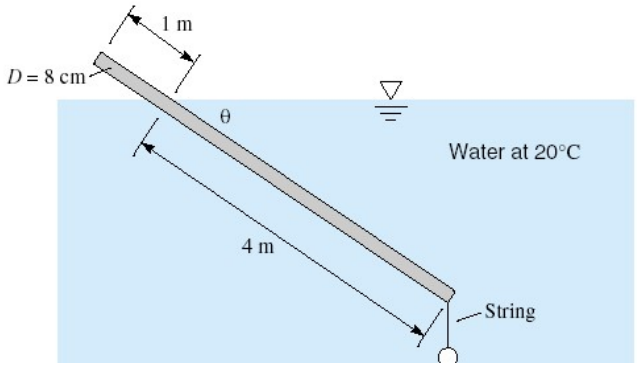
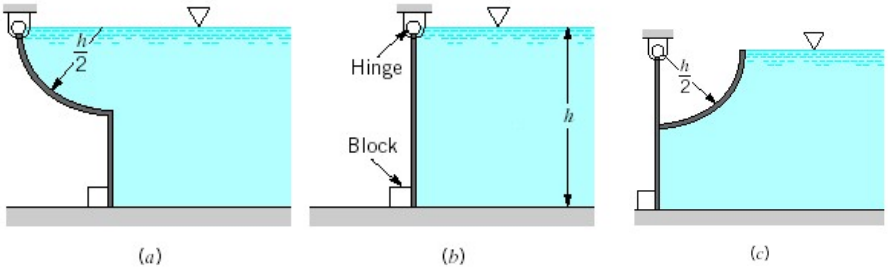
Fluid Mechanics
Assignment # 4

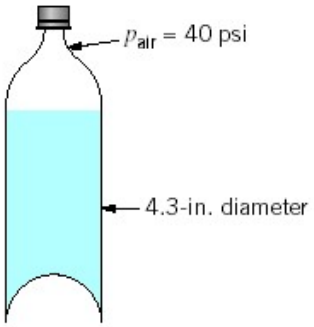
P1- The uniform 5-m-long round wooden rod in Fig. P2.3 is tied to the bottom by a string. Determine (*a*) the tension in the string and (*b*) the specific gravity of the wood. Is it possible for the given information to determine the inclination angle θ? Explain.



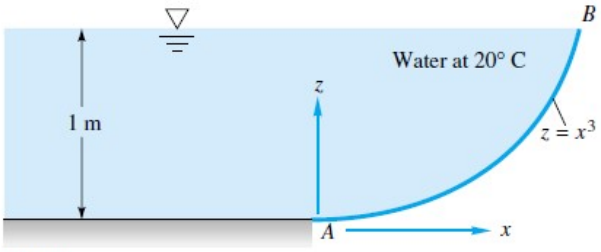
P2. Three gates of negligible weight are used to hold back water in a channel of width *b* as shown. The force of the gate against the block for gate (b) is *R*. Determine (in terms of *R*) the force against the blocks for the other two gates.



P3. What would be the magnitude, line of action, and direction of the resultant force acting on the hemispherical bottom? The air pressure in the top of the bottle is 40 psi, and the pop has approximately the same specific gravity as that of water (γ =62.4 lb/ft^3). Assume that the volume of pop remains at 2 liters.



P4- Determine (*a*) the total hydrostatic force on the curved surface *AB* in Fig. P2.84 and (*b*) its line of action. Neglect atmospheric pressure, and let the surface have unit width.



P5-

The hemispherical dome in Fig. P2.91 weighs 30 kN and is filled with water and attached to the floor by six equally spaced bolts. What is the force in each bolt required to hold down the dome?