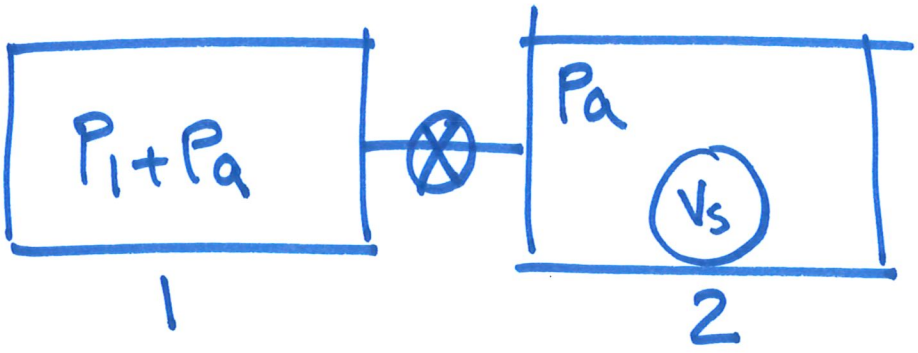
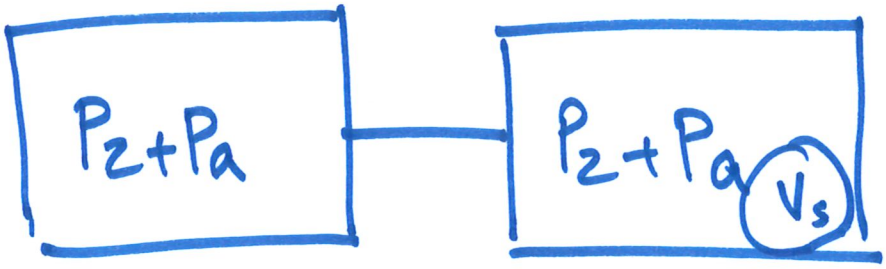
9/7/23

Example:



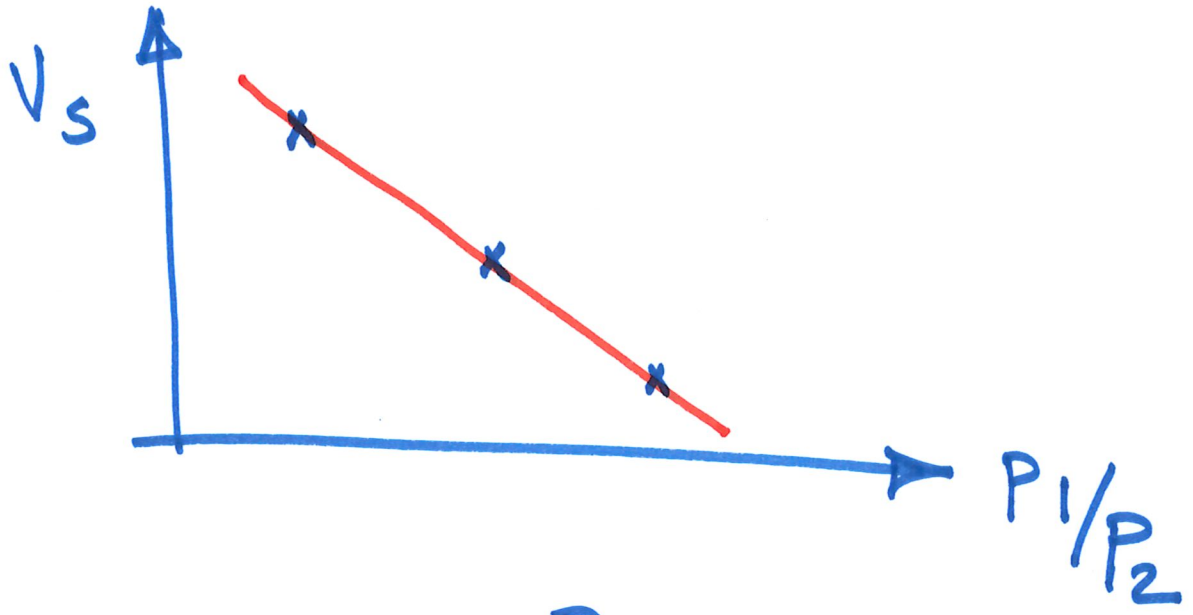


$$(P_1+P_a)V_1 + P_a(V_2-V_s)$$

$$= (P_2+P_a)(V_1+V_2-V_s)$$

$$\Rightarrow \boxed{V_s = (V_1+V_2) - \frac{P_1}{P_2}V_1}$$

V_s = Y, $\frac{P_1}{P_2}$ = X



$$V_s = -25.3 \frac{P_1}{P_2} + 75.5$$

$V_1 = 25.3 \text{ cm}^3$

$V_2 = 50.2 \text{ cm}^3$

$V_b = 32 \text{ cm}^3$

(c) $\phi = ?$

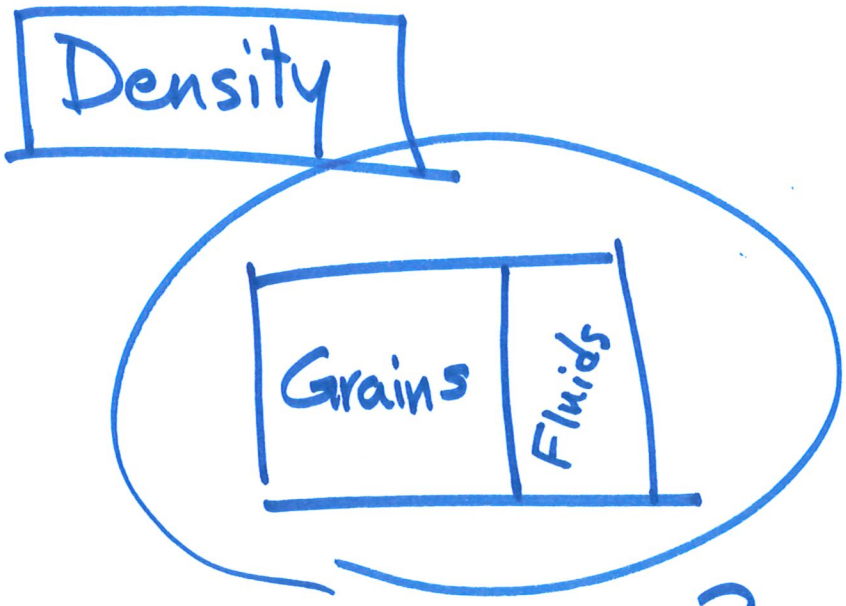
$P_2 = 50.4 \text{ psig}$

$P_1 = 100 \text{ psig}$

$$V_s = -25.3 \frac{100}{50.4} + 75.5$$

$$\rightarrow V_s = 25\ cm^3$$

$$\phi = \frac{V_b - V_s}{V_b} = \underline{21\%}$$



$$\rho_b \xrightarrow{?} \phi$$

$$\rho_b = \phi(\rho_f) + (1-\phi)\rho_m$$

$$\phi = \frac{\rho_b - \rho_m}{\rho_f - \rho_m}$$

$$\rho_m = \sum C_i \rho_i$$

$$\rho_f = S_w \rho_w + (1-S_w)\rho_{HC}$$