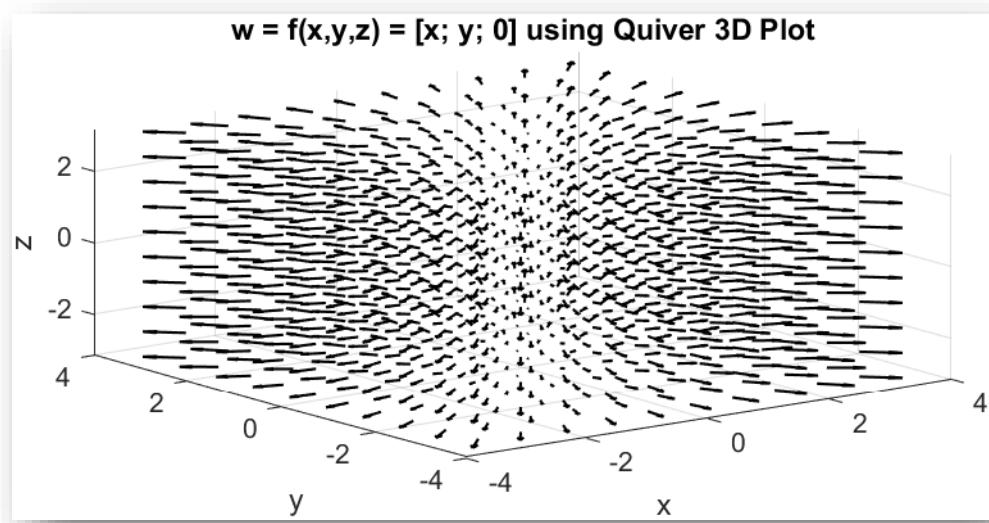
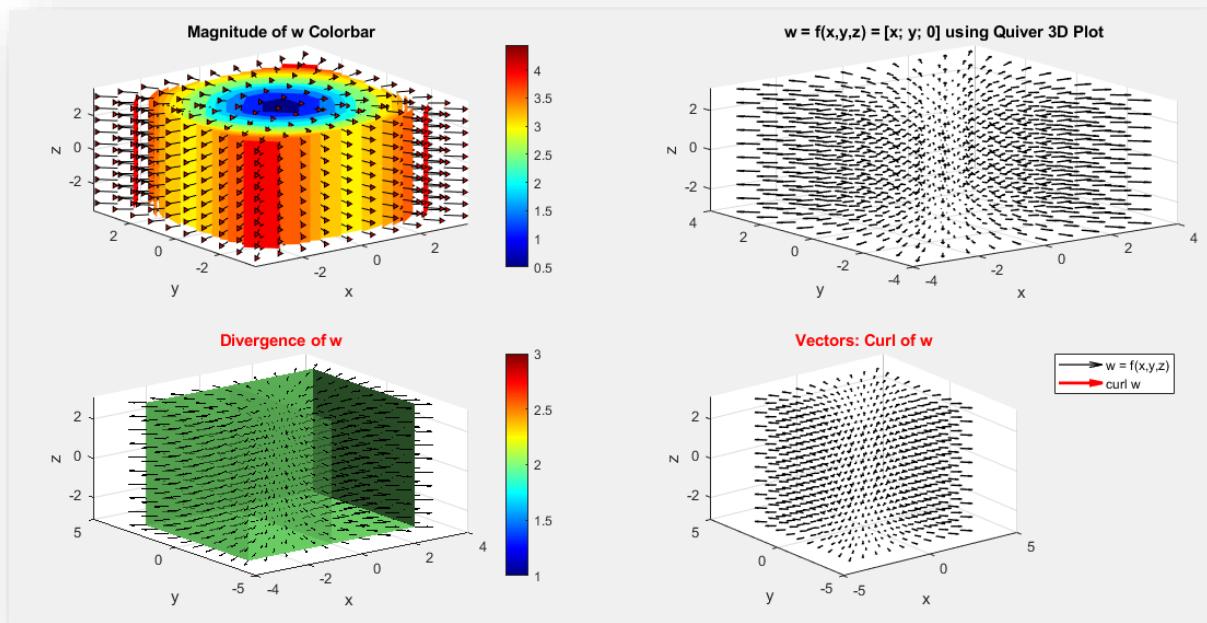


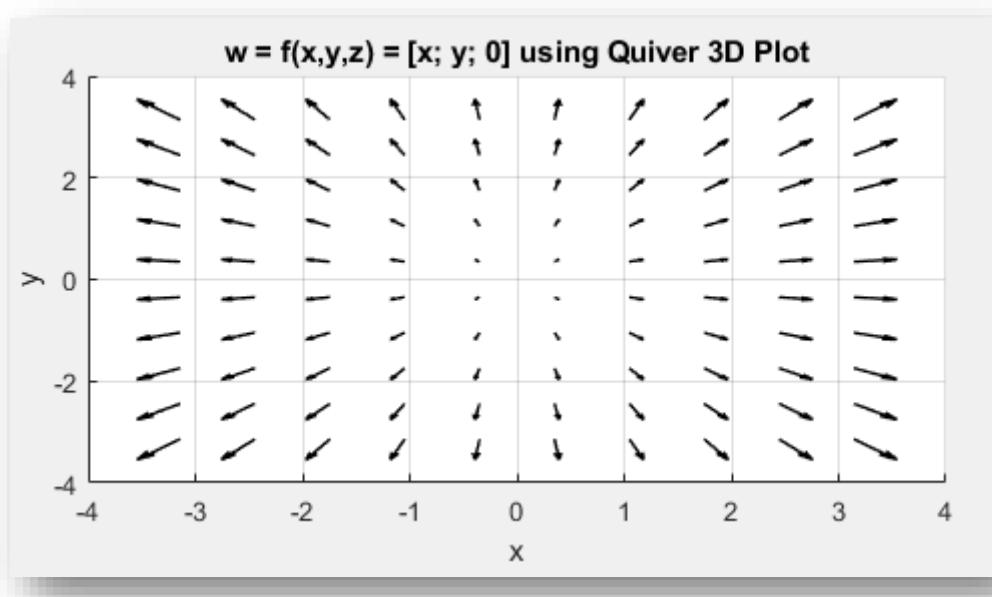
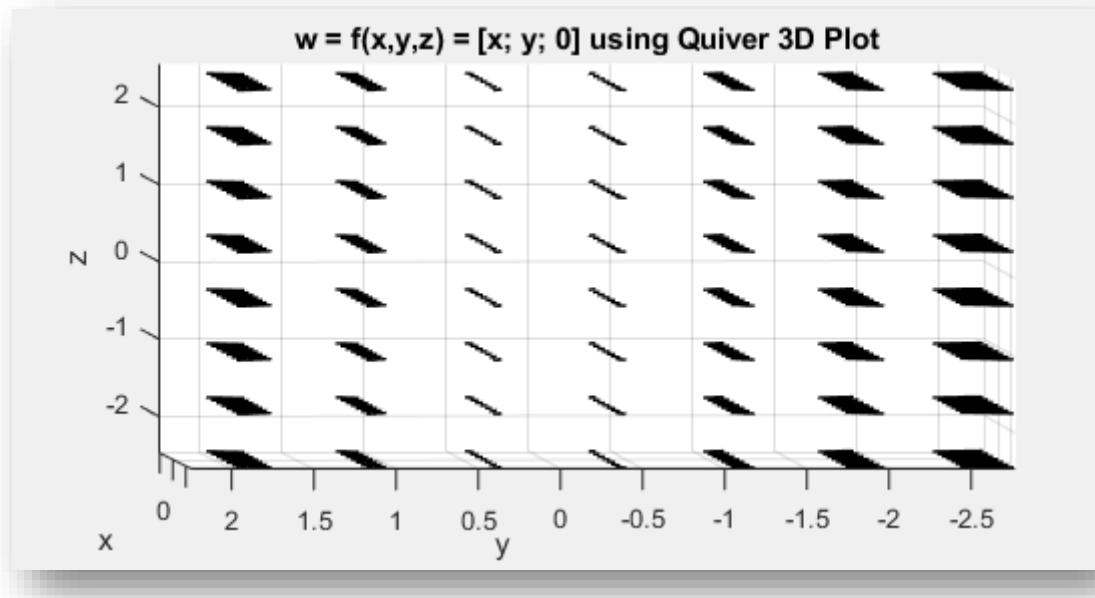
**Q:** Draw the following function with MATLAB software; Display its gradient, divergence and curl as well.

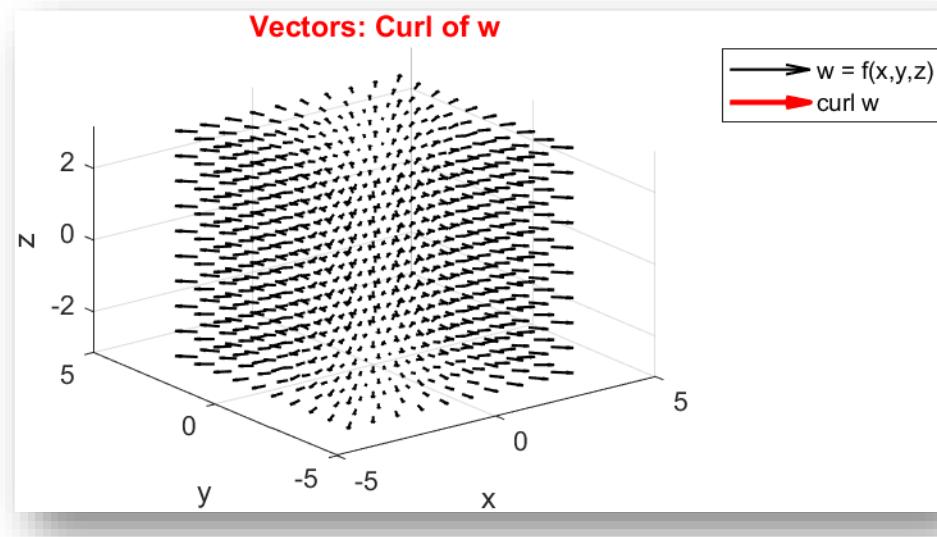
$$\vec{E}(x, y, z) = x\hat{i} + y\hat{j}$$

**Sol:**



Be careful, because we don't have an axis, so it can be imagined for each parallel plane and draw it. In the following, you can understand this point more.





As it turns out, its curl graph doesn't exist because:

$$\begin{aligned}\nabla \times E &= \begin{vmatrix} \hat{x} & \hat{y} & \hat{z} \\ \partial/\partial x & \partial/\partial y & \partial/\partial z \\ E_x & E_y & E_z \end{vmatrix} = \hat{x} \left( \frac{\partial E_z}{\partial y} - \frac{\partial E_y}{\partial z} \right) + \hat{y} \left( \frac{\partial E_x}{\partial z} - \frac{\partial E_z}{\partial x} \right) + \hat{z} \left( \frac{\partial E_y}{\partial x} - \frac{\partial E_x}{\partial y} \right) \\ &= \hat{x}(0 - 0) + \hat{y}(0 - 0) + \hat{z}(0 - 0) = 0\end{aligned}$$



