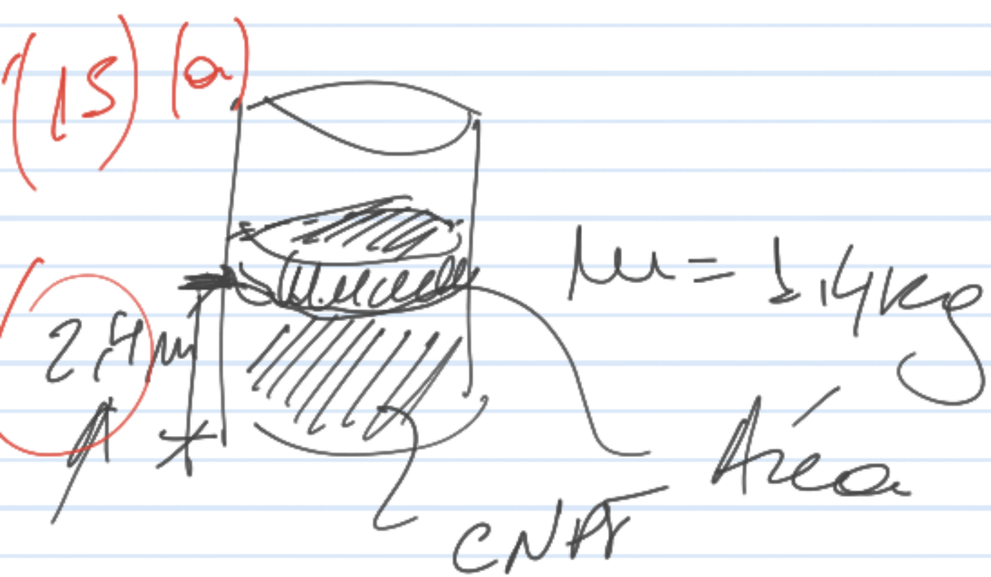
Universidad Nacional de Río Negro
Física III B – 2021

- **Unidad** 02
- **Clase** U02 C01 - 07/30
- **Fecha** 09 Abr 2021
- **Cont** Primer principio
- **Cátedra** Asorey - Calderón
- **Web** https://gitlab.com/asoreyh/unrn-f3b

RIO NEGRO

Notas de clase

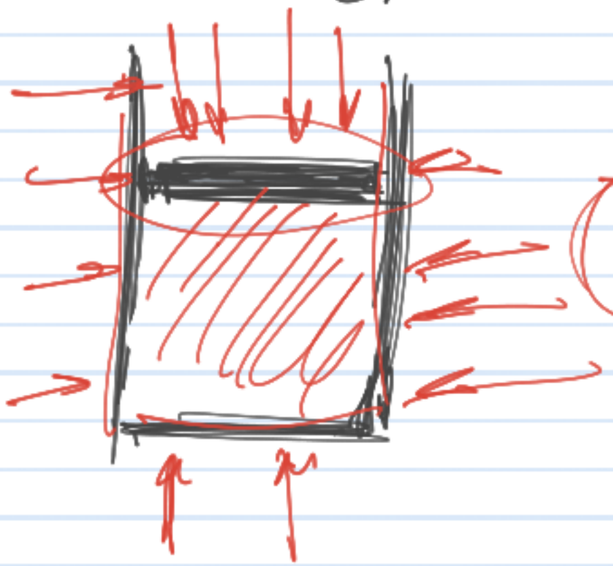
(15) (a)



$m = 1,4\,kg$

Área

$PV = nRT$

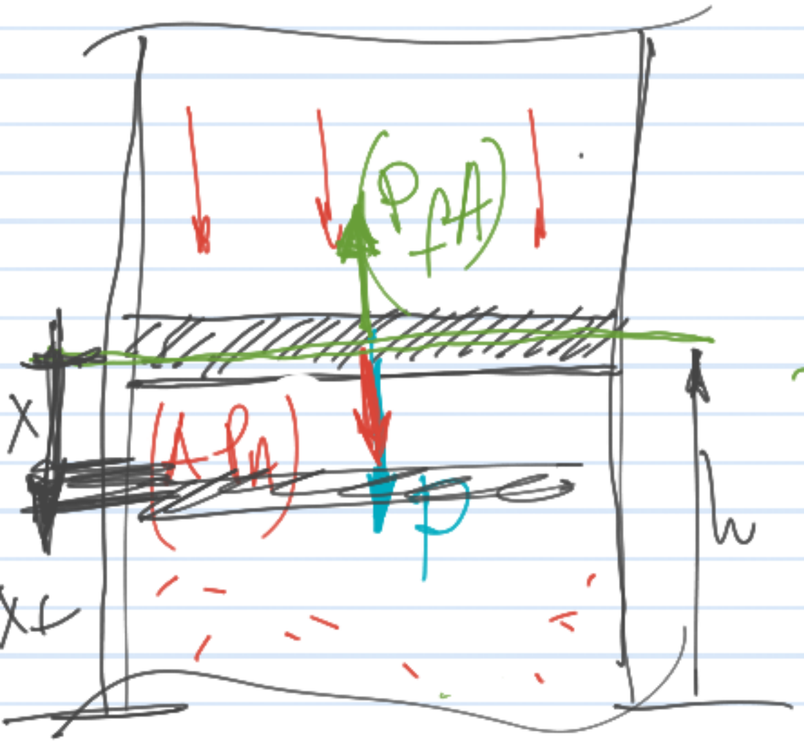


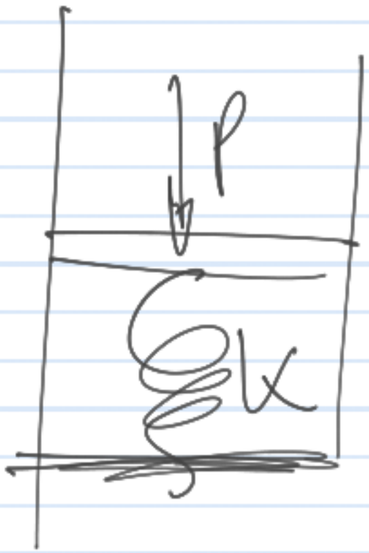
$$\frac{F}{A} = p = \frac{mg}{A}$$

$$p_f = p_{Atm} + \frac{mg}{A}$$

$$p_f = 116034\ Pa$$

$$h_f = 2,1\,m$$





$$pV = nRT \overset{cte}{=} p(t)V(t) = cte = p_f V_f \qquad t=0$$

$$p(t) = \frac{p_f V_f}{V(t)} = \frac{p_f \cancel{A} h}{\cancel{A}(h-x)} \Rightarrow \boxed{p(t) = \frac{p_f}{1 - x/h}} \qquad x \ll h$$

$$\left(\frac{1}{1-\epsilon}\right)^n = (1-\epsilon)^n \quad \text{x Taylor} \simeq 1 + n\epsilon \qquad n=-1 \quad (1-\epsilon)^{-1} = 1-\epsilon$$

$$p(t) = p_f' \left(1 + x(t)/h\right)$$

$$\ddot{x} = -\omega^2 x$$

$$\frac{d^2x}{dt^2} = a$$

$$F = mg + p_A \cdot A - p(t) \cdot A = ma$$

$$\left(\frac{mg}{A} + p_A\right) = p_f$$

$$\left(\frac{mg}{A} + p_A\right) \cdot A = p_f \cdot A$$

$$F = ma = p_f \cdot A - p(t) \cdot A = \left[p_f - p(t)\right] A$$

$$ma = -\left(p(t) - p_f\right) A$$

$$ma = -\left[p_f \left(1 + \frac{x}{h}\right) - p_f\right] \cdot A$$

$$\Rightarrow ma = -\left\{p_f + x p_f/h - p_f\right\} \cdot A$$

$$\ddot{x} = -\omega^2 x$$

$$m a = -\frac{p_f \cdot x}{h} \cdot A \Rightarrow a \equiv \ddot{x} = -\underbrace{\left(\frac{p_f \cdot A}{h \cdot m}\right)}_{\omega^2} \cdot x(t)$$

$$\omega = \sqrt{\frac{p_f \cdot A}{h\, m}}$$

$$\omega = 6{,}07 \ \frac{rad}{s} \qquad f = \frac{\omega}{2\pi} = 0{,}966 \ Hz$$

$$\tau = \frac{1}{f} = 1{,}045$$

CO_2 $\quad c = \frac{C}{M}$

gas ideal triatomicos

$\rightarrow C_V = \frac{7}{2}R = \frac{6}{2}R = 3R$

$\rightarrow C_p = C_{V,1} + R = 4R = \frac{7+2}{2} \cdot R$

$c_V = C_V / M = \frac{3R}{44\ g/mol} = 0{,}5668\ \frac{J}{gK}$

C_p