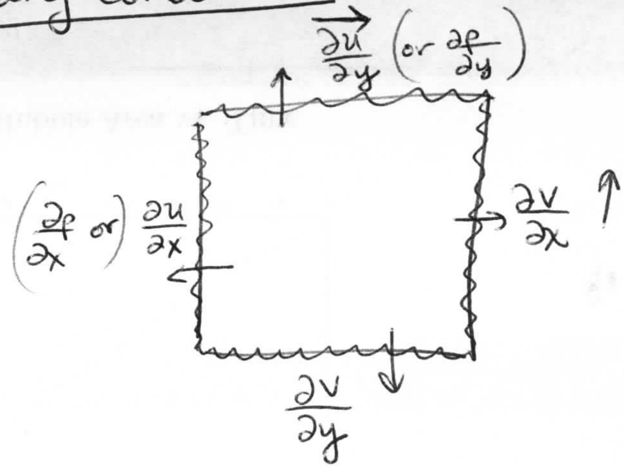
Boundary conditions

$$\frac{D\bar{u}}{Dt} = -\nabla p$$

$$\bar{u}_t + (\bar{u}\cdot\nabla)\bar{u} = -\nabla p$$

$$u_t + u\frac{\partial u}{\partial x} + v\frac{\partial u}{\partial y} = -\frac{\partial p}{\partial x}$$

$$v_t + u\frac{\partial v}{\partial x} + v\frac{\partial v}{\partial y} = -\frac{\partial p}{\partial y}$$



scalar for Euler's eqn
(normal components)
(or tangential)

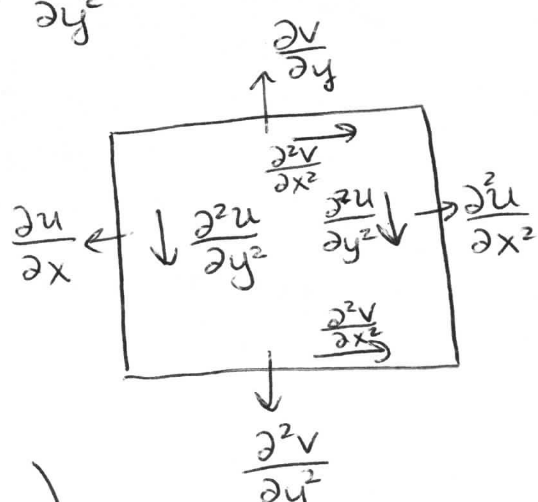
$$\frac{D\bar{u}}{Dt} = \mu\Delta\bar{u} - \nabla p$$

$$u_t + u\frac{\partial u}{\partial x} + v\frac{\partial u}{\partial y} = -\frac{\partial p}{\partial x} + \mu\frac{\partial^2 u}{\partial x^2} + \mu\frac{\partial^2 u}{\partial y^2}$$

$$v_t + u\frac{\partial v}{\partial x} + v\frac{\partial v}{\partial y} = -\frac{\partial p}{\partial y} + \mu\frac{\partial^2 v}{\partial x^2} + \mu\frac{\partial^2 v}{\partial y^2}$$

Same for Stokes

and unsteady Stokes



1D Laplace's eqn
$\Rightarrow$ scalar at each bdry (only normal or tangential)

2D Laplace's eqn
$\Rightarrow$ 2 scalars at each bdry (can specify full velocity at each bdry)

2 scalars at each bdry
normal + tangential