ROZWIĄZANIE - MINITEST 12-LS 2023/24 - MATEMATYKA A-1 JA

09:15:

$$f(x,y) = x^2 + 2x + 4xy - 2y^3 + 6y^2 + 4y$$

I.) $\frac{\partial f}{\partial x} = 2x + 2 + 4y = 0 \Rightarrow 2x = -2 - 4y$

$x = -1 - 2y$

II.) $\frac{\partial f}{\partial y} = -2 \cdot 3y^2 + 6 \cdot 2y + 4x = -6y^2 + 12y + 4 + 4x = 0$

$+4$

$-6y^2 + 12y + 4 + 4 \cdot (-1 - 2y) = -6y^2 + 12y + 4 - 4 - 8y = 0$

$-6y^2 + 4y = 0 \Rightarrow y \cdot (4 - 6y) = 0$

$y_1 = 0$

y_2: $4 - 6y_2 = 0$

$-6y_2 = -4$

$y_2 = \frac{4}{6} = \frac{2}{3}$

$x_1 = -1 - 2 \cdot 0 = -1$

$[-1, 0]$

$x_2 = -1 - 2 \cdot (\frac{2}{3}) =$

$= -1 - \frac{4}{3} = \frac{-3-4}{3}$

$= -\frac{7}{3}$

$[-\frac{7}{3}, \frac{2}{3}]$

STAC. BODY: $[-1, 0]; [-\frac{7}{3}, \frac{2}{3}]$

11:00: $f(x,y) = x^2 - 2x - 2xy + 2y^3 + 6y^2 + 2y$

I.) $\frac{\partial f}{\partial x} = 2x - 2 - 2y = 0 \Rightarrow 2x = +2 + 2y$

$x = 1 + 1y$

II.) $\frac{\partial f}{\partial y} = -2x + 2 \cdot 3y^2 + 6 \cdot 2y + 2 = 6y^2 + 12y + 2 - 2x = 0$

... dosadzovacou metódou: $6y^2 + 12y + 2 - 2 \cdot (1 + 1y) = 0$

$6y^2 + 12y + 2 - 2 - 2y = 0$

$6y^2 + 10y = 0 \Rightarrow y \cdot (10 + 6y) = 0$

$y_1 = 0$

y_2: $10 = -6y_2$

$y_2 = -\frac{10}{6} = -\frac{5}{3}$

$y_1 = 0$; $y_2 = -\frac{5}{3}$

$\Downarrow$

$x_1 = 1 + y$; $x_2 = 1 - \frac{5}{3} = \frac{3-5}{3} = -\frac{2}{3}$

$\Downarrow$

$[1, 0]$; $[-\frac{2}{3}, \frac{5}{3}]$

STAC. BODY: $[1,0]$; $[-\frac{2}{3}, \frac{5}{3}]$