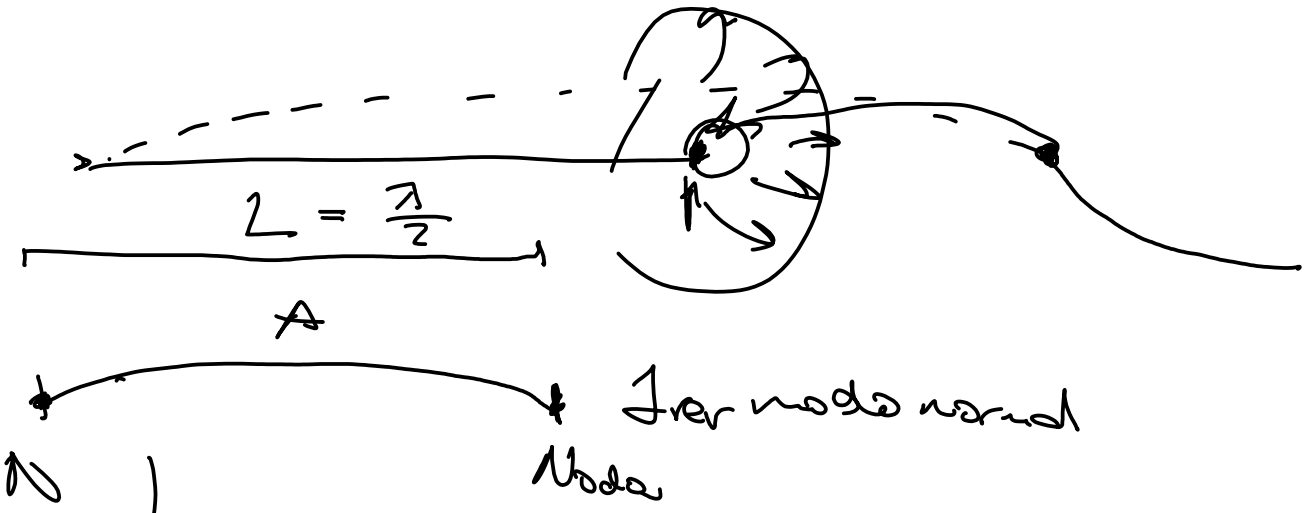
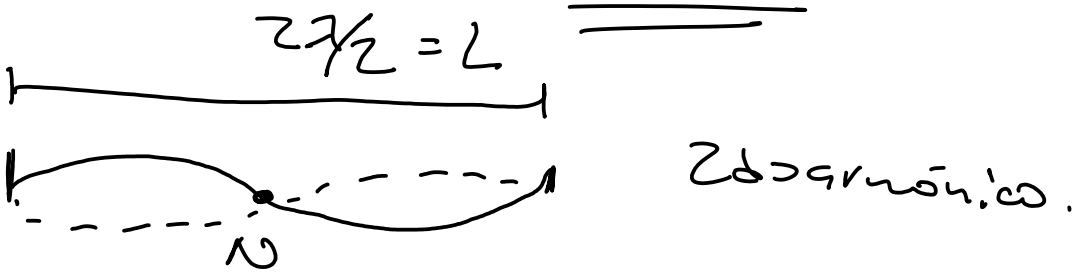
TALLER 7

Modos Normales. → Resonancia.

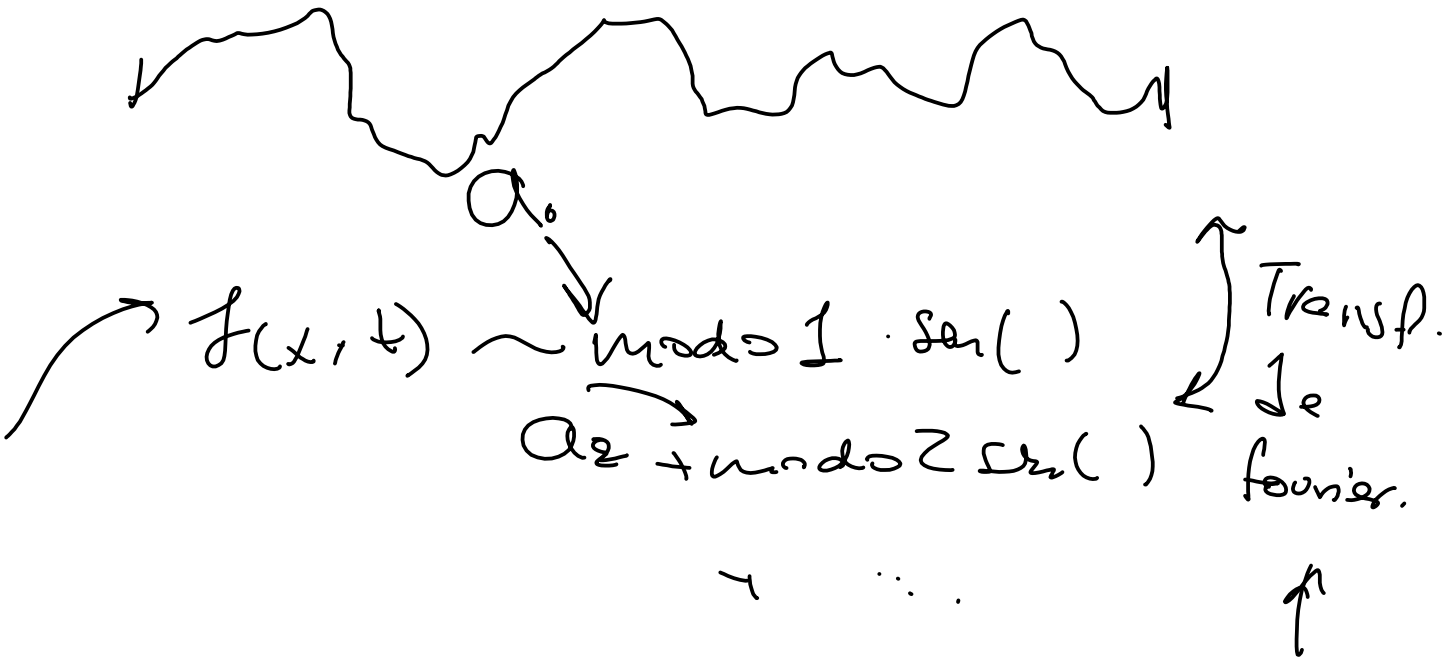




$$L = n\frac{\lambda}{2} \rightarrow \lambda_n = \frac{2L}{n}$$

$$f_n = n\frac{v}{2L} = n f_1$$

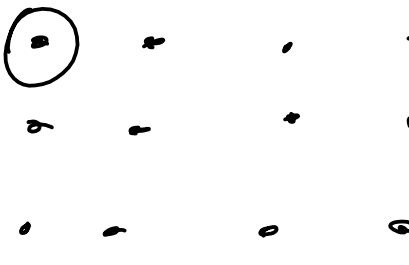
$$\rightarrow \boxed{f_n = n f_1}$$



$$\rightarrow \quad 1 + \frac{1}{2} + \frac{1}{3} + \frac{1}{4} + \cdots$$

Sonido

Aire.



$$y(x,t) = A\cos(kx - \omega t)$$

$p(x,t) = ?$

Esfuerzo

$$B = -\frac{p(x,t)}{dV/V}$$

$$\frac{\Delta V}{V} = \frac{\partial y(x,t)}{\partial x}$$

Derivada parcial.

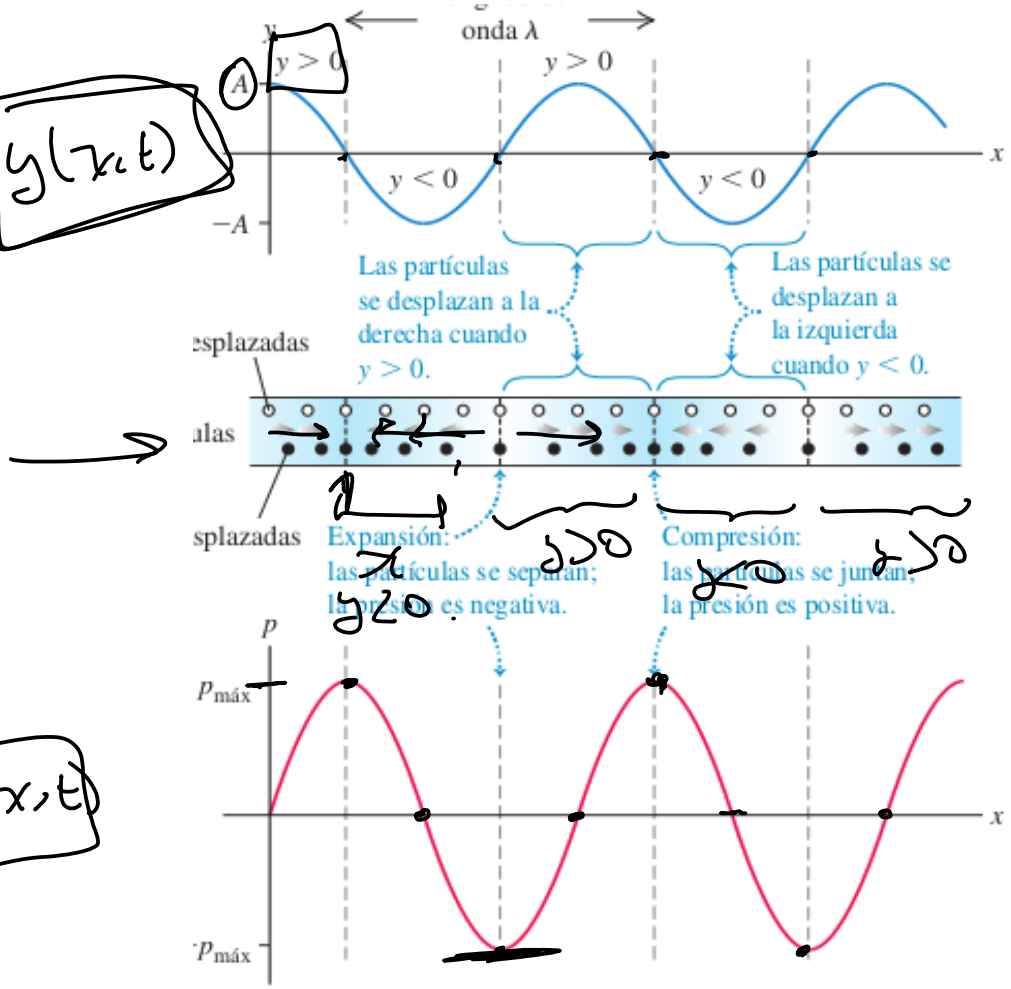
Ampl.

$$p(x,t) = BkA\cos(kx-\omega t)$$

$\pi/2$

$$y(x,t) = A\operatorname{sen}(kx-\omega t)$$

$y(x,t)$



$t \rightarrow$ fijo.

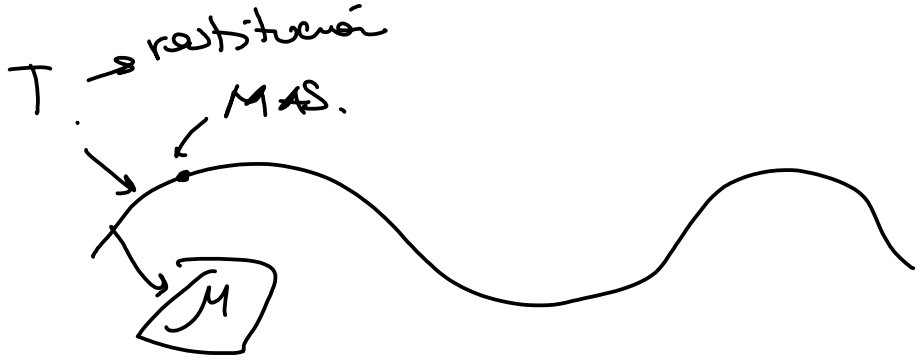
$p(x,t)$

Velocidad de las ondas.

$$v = \sqrt{\frac{F}{\mu}}$$

μ → densidad lineal de masa

Para cualquier onda.



$$v = \sqrt{\frac{\text{F. restitución}}{\text{Medida de inercia}}}$$

Así

$$v = \sqrt{B/\rho}$$

Solido

$$v = \sqrt{Y/\rho}$$

Gas ideal

$$v = \sqrt{\frac{\gamma RT}{M}}$$

¿Cómo funciona un ultrasonido?

~0 → 20,000 Hz 125,000 Hz

OH. Sonares.

0.7 → 3.3 MHz

U.S.