(2) Pre funkciu $f(x,y,z) = 8 - 5x^2 - 3y^2 - z$

najdite ; (a) dotyčnú rovinu v $\vec{a} = (1,0,3)$ **(5b)**

k ploche $f(x,y,z) = 0$. (b) derváciu $D_{\bar{u}} f(\bar{a})$ v smere

$$\bar{u} = \left(\tfrac{1}{3}, -\tfrac{2}{3}, \tfrac{2}{3} \right).$$ **(3b)**

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2(a) $\dfrac{\partial f}{\partial x} = -10x$, $\dfrac{\partial f}{\partial y} = -6y$, $\dfrac{\partial f}{\partial z} = -1$ **(1)**

$\nabla f(\bar{a}) = (-10 \cdot 1, -6 \cdot 0, -1) = (-10, 0, -1)$ **(1)**

$\varsigma = \nabla f(\bar{a}) \cdot (x-1, y, z-3) = 0$ je hľadaná

dotyčná rovina. Teda

$\varsigma \equiv (-10, 0, -1) \cdot (x-1, y, z-3) = 0$ **(2)**

$\varsigma \equiv -10(x-1) - (z-3) = 0$

$\varsigma \equiv -10x - z + 13 = 0$

$\varsigma \equiv 10x + z - 13 = 0$ **(1)**

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2(b)

$D_{\bar{u}} f(\bar{a}) = \nabla f(\bar{a}) \cdot \bar{u} = (-10, 0, -1) \cdot \left(\tfrac{1}{3}, -\tfrac{2}{3}, \tfrac{2}{5} \right) =$

$= -\dfrac{10}{3} - \dfrac{2}{3} = -\dfrac{12}{3} = \underline{-4}$ **(3)**