Physics 160 Written Homework - Chapter 12-13

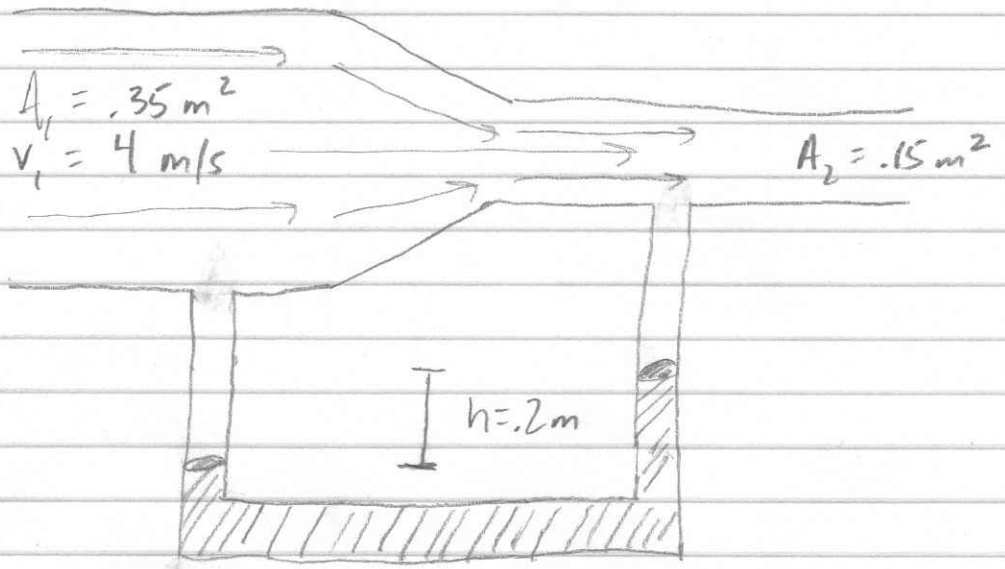
1 Fluid Mechanics

Water travels though a pipe with a cross sectional area $A_1 = .35m^2$ at $4m/s$. The pipe then narrows to a cross sectional area of $A_2 = .15m^2$. A smaller pipe of constant cross sectional area is connected to the larger pipe, one end at the larger cross section, and the other at the smaller cross section. This pipe contains a fluid, that has a height difference $h = .2m$ between the level of the fluid on each side of the pipe. (See the attached diagram.) Find the unknown density of this fluid.

2 Gravitation

A satellite $3000km$ above the surface of the earth is to maintain a circular orbit. Find the necessary tangential speed v, and, in your own words, explain why the mass of the satellite is irrelevant.

Problem 1



$\rho_{WATER} = 1\ kg/m^3$

$\rho_{FLUID} = ?$