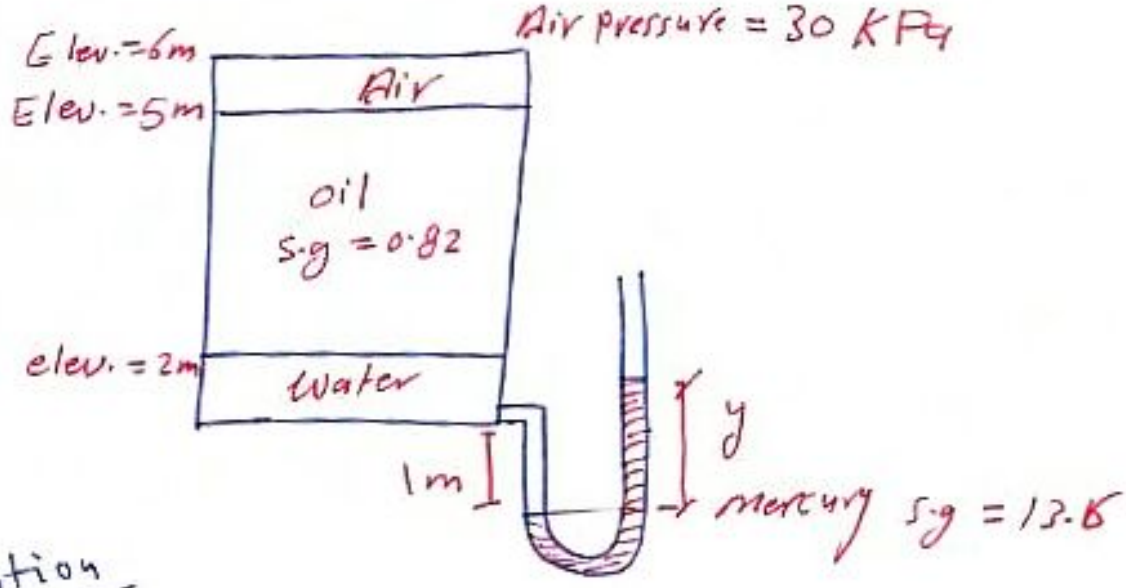
EX:

A manometer is attached to a tank containing 3 differen Fluid. What will be the difference in elevation of the mercur Colum in the manometer ?



Solution

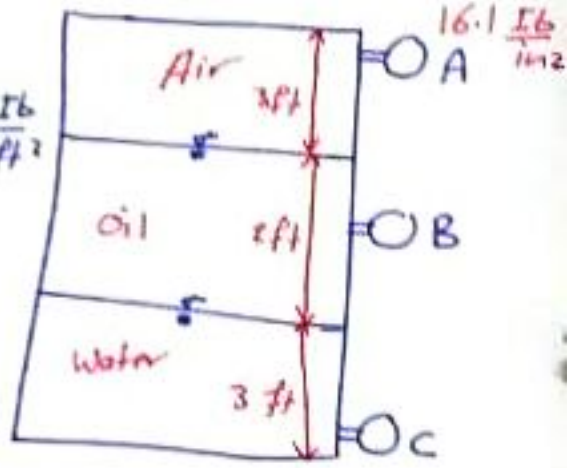
$$30 + (5-2)*9.81*0.82 + (2+1)*9.81 - y*9.81*13.6 =$$

$$y = 0.627\,m$$

Ex:- The air-oil. water system shown in fig. IF gauge (A) 16.1 Ib/in². and gauge (B) reads (2Ib/in²) less than gauge (C) compute (1) The specific weight of the oil ?

$\gamma_{air} = 0.075 \frac{Ib}{ft^2}$ (2) The reading of the gauge. C

Solution



(1) $P_A = 16.1 \frac{Ib}{in^2} * 144 \frac{in^2}{ft^2} \Rightarrow P_A = 2318.4 \frac{Ib}{ft^2}$

$P_B = P_A + (\gamma_{air} * h) + (\gamma_{oil} * h)$

$P_B = 2318.4 + (0.075 * 3) + (\gamma_{oil} * 2)$

$P_B = 2318.4 +$

$P_B = 2318.625 + 2 * \gamma_{oil}$ ----- (1)

$P_C = P_B + (\gamma_{oil} * h) + (\gamma_{water} * h)$

$P_C = P_B + (\gamma_{oil} * 2) + (62.4 * 3)$ ----- (2)

$P_C = P_B + \left(2 \frac{Ib}{in^2} * 144 \frac{in^2}{ft^2}\right)$

$P_C = P_B + 288$ ---- (3) Sub. eq (3) in eq (2)

$P_B + 288 = P_B + (2 * \gamma_{oil}) + (62.4 * 3)$

$\therefore \gamma_{oil} = 50.4 \frac{Ib}{ft^3}$

$\gamma_{oil} = 50.4 \frac{lb}{ft^3}$ Sub in eq. (1)

$P_B = 2318.625 + 2 \times \gamma_{oil}$ -- (1)

$P_B = 2318.625 + (2 * 50.4)$

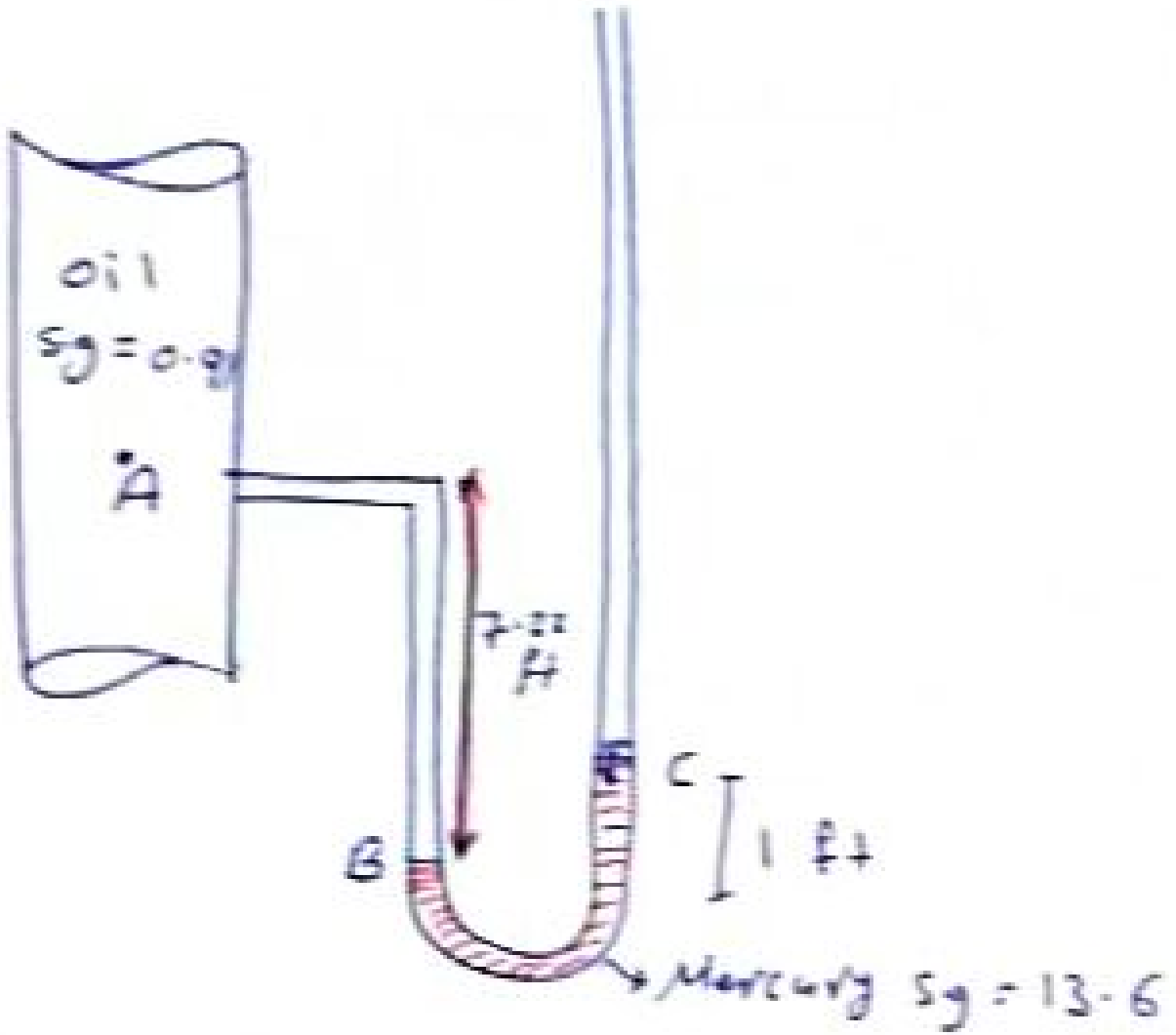
$P_B = 2419.425 \frac{lb}{ft^2}$ --- Sub in eq. (

$P_c = P_B + 288$ ---(3)

$= 2419.425 + 288$

$= 2707.425 \frac{lb}{ft^2}$

Ex: For the Vertical Pipe with manometer attached.
Find the Pressure at point A ?



Ex:- Calculate the pressure in (KPa) at A, B, C & D

Neglecting air.