# PRESSURE

SPH4C

# MEASURING GAUGE PRESSURE

- Absolute pressure
  - The true pressure, or the sum of the atmospheric and gauge pressure
  - $p_{abs}$
- Gauge pressure
  - The difference between the absolute pressure and the atmospheric pressure
  - $p_g$

# FORMULA

$$p_g = p_{abs} - p_{atm}$$

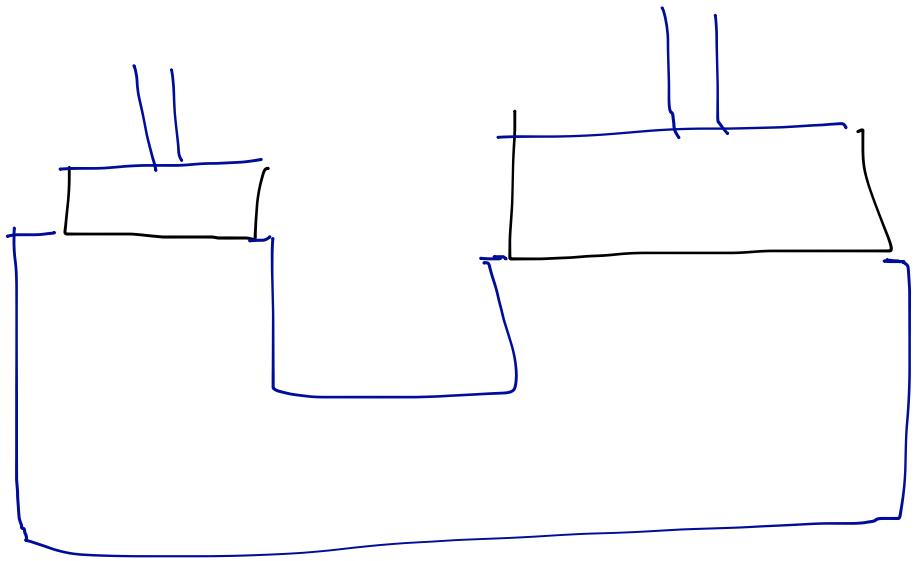
$$p_{abs} = p_g + p_{atm}$$

# PASCAL'S PRINCIPLE

- Pressure applied to an enclosed liquid is transmitted equally to every part of the liquid and walls of the container

- $p_{small} = p_{large}$

$$\frac{F_{small}}{A_{small}} = \frac{F_{Large}}{A_{large}}$$



Pg. 244 #5.

$P_g = 205\ kPa$

$P_{atm} = 101\ kPa$

$P_{abs} = P_g + P_{atm}$

$= 205\ kPa + 101\ kPa$

$P_{abs} = 306\ kPa$

# Pg. 249 #4

$F_S = 2.2 \times 10^3 N$ $A_L = 2.0 m^2$

$A_S = 0.10 m^2$

Given: $F_S = 2.2 \times 10^3 N$ Unknown: $F_L$

$A_S = 0.10 m^2$

$A_L = 2.0 m^2$

mass associated with $F_L$

Steps

$P_S = P_L$

$\frac{F_S}{A_S} = \frac{F_L}{A_L}$

$\frac{2200 N}{0.10 m^2} = \frac{F_L}{2.0 m^2}$

$\frac{22000 N}{m^2} = \frac{F_L}{2.0 m^2}$

$2.0 \cancel{m^2} \times 22000 \frac{N}{\cancel{m^2}} = F_L$

$44000 N = F_L$

$1 N = 1 kg \frac{m}{s^2}$

b) $F = mg$ ($g = 9.8 \frac{m}{s^2}$)

$44000 N = m\left(9.8 \frac{m}{s^2}\right)$

$44000 kg \frac{m}{s^2} = m\left(9.8 \frac{m}{s^2}\right)$

$\frac{44000 kg \frac{m}{\cancel{s^2}}}{9.8 \frac{m}{\cancel{s^2}}} = m$

$m = 4490 kg$