

Class Test 2:

AFD

Instructions: Answer all questions. Closed book, closed notes examination. All symbols carry their usual meaning. Assume missing data suitably. Follow the five step problem solving methodology. Data required are included in the question paper.

1. Consider steady flow through a narrow slit of rectangular geometry without any end effect. Use the steady state vorticity equation

$$\mathbf{v} \cdot \nabla \mathbf{w} = \nu \nabla^2 \mathbf{w} + \mathbf{w} \cdot \nabla \mathbf{v}$$

to show that the velocity in this channel is given by the equation:

$$\frac{\partial^3 v_z}{\partial y^3} = 0$$

