Hoy

$$y = f(x - ct)$$

$$y = A \operatorname{sen}\left(2\pi\left(\frac{x}{\lambda} - \frac{t}{T}\right)\right)$$

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

$$\Rightarrow \boxed{C = \frac{\omega}{k}}$$

$k = \frac{2\pi}{\lambda}$: N° de Onda

$\omega = \frac{2\pi}{T}$: frecuencia

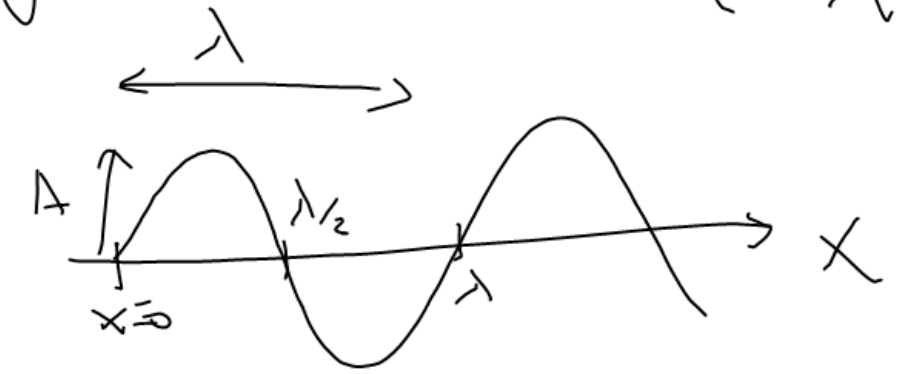
$$y = A \operatorname{sen}(Kx - \omega t)$$

$$y(x,t) = y = A \operatorname{sen}\left(2\pi\left(\frac{x}{\lambda} - \frac{t}{T}\right)\right)$$

λ: Longitud de onda

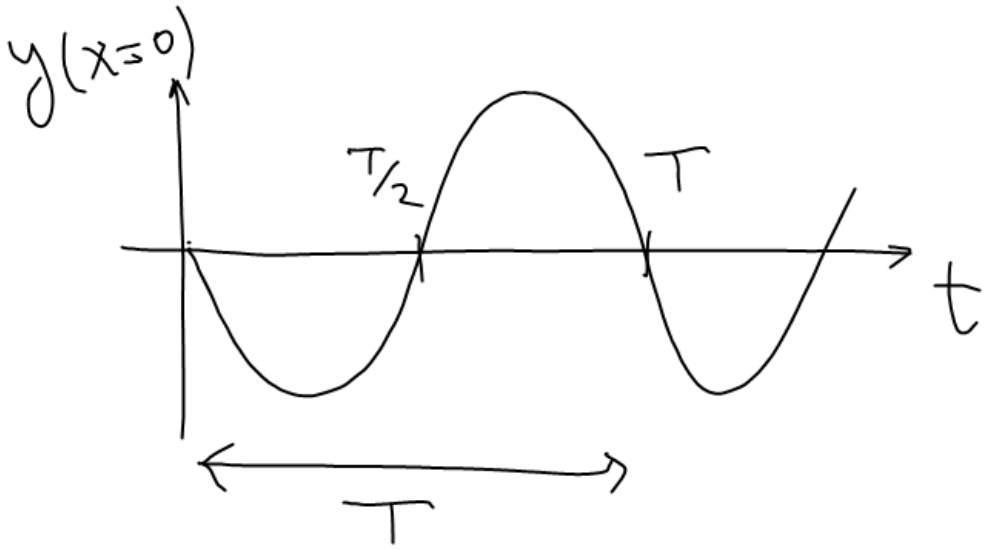
T: Periodo.

Para $t = 0$ $\quad y(x, t=0) = A \operatorname{sen}\left(2\pi \frac{x}{\lambda}\right)$



$$y(x,t) = A \operatorname{sen}\left(2\pi\left(\frac{x}{\lambda} - \frac{t}{T}\right)\right)$$

$$y(x=0,t) = A \operatorname{sen}\left(-2\pi \frac{t}{T}\right)$$



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

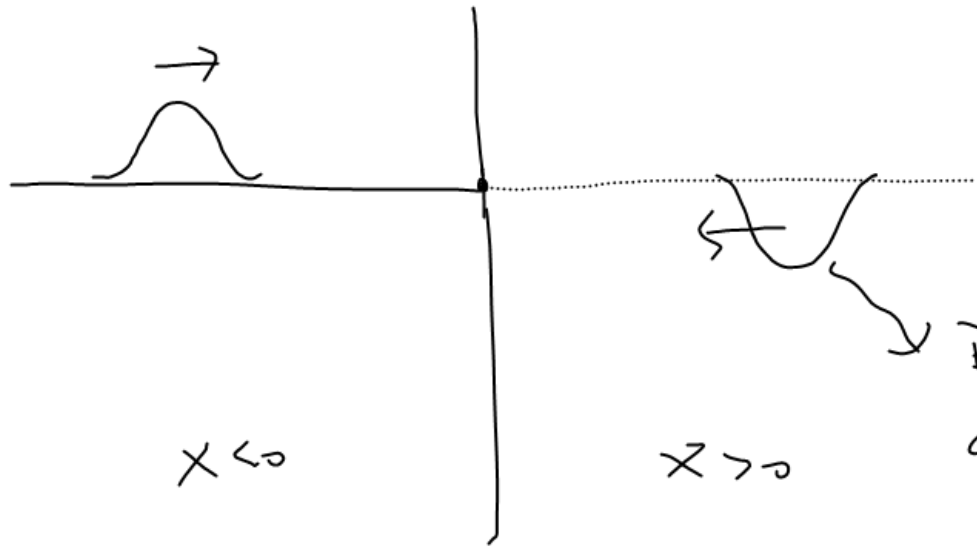
$$C = \frac{\omega}{k} = \sqrt{\frac{T}{\mu}}$$

$$C = \frac{\lambda}{T}$$

Notar que λ NO es independiente de T

Ej: $C = 1 = \frac{1\,m}{1\,seg} = \frac{10\,m}{10\,seg}$

$t < 0$



Pulso invertido

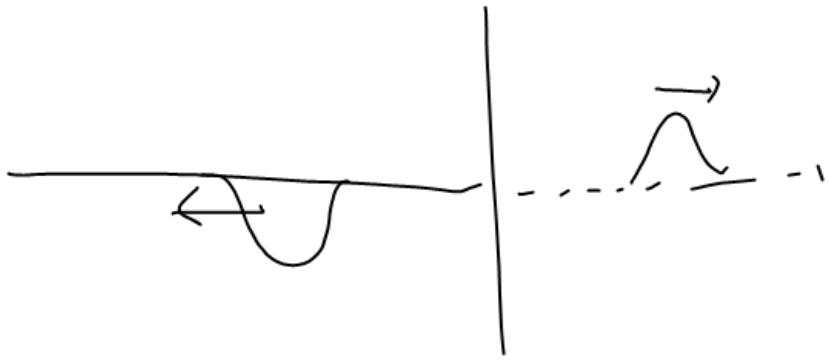
$x < 0$ $x > 0$

$x = 0$

garantiza

$y(x=0,t) = 0 \quad \forall t$

$t > 0$



Cuerda fija en un punto

K: cualquiera ← $y(x,t) = A \operatorname{sen}(\omega t) \operatorname{sen}(Kx)$ ✓

Cuerda fija en $x=0$ y $x=L$

$y(x=0,t)=0$ trivial

$\forall t$

$$\begin{cases} y(x=L,t)=0 \\ \hookrightarrow \operatorname{sen}(K \cdot L)=0 \rightarrow \end{cases}$$

$KL = n\pi$

Entonces

HdA

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

COMO ~~ES~~ SI

$$kL = n\pi \rightarrow k = \frac{n\pi}{L}$$

k_n, λ_n

$\omega_n \quad T_n$

↓

MODOS NORMALES

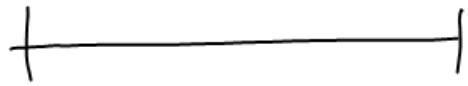
$$\frac{2\pi}{\lambda_k} = k_n = \frac{n\pi}{L}$$

$$\boxed{\lambda_n = \frac{2L}{n}}$$

Cuerda de 1.5 m "pesa" 6 gr

Portamesa 12.8 gr

MODOS NORMALES:



$$\rightarrow \quad \lambda_n = \frac{2L}{n} \qquad n = 1, 2, \cdots$$

$$C = \frac{\lambda_n}{T_n}$$

$$\rightarrow \quad T_n = \frac{2L}{nC} \Rightarrow \omega_n = \frac{nC\pi}{L}$$