$x = e^u + u \sin v$ $\quad$ $u(\underbrace{x, y}_{\bar{x}})$ $\quad$ $\frac{\partial u}{\partial x}(1)$

$y = e^u - u \cos v$ $\quad$ $v(x, y)$ $\quad$ $\frac{\partial v}{\partial x}(1)$

$[x_0, y_0, u_0, v_0] = [e+1, \ e, \ 1, \ \frac{\pi}{2}] = 1$

$F_1 = e^u + u \sin v - x$ $\quad$ $(x, y) = \bar{x}$

$(u, v) = \bar{y}$

$F_2 = e^u - u \cos v - y$

$F = (F_1, F_2)$ $\quad$ $F : \mathbb{R}^4 \longrightarrow \mathbb{R}^2$

$\mathbb{R}^{2+2} \longrightarrow \mathbb{R}^2$

$F \in C^1(\mathbb{R}^4)$

$\Downarrow$

$G = \mathbb{R}^4$

$F_1(1) = e^1 + \cancel{u}\, 1 \sin \frac{\pi}{2} - (e+1) = 0$

$F_2(1) = e^1 - 1 \cos \frac{\pi}{2} - e = 0$:)

$\frac{\partial F_1}{\partial u}$ $\qquad$ $\frac{\partial F_1}{\partial v}$

$$\begin{vmatrix} e^u + \sin v & u\cos v \\ e^u - \cos v & + u \sin v \end{vmatrix}$$

$\frac{\partial F_2}{\partial u}$ $\qquad$ $\frac{\partial F_2}{\partial v}$

Jacobiano A

$$\begin{vmatrix} e + 1 & \overbrace{1\cos\frac{\pi}{2}}^{0} \\ e - 0 & 1 \end{vmatrix} =$$

$$= e + 1 \neq 0 \quad :)$$

$\frac{\partial u}{\partial x}$ $\qquad$ $\frac{\partial v}{\partial x}$:

$u(x,y)$

$x = e^u + \underline{u \cdot \sin v},$

$y = e^u - u\cos v$

(u,v)

$\partial x:$

$$\frac{\partial f}{\partial u}\cdot\frac{\partial u}{\partial x} + \frac{\partial f}{\partial v}\cdot\frac{\partial v}{\partial x}$$

$$1 = e^u \cdot \frac{\partial u}{\partial x} + \left(1\cdot\sin v \cdot \frac{\partial u}{\partial x} + u\cdot\cos v \cdot \frac{\partial v}{\partial x}\right)$$

$$0 = e^u \frac{\partial u}{\partial x} - \left(\cos v \frac{\partial u}{\partial x} + u(-\sin v)\frac{\partial v}{\partial x}\right)$$

$$\left[\underset{x}{e+1},\ \underset{y}{e},\ \underset{u}{1},\ \underset{v}{\pi/2}\right]$$

$$1 = e\cdot\frac{\partial u}{\partial x} + \frac{\partial u}{\partial x} + 0$$

$$\boxed{\frac{\partial u}{\partial x}(A) = \frac{1}{1+e}}$$

$$0 = e\frac{\partial u}{\partial x} - \left(0 - 1\cdot 1\cdot\frac{\partial v}{\partial x}\right)$$

$$\frac{\partial v}{\partial x}(A) = -e\frac{\partial u}{\partial x}$$

$$\boxed{\frac{\partial v}{\partial x}(A) = \frac{-e}{1+e}}$$

$$e^{u(x,y)/x}\cos\frac{v(x,y)}{y} = \frac{x}{\sqrt{2}}$$

$$e^{u/x}\sin\frac{v}{y} = \frac{y}{\sqrt{2}}$$

podle x

$$e^{\frac{u}{x}}\cdot\underbrace{\left(\frac{\partial \frac{u}{x}}{\partial x}\right)}_{\left(\frac{\frac{\partial u}{\partial x}\cdot x - u\cdot 1}{x^2}\right)}\cos\frac{v}{y} + e^{\frac{u}{x}}\cdot\underbrace{\frac{\partial \cos\frac{v}{y}}{\partial x}}_{\left(-\sin\left(\frac{v}{y}\right)\cdot\frac{1}{y}\frac{\partial v}{\partial x}\right)} = \frac{1}{\sqrt{2}}$$

$$e^{\frac{u}{x}}\underbrace{\left(\frac{\partial\left(\frac{u}{x}\right)}{\partial x}\right)}_{\frac{\frac{\partial u}{\partial x}\cdot x - u\cdot 1}{x^2}}\sin\frac{v}{y} + e^{\frac{u}{x}}\cos\frac{v}{y}\cdot\underbrace{\left(\frac{\partial\frac{v}{y}}{\partial x}\right)}_{\frac{1}{y}\frac{\partial v}{\partial x}} = 0$$