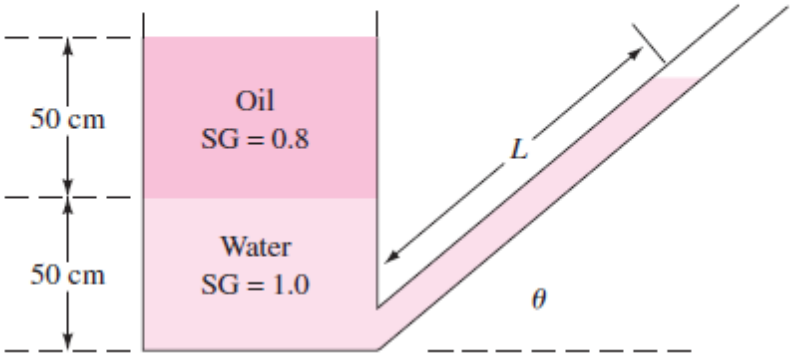
Fluid Mechanics and Rate Processes: Fluid Statics Tutorial: August 04, 2016

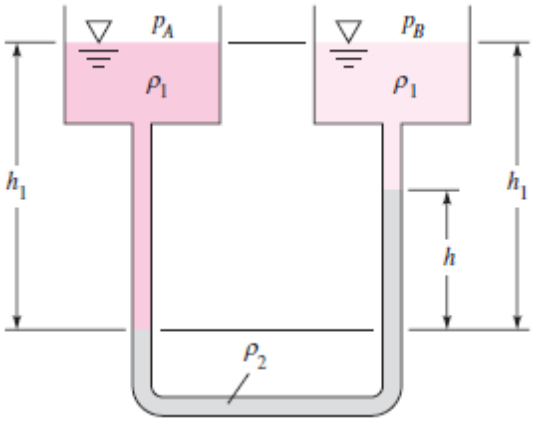
(Question are adopted from Chap 2, Fluid Mechanics, F. M. White, 7th Ed.)

P2.41. In Fig. P 2.41 both the tank and the tube are open to the atmosphere. If L 2.13 m, what is the angle of tilt θ of the tube?



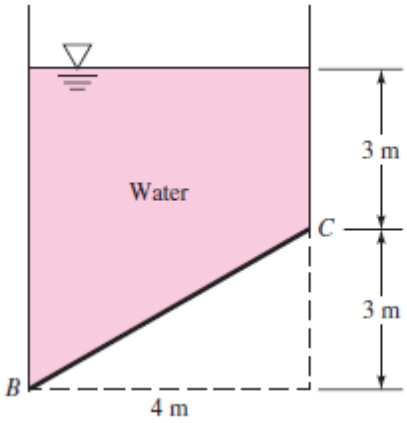
P 2.41

P2.47. Very small pressure differences $P_A - P_B$ can be measured accurately by the two-fluid differential manometer in Fig. P2.47. Density ρ_2 is only slightly larger than that of the upper fluid ρ_1. Derive an expression for the proportionality between h and $P_A - P_B$ if the reservoirs are very large.



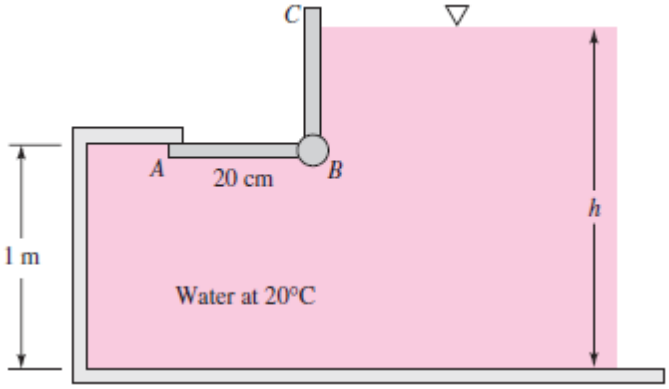
P 2.47

P2.63. The tank in Fig. P2.63 is 2 m wide into the paper. Neglecting atmospheric pressure, find the resultant hydrostatic force on panel *BC* (*a*) from a single formula and (*b*) by computing horizontal and vertical forces separately, in the spirit of Section 2.6.



P 2.63

P2.71. Gate *ABC* in Fig. P2.71 has a fixed hinge line at *B* and is 2 m wide into the paper. The gate will open at *A* to release water if the water depth is high enough. Compute the depth *h* for which the gate will begin to open.



P 2.71