

### Solution to Problem 114B:

From the given expressions:

$$\frac{\partial u}{\partial x} = \frac{6x^2yz - 2y^3z}{(x^2 + y^2)^3} \quad (1)$$

and

$$\frac{\partial v}{\partial y} = \frac{-6x^2yz + 2y^3z}{(x^2 + y^2)^3} \quad (2)$$

and

$$\frac{\partial w}{\partial z} = 0 \quad (3)$$

Therefore

$$\frac{\partial u}{\partial x} + \frac{\partial v}{\partial y} + \frac{\partial w}{\partial z} = 0 \quad (4)$$

and therefore since the divergence of the velocity is zero the fluid is incompressible.