

**CHEN.3030 Fluid Mechanics**  
**Short Quiz: Fluid Kinematics**

The 2-D velocity vector field for a fluid is given as follows:

$$\vec{v}(x, y, t) = u(x, y, t)\hat{i} + v(x, y, t)\hat{j} = (xt + 2y)\hat{i} + (xt^2 - yt)\hat{j}$$

- a. Is the flow **uniform** or **non-uniform**? Is it **steady** or **unsteady** flow? Just circle the correct choices.
- b. Determine an expression for the x-directed component of the acceleration vector.
- c. What are the values of the x-directed velocity and the x-directed acceleration at the point  $x = 0.5$  m and  $y = 1$  m at  $t = 2$  seconds?