

SOLUCIÓN GENERAL

ES UNA FUNCIÓN PARAMÉTRICA
QUE REPRESENTA A TODAS LAS
SOLUCIONES PARTICULARES POSIBLES

$$\frac{d^2 y}{dx^2} - 3 \frac{dy}{dx} + 2y = 0 \quad \text{EDO}(2) \quad \perp$$

$$y_g = c_1 y_1 + c_2 y_2$$

Hipótesis.

$$y_p = e^{mx} \Rightarrow 0$$

$$\frac{dy}{dx} = e^{mx}(m) \Rightarrow m e^{mx}$$

$$\frac{d^2 y}{dx^2} = m(e^{mx}(m)) \Rightarrow m^2 e^{mx}$$

$$m^2 e^{mx} - 3m e^{mx} + 2e^{mx} = 0$$

$$(m^2 - 3m + 2)e^{mx} = 0$$

ECUACIÓN
CARACTERÍSTICA

$$m^2 - 3m + 2 = 0$$

$$e^{mx} = 0$$

Solución
"trivial"

$$(m - m_1)(m - m_2) = 0$$

$$m_1 + m_2 = 3$$

$$m_1 \cdot m_2 = 2$$

$$\begin{array}{|c|} \hline m_1 = 1 \\ \hline m_2 = 2 \\ \hline \end{array}$$

$$\Rightarrow (m - 1)(m - 2) = 0$$

$$y_1 = e^x \quad y_2 = e^{2x}$$

Soluciones
"FUNDAMENTALES"

$$y_g = c_1 e^x + c_2 e^{2x}$$

$$\frac{d^2y}{dx^2} - 3\frac{dy}{dx} + 2y = 0 \quad \begin{cases} y(0) = 2 \\ y'(0) = 5 \end{cases} \text{ (cond)}$$

$$y_g = C_1 e^x + C_2 e^{2x}$$

$$y(0) \Rightarrow 2 = C_1 e^{(0)} + C_2 e^{2(0)} \quad e^{(0)} = 1.$$

$$2 = C_1 + C_2$$

$$\frac{dy}{dx} = C_1 e^x + 2C_2 e^{2x}$$

$$y'(0) \Rightarrow 5 = C_1 e^{(0)} + 2C_2 e^{2(0)}$$

$$5 = C_1 + 2C_2$$

$$\begin{aligned} C_1 + C_2 &= 2 \\ C_1 + 2C_2 &= 5 \\ \hline -C_1 - C_2 &= -2 \quad (+) \\ \hline C_2 &= 3 \\ C_1 &= 2 - 3 \\ C_1 &= -1 \end{aligned}$$

$$y_p = -e^x + 3e^{2x}$$

$$\begin{aligned} y(0) &= 2 \\ y'(0) &= 5 \end{aligned}$$

SOLUCIÓN PARTICULAR

$$\frac{dy}{dx} = -e^x + 6e^{2x}$$

$$\frac{d^2y}{dx^2} = -e^x + 12e^{2x}$$

$$\begin{aligned} y(0) &= -e^{(0)} + 3e^{2(0)} \Rightarrow 2 \\ y'(0) &= -e^{(0)} + 6e^{2(0)} \Rightarrow 5 \end{aligned}$$

$$[-e^x + 12e^{2x}] - 3[-e^x + 6e^{2x}] + 2[-e^x + 3e^{2x}] = 0$$

$$(-1 + 3 - 2)e^x + (12 - 18 + 6)e^{2x} = 0$$

$$(0)e^x + (0)e^{2x} = 0$$

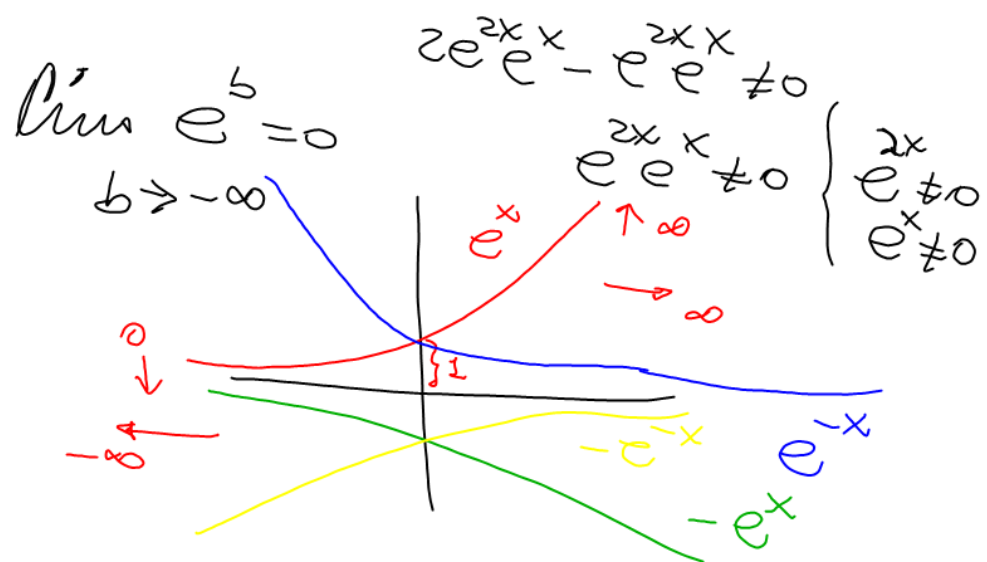
$$\underline{\underline{0 = 0}}$$

$$y_g = C_1 y_1 + C_2 y_2 + \dots + C_n y_n$$

$$W = \begin{vmatrix} y_1 & y_2 & \dots & y_n \\ y_1' & y_2' & \dots & y_n' \\ \vdots & \vdots & \ddots & \vdots \\ y_1^{(n-1)} & y_2^{(n-1)} & \dots & y_n^{(n-1)} \end{vmatrix} \neq 0$$

$$y = C_1 e^x + C_2 e^{2x}$$

$$W = \begin{vmatrix} e^x & e^{2x} \\ e^x & 2e^{2x} \end{vmatrix} \neq 0$$



$$\frac{d^2 y}{dx^2} - 3 \frac{dy}{dx} + 2y = 0$$

$$y = \cos(x) \quad \text{X}$$

$$\frac{dy}{dx} = -\sin(x)$$

$$\frac{d^2 y}{dx^2} = -\cos(x)$$

$$[-\cos(x)] - 3[-\sin(x)] + 2[\cos(x)] = 0$$

$$\cos(x) + 3\sin(x) = 0$$

$$\frac{d^3 y}{dx^3} = 0 \quad \frac{d^2 y}{dx^2} = C_1 \quad \frac{d}{dx}\left(\frac{dy}{dx}\right) = C_1$$

$$\int d\left(\frac{dy}{dx}\right) = C_1 dx \rightarrow \frac{dy}{dx} = C_1 x + C_2$$

$$dy = (C_1 x + C_2) dx$$

$$\int dy = C_1 \int x dx + C_2 \int dx$$

$$\boxed{\frac{d^3 y}{dx^3} = 0}$$

$$y = \frac{C_1}{2} x^2 + C_2 x + C_3$$

Ej(3) L

Sf

$$y_1 = x^2 \quad y_2 = x \quad y_3 = 1$$

$$\text{Ej(2) L} \quad \frac{d^2 y}{dx^2} + y = 0$$

$$y = C_1 y_1 + C_2 y_2$$

$$y_1 = \cos(x) \quad \checkmark$$

$$y_1' = -\sin(x)$$

$$y_1'' = -\cos(x)$$

$$[-\cos(x)] + [\cos(x)] = 0$$

$$0 \equiv 0$$

$$y_2 = \sin(x)$$

$$y_2' = \cos(x)$$

$$y_2'' = -\sin(x)$$

$$[-\sin(x)] + [\sin(x)] = 0$$

$$0 \equiv 0$$

$$\frac{d^2 y}{dx^2} + y = 0$$

$$y = C_1 \cos(x) + C_2 \sin(x)$$

$$\text{Prom Tareas y Series} = \frac{\sum_{i=1}^n T_i + \sum_{j=1}^5 S_j}{n+5}$$

$$\text{Prom Exam Parc.} = \frac{\sum_{i=1}^3 E_i}{3}$$

$$P_{\text{FINAL}} = \frac{P_{\text{TS}} + P_{\text{EP}}}{2}$$

$$C_{\text{final}} = \frac{P_{\text{FINAL}} + E_F}{2}$$