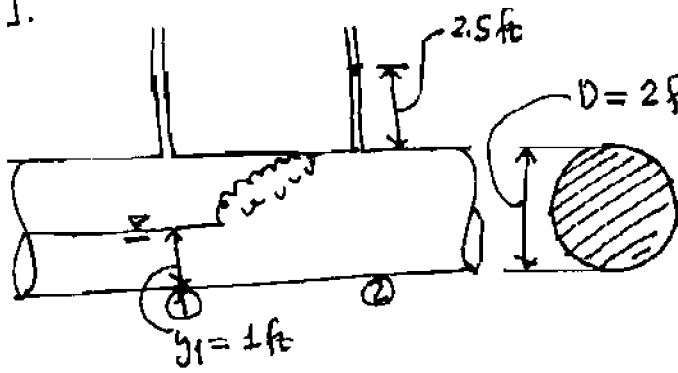
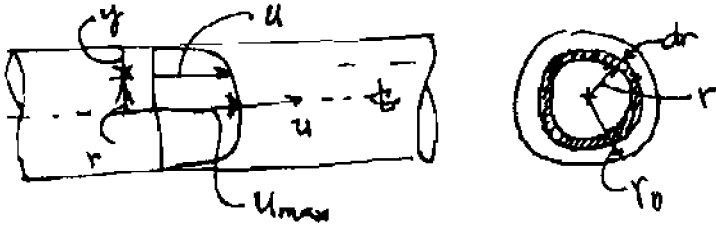


[1].



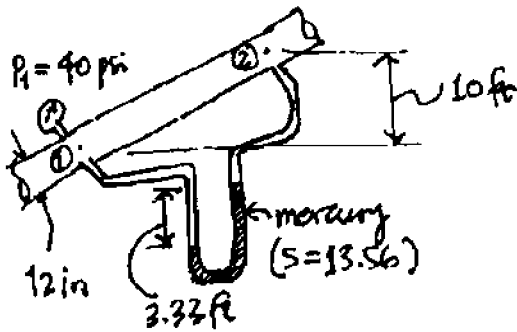
A hydraulic jump occurs in a pipe as illustrated. Determine the discharge Q .

[2]. Turbulent flow in a pipe follows the power law $u = u_{max} (y/r_0)^{1/4}$.



Calculate the kinetic energy correction factor, α .

[3]. A 12-in pipe is being tested to evaluate the loss of head in the setup shown. Determine the head loss between points 1 and 2.



[4] sketch the EL and the HGL for the system in the figure.

[5]. In the figure, $D_1 = 3$ ft, $D_2 = 2$ ft, $\Delta H = 250$ ft and $Q = 80$ cfs. Neglect all losses except discharge losses.

Calculate the power extracted by the turbine in hp.

[4] & [5]

