Homework problems on Fluid Dynamics
(1.63J/2.21J)
by Chiang C. Mei, 2002

T-tube.tex

Draining of a T tube

A vertical tube of constant cross sectional area $A$ branches off at the lower end into two horizontal tubes. The cross sectional area of the branches $OB$ and $OB'$ are both $A/2$. At the points of branching there are two valves.

With the valves closed, the vertical tube is filled with water to the height $H$. At $t = 0$ the valves are suddenly open. Find the motion in the vertical and horizontal tubes as a result of gravity. Ignore viscosity and treat the flow as one dimensional and transient.