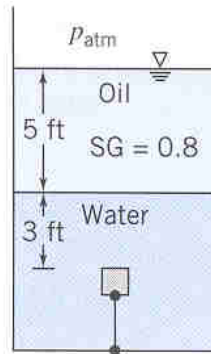


#1.

The deepest known point in the ocean is 11,034 m in the Mariana Trench in the Pacific. At this depth the specific weight of seawater is approximately  $10,520 \text{ N/m}^3$ . At the surface,  $\gamma = 10,050 \text{ N/m}^3$ . Estimate the absolute pressure at this depth, in *atm*.

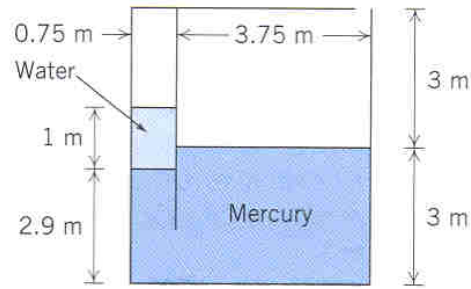
#2.

A 1 ft cube of solid oak is held submerged by a tether as shown. Calculate the actual force of the water on the bottom surface of the cube and the tension in the tether.



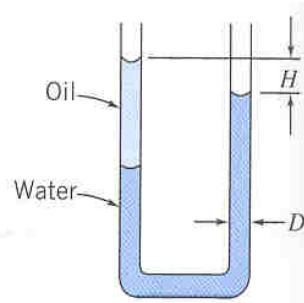
#3.

A partitioned tank as shown contains water and mercury. What is the gage pressure in the air trapped in the left chamber? What pressure would the air on the left need to be pumped to in order to bring the water and the mercury free surfaces level?



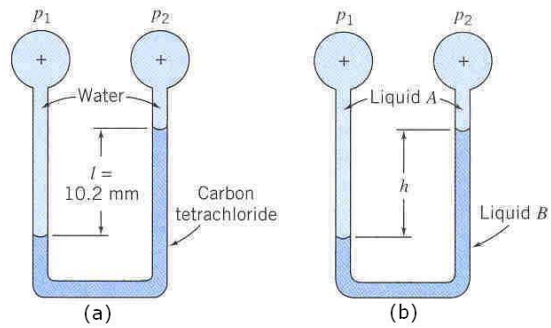
#4.

A manometer is formed from glass tubing with uniform inside diameter,  $D = 6.35$  mm, as shown. The U- tube is partially filled with water. Then  $V = 3.25$  cm<sup>3</sup> of Meriam red oil ( $SG = 0.827$ ) is added to the left side. Calculate the equilibrium height,  $H$ , when both legs of the U-tube are open to the atmosphere.



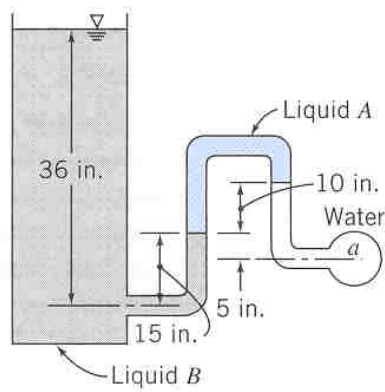
#5.

- a). Consider the two fluid manometer shown (Fig a). Calculate the pressure difference?  
b). The manometer shown contains two liquids (Fig b). Liquid A has  $SG = 0.88$  and liquid B has  $SG = 2.95$ . Calculate the deflection,  $h$ , when the applied pressure difference is  $p_1 - p_2 = 870 \text{ Pa}$ ?



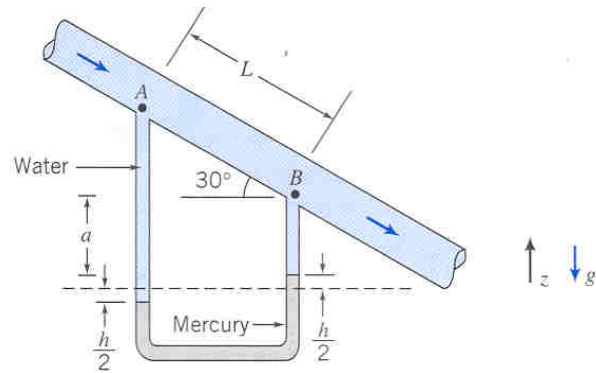
#6.

Determine the gage pressure in psig at point  $a$ , if liquid  $A$  has  $SG = 0.75$  and the liquid  $B$  has  $SG = 1.20$ . The liquid surrounding point  $a$  is water and the tank on left is open to the atmosphere.



#7.

Water flows downward along a pipe that is inclined at  $30^\circ$  below the horizontal, as shown. Derive an algebraic expression for the pressure difference. Evaluate the pressure difference if  $L = 5$  ft and  $h = 6$  in.



#8.

The inclined tube manometer shown has  $D = 3$  in. and  $d = 0.25$  in., and is filled with Meriam red oil. Compute the angle,  $\theta$ , that will give a 5 in oil deflection along the inclined tube for an applied pressure of 1 in. of water (gage). Determine the sensitivity of this manometer.

