2.) $f(x,y) = e^x \cos y$

crit. p:

$\frac{\partial f}{\partial x} = e^x \cos y = 0 \rightarrow \cos y = 0$ ~~↯~~

$\frac{\partial f}{\partial y} = -e^x \sin y = 0 \rightarrow \sin y = 0$ ~~↯~~

(∧)

$y \in \emptyset \Rightarrow$

$\Rightarrow$ NO critical p. $\Rightarrow$ NO loc. extreme

3.) $f(x,y) = y \cos x$

$\nabla f = 0$: (I) $\frac{\partial f}{\partial x} = -y \sin x = 0 \Rightarrow y = 0$

(or ~~$\sin x = 0$~~) ↵ can't be

(II) $\frac{\partial f}{\partial y} = \cos x = 0$ ~~↯~~

(II) eq. $\Rightarrow$ $x = \frac{\pi}{2} + k\pi$; $k \in \mathbb{Z}$

crit. p. : $\left[\frac{\pi}{2} + k\pi ; 0\right]$

∞ many of them