

Papelera de reciclaje

MPLAB IDE v8.89

WorkSpace

eBeam Tool Palette

PROFESOR

Audacity

Notepad++

CodeBlocks

GeoGebra 6

Bitvise SSH Client

PSeInt

Computer-Thermody...

Graficadora

Google Earth Pro

R 4.4.1

Dev-C++

RStudio

Maple 2023

VLC media player

eBeam Home

Sublime Text 3

MATLAB R2022b

Wolfram 14.1

eBeam Scrapbook

Visual Studio 2022

Maple™

The Essential Tool for Mathematics

Maplesoft 2023

Release 2023.2

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División de Ciencias Básicas

UNAM

TEMA IV - Una muy breve  
introducción a las ecuaciones  
diferenciales en Derivadas Parciales.

$$P(D^n)y(x)=0 \quad n=\text{orden}$$

$$P(D^n)y(x,t)=0$$

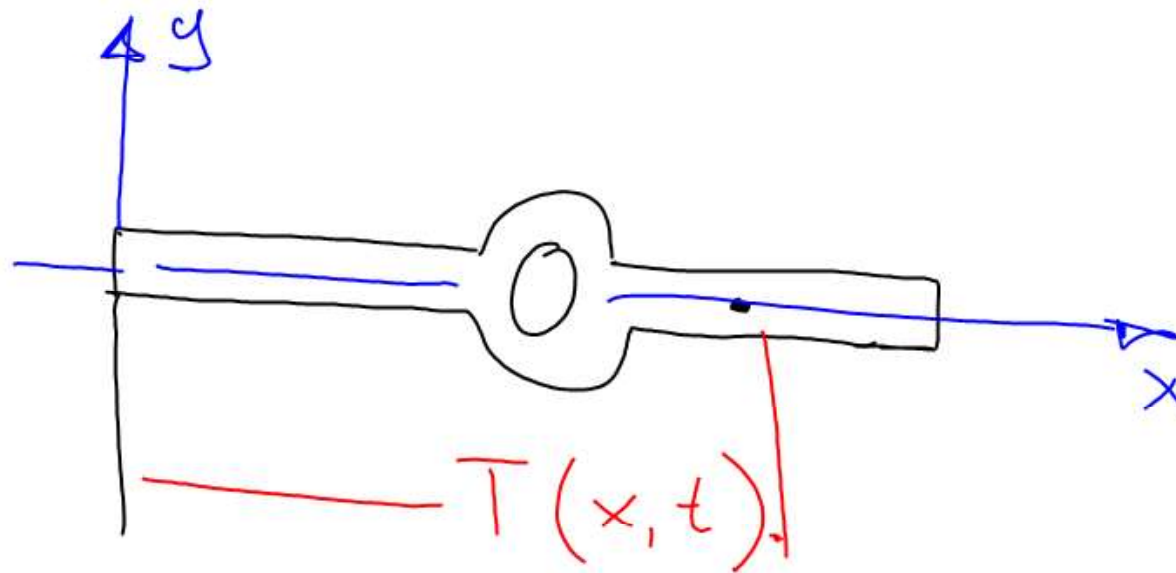
$$\frac{d^2 y}{dx^2} + 5 \frac{dy}{dx} = 8e^{2x} \quad n=2 \text{ orden}$$

$$\frac{\partial^2 y}{\partial x^2} + \frac{\partial^2 y}{\partial x \partial t} - 7 \frac{\partial^2 y}{\partial t^2} = y(x,t) \quad n=2$$

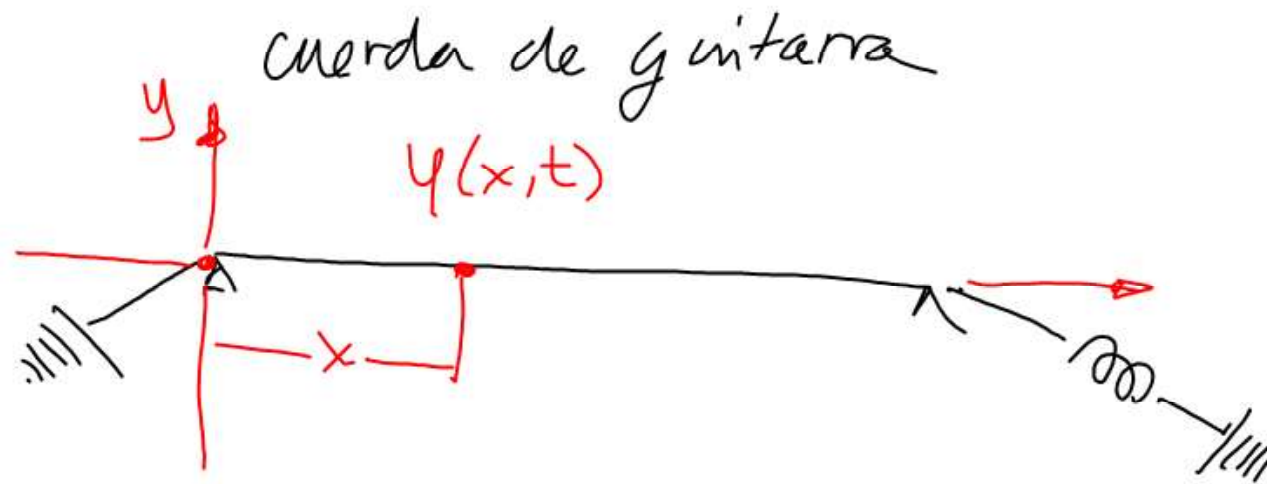
$$y_g = C_1 y_1 + C_2 y_2 + F(x)$$

$$y(x,t) = F_1(x,t) + F_2(x,t)$$

	Progr.	VIDA REAL
EDO	85%	20%
EDen <del>DP</del>	15%	80%



$$\frac{\partial^2 T(x, t)}{\partial x^2} - k_1 \frac{\partial^2 T(x, t)}{\partial t^2} = 0$$



$$\frac{\partial^2 y(x,t)}{\partial x^2} + 5 \frac{\partial^2 y(x,t)}{\partial x \partial t} + 6 \frac{\partial^2 y(x,t)}{\partial t^2} = 0$$

$$H_0 \rightarrow y = f(t+mx) \quad \leftarrow$$

$$\frac{\partial y}{\partial x} = m f'(t+mx) \quad \frac{\partial y}{\partial t} = f'(t+mx)$$

$$\frac{\partial^2 y}{\partial x^2} = m^2 f''(t+mx)$$

$$\frac{\partial^2 y}{\partial t^2} = f''(t+mx)$$

$$\frac{\partial^2 y}{\partial x \partial t} = m f''(t+mx)$$

$$m^2 f''(t+mx) + 5m f''(t+mx) + 6 f''(t+mx) = 0$$

$$(m^2 + 5m + 6) f''(t+mx) = 0$$

$$m^2 + 5m + 6 = 0 \quad f''(t+mx) = 0$$

$$(m+3)(m+2) = 0 \quad f'(t+mx) = C_1$$

$$m_1 = -3$$

$$m_2 = -2$$

$$f(t+mx) = C_1(t+mx) + C_2$$

$$y = f_1(t-3x) + f_2(t-2x) \quad \text{trivial.}$$

$$y_p = (t-3x)^3 + 4(t-2x)^2$$

$$y_p = \cos(t-3x) + \sin(t-2x)$$

$$y_p = e^{(t-2x)} \cos(t-2x) + e^{(t-3x)}$$

$$EDO(n) \begin{cases} L \\ NL \end{cases} \begin{cases} CC \\ CV \end{cases} \begin{cases} H \\ NH \end{cases} \infty SP.$$


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$$SOL. GRAL \rightarrow ÚNICA.$$

$$\begin{cases} a) \infty SP. \\ b) \infty SP. \\ \quad \# SS. \end{cases}$$

$ED en DP \rightarrow$

$SOL GRAL \rightarrow$  NO SON ÚNICAS.



$$\frac{\partial^2 z(x, y)}{\partial x^2} - 4 \frac{\partial^2 z(x, y)}{\partial x \partial y} + 4 \frac{\partial^2 z(x, y)}{\partial y^2} = 0$$

$$z(x, y) = f(y + mx)$$

$$m^2 - 4m + 4 = 0$$

$$(m - 2)^2 = 0 \quad m_1 = 2 \quad m_2 = 2$$

$$\left\{ \begin{array}{l} z(x, y) = f_1(y + 2x) + f_2(y + 2x) \cdot x \\ z(x, y) = f(y + 2x) + f_2(y + 2x) \cdot y \end{array} \right.$$



# Método de Separación de Variables

$$\text{Ecuación (2)} \quad \frac{\partial^2 z}{\partial x^2} + 6 \frac{\partial z}{\partial y} = z \quad z(x, y)$$

$$H_0: z(x, y) = P(x)Q(y)$$

$$\frac{\partial z}{\partial x} = P'(x) \cdot Q(y) \quad \frac{\partial^2 z}{\partial x^2} = P''(x) \cdot Q(y)$$

$$\frac{\partial z}{\partial y} = P(x) \cdot Q'(y)$$

$$P''(x) \cdot Q(y) + 6 P(x) Q'(y) = P(x) \cdot Q(y)$$

$$P''(x) \cdot Q(y) = -6 P(x) Q'(y) + P(x) Q(y)$$

$$P''(x) \cdot Q(y) = P(x) [-6 Q'(y) + Q(y)]$$

$$\frac{P''(x)}{P(x)} = \frac{-6 Q'(y) + Q(y)}{Q(y)}$$

$$\text{Ecu } X \Rightarrow \frac{P''(x)}{P(x)} = \alpha \quad \text{Ecu } Y = \frac{-6 Q'(y) + Q(y)}{Q(y)} = \alpha$$

$$P''(x) \cdot Q(y) - P(x) \cdot Q''(y) = -6 P(x) Q'(y)$$

$$(P''(x) - P(x)) Q(y) = -6 P(x) Q'(y)$$

$$\frac{P''(x) - P(x)}{-6 P(x)} = \frac{Q'(y)}{Q(y)}$$

$$\text{Ecuación } X = \frac{P''(x) - P(x)}{-6 P(x)} = \alpha \quad \text{Ecuación } Y = \frac{Q'(y)}{Q(y)} = \alpha$$