1. Review
2. Problems from old Midterms
3. Midterm 2008

Review

- Introduction
- Tensors, vectors, symmetric and antisymmetric tensors, vector calculus, Gauss’ and Stokes’ Theorems, ...
- Streamlines, pathlines, convective derivative
- Definitions: strain-rate tensor, vorticity, circulation, rigid rotation, stream function
Review

• Conservation of mass, Navier-Stokes, Newtonian fluids, Stokes’ model for stress tensor, deformation work, viscous dissipation

• Bernoulli’s principle for inviscid, irrotational flow

• Rotating frame of reference, centrifugal force, Coriolis force

Review

• Vorticity equation, Kelvin’s theorem, vorticity dynamics

• Potential flow, 2D Euler flow, complex velocity potential, Blasius theorem

• Dimensional analysis, Reynolds number

• Steady, laminar flow with strong viscosity