

**Vector Calculus**  
*Grad, Div and Curl*

**Question**

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

$$\underline{F} = x\underline{i} + x\underline{k}$$

**Answer**

$$\operatorname{div}\underline{F} = \frac{\partial}{\partial x}(x) + \frac{\partial}{\partial y}(0) + \frac{\partial}{\partial z}(x) = 1$$

$$\operatorname{curl}\underline{F} = \begin{vmatrix} \underline{i} & \underline{j} & \underline{k} \\ \frac{\partial}{\partial x} & \frac{\partial}{\partial y} & \frac{\partial}{\partial z} \\ x & 0 & x \end{vmatrix} = -\underline{j}$$