CE 3305 Fluid Mechanics; Spring 2014
Quiz 5

1. A bubbler gage is a device that determines the surface level of a liquid by discharging a small amount of gas through a small tube, one end is submerged in the liquid, and a pressure gage is tapped into the tube to measure pressure of the gas.

   If the pressure on the gage in Figure 1 is 15 kPa, what is the depth of the liquid d in the figure?

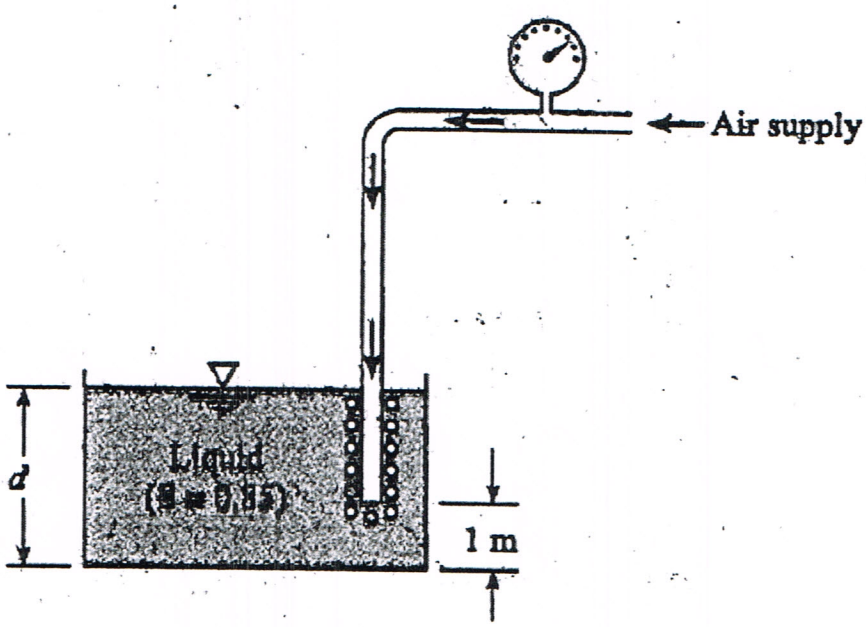


Figure 1: Sketch of bubbler in a tank. Notice the liquid is at S.G.=0.8

KNOWN:

$\rho g = 0.8(9800 N/m^3) = 7840 N/m^3$

$P = 15$ kN

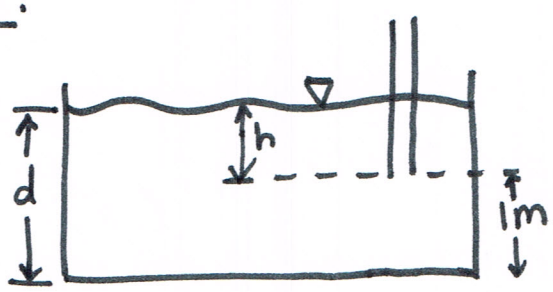
GOVERNING EQUATION:

$P = \rho g h$

UNKNOWN:

d

SKETCH:



SOLUTION:

$d = 1m + h$

$P = \rho g h$

$\therefore h = \frac{P}{\rho g} = \frac{15{,}000 N/m^2}{0.8(9800 N/m^3)} = 1.91$ meters

$d = h + 1 = 1.91 + 1 = \boxed{2.91 \text{ meters}}$