

Vector Calculus
Grad, Div and Curl

Question

Calculate **divF** and **curlF** for the vector field

$$\underline{F} = f(x)\underline{i} + g(y)\underline{j} + h(z)\underline{k}$$

Answer

$$\begin{aligned}\operatorname{div}\underline{F} &= \frac{\partial}{\partial x}f(x) + \frac{\partial}{\partial y}g(y) + \frac{\partial}{\partial z}h(z) \\ &= f'(x) + g'(y) + h'(z) \\ \operatorname{curl}\underline{F} &= \begin{vmatrix} \underline{i} & \underline{j} & \underline{k} \\ \frac{\partial}{\partial x} & \frac{\partial}{\partial y} & \frac{\partial}{\partial z} \\ f(x) & g(y) & h(z) \end{vmatrix} = \underline{0}\end{aligned}$$