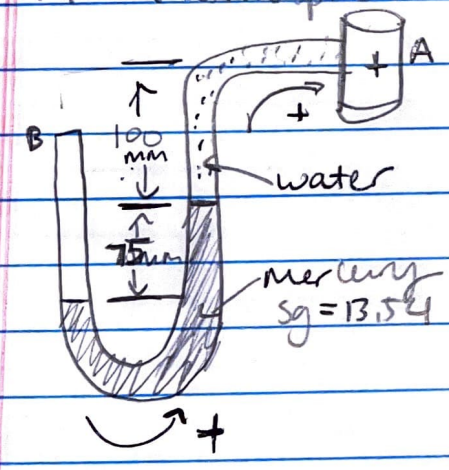
Dylan Arnold HW2 University ID: 01166349
MET 330
May 23rd, 2023
Summer 2023

3.7. **False.** The atmospheric pressure on the surface of the Earth ranges from 13.8psia to 15.3 psia

3.11. At 4000ft elevation, atmospheric pressure to be approximately 12.7psia. An increase of 1000ft elevation = decrease of 3.4kPa (0.5psi). 0.5 x 4 = 2.0
14.7 (atmospheric @ earth surface - 2.0) = **12.7psia**

3.62



Calculate pressure in kPa (gage)
$P_A - P_b$

75/25.4 = 2.953in/12 = 0.246063ft
100/25.4 = 3.937in/12 = 0.32808ft

$\gamma_{water} = 62.4 lb/ft^3$
$\gamma_{mercury} = 13.54 \cdot 62.4 lb/ft^3 = 844.896 lb/ft^3$

$P_A - P_b = (844.896 lb/ft^3 \cdot 0.246063ft) + (62.4 lb/ft^3 \cdot 0.32808ft)$
$= 228.371 lb/ft^2$

$$\frac{47.88Pa}{lb/ft^2} \cdot \frac{0.001kPa}{1Pa} = \frac{0.04788kPa}{lb/ft^2} \cdot \frac{228.371 lb/ft^2}{1} = \boxed{10.93kPa}$$

Dylan Arnold
MET 330
HW2
UID: 01166349

3.33. 30.65 in mercury
Calculate atm pressure in psia

$p_{atm} = \gamma_m h$

$\gamma_m = 848.7\ lb/ft^3$

$h = 30.65\ in$

$$p_{atm} = \frac{848.7\ lb}{ft^3} \times 30.65\ in \times \frac{1\ ft^3}{1728\ in^3}$$

$$p_{atm} = 15.05\ lb/ft^2 = \boxed{15.05\ psia}$$