# EDO L(2) cc NH.

## MÉTODO DE PARAMETROS VARIABLES

$$\frac{dy}{dx} + a_1 y = q(x)$$

$$y(x) = C_1 e^{-a_1 x} + e^{-a_1 x} \int e^{a_1 x} q(x)\,dx$$

$$= \left[ C_1 + \int e^{a_1 x} q(x)\,dx \right] e^{-a_1 x}$$

$$y_{g/NH} = A(x) e^{-a_1 x}$$

$$y_{g/H} = C_1 e^{-a_1 x}$$

PARÁMETROS VARIABLES

$$\frac{d^2y}{dx^2} + a_1\frac{dy}{dx} + a_2 y = Q(x)$$

$$m^2 + a_1 m + a_2 = 0 \qquad \begin{matrix} m_1 \\ m_2 \end{matrix} \qquad m_1 \neq m_2 \in \mathbb{R}$$

$$y(x) = c_1 e^{m_1 x} + c_2 e^{m_2 x}$$

$$y(x) = c_1 e^{m_1 x} + c_2 x e^{m_1 x} \qquad m_1 = m_2 \in \mathbb{R}$$

$$y(x) = c_1 e^{ax}\cos(bx) + c_2 e^{ax}\operatorname{sen}(bx) \qquad m_1, m_2 = a \pm bi$$

$$\frac{d^2y}{dx^2} + a_1\frac{dy}{dx} + a_2 y = Q(x)$$

$$y_h = C_1 e^{m_1 x} + C_2 e^{m_2 x}$$

$$y_{g/n-h} = A(x)e^{m_1 x} + B(x)e^{m_2 x}$$

$$y' = m_1 A(x)e^{m_1 x} + m_2 B(x)e^{m_2 x} + \left[A'(x)e^{m_1 x} + B'(x)e^{m_2 x}\right]$$

$$= 0$$

$$y'' = m_1^2 A(x)e^{m_1 x} + m_2^2 B(x)e^{m_2 x} + \left[m_1 A'(x)e^{m_1 x} + m_2 B'(x)e^{m_2 x}\right]$$

$$= Q(x)$$

$$y'' = m_1^2 A(x)e^{m_1 x} + m_2^2 B(x)e^{m_2 x} + Q(x)$$

$$A'(x)e^{m_1x}+B'(x)e^{m_2x}=0$$

$$m_1A'(x)e^{m_1x}+m_2B'(x)e^{m_2x}=Q(x)$$

$$\begin{bmatrix} e^{m_1x} & e^{m_2x} \\ m_1e^{m_1x} & m_2e^{m_2x} \end{bmatrix}\times\begin{bmatrix} A'(x) \\ B'(x) \end{bmatrix}=\begin{bmatrix} 0 \\ Q(x) \end{bmatrix}$$

$$y'' + 2y' + 2y = 3e^{x}\cos(x)$$

$$y'' - 4y' + 4y = 2x^{2}e^{2x}$$

$$(m^2 - 4m + 4)(m-2)(m-2)_{A.} = 0$$

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

$$y = C_1e^{2x} + C_2xe^{2x} + C_3x^2e^{2x} + C_4x^3e^{2x}$$

$$y_p = Ax^2e^{2x} + Bx^3e^{2x}$$

$$m_1 = m_2 = 5$$