HW 2.2.

6. True, absolute Pressure will always be postive, whereas gauge pressure can be negative
7. False, atmospheric pressure varies with elevation. It is not 14.7 psia everywhere
8.

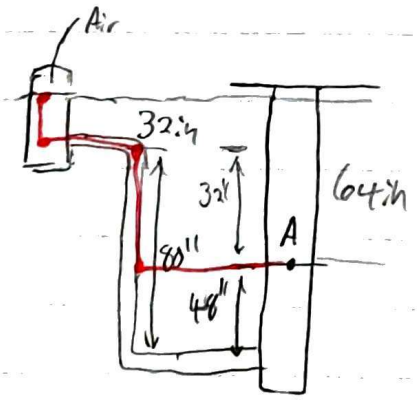
a.

10.

11. 12.7 psia ✓

13. 0 gauge Pressure ✓

41.



$P_A - \gamma_{oil} \cdot 5.33ft = P_{Air}$

$180 psig - 56.16 \frac{lb}{ft^3} \cdot 5.33 ft \cdot \frac{ft^2}{144 in^2} = P_{Air}$

$177.92 \frac{lb\ gage}{in^2} = P_{air}$

$P_{air} = 177.92 psig$ ✓

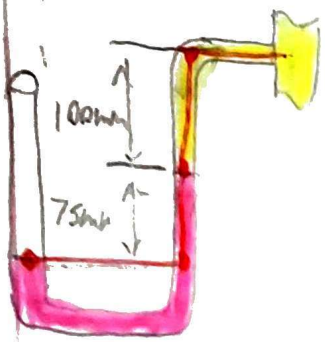
$A = 180 psig$

$Sg_{oil} = 0.90$

$64 in \cdot \frac{1 ft}{12 in} = 5.33 ft$

$\gamma_{oil} = 0.90 \cdot 62.4 lb/ft^3 = 56.16 lb/ft^3$

62. Calculate Pressure at A in kPa (gauge)



$\gamma_{oil} = 13.54 \cdot 9.81 \frac{KN}{m^3} = 132.82 \frac{KN}{m^3}$

$P_A = 9.81 \frac{KN}{m^3 2} \cdot 100\,mm \cdot \frac{1\,m}{1000\,mm} + 132.82 \frac{KN}{m^3 2} \cdot 75\,mm \cdot \frac{1\,m}{1000\,mm}$

$P_A = 10.94 \frac{KN}{m^2}$

$\boxed{P_A = 10.94\ KPa}$

83. $P_{atm} = 30.65$ in of mercury $\quad P_{atm} = psia?$

$P_{atm} = \gamma \cdot h$

$P_{atm} = 844.9 \frac{lb}{ft^3} \cdot \frac{ft^3}{1728\,in^2} \cdot 30.65\,in$

$\boxed{P_{atm} = 14.99\ psia}$ ✓

90. $P = -68.2\ KPa \quad P = mmHg?$

$P = \gamma \cdot h \qquad \frac{P}{\gamma} = h$

$h = \frac{-68.2\ KPa}{132.8 \frac{KN}{m^3}} = \frac{-68.2 \frac{KN}{m^2}}{132.8 \frac{KN}{m^3}} \cdot \frac{1000\,mm}{1\,m} = -513.55\ mm\,Hg$

$\boxed{P = -513.55\ mm\,Hg}$

94. $P = \gamma \times h$

$= 9.81 \frac{KN}{m^3} \cdot 16\,m$

$P = 155.96 \frac{KN}{m^2}$

$\boxed{P = 155.96\ KPa}$