Zadaci za vježbu

1. $f(x,y) = (x^2+y^2)\sin\left(\frac{1}{xy}\right)$, $T_0(0,0)$

$x = \frac{1}{y^2} \to \lim_{y\to 0}\left(\frac{1}{y^2}+y^2\right)\underbrace{\sin(y)}_{0} \longrightarrow 0$

2. $f(x,y) = \frac{3xy^3}{x^2+2y^6}$, $T_0(0,0)$

nedaje se

$$\lim_{r\to 0}\frac{3r^4\sin\varphi\cdot\cos^3\varphi}{r^2\sin^2\varphi + 2\cdot r^6\cdot\cos^6 y} = \lim_{r\to 0}\frac{3r^2\sin\varphi\cos^3\varphi}{\sin\varphi + 2r^4\cos^6 y}$$

3. $f(x,y) = \frac{x^2-y^2}{x^2+y^2}$ $T_0(0,0)$

$$\lim_{r\to 0}\frac{r^2\sin\varphi - r^2\cos\varphi}{r^2} = \lim_{r\to 0}(\sin\varphi-\cos\varphi) \Rightarrow \text{Ne postoji limes jer ovisi o } \varphi$$

4. $f(x,y) = \frac{x}{x+y}$ $T_0(0,0)$

$$\lim_{r\to 0}\frac{r\sin\varphi}{r(\sin\varphi+\cos\varphi)} = \lim_{r\to 0}\frac{\sin\varphi}{\sin\varphi+\cos\varphi} \Rightarrow \text{ne postoji jer ovisi o } \varphi$$

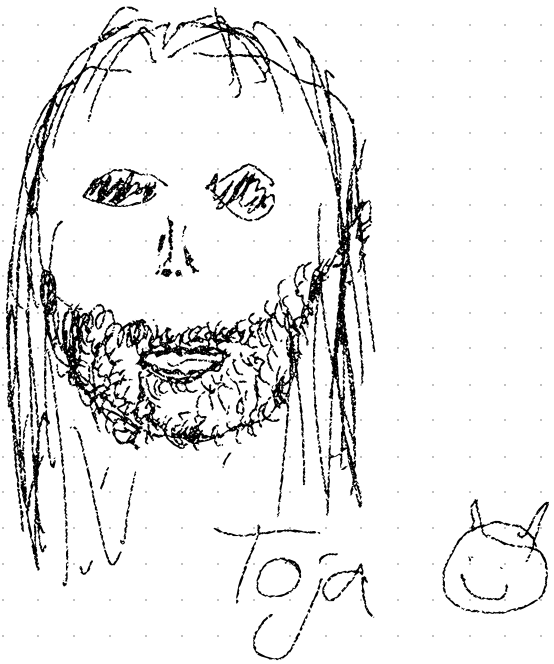
5. $z = \ln\left[\sin\left(\frac{x+1}{\sqrt{y}}\right)\right]$

$$\frac{\partial z}{\partial x} = \frac{1}{\sin\left(\frac{x+1}{\sqrt{y}}\right)}\cdot\cos\left(\frac{x+1}{\sqrt{y}}\right)\cdot\left(x\cdot\frac{1}{\sqrt{y}} + \frac{1}{\sqrt{y}}\right)'$$

(konst, konst)

$$\frac{\partial z}{\partial x} = \operatorname{ctg}\left(\frac{x+1}{\sqrt{y}}\right)\cdot\frac{1}{\sqrt{y}} \qquad y^{-\frac{1}{2}} \to -\frac{1}{2}\cdot y^{-\frac{3}{2}}$$

$$\frac{\partial z}{\partial y} = \operatorname{ctg}\left(\frac{x+1}{\sqrt{y}}\right)\left(-\frac{1}{2}\cdot\frac{x}{\sqrt{y^3}} - \frac{1}{2}\cdot\frac{1}{\sqrt{y^3}}\right) = \operatorname{ctg}\left(\frac{x+1}{\sqrt{y}}\right)\left(-\frac{x+1}{2\sqrt{y^2}}\right)$$


Toja