$$z_{y} = 2^{\sin \frac{y}{x}} \ln 2 \cdot \left(\sin \frac{y}{x}\right)' = 2^{\sin \frac{y}{x}} \ln 2 \cdot \cos \frac{y}{x} \cdot \left(\frac{y}{x}\right)'$$

$$\frac{(\sin x)' = \cos x}{(\sin (\text{nešto}))' = \cos (\text{nešto}) \cdot (\text{nešto})'}$$

c)
$$z_{x} = 2^{\sin \frac{y}{x}} \ln 2 \cdot \left(\sin \frac{y}{x}\right)_{x}' = 2^{\sin \frac{y}{x}} \ln 2 \cdot \cos \frac{y}{x} \cdot \left(\frac{y}{x}\right)_{x}' =$$
$$= 2^{\sin \frac{y}{x}} \ln 2 \cdot \cos \frac{y}{x} \cdot \frac{-y}{x^{2}} = -\frac{y}{x^{2}} \cdot 2^{\sin \frac{y}{x}} \ln 2 \cdot \cos \frac{y}{x}$$

 $=2^{\sin\frac{y}{x}}\ln 2\cdot\cos\frac{y}{x}$

c)

$$z_y = 2^{\sin \frac{y}{x}} \ln 2 \cdot \left(\sin \frac{y}{x}\right)' = 2^{\sin \frac{y}{x}} \ln 2 \cdot \cos \frac{y}{x} \cdot \left(\frac{y}{x}\right)' =$$

$$\frac{(\sin x)' = \cos x}{(\sin (\text{nešto}))' = \cos (\text{nešto}) \cdot (\text{nešto})'}$$

c)
$$z_{x} = 2^{\sin\frac{y}{x}} \ln 2 \cdot \left(\sin\frac{y}{x}\right)_{x}' = 2^{\sin\frac{y}{x}} \ln 2 \cdot \cos\frac{y}{x} \cdot \left(\frac{y}{x}\right)_{x}' =$$
$$= 2^{\sin\frac{y}{x}} \ln 2 \cdot \cos\frac{y}{x} \cdot \frac{-y}{x^{2}} = -\frac{y}{x^{2}} \cdot 2^{\sin\frac{y}{x}} \ln 2 \cdot \cos\frac{y}{x}$$

 $=2^{\sin\frac{y}{x}}\ln 2\cdot\cos\frac{y}{x}$

$$= 2^{\sin \frac{y}{x}} \ln 2 \cdot \cos \frac{y}{x} \cdot \frac{y}{x^2} = -\frac{y}{x^2} \cdot 2^{\sin \frac{y}{x}} \ln 2 \cdot \cos \frac{y}{x}$$

$$z_y = 2^{\sin \frac{y}{x}} \ln 2 \cdot \left(\sin \frac{y}{x}\right)' = 2^{\sin \frac{y}{x}} \ln 2 \cdot \cos \frac{y}{x} \cdot \left(\frac{y}{x}\right)' = 2^{\sin \frac{y}{x}} \ln 2 \cdot \cos \frac{y}{x} \cdot \left(\frac{y}{x}\right)' = 2^{\sin \frac{y}{x}} \ln 2 \cdot \cos \frac{y}{x} \cdot \left(\frac{y}{x}\right)' = 2^{\sin \frac{y}{x}} \ln 2 \cdot \cos \frac{y}{x} \cdot \left(\frac{y}{x}\right)' = 2^{\sin \frac{y}{x}} \ln 2 \cdot \cos \frac{y}{x} \cdot \left(\frac{y}{x}\right)' = 2^{\sin \frac{y}{x}} \ln 2 \cdot \cos \frac{y}{x} \cdot \left(\frac{y}{x}\right)' = 2^{\sin \frac{y}{x}} \ln 2 \cdot \cos \frac{y}{x} \cdot \left(\frac{y}{x}\right)' = 2^{\sin \frac{y}{x}} \ln 2 \cdot \cos \frac{y}{x} \cdot \left(\frac{y}{x}\right)' = 2^{\sin \frac{y}{x}} \ln 2 \cdot \cos \frac{y}{x} \cdot \left(\frac{y}{x}\right)' = 2^{\sin \frac{y}{x}} \ln 2 \cdot \cos \frac{y}{x} \cdot \left(\frac{y}{x}\right)' = 2^{\sin \frac{y}{x}} \ln 2 \cdot \cos \frac{y}{x} \cdot \left(\frac{y}{x}\right)' = 2^{\sin \frac{y}{x}} \ln 2 \cdot \cos \frac{y}{x} \cdot \left(\frac{y}{x}\right)' = 2^{\sin \frac{y}{x}} \ln 2 \cdot \cos \frac{y}{x} \cdot \left(\frac{y}{x}\right)' = 2^{\sin \frac{y}{x}} \ln 2 \cdot \cos \frac{y}{x} \cdot \left(\frac{y}{x}\right)' = 2^{\sin \frac{y}{x}} \ln 2 \cdot \cos \frac{y}{x} \cdot \left(\frac{y}{x}\right)' = 2^{\sin \frac{y}{x}} \ln 2 \cdot \cos \frac{y}{x} \cdot \left(\frac{y}{x}\right)' = 2^{\sin \frac{y}{x}} \ln 2 \cdot \cos \frac{y}{x} \cdot \left(\frac{y}{x}\right)' = 2^{\sin \frac{y}{x}} \ln 2 \cdot \cos \frac{y}{x} \cdot \left(\frac{y}{x}\right)' = 2^{\sin \frac{y}{x}} \ln 2 \cdot \cos \frac{y}{x} \cdot \left(\frac{y}{x}\right)' = 2^{\sin \frac{y}{x}} \ln 2 \cdot \cos \frac{y}{x} \cdot \left(\frac{y}{x}\right)' = 2^{\sin \frac{y}{x}} \ln 2 \cdot \cos \frac{y}{x} \cdot \left(\frac{y}{x}\right)' = 2^{\sin \frac{y}{x}} \ln 2 \cdot \cos \frac{y}{x} \cdot \left(\frac{y}{x}\right)' = 2^{\sin \frac{y}{x}} \ln 2 \cdot \cos \frac{y}{x} \cdot \left(\frac{y}{x}\right)' = 2^{\sin \frac{y}{x}} \ln 2 \cdot \cos \frac{y}{x} \cdot \left(\frac{y}{x}\right)' = 2^{\sin \frac{y}{x}} \ln 2 \cdot \cos \frac{y}{x} \cdot \left(\frac{y}{x}\right)' = 2^{\sin \frac{y}{x}} \ln 2 \cdot \cos \frac{y}{x} \cdot \left(\frac{y}{x}\right)' = 2^{\sin \frac{y}{x}} \ln 2 \cdot \cos \frac{y}{x} \cdot \left(\frac{y}{x}\right)' = 2^{\sin \frac{y}{x}} \ln 2 \cdot \cos \frac{y}{x} \cdot \left(\frac{y}{x}\right)' = 2^{\sin \frac{y}{x}} \ln 2 \cdot \cos \frac{y}{x} \cdot \left(\frac{y}{x}\right)' = 2^{\sin \frac{y}{x}} \ln 2 \cdot \cos \frac{y}{x} \cdot \left(\frac{y}{x}\right)' = 2^{\sin \frac{y}{x}} \ln 2 \cdot \cos \frac{y}{x} \cdot \left(\frac{y}{x}\right)' = 2^{\sin \frac{y}{x}} \ln 2 \cdot \cos \frac{y}{x} \cdot \left(\frac{y}{x}\right)' = 2^{\sin \frac{y}{x}} \ln 2 \cdot \cos \frac{y}{x} \cdot \left(\frac{y}{x}\right)' = 2^{\sin \frac{y}{x}} \ln 2 \cdot \cos \frac{y}{x} \cdot \left(\frac{y}{x}\right)' = 2^{\sin \frac{y}{x}} \ln 2 \cdot \cos \frac{y}{x} \cdot \left(\frac{y}{x}\right)' = 2^{\sin \frac{y}{x}} \ln 2 \cdot \cos \frac{y}{x} \cdot \left(\frac{y}{x}\right)' = 2^{\sin \frac{y}{x}} \ln 2 \cdot \cos \frac{y}{x} \cdot \left(\frac{y}{x}\right)' = 2^{\sin \frac{y}{x}} \ln 2 \cdot \cos \frac{y}{x} \cdot \left(\frac{y}{x}\right)' = 2^{\sin \frac{y}{x}} \ln 2 \cdot \cos \frac{y}{x} \cdot \left(\frac{y}{x}\right)' = 2^{\sin \frac{y}{x}} \ln 2 \cdot \cos \frac{y}{x} \cdot \left(\frac{y}{x}\right)' = 2^{\sin \frac{y}{x}} \ln 2 \cdot \cos \frac{y}{x}$$

$$(\sin x)' = \cos x$$

$$(\sin (\text{nešto}))' = \cos (\text{nešto}) \cdot (\text{nešto})'$$

c)
$$z_x = 2^{\sin\frac{y}{x}} \ln 2 \cdot \left(\sin\frac{y}{x}\right)_x' = 2^{\sin\frac{y}{x}} \ln 2 \cdot \cos\frac{y}{x} \cdot \left(\frac{y}{x}\right)_x' = 2^{\sin\frac{y}{x}} \ln 2 \cdot \cos\frac{y$$

$$= 2^{\sin\frac{y}{x}} \ln 2 \cdot \cos\frac{y}{x} \cdot \frac{-y}{x^2} = -\frac{y}{x^2} \cdot 2^{\sin\frac{y}{x}} \ln 2 \cdot \cos\frac{y}{x}$$

$$z_y = 2^{\sin\frac{y}{x}} \ln 2 \cdot \left(\sin\frac{y}{x}\right)_y' = 2^{\sin\frac{y}{x}} \ln 2 \cdot \cos\frac{y}{x} \cdot \left(\frac{y}{x}\right)_y' =$$

$$= 2^{\sin \frac{y}{x}} \ln 2 \cdot \cos \frac{y}{x} \cdot \frac{1}{x}$$

$$\frac{(\sin x)' = \cos x}{(\sin (\text{nešto}))' = \cos (\text{nešto}) \cdot (\text{nešto})'}$$

 $z_x = 2^{\sin \frac{y}{x}} \ln 2 \cdot \left(\sin \frac{y}{x}\right)' = 2^{\sin \frac{y}{x}} \ln 2 \cdot \cos \frac{y}{x} \cdot \left(\frac{y}{x}\right)' =$

$$= 2^{\sin\frac{y}{x}} \ln 2 \cdot \cos\frac{y}{x} \cdot \frac{-y}{x^2} = -\frac{y}{x^2} \cdot 2^{\sin\frac{y}{x}} \ln 2 \cdot \cos\frac{y}{x}$$

$$z_y = 2^{\sin\frac{y}{x}} \ln 2 \cdot \left(\sin\frac{y}{x}\right)_y' = 2^{\sin\frac{y}{x}} \ln 2 \cdot \cos\frac{y}{x} \cdot \left(\frac{y}{x}\right)_y' =$$
$$= 2^{\sin\frac{y}{x}} \ln 2 \cdot \cos\frac{y}{x} \cdot \frac{1}{x} = \frac{1}{x}.$$

c)

 $(a^{x})' = a^{x} \ln a$ $(a^{\text{nešto}})' = a^{\text{nešto}} \ln a \cdot (\text{nešto})'$

$$(\sin x)' = \cos x$$

$$(\sin (\text{nešto}))' = \cos (\text{nešto}) \cdot (\text{nešto})'$$

c)
$$z_{x} = 2^{\sin\frac{y}{x}} \ln 2 \cdot \left(\sin\frac{y}{x}\right)_{x}' = 2^{\sin\frac{y}{x}} \ln 2 \cdot \cos\frac{y}{x} \cdot \left(\frac{y}{x}\right)_{x}' =$$
$$= 2^{\sin\frac{y}{x}} \ln 2 \cdot \cos\frac{y}{x} \cdot \frac{-y}{x^{2}} = -\frac{y}{x^{2}} \cdot 2^{\sin\frac{y}{x}} \ln 2 \cdot \cos\frac{y}{x}$$

$$z_y = 2^{\sin\frac{y}{x}} \ln 2 \cdot \left(\sin\frac{y}{x}\right)' = 2^{\sin\frac{y}{x}} \ln 2 \cdot \cos\frac{y}{x} \cdot \left(\frac{y}{x}\right)' =$$

$$= 2^{\sin \frac{y}{x}} \ln 2 \cdot \cos \frac{y}{x} \cdot \frac{1}{x} = \frac{1}{x} \cdot 2^{\sin \frac{y}{x}} \ln 2 \cdot \cos \frac{y}{x}$$

$$z_x = 2^{\sin \frac{y}{x}} \ln 2 \cdot \left(\sin \frac{y}{x}\right)_x = 2^{\sin \frac{y}{x}} \ln 2 \cdot \cos \frac{y}{y}$$

$$= 2^{\sin\frac{y}{x}} \ln 2 \cdot \cos\frac{y}{x} \cdot \frac{-y}{x^2} = -\frac{y}{x^2} \cdot 2^{\sin\frac{y}{x}} \ln 2 \cdot \cos\frac{y}{x}$$

$$z_y = 2^{\sin\frac{y}{x}} \ln 2 \cdot \left(\sin\frac{y}{x}\right)_y' = 2^{\sin\frac{y}{x}} \ln 2 \cdot \cos\frac{y}{x} \cdot \left(\frac{y}{x}\right)_y' = 2^{\sin\frac{y}{x}} \ln 2 \cdot \cos\frac{y}{x} \cdot \left(\frac{y}{x}\right)_x' = 2^{\sin\frac{y}{x}} \ln 2 \cdot \cos\frac{y}{x} \cdot \left(\frac$$

$$= 2^{\sin \frac{y}{x}} \ln 2 \cdot \cos \frac{y}{x} \cdot \frac{1}{x} = \frac{1}{x} \cdot 2^{\sin \frac{y}{x}} \ln 2 \cdot \cos \frac{y}{x}$$

$$=2^{\sin\frac{y}{x}}\ln 2 \cdot \cos x$$

 $z = x^y$

d)
$$z_x$$

$$-2\sin\frac{y}{x}\ln 2 \cos\frac{y}{x}$$

$$= 2^{\sin\frac{y}{x}} \ln 2 \cdot \cos\frac{y}{x} \cdot \frac{-y}{x^2} = -\frac{y}{x^2} \cdot 2^{\sin\frac{y}{x}} \ln 2 \cdot \cos\frac{y}{x}$$

$$z_y = 2^{\sin\frac{y}{x}} \ln 2 \cdot \left(\sin\frac{y}{x}\right)$$

$$z_y = 2^{\sin\frac{y}{x}} \ln 2 \cdot \left(\sin\frac{y}{x}\right)$$

$$z_y = 2^{\sin \frac{y}{x}} \ln 2 \cdot \left(\sin \frac{y}{x}\right)_y' = 2^{\sin \frac{y}{x}} \ln 2 \cdot \cos \frac{y}{x} \cdot \left(\frac{y}{x}\right)_y' =$$

$$= 2^{\sin \frac{y}{x}} \ln 2 \cdot \cos \frac{y}{x} \cdot \frac{1}{x} = \frac{1}{x} \cdot 2^{\sin \frac{y}{x}} \ln 2 \cdot \cos \frac{y}{x}$$

d)
$$z = vx^{y-1}$$

 $z = x^y$

d) $z_x = yx^{y-1}$

$$z_x = 2^{\sin \frac{\pi}{x}} \ln 2 \cdot \left(\sin \frac{\pi}{x}\right)$$

$$= 2^{\sin\frac{y}{x}} \ln 2 \cdot \cos\frac{y}{x} \cdot \frac{-y}{x^2} = -\frac{y}{x^2} \cdot 2^{\sin\frac{y}{x}} \ln 2 \cdot \cos\frac{y}{x}$$

$$z_y = 2^{\sin\frac{y}{x}} \ln 2 \cdot \left(\sin\frac{y}{x}\right)$$

$$z_y = 2^{\sin \frac{y}{x}} \ln 2 \cdot \left(\sin \frac{y}{x}\right)_y' = 2^{\sin \frac{y}{x}} \ln 2 \cdot \cos \frac{y}{x} \cdot \left(\frac{y}{x}\right)_y' =$$

$$z_y = 2^{\sin\frac{y}{x}} \ln 2 \cdot \left(\sin\frac{y}{x}\right)$$

$$2^{\sin \frac{y}{x}} \ln 2 \cdot \left(\sin \frac{y}{x}\right)$$

$$\left(\frac{y}{x}\right)_{y}^{\prime}=2^{\sin\frac{y}{x}}\ln 2$$

$$\left(\frac{x}{x}\right)_y = 2^{\sin x} \ln 2$$

8/24

 $z=2^{\sin\frac{y}{x}}$

$$z_y = 2^n \times \ln 2 \cdot \left(\frac{\sin - x}{x} \right)$$

 $z = x^y$

d) $z_x = yx^{y-1}$

$$\frac{y}{x} \cdot \frac{1}{x} = \frac{1}{x} \cdot 2^{\sin \frac{y}{x}}$$

$$= 2^{\sin\frac{y}{x}} \ln 2 \cdot \cos\frac{y}{x} \cdot \frac{1}{x} = \frac{1}{x} \cdot 2^{\sin\frac{y}{x}} \ln 2 \cdot \cos\frac{y}{x}$$

$$\cdot \cos \frac{x}{x}$$

$$z_v =$$

$$(x^n)' = nx^{n-1} \left[\frac{(\sin x)' = \cos x}{(\sin (\text{nešto}))' = \cos (\text{nešto}) \cdot (\text{nešto})'} \right]$$

$$c) \qquad z_x = 2^{\sin \frac{y}{x}} \ln 2 \cdot \left(\sin \frac{y}{x}\right)' = 2^{\sin \frac{y}{x}} \ln 2 \cdot \cos \frac{y}{x} \cdot \left(\frac{y}{x}\right)' =$$

 $=2^{\sin\frac{y}{x}}\ln 2\cdot\cos\frac{y}{x}\cdot\frac{-y}{x^2}=-\frac{y}{x^2}\cdot2^{\sin\frac{y}{x}}\ln 2\cdot\cos\frac{y}{x}$

 $z=2^{\sin\frac{y}{x}}$

$$z_y = 2^{\sin\frac{y}{x}} \ln 2 \cdot \left(\sin\frac{y}{x}\right)_y' = 2^{\sin\frac{y}{x}} \ln 2 \cdot \cos\frac{y}{x} \cdot \left(\frac{y}{x}\right)_y' =$$

 $= 2^{\sin \frac{y}{x}} \ln 2 \cdot \cos \frac{y}{x} \cdot \frac{1}{x} = \frac{1}{x} \cdot 2^{\sin \frac{y}{x}} \ln 2 \cdot \cos \frac{y}{x}$

 $(a^{x})' = a^{x} \ln a$ $(a^{\text{nešto}})' = a^{\text{nešto}} \ln a \cdot (\text{nešto})'$

četvrti zadatak

Izračunajte vrijednosti parcijalnih derivacija funkcije

$$f(x, y, z) = e^{2xz} - \ln(yz) + 1$$

u točki (0, 2, 1).

... () = / 1 =

 $(e^{\mathsf{ne ext{ iny sto}}})' = e^{\mathsf{ne iny sto}} \cdot (\mathsf{ne iny sto})'$

Izračunajte vrijednosti parcijalnih derivacija funkcije

$$f(x,y,z)=e^{2xz}-\ln{(yz)}+1$$

u točki (0, 2, 1).

$$f_{x} =$$

 $(e^{\mathsf{ne ext{ iny sto}}})' = e^{\mathsf{ne iny sto}} \cdot (\mathsf{ne iny sto})'$

Izračunajte vrijednosti parcijalnih derivacija funkcije

$$f(x,y,z)=e^{2xz}-\ln{(yz)}+1$$

u točki (0, 2, 1).

$$f_x = e^{2xz}$$

 $- \sin(yz) + 1$

 $(e^{\mathsf{ne ext{ iny sto}}})' = e^{\mathsf{ne ext{ iny sto}}} \cdot (\mathsf{ne ext{ iny sto}})'$

Izračunajte vrijednosti parcijalnih derivacija funkcije

$$f(x,y,z)=e^{2xz}-\ln{(yz)}+1$$

u točki (0, 2, 1).

Rješenje

$$f_{x} = e^{2xz} \cdot (2xz)'_{x}$$

 $(e^{\mathsf{ne ext{ iny sto}}})' = e^{\mathsf{ne ext{ iny sto}}} \cdot (\mathsf{ne ext{ iny sto}})'$

Izračunajte vrijednosti parcijalnih derivacija funkcije

$$f(x,y,z)=e^{2xz}-\ln{(yz)}+1$$

u točki (0, 2, 1).

Rješenje

$$f_{x}=e^{2xz}\cdot(2xz)_{x}^{\prime}-0$$

 $(e^x)'=e^x$

 $(e^{\mathsf{ne ext{ iny sto}}})' = e^{\mathsf{ne ext{ iny sto}}} \cdot (\mathsf{ne ext{ iny sto}})'$

Izračunajte vrijednosti parcijalnih derivacija funkcije

$$f(x,y,z)=e^{2xz}-\ln{(yz)}+1$$

u točki (0, 2, 1).

$$f_x = e^{2xz} \cdot (2xz)'_y - 0 + 0$$

$$f_x = e^{2xz} \cdot (2xz)_x' - 0 +$$

m (y2) + 1

 $(e^x)'=e^x$

 $(e^{\mathsf{ne ext{ iny sto}}})' = e^{\mathsf{ne iny sto}} \cdot (\mathsf{ne iny sto})'$

Izračunajte vrijednosti parcijalnih derivacija funkcije

$$f(x,y,z)=e^{2xz}-\ln{(yz)}+1$$

u točki (0, 2, 1).

$$f_x = e^{2xz} \cdot (2xz)'_x - 0 + 0 = e^{2xz}$$

... (y2) 1 I

 $(e^x)'=e^x$

 $(e^{\mathsf{ne ext{ iny sto}}})' = e^{\mathsf{ne iny sto}} \cdot (\mathsf{ne iny sto})'$

Izračunajte vrijednosti parcijalnih derivacija funkcije

$$f(x,y,z)=e^{2xz}-\ln{(yz)}+1$$

u točki (0, 2, 1).

$$f_x = e^{2xz} \cdot (2xz)'_x - 0 + 0 = e^{2xz}$$

... (y2) | 1

 $(e^x)'=e^x$

 $(e^{\mathsf{ne ext{ iny sto}}})' = e^{\mathsf{ne iny sto}} \cdot (\mathsf{ne iny sto})'$

Izračunajte vrijednosti parcijalnih derivacija funkcije

$$f(x,y,z)=e^{2xz}-\ln{(yz)}+1$$

u točki (0, 2, 1).

$$f_x = e^{2xz} \cdot (2xz)'_y - 0 + 0 = e^{2xz} \cdot 2z$$

— III (y2) — I

 $(e^x)'=e^x$

 $(e^{\mathsf{ne ext{ iny fto}}})' = e^{\mathsf{ne iny iny fto}} \cdot (\mathsf{ne iny iny fto})'$

Izračunajte vrijednosti parcijalnih derivacija funkcije

$$f(x,y,z)=e^{2xz}-\ln{(yz)}+1$$

u točki (0, 2, 1).

Rješenje

$$f_x = e^{2xz} \cdot (2xz)'_x - 0 + 0 = e^{2xz} \cdot 2z = 2ze^{2xz}$$

 $(e^x)'=e^x$

 $(e^{\mathsf{nešto}})' = e^{\mathsf{nešto}} \cdot (\mathsf{nešto})'$

Izračunajte vrijednosti parcijalnih derivacija funkcije

$$f(x,y,z)=e^{2xz}-\ln{(yz)}+1$$

u točki (0, 2, 1).

Rješenje

$$f_x = e^{2xz} \cdot (2xz)'_x - 0 + 0 = e^{2xz} \cdot 2z = 2ze^{2xz}$$
 $f_y =$

 $(e^x)'=e^x$

 $\left| (e^{\mathsf{ne ext{ iny sto}}})' = e^{\mathsf{ne iny sto}} \cdot (\mathsf{ne iny sto})'
ight|$

Izračunajte vrijednosti parcijalnih derivacija funkcije

$$f(x,y,z)=e^{2xz}-\ln{(yz)}+1$$

u točki (0, 2, 1).

Rješenje

$$f_x = e^{2xz} \cdot (2xz)'_x - 0 + 0 = e^{2xz} \cdot 2z = 2ze^{2xz}$$

 $f_y = 0$

$$f(x,y,z) = e^{2xz} - \ln(yz) + 1$$

$$\left(\ln(\text{nešto})\right)' = \frac{1}{\text{nešto}} \cdot (\text{nešto})'$$

 $(e^{\mathsf{nešto}})' = e^{\mathsf{nešto}} \cdot (\mathsf{nešto})'$

Izračunajte vrijednosti parcijalnih derivacija funkcije

u točki (0, 2, 1).

$$f_x = e^{2xz} \cdot (2xz)_x' - 0 + 0 = e^{2xz} \cdot 2z = 2ze^{2xz}$$

$$f_{x}=e^{it}$$

 $f_{y} = 0 -$

$$f(x, y, z) = e^{2xz} - \ln(yz) + 1$$
 $(\ln x)' = \frac{1}{x}$

 $\left(\ln\left(\text{nešto}\right)\right)' = \frac{1}{\text{nešto}} \cdot (\text{nešto})'$

 $(e^{\mathsf{nešto}})' = e^{\mathsf{nešto}} \cdot (\mathsf{nešto})'$

Izračunajte vrijednosti parcijalnih derivacija funkcije

u točki (0, 2, 1).

 $f_{y} = 0 - \frac{1}{v^{2}}$

f_x =
$$e^{2xz} \cdot (2xz)'_x - 0 + 0 = e^{2xz} \cdot 2z = 2ze^{2xz}$$

$$f_{x} = 0$$

$$f(x, y, z) = e^{2xz} - \ln(yz) + 1$$

 $\left(\ln\left(\text{nešto}\right)\right)' = \frac{1}{\text{nešto}} \cdot (\text{nešto})'$

 $(e^{\mathsf{nešto}})' = e^{\mathsf{nešto}} \cdot (\mathsf{nešto})'$

Izračunajte vrijednosti parcijalnih derivacija funkcije

u točki (0, 2, 1).

$$f_x = e^{2xz} \cdot (2xz)'_x - 0 + 0 = e^{2xz} \cdot 2z = 2ze^{2xz}$$

$$f_y = 0 - \frac{1}{vz} \cdot (yz)'_y$$

$$f(x,y,z) = e^{2xz} - \ln(yz) + 1$$

 $\left(\ln\left(\text{nešto}\right)\right)' = \frac{1}{\text{nešto}} \cdot (\text{nešto})'$

 $(e^{\mathsf{nešto}})' = e^{\mathsf{nešto}} \cdot (\mathsf{nešto})'$

Izračunajte vrijednosti parcijalnih derivacija funkcije

u točki (0, 2, 1).

$$f_x = e^{2xz} \cdot (2xz)'_x - 0 + 0 = e^{2xz} \cdot 2z = 2ze^{2xz}$$

$$f_y = 0 - \frac{1}{yz} \cdot (yz)_y' + 0$$

$$f(x,y,z) = e^{2xz} - \ln(yz) + 1$$

$$\frac{(\ln x)' = \frac{1}{x}}{(\ln(\text{nešto}))' = \frac{1}{\text{nešto}} \cdot (\text{nešto})'}$$

 $(e^{\text{nešto}})' = e^{\text{nešto}} \cdot (\text{nešto})'$

Izračunajte vrijednosti parcijalnih derivacija funkcije

u točki (0, 2, 1).

$$f_x = e^{2xz} \cdot (2xz)'_x - 0 + 0 = e^{2xz} \cdot 2z = 2ze^{2xz}$$

 $f_x = 0$ 1 $(xz)'_x + 0 = 1$

$$f_y = 0 - \frac{1}{yz} \cdot (yz)'_y + 0 = -\frac{1}{yz}$$

$$f(x, y, z) = e^{2xz} - \ln(yz) + 1$$
 $\frac{(\ln x)' = \frac{1}{x}}{}$

 $\left(\ln\left(\text{nešto}\right)\right)' = \frac{1}{\text{nešto}} \cdot (\text{nešto})'$

 $(e^{x})' = e^{x}$

 $(e^{\text{nešto}})' = e^{\text{nešto}} \cdot (\text{nešto})'$

Izračunajte vrijednosti parcijalnih derivacija funkcije

u točki (0, 2, 1).

Rjesenje
$$f_x = e^{2xz} \cdot (2xz)'_x - 0 + 0 = e^{2xz} \cdot 2z = 2ze^{2xz}$$

$$f_y = 0 - \frac{1}{yz} \cdot (yz)'_y + 0 = -\frac{1}{yz} \cdot$$

 $(\ln x)' = \frac{1}{x}$ $f(x, y, z) = e^{2xz} - \ln(yz) + 1$

 $\left(\ln\left(\text{nešto}\right)\right)' = \frac{1}{\text{nešto}} \cdot (\text{nešto})'$

 $(e^{\text{nešto}})' = e^{\text{nešto}} \cdot (\text{nešto})'$

u točki (0, 2, 1).

$$f_x = e^{2xz} \cdot (2xz)'_x - 0 + 0 = e^{2xz} \cdot 2z = 2ze^{2xz}$$

Izračunajte vrijednosti parcijalnih derivacija funkcije

$$f_{x} = 0 - \frac{1}{vz} \cdot (zxz)_{x} - 0 + 0 = 0$$

$$f_{y} = 0 - \frac{1}{vz} \cdot (yz)_{y}' + 0 = -\frac{1}{vz} \cdot z$$

$$f(x,y,z) = e^{2xz} - \ln(yz) + 1$$

$$\frac{(\ln x)' = \frac{1}{x}}{(\ln(\text{nešto}))' = \frac{1}{\text{nešto}} \cdot (\text{nešto})'}$$

 $(e^{\text{nešto}})' = e^{\text{nešto}} \cdot (\text{nešto})'$

Izračunajte vrijednosti parcijalnih derivacija funkcije

u točki (0, 2, 1).

$$f_x = e^{2xz} \cdot (2xz)'_x - 0 + 0 = e^{2xz} \cdot 2z = 2ze^{2xz}$$

$$f_y = 0 - \frac{1}{yz} \cdot (yz)'_y + 0 = -\frac{1}{yz} \cdot z = -\frac{1}{y}$$

$$f(x, y, z) = e^{2xz} - \ln(yz) + 1$$
 $(\ln x)' = \frac{1}{x}$

 $\left(\ln\left(\text{nešto}\right)\right)' = \frac{1}{\text{nešto}} \cdot (\text{nešto})'$

 $(e^{\text{nešto}})' = e^{\text{nešto}} \cdot (\text{nešto})'$

Izračunajte vrijednosti parcijalnih derivacija funkcije

u točki (0, 2, 1).

Rješenje

$$f_x = e^{2xz} \cdot (2xz)'_x - 0 + 0 = e^{2xz} \cdot 2z = 2ze^{2xz}$$

$$t_{x}=\epsilon$$

$$f(x, y, z) = e^{2xz} - \ln(yz) + 1$$
 $(\ln x)' = \frac{1}{x}$

 $\left(\ln\left(\text{nešto}\right)\right)' = \frac{1}{\text{nešto}} \cdot (\text{nešto})'$

 $(e^{\text{nešto}})' = e^{\text{nešto}} \cdot (\text{nešto})'$

Izračunajte vrijednosti parcijalnih derivacija funkcije

u točki (0, 2, 1).

$$f_x = e^{2xz} \cdot (2xz)'_x - 0 + 0 = e^{2xz} \cdot 2z = 2ze^{2xz}$$

$$f_y = 0 - \frac{1}{vz} \cdot (yz)'_y + 0 = -\frac{1}{vz} \cdot z = -\frac{1}{v}$$

$$f_y = 0$$

$$f_z = e^{2xz}$$

$$f(x, y, z) = e^{2xz} - \ln(yz) + 1$$
 $\frac{(\ln x)' = \frac{1}{x}}{}$

 $\left(\ln\left(\text{nešto}\right)\right)' = \frac{1}{\text{nešto}} \cdot (\text{nešto})'$

 $(e^{\mathsf{nešto}})' = e^{\mathsf{nešto}} \cdot (\mathsf{nešto})'$

Izračunajte vrijednosti parcijalnih derivacija funkcije

u točki (0, 2, 1).

$$f_x = e^{2xz} \cdot (2xz)'_x - 0 + 0 = e^{2xz} \cdot 2z = 2ze^{2xz}$$

$$t_{x} = 0$$

$$f_y = 0 - \frac{1}{yz} \cdot (yz)'_y + 0 = -\frac{1}{yz} \cdot z = -\frac{1}{y}$$

 $f_z = e^{2xz} \cdot (2xz)'_z$

$$f(x, y, z) = e^{2xz} - \ln(yz) + 1$$
 $\frac{(\ln x)' = \frac{1}{x}}{}$

 $\left(\ln\left(\text{nešto}\right)\right)' = \frac{1}{\text{nešto}} \cdot (\text{nešto})'$

 $(e^{\mathsf{nešto}})' = e^{\mathsf{nešto}} \cdot (\mathsf{nešto})'$

Izračunajte vrijednosti parcijalnih derivacija funkcije

u točki (0, 2, 1).

$$f_x = e^{2xz} \cdot (2xz)'_x - 0 + 0 = e^{2xz} \cdot 2z = 2ze^{2xz}$$

$$r_X$$
 —

$$f_y = 0 - \frac{1}{yz} \cdot (yz)'_y + 0 = -\frac{1}{yz} \cdot z = -\frac{1}{y}$$

$$f_z = e^{2xz} \cdot (2xz)'_z -$$

$$f(x, y, z) = e^{2xz} - \ln(yz) + 1$$
 $(\ln x)' = \frac{1}{x}$

 $\left(\ln\left(\text{nešto}\right)\right)' = \frac{1}{\text{nešto}} \cdot (\text{nešto})'$

 $(e^{\mathsf{nešto}})' = e^{\mathsf{nešto}} \cdot (\mathsf{nešto})'$

Izračunajte vrijednosti parcijalnih derivacija funkcije

u točki (0, 2, 1).

Rjesenje
$$f_x = e^{2xz} \cdot (2xz)'_x - 0 + 0 = e^{2xz} \cdot 2z = 2ze^{2xz}$$

$$f_y = 0 - \frac{1}{yz} \cdot (yz)_y + 0$$

$$f_z = e^{2xz} \cdot (2xz)_z' - \frac{1}{yz}$$

$$f_y = 0 - \frac{1}{yz} \cdot (yz)'_y + 0 = -\frac{1}{yz} \cdot z = -\frac{1}{y}$$

$$f_y = e^{2xz} \cdot (2yz)'$$

$$f(x, y, z) = e^{2xz} - \ln(yz) + 1$$
 $(\ln x)' = \frac{1}{x}$

 $(e^{\mathsf{nešto}})' = e^{\mathsf{nešto}} \cdot (\mathsf{nešto})'$

Izračunajte vrijednosti parcijalnih derivacija funkcije

u točki (0, 2, 1).

u točki
$$(0,2,1)$$
.

Rješenje
$$f_x = e^{2xz} \cdot (2xz)'_x - 0 + 0 = e^{2xz} \cdot 2z = 2ze^{2xz}$$

$$t_{\times} = \epsilon$$

$$f_y = 0 - \frac{1}{yz} \cdot (yz)'_y + 0 = -\frac{1}{yz} \cdot z = -\frac{1}{y}$$

$$f_z = e^{2xz} \cdot (2xz)'_z - \frac{1}{vz} \cdot (yz)'_z$$

$$f(x, y, z) = e^{2xz} - \ln(yz) + 1$$
 $(\ln x)' = \frac{1}{x}$

 $\left(\ln\left(\text{nešto}\right)\right)' = \frac{1}{\text{nešto}} \cdot (\text{nešto})'$

 $(e^{\mathsf{nešto}})' = e^{\mathsf{nešto}} \cdot (\mathsf{nešto})'$

Izračunajte vrijednosti parcijalnih derivacija funkcije

u točki (0, 2, 1).

$$f_y = 0 - \frac{1}{yz} \cdot (yz)'_y + 0 = -\frac{1}{yz} \cdot z = -\frac{1}{y}$$

 $f_{x} = e^{2xz} \cdot (2xz)'_{x} - 0 + 0 = e^{2xz} \cdot 2z = 2ze^{2xz}$

$$f_z = e^{2xz} \cdot (2xz)_z' - \frac{1}{vz} \cdot (yz)_z' + 0$$

$$f(x, y, z) = e^{2xz} - \ln(yz) + 1$$
 $\frac{(\ln x)' = \frac{1}{x}}{}$

 $\left(\ln\left(\text{nešto}\right)\right)' = \frac{1}{\text{nešto}} \cdot (\text{nešto})'$

 $(e^{\mathsf{nešto}})' = e^{\mathsf{nešto}} \cdot (\mathsf{nešto})'$

Izračunajte vrijednosti parcijalnih derivacija funkcije

u točki (0, 2, 1).

$$f_y = 0 - \frac{1}{yz} \cdot (yz)'_y + 0 = -\frac{1}{yz} \cdot z = -\frac{1}{y}$$

 $f_{x} = e^{2xz} \cdot (2xz)'_{x} - 0 + 0 = e^{2xz} \cdot 2z = 2ze^{2xz}$

$$f_z = e^{2xz} \cdot (2xz)'_z - \frac{1}{vz} \cdot (yz)'_z + 0 = e^{2xz}$$

$$f(x, y, z) = e^{2xz} - \ln(yz) + 1$$
 $\frac{(\ln x)' = \frac{1}{x}}{}$

 $(e^{\text{nešto}})' = e^{\text{nešto}} \cdot (\text{nešto})'$

Izračunajte vrijednosti parcijalnih derivacija funkcije

u točki (0, 2, 1).

$$u \text{ točki } (0,2,1).$$

Rješenje
$$f_x = e^{2xz} \cdot (2xz)'_x - 0 + 0 = e^{2xz} \cdot 2z = 2ze^{2xz}$$

$$(ln (nešto))' = \frac{1}{\text{nešto}} \cdot (\text{nešto})'$$

$$t_{x}=\epsilon$$

$$f_y = 0 - \frac{1}{yz} \cdot (yz)'_y + 0 = -\frac{1}{yz} \cdot z = -\frac{1}{y}$$

$$f_z = e^{2xz} \cdot (2xz)'_z - \frac{1}{vz} \cdot (yz)'_z + 0 = e^{2xz} \cdot$$

9/24

$$f(x, y, z) = e^{2xz} - \ln(yz) + 1$$
 $(\ln x)' = \frac{1}{x}$

 $\left(\ln\left(\text{nešto}\right)\right)' = \frac{1}{\text{nešto}} \cdot (\text{nešto})'$

 $(e^{\text{nešto}})' = e^{\text{nešto}} \cdot (\text{nešto})'$

Izračunajte vrijednosti parcijalnih derivacija funkcije

u točki (0, 2, 1).

$$f_y = 0 - \frac{1}{yz} \cdot (yz)'_y + 0 = -\frac{1}{yz} \cdot z = -\frac{1}{y}$$

 $f_{x} = e^{2xz} \cdot (2xz)'_{x} - 0 + 0 = e^{2xz} \cdot 2z = 2ze^{2xz}$

$$f_z = e^{2xz} \cdot (2xz)_z' - \frac{1}{vz} \cdot (yz)_z' + 0 = e^{2xz} \cdot 2x$$

$$f(x, y, z) = e^{2xz} - \ln(yz) + 1$$
 $(\ln x)' = \frac{1}{x}$

 $\left(\ln\left(\text{nešto}\right)\right)' = \frac{1}{\text{nešto}} \cdot (\text{nešto})'$

 $(e^{\mathsf{nešto}})' = e^{\mathsf{nešto}} \cdot (\mathsf{nešto})'$

Izračunajte vrijednosti parcijalnih derivacija funkcije

u točki (0, 2, 1).

$$f_x = e^{2xz} \cdot (2xz)_x' - 0 + 0 = e^{2xz} \cdot 2z = 2ze^{2xz}$$

$$f_{y} = 0 - \frac{1}{yz} \cdot (yz)'_{y} + 0 = -\frac{1}{yz} \cdot z = -\frac{1}{y}$$

$$f_{z} = e^{2xz} \cdot (2xz)'_{z} - \frac{1}{yz} \cdot (yz)'_{z} + 0 = e^{2xz} \cdot 2x - \frac{1}{yz}$$

9/24

$$f(x, y, z) = e^{2xz} - \ln(yz) + 1$$
 $\frac{(\ln x)' = \frac{1}{x}}{}$

 $\left(\ln\left(\text{nešto}\right)\right)' = \frac{1}{\text{nešto}} \cdot (\text{nešto})'$

 $(e^{\mathsf{nešto}})' = e^{\mathsf{nešto}} \cdot (\mathsf{nešto})'$

Izračunajte vrijednosti parcijalnih derivacija funkcije

u točki (0, 2, 1).

$$f_x = e^{2xz} \cdot (2xz)'_x - 0 + 0 = e^{2xz} \cdot 2z = 2ze^{2xz}$$

 $f_y = 0 - \frac{1}{vz} \cdot (yz)'_y + 0 = -\frac{1}{vz} \cdot z = -\frac{1}{v}$

$$f_z = e^{2xz} \cdot (2xz)'_z - \frac{1}{vz} \cdot (yz)'_z + 0 = e^{2xz} \cdot 2x - \frac{1}{vz}$$

9/24

$$f(x, y, z) = e^{2xz} - \ln(yz) + 1$$
 $\frac{(\ln x)' = \frac{1}{x}}{}$

 $\left(\ln\left(\text{nešto}\right)\right)' = \frac{1}{\text{nešto}} \cdot (\text{nešto})'$

 $(e^{\mathsf{nešto}})' = e^{\mathsf{nešto}} \cdot (\mathsf{nešto})'$

Izračunajte vrijednosti parcijalnih derivacija funkcije

u točki (0, 2, 1).

$$f_y = 0 - \frac{1}{vz} \cdot (yz)'_y + 0 = -\frac{1}{vz} \cdot z = -\frac{1}{vz}$$

 $f_{x} = e^{2xz} \cdot (2xz)'_{x} - 0 + 0 = e^{2xz} \cdot 2z = 2ze^{2xz}$

$$f_z = e^{2xz} \cdot (2xz)_z' - \frac{1}{vz} \cdot (yz)_z' + 0 = e^{2xz} \cdot 2x - \frac{1}{vz} \cdot y$$

Izračunajte vrijednosti parcijalnih derivacija funkcije
$$f(x, y, z) = e^{2xz} - \ln{(yz)} + 1$$

$$(\ln{x})' = \frac{1}{x}$$

 $(e^{\mathsf{nešto}})' = e^{\mathsf{nešto}} \cdot (\mathsf{nešto})'$

$$u \text{ točki } (0,2,1).$$

$$\left(\ln \left(\text{nešto}\right)\right)' = \frac{1}{\text{nešto}} \cdot \left(\text{nešto}\right)'$$

$$f_x = e^{2xz} \cdot (2xz)'_x - 0 + 0 = e^{2xz} \cdot 2z = 2ze^{2xz}$$

$$f_x =$$

$$f_y = 0 - \frac{1}{yz} \cdot (yz)'_y + 0 = -\frac{1}{yz} \cdot z = -\frac{1}{y}$$

$$f_z = e^{2xz} \cdot (2xz)_z' - \frac{1}{vz} \cdot (yz)_z' + 0 = e^{2xz} \cdot 2x - \frac{1}{vz} \cdot y = 2xe^{2xz}$$

$$f(x, y, z) = e^{2xz} - \ln(yz) + 1$$
 $(\ln x)' = \frac{1}{x}$

 $\left(\ln\left(\text{nešto}\right)\right)' = \frac{1}{\text{nešto}} \cdot (\text{nešto})'$

 $(e^{\mathsf{nešto}})' = e^{\mathsf{nešto}} \cdot (\mathsf{nešto})'$

u točki (0, 2, 1).

Rješenje

$$f_x = e^{2xz} \cdot (2xz)'_x - 0 + 0 = e^{2xz} \cdot 2z = 2ze^{2xz}$$

$$f_{x} = f_{x}$$

$$f_x = e^{2xz}$$
.

$$f_x = e^{2xz} \cdot (2xz)_x' - 0 + 0 = e^{2xz} \cdot 2z = 2ze^{2xz}$$

 $f_y = 0 - \frac{1}{vz} \cdot (yz)_y' + 0 = -\frac{1}{vz} \cdot z = -\frac{1}{v}$

Izračunajte vrijednosti parcijalnih derivacija funkcije

$$f_y =$$

$$=0-\frac{1}{yz}\cdot(yz)_y'+0$$

$$-\frac{1}{yz}\cdot (yz)'_y$$

$$=-rac{1}{yz}$$
.

$$f_{z} = e^{2xz} \cdot (2xz)'_{z} - \frac{1}{vz} \cdot (yz)'_{z} + 0 = e^{2xz} \cdot 2x - \frac{1}{vz} \cdot y = 2xe^{2xz} - \frac{1}{z}$$

 $(e^{x})' = e^{x}$

Izračunajte vrijednosti parcijalnih derivacija funkcije
$$f(x, v, z) = e^{2xz} - \ln{(vz)} + 1$$

 $\left(\ln\left(\text{nešto}\right)\right)' = \frac{1}{\text{nešto}} \cdot (\text{nešto})'$

 $(e^{x})' = e^{x}$

 $(\ln x)' = \frac{1}{-}$

u točki (0, 2, 1).

$$f_x = e^{2xz} \cdot (2xz)_x' - 0 + 0 = e^{2xz} \cdot 2z = 2ze^{2xz}$$

$$f_{x}=\epsilon$$

$$r_{x} = c$$

$$f_y = 0 - \frac{1}{vz} \cdot (yz)'_y + 0 = -\frac{1}{vz} \cdot z = -\frac{1}{v}$$

$$f_y = 0$$

$$+0=-\frac{1}{yz}\cdot z=-\frac{1}{y}$$

$$yz$$
 yz 1

$$f_z = e^{2xz} \cdot (2xz)'_z - \frac{1}{vz} \cdot (yz)'_z + 0 = e^{2xz} \cdot 2x - \frac{1}{vz} \cdot y = 2xe^{2xz} - \frac{1}{z}$$

 $(e^{\mathsf{nešto}})' = e^{\mathsf{nešto}} \cdot (\mathsf{nešto})'$

$$f_z = e^{2xz} \cdot e^{2xz}$$

$$f_{x}(0,2,1) =$$

$$f(x, y, z) = e^{2xz} - \ln(yz) + 1$$
 $(\ln x)' = \frac{1}{x}$

 $\left(\ln\left(\text{nešto}\right)\right)' = \frac{1}{\text{nešto}} \cdot (\text{nešto})'$

 $(e^{\mathsf{nešto}})' = e^{\mathsf{nešto}} \cdot (\mathsf{nešto})'$

$$f_x = e^{2xz} \cdot (2xz)_x' - 0 + 0 = e^{2xz} \cdot 2z = 2ze^{2xz}$$

$$f_x = e^{2xz} \cdot ($$

$$f_{x} = e^{2xz} \cdot (2x)$$

$$f_y = 0 - \frac{1}{vz} \cdot (yz)'_y + 0 = -\frac{1}{vz} \cdot z = -\frac{1}{v}$$

Izračunajte vrijednosti parcijalnih derivacija funkcije

$$f_z = e^{2xz} \cdot (2xz)_z' - \frac{1}{vz} \cdot (yz)_z' + 0 = e^{2xz} \cdot 2x - \frac{1}{vz} \cdot y = 2xe^{2xz} - \frac{1}{z}$$

$$yz$$
 $f_{x}(0,2,1) = 2 \cdot 1 \cdot e^{2 \cdot 0 \cdot 1}$

 $f(x, y, z) = e^{2xz} - \ln(yz) + 1$

 $(e^{\mathsf{nešto}})' = e^{\mathsf{nešto}} \cdot (\mathsf{nešto})'$

$$u \text{ točki } (0,2,1).$$

$$\left(\ln\left(\text{nešto}\right)\right)' = \frac{1}{\text{nešto}} \cdot (\text{nešto})'$$

Rješenje

$$f_x = e^{2xz} \cdot (2xz)_x' - 0 + 0 = e^{2xz} \cdot 2z = 2ze^{2xz}$$

$$f_y =$$

$$f_y = 0 - \frac{1}{yz} \cdot (yz)'_y + 0 = -\frac{1}{yz} \cdot z = -\frac{1}{y}$$

$$f_z = e^{2xz} \cdot (2xz)'_z - \frac{1}{yz} \cdot (yz)'_z + 0 = e^{2xz} \cdot 2x - \frac{1}{yz} \cdot y = 2xe^{2xz} - \frac{1}{z}$$

 $(e^x)'=e^x$

 $(\ln x)' = \frac{1}{-1}$

Izračunajte vrijednosti parcijalnih derivacija funkcije $(\ln x)' = \frac{1}{-1}$ $f(x, y, z) = e^{2xz} - \ln(yz) + 1$

 $\left(\ln\left(\text{nešto}\right)\right)' = \frac{1}{\text{nešto}} \cdot (\text{nešto})'$

 $(e^{\text{nešto}})' = e^{\text{nešto}} \cdot (\text{nešto})'$

$$f_x = e^{2xz} \cdot (2xz)_x' - 0 + 0 = e^{2xz} \cdot 2z = 2ze^{2xz}$$

$$f_{\cdot \cdot} = 0$$

$$f_y = 0 - \frac{1}{vz} \cdot (yz)'_y + 0 = -\frac{1}{vz} \cdot z = -\frac{1}{vz}$$

$$f_z = e^{2xz} \cdot (2xz)_z' - \frac{1}{vz} \cdot (yz)_z' + 0 = e^{2xz} \cdot 2x - \frac{1}{vz} \cdot y = 2xe^{2xz} - \frac{1}{z}$$

$$\rho^{2\cdot 0\cdot 1} - 2\rho^{0} -$$

 $f(x, y, z) = e^{2xz} - \ln(yz) + 1$

 $(e^{\text{nešto}})' = e^{\text{nešto}} \cdot (\text{nešto})'$

u točki (0, 2, 1).

Rješenje

$$f_{x}=\epsilon$$

$$f_x = e^{2xz} \cdot (2xz)_x' - 0 + 0 = e^{2xz} \cdot 2z = 2ze^{2xz}$$

$$e^{2x^2} \cdot (2x^2)$$

$$-\frac{1}{yz}\cdot(yz)_y'+0=$$

$$f_y = 0 - \frac{1}{yz} \cdot (yz)_y' + 0$$

$$f_y = 0 - \frac{1}{vz} \cdot (yz)'_y + 0 = -\frac{1}{vz} \cdot z = -\frac{1}{v}$$

$$-\frac{1}{yz}\cdot z = -\frac{1}{z}$$

$$0 - e^{2xz}$$

$$= e^{2xz} \cdot i$$

$$e^{2xz} \cdot 2$$

$$\frac{1}{2} \cdot 2x$$

$$2xz \cdot 2x$$

$$y = 2$$

 $\left(\ln\left(\text{nešto}\right)\right)' = \frac{1}{\text{nešto}} \cdot (\text{nešto})'$

 $(e^x)'=e^x$

 $(\ln x)' = \frac{1}{-}$

$$f_z = e^{2xz} \cdot (2xz)'_z - \frac{1}{yz} \cdot (yz)'_z + 0 = e^{2xz} \cdot 2x - \frac{1}{yz} \cdot y = 2xe^{2xz} - \frac{1}{z}$$

$$f_x(0,2,1) = 2 \cdot 1 \cdot e^{2 \cdot 0 \cdot 1} = 2e^0 = 2$$

$$f_y(0,2,1) = 2 \cdot 1 \cdot e^{2 \cdot 0 \cdot 1} = 2e^0 = 2$$

$$f_y(0,2,1) =$$

 $(e^{\text{nešto}})' = e^{\text{nešto}} \cdot (\text{nešto})'$

 $\left(\ln\left(\text{nešto}\right)\right)' = \frac{1}{\text{nešto}} \cdot (\text{nešto})'$

 $f(x, y, z) = e^{2xz} - \ln(yz) + 1$

$$f_x = e^{2xz} \cdot (2xz)_x' - 0 + 0 = e^{2xz} \cdot 2z = 2ze^{2xz}$$

$$f_y = 0$$
 –

$$f_y = 0 - \frac{1}{yz} \cdot (yz)'_y + 0 = -\frac{1}{yz} \cdot z = -\frac{1}{y}$$

 $f_x(0,2,1) = 2 \cdot 1 \cdot e^{2 \cdot 0 \cdot 1} = 2e^0 = 2$

$$t_y = 0 - \frac{1}{yz}$$

u točki (0, 2, 1).

$$-\frac{1}{2}\cdot(vz)'+0$$

$$f_z = e^{2xz} \cdot (2xz)'_z - \frac{1}{vz} \cdot (yz)'_z + 0 = e^{2xz} \cdot 2x - \frac{1}{vz} \cdot y = 2xe^{2xz} - \frac{1}{z}$$

$$\frac{1}{\sqrt{z}}\cdot(yz)_z'+0$$

$$(yz)'_{z} + 0$$

$$-0=e^2$$

$$2x - \frac{1}{\sqrt{2}}$$

$$\frac{1}{vz}$$
.

$$e^{2xz}$$
 —

 $(e^x)'=e^x$

 $(\ln x)' = \frac{1}{-1}$

9/24

$$f_y(0,2,1) = -\frac{1}{2}$$

Zadatak 4 Izračunajte vrijednosti parcijalnih derivacija funkcije

u točki (0, 2, 1).

 $f_{z}(0,2,1) =$

 $f(x, y, z) = e^{2xz} - \ln(yz) + 1$

 $(e^{\mathsf{nešto}})' = e^{\mathsf{nešto}} \cdot (\mathsf{nešto})'$

 $\left(\ln\left(\text{nešto}\right)\right)' = \frac{1}{\text{nešto}} \cdot (\text{nešto})'$

Rješenje

 $f_x = e^{2xz} \cdot (2xz)'_y - 0 + 0 = e^{2xz} \cdot 2z = 2ze^{2xz}$

 $f_{\mathsf{x}}(0,2,1) = 2 \cdot 1 \cdot e^{2 \cdot 0 \cdot 1} = 2e^{0} = 2$

 $f_y = 0 - \frac{1}{vz} \cdot (yz)'_y + 0 = -\frac{1}{vz} \cdot z = -\frac{1}{v}$

 $f_z = e^{2xz} \cdot (2xz)'_z - \frac{1}{yz} \cdot (yz)'_z + 0 = e^{2xz} \cdot 2x - \frac{1}{vz} \cdot y = \left| 2xe^{2xz} - \frac{1}{z} \right|$

 $(e^x)'=e^x$

 $(\ln x)' = \frac{1}{-1}$

9/24

 $f_{y}(0,2,1) = -\frac{1}{2}$

Zadatak 4 Izračunajte vrijednosti parcijalnih derivacija funkcije

 $f(x, y, z) = e^{2xz} - \ln(yz) + 1$

 $(e^{\text{nešto}})' = e^{\text{nešto}} \cdot (\text{nešto})'$

u točki (0, 2, 1). $\left(\ln\left(\text{nešto}\right)\right)' = \frac{1}{\text{nešto}} \cdot (\text{nešto})'$ Rješenje

$$f_x = e^{2xz} \cdot (2xz)_x' - 0 + 0 = e^{2xz} \cdot 2z = 2ze^{2xz}$$

 $f_y = 0 - \frac{1}{vz} \cdot (yz)_y' + 0 = -\frac{1}{vz} \cdot z = -\frac{1}{v}$

$$f_y = 0 - \frac{1}{yz} \cdot (yz)$$

$$\frac{(32)^{y}}{z} + 0 = \frac{1}{(32)^{y}}$$

$$yz$$

$$z' - \frac{1}{x} \cdot (yz)' + \frac{1}{x} \cdot (yz)' +$$

$$\frac{1}{2} = \frac{1}{2} = \frac{1}$$

 $(e^x)'=e^x$

 $(\ln x)' = \frac{1}{-1}$

9/24

$$f_z = e^{2xz} \cdot (2xz)'_z - \frac{1}{yz} \cdot (yz)'_z + 0 = e^{2xz} \cdot 2x - \frac{1}{yz} \cdot y = 2xe^{2xz} - \frac{1}{z}$$

$$(2xz)_z' - \frac{1}{yz} \cdot (yz)_z'$$

$$(yz)'_z + 0 = e^{2xz} \cdot 2x - \frac{1}{yz} \cdot y$$

$$(yz)'_z + 0 = e^{2xz} \cdot 2x - \frac{1}{yz} \cdot y$$

$$(z)'_z + 0 = e^{2xz} \cdot 2x - \frac{1}{yz} \cdot y$$

$$x \quad \forall \quad z$$

$$yz = yz = x y z = 2e^{0} = 2 f_{v}(0, 2, 1) = 0$$

$$yz$$
 $x \ y \ z$
 $f_x(0,2,1) = 2 \cdot 1 \cdot e^{2 \cdot 0 \cdot 1} =$

$$2e^{0} = 2$$
 $f_{y}(0, 2, 1) = -\frac{1}{2}$

$$f_x(0,2,1) = 2 \cdot 1 \cdot e^{2 \cdot 0 \cdot 1} = 2e^0 = 2$$

$$= 2 f_y(0,2,1) = -\frac{1}{2}$$

$$f_x(0,2,1) = 2 \cdot 1 \cdot e^{2 \cdot 0 \cdot 1} = 2e^{x}$$

 $f_z(0,2,1) = 2 \cdot 0 \cdot e^{2 \cdot 0 \cdot 1} - \frac{1}{1}$

$$f_y(0,2,1) = -\frac{1}{2}$$

Zadatak 4
$$(e^{ilesto})' = e^{ilesto} \cdot (n^2)$$

Izračunajte vrijednosti parcijalnih derivacija funkcije

 $f(x, y, z) = e^{2xz} - \ln(yz) + 1$

 $(e^{\text{nešto}})' = e^{\text{nešto}} \cdot (\text{nešto})'$

$$\ln(yz) + 1 \qquad \frac{(\ln x)' = \frac{1}{x}}{(\ln(\text{nešto}))' = \frac{1}{\text{nešto}} \cdot (\text{nešto})'}$$

9/24

 $(e^x)'=e^x$

u točki (0, 2, 1).

$$f_x = e^{2xz} \cdot (2xz)'_x - 0 + 0 = e^{2xz} \cdot 2z = 2ze^{2xz}$$

 $f_y = 0 - \frac{1}{vz} \cdot (yz)'_y + 0 = -\frac{1}{vz} \cdot z = -\frac{1}{v}$

 $f_{x}(0,2,1) = 2 \cdot 1 \cdot e^{2 \cdot 0 \cdot 1} = 2e^{0} = 2$

 $f_z(0,2,1) = 2 \cdot 0 \cdot e^{2 \cdot 0 \cdot 1} - \frac{1}{1} = 0 \cdot e^0 - 1$

$$-\frac{1}{yz}\cdot z=-\frac{1}{y}$$

$$f_z = e^{2xz} \cdot (2xz)_z' - \frac{1}{yz} \cdot (yz)_z' + 0 = e^{2xz} \cdot 2x - \frac{1}{yz} \cdot y = 2xe^{2xz} - \frac{1}{z}$$

$$y = 2xe^2$$

 $f_{y}(0,2,1) = -\frac{1}{2}$

$$f_z = e^{2xz} \cdot (2$$

$$r_y = 0$$

Zadatak 4
$$(e^{ilesto})' = e^{ilesto} \cdot (n^2)$$

Izračunajte vrijednosti parcijalnih derivacija funkcije

 $f(x, y, z) = e^{2xz} - \ln(yz) + 1$

 $(e^{\text{nešto}})' = e^{\text{nešto}} \cdot (\text{nešto})'$

 $\left(\ln\left(\text{nešto}\right)\right)' = \frac{1}{\text{nešto}} \cdot (\text{nešto})'$

 $(e^x)'=e^x$

 $(\ln x)' = \frac{1}{x}$

9/24

u točki (0, 2, 1).

$$f_x = e^{2xz} \cdot (2xz)_x' - 0 + 0 = e^{2xz} \cdot 2z = 2ze^{2xz}$$

 $f_x = 0 - \frac{1}{2} \cdot (yz)_x' + 0 = -\frac{1}{2} \cdot z = -\frac{1}{2}$

$$f_y = 0 - \frac{1}{yz} \cdot (yz)'_y + 0 = -\frac{1}{yz} \cdot z = -\frac{1}{y}$$

$$\frac{1}{yz} \cdot (yz)' + 0$$

$$yz y$$
$$z)'_z + 0 = e^{2xz} \cdot$$

$$f_z = e^{2xz} \cdot (2xz)'_z - \frac{1}{yz} \cdot (yz)'_z + 0 = e^{2xz} \cdot 2x - \frac{1}{yz} \cdot y = 2xe^{2xz} - \frac{1}{z}$$

$$f_z = e^{2xz} \cdot (2xz)_z' - \frac{1}{yz} \cdot ($$

$$(x)'_z + 0 = e^{2xz} \cdot 2x - \frac{1}{yz} \cdot y = 0$$

$$f_z = e^{2xz} \cdot (2xz)'_z - \frac{1}{yz} \cdot (yz)'_z$$

$$z)'_z + 0 = e^{2xz} \cdot 2x - \frac{1}{yz} \cdot y$$

$$x \quad y \quad z$$

$$(x)'_z + 0 = e^{2xz} \cdot 2x - \frac{1}{yz} \cdot y$$

$$(x \quad y \quad z)$$

$$yz$$

 $x \ y \ z$
 $f_v(0, 2, 1) =$

$$2e^{0} = 2$$

$$f_{y}(0,2,1) = -\frac{1}{2}$$

$$f_x(0,2,1) = 2 \cdot 1 \cdot e^{2 \cdot 0 \cdot 1} = 2e^0 = 2$$

$$f_y(0,2,1) = 2e^0 = 2$$

$$f_x(0,2,1) = 2 \cdot 1 \cdot e^{2 \cdot 0 \cdot 1} = 2e^0 = 2$$
 $f_y(0,2,1) = -\frac{1}{2}$
 $f_z(0,2,1) = 2 \cdot 0 \cdot e^{2 \cdot 0 \cdot 1} - \frac{1}{1} = 0 \cdot e^0 - 1 = -1$

Zadatak 4
$$(e^{ilesto})' = e^{ilesto} \cdot (n^2)$$

Izračunajte vrijednosti parcijalnih derivacija funkcije

Rješenje

$$f(x,y,z) = e^{2xz} - \ln(yz) + 1$$

 $(e^{\text{nešto}})' = e^{\text{nešto}} \cdot (\text{nešto})'$

$$f_x = e^{2xz} \cdot (2xz)_x' - 0 + 0 = e^{2xz} \cdot 2z = 2ze^{2xz}$$

$$f_y = 0 - \frac{1}{yz} \cdot (yz)'_y + 0 = -\frac{1}{yz} \cdot z = -\frac{1}{y}$$

$$yz$$

$$(2xz)'_z - \frac{1}{z} \cdot (yz)$$

 $f_{x}(0,2,1) = 2 \cdot 1 \cdot e^{2 \cdot 0 \cdot 1} = 2e^{0} = 2$

 $f_z(0,2,1) = 2 \cdot 0 \cdot e^{2 \cdot 0 \cdot 1} - \frac{1}{1} = 0 \cdot e^0 - 1 = -1$

$$f_z = e^{2xz} \cdot (2xz)'_z - \frac{1}{vz} \cdot (yz)'_z + 0 = e^{2xz} \cdot 2x - \frac{1}{vz} \cdot y = 2xe^{2xz} - \frac{1}{z}$$

$$=-\frac{1}{yz}\cdot z$$

$$= 2ze^{-1}$$
 $= \frac{1}{2}$

 $\left(\ln\left(\text{nešto}\right)\right)' = \frac{1}{\text{nešto}} \cdot (\text{nešto})'$

 $f_{y}(0,2,1) = -\frac{1}{2}$

 $(e^x)'=e^x$

 $(\ln x)' = \frac{1}{x}$

9/24

Parcijalne derivacije drugog reda – oznake

Parcijalne derivacije drugog reda – oznake

• Funkcija dvije varijable: z = z(x, y)

$$z_{xx}$$
 z'_{xx} $\frac{\partial^2 z}{\partial x^2}$
 z_{xy} z'_{xy} $\frac{\partial^2 z}{\partial x \partial y}$
 z_{yx} z'_{yx} $\frac{\partial^2 z}{\partial y \partial x}$
 z_{yy} z'_{yy} $\frac{\partial^2 z}{\partial y^2}$

peti zadatak

Odredite parcijalne derivacije drugog reda funkcije $z(x, y) = y^2 \cdot 2^x$.

Odredite parcijalne derivacije drugog reda funkcije $z(x, y) = y^2 \cdot 2^x$.

Rješenje

$$z_{x} =$$

$$(x^n)' = nx^{n-1}$$

 $(a^x)'=a^x \ln a$

Odredite parcijalne derivacije drugog reda funkcije $z(x,y) = y^2 \cdot 2^x$.

Rješenje

$$z_x = y^2$$
.

$$(a^{x})' = a^{x} \ln a$$

$$(x^{n})' = nx^{n-1}$$

Odredite parcijalne derivacije drugog reda funkcije $z(x,y) = y^2 \cdot 2^x$.

Rješenje

$$z_{x} = y^{2} \cdot 2^{x} \ln 2$$

$$(a^{x})' = a^{x} \ln a$$

$$(x^{n})' = nx^{n-1}$$

Odredite parcijalne derivacije drugog reda funkcije $z(x, y) = y^2 \cdot 2^x$.

Rješenje

 $(a^x)'=a^x \ln a$

$$z_x = y^2 \cdot 2^x \ln 2$$

$$z_{v} =$$

Odredite parcijalne derivacije drugog reda funkcije $z(x, y) = y^2 \cdot 2^x$.

Rješenje

$$(a^{x})' = a^{x} \ln a$$

 $(x^n)'=nx^{n-1}$

$$z_x = y^2 \cdot 2^x \ln 2$$
$$z_y = 2^x \cdot 2^x \cdot 2^x \ln 2$$

Odredite parcijalne derivacije drugog reda funkcije $z(x, y) = y^2 \cdot 2^x$.

Rješenje

 $(a^x)' = a^x \ln a$

 $(x^n)'=nx^{n-1}$

$$z_x = y^2 \cdot 2^x \ln 2$$
$$z_y = 2^x \cdot 2y$$

Odredite parcijalne derivacije drugog reda funkcije $z(x,y) = y^2 \cdot 2^x$.

Rješenje

$$(a^x)' = a^x \ln a$$

 $(x^n)'=nx^{n-1}$

$$z_x = y^2 \cdot 2^x \ln 2$$

$$z_y = 2^x \cdot 2y = y \cdot 2^{x+1}$$

Odredite parcijalne derivacije drugog reda funkcije $z(x,y) = y^2 \cdot 2^x$.

Rješenje

Expression
$$(a^{x})' = a^{x} \ln a$$

$$z_{x} = y^{2} \cdot 2^{x} \ln 2$$

$$(x^{n})' = nx^{n-1}$$

$$z_x = y^2 \cdot 2^x \ln 2$$

$$z_y = 2^x \cdot 2y = y \cdot 2^{x+1}$$

$$z_{xx} =$$

Odredite parcijalne derivacije drugog reda funkcije $z(x,y) = y^2 \cdot 2^x$.

Rješenje

$$z_{x} = y^{2} \cdot 2^{x} \ln 2$$

$$z_{y} = 2^{x} \cdot 2y = y \cdot 2^{x+1}$$

$$z_{xx} = (z_{x})_{x}$$

 $(a^{x})' = a^{x} \ln a$ $(x^{n})' = nx^{n-1}$

Odredite parcijalne derivacije drugog reda funkcije $z(x,y) = y^2 \cdot 2^x$.

Rješenje

$$z_{x} = y^{2} \cdot 2^{x} \ln 2$$

$$z_{y} = 2^{x} \cdot 2y = y \cdot 2^{x+1}$$

$$z_{yy} = (z_y)_y = y^2 \ln 2$$
.

 $(a^{x})' = a^{x} \ln a$ $(x^{n})' = nx^{n-1}$

Odredite parcijalne derivacije drugog reda funkcije $z(x,y) = y^2 \cdot 2^x$.

Rješenje

$$z_x = y^2 \cdot 2^x \ln 2$$

$$z_y = 2^x \cdot 2y = y \cdot 2^{x+1}$$

$$z_{xx} = (z_x)_x = y^2 \ln 2 \cdot 2^x \ln 2$$

11/24

 $(a^x)'=a^x \ln a$

 $(x^n)' = nx^{n-1}$

Odredite parcijalne derivacije drugog reda funkcije $z(x,y) = y^2 \cdot 2^x$.

Rješenje

$$z_x = y^2 \cdot 2^x \ln 2$$

$$z_y = 2^x \cdot 2y = y \cdot 2^{x+1}$$

$$z_{xx} = (z_x)_x = y^2 \ln 2 \cdot 2^x \ln 2 = y^2 \cdot$$

 $(a^x)'=a^x \ln a$

 $(x^n)' = nx^{n-1}$

Odredite parcijalne derivacije drugog reda funkcije $z(x, y) = y^2 \cdot 2^x$.

Rješenje

 $(a^x)' = a^x \ln a$ $(x^n)' = nx^{n-1}$

$$z_{x} = y^{2} \cdot 2^{x} \ln 2$$

$$z_y = 2^x \cdot 2y = y \cdot 2^{x+1}$$

$$z_{xx} = (z_x)_x = y^2 \ln 2 \cdot 2^x \ln 2 = y^2 \cdot 2^x \ln^2 2$$

Odredite parcijalne derivacije drugog reda funkcije $z(x, y) = y^2 \cdot 2^x$.

Rješenje

Rjesenje
$$(a^{x})' = a^{x} \ln a$$

$$z_{x} = y^{2} \cdot 2^{x} \ln 2$$

$$z_{y} = 2^{x} \cdot 2y = y \cdot 2^{x+1}$$

 $z_{xx} = (z_x)_x = y^2 \ln 2 \cdot 2^x \ln 2 = y^2 \cdot 2^x \ln^2 2$

 $z_{xv} =$

Odredite parcijalne derivacije drugog reda funkcije $z(x,y) = y^2 \cdot 2^x$.

Rješenje

$$z_{x} = y^{2} \cdot 2^{x} \ln 2$$

$$z_{y} = 2^{x} \cdot 2y = y \cdot 2^{x+1}$$

$$z_{xx} = (z_{x})_{x} = y^{2} \ln 2 \cdot 2^{x} \ln 2 = y^{2} \cdot 2^{x} \ln^{2} 2$$

$$z_{xy} = (z_{x})_{y}$$

 $(a^x)' = a^x \ln a$

Odredite parcijalne derivacije drugog reda funkcije $z(x,y) = y^2 \cdot 2^x$.

Rješenje

$$z_{x} = y^{2} \cdot 2^{x} \ln 2$$

$$z_{y} = 2^{x} \cdot 2y = y \cdot 2^{x+1}$$

$$z_{xx} = (z_{x})_{x} = y^{2} \ln 2 \cdot 2^{x} \ln 2 = y^{2} \cdot 2^{x} \ln^{2} 2$$

$$z_{xy} = (z_{x})_{y} = 2^{x} \ln 2 \cdot$$

 $(a^x)' = a^x \ln a$

Odredite parcijalne derivacije drugog reda funkcije $z(x,y) = y^2 \cdot 2^x$.

Rješenje

$$z_{x} = y^{2} \cdot 2^{x} \ln 2$$

$$z_{y} = 2^{x} \cdot 2y = y \cdot 2^{x+1}$$

$$z_{xx} = (z_{x})_{x} = y^{2} \ln 2 \cdot 2^{x} \ln 2 = y^{2} \cdot 2^{x} \ln^{2} 2$$

$$z_{xy} = (z_{x})_{y} = 2^{x} \ln 2 \cdot 2y$$

 $(a^x)' = a^x \ln a$

Odredite parcijalne derivacije drugog reda funkcije $z(x,y) = y^2 \cdot 2^x$.

Rješenje

$$z_{x} = y^{2} \cdot 2^{x} \ln 2$$

$$z_{y} = 2^{x} \cdot 2y = y \cdot 2^{x+1}$$

$$z_{xx} = (z_{x})_{x} = y^{2} \ln 2 \cdot 2^{x} \ln 2 = y^{2} \cdot 2^{x} \ln^{2} 2$$

$$z_{xy} = (z_{x})_{y} = 2^{x} \ln 2 \cdot 2y = y$$

 $(a^x)' = a^x \ln a$

Odredite parcijalne derivacije drugog reda funkcije $z(x,y) = y^2 \cdot 2^x$.

Rješenje

$$z_{x} = y^{2} \cdot 2^{x} \ln 2$$

$$z_{y} = 2^{x} \cdot 2y = y \cdot 2^{x+1}$$

$$z_{xx} = (z_{x})_{x} = y^{2} \ln 2 \cdot 2^{x} \ln 2 = y^{2} \cdot 2^{x} \ln^{2} 2$$

$$z_{xy} = (z_{x})_{y} = 2^{x} \ln 2 \cdot 2y = y \cdot 2^{x+1} \ln 2$$

 $(a^x)' = a^x \ln a$

Odredite parcijalne derivacije drugog reda funkcije $z(x,y) = y^2 \cdot 2^x$.

Rjesenje
$$(a^{x})' = a^{x} \ln a$$

$$(x^{n})' = nx^{n-1}$$

$$z_{y} = 2^{x} \cdot 2y = y \cdot 2^{x+1}$$

$$z_{xx} = (z_x)_x = y^2 \ln 2 \cdot 2^x \ln 2 = y^2 \cdot 2^x \ln^2 2$$

 $z_{xy} = (z_x)_y = 2^x \ln 2 \cdot 2y = y \cdot 2^{x+1} \ln 2$

$$z_{vx} =$$

Odredite parcijalne derivacije drugog reda funkcije $z(x,y) = y^2 \cdot 2^x$.

Rješenje

$$z_{x} = y^{2} \cdot 2^{x} \ln 2$$

$$z_{y} = 2^{x} \cdot 2y = y \cdot 2^{x+1}$$

$$z_{xx} = (z_{x})_{x} = y^{2} \ln 2 \cdot 2^{x} \ln 2 = y^{2} \cdot 2^{x} \ln^{2} 2$$

$$z_{xy} = (z_{x})_{y} = 2^{x} \ln 2 \cdot 2y = y \cdot 2^{x+1} \ln 2$$

$$z_{yx} = (z_{y})_{x}$$

 $(a^x)' = a^x \ln a$

Odredite parcijalne derivacije drugog reda funkcije $z(x,y) = y^2 \cdot 2^x$.

Rješenje

$$z_{x} = y^{2} \cdot 2^{x} \ln 2$$

$$z_{y} = 2^{x} \cdot 2y = y \cdot 2^{x+1}$$

$$z_{xx} = (z_{x})_{x} = y^{2} \ln 2 \cdot 2^{x} \ln 2 = y^{2} \cdot 2^{x} \ln^{2} 2$$

$$z_{xy} = (z_{x})_{y} = 2^{x} \ln 2 \cdot 2y = y \cdot 2^{x+1} \ln 2$$

$$z_{yx} = (z_{y})_{x} = y \cdot 2^{x} \ln 2 \cdot 2y = y \cdot 2^{x+1} \ln 2$$

 $(a^x)' = a^x \ln a$

Odredite parcijalne derivacije drugog reda funkcije $z(x,y) = y^2 \cdot 2^x$.

Rješenje

$$z_{x} = y^{2} \cdot 2^{x} \ln 2$$

$$z_{y} = 2^{x} \cdot 2y = y \cdot 2^{x+1}$$

$$z_{xx} = (z_{x})_{x} = y^{2} \ln 2 \cdot 2^{x} \ln 2 = y^{2} \cdot 2^{x} \ln^{2} 2$$

$$z_{xy} = (z_{x})_{y} = 2^{x} \ln 2 \cdot 2y = y \cdot 2^{x+1} \ln 2$$

$$z_{yx} = (z_{y})_{x} = y \cdot 2^{x+1} \ln 2$$

 $(a^x)' = a^x \ln a$

Odredite parcijalne derivacije drugog reda funkcije $z(x,y) = y^2 \cdot 2^x$.

Rješenje

$$z_{x} = y^{2} \cdot 2^{x} \ln 2$$

$$z_{y} = 2^{x} \cdot 2y = y \cdot 2^{x+1}$$

$$z_{xx} = (z_{x})_{x} = y^{2} \ln 2 \cdot 2^{x} \ln 2 = y^{2} \cdot 2^{x} \ln^{2} 2$$

$$z_{xy} = (z_{x})_{y} = 2^{x} \ln 2 \cdot 2y = y \cdot 2^{x+1} \ln 2$$

$$z_{yx} = (z_{y})_{x} = y \cdot 2^{x+1} \ln 2 \cdot (x+1)'_{x}$$

 $(a^x)' = a^x \ln a$

Odredite parcijalne derivacije drugog reda funkcije $z(x,y) = y^2 \cdot 2^x$.

Rješenje

$$z_{x} = y^{2} \cdot 2^{x} \ln 2$$

$$z_{y} = 2^{x} \cdot 2y = y \cdot 2^{x+1}$$

$$z_{xx} = (z_{x})_{x} = y^{2} \ln 2 \cdot 2^{x} \ln 2 = y^{2} \cdot 2^{x} \ln^{2} 2$$

$$z_{xy} = (z_{x})_{y} = 2^{x} \ln 2 \cdot 2y = y \cdot 2^{x+1} \ln 2$$

$$z_{yx} = (z_{y})_{x} = y \cdot 2^{x+1} \ln 2 \cdot (x+1)'_{x} = y \cdot 2^{x+1} \ln 2$$

$$= 1$$

Odredite parcijalne derivacije drugog reda funkcije $z(x,y) = y^2 \cdot 2^x$.

Rješenje
$$(a^{x})' = a^{x} \ln a$$

$$z_{y} = 2^{x} \cdot 2y = y \cdot 2^{x+1}$$

$$z_{xx} = (z_{x})_{x} = y^{2} \ln 2 \cdot 2^{x} \ln 2 = y^{2} \cdot 2^{x} \ln^{2} 2$$

$$z_{xy} = (z_{x})_{y} = 2^{x} \ln 2 \cdot 2y = y \cdot 2^{x+1} \ln 2$$

$$z_{yx} = (z_{y})_{x} = y \cdot 2^{x+1} \ln 2 \cdot (x+1)'_{x} = y \cdot 2^{x+1} \ln 2$$

$$z_{yy} = 0$$

 $z_x = y^2 \cdot 2^x \ln 2$

Odredite parcijalne derivacije drugog reda funkcije $z(x,y) = y^2 \cdot 2^x$.

Rješenje

$$z_{x} = y^{2} \cdot 2^{x} \ln 2$$

$$z_{y} = 2^{x} \cdot 2y = y \cdot 2^{x+1}$$

$$z_{xx} = (z_{x})_{x} = y^{2} \ln 2 \cdot 2^{x} \ln 2 = y^{2} \cdot 2^{x} \ln^{2} 2$$

$$z_{xy} = (z_{x})_{y} = 2^{x} \ln 2 \cdot 2y = y \cdot 2^{x+1} \ln 2$$

$$z_{yx} = (z_{y})_{x} = y \cdot 2^{x+1} \ln 2 \cdot (x+1)'_{x} = y \cdot 2^{x+1} \ln 2$$

$$z_{yy} = (z_{y})_{y}$$

Odredite parcijalne derivacije drugog reda funkcije $z(x,y) = y^2 \cdot 2^x$.

Rješenje

$$z_{x} = y^{2} \cdot 2^{x} \ln 2$$

$$z_{y} = 2^{x} \cdot 2y = y \cdot 2^{x+1}$$

$$z_{xx} = (z_{x})_{x} = y^{2} \ln 2 \cdot 2^{x} \ln 2 = y^{2} \cdot 2^{x} \ln^{2} 2$$

$$z_{xy} = (z_{x})_{y} = 2^{x} \ln 2 \cdot 2y = y \cdot 2^{x+1} \ln 2$$

$$z_{yx} = (z_{y})_{x} = y \cdot 2^{x+1} \ln 2 \cdot (x+1)'_{x} = y \cdot 2^{x+1} \ln 2$$

$$z_{yy} = (z_{y})_{y} = 2^{x+1} \cdot$$

Odredite parcijalne derivacije drugog reda funkcije $z(x,y) = y^2 \cdot 2^x$.

Rješenje

$$z_{x} = y^{2} \cdot 2^{x} \ln 2$$

$$z_{y} = 2^{x} \cdot 2y = y \cdot 2^{x+1}$$

$$z_{xx} = (z_{x})_{x} = y^{2} \ln 2 \cdot 2^{x} \ln 2 = y^{2} \cdot 2^{x} \ln^{2} 2$$

$$z_{xy} = (z_{x})_{y} = 2^{x} \ln 2 \cdot 2y = y \cdot 2^{x+1} \ln 2$$

$$z_{yx} = (z_{y})_{x} = y \cdot 2^{x+1} \ln 2 \cdot (x+1)'_{x} = y \cdot 2^{x+1} \ln 2$$

$$z_{yy} = (z_{y})_{y} = 2^{x+1} \cdot 1$$

Odredite parcijalne derivacije drugog reda funkcije $z(x,y) = y^2 \cdot 2^x$.

Rješenje

$$z_{x} = y^{2} \cdot 2^{x} \ln 2$$

$$z_{y} = 2^{x} \cdot 2y = y \cdot 2^{x+1}$$

$$z_{xx} = (z_{x})_{x} = y^{2} \ln 2 \cdot 2^{x} \ln 2 = y^{2} \cdot 2^{x} \ln^{2} 2$$

$$z_{xy} = (z_{x})_{y} = 2^{x} \ln 2 \cdot 2y = y \cdot 2^{x+1} \ln 2$$

$$z_{yx} = (z_{y})_{x} = y \cdot 2^{x+1} \ln 2 \cdot (x+1)'_{x} = y \cdot 2^{x+1} \ln 2$$

$$z_{yy} = (z_{y})_{y} = 2^{x+1} \cdot 1 = 2^{x+1}$$

Odredite parcijalne derivacije drugog reda funkcije $z(x,y) = y^2 \cdot 2^x$.

Rješenje
$$(a^x)' = a^x \ln a$$

$$z_{xx} = (z_x)_x = y^2 \ln 2 \cdot 2^x \ln 2 = y^2 \cdot 2^x \ln^2 2$$

$$z_{xy} = (z_x)_y = 2^x \ln 2 \cdot 2y = y \cdot 2^{x+1} \ln 2$$

$$z_{yx} = (z_y)_x = y \cdot 2^{x+1} \ln 2 \cdot (x+1)_x' = y \cdot 2^{x+1} \ln 2$$

 $z_{vv} = (z_v)_v = 2^{x+1} \cdot 1 = 2^{x+1}$

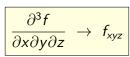
 $z_x = y^2 \cdot 2^x \ln 2$

 $z_v = 2^x \cdot 2v = v \cdot 2^{x+1}$

šesti zadatak

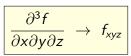
Zadana je funkcija $f(x, y, z) = z \cdot y^x$. Odredite $\frac{\partial^3 f}{\partial x \partial y \partial z}$.

Zadana je funkcija $f(x, y, z) = z \cdot y^x$. Odredite $\frac{\partial^3 f}{\partial x \partial y \partial z}$.



Zadana je funkcija $f(x, y, z) = z \cdot y^x$. Odredite $\frac{\partial^3 f}{\partial x \partial y \partial z}$.

$$f_{x} =$$



Zadana je funkcija $f(x, y, z) = z \cdot y^x$. Odredite $\frac{\partial^3 f}{\partial x \partial y \partial z}$.

$$f_{x}=z$$
.

$$\frac{\partial^3 f}{\partial x \partial y \partial z} \rightarrow f_{xyz}$$

Zadana je funkcija $f(x, y, z) = z \cdot y^x$. Odredite $\frac{\partial^3 f}{\partial x \partial y \partial z}$.

$$f_x = z \cdot y^x \ln y$$

$$\frac{\partial^3 f}{\partial x \partial y \partial z} \rightarrow f_{xyz}$$

Zadana je funkcija $f(x, y, z) = z \cdot y^x$. Odredite $\frac{\partial^3 f}{\partial x \partial y \partial z}$.

$$f_x = z \cdot y^x \ln y = zy^x \ln y$$

$$\frac{\partial^3 f}{\partial x \partial y \partial z} \rightarrow f_{xyz}$$

Zadana je funkcija $f(x, y, z) = z \cdot y^x$. Odredite $\frac{\partial^3 f}{\partial x \partial y \partial z}$.

$$f_{x} = z \cdot y^{x} \ln y = zy^{x} \ln y$$

$$f_{xy} =$$

$$=a^{x}\ln a$$

Zadana je funkcija $f(x, y, z) = z \cdot y^x$. Odredite $\frac{\partial^3 f}{\partial x \partial y \partial z}$.

 $(uv)'(x) = u'(x) \cdot v(x) + u(x) \cdot v'(x)$

Rješenje

$$f_x = z \cdot y^x \ln y = zy^x \ln y$$
 $f_{xy} = (f_x)_y$

Zadana je funkcija $f(x, y, z) = z \cdot y^x$. Odredite $\frac{\partial^3 f}{\partial x \partial y \partial z}$.

 $(uv)'(x) = u'(x) \cdot v(x) + u(x) \cdot v'(x)$

 $\left| \frac{\partial^3 f}{\partial x \partial v \partial z} \right| \to f_{xyz}$

$$f_x = z \cdot y^x \ln y = zy^x \ln y$$

 $f_{xy} = (f_x)_y = z$

Zadana je funkcija $f(x, y, z) = z \cdot y^x$. Odredite $\frac{\partial^3 f}{\partial x \partial y \partial z}$.

 $(uv)'(x) = u'(x) \cdot v(x) + u(x) \cdot v'(x)$

 $\left| \frac{\partial^3 f}{\partial x \partial v \partial z} \right| \to f_{xyz}$

$$f_x = z \cdot y^x \ln y = zy^x \ln y$$

 $f_{xy} = (f_x)_y = zxy^{x-1}$

$$(a^{\times})' = a^{\times} \ln a \qquad (x^n)' = nx^{n-1}$$

Zadana je funkcija
$$f(x, y, z) = z \cdot y^x$$
. Odredite $\frac{\partial^3 f}{\partial x \partial y \partial z}$.

 $(uv)'(x) = u'(x) \cdot v(x) + u(x) \cdot v'(x)$

 $\left| \frac{\partial^3 f}{\partial x \partial v \partial z} \right| \to f_{xyz}$

$$f_x = z \cdot y^x \ln y = zy^x \ln y$$

$$f_{xy} = (f_x)_y = zxy^{x-1} \cdot$$

$$(a^{x})' = a^{x} \ln a$$

$$(x^{n})' = nx^{n-1}$$

$$x^{n-1}$$

Zadana je funkcija $f(x, y, z) = z \cdot y^x$. Odredite $\frac{\partial^3 f}{\partial x \partial y \partial z}$.

 $(uv)'(x) = u'(x) \cdot v(x) + u(x) \cdot v'(x)$

Rješenje
$$\frac{\partial^3 f}{\partial x \partial y \partial z} \to f_{xyz}$$

$$f_x = z \cdot y^x \ln y = zy^x \ln y$$

$$f_{xy} = (f_x)_y = zxy^{x-1} \cdot \ln y$$

$$(a^{x})' = a^{x} \ln a \qquad (x^{n})' = nx^{n-1}$$

Zadana je funkcija $f(x, y, z) = z \cdot y^x$. Odredite $\frac{\partial^3 f}{\partial x \partial y \partial z}$.

 $(uv)'(x) = u'(x) \cdot v(x) + u(x) \cdot v'(x)$

Rješenje
$$\frac{\partial^3 f}{\partial x \partial y \partial z} \to f_{xyz}$$

$$f_{xy} = (f_x)_y = zxy^{x-1} \cdot \ln y +$$

 $f_x = z \cdot y^x \ln y = zy^x \ln y$

$$(a^{x})' = a^{x} \ln a \qquad (x^{n})' = nx^{n-1}$$

Zadana je funkcija $f(x, y, z) = z \cdot y^x$. Odredite $\frac{\partial^3 f}{\partial x \partial y \partial z}$.

 $(uv)'(x) = u'(x) \cdot v(x) + u(x) \cdot v'(x)$

 $\left| \frac{\partial^3 f}{\partial x \partial v \partial z} \right. \to \left. f_{xyz} \right.$

$$f_x = z \cdot y^x \ln y = zy^x \ln y$$

$$f_{xy} = (f_x)_y = zxy^{x-1} \cdot \ln y + zy^x$$

$$(a^{x})' = a^{x} \ln a$$
 $(x^{n})' = nx^{n-1}$

Zadana je funkcija $f(x, y, z) = z \cdot y^x$. Odredite $\frac{\partial^3 f}{\partial x \partial y \partial z}$.

Rješenje

$$f_x = z \cdot y^x \ln y = zy^x \ln y$$

$$f_{xy} = (f_x)_y = zxy^{x-1} \cdot \ln y + zy^x \cdot$$

$$(a^{x})' = a^{x} \ln a$$
 $(x^{n})' = nx^{n-1}$ $(\ln x)' = \frac{1}{x}$

$$\frac{1}{(\ln x)' - 1}$$

 $(uv)'(x) = u'(x) \cdot v(x) + u(x) \cdot v'(x)$

Zadana je funkcija $f(x, y, z) = z \cdot y^x$. Odredite $\frac{\partial^3 f}{\partial x \partial y \partial z}$.

Rješenje

$$f_{x} = z \cdot y^{x} \ln y = zy^{x} \ln y$$

$$f_{xy} = (f_x)_y = zxy^{x-1} \cdot \ln y + zy^x \cdot \frac{1}{y}$$

$$(a^{x})' = a^{x} \ln a \qquad (x^{n})' = nx^{n-1} \qquad (\ln x)' = \frac{1}{x}$$

 $(uv)'(x) = u'(x) \cdot v(x) + u(x) \cdot v'(x)$

12/24

Zadana je funkcija $f(x, y, z) = z \cdot y^x$. Odredite $\frac{\partial^3 f}{\partial x \partial y \partial z}$.

$$f_x = z \cdot y^x \ln y = zy^x \ln y$$

$$f_{xy} = (f_x)_y = zxy^{x-1} \cdot \ln y + zy^x \cdot \frac{1}{y} = xzy^{x-1} \ln y$$

$$(a^{x})' = a^{x} \ln a$$
 $(x^{n})' = nx^{n-1}$ $(\ln x)' = \frac{1}{x}$

 $\left| \frac{\partial^3 f}{\partial x \partial v \partial z} \right. \to \left. f_{xyz} \right.$

 $(uv)'(x) = u'(x) \cdot v(x) + u(x) \cdot v'(x)$

 $(uv)'(x) = u'(x) \cdot v(x) + u(x) \cdot v'(x)$

 $\frac{\partial^3 f}{\partial x \partial v \partial z} \rightarrow f_{xyz}$

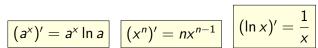
Zadana je funkcija $f(x, y, z) = z \cdot y^x$. Odredite $\frac{\partial^3 f}{\partial x \partial y \partial z}$. Rješenje

$$f_x = z \cdot y^x \ln y = zy^x \ln y$$

$$f_x = z \cdot y^x \ln y = zy^x \ln y$$

$$f_{xy} = (f_x)_y = zxy^{x-1} \cdot \ln y$$

$$f_{xy} = (f_x)_y = zxy^{x-1} \cdot \ln y + zy^x \cdot \frac{1}{v} = xzy^{x-1} \ln y + zy^x \cdot \frac{1}{v}$$



Zadana je funkcija $f(x, y, z) = z \cdot y^x$. Odredite $\frac{\partial^3 f}{\partial x \partial y \partial z}$.

 $(uv)'(x) = u'(x) \cdot v(x) + u(x) \cdot v'(x)$

 $\frac{\partial^3 f}{\partial x \partial v \partial z} \rightarrow f_{xyz}$

$$f_x = z \cdot y^x \ln y = zy^x \ln y$$

$$f_x = z \cdot y^{\wedge} \ln y = zy^{\wedge} \ln y$$

$$f_{xy} = (f_x)_y = zxy^{x-1} \cdot \ln y + zy^x \cdot \frac{1}{y} = xzy^{x-1} \ln y + zy^{x-1}$$

$$(a^{x})' = a^{x} \ln a$$
 $(x^{n})' = nx^{n-1}$ $(\ln x)' = \frac{1}{x}$

 $f_{xyz} =$

Zadana je funkcija $f(x, y, z) = z \cdot y^x$. Odredite $\frac{\partial^3 f}{\partial x \partial y \partial z}$.

Rješenje

$$f_x = z \cdot y^x \ln y = zy^x \ln y$$

$$f \qquad (f) \qquad -\infty^{X-1} \quad \text{in }$$

$$f_{xy} = (f_x)_y = zxy^{x-1} \cdot \ln y + zy^x \cdot \frac{1}{y} = xzy^{x-1} \ln y + zy^{x-1}$$

$$f_x)_y=zxy^{x-1}$$

$$\ln y + z$$

 $(uv)'(x) = u'(x) \cdot v(x) + u(x) \cdot v'(x)$

$$\frac{\partial^3 f}{\partial x \partial y \partial z} \to f_{xyz}$$

Zadana je funkcija $f(x, y, z) = z \cdot y^x$. Odredite $\frac{\partial^3 f}{\partial x \partial v \partial z}$.

Rješenje

$$f_x = z \cdot y^x \ln y = zy^x \ln y$$

$$f_{xy} = (f_x)_y = zxy^{x-1} \cdot \ln y$$

 $f_{xy} = (f_x)_y = zxy^{x-1} \cdot \ln y + zy^x \cdot \frac{1}{y} = xzy^{x-1} \ln y + zy^{x-1}$

$$f_{xy} = (f_x)_y = zxy^{x-1}$$

$$f_{xyz}=(f_{xy})_z$$

$$(a^{x})' = a^{x} \ln a$$
 $(x^{n})' = nx^{n-1}$ $(\ln x)' = \frac{1}{x}$

$$(x)' - \frac{1}{x}$$

 $(uv)'(x) = u'(x) \cdot v(x) + u(x) \cdot v'(x)$

 $\frac{\partial^3 f}{\partial x \partial v \partial z} \rightarrow f_{xyz}$

Zadana je funkcija $f(x, y, z) = z \cdot y^x$. Odredite $\frac{\partial^3 f}{\partial x \partial y \partial z}$.

$$f_x = z \cdot y^x \ln y = zy^x \ln y$$

$$f_{xy} = (f_x)_y = zxy^{x-1} \cdot \ln y + zy^x \cdot \frac{1}{v} = xzy^{x-1} \ln y + zy^{x-1}$$

 $f_{xyz} = (f_{xy})_z = xy^{x-1} \ln y$

$$f_{xyz}=(f_{xy})_z=xy^{x-1}\,\mathsf{I}$$

$$(a^{x})' = a^{x} \ln a$$
 $(x^{n})' = nx^{n-1}$ $(\ln x)' = \frac{1}{x}$

 $(uv)'(x) = u'(x) \cdot v(x) + u(x) \cdot v'(x)$

 $\frac{\partial^3 f}{\partial x \partial v \partial z} \rightarrow f_{xyz}$

Zadana je funkcija $f(x, y, z) = z \cdot y^x$. Odredite $\frac{\partial^3 f}{\partial x \partial y \partial z}$.

Rješenje

$$f_x = z \cdot y^x \ln y = zy^x \ln y$$

$$T_x = z \cdot y \quad \text{in } y = zy \quad \text{in } y$$

$$f_{xy} = (f_x)_y = zxy^{x-1} \cdot \ln y + zy^x \cdot \frac{1}{y} = xzy^{x-1} \ln y + zy^{x-1}$$

$$f = (f_x)_y = zxy^{x-1}$$

$$f_{xyz} = (f_{xy})_z = xy^{x-1} \ln y +$$

$$(a^{x})' = a^{x} \ln a$$
 $(x^{n})' = nx^{n-1}$ $(\ln x)' = \frac{1}{x}$

$$\frac{\partial^3 f}{\partial x \partial y \partial z} \to f_{xyz}$$

 $(uv)'(x) = u'(x) \cdot v(x) + u(x) \cdot v'(x)$

$$^{-1} \ln y + z y^{x-1}$$

$$-zy^{x-1}$$

Zadana je funkcija $f(x, y, z) = z \cdot y^x$. Odredite $\frac{\partial^3 f}{\partial x \partial y \partial z}$.

Rješenje

$$f_x = z \cdot y^x \ln y = zy^x \ln y$$

$$I_X = Z \cdot y \quad \text{iii} \quad y = Zy \quad \text{iii}$$

$$f_{xy} = (f_x)_y = zxy^{x-1} \cdot \ln y + zy^x \cdot \frac{1}{y} = xzy^{x-1} \ln y + zy^{x-1}$$

$$f_{xy} = (f_x)_y = zxy^{x-}$$

$$f_{xyz} = (f_{xy})_z = xy^{x-1} \ln y + y^{x-1}$$

$$\frac{\partial^3 f}{\partial x \partial y \partial z} \rightarrow f_{xyz}$$

 $(uv)'(x) = u'(x) \cdot v(x) + u(x) \cdot v'(x)$

$$-1 \ln y + z y^{x-1}$$

sedmi zadatak

Odredite lokalne ekstreme funkcije $f(x, y) = 80 - y^2 + x^3 + 12y - 3x$.

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$$f_{x} =$$

Odredite lokalne ekstreme funkcije $f(x, y) = 80 - y^2 + x^3 + 12y - 3x$.

$$f_{\rm x} = 3x^2 - 3$$

Odredite lokalne ekstreme funkcije $f(x, y) = 80 - y^2 + x^3 + 12y - 3x$.

$$f_x = 3x^2 - 3$$
$$f_y =$$

Odredite lokalne ekstreme funkcije $f(x, y) = 80 - y^2 + x^3 + 12y - 3x$.

$$f_x = 3x^2 - 3$$
$$f_y = -2y + 12$$

Odredite lokalne ekstreme funkcije $f(x, y) = 80 - y^2 + x^3 + 12y - 3x$.

$$f_x = 3x^2 - 3$$
 $3x^2 - 3 = 0$
 $f_y = -2y + 12$ $-2y + 12 = 0$

Odredite lokalne ekstreme funkcije $f(x, y) = 80 - y^2 + x^3 + 12y - 3x$.

$$f_x = 3x^2 - 3$$
 $3x^2 - 3 = 0 \longrightarrow x^2 = 1$
 $f_y = -2y + 12$ $-2y + 12 = 0$

Odredite lokalne ekstreme funkcije $f(x, y) = 80 - y^2 + x^3 + 12y - 3x$.

$$f_x = 3x^2 - 3$$
 $3x^2 - 3 = 0 \longrightarrow x^2 = 1 \longrightarrow x_1 = 1, x_2 = -1$
 $f_y = -2y + 12$ $-2y + 12 = 0$

Odredite lokalne ekstreme funkcije $f(x, y) = 80 - y^2 + x^3 + 12y - 3x$.

$$f_x = 3x^2 - 3$$
 $3x^2 - 3 = 0 \longrightarrow x^2 = 1 \longrightarrow x_1 = 1, x_2 = -1$
 $f_y = -2y + 12$ $-2y + 12 = 0 \longrightarrow y = 6$

Odredite lokalne ekstreme funkcije $f(x, y) = 80 - y^2 + x^3 + 12y - 3x$.

Rješenje

$$f_x = 3x^2 - 3$$
 $3x^2 - 3 = 0 \longrightarrow x^2 = 1 \longrightarrow x_1 = 1, x_2 = -1$
 $f_y = -2y + 12$ $-2y + 12 = 0 \longrightarrow y = 6$

Stacionarne točke:

Odredite lokalne ekstreme funkcije $f(x, y) = 80 - y^2 + x^3 + 12y - 3x$.

Rješenje

$$f_x = 3x^2 - 3$$
 $3x^2 - 3 = 0 \longrightarrow x^2 = 1 \longrightarrow x_1 = 1, x_2 = -1$
 $f_y = -2y + 12$ $-2y + 12 = 0 \longrightarrow y = 6$

Stacionarne točke: (1,6)

Odredite lokalne ekstreme funkcije $f(x, y) = 80 - y^2 + x^3 + 12y - 3x$.

Rješenje

$$f_x = 3x^2 - 3$$
 $3x^2 - 3 = 0 \longrightarrow x^2 = 1 \longrightarrow x_1 = 1, x_2 = -1$
 $f_y = -2y + 12$ $-2y + 12 = 0 \longrightarrow y = 6$

Stacionarne točke: (1,6), (-1,6)

Odredite lokalne ekstreme funkcije $f(x, y) = 80 - y^2 + x^3 + 12y - 3x$.

Rješenje

$$f_x = 3x^2 - 3$$
 $3x^2 - 3 = 0 \longrightarrow x^2 = 1 \longrightarrow x_1 = 1, x_2 = -1$
 $f_y = -2y + 12$ $-2y + 12 = 0 \longrightarrow y = 6$
Stacionarne točke: $(1, 6), (-1, 6)$

 $f_{xx} =$

Odredite lokalne ekstreme funkcije $f(x, y) = 80 - y^2 + x^3 + 12y - 3x$.

Rješenje

$$f_x = 3x^2 - 3$$
 $3x^2 - 3 = 0 \longrightarrow x^2 = 1 \longrightarrow x_1 = 1, x_2 = -1$
 $f_y = -2y + 12$ $-2y + 12 = 0 \longrightarrow y = 6$
Stacionarne točke: $(1, 6), (-1, 6)$

 $f_{xx} = 6x$

Odredite lokalne ekstreme funkcije $f(x, y) = 80 - y^2 + x^3 + 12y - 3x$.

Rješenje

$$f_x = 3x^2 - 3 \qquad 3x^2 - 3 = 0 \longrightarrow x^2 = 1 \longrightarrow x_1 = 1, \ x_2 = -1$$

$$f_y = -2y + 12 \qquad -2y + 12 = 0 \longrightarrow y = 6$$

$$x_1 \quad y \qquad x_2 \quad y \qquad y = 0$$
Stacionarne točke: (1, 6), (-1, 6)

Stacionarne točke: (1,6), (-1,6) $f_{xx} = 6x$, $f_{xy} =$

Odredite lokalne ekstreme funkcije $f(x, y) = 80 - y^2 + x^3 + 12y - 3x$.

Rješenje

$$f_x = 3x^2 - 3$$
 $3x^2 - 3 = 0 \longrightarrow x^2 = 1 \longrightarrow x_1 = 1, x_2 = -1$
 $f_y = -2y + 12$ $-2y + 12 = 0 \longrightarrow y = 6$
Stacionarne točke: $(1, 6), (-1, 6)$

 $f_{xx} = 6x, \quad f_{xy} = 0$

13/24

Odredite lokalne ekstreme funkcije $f(x, y) = 80 - y^2 + x^3 + 12y - 3x$.

$$f_x = 3x^2 - 3$$
 $3x^2 - 3 = 0 \longrightarrow x^2 = 1 \longrightarrow x_1 = 1, x_2 = -1$
 $f_y = -2y + 12$ $-2y + 12 = 0 \longrightarrow y = 6$
Stacionarne točke: $(1, 6), (-1, 6)$

Stacionarne točke:
$$(1,6)$$
, $(-1,6)$

$$f_{xx} = 6x, \quad f_{xy} = 0, \quad f_{yy} = 0$$

Odredite lokalne ekstreme funkcije $f(x, y) = 80 - y^2 + x^3 + 12y - 3x$.

Rješenje

$$f_x = 3x^2 - 3$$
 $3x^2 - 3 = 0 \longrightarrow x^2 = 1 \longrightarrow x_1 = 1, x_2 = -1$
 $f_y = -2y + 12$ $-2y + 12 = 0 \longrightarrow y = 6$
Stacionarne točke: $(1, 6), (-1, 6)$

Stacionarne tocke: (1,0), (-1,0)

 $f_{xx}=6x, \quad f_{xy}=0, \quad f_{yy}=-2$

13/24

Odredite lokalne ekstreme funkcije $f(x, y) = 80 - y^2 + x^3 + 12y - 3x$.

$$f_x = 3x^2 - 3$$

$$f_y = -2y + 12$$

$$3x^2 - 3 = 0 \longrightarrow x^2 = 1 \longrightarrow x_1 = 1, x_2 = -1$$

$$-2y + 12 = 0 \longrightarrow y = 6$$

$$x_1 \quad y \qquad x_2 \quad y \qquad y = 6$$

$$f_{y} = -2y + 12 \qquad | \qquad -2y + 12 = 0 \longrightarrow y = 6$$

$$x_{1} \quad y \qquad x_{2} \quad y$$
Stacionarne točke: $(1,6)$, $(-1,6)$

$$f_{x} = 6x \quad f_{x} = 0 \quad f_{x} = 2$$

$$H(x,y) = \begin{vmatrix} f_{xx} & f_{xy} \\ f_{xy} & f_{yy} \end{vmatrix}$$

Stacionarne točke:
$$(1,6), (-1,6)$$

$$f_{xx} = 6x, \quad f_{xy} = 0, \quad f_{yy} = -2$$

$$H(x,y) = \begin{vmatrix} f_{xx} & f_{xy} \\ f_{xy} & f_{yy} \end{vmatrix}$$

Odredite lokalne ekstreme funkcije $f(x, y) = 80 - y^2 + x^3 + 12y - 3x$.

$$f_x = 3x^2 - 3$$

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$$x_1 \quad y \quad x_2 \quad y$$

$$f_{y} = -2y + 12 \qquad | \quad -2y + 12 = 0 \longrightarrow y = 6$$
Stacionarne točke: $(1,6), (-1,6)$

$$H(x,y) = \begin{vmatrix} f_{xx} & f_{xy} \\ f & f \end{vmatrix} = \begin{vmatrix} 6x & 0 \\ 0 & 2 \end{vmatrix}$$

Stacionarne točke:
$$(1,6), (-1,6)$$

$$f_{xx} = 6x, \quad f_{xy} = 0, \quad f_{yy} = -2$$

$$H(x,y) = \begin{vmatrix} f_{xx} & f_{xy} \\ f_{xy} & f_{yy} \end{vmatrix} = \begin{vmatrix} 6x & 0 \\ 0 & -2 \end{vmatrix}$$

Odredite lokalne ekstreme funkcije $f(x, y) = 80 - y^2 + x^3 + 12y - 3x$.

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$$-2y + 12 = 0 \longrightarrow y = 6$$

$$x_1 \quad y \qquad x_2 \quad y$$

Stacionarne točke:
$$(1,6), (-1,6)$$

$$f_{xx} = 6x, \quad f_{xy} = 0, \quad f_{yy} = -2$$

$$H(x,y) = \begin{vmatrix} f_{xx} & f_{xy} \\ f_{xy} & f_{yy} \end{vmatrix} = \begin{vmatrix} 6x & 0 \\ 0 & -2 \end{vmatrix}$$

Stacionarne točke:
$$(1,6), (-1,6)$$
 $f_{xx} = 6x, \quad f_{xy} = 0, \quad f_{yy} = -2$
 $H(x,y) = \begin{vmatrix} f_{xx} & f_{xy} \\ f_{xy} & f_{yy} \end{vmatrix} = \begin{vmatrix} 6x & 0 \\ 0 & -2 \end{vmatrix}$

$$H(1,6) =$$

Odredite lokalne ekstreme funkcije $f(x, y) = 80 - y^2 + x^3 + 12y - 3x$.

$$f_{x} = 3x^{2} - 3 \qquad 3x^{2} - 3 = 0 \longrightarrow x^{2} = 1 \longrightarrow x_{1} = 1, x_{2} = -1$$

$$f_{y} = -2y + 12 \qquad -2y + 12 = 0 \longrightarrow y = 6$$

$$\begin{cases} x_{1} & y & x_{2} & y \\ (1 & 0) & (1 & 0) \end{cases}$$

Stacionarne točke:
$$(1,6)$$
, $(-1,6)$

$$f_{xx} = 6x$$
, $f_{xy} = 0$, $f_{yy} = -2$

$$H(x,y) = \begin{vmatrix} f_{xx} & f_{xy} \\ f_{xy} & f_{yy} \end{vmatrix} = \begin{vmatrix} 6 & 6 & 6 \\ 6 & 6 & 6 \end{vmatrix}$$

Stacionarne točke:
$$(1,6)$$
, $(-1,6)$

$$f_{xx} = 6x, \quad f_{xy} = 0, \quad f_{yy} = -2$$

$$H(x,y) = \begin{vmatrix} f_{xx} & f_{xy} \\ f_{xy} & f_{yy} \end{vmatrix} = \begin{vmatrix} 6x & 0 \\ 0 & -2 \end{vmatrix}$$

$$H(1,6) = \begin{vmatrix} 6 & 0 \\ 0 & -2 \end{vmatrix}$$

Odredite lokalne ekstreme funkcije $f(x, y) = 80 - y^2 + x^3 + 12y - 3x$.

Rješenje

$$f_x = 3x^2 - 3$$
 $3x^2 - 3 = 0 \longrightarrow x^2 = 1 \longrightarrow x_1 = 1, x_2 = -1$
 $f_y = -2y + 12$ $-2y + 12 = 0 \longrightarrow y = 6$

Stacionarne točke: (1,6), (-1,6)

$$f_{xx} = 6x$$
, $f_{xy} = 0$, $f_{yy} = -2$

$$H(1,6) = \begin{vmatrix} 6 & 0 \\ 0 & -2 \end{vmatrix} = -12$$

$$H(x,y) =$$

$$\frac{1,6)}{2} \qquad H(x,y) =$$

$$H(x,y) = \begin{vmatrix} f_{xx} & f_{xy} \\ f_{xy} & f_{yy} \end{vmatrix} = \begin{vmatrix} 6x & 0 \\ 0 & -2 \end{vmatrix}$$

$$f_{xx}$$

$$f_{xy}\Big| = 6x$$

$$\left. egin{array}{c} f_{xy} \\ f_{yy} \end{array}
ight| =$$

$$= \begin{vmatrix} 6x & 0 \\ 0 & -2 \end{vmatrix}$$

Odredite lokalne ekstreme funkcije $f(x, y) = 80 - y^2 + x^3 + 12y - 3x$.

$$f_x = 3x^2 - 3$$
 $3x^2 - 3 = 0 \longrightarrow x^2 = 1 \longrightarrow x_1 = 1, x_2 = -1$
 $f_y = -2y + 12$ $-2y + 12 = 0 \longrightarrow y = 6$

Stacionarne točke:
$$(1,6), (-1,6)$$

$$f_{xy} = 6x, \quad f_{xy} = 0, \quad f_{xy} = -2$$

$$H(x,y) = \begin{vmatrix} f_{xx} & f_{xy} \\ f_{xy} & f_{yy} \end{vmatrix} = \begin{vmatrix} 6x & 0 \\ 0 & -2 \end{vmatrix}$$

$$f_{xx} = 6x$$
, $f_{xy} = 0$, $f_{yy} = -2$
 $H(1,6) = \begin{vmatrix} 6 & 0 \\ 0 & -2 \end{vmatrix} = -12 < 0$

$$H(x,y) = \begin{vmatrix} f_{xx} & f_{yy} \\ f_{xy} & f_{yy} \end{vmatrix}$$

Odredite lokalne ekstreme funkcije $f(x, y) = 80 - y^2 + x^3 + 12y - 3x$.

$$f_x = 3x^2 - 3$$

$$f_y = -2y + 12$$

$$3x^2 - 3 = 0 \longrightarrow x^2 = 1 \longrightarrow x_1 = 1, x_2 = -1$$

$$-2y + 12 = 0 \longrightarrow y = 6$$

$$x_1 \quad y \qquad x_2 \quad y \qquad y = 6$$

Stacionarne točke:
$$(1,6)$$
, $(-1,6)$

Stacionarne točke:
$$(1,6), (-1,6)$$
 $f_{xy} = 6x, f_{xy} = 0, f_{xy} = -2$
 $H(x,y) = \begin{vmatrix} f_{xx} & f_{xy} \\ f_{xy} & f_{yy} \end{vmatrix} = \begin{vmatrix} 6x & 0 \\ 0 & -2 \end{vmatrix}$

$$f_{xx} = 6x$$
, $f_{xy} = 0$, $f_{yy} = -2$ $\begin{vmatrix} t_{xy} & t_{yy} \\ t_{yy} & t_{yy} \end{vmatrix}$

$$\begin{vmatrix} x & y \\ t_{yy} & t_{yy} \end{vmatrix} = -12 < 0 \longrightarrow \text{sedlasta točk}$$

$$H(1,6) = \begin{vmatrix} 6 & 0 \\ 0 & -2 \end{vmatrix} = -12 < 0 \longrightarrow$$
 sedlasta točka

Odredite lokalne ekstreme funkcije $f(x, y) = 80 - y^2 + x^3 + 12y - 3x$.

$$f_x = 3x^2 - 3$$
 $3x^2 - 3 = 0 \longrightarrow x^2 = 1 \longrightarrow x_1 = 1, x_2 = -1$
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Stacionarne točke: (1, 6), (-1, 6)

Stacionarne točke:
$$(1,6)$$
, $(-1,6)$

$$H(x,y) =$$

Stacionarne točke:
$$(1,6),\ (-1,6)$$

 $f_{xx}=6x,\quad f_{xy}=0,\quad f_{yy}=-2$
 $H(x,y)=0$

Stacionarne točke:
$$(1,6)$$
, $(-1,6)$

$$f_{xx} = 6x$$
, $f_{xy} = 0$, $f_{yy} = -2$

$$H(x,y) = \begin{vmatrix} f_{xx} & f_{xy} \\ f_{xy} & f_{yy} \end{vmatrix} = \begin{vmatrix} 6x & 0 \\ 0 & -2 \end{vmatrix}$$

$$H(1,6) = \begin{vmatrix} 6 & 0 \\ -12 \end{vmatrix} = -12 < 0 \longrightarrow \text{sedlasta točka}$$

$$H(1,6) = \begin{vmatrix} 6 & 0 \\ 0 & -2 \end{vmatrix} = -12 < 0 \longrightarrow \text{sedlasta točka}$$

$$H(-1,6) =$$

Odredite lokalne ekstreme funkcije $f(x, y) = 80 - y^2 + x^3 + 12y - 3x$.

Rješenje

$$f_{x} = 3x^{2} - 3 \qquad 3x^{2} - 3 = 0 \longrightarrow x^{2} = 1 \longrightarrow x_{1} = 1, x_{2} = -1$$

$$f_{y} = -2y + 12 \qquad -2y + 12 = 0 \longrightarrow y = 6$$
Stacionarno točke: $\begin{pmatrix} x_{1} & y & x_{2} & y \\ -1 & 6 \end{pmatrix}$

Stacionarne točke:
$$(1,6)$$
, $(-1,6)$

$$H(x,y)$$

Stacionarne točke:
$$(1,6),\ (-1,6)$$
 $f_{xx}=6x,\quad f_{xy}=0,\quad f_{yy}=-2$
 $H(x,y)=0$

 $H(x,y) = \begin{vmatrix} f_{xx} & f_{xy} \\ f_{xy} & f_{yy} \end{vmatrix} = \begin{vmatrix} 6x & 0 \\ 0 & -2 \end{vmatrix}$ $f_{xx} = 6x$, $f_{xy} = 0$, $f_{yy} = -2$

 $H(1,6) = \begin{vmatrix} 6 & 0 \\ 0 & -2 \end{vmatrix} = -12 < 0$ → sedlasta točka

$$H(-1,6) = \begin{vmatrix} -6 & 0 \\ 0 & -2 \end{vmatrix}$$

Odredite lokalne ekstreme funkcije $f(x, y) = 80 - y^2 + x^3 + 12y - 3x$.

Rješenje

 $f_{xx} = 6x$, $f_{xy} = 0$, $f_{yy} = -2$ $H(1,6) = \begin{vmatrix} 6 & 0 \\ 0 & -2 \end{vmatrix} = -12 < 0$

$$H(x,y) =$$

→ sedlasta točka

$$H(-1,6) = \begin{vmatrix} -6 & 0 \\ 0 & -2 \end{vmatrix} = 12$$

$$\begin{vmatrix} 0 \\ -2 \end{vmatrix} =$$

13/24

Odredite lokalne ekstreme funkcije $f(x, y) = 80 - y^2 + x^3 + 12y - 3x$.

Rješenje

$$f_x = 3x^2 - 3$$
 $3x^2 - 3 = 0 \longrightarrow x^2 = 1 \longrightarrow x_1 = 1, x_2 = -1$
 $f_y = -2y + 12$ $-2y + 12 = 0 \longrightarrow y = 6$
Stacionarne točke: $(1,6), (-1,6)$ $|f_x = f_y| = |f_x = 0|$

 $f_{xx} = 6x$, $f_{xy} = 0$, $f_{yy} = -2$ $H(1, 6) = \begin{vmatrix} 6 & 0 \\ 0 & -2 \end{vmatrix} = -12 < 0$

$$H(x,y) = \begin{vmatrix} f_{xx} & f_{xy} \\ f_{xy} & f_{yy} \end{vmatrix} = \begin{vmatrix} 6x & 0 \\ 0 & -2 \end{vmatrix}$$

 $H(-1,6) = \begin{vmatrix} x & y \\ -6 & 0 \\ 0 & -2 \end{vmatrix} = 12 > 0$

→ sedlasta točka

Odredite lokalne ekstreme funkcije $f(x, y) = 80 - y^2 + x^3 + 12y - 3x$.

Rješenje

$$f_x = 3x^2 - 3 \qquad 3x^2 - 3 = 0 \longrightarrow x^2 = 1 \longrightarrow x_1 = 1, \ x_2 = -1$$

$$f_y = -2y + 12 \qquad -2y + 12 = 0 \longrightarrow y = 6$$
Stacionarne točke: $(1,6), (-1,6)$

Stacionarne točke:
$$(1,6)$$
, $(-1,6)$

$$H(x,y) =$$

Stacionarne točke:
$$(1,6), (-1,6)$$

 $f_{xx} = 6x, \quad f_{xy} = 0, \quad f_{yy} = -2$
 $H(x,y) = 0$

tracionarne točke:
$$(1,6)$$
, $(-1,6)$

$$f_{xx} = 6x, \quad f_{xy} = 0, \quad f_{yy} = -2$$

$$f_{xy} = \begin{bmatrix} f_{xx} & f_{xy} \\ f_{xy} & f_{yy} \end{bmatrix} = \begin{bmatrix} 6x & 0 \\ 0 & -2 \end{bmatrix}$$

$$f_{xy} = \begin{bmatrix} 6x & 0 \\ 0 & -2 \end{bmatrix}$$

$$H(1,6) = \begin{vmatrix} 6 & 0 \\ 0 & -2 \end{vmatrix} = -12 < 0 \longrightarrow \text{sedlasta točka}$$

$$x \quad y \quad | \overbrace{-6}^{0} = 0 |$$

$$H(-1,6) = \begin{vmatrix} x & y \\ -6 & 0 \\ 0 & -2 \end{vmatrix} = 12 > 0$$

Odredite lokalne ekstreme funkcije $f(x, y) = 80 - y^2 + x^3 + 12y - 3x$.

Rješenje

$$f_{x} = 3x^{2} - 3 \qquad 3x^{2} - 3 = 0 \longrightarrow x^{2} = 1 \longrightarrow x_{1} = 1, \ x_{2} = -1$$

$$f_{y} = -2y + 12 \qquad -2y + 12 = 0 \longrightarrow y = 6$$
Statistic representation (1.6)

Stacionarne točke:
$$(1,6)$$
, $(-1,6)$

$$H(x,y) =$$

Stacionarne točke:
$$(1,6)$$
, $(-1,6)$

$$f_{xx} = 6x$$
, $f_{xy} = 0$, $f_{yy} = -2$

$$H(x,y) = \begin{vmatrix} f_{xx} & f_{xy} \\ f_{xy} & f_{yy} \end{vmatrix} = \begin{vmatrix} 6x & 0 \\ 0 & -2 \end{vmatrix}$$

Stacionarne točke:
$$(1,6), (-1,6)$$

 $f_{xx} = 6x, \quad f_{xy} = 0, \quad f_{yy} = -2$
 $H(x,y) = -2$

$$H(1,6) = \begin{vmatrix} 6 & 0 \\ 0 & -2 \end{vmatrix} = -12 < 0 \longrightarrow \text{sedlasta točka}$$

$$H(-1,6) = \begin{vmatrix} x & y \\ -6 & 0 \\ 0 & -2 \end{vmatrix} = 12 > 0 \longrightarrow \text{točka lokalnog maksimuma}$$

Odredite lokalne ekstreme funkcije $f(x, y) = 80 - y^2 + x^3 + 12y - 3x$.

Rješenje

$$f_x = 3x^2 - 3$$
 $3x^2 - 3 = 0 \longrightarrow x^2 = 1 \longrightarrow x_1 = 1, x_2 = -1$
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Stacionarne točke:
$$(1,6)$$
, $(-1,6)$

$$f_{xx} = 6x$$
, $f_{xy} = 0$, $f_{yy} = -2$

$$H(x,y) = \begin{vmatrix} f_{xx} & f_{xy} \\ f_{xy} & f_{yy} \end{vmatrix} = \begin{vmatrix} 6x & 0 \\ 0 & -2 \end{vmatrix}$$

f(-1,6) =

$$H(1,6) = \begin{vmatrix} 6 & 0 \\ 0 & -2 \end{vmatrix} = -12 < 0 \longrightarrow \text{sedlasta točka}$$

$$\begin{vmatrix} x & y & | & 0 \\ -6 & 0 & | & 12 > 0 \end{vmatrix}$$

$$\begin{pmatrix} x & y & | & 6 & 0 \\ 1 & 6 & | & -12 & 0 \end{pmatrix}$$

 $H(-1,6) = \begin{vmatrix} x & y \\ -6 & 0 \\ 0 & -2 \end{vmatrix} = 12 > 0 \longrightarrow \text{točka lokalnog maksimuma}$

Odredite lokalne ekstreme funkcije $f(x, y) = 80 - y^2 + x^3 + 12y - 3x$.

Rješenje

$$f_x = 3x^2 - 3$$
 $3x^2 - 3 = 0 \longrightarrow x^2 = 1 \longrightarrow x_1 = 1, x_2 = -1$
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Stacionarne točke:
$$(1,6)$$
, $(-1,6)$

 $f_{xx} = 6x$, $f_{xy} = 0$, $f_{yy} = -2$

$$H(x,y) = \begin{vmatrix} f_{xx} & f_{xy} \\ f_{xy} & f_{yy} \end{vmatrix} = \begin{vmatrix} 6x & 0 \\ 0 & -2 \end{vmatrix}$$

13/24

$$H(1,6) = \begin{vmatrix} 6 & 0 \\ 0 & -2 \end{vmatrix} = -12 < 0 -$$

$$H(1,6) = \begin{vmatrix} 0 & 0 \\ 0 & -2 \end{vmatrix} = -12 < 0 \longrightarrow \text{sedlasta točka}$$

$$H(-1,6) = \begin{vmatrix} 0 & 0 \\ 0 & -2 \end{vmatrix} = -12 > 0 \longrightarrow \text{točka lokalnog maksimuma}$$

$$\begin{pmatrix} x & y \\ -1 & 6 \end{pmatrix} = \begin{pmatrix} -6 & 0 \\ 0 & -12 > 0 \end{pmatrix} \longrightarrow \text{točka lokalnog maksimuma}$$

$$H(-1,6) = \begin{vmatrix} x & y \\ -6 & 0 \\ 0 & -2 \end{vmatrix} = 12 > 0 \longrightarrow \text{točka lokalnog maksimuma}$$

Odredite lokalne ekstreme funkcije $f(x, y) = 80 - y^2 + x^3 + 12y - 3x$.

Rješenje

$$f_x = 3x^2 - 3$$
 $3x^2 - 3 = 0 \longrightarrow x^2 = 1 \longrightarrow x_1 = 1, x_2 = -1$
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Stacionarne točke: (1,6), (-1,6)

Stacionarne točke:
$$(1,6)$$
, $(-1,6)$
 $f_{xx} = 6x$, $f_{xy} = 0$, $f_{yy} = -2$

 $H(x,y) = \begin{vmatrix} f_{xx} & f_{xy} \\ f_{yy} & f_{yy} \end{vmatrix} = \begin{vmatrix} 6x & 0 \\ 0 & -2 \end{vmatrix}$

13/24

$$H(1,6) = \begin{vmatrix} 6 & 0 \\ 0 & -2 \end{vmatrix} = -12 < 0$$

 $H(-1,6) = \begin{vmatrix} x & y \\ -6 & 0 \\ 0 & -2 \end{vmatrix} = 12 > 0 \longrightarrow \text{točka lokalnog maksimuma}$

 $f(-1,6) = 80 - 6^2 + (-1)^3 + 12 \cdot 6 - 3 \cdot (-1)$

$$H(1,0) = \begin{vmatrix} 0 & -1 \\ 0 & -1 \end{vmatrix}$$

 $H(1,6) = \begin{vmatrix} 6 & 0 \\ 0 & -2 \end{vmatrix} = -12 < 0$ → sedlasta točka

$$H(1,6) = \begin{vmatrix} 6 & 0 \\ 0 & -2 \end{vmatrix} = -12 < 0 \longrightarrow \text{sedlasta točka}$$

Odredite lokalne ekstreme funkcije $f(x, y) = 80 - y^2 + x^3 + 12y - 3x$.

$$f_x = 3x^2 - 3$$
 $3x^2 - 3 = 0 \longrightarrow x^2 = 1 \longrightarrow x_1 = 1, x_2 = -1$
 $f_y = -2y + 12$ $-2y + 12 = 0 \longrightarrow y = 6$

Stacionarne točke: (1,6), (-1,6) $H(x,y) = \begin{vmatrix} f_{xx} & f_{xy} \\ f_{yy} & f_{yy} \end{vmatrix} = \begin{vmatrix} 6x & 0 \\ 0 & -2 \end{vmatrix}$ $f_{xx} = 6x$, $f_{xy} = 0$, $f_{yy} = -2$

$$H(1,6) = \begin{vmatrix} 6 & 0 \\ 0 & -2 \end{vmatrix} = -12 < 0 \longrightarrow \text{sedlasta točka}$$

$$H(1,6) = \begin{vmatrix} 6 & 0 \\ 0 & -2 \end{vmatrix} = -12 < 0 \longrightarrow \text{sedlasta točka}$$

$$H(1,6) = \begin{vmatrix} 6 & 0 \\ 0 & -2 \end{vmatrix} = -12 < 0 \longrightarrow \text{sedlasta točka}$$

$$\begin{array}{c|c}
 & x & y & | \overbrace{-6} & 0 & | \\
 & & & & & \\
\end{array}$$

$$\begin{pmatrix} x & y \\ -1 & 6 \end{pmatrix} = \begin{pmatrix} -6 & 0 \\ 0 & 12 > 0 \end{pmatrix} = 12 > 0 \longrightarrow \text{točka lokalnog maksimuma}$$

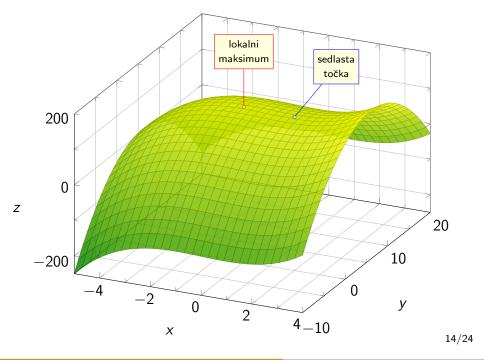
$$H(-1,6) = \begin{vmatrix} x & y \\ -6 & 0 \\ 0 & -2 \end{vmatrix} = 12 > 0 \longrightarrow \text{točka lokalnog maksimuma}$$

$$H(-1,6) = \begin{vmatrix} 0 & 0 \\ 0 & -2 \end{vmatrix} = 12 > 0 \longrightarrow točka lokalnog maksimuma$$

$$H(-1,6) = \begin{vmatrix} 0 & -2 \\ 0 & -2 \end{vmatrix} = 12 > 0 \longrightarrow \text{točka lokalnog maksimuma}$$

 $f(-1,6) = 80 - 6^2 + (-1)^3 + 12 \cdot 6 - 3 \cdot (-1) = 118$

13/24



osmi zadatak

Odredite lokalne ekstreme funkcije

$$z(x,y)=\frac{8}{x}+\frac{x}{y}+y.$$

Odredite lokalne ekstreme funkcije

$$z(x,y)=\frac{8}{x}+\frac{x}{y}+y.$$

Rješenje

Odredite lokalne ekstreme funkcije

$$z(x,y)=\frac{8}{x}+\frac{x}{y}+y.$$

$$z(x,y) = 8x^{-1} + xy^{-1} + y$$

Odredite lokalne ekstreme funkcije

$$z(x,y)=\frac{8}{x}+\frac{x}{y}+y.$$

$$z(x,y) = 8x^{-1} + xy^{-1} + y$$

$$z_x =$$

Odredite lokalne ekstreme funkcije

$$z(x,y)=\frac{8}{x}+\frac{x}{y}+y.$$

$$z(x,y) = 8x^{-1} + xy^{-1} + y$$

$$z_{x}=-8x^{-2}$$

Odredite lokalne ekstreme funkcije

$$z(x,y)=\frac{8}{x}+\frac{x}{y}+y.$$

$$z(x,y) = 8x^{-1} + xy^{-1} + y$$

$$z_x = -8x^{-2} + y^{-1}$$

Odredite lokalne ekstreme funkcije

$$z(x,y)=\frac{8}{x}+\frac{x}{y}+y.$$

$$z(x,y) = 8x^{-1} + xy^{-1} + y$$

$$z_x = -8x^{-2} + y^{-1}$$

$$z_y =$$

Odredite lokalne ekstreme funkcije

$$z(x,y)=\frac{8}{x}+\frac{x}{y}+y.$$

$$z(x,y) = 8x^{-1} + xy^{-1} + y$$

$$z_x = -8x^{-2} + y^{-1}$$
$$z_y = -xy^{-2}$$

Odredite lokalne ekstreme funkcije

$$z(x,y)=\frac{8}{x}+\frac{x}{y}+y.$$

$$z(x,y) = 8x^{-1} + xy^{-1} + y$$

$$z_x = -8x^{-2} + y^{-1}$$

$$z_y = -xy^{-2} + 1$$

Odredite lokalne ekstreme funkcije

$$z(x,y)=\frac{8}{x}+\frac{x}{y}+y.$$

$$z(x, y) = 8x^{-1} + xy^{-1} + y$$

$$z_x = -8x^{-2} + y^{-1}$$
 $-8x^{-2} + y^{-1} = 0$
 $z_y = -xy^{-2} + 1$ $-xy^{-2} + 1 = 0$

$$-8x^{-2} + y^{-1} = 0$$
$$-xy^{-2} + 1 = 0$$

$$-8x^{-2} + y^{-1} = 0$$
$$-xy^{-2} + 1 = 0$$
$$-\frac{8}{x^2} + \frac{1}{y} = 0$$

$$-8x^{-2} + y^{-1} = 0$$

$$-xy^{-2} + 1 = 0$$

$$-\frac{8}{x^{2}} + \frac{1}{y} = 0$$

$$-\frac{x}{y^{2}} + 1 = 0$$

$$-8x^{-2} + y^{-1} = 0$$

$$-xy^{-2} + 1 = 0$$

$$-\frac{8}{x^{2}} + \frac{1}{y} = 0$$

$$-\frac{x}{y^{2}} + 1 = 0$$

$$-8x^{-2} + y^{-1} = 0$$

$$-xy^{-2} + 1 = 0$$

$$-\frac{8}{x^{2}} + \frac{1}{y} = 0$$

$$-\frac{x}{y^{2}} + 1 = 0$$

$$-8x^{-2} + y^{-1} = 0$$

$$-xy^{-2} + 1 = 0$$

$$-\frac{8}{x^{2}} + \frac{1}{y} = 0$$

$$-\frac{x}{y^{2}} + 1 = 0$$

$$-\frac{x^{2}y}{y^{2}} + 1 = 0$$

$$-8x^{-2} + y^{-1} = 0$$

$$-xy^{-2} + 1 = 0$$

$$-\frac{8}{x^{2}} + \frac{1}{y} = 0$$

$$-\frac{x}{y^{2}} + 1 = 0$$

$$\frac{-8y}{x^{2}y}$$

$$-8x^{-2} + y^{-1} = 0$$

$$-xy^{-2} + 1 = 0$$

$$-\frac{8}{x^{2}} + \frac{1}{y} = 0$$

$$-\frac{x}{y^{2}} + 1 = 0$$

$$\frac{-8y + x^{2}y}{x^{2}y}$$

$$-8x^{-2} + y^{-1} = 0$$

$$-xy^{-2} + 1 = 0$$

$$-\frac{8}{x^{2}} + \frac{1}{y} = 0$$

$$-\frac{x}{y^{2}} + 1 = 0$$

$$\frac{-8y + x^{2}}{x^{2}y}$$

$$-8x^{-2} + y^{-1} = 0$$
$$-xy^{-2} + 1 = 0$$
$$-\frac{8}{x^{2}} + \frac{1}{y} = 0$$
$$-\frac{x}{y^{2}} + 1 = 0$$
$$\frac{-8y + x^{2}}{x^{2}y} = 0$$

$$-8x^{-2} + y^{-1} = 0$$

$$-xy^{-2} + 1 = 0$$

$$-\frac{8}{x^{2}} + \frac{1}{y} = 0$$

$$-\frac{x}{y^{2}} + 1 = 0$$

$$\frac{-8y + x^{2}}{x^{2}y} = 0$$

$$-8x^{-2} + y^{-1} = 0$$

$$-xy^{-2} + 1 = 0$$

$$-\frac{8}{x^{2}} + \frac{1}{y} = 0$$

$$-\frac{x}{y^{2}} + 1 = 0$$

$$\frac{-8y + x^{2}}{x^{2}y} = 0$$

$$\frac{-y^{2}}{y^{2}}$$

$$-8x^{-2} + y^{-1} = 0$$

$$-xy^{-2} + 1 = 0$$

$$-\frac{8}{x^{2}} + \frac{1}{y} = 0$$

$$-\frac{x}{y^{2}} + 1 = 0$$

$$\frac{-8y + x^{2}}{x^{2}y} = 0$$

$$\frac{-x}{y^{2}}$$

$$-8x^{-2} + y^{-1} = 0$$

$$-xy^{-2} + 1 = 0$$

$$-\frac{8}{x^{2}} + \frac{1}{y} = 0$$

$$-\frac{x}{y^{2}} + 1 = 0$$

$$\frac{-8y + x^{2}}{x^{2}y} = 0$$

$$\frac{-x + y^{2}}{y^{2}}$$

$$-8x^{-2} + y^{-1} = 0$$

$$-xy^{-2} + 1 = 0$$

$$-\frac{8}{x^{2}} + \frac{1}{y} = 0$$

$$-\frac{x}{y^{2}} + 1 = 0$$

$$\frac{-8y + x^{2}}{x^{2}y} = 0$$

$$\frac{-x + y^{2}}{y^{2}}$$

$$-8x^{-2} + y^{-1} = 0$$

$$-xy^{-2} + 1 = 0$$

$$-\frac{8}{x^2} + \frac{1}{y} = 0$$

$$-\frac{x}{y^2} + 1 = 0$$

$$\frac{-8y + x^2}{x^2y} = 0$$

$$\frac{-x + y^2}{y^2} = 0$$

$$-8x^{-2} + y^{-1} = 0$$

$$-xy^{-2} + 1 = 0$$

$$-\frac{8}{x^{2}} + \frac{1}{y} = 0$$

$$-\frac{x}{y^{2}} + 1 = 0$$

$$\frac{-8y + x^{2}}{x^{2}y} = 0$$

$$\frac{-x + y^{2}}{y^{2}} = 0$$

$$-8x^{-2} + y^{-1} = 0$$

$$-xy^{-2} + 1 = 0$$

$$-\frac{8}{x^{2}} + \frac{1}{y} = 0$$

$$-\frac{x}{y^{2}} + 1 = 0$$

$$\frac{-8y + x^{2}}{x^{2}y} = 0$$

$$\frac{-x + y^{2}}{y^{2}} = 0$$

$$-8y+x^2=0$$

$$-8x^{-2} + y^{-1} = 0$$

$$-xy^{-2} + 1 = 0$$

$$-\frac{8}{x^{2}} + \frac{1}{y} = 0$$

$$-\frac{x}{y^{2}} + 1 = 0$$

$$\frac{-8y + x^{2}}{x^{2}y} = 0$$

$$\frac{-x + y^{2}}{y^{2}} = 0$$

$$-8y + x^2 = 0$$
$$-x + y^2 = 0$$

$$-8x^{-2} + y^{-1} = 0$$

$$-xy^{-2} + 1 = 0$$

$$-\frac{8}{x^{2}} + \frac{1}{y} = 0$$

$$-\frac{x}{y^{2}} + 1 = 0$$

$$\frac{-8y + x^{2}}{x^{2}y} = 0$$

$$\frac{-x + y^{2}}{y^{2}} = 0$$

$$-8y + x^2 = 0$$
$$-x + y^2 = 0$$

$$-8x^{-2} + y^{-1} = 0$$

$$-xy^{-2} + 1 = 0$$

$$-\frac{8}{x^{2}} + \frac{1}{y} = 0$$

$$-\frac{x}{y^{2}} + 1 = 0$$

$$\frac{-8y + x^{2}}{x^{2}y} = 0$$

$$\frac{-x + y^{2}}{y^{2}} = 0$$

$$-8y + x^2 = 0$$
$$-x + y^2 = 0$$

$$-8x^{-2} + y^{-1} = 0$$

$$-xy^{-2} + 1 = 0$$

$$-\frac{8}{x^{2}} + \frac{1}{y} = 0$$

$$-\frac{x}{y^{2}} + 1 = 0$$

$$\frac{-8y + x^{2}}{x^{2}y} = 0$$

$$\frac{-x + y^{2}}{y^{2}} = 0$$

$$-8y + x^2 = 0$$

$$-x + y^2 = 0$$

$$x = y^2$$

$$-8x^{-2} + y^{-1} = 0$$

$$-xy^{-2} + 1 = 0$$

$$-\frac{8}{x^{2}} + \frac{1}{y} = 0$$

$$-\frac{x}{y^{2}} + 1 = 0$$

$$-\frac{8y + x^{2}}{x^{2}y} = 0$$

$$\frac{-x + y^{2}}{y^{2}} = 0$$

$$-8y + x^2 = 0$$

$$-x + y^2 = 0$$

$$x = y^2$$

$$-8x^{-2} + y^{-1} = 0$$

$$-xy^{-2} + 1 = 0$$

$$-\frac{8}{x^{2}} + \frac{1}{y} = 0$$

$$-\frac{x}{y^{2}} + 1 = 0$$

$$\frac{-8y + x^{2}}{x^{2}y} = 0$$

$$\frac{-x + y^{2}}{y^{2}} = 0$$

$$-8y + x^2 = 0$$

$$-x + y^2 = 0$$

$$x = y^2$$

$$-8y + (y^2)^2 = 0$$
$$-8y + y^4 = 0$$

$$-8x^{-2} + y^{-1} = 0$$

$$-xy^{-2} + 1 = 0$$

$$-\frac{8}{x^{2}} + \frac{1}{y} = 0$$

$$-\frac{x}{y^{2}} + 1 = 0$$

$$\frac{-8y + x^{2}}{x^{2}y} = 0$$

$$\frac{-x + y^{2}}{y^{2}} = 0$$

$$-8y + x^{2} = 0$$

$$-x + y^{2} = 0$$

$$-8y + (y^{2})^{2} = 0$$

$$-8y + y^{4} = 0$$

$$y(y^{3} - 8) = 0$$

$$-8x^{-2} + y^{-1} = 0
-xy^{-2} + 1 = 0$$

$$-\frac{8}{x^{2}} + \frac{1}{y} = 0$$

$$-\frac{x}{y^{2}} + 1 = 0$$

$$-8y + x^{2} = 0$$

$$-8y + (y^{2})^{2} = 0$$

$$-8y + (y^{2})^{2} = 0$$

$$-8y + y^{4} = 0$$

$$-8y + y^{4} = 0$$

$$y(y^{3} - 8) = 0$$

$$-x + y^{2}$$

$$y = 0$$

 $x = y^2$

$$-8x^{-2} + y^{-1} = 0$$

$$-xy^{-2} + 1 = 0$$

$$-\frac{8}{x^{2}} + \frac{1}{y} = 0$$

$$-\frac{x}{y^{2}} + 1 = 0$$

$$-8y + x^{2} = 0$$

$$-x + y^{2} = 0$$

$$-8y + (y^{2})^{2} = 0$$

$$-8y + y^{4} = 0$$

$$-8y + y^{4} = 0$$

$$y(y^{3} - 8) = 0$$

$$-x + y^{2}$$

$$y = 0$$

$$y^{3} - 8 = 0$$

$$-8x^{-2} + y^{-1} = 0
-xy^{-2} + 1 = 0$$

$$-\frac{8}{x^2} + \frac{1}{y} = 0$$

$$-\frac{x}{y^2} + 1 = 0$$

$$-8y + x^2 = 0$$

$$-x + y^2 = 0$$

$$-8y + (y^2)^2 = 0$$

$$-8y + y^4 = 0$$

$$-8y + y^4 = 0$$

$$y(y^3 - 8) = 0$$

$$-x + y^2$$

$$y^3 - 8 = 0$$
nije u domeni

$$-8x^{-2} + y^{-1} = 0$$

$$-xy^{-2} + 1 = 0$$

$$-\frac{8}{x^2} + \frac{1}{y} = 0$$

$$-\frac{x}{y^2} + 1 = 0$$

$$-8y + x^2 = 0$$

$$-x + y^2 = 0$$

$$-8y + (y^2)^2 = 0$$

$$-8y + (y^2)^2 = 0$$

$$-8y + y^4 = 0$$

$$y(y^3 - 8) = 0$$

$$-x + y^2$$

$$y^2 - 8 = 0$$
nije u domeni
$$y = 2$$

$$-8x^{-2} + y^{-1} = 0$$

$$-xy^{-2} + 1 = 0$$

$$-\frac{8}{x^2} + \frac{1}{y} = 0$$

$$-\frac{x}{y^2} + 1 = 0$$

$$-8y + x^2 = 0$$

$$-x + y^2 = 0$$

$$-8y + (y^2)^2 = 0$$

$$-8y + y^4 = 0$$

$$-8y + y^4 = 0$$

$$y(y^3 - 8) = 0$$

$$-x + y^2$$

$$y = 0$$
nije u domeni
$$y = 2$$

$$-8x^{-2} + y^{-1} = 0$$

$$-xy^{-2} + 1 = 0$$

$$-\frac{8}{x^{2}} + \frac{1}{y} = 0$$

$$-\frac{x}{y^{2}} + 1 = 0$$

$$-8y + x^{2} = 0$$

$$-x + y^{2} = 0$$

$$-8y + (y^{2})^{2} = 0$$

$$-8y + y^{4} = 0$$

$$-8y + y^{4} = 0$$

$$y(y^{3} - 8) = 0$$

$$-x + y^{2}$$

$$y^{3} - 8 = 0$$
nije u domeni
$$y = 2$$

$$-8x^{-2} + y^{-1} = 0$$

$$-xy^{-2} + 1 = 0$$

$$-\frac{8}{x^{2}} + \frac{1}{y} = 0$$

$$-\frac{x}{y^{2}} + 1 = 0$$

$$-8y + x^{2} = 0$$

$$-x + y^{2} = 0$$

$$-8y + (y^{2})^{2} = 0$$

$$-8y + y^{4} = 0$$

$$-8y + y^{4} = 0$$

$$y(y^{3} - 8) = 0$$

$$-x + y^{2}$$

$$y^{3} - 8 = 0$$
nije u domeni
$$y = 2$$

$$-8x^{-2} + y^{-1} = 0$$

$$-xy^{-2} + 1 = 0$$

$$-\frac{8}{x^{2}} + \frac{1}{y} = 0$$

$$-\frac{x}{y^{2}} + 1 = 0$$

$$-8y + x^{2} = 0$$

$$-8y + y^{2} = 0$$

$$-8y + y^{2} = 0$$

$$-8y + y^{4} = 0$$

$$-8y + y^{4} = 0$$

$$y(y^{3} - 8) = 0$$

$$-x + y^{2}$$

$$y^{3} - 8 = 0$$
nije u domeni
$$y = 2$$

$$-8x^{-2} + y^{-1} = 0$$

$$-xy^{-2} + 1 = 0$$

$$-\frac{8}{x^{2}} + \frac{1}{y} = 0$$

$$-\frac{x}{y^{2}} + 1 = 0$$

$$-8y + x^{2} = 0$$

$$-8y + (y^{2})^{2} = 0$$

$$-8y + y^{4} = 0$$

$$-8y + y^{4} = 0$$

$$y(y^{3} - 8) = 0$$

$$-x + y^{2}$$

$$-x + y^{2}$$

$$y^{3} - 8 = 0$$
nije u domeni
$$y = 2$$

Stacionarna točka:

$$-8x^{-2} + y^{-1} = 0$$

$$-xy^{-2} + 1 = 0$$

$$-\frac{8}{x^{2}} + \frac{1}{y} = 0$$

$$-\frac{x}{y^{2}} + 1 = 0$$

$$-8y + x^{2} = 0$$

$$-8y + (y^{2})^{2} = 0$$

$$-8y + y^{4} = 0$$

$$-8y + y^{4} = 0$$

$$y(y^{3} - 8) = 0$$

$$-x + y^{2}$$

$$-x + y^{2}$$

$$y^{3} - 8 = 0$$
nije u domeni
$$y = 2$$

Stacionarna točka: (4,2)

 $z_{xx} =$

 $z_{xx} = -8$

$$z_{xx}=-8\cdot(-2)x^{-3}$$

 $z_{xx} = -8 \cdot (-2)x^{-3} = \frac{16}{x^3}$

 $z_{xx} = -8 \cdot (-2)x^{-3} = \frac{16}{x^3}$

 $z_{xx} = -8 \cdot (-2)x^{-3} = \frac{16}{x^3}$

 $z_{xy} = -1 \cdot y^{-2}$

 $z_{xx} = -8 \cdot (-2)x^{-3} = \frac{16}{\sqrt{3}}$

 $z_{xy} = -1 \cdot y^{-2} = -\frac{1}{v^2}$

 $z_{yy} = -x \cdot (-2)y^{-3}$

 $z_x = -8x^{-2} + y^{-1}$

 $z_{xx} = -8 \cdot (-2)x^{-3} = \frac{16}{x^3}$

 $z_{yy} = -x \cdot (-2)y^{-3} = \frac{2x}{y^3}$

 $z_y = -xy^{-2} + 1$

 $z_x = -8x^{-2} + y^{-1}$

 $z_{xx} = -8 \cdot (-2)x^{-3} = \frac{16}{x^3}$

 $z_{yy} = -x \cdot (-2)y^{-3} = \frac{2x}{v^3}$

 $z_{xy} = -1 \cdot y^{-2} = -\frac{1}{v^2}$

 $H(x,y) = \begin{vmatrix} \frac{16}{x^3} & -\frac{1}{y^2} \\ -\frac{1}{v^2} & \frac{2x}{v^3} \end{vmatrix}$

$$z_{yy} = -x \cdot (-2)y^{-3} = \frac{2x}{y^3}$$

$$H(4,2) =$$

 $z_y = -xy^{-2} + 1$

 $z_{x} = -8x^{-2} + y^{-1}$

 $z_{xx} = -8 \cdot (-2)x^{-3} = \frac{16}{\sqrt{3}}$

 $z_{xy} = -1 \cdot y^{-2} = -\frac{1}{v^2}$

17/24

 $H(x,y) = \begin{vmatrix} \frac{16}{x^3} & -\frac{1}{y^2} \\ -\frac{1}{y^2} & \frac{2x}{y^3} \end{vmatrix}$

$$z_{yy} = -x \cdot (-2)y^{-3} = \frac{2x}{y^3}$$
 $H(4,2) =$

 $z_y = -xy^{-2} + 1$

 $z_x = -8x^{-2} + y^{-1}$

 $z_{xx} = -8 \cdot (-2)x^{-3} = \frac{16}{\sqrt{3}}$

 $z_{xy} = -1 \cdot y^{-2} = -\frac{1}{v^2}$

 $z = \frac{8}{x} + \frac{x}{y} + y$

 $H(x,y) = \begin{vmatrix} \frac{16}{x^3} & -\frac{1}{y^2} \\ -\frac{1}{y^2} & \frac{2x}{y^3} \end{vmatrix}$

$$z_{yy} = -x \cdot (-2)y^{-3} = \frac{2x}{y^3}$$

$$H(4,2) = \begin{vmatrix} \frac{1}{4} & -\frac{1}{4} \\ -\frac{1}{4} & 1 \end{vmatrix}$$

 $z_{xx} = -8 \cdot (-2)x^{-3} = \frac{16}{x^3}$

 $z_{xy} = -1 \cdot y^{-2} = -\frac{1}{v^2}$

 $z = \frac{8}{x} + \frac{x}{v} + y$

 $H(x,y) = \begin{vmatrix} \frac{16}{x^3} & -\frac{1}{y^2} \\ -\frac{1}{v^2} & \frac{2x}{y^3} \end{vmatrix}$

$$z_{yy} = -x \cdot (-2)y^{-3} = \frac{2x}{y^3}$$

$$H(4,2) = \begin{vmatrix} \frac{1}{4} & -\frac{1}{4} \\ -\frac{1}{4} & 1 \end{vmatrix} = \frac{1}{4} - \frac{1}{16}$$

 $z_{xx} = -8 \cdot (-2)x^{-3} = \frac{16}{3}$

 $z_{xy} = -1 \cdot y^{-2} = -\frac{1}{v^2}$

17/24

 $z = \frac{8}{x} + \frac{x}{v} + y$

 $H(x,y) = \begin{vmatrix} \frac{16}{x^3} & -\frac{1}{y^2} \\ -\frac{1}{y^2} & \frac{2x}{y^3} \end{vmatrix}$

$$H(4,2) = \begin{vmatrix} \frac{1}{4} & -\frac{1}{4} \\ -\frac{1}{4} & 1 \end{vmatrix} = \frac{1}{4} - \frac{1}{16} = \frac{3}{16}$$

 $z_{xx} = -8 \cdot (-2)x^{-3} = \frac{16}{3}$

 $z_{xy} = -1 \cdot y^{-2} = -\frac{1}{v^2}$

 $z_{yy} = -x \cdot (-2)y^{-3} = \frac{2x}{x^3}$

17/24

 $z = \frac{8}{x} + \frac{x}{v} + y$

 $H(x,y) = \begin{vmatrix} \frac{16}{x^3} & -\frac{1}{y^2} \\ -\frac{1}{v^2} & \frac{2x}{v^3} \end{vmatrix}$

$$z_{yy} = -x \cdot (-2)y^{-3} = \frac{2x}{y^3}$$

$$H(4,2) = \begin{vmatrix} \frac{1}{4} & -\frac{1}{4} \\ -\frac{1}{4} & 1 \end{vmatrix} = \frac{1}{4} - \frac{1}{16} = \frac{3}{16} > 0$$

 $z_{xx} = -8 \cdot (-2)x^{-3} = \frac{16}{.3}$

 $z_{xy} = -1 \cdot y^{-2} = -\frac{1}{v^2}$

 $z = \frac{8}{x} + \frac{x}{y} + y$

 $H(x,y) = \begin{vmatrix} \frac{16}{x^3} & -\frac{1}{y^2} \\ -\frac{1}{v^2} & \frac{2x}{y^3} \end{vmatrix}$

$$H(4,2) = \begin{vmatrix} \frac{1}{4} & 0 \\ -\frac{1}{4} & 1 \end{vmatrix} = \frac{1}{4} - \frac{1}{16} = \frac{3}{16} > 0$$

 $z_x = -8x^{-2} + y^{-1} \mid z_y = -xy^{-2} + 1$

 $z_{xx} = -8 \cdot (-2)x^{-3} = \frac{16}{3}$

 $z_{xy} = -1 \cdot y^{-2} = -\frac{1}{2}$

 $z_{yy} = -x \cdot (-2)y^{-3} = \frac{2x}{x^3}$

17/24

 $z = \frac{8}{x} + \frac{x}{v} + y$

 $H(x,y) = \begin{vmatrix} \frac{16}{x^3} & -\frac{1}{y^2} \\ -\frac{1}{v^2} & \frac{2x}{y^3} \end{vmatrix}$

$$z_{yy} = -x \cdot (-2)y^{-3} = \frac{2x}{y^3}$$

$$H(4,2) = \begin{vmatrix} \frac{1}{4} & -\frac{1}{4} \\ -\frac{1}{4} & 1 \end{vmatrix} = \frac{1}{4} - \frac{1}{16} = \frac{3}{16} > 0 \longrightarrow \text{točka lokalnog minimuma}$$

 $z_x = -8x^{-2} + y^{-1} \mid z_y = -xy^{-2} + 1$

 $z_{xx} = -8 \cdot (-2)x^{-3} = \frac{16}{3}$

 $z_{xy} = -1 \cdot y^{-2} = -\frac{1}{v^2}$

 $z = \frac{8}{x} + \frac{x}{v} + y$

 $H(x,y) = \begin{vmatrix} \frac{16}{x^3} & -\frac{1}{y^2} \\ -\frac{1}{x^2} & \frac{2x}{x^3} \end{vmatrix}$

$$z_{xx} = -8 \cdot (-2)x^{-3} = \frac{1}{x^{3}}$$

$$z_{xy} = -1 \cdot y^{-2} = -\frac{1}{y^{2}}$$

$$H(x,y) = \begin{vmatrix} \frac{16}{x^{3}} & -\frac{1}{y^{2}} \\ -\frac{1}{y^{2}} & \frac{2x}{y^{3}} \end{vmatrix}$$

$$z_{yy} = -x \cdot (-2)y^{-3} = \frac{2x}{y^{3}}$$

$$H(4,2) = \begin{vmatrix} \frac{1}{4} & -\frac{1}{4} \\ -\frac{1}{4} & 1 \end{vmatrix} = \frac{1}{4} - \frac{1}{16} = \frac{3}{16} > 0 \longrightarrow \text{točka lokalnog minimuma}$$

z(4,2) =

 $z = \frac{8}{x} + \frac{x}{v} + y$

17/24

 $z_x = -8x^{-2} + y^{-1} \mid z_y = -xy^{-2} + 1$

 $z_{xx} = -8 \cdot (-2)x^{-3} = \frac{16}{3}$

$$z_{xx} = -8 \cdot (-2)x^{-3} = \frac{1}{x^{3}}$$

$$z_{xy} = -1 \cdot y^{-2} = -\frac{1}{y^{2}}$$

$$z_{yy} = -x \cdot (-2)y^{-3} = \frac{2x}{y^{3}}$$

$$H(x,y) = \begin{vmatrix} \frac{16}{x^{3}} & -\frac{1}{y^{2}} \\ -\frac{1}{y^{2}} & \frac{2x}{y^{3}} \end{vmatrix}$$

$$H(4,2) = \begin{vmatrix} \frac{1}{4} & -\frac{1}{4} \\ -\frac{1}{4} & 1 \end{vmatrix} = \frac{1}{4} - \frac{1}{16} = \frac{3}{16} > 0 \longrightarrow \text{točka lokalnog minimuma}$$

z(4,2) =

 $z = \frac{8}{x} + \frac{x}{v} + y$

17/24

 $z_x = -8x^{-2} + y^{-1} \mid z_y = -xy^{-2} + 1$

 $z_{xx} = -8 \cdot (-2)x^{-3} = \frac{16}{3}$

$$z_{xx} = -8 \cdot (-2)x^{-3} = \frac{16}{x^3}$$

$$z_{xy} = -1 \cdot y^{-2} = -\frac{1}{y^2}$$

$$z_{yy} = -x \cdot (-2)y^{-3} = \frac{2x}{y^3}$$

$$H(x,y) = \begin{vmatrix} \frac{16}{x^3} & -\frac{1}{y^2} \\ -\frac{1}{y^2} & \frac{2x}{y^3} \end{vmatrix}$$

$$H(x,y) = \begin{vmatrix} \frac{1}{4} & \frac{1}{4} & \frac{1}{4} \\ -\frac{1}{4} & \frac{1}{4} & \frac{1}{4} \end{vmatrix} = \frac{1}{4} - \frac{1}{16} = \frac{3}{16} > 0 \longrightarrow \text{točka lokalnog minimuma}$$

 $z(4,2) = \frac{8}{4} + \frac{4}{2} + 2$

 $z = \frac{8}{x} + \frac{x}{v} + y$

17/24

 $z_x = -8x^{-2} + y^{-1} \mid z_y = -xy^{-2} + 1$

$$z_{xx} = -8 \cdot (-2)x^{-3} = \frac{16}{x^3}$$

$$z_{xy} = -1 \cdot y^{-2} = -\frac{1}{y^2}$$

$$z_{yy} = -x \cdot (-2)y^{-3} = \frac{2x}{y^3}$$

$$H(x,y) = \begin{vmatrix} \frac{16}{x^3} & -\frac{1}{y^2} \\ -\frac{1}{y^2} & \frac{2x}{y^3} \end{vmatrix}$$

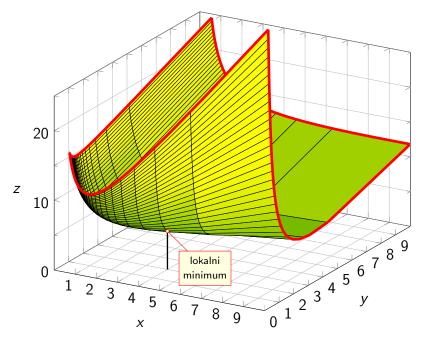
$$H(x,y) = \begin{vmatrix} \frac{1}{4} & -\frac{1}{4} \\ -\frac{1}{4} & 1 \end{vmatrix} = \frac{1}{4} - \frac{1}{16} = \frac{3}{16} > 0 \longrightarrow \text{točka lokalnog minimuma}$$

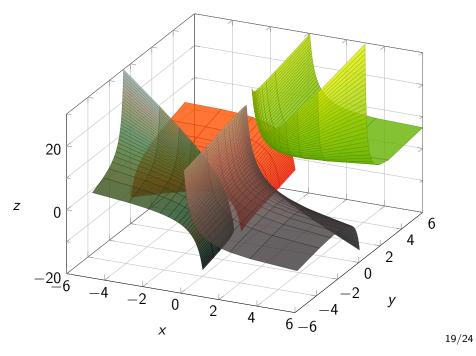
 $z(4,2) = \frac{8}{4} + \frac{4}{2} + 2 = 6$

 $z = \frac{8}{x} + \frac{x}{v} + y$

17/24

 $z_x = -8x^{-2} + y^{-1} \mid z_y = -xy^{-2} + 1$





deveti zadatak

Odredite ekstreme funkcije $z(x, y) = e^{xy}$ uz uvjet x + y = 4.

Odredite ekstreme funkcije $z(x, y) = e^{xy}$ uz uvjet x + y = 4.

Rješenje

x + y = 4

Odredite ekstreme funkcije $z(x, y) = e^{xy}$ uz uvjet x + y = 4.

$$x + y = 4 \implies y = 4 - x$$

Odredite ekstreme funkcije $z(x, y) = e^{xy}$ uz uvjet x + y = 4.

$$x + y = 4 \implies y = 4 - x$$

Odredite ekstreme funkcije $z(x,y) = e^{xy}$ uz uvjet x + y = 4.

$$x + y = 4 \implies y = 4 - x$$

$$z(x,4-x)=$$

Odredite ekstreme funkcije $z(x,y) = e^{xy}$ uz uvjet x + y = 4.

$$x + y = 4 \implies y = 4 - x$$

$$z(x,4-x)=e^{x\cdot(4-x)}$$

Odredite ekstreme funkcije $z(x, y) = e^{xy}$ uz uvjet x + y = 4.

$$x + y = 4 \implies y = 4 - x$$

$$z(x, 4-x) = e^{x\cdot(4-x)} = e^{4x-x^2}$$

Odredite ekstreme funkcije $z(x, y) = e^{xy}$ uz uvjet x + y = 4.

$$x + y = 4 \implies y = 4 - x$$

$$z(x, 4-x) = e^{x\cdot(4-x)} = e^{4x-x^2} \longrightarrow f(x) = e^{4x-x^2}$$

Odredite ekstreme funkcije $z(x, y) = e^{xy}$ uz uvjet x + y = 4.

$$x + y = 4 \implies y = 4 - x$$

$$z(x, 4-x) = e^{x\cdot(4-x)} = e^{4x-x^2} \longrightarrow f(x) = e^{4x-x^2}$$

$$f'(x) =$$

Odredite ekstreme funkcije $z(x, y) = e^{xy}$ uz uvjet x + y = 4.

$$x + y = 4 \implies y = 4 - x$$

$$z(x, 4-x) = e^{x\cdot(4-x)} = e^{4x-x^2} \longrightarrow f(x) = e^{4x-x^2}$$

$$f'(x) = e^{4x - x^2}$$

Odredite ekstreme funkcije $z(x, y) = e^{xy}$ uz uvjet x + y = 4.

$$x + y = 4 \implies y = 4 - x$$

$$z(x, 4-x) = e^{x\cdot(4-x)} = e^{4x-x^2} \longrightarrow f(x) = e^{4x-x^2}$$

$$f'(x) = e^{4x - x^2} \cdot$$

Odredite ekstreme funkcije $z(x, y) = e^{xy}$ uz uvjet x + y = 4.

$$x + y = 4 \implies y = 4 - x$$

$$z(x, 4-x) = e^{x\cdot(4-x)} = e^{4x-x^2} \longrightarrow f(x) = e^{4x-x^2}$$

$$f'(x) = e^{4x-x^2} \cdot (4x - x^2)'$$

Odredite ekstreme funkcije $z(x, y) = e^{xy}$ uz uvjet x + y = 4.

$$x + y = 4 \implies y = 4 - x$$

$$z(x, 4-x) = e^{x\cdot(4-x)} = e^{4x-x^2} \longrightarrow f(x) = e^{4x-x^2}$$

$$f'(x) = e^{4x - x^2} \cdot (4x - x^2)' = (4 - 2x)e^{4x - x^2}$$

Odredite ekstreme funkcije $z(x, y) = e^{xy}$ uz uvjet x + y = 4.

$$x + y = 4 \implies y = 4 - x$$

$$z(x, 4-x) = e^{x\cdot(4-x)} = e^{4x-x^2} \longrightarrow f(x) = e^{4x-x^2}$$

$$f'(x) = e^{4x - x^2} \cdot (4x - x^2)' = (4 - 2x)e^{4x - x^2}$$
$$(4 - 2x)e^{4x - x^2} = 0$$

Odredite ekstreme funkcije $z(x, y) = e^{xy}$ uz uvjet x + y = 4.

$$x + y = 4 \implies y = 4 - x$$

$$z(x, 4-x) = e^{x\cdot(4-x)} = e^{4x-x^2} \longrightarrow f(x) = e^{4x-x^2}$$

$$f'(x) = e^{4x - x^2} \cdot (4x - x^2)' = (4 - 2x)e^{4x - x^2}$$
$$(4 - 2x)e^{4x - x^2} = 0$$
$$4 - 2x = 0$$

Odredite ekstreme funkcije $z(x, y) = e^{xy}$ uz uvjet x + y = 4.

Rješenje

$$x + y = 4 \implies y = 4 - x$$

$$z(x, 4-x) = e^{x\cdot(4-x)} = e^{4x-x^2} \longrightarrow f(x) = e^{4x-x^2}$$

$$(4-2x)e^{4x-x^2}=0$$

 $f'(x) = e^{4x-x^2} \cdot (4x - x^2)' = (4 - 2x)e^{4x-x^2}$

$$4-2x=0$$

Odredite ekstreme funkcije $z(x, y) = e^{xy}$ uz uvjet x + y = 4.

Rješenje
$$x + y =$$

$$x + y = 4 \implies y = 4 - x$$

$$z(x, 4-x) = e^{x \cdot (4-x)} = e^{4x-x^2} \longrightarrow f(x) = e^{4x-x^2}$$

$$(4-2x)e^{4x-x^2}=0$$

 $f'(x) = e^{4x-x^2} \cdot (4x - x^2)' = (4 - 2x)e^{4x-x^2}$

$$4-2x=0$$

$$x = 2$$

Odredite ekstreme funkcije $z(x,y) = e^{xy}$ uz uvjet x + y = 4.

$$x + y = 4 \implies y = 4 - x$$

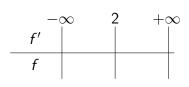
$$z(x, 4-x) = e^{x\cdot(4-x)} = e^{4x-x^2} \longrightarrow f(x) = e^{4x-x^2}$$

$$f'(x) = e^{4x - x^2} \cdot (4x - x^2)' = (4 - 2x)e^{4x - x^2}$$

$$(4-2x)e^{4x-x^2} = 0$$

$$4-2x=0$$

$$x = 2$$



Odredite ekstreme funkcije $z(x, y) = e^{xy}$ uz uvjet x + y = 4.

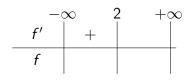
$$x + y = 4 \implies y = 4 - x$$

$$z(x, 4-x) = e^{x \cdot (4-x)} = e^{4x-x^2} \longrightarrow f(x) = e^{4x-x^2}$$

$$f'(x) = e^{4x - x^2} \cdot (4x - x^2)' = (4 - 2x)e^{4x - x^2}$$
$$(4 - 2x)e^{4x - x^2} = 0$$

$$4-2x=0$$

$$-2x=0$$
 $x=2$



Odredite ekstreme funkcije $z(x, y) = e^{xy}$ uz uvjet x + y = 4.

$$x + y = 4 \implies y = 4 - x$$

$$z(x, 4-x) = e^{x\cdot(4-x)} = e^{4x-x^2} \longrightarrow f(x) = e^{4x-x^2}$$

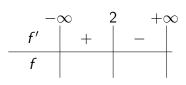
$$f'(x) = e^{4x - x^2} \cdot (4x - x^2)' = (4 - 2x)e^{4x - x^2}$$
$$(4 - 2x)e^{4x - x^2} = 0$$

$$4 - 2x e = 0$$

 $4 - 2x = 0$

$$-2x=0$$

$$x = 2$$



Odredite ekstreme funkcije $z(x, y) = e^{xy}$ uz uvjet x + y = 4.

$$x + y = 4 \implies y = 4 - x$$

$$z(x, 4-x) = e^{x\cdot(4-x)} = e^{4x-x^2} \longrightarrow f(x) = e^{4x-x^2}$$

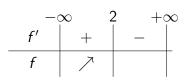
$$f'(x) = e^{4x - x^2} \cdot (4x - x^2)' = (4 - 2x)e^{4x - x^2}$$
$$(4 - 2x)e^{4x - x^2} = 0$$

$$4 - 2x e = 0$$

 $4 - 2x = 0$

$$1-2x=0$$

$$x = 2$$



Odredite ekstreme funkcije $z(x, y) = e^{xy}$ uz uvjet x + y = 4.

$$x + y = 4 \implies y = 4 - x$$

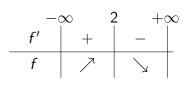
$$z(x, 4-x) = e^{x\cdot(4-x)} = e^{4x-x^2} \longrightarrow f(x) = e^{4x-x^2}$$

$$f'(x) = e^{4x - x^2} \cdot (4x - x^2)' = (4 - 2x)e^{4x - x^2}$$

$$(4-2x)e^{4x-x^2}=0$$

$$4 - 2x = 0$$

$$x = 2$$



Odredite ekstreme funkcije $z(x,y) = e^{xy}$ uz uvjet x + y = 4.

Rješenje

$$x + y = 4 \implies y = 4 - x$$

$$z(x, 4-x) = e^{x\cdot(4-x)} = e^{4x-x^2} \longrightarrow f(x) = e^{4x-x^2}$$

$$f'(x) = e^{4x - x^2} \cdot (4x - x^2)' = (4 - 2x)e^{4x - x^2}$$
$$(4 - 2x)e^{4x - x^2} = 0$$
$$4 - 2x = 0$$
$$f'$$

x = 2

globalni maksimum

Odredite ekstreme funkcije $z(x, y) = e^{xy}$ uz uvjet x + y = 4.

$$x + y = 4 \implies y = 4 - x$$

$$-(\cdot, A, \cdot, \cdot)$$
 $-x \cdot (4-x)$ $-4x-x^2$

$$z(x, 4-x) = e^{x\cdot(4-x)} = e^{4x-x^2} \longrightarrow f(x) = e^{4x-x^2}$$

$$f'(x) = e^{4x-x^2} \cdot (4x-x^2)' = (4-2x)e^{4x-x^2}$$

$$(4-2x)e^{4x-x^2} = 0$$

$$4 - 2x = 0$$

$$x = 2$$

$$f'$$
 +

$$\begin{array}{c|c} 2 & +\infty \\ \hline & - & \\ \hline \end{array}$$

globalni maksimum

 $f(2) = e^4$

Odredite ekstreme funkcije $z(x, y) = e^{xy}$ uz uvjet x + y = 4.

$$x + y = 4 \implies y = 4 - x$$

(A)
$$y : (A - y) = Ay - y$$

$$z(x, 4-x) = e^{x \cdot (4-x)} = e^{4x-x^2} \longrightarrow f(x) = e^{4x-x^2}$$

$$(x 4 - x) = e^{x \cdot (4 - x)} = e^{4x - x}$$

$$f'(x) = e^{4x - x^2} \cdot (4x - x^2)' = (4 - 2x)e^{4x - x^2}$$
$$(4 - 2x)e^{4x - x^2} = 0$$

x = 2

$$(-2x)e^{4x-x^2} = 0$$
$$4 - 2x = 0$$

$$y = 4 - x$$

 $f(2) = e^4$

globalni maksimum

Odredite ekstreme funkcije $z(x, y) = e^{xy}$ uz uvjet x + y = 4.

$$x + y = 4 \implies y = 4 - x$$

$$z(x \ 4-x) = e^{x \cdot (4-x)} = e^{4x-x^2} - \frac{1}{2}$$

$$z(x, 4-x) = e^{x\cdot(4-x)} = e^{4x-x^2} \longrightarrow f(x) = e^{4x-x^2}$$

$$f'(x) = e^{4x - x^2} \cdot (4x - x^2)' = (4 - 2x)e^{4x - x^2}$$

$$(4 - 2x)e^{4x - x^2} = 0$$
$$4 - 2x = 0$$

$$x = 2x = 0$$

$$f(x) = e^{4x - x^2}$$

$$-\infty$$
 2 $+\infty$ $+\infty$

globalni maksimum

$$v = 4 - x = 4 - 2 = 2$$

$$4 - 2 =$$

 $f(2) = e^4$

Odredite ekstreme funkcije $z(x, y) = e^{xy}$ uz uvjet x + y = 4.

Riešenie

$$x + y = 4 \implies y = 4 - x$$

$$x + y = 4 \qquad y = 4 - x$$

$$z(x, 4-x) = e^{x \cdot (4-x)} = e^{4x-x^2} \longrightarrow f(x) = e^{4x-x^2}$$

$$6^{4x-x^2}$$

$$\longrightarrow f(x) = e^{4x-}$$

$$f'(x) = e^{4x - x^2} \cdot (4x - x^2)' = (4 - 2x)e^{4x - x^2}$$
$$(4 - 2x)e^{4x - x^2} = 0$$

x = 2

$$= 0$$

$$-2x)e^{4x-x^{2}} = 0$$
$$4 - 2x = 0$$

globalni maksimum

 $f(2) = e^4$

$$y = 4 - x = 4 - 2 = 2$$

Odredite ekstreme funkcije $z(x, y) = e^{xy}$ uz uvjet x + y = 4.

Riešenie

$$x + y = 4 \implies y = 4 - x$$

$$z(x \land -x) = e^{x \cdot (4-x)} = e^{4x-x}$$

$$z(x, 4-x) = e^{x \cdot (4-x)} = e^{4x-x^2} \longrightarrow f(x) = e^{4x-x^2}$$

$$f'(x) = e^{4x - x^2} \cdot (4x - x^2)' = (4 - 2x)e^{4x - x^2}$$
$$(4 - 2x)e^{4x - x^2} = 0$$

x = 2

$$4 - 2x = 0$$

$$y = 4 - x = 4 - 2 = 2$$

$$f(2) = e^4$$
 globalni maksimum

stacionarna točka:

Odredite ekstreme funkcije $z(x, y) = e^{xy}$ uz uvjet x + y = 4.

$$x + y = 4 \implies y = 4 - x$$

$$4x-x^2$$

$$z(x, 4-x) = e^{x\cdot(4-x)} = e^{4x-x^2} \longrightarrow f(x) = e^{4x-x^2}$$

$$z(x,4-x)=e^{x(x-x)}=e^{x(x-x)}$$

$$f'(x) = e^{4x - x^2} \cdot (4x - x^2)' = (4 - 2x)e^{4x - x^2}$$
$$(4 - 2x)e^{4x - x^2} = 0$$

$$\begin{array}{c|cccc}
 & 2 & +\infty \\
 & + & - & \\
\hline
 & \nearrow & \searrow
\end{array}$$

globalni maksimum

$$4-2x=0$$

$$-2x = 0$$
 $x = 2$

stacionarna točka: (2,2)

$$y = 4 - x = 4 - 2 = 2$$

 $f(2) = e^4$

$$- 2 =$$

Odredite ekstreme funkcije $z(x, y) = e^{xy}$ uz uvjet x + y = 4.

$$x + y = 4 \implies y = 4 - x$$

$$x + y - 4 \longrightarrow y - 4$$

$$e^{x \cdot (4-x)} = e^{4x-x^2}$$

4 - 2x = 0x = 2

$$4x-x^2$$

$$z(x, 4-x) = e^{x\cdot(4-x)} = e^{4x-x^2} \longrightarrow f(x) = e^{4x-x^2}$$

$$f'(x) = e^{4x-x^2} \cdot (4x - x^2)' = (4 - 2x)e^{4x-x^2}$$

$$(4-2x)e^{4x-x^2}=0$$

stacionarna točka: (2,2)

globalni maksimum

 $f(2) = e^4$

$$y = 4 - x = 4 - 2 = 2$$

Funkcija z postiže globalni maksimum uz uvjet x + y = 4 u točki (2,2)

 $x + y = 4 \implies y = 4 - x$

Riešenje

Odredite ekstreme funkcije $z(x, y) = e^{xy}$ uz uvjet x + y = 4.

 $z(x, 4-x) = e^{x\cdot(4-x)} = e^{4x-x^2} \longrightarrow f(x) = e^{4x-x^2}$

$$f'(x) = e^{4x-x^2} \cdot (4x-x^2)' = (4-2x)e^{4x-x^2} \qquad \text{globalni maksimum}$$

$$(4-2x)e^{4x-x^2} = 0 \qquad -\infty \qquad 2 \qquad +\infty$$

$$4-2x = 0 \qquad \qquad f' \qquad + \qquad -$$

$$x = 2 \qquad \qquad f \qquad \qquad x \qquad y$$

$$y = 4-x = 4-2 = 2 \qquad y = 2 \qquad \text{stacionarna točka: } (2,2)$$
Funkcija z postiže globalni maksimum uz uvjet $x+y=4$ u točki $(2,2)$ i taj maksimum je jednak

Rješenje

 $x + y = 4 \implies ||y = 4 - x||$

Odredite ekstreme funkcije $z(x,y) = e^{xy}$ uz uvjet x + y = 4.

 $z(x, 4-x) = e^{x\cdot(4-x)} = e^{4x-x^2} \longrightarrow f(x) = e^{4x-x^2}$

$$f'(x) = e^{4x-x^2} \cdot (4x-x^2)' = (4-2x)e^{4x-x^2} \qquad \text{globalni maksimum}$$

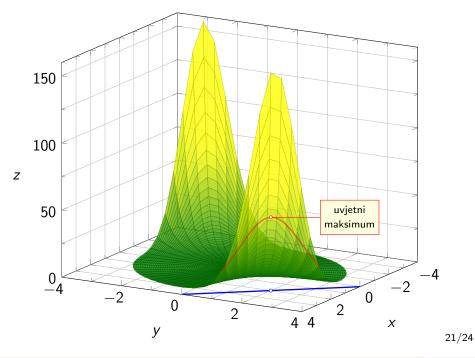
$$(4-2x)e^{4x-x^2} = 0 \qquad -\infty \qquad 2 \qquad +\infty$$

$$4-2x=0 \qquad \qquad f' \qquad + \qquad -$$

$$x=2 \qquad \qquad f \qquad \qquad x \qquad y$$

$$y=4-x=4-2=2 \qquad y=2 \qquad \text{stacionarna točka: } (2,2)$$
Funkcija z postiže globalni maksimum uz uvjet $x+y=4$ u točki $(2,2)$ i taj maksimum je jednak $z(2,2)=e^4$.

20/24



deseti zadatak

Odredite ekstreme funkcije f(x, y) = -x - y uz uvjet $x^2 + y^2 = 2$.

Odredite ekstreme funkcije f(x, y) = -x - y uz uvjet $x^2 + y^2 = 2$.

Rješenje

$$x^2 + y^2 = 2$$

Odredite ekstreme funkcije f(x,y) = -x - y uz uvjet $x^2 + y^2 = 2$.

Rješenje

$$x^2 + y^2 = 2 \longrightarrow x^2 + y^2 - 2 = 0$$

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

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

$$L(x, y, \lambda) = \text{funkcija} + \lambda \cdot \text{uvjet}$$

Odredite ekstreme funkcije f(x, y) = -x - y uz uvjet $x^2 + y^2 = 2$.

Rješenje

$$x^2 + y^2 = 2 \longrightarrow x^2 + y^2 - 2 = 0$$
 funkcija

• Lagrangeova funkcija

$$L(x, y, \lambda) = \text{funkcija} + \lambda \cdot \text{uvjet}$$

Odredite ekstreme funkcije f(x, y) = -x - y uz uvjet $x^2 + y^2 = 2$.

Rješenje

kjesenje
$$x^2 + y^2 = 2 \longrightarrow x^2 + y^2 - 2 = 0$$
• Lagrangeova funkcija

uvjet

 $L(x, y, \lambda) = \text{funkcija} + \lambda \cdot \text{uvjet}$

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

$$L(x, y, \lambda) = \text{funkcija} + \lambda \cdot \text{uvjet}$$

$$L(x, y, \lambda) = -x - y + \lambda (x^2 + y^2 - 2)$$

funkcija

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

$$L(x, y, \lambda) = ext{funkcija} + \lambda \cdot ext{uvjet}$$

$$L(x, y, \lambda) = -x - y + \lambda (x^2 + y^2 - 2)$$

Parcijalne derivacije Lagrangeove funkcije

$$L_x =$$

funkcija

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

$$L(x, y, \lambda) = \text{funkcija} + \lambda \cdot \text{uvjet}$$

$$L(x, y, \lambda) = -x - y + \lambda (x^2 + y^2 - 2)$$

Parcijalne derivacije Lagrangeove funkcije

$$L_{x} = -1 + 2\lambda x$$

funkcija

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

$$L(x,y,\lambda) = ext{funkcija} + \lambda \cdot ext{uvjet}$$
 $L(x,y,\lambda) = -x - y + \lambda \left(x^2 + y^2 - 2\right)$

Parcijalne derivacije Lagrangeove funkcije

$$L_x = -1 + 2\lambda x$$
$$L_y =$$

funkcija

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

$$L(x, y, \lambda) = ext{funkcija} + \lambda \cdot ext{uvjet}$$
 $L(x, y, \lambda) = -x - y + \lambda (x^2 + y^2 - 2)$

• Parcijalne derivacije Lagrangeove funkcije

$$L_{x} = -1 + 2\lambda x$$
$$L_{y} = -1 + 2\lambda y$$

funkcija

Odredite ekstreme funkcije f(x, y) = -x - y uz uvjet $x^2 + y^2 = 2$.

Rješenje

Kjesenje
$$x^2 + y^2 = 2 \longrightarrow x^2 + y^2 - 2 = 0$$
• Lagrangeova funkcija

uvjet

Lagrangeova funkcija

$$L(x, y, \lambda) = \text{funkcija} + \lambda \cdot \text{uvjet}$$

$$L(x, y, \lambda) = -x - y + \lambda (x^2 + y^2 - 2)$$

Parcijalne derivacije Lagrangeove funkcije

$$L_{x} = -1 + 2\lambda x$$

$$L_{y} = -1 + 2\lambda y$$

$$L_{\lambda} =$$

Odredite ekstreme funkcije f(x, y) = -x - y uz uvjet $x^2 + y^2 = 2$.

Rješenje

Specific

$$x^{2} + y^{2} = 2 \longrightarrow x^{2} + y^{2} - 2 = 0$$
• Lagrangeova funkcija uvjet

 $L(x, y, \lambda) = \text{funkcija} + \lambda \cdot \text{uvjet}$

$$L(x, y, \lambda) = -x - y + \lambda (x^2 + y^2 - 2)$$

Parcijalne derivacije Lagrangeove funkcije

$$L_x = -1 + 2\lambda x$$

$$L_y = -1 + 2\lambda y$$

$$L_\lambda = x^2 + y^2 - 2$$

Odredite ekstreme funkcije f(x, y) = -x - y uz uvjet $x^2 + y^2 = 2$.

Rješenje

$$x^{2} + y^{2} = 2 \longrightarrow x^{2} + y^{2} - 2 = 0$$
 funkcija

Lagrangeova funkcija

$$L(x, y, \lambda) = \text{funkcija} + \lambda \cdot \text{uvjet}$$

 $L(x, y, \lambda) = -x - y + \lambda(x^2 + y^2 - 2)$

uvjet

Parcijalne derivacije Lagrangeove funkcije

$$L_x = -1 + 2\lambda x$$
 $-1 + 2\lambda x = 0$
 $L_y = -1 + 2\lambda y$ $-1 + 2\lambda y = 0$
 $L_\lambda = x^2 + y^2 - 2$ $x^2 + y^2 - 2 = 0$

$$-1 + 2\lambda x = 0$$
$$-1 + 2\lambda y = 0$$
$$x^2 + y^2 - 2 = 0$$

$$-1 + 2\lambda x = 0 \longrightarrow 2\lambda x = 1$$

$$-1 + 2\lambda y = 0$$

$$x^{2} + y^{2} - 2 = 0$$

$$-1 + 2\lambda x = 0 \longrightarrow 2\lambda x = 1 \longrightarrow \lambda = \frac{1}{2x}$$

$$-1 + 2\lambda y = 0$$

$$x^{2} + y^{2} - 2 = 0$$

$$-1 + 2\lambda x = 0 \longrightarrow 2\lambda x = 1 \longrightarrow \lambda = \frac{1}{2x}$$

$$-1 + 2\lambda y = 0 \longrightarrow 2\lambda y = 1$$

$$x^{2} + y^{2} - 2 = 0$$

$$-1 + 2\lambda x = 0 \longrightarrow 2\lambda x = 1 \longrightarrow \lambda = \frac{1}{2x}$$

$$-1 + 2\lambda y = 0 \longrightarrow 2\lambda y = 1 \longrightarrow \lambda = \frac{1}{2y}$$

$$x^2 + y^2 - 2 = 0$$

 $\begin{vmatrix}
-1 + 2\lambda x = 0 & \longrightarrow & 2\lambda x = 1 & \longrightarrow \lambda = \frac{1}{2x} \\
-1 + 2\lambda y = 0 & \longrightarrow & 2\lambda y = 1 & \longrightarrow \lambda = \frac{1}{2y}
\end{vmatrix}
\Rightarrow \frac{1}{2x} = \frac{1}{2y}$

 $x^2 + y^2 - 2 = 0$

 $x^2 + y^2 - 2 = 0$

 $\begin{vmatrix}
-1 + 2\lambda x = 0 & \longrightarrow & 2\lambda x = 1 & \longrightarrow & \lambda = \frac{1}{2x} \\
-1 + 2\lambda y = 0 & \longrightarrow & 2\lambda y = 1 & \longrightarrow & \lambda = \frac{1}{2y}
\end{vmatrix} \implies \frac{1}{2x} = \frac{1}{2y}$ $\begin{vmatrix}
x = y
\end{vmatrix}$

 $x^2 + y^2 - 2 = 0$

$$\begin{array}{c}
-1 + 2\lambda x = 0 \longrightarrow 2\lambda x = 1 \\
-1 + 2\lambda y = 0 \longrightarrow 2\lambda y = 1 \\
x^2 + y^2 - 2 = 0
\end{array}$$

$$\lambda = \frac{1}{2x}$$

$$\lambda = \frac{1}{2y}$$

$$\lambda = \frac{1}{2y}$$

$$x = y$$

_

$$\begin{vmatrix}
-1 + 2\lambda x = 0 & \longrightarrow & 2\lambda x = 1 \\
-1 + 2\lambda y = 0 & \longrightarrow & 2\lambda y = 1 \\
x^2 + y^2 - 2 = 0 & \longleftarrow & \lambda = \frac{1}{2y}
\end{vmatrix} \Longrightarrow \frac{1}{2x} = \frac{1}{2y}$$

$$\begin{vmatrix}
x = y \\
x^2 + x^2 - 2 = 0
\end{vmatrix}$$

$$2x^2 = 2$$

$$\begin{vmatrix}
-1 + 2\lambda x = 0 & \longrightarrow & 2\lambda x = 1 \\
-1 + 2\lambda y = 0 & \longrightarrow & 2\lambda y = 1 \\
x^2 + y^2 - 2 = 0 & \longrightarrow & \lambda = \frac{1}{2y}
\end{vmatrix}
\Rightarrow \frac{1}{2x} = \frac{1}{2y}$$

$$\begin{vmatrix}
x^2 + x^2 - 2 = 0 \\
x^2 + x^2 - 2 = 0
\end{vmatrix}$$

$$+x^2 - 2 = 2$$
$$2x^2 = 2$$
$$x^2 = 1$$

$$\begin{vmatrix}
-1+2\lambda x = 0 & \longrightarrow 2\lambda x = 1 & \longrightarrow \lambda = \frac{1}{2x} \\
-1+2\lambda y = 0 & \longrightarrow 2\lambda y = 1 & \longrightarrow \lambda = \frac{1}{2y}
\end{vmatrix} \Longrightarrow \frac{1}{2x} = \frac{1}{2y}$$

$$x^{2}+y^{2}-2=0$$

$$x^{2}+x^{2}-2=0$$

$$x^{2} + x^{2} - 2 = 0$$

$$2x^{2} = 2$$

$$x^{2} = 1$$

$$x_{1} = 1, \quad x_{2} = -1$$

23/24

$$\begin{vmatrix}
-1 + 2\lambda x = 0 & \longrightarrow & 2\lambda x = 1 & \longrightarrow & \lambda = \frac{1}{2x} \\
-1 + 2\lambda y = 0 & \longrightarrow & 2\lambda y = 1 & \longrightarrow & \lambda = \frac{1}{2y}
\end{vmatrix} \Longrightarrow \frac{1}{2x} = \frac{1}{2y}$$

$$\begin{vmatrix}
x^2 + y^2 - 2 = 0 & \longleftarrow & x = y
\end{vmatrix}$$

$$x^{2} + x^{2} - 2 = 0$$

$$2x^{2} = 2$$

$$x^{2} = 1$$

$$x_{1} = 1, \quad x_{2} = -1$$

$$y_{1} = 1, \quad y_{2} = -1$$

$$x^2 = 1$$
 $x_1 = 1, \quad x_2 = -1$
 $y_1 = 1, \quad y_2 = -1$

 $2x^2 = 2$

$$\begin{vmatrix}
-1 + 2\lambda x = 0 & \longrightarrow & 2\lambda x = 1 & \longrightarrow & \lambda = \frac{1}{2x} \\
-1 + 2\lambda y = 0 & \longrightarrow & 2\lambda y = 1 & \longrightarrow & \lambda = \frac{1}{2y}
\end{vmatrix} \Longrightarrow \frac{1}{2x} = \frac{1}{2y}$$

$$x^{2} + y^{2} - 2 = 0$$

$$x^{2} + x^{2} - 2 = 0$$

$$x^{2} + x^{2} - 2 = 0$$
 $2x^{2} = 2$
 $x^{2} = 1$
 $x_{1} \quad y_{1} \quad x_{2} \quad y_{2}$
 $x_{1} = 1, \quad x_{2} = -1$
Stacionarne točke: $(1, 1), (-1, -1)$

 $y_1 = 1, \quad y_2 = -1$

23/24

$$\begin{vmatrix}
-1+2\lambda x = 0 & \longrightarrow & 2\lambda x = 1 & \longrightarrow & \lambda = \frac{1}{2x} \\
-1+2\lambda y = 0 & \longrightarrow & 2\lambda y = 1 & \longrightarrow & \lambda = \frac{1}{2y}
\end{vmatrix}
\Rightarrow \frac{1}{2x} = \frac{1}{2y}$$

$$x^{2} + x^{2} - 2 = 0$$

$$x^{2} + x^{2} - 2 = 0$$

$$2x^{2} = 2$$

$$x^{2} = 1$$

$$x_{1} = 1, \quad x_{2} = -1$$

$$y_{1} = 1, \quad y_{2} = -1$$

$$x_{1} = 1, \quad x_{2} = -1$$

$$f(x, y) = -x - y$$

$$\begin{vmatrix}
-1+2\lambda x = 0 & \longrightarrow 2\lambda x = 1 & \longrightarrow \lambda = \frac{1}{2x} \\
-1+2\lambda y = 0 & \longrightarrow 2\lambda y = 1 & \longrightarrow \lambda = \frac{1}{2y}
\end{vmatrix}
\Rightarrow \frac{1}{2x} = \frac{1}{2y}$$

$$x^{2} + y^{2} - 2 = 0$$

$$x^{2} + x^{2} - 2 = 0$$

$$2x^{2} = 2$$

$$x^{2} = 1$$

$$x_{1} = 1, \quad x_{2} = -1$$

$$y_{1} = 1, \quad y_{2} = -1$$

$$f(x, y) = -x - y$$

$$f(1,1) =$$

$$\begin{vmatrix}
-1+2\lambda x = 0 & \longrightarrow & 2\lambda x = 1 & \longrightarrow & \lambda = \frac{1}{2x} \\
-1+2\lambda y = 0 & \longrightarrow & 2\lambda y = 1 & \longrightarrow & \lambda = \frac{1}{2y}
\end{vmatrix}
\Rightarrow \frac{1}{2x} = \frac{1}{2y}$$

$$x^{2} + x^{2} - 2 = 0$$

$$x^{2} + x^{2} - 2 = 0$$

$$2x^{2} = 2$$

$$x^{2} = 1$$

$$x_{1} = 1, \quad x_{2} = -1$$

$$y_{1} = 1, \quad y_{2} = -1$$

$$x_{1} = 1, \quad y_{2} = -1$$

$$f(x, y) = -x - y$$

$$f(1,1) = -1 - 1 = -2$$

$$\begin{vmatrix}
-1+2\lambda x = 0 & \longrightarrow & 2\lambda x = 1 & \longrightarrow & \lambda = \frac{1}{2x} \\
-1+2\lambda y = 0 & \longrightarrow & 2\lambda y = 1 & \longrightarrow & \lambda = \frac{1}{2y}
\end{vmatrix}
\Rightarrow \frac{1}{2x} = \frac{1}{2y}$$

$$x^{2} + x^{2} - 2 = 0$$

$$x^{2} + x^{2} - 2 = 0$$

$$2x^{2} = 2$$

$$x^{2} = 1$$
Stacionarne točke: $(1, 1), (-1, -1)$

$$x_{1} = 1, \quad x_{2} = -1$$

$$f(x, y) = -x - y$$

$$f(1,1) = -1 - 1 = -2$$
$$f(-1,-1) =$$

$$\begin{vmatrix}
-1+2\lambda x = 0 & \longrightarrow 2\lambda x = 1 \\
-1+2\lambda y = 0 & \longrightarrow 2\lambda y = 1
\end{vmatrix}$$

$$\begin{vmatrix}
\lambda = \frac{1}{2x} \\
\frac{1}{2x} = \frac{1}{2y}
\end{vmatrix}$$

$$\begin{vmatrix}
x^2 + x^2 - 2 = 0 \\
2x^2 = 2
\end{vmatrix}$$

$$\begin{vmatrix}
x^2 + x^2 - 2 = 0 \\
2x^2 = 1
\end{vmatrix}$$
Stacionarne točke: $(1, 1), (-1, -1)$

$$x_1 = 1, \quad x_2 = -1$$

$$\begin{vmatrix}
f(x, y) = -x - y
\end{vmatrix}$$

$$f(1,1) = -1 - 1 = -2$$

 $f(-1,-1) = -(-1) - (-1) = 2$

$$\begin{array}{c}
-1 + 2\lambda x = 0 \longrightarrow 2\lambda x = 1 \longrightarrow \lambda = \frac{1}{2x} \\
-1 + 2\lambda y = 0 \longrightarrow 2\lambda y = 1 \longrightarrow \lambda = \frac{1}{2y}
\end{array}$$

$$\begin{array}{c}
x^2 + y^2 - 2 = 0 \\
2x^2 = 2 \\
x^2 = 1
\end{array}$$
Stacionarne točke: $(1, 1), (-1, -1)$

$$x_1 = 1, \quad x_2 = -1$$

f(x, y) = -x - y

$$f(1,1) = -1 - 1 = -2$$
 minimum
$$f(-1,-1) = -(-1) - (-1) = 2$$

$$\begin{vmatrix}
-1+2\lambda x = 0 & \longrightarrow & 2\lambda x = 1 & \longrightarrow & \lambda = \frac{1}{2x} \\
-1+2\lambda y = 0 & \longrightarrow & 2\lambda y = 1 & \longrightarrow & \lambda = \frac{1}{2y}
\end{vmatrix} \Longrightarrow \frac{1}{2x} = \frac{1}{2y}$$

$$x^{2} + x^{2} - 2 = 0$$

$$x^{2} + x^{2} - 2 = 0$$

$$2x^{2} = 2$$

$$x^{2} = 1$$
Stacionarne točke: $(1, 1), (-1, -1)$

f(x, y) = -x - y

$$f(1,1) = -1 - 1 = -2$$
 minimum
$$f(-1,-1) = -(-1) - (-1) = 2$$
 maksimum

 $x_1 = 1, \quad x_2 = -1$

