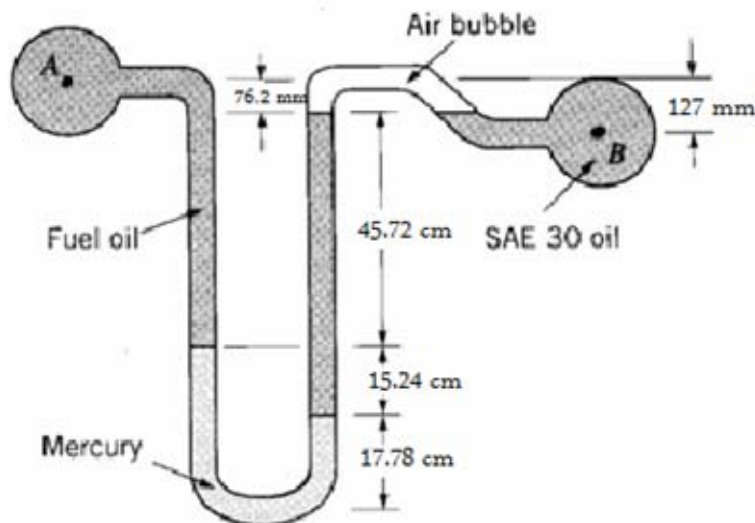


## Sheet 2

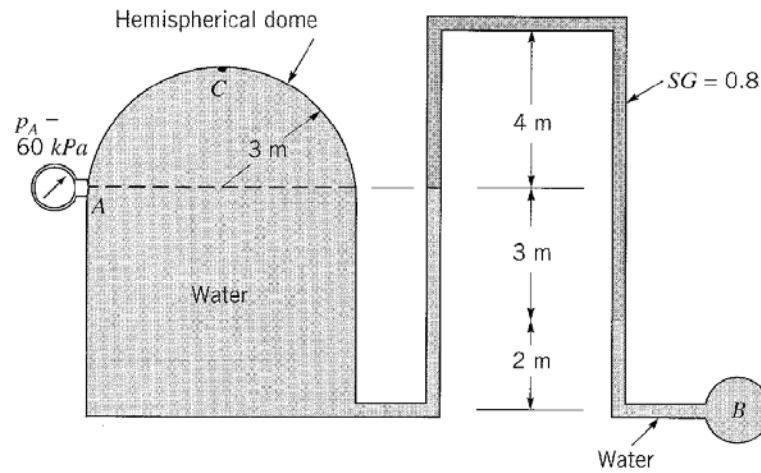
### Part I: Manometers

1. A mercury manometer is used to measure the pressure difference in the two pipelines of figure -11. Fuel oil (specific weight =  $6.68 \text{ N/m}^3$ ) is flowing in A and SAE 30 lube oil (specific weight =  $7.18 \text{ N/m}^3$ ) is flowing in B. An air pocket has become entrapped in the tube oil as indicated. Determine the pressure in pipe B if the pressure in A is 105.5 KPa.



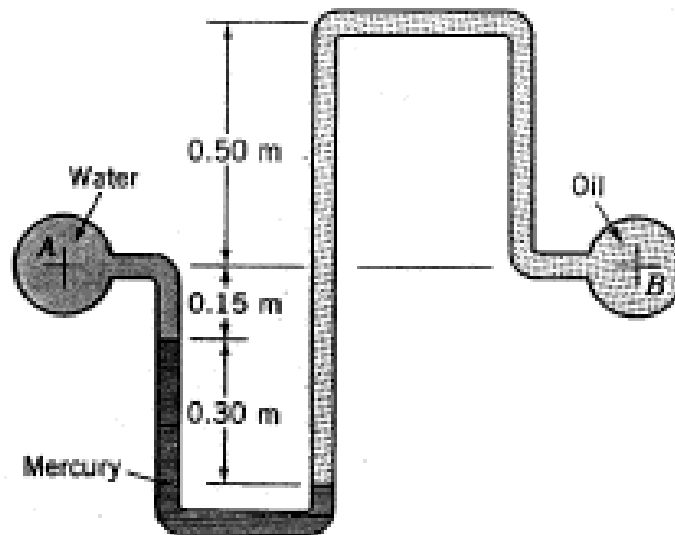
**Figure 1-1**

2. A closed cylindrical tank filled with water has a hemispherical dome and is connected to an inverted piping system as shown in figure 1-2. The liquid in the top part of the piping system has specific gravity of 0.8 and the remaining parts of the system are filled with water. If the pressure gauge reading at A is 60 kPa, determine (a) the pressure in pipe B, and (b) the pressure head in millimeters mercury at the top of dome (point C).



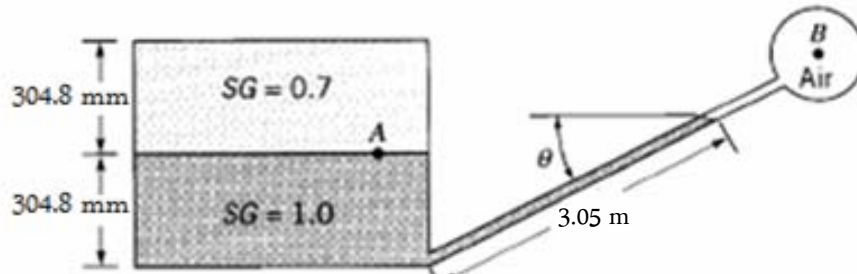
**Figure 1-2**

3. The mercury manometer of figure 3 indicates a differential reading of 0.3 in when the pressure in pipe A is 30 mm Hg vaccum. Determine the pressure in pipe B.



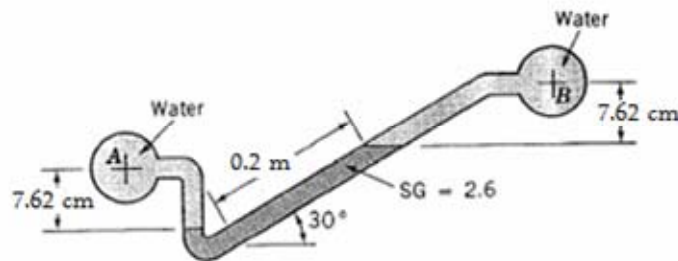
**Figure 1-3**

4. Determine the angle  $\theta$  of the inclined tube shown in figure 1-4 if the pressure at A is 689.5 KPa greater than at B.



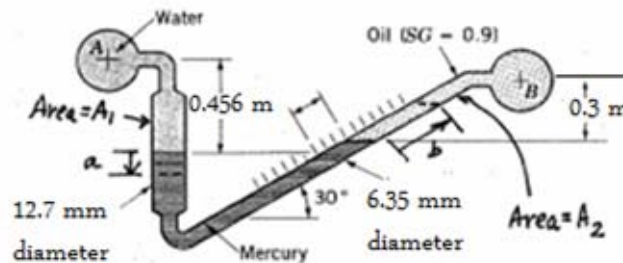
**Figure 1-4**

5. For the inclined-tube manometer of figure 1-5 the pressure in pipe A is 551.5 KPa. the fluid in both pipes A and B is water and the gauge fluid in the manometer has a specific gravity of 2.6. What is the pressure in pipe B corresponding to the differential reading shown?



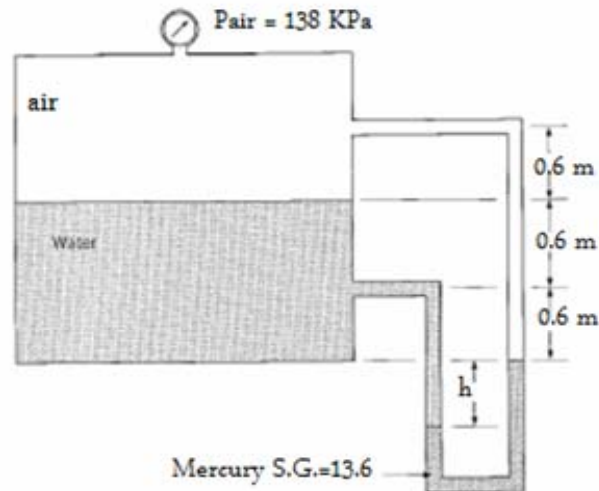
**Figure 1-5**

6. Determine the change in the elevation of the mercury in the left leg of the manometer of figure 1-6 as a result of an increase in pressure of 344.7 KPa in pipe A while the pressure in pipe B remains constant.



**Figure 1-6**

7. A U-tube mercury manometer is connected to a closed pressurized tank as illustrated in figure 1-7. If the air pressure is 138 KPa, determine the differential reading,  $h$ . The specific weight of the air is negligible.



**Figure 1-7**