Quiz 8 MATH 3503

Calculate curl and divergence of $\langle xy, yz, xz \rangle$.

Soln: curl $\langle xy, yz, xz \rangle = \nabla \times \langle xy, yz, xz \rangle$

$$= \det \begin{bmatrix} \vec{i} & \vec{j} & \vec{k} \\ \frac{\partial}{\partial x} & \frac{\partial}{\partial y} & \frac{\partial}{\partial z} \\ xy & yz & xz \end{bmatrix}$$

$$= \langle 0 - y, -(z - 0), 0 - x \rangle$$

$$= \langle -y, -z, -x \rangle$$

$$\text{div} \langle xy, yz, xz \rangle = \nabla \cdot \langle xy, yz, xz \rangle$$

$$= \frac{\partial}{\partial x}(xy) + \frac{\partial}{\partial y}(yz) + \frac{\partial}{\partial z}(xz)$$

$$= y + z + x$$