

1. Fie $f(x, y) = \ln(x^2 y)$, $x(t) = \sqrt{t}$, $y(t) = \cos t$; calculati derivata $(f(x(t), y(t)))'$
2. Calculati matricea *Jacobiana* a functiei $f: \mathbb{R}^2 \rightarrow \mathbb{R}^2$, $f(x, y) = (\arcsin(x + 2y), y \ln(2x + 3y))$
3. Fie:
$$\begin{cases} x + y - 3v^2 - w = 0 \\ xy + v + w^2 = 0 \end{cases}, v = v(x, y), w = w(x, y). \text{ Calculați } \frac{\partial^2 v}{\partial x^2}.$$
4. Determinați punctele de extrem local pentru $f: \mathbb{R}^2 \rightarrow \mathbb{R}$, $f(x, y) = (xy + 1)^2 + x^2 - 4x + 4$.

1. Fie $f(x, y) = \cos(x + 2y)$, $x(t) = \ln t$, $y(t) = \sqrt{t}$; calculati derivata $(f(x(t), y(t)))'$
2. Calculati matricea *Jacobiana* a functiei $f: \mathbb{R}^2 \rightarrow \mathbb{R}^2$, $f(x, y) = (\operatorname{tg}(2x + y), 2x \ln(1 - 3y))$
3. Fie sistemul:
$$\begin{cases} xy - z - t = 0 \\ xy + z - tx = 0 \end{cases}, y = y(x, t), z = z(x, t). \text{ Calculați } \frac{\partial^2 z}{\partial x \partial t}.$$
4. Determinați punctele de extrem ale functiei $f: \mathbb{R}^2 \rightarrow \mathbb{R}$, $f(x, y) = x^2 + y^2 - xy - 3x + 3y$.

1. Fie $f(x, y) = \ln(x - y)$, $x(t) = \operatorname{tg} t$, $y(t) = t^{-2}$; calculati derivata $(f(x(t), y(t)))'$
2. Calculati matricea *Jacobiana* a functiei $f: \mathbb{R}^2 \rightarrow \mathbb{R}^2$, $f(x, y) = (x \arctg(2 + y), (x - 1) \ln(y))$
3. Fie $y \ln t + y = 0$. Calculați $y''(t)$.
4. Determinați punctele de extrem ale functiei $f: \mathbb{R}^2 \rightarrow \mathbb{R}$, $f(x, y) = y^2 - 3x^2 - x^3$.

1. Fie $f(x, y) = \sqrt[3]{x^2 y}$, $x(t) = t^{-1}$, $y(t) = \ln t$; calculati derivata $(f(x(t), y(t)))'$
2. Calculati matricea *Jacobiana* a functiei $f: \mathbb{R}^2 \rightarrow \mathbb{R}^2$, $f(x, y) = (\cos(xy^2), x \ln(x - y))$
3. Fie $\sin x + xy = 0$. Calculați $y''(x)$.
4. Determinați punctele de extrem ale functiei $f: \mathbb{R}^2 \rightarrow \mathbb{R}$, $f(x, y) = x^2 y^2 + 2xy + x^2 - 2x + 2$.

1. Fie $f(x, y) = \arctg(2x - y)$, $x(t) = t^{\frac{1}{2}}$, $y(t) = \sqrt{t^3}$; calculati derivata $(f(x(t), y(t)))'$
2. Calculati matricea *Jacobiana* a functiei $f: \mathbb{R}^2 \rightarrow \mathbb{R}^2$, $f(x, y) = \left(x \ln(x - 2y), \frac{x}{\sqrt{y}} \right)$
3. Fie $(x + 1)y + 2 = 0$. Calculați $y''(x)$.
4. Determinați punctele de extrem ale functiei $f: \mathbb{R}^2 \rightarrow \mathbb{R}$, $f(x, y) = 2x^2 + 2y^2 + 2xy + 1$.

1. Fie $f(x, y) = \sqrt{x^2 + 3y}$, $x(t) = \cos t$, $y(t) = \ln t$; calculati derivata $(f(x(t), y(t)))'$
2. Calculati matricea *Jacobiana* a functiei $f: \mathbb{R}^2 \rightarrow \mathbb{R}^2$, $f(x, y) = (x \ln(xy), \sqrt{x - y})$
3. Fie $x^2 + xy - 1 = 0$. Calculați $y''(x)$
4. Determinați punctele de extrem local ale functiei $f: \mathbb{R}^2 \rightarrow \mathbb{R}$, $f(x, y) = x^2 y^2 - 2xy + x^2 + 2x + 2$.