EDO(2)LCC <u>NH</u>

método (general) por Parámetros Variables.

$$\frac{dy}{dx} + p(x)\,y = q(x) \quad \text{EDO(1)LCV NH.}$$

SOLUCIÓN GENERAL $\Big\}$ $$y = Ce^{-\int p(x)dx} + e^{-\int p(x)dx}\int e^{\int p(x)dx} q(x)\,dx$$

$$y = \Big(\underbrace{C + \int e^{\int p(x)dx} q(x)\,dx}\Big) e^{-\int p(x)dx}$$

$$y_{g/nh} = A(x)\,e^{-\int p(x)dx}$$

$$y_{g/h} = C_1 e^{-\int p(x)dx}$$

$$\frac{d^2y}{dx^2} - 5\frac{dy}{dx} + 6y = 8e^{x} \quad \text{EDO(2)LCC NH.}$$

①
$$\boxed{\begin{gathered}\frac{d^2y}{dx^2} - 5\frac{dy}{dx} + 6y = 0\\ (D^2 - 5D + 6)y = 0\\ (D-3)(D-2)y = 0\\ y_{g/h} = C_1e^{3x} + C_2e^{2x}\end{gathered}}$$

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

②
$$y_{g/n \cdot h} = A(x)e^{3x} + B(x)e^{2x}$$

$$\frac{dy}{dx} = A(x)(3e^{3x}) + B(x)2e^{2x} + \underbrace{A'(x)e^{3x} + B'(x)e^{2x}}_{=0}$$

$$\frac{dy}{dx} = 3A(x)e^{3x} + 2B(x)e^{2x} + (0)$$

$$\frac{d^2y}{dx^2} = 9A(x)e^{3x} + 4B(x)e^{2x} + \underbrace{3A'(x)e^{3x} + 2B'(x)e^{2x}}_{=Q(x)}$$

$$\frac{d^2y}{dx^2} = 9A(x)e^{3x} + 4B(x)e^{2x} + 8e^{x}$$

$$\left(9A(x)e^{3x} + 4B(x)e^{2x} + 8e^{x}\right) - 5\left(3A(x)e^{3x} + 2B(x)e^{2x}\right) + 6\left(A(x)e^{3x} + B(x)e^{2x}\right) = 8e^{x}$$

$$(9 - 15 + 6)A(x)e^{3x} + (4 - 10 + 6)B(x)e^{2x} + 8e^{x} = 8e^{x}$$

$$(0)A(x)e^{3x} + (0)B(x)e^{2x} + 8e^{x} = 8e^{x}$$

$$8e^{x} - 8e^{x} = 0$$

$$0 \equiv 0$$

$$\oplus\begin{cases} A'(x)e^{3x} + B'(x)e^{2x} = 0 \\ 3A'(x)e^{3x} + 2B'(x)e^{2x} = 8e^{x} \\ -2A'(x)e^{3x} - 2B'(x)e^{2x} = 0 \end{cases}$$

$$A'(x)e^{3x} + (0) = 8e^{x}$$

$$A'(x) = 8\frac{e^{x}}{e^{3x}} \Rightarrow 8e^{x}e^{-3x} \Rightarrow 8e^{-2x}$$

$$A'(x) = 8e^{-2x}$$

$$B'(x) = \frac{-A'(x)e^{3x}}{e^{2x}} \Rightarrow -(8e^{-2x})e^{3x}e^{-2x}$$

$$B'(x) = -8e^{-x}$$

$$A(x) = \int 8e^{-2x}dx \qquad B(x) = \int -8e^{-x}dx$$

$$A(x) = 8\left[\frac{e^{-2x}}{-2}\right] + c_1 \Rightarrow -4e^{-2x} + c_1$$

$$B(x) = -8\left[\frac{e^{-x}}{-1}\right] + c_2 \Rightarrow 8e^{-x} + c_2$$

$$y_{g/n-h} = (-4e^{-2x} + c_1)e^{3x} + (8e^{-x} + c_2)e^{2x}$$

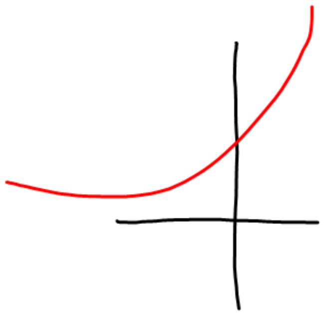
$$y = c_1e^{3x} + c_2e^{2x} + (-4e^{x} + 8e^{x})$$

$$y = c_1e^{3x} + c_2e^{2x} + 4e^{x}$$

$$y_{g/h} = c_1 e^{3x} + c_2 e^{2x} \qquad y_1 = e^{3x} \qquad y_2 = e^{2x}$$

$$\begin{vmatrix} e^{3x} & e^{2x} \\ 3e^{3x} & 2e^{2x} \end{vmatrix} \neq 0. \qquad 2e^{3x}e^{2x} - 3e^{3x}e^{2x} \neq 0$$

$$-e^{3x}e^{2x} \neq 0$$



$$W = \begin{bmatrix} e^{3x} & e^{2x} \\ 3e^{3x} & 2e^{2x} \end{bmatrix}$$

$$A'(x)e^{3x} + B'(x)e^{2x} = 0$$

$$3A'(x)e^{3x} + 2B'(x)e^{2x} = 8e^{x}$$

$$\begin{bmatrix} e^{3x} & e^{2x} \\ 3e^{3x} & 2e^{2x} \end{bmatrix} \begin{bmatrix} A'(x) \\ B'(x) \end{bmatrix} = \begin{bmatrix} 0 \\ 8e^{x} \end{bmatrix}$$

$$\begin{bmatrix} y_1 & y_2 & y_3 \\ y_1' & y_2' & y_3' \\ y_1'' & y_2'' & y_3'' \end{bmatrix} \begin{bmatrix} A'(x) \\ B'(x) \\ D'(x) \end{bmatrix} = \begin{bmatrix} 0 \\ 0 \\ Q(x) \end{bmatrix}$$

U/W

BB

$$\frac{d^3y}{dx^3} + y = x$$