

Determinar A y B:

$$\frac{\partial^2 \phi}{\partial x^2} = 6 \underbrace{Ax}_{\forall x} = kx \Rightarrow A = k/6$$

$$\phi(1) = 0 \Rightarrow A + B = 0 \Rightarrow B = -k/6$$

$$\Rightarrow \phi(x) = \frac{k}{6} (x^3 - x)$$

ahora solo basta encontrar $y(x,t)$; y luego

$$u(x,t) = y(x,t) - \phi(x)$$

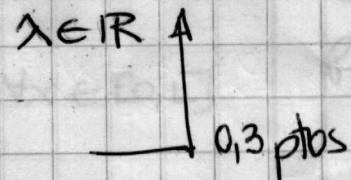
Por Separación de Variables:

$$y(x,t) = X(x) \cdot T(t);$$

$$(3) \Rightarrow \frac{\partial^2 T(t)}{\partial t^2} \cdot X(x) - \frac{\partial^2 X(x)}{\partial x^2} \cdot T(t) = 0 \quad / \div T(t) \cdot X(x)$$

$$\Rightarrow \frac{\partial^2 T}{\partial t^2} / T - \frac{\partial^2 X}{\partial x^2} / X = 0$$

$$\Rightarrow \frac{\partial^2 T}{\partial t^2} / T = \frac{\partial^2 X}{\partial x^2} / X = \lambda$$



obviamente buscamos la solución no trivial:

$$\lambda = 0 \Rightarrow \frac{\partial^2 T}{\partial t^2} = \frac{\partial^2 X}{\partial x^2} = 0 \quad \text{con C.B. nulas}$$

$$\Rightarrow X(x) = 0 \wedge$$

$$T(t) = 0$$

$$\Rightarrow \text{no sirve } \lambda = 0$$

$\lambda > 0$ produce soluciones exponenciales que no se anulan Z veces \Rightarrow No cumple C.B. \Rightarrow solución trivial

0,2 ptos