| MET 330 | HW 1.2 | Group 1 |
|---|---|---|

11.) $\Delta P = \gamma h$ $\quad \gamma = 0.076$ lb/ft$^3$ $\quad h = 4000$ ft $\quad P = 14.7$ atm

$\Delta P = (0.076)(4000) = 304$ lb/ft$^2$ $\times$ (ft$^2$/144 in$^2$)

$\Delta P = 2.11$ psi $= 14.7$ atm

$P = 12.59$ psi

13.) Ogage, since it is at 1 atm pressure at the surface

41.) $P_{air} + (\gamma_{oil} h) = 180$ psig $\quad \gamma = 0.9$

$P_{air} + (0.90) \times [32 + (80 - 48)] = 180$ psig

$P_{air} = 180 - 57.6$

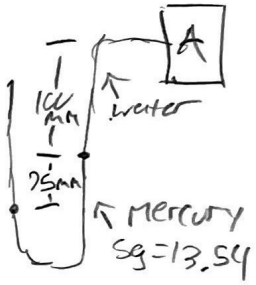
$P_{air} = 122.4$ psi

62.) $P_2 = P_A + \rho_w g h_1 + \rho_m g h_2$

$= P_A + (1000 \times 9.81 \times 0.1\text{m}) + (13600 \times 9.81 \times 0.075\text{m})$

$= P_A + (981) + (10,006.2)$

$\Rightarrow P_2 = P_A + 10,987.2 \quad \Rightarrow P_A = 10,987.2$ Pa




6.) True

7.) False, atmospheric pressure will also change

8.) False, the absolute pressure is always positive, perfect vacuum is 0

9.) True

10.) False, atmospheric pressure near surface is 101 kPa

83.) $P_{atm} = 30.65$ in of Hg $\quad$ 1 in of Hg $= 0.49$ psia

$P_{atm} = 30.65 \times 0.49$

$P_{atm} = 15.018$ psia

90.) $P = -68.2$ kPa

$68.2$ kPa $\times 1000 = 6,820$ Pa

$\frac{6,820 \text{ Pa}}{133.322} = 511.543$ mm Hg

1 kPa $= 1000$ Pa

133.322 Pa $= 1$ mm Hg

94.) $P_1 + \frac{1}{2}\rho V_1^2 + \rho g h_1 = P_2 + \frac{1}{2}\rho V_2^2 + \rho g h_2$

$P_a + \rho g \times 16\text{m} = P_2$

$P_2 = P_a + 1000 \times 9.81 \times 16$

$= P_a + 156960$ Pa

$P_{2\,gage} = P_2 - P_a$

$= 156900$ Pa $\times 0.001$

$= 156.96$ kPa

$P_{min} = 156.96$ kPa