CN: : eq of a plane.

20: Q: What is the equation $z = g(x,y)$ of the plane in Ex1?

Formula for a plane should be $ax+by+cz+d=0$.

$((x,y,z)-(1,0,0)) \cdot \underline{n} = 0$, $\underline{n}$ is a normal vector to the plane.

$(x-1, y, z) \cdot \underline{n} = 0$

$$\underline{n} = \underline{v}_1 \times \underline{v}_2 = \begin{vmatrix} \underline{i} & \underline{j} & \underline{k} \\ -1 & 2 & 0 \\ -1 & 0 & 2 \end{vmatrix} = \underline{i}\begin{vmatrix} 2 & 0 \\ 0 & 2 \end{vmatrix} - \underline{j}\begin{vmatrix} -1 & 0 \\ -1 & 2 \end{vmatrix} + \underline{k}\begin{vmatrix} -1 & 2 \\ -1 & 0 \end{vmatrix}$$

$$= \underline{i} \cdot 4 - \underline{j}(-2) + k(2) = 4\underline{i} + 2\underline{j} + 2\underline{k}.$$

$(x-1, y, z) \cdot (4, 2, 2) = 0 \rightarrow 4(x-1) + 2y + 2z = 0.$

$\rightarrow 4x - 4 + 2y + 2z = 0 \rightarrow 4x + 2y + 2z - 4 = 0.$

$m_{(x)} = \frac{\partial g}{\partial x} = -2$ ✓

$m_{(y)} = \frac{\partial g}{\partial y} = -1$ ✓

$2z = 4 - 4x - 2y$

$z = \frac{-4x - 2y + 4}{2} = -2x - y + 2$

$z = g(x,y) = -2x - y + 2.$