

$$F(x, y, \frac{dy}{dx}, \dots) = 0$$

Resolver $\left\{ \begin{array}{l} \text{incógnita } y(x) \\ \text{solución } \left\{ \begin{array}{l} \text{general} \\ \text{particular } (y_0) \end{array} \right. \end{array} \right.$

$$\frac{dy}{dx} = 0 \quad \text{SG} \quad y = c, \quad y(0) = 2$$

$$\text{orden} = 1 \quad y = 2 \quad \text{SP}$$

$$\frac{dy}{dx} = y \quad y = c_1 e^x \quad \text{SG} \quad y(0) = 2$$

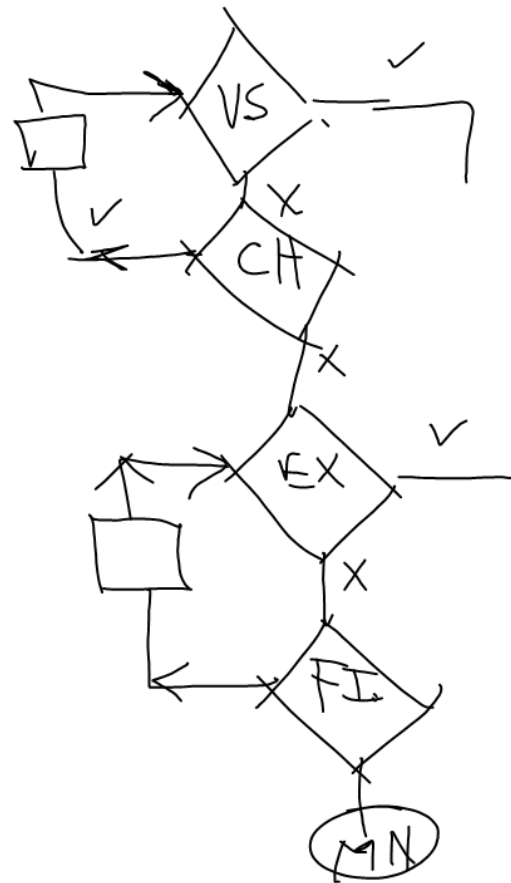
$$y = 2e^x \quad \text{SP}$$

$\text{ED} \left\{ \begin{array}{l} \text{EDO} - \left\{ \begin{array}{l} \text{NO LINEAL} - \text{TEMA 1} \\ \text{LINEAL} - \text{TEMA 2} \end{array} \right. \\ \text{SIST. ED.} - \text{TEMA 3} \\ \text{ED en DP} - \text{TEMA 4.} \end{array} \right.$

TEMA 1. NO LINEALES

$$M + N \frac{dy}{dx} = 0$$

$$\left(\frac{dy}{dx}\right)^2 + 8 \frac{dy}{dx} = 6$$



> with (DEtools):
 > odeadvisor(ECUA).
 > intfactor(ECUA).

TEMA 2.

$$EDOL \left\{ \begin{array}{l} \text{Hom.} \\ \text{No-Hom} \end{array} \right. \left\{ \begin{array}{l} CC \\ CV \end{array} \right. \begin{array}{l} \\ \times \end{array}$$

$$y = e^{mx}$$

CASO 1 - $m_1 \neq m_2 \in \mathbb{R}$

$$m^2 + a_1 m + a_2 = 0$$

CASO 2 - $m_1 = m_2 \in \mathbb{R}$

$$y_{\mathbb{C}\mathbb{I}} = C_1 e^{m_1 x} + C_2 e^{m_2 x} \quad \text{CASO 3 - } m_{1,2} \in \mathbb{C}$$

$$y_{\mathbb{C}\mathbb{II}} = C_1 e^{m_1 x} + C_2 x e^{m_1 x}$$

$$m_{1,2} = a \pm bi \quad \begin{array}{l} a \in \mathbb{R} \\ b \in \mathbb{R}^+ \end{array}$$

$$y_{\mathbb{C}\mathbb{III}} = e^{ax} (C_1 \cos(bx) + C_2 \sin(bx))$$

$$y_g = C_1 e^{2x} + C_2 x e^{2x} + C_3 e^{2x} \cos(3x) + C_4 e^{2x} \sin(3x)$$

$$(m-2)^2 / ((m-2)^2 + (3)^2) = 0$$

$$(m^2 - 4m + 4)(m^2 - 4m + 4 + 9) = 0$$

$$m^4 - 8m^3 + 33m^2 - 68m + 52 = 0$$

$$y^{IV} - 8y''' + 33y'' - 68y' + 52y = 0$$

$$\mathcal{P}(D)y = Q(x) \quad EDO_2(n)NH.$$

$$\frac{d^2 y}{dx^2} - 6 \frac{dy}{dx} + 5y = 8x^2 - 6e^x$$

$$(D^2 - 6D + 5)y = 8x^2 - 6e^x$$

$$(D-1)(D-5)D_A^3(D-1)_A = 0$$

$$y_g = \underbrace{c_1 e^x + c_2 e^{5x}}_{y_{g/h}} + \underbrace{A + Bx + Dx^2 + Exe^x}_{y_{p/q}}$$

$$y = A + Bx + Dx^2 + Exe^x$$

$$y' = B + 2Dx + Exe^x + Ee^x$$

$$y'' = 2D + Exe^x + 2Ee^x$$