

Quiz

am curl von Vektorfunktion

$$\vec{a} = y^2 \vec{i} + z^2 \vec{j} + x^2 \vec{k}$$

$$\text{curl } \vec{a} = \vec{\nabla} \times \vec{a}$$

$$\vec{\nabla} \times \vec{a} = \left[\frac{\partial}{\partial x} \vec{i} + \frac{\partial}{\partial y} \vec{j} + \frac{\partial}{\partial z} \vec{k} \right] \times \left[y^2 \vec{i} + z^2 \vec{j} + x^2 \vec{k} \right]$$

$$= \begin{vmatrix} \vec{i} & \vec{j} & \vec{k} \\ \frac{\partial}{\partial x} & \frac{\partial}{\partial y} & \frac{\partial}{\partial z} \\ y^2 & z^2 & x^2 \end{vmatrix}$$

$$= \frac{\partial x^2}{\partial y} \vec{i} + \frac{\partial y^2}{\partial z} \vec{j} + \frac{\partial z^2}{\partial x} \vec{k} - \frac{\partial y^2}{\partial z} \vec{k} - \frac{\partial z^2}{\partial x} \vec{i} - \frac{\partial x^2}{\partial y} \vec{j}$$

$$= -2y \vec{k} - 2z \vec{i} - 2x \vec{j}$$

$$\vec{\nabla} \times \vec{a} = -2z \vec{i} - 2x \vec{j} - 2y \vec{k} \quad \#$$