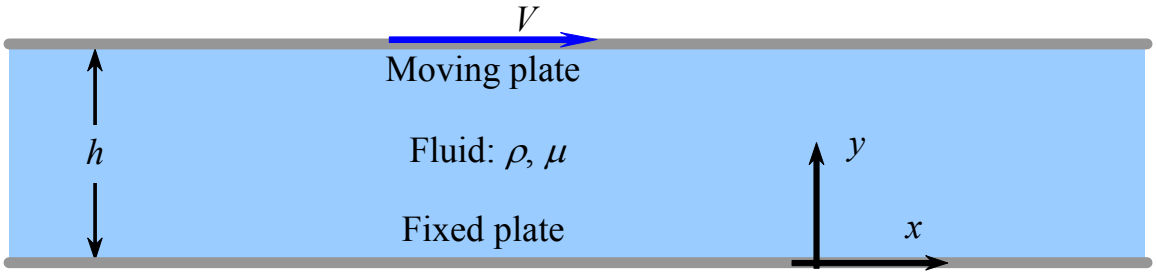
Example Problem – Exact Solution for Couette Flow

Given: Steady, incompressible, laminar flow in the x-y plane between two infinite parallel plates.



Assumptions and approximations:

1. The flow is steady [$\partial/\partial t$ of anything = 0].
2. The flow is two-dimensional in the x-y plane [$\partial/\partial z$ of anything = 0, w = 0].
3. Gravity effects are negligible or ignored.
4. The flow is fully developed [$\partial/\partial x$ of any velocity = 0 – velocity does not change with x].
5. Pressure is constant everywhere.

To do: Calculate the velocity field.

Solution: [to be done in class]