Paula P2 C3 MAZZA

a) $\boxed{\nabla f = 0}$ (pontos críticos)

$$\left.\begin{aligned} \frac{\partial f}{\partial x} &= 2x - \cos(x+y) = 0 \\ \frac{\partial f}{\partial y} &= -\cos(x+y) = 0 \end{aligned}\right] \Rightarrow \begin{aligned} x &= 0 \\ y &= \frac{\pi}{2} + k\pi, \quad k \in \mathbb{Z}. \end{aligned}$$ (1º) $\left(0, \frac{\pi}{2} + k\pi\right)$

$\boxed{\text{Hessiano}}$ (determinar se são máx, mín o pto sela)

$$Hf = \begin{bmatrix} 2 + \operatorname{sen}(x+y) & \operatorname{sen}(x+y) \\ \operatorname{sen}(x+y) & \operatorname{sen}(x+y) \end{bmatrix}$$

(1º) ... det H ...
... 2 casos

Dos casos: • k par $\Rightarrow \operatorname{sen}\left(\frac{\pi}{2} + k\pi\right) = 1 \Rightarrow Hf = \begin{bmatrix} 3 & 1 \\ 1 & 1 \end{bmatrix}$

$$\begin{vmatrix} 3-\lambda & 1 \\ 1 & 1-\lambda \end{vmatrix} = (3-\lambda)(1-\lambda) - 1 = \lambda^2 - 4\lambda + 2 = 0$$

$\Rightarrow \lambda_1 = 2+\sqrt{2} > 0$
$\lambda_2 = 2-\sqrt{2} > 0$

$\Rightarrow$ Hf def. positiva $\Rightarrow \left(0, \frac{\pi}{2} + k\pi\right)$ mínimos ... para k par (1º)

• k impar $\Rightarrow \operatorname{sen}\left(\frac{\pi}{2} + k\pi\right) = -1 \Rightarrow Hf = \begin{bmatrix} 1 & -1 \\ -1 & -1 \end{bmatrix}$

$$\begin{vmatrix} 1-\lambda & -1 \\ -1 & -1-\lambda \end{vmatrix} = (\lambda-1)(\lambda+1) - 1 = \lambda^2 - 2 = 0 \Rightarrow \begin{aligned} \lambda_1 &= \sqrt{2} \\ \lambda_2 &= -\sqrt{2} \end{aligned}$$

$\Rightarrow \left(0, \frac{\pi}{2} + k\pi\right)$ com k impar ... pto sela (1º)