a

1) $\begin{cases} f'_x\,(-0{,}6) + f'_y\,0{,}8 = -2 \\ f'_x\,0{,}8 + f'_y\,0{,}6 = 1 \end{cases}$

$$f'_x = \frac{\begin{vmatrix} -2 & 0{,}8 \\ 1 & 0{,}6 \end{vmatrix}}{\begin{vmatrix} -0{,}6 & 0{,}8 \\ 0{,}8 & 0{,}6 \end{vmatrix}} = \frac{-2\cdot 0{,}6 - 0{,}8}{-0{,}6\cdot 0{,}6 - 0{,}8\cdot 0{,}8} = \frac{-2}{-0{,}36-0{,}64} = 2$$

$$f'_{(\bar{A};(0{,}3;-0{,}4))} = 2\cdot 0{,}3 - 1(-0{,}4) = 0{,}6+0{,}4 = \boxed{1}$$

$$f'_y = \frac{\begin{vmatrix} -0{,}6 & -2 \\ 0{,}8 & 1 \end{vmatrix}}{\begin{vmatrix} & \\ & \end{vmatrix}} = \frac{-0{,}6+1{,}6}{-1} = -1$$

$$\boxed{\check{v} = \left(\frac{1,2)}{\sqrt{5}}\right. \quad y \quad \check{v} = \left(\frac{-1,-2)}{\sqrt{5}}\right.}$$

2) $(x,y) = (3,2) \to (u,v,w) = (7,3,5)$

$$D\bar{g} = \begin{pmatrix} y & x \\ y-1 & x \\ y & x \end{pmatrix} \qquad D_{g(3,2)} = \begin{pmatrix} 2 & 3 \\ 1 & 3 \\ 2 & 3 \end{pmatrix}$$

$$D_{h(3,2)} = \begin{pmatrix} 3 & -2 & 1 \end{pmatrix}\begin{pmatrix} 2 & 3 \\ 1 & 3 \\ 2 & 3 \end{pmatrix} = \begin{pmatrix} 6-2+2 & 9-6+3 \end{pmatrix} = \begin{pmatrix} 6 & 6 \end{pmatrix}$$

$$\text{máx } h'_{\check{v}(3,2)} = \sqrt{36+36} = \boxed{\sqrt{72}} \qquad \boxed{\check{v} = \frac{(6,6)}{\sqrt{72}}}$$

3) $g(x,y,z) = x + yz + \ln(x+y^2-z-3) - 3 \qquad 1+2z_0 + \ln(2-z_0) = 3 \quad z_0 = 1$

$$\nabla g = \left(1 + \frac{1}{x+y^2-z-3},\ z + \frac{2y}{x+y^2-z-3},\ y + \frac{-1}{x+y^2-z-3}\right)$$

$$\bar{\nabla} g_{(1,2,1)} = (2,5,1)$$

$$\boxed{(x,y,z) = (1,2,1) + t(2,5,1) \quad t\in\mathbb{R}}$$

$$\begin{cases} x = 1+2t \\ y = 2+5t = 0 \Rightarrow t = -2/5 \\ z = 1+t \end{cases} \qquad \begin{aligned} x &= 1 - 4/5 = 1/5 \\ z &= 1 - 2/5 = 3/5 \end{aligned}$$

$$\boxed{\left(\tfrac{1}{5}, 0, \tfrac{3}{5}\right)}$$

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4) $y' - \frac{4}{x} y = x^5 e^x$

$u'v + u v' - \frac{4}{x} u v = x^5 e^x \rightarrow u'v + u\left(v' - \frac{4}{x} v\right) = x^5 e^x$

$\frac{dv}{dx} = \frac{4v}{x} \rightarrow \int \frac{dv}{v} = 4\int \frac{dx}{x} \rightarrow \ln|v| = 4\ln|x| + \ln|C_1|$

$v = C_1 x^4$

$\frac{du}{dx} C_1 \cancel{x^4} = x^{\cancel{5}} e^x \rightarrow \int du = \int \frac{x e^x}{C_1} dx \rightarrow u = \frac{e^x}{C_1}(x-1) + C_2$

$y = \left[\frac{e^x}{C_1}(x-1) + C_2\right] C_1 x^4 \rightarrow \boxed{y = e^x(x^5 - x^4) + C x^4}$

$1 = C$

$\boxed{y = e^x(x^5 - x^4) + x^4}$

T1) $y = mx$

$\lim_{x \to 0} \frac{mx}{x - mx} = \frac{m}{1-m} \rightarrow \nexists \lim_{(x,y)\to(0,0)} f \rightarrow f$ no es cont. en $(0,0)$

T2) $\check{v} = (v_x, v_y)$

si $v_x = 0$ $\quad f'_{\check{v}}(0,0) = \boxed{0}$

$v_x \neq 0$ $\quad f'_{v}(0,0) = \lim_{t \to 0} \frac{\frac{t^2 v_y^2}{t v_x}}{t} = \boxed{\frac{v_y^2}{v_x}}$