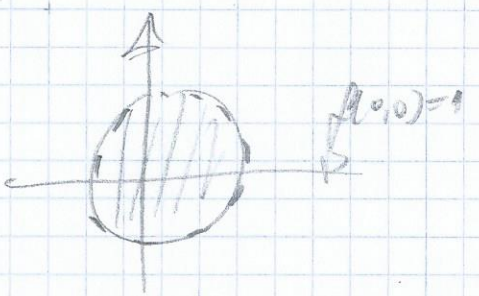
Ex.4 Complementos

1) No interior do domínio ($x^2+y^2<1$)

$$\begin{cases} \frac{\partial f}{\partial x}=0 \\ \frac{\partial f}{\partial y}=0 \end{cases} \begin{cases} -2x+\frac{y}{2}=0 \\ -2y+\frac{x}{2}=0 \end{cases} \begin{cases} -4x+y=0 \\ -4y+x=0 \end{cases} \Leftrightarrow \begin{cases} y=4x \\ -4\cdot 4x+x=0 \end{cases} \Leftrightarrow \begin{cases} y=0 \\ x=0 \end{cases}$$



2) Na fronteira ($x^2+y^2=1$)

$$\begin{cases} \frac{\partial f}{\partial x}=\lambda\frac{\partial g}{\partial x} \\ \frac{\partial f}{\partial y}=\lambda\frac{\partial g}{\partial y} \\ x^2+y^2=1 \end{cases} \begin{cases} -2x+\frac{y}{2}=\lambda 2x \\ -2y+\frac{x}{2}=\lambda 2y \\ x^2+y^2=1 \end{cases} \begin{cases} -4x+y=\lambda 4x \\ -4y+x=\lambda 4y \end{cases}$$

$$\begin{cases} \lambda=\frac{-4x+y}{4x} \\ \lambda=-\frac{4y+x}{4y} \end{cases} \begin{cases} \frac{-4x+y}{4x}=\frac{-4y-x}{4y} \\ = \end{cases} \begin{cases} -16xy+4y^2=16xy+x^2 \\ = \end{cases}$$

$$\begin{cases} y^2=x^2 \\ = \end{cases} \begin{cases} y=\pm x \\ x^2+x^2=1 \end{cases} \begin{cases} = \\ x^2=\frac{1}{2} \Rightarrow x=\frac{1}{\sqrt{2}} \end{cases}$$

$$\left(\frac{1}{\sqrt{2}},\frac{1}{\sqrt{2}}\right),\left(-\frac{1}{\sqrt{2}},\frac{1}{\sqrt{2}}\right),\left(\frac{1}{\sqrt{2}},-\frac{1}{\sqrt{2}}\right),\left(-\frac{1}{\sqrt{2}},-\frac{1}{\sqrt{2}}\right)$$

$f(0,0)=1 \rightarrow$ Max absoluto

$f\left(\pm\frac{1}{\sqrt{2}},\pm\frac{1}{\sqrt{2}}\right)=\frac{1}{4}$ nada sabemos