

TEMA II: EDO (n) LCC $\left\{ \begin{array}{l} H \\ NH \end{array} \right.$

MÉTODO OPERADOR DIFERENCIAL " PARÁMETROS VARIABLES

$$\frac{d^2 y}{dx^2} - 7 \frac{dy}{dx} + 12y = 5e^{3x} + x^2$$

$$\frac{d^2 y}{dx^2} - 7 \frac{dy}{dx} + 12y = 0$$

$$(D^2 - 7D + 12)y = 0$$

$$(D - 3)(D - 4)y = 0$$

$$y_g = C_1 e^{3x} + C_2 e^{4x}$$

$$(D-3)(D-4)y = 5e^{3x} + x^2$$

$$(D-3)(D-4)(D-3)_A D^3 y = 0$$

FEDO(6)L

$$(D-4)(D-3)^2 D^3 y = 0$$

$$y_{gh} = C_1 e^{4x} + C_2 e^{3x} + C_3 x e^{3x} + C_4 + C_5 x + C_6 x^2$$

$$y_{gh} = C_1 e^{4x} + C_2 e^{3x} + A x e^{3x} + B + D x + E x^2$$

$$y_{p/q} = A x e^{3x} + B + D x + E x^2$$

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

$$\frac{d^2 y}{dx^2} = A(6e^{3x} + 9x e^{3x}) + (0) + 2E.$$

$$\frac{d^2 y}{dx^2} \Leftrightarrow A(6e^{3x} + 9xe^{3x}) + (0) + (0) + 2E$$

$$+ \frac{dy}{dx} \Leftrightarrow -7A(e^{3x} + 3xe^{3x}) + (0) - 7D - 14Ex$$

$$+ 12y \Leftrightarrow +12A(xe^{3x}) + 12B + 12Dx + 12Ex^2$$

← (=)

$$5e^{3x} \Leftrightarrow (6A - 7A)e^{3x} + (12A - 21A + 9A)xe^{3x}$$

$$+ \frac{x^2}{x^2} \Leftrightarrow (2E - 7D + 12B) + (-14E + 12D)x + (12E)x^2$$

$$-A = 5 \quad \longrightarrow \quad A = -5$$

$$2E - 7D + 12B = 0$$

$$-14E + 12D = 0$$

$$12E = 1$$

$$12D = \frac{14}{12}$$

$$E = \frac{1}{12}$$

$$D = \frac{7}{72}$$

$$12B = 7D - 2E$$

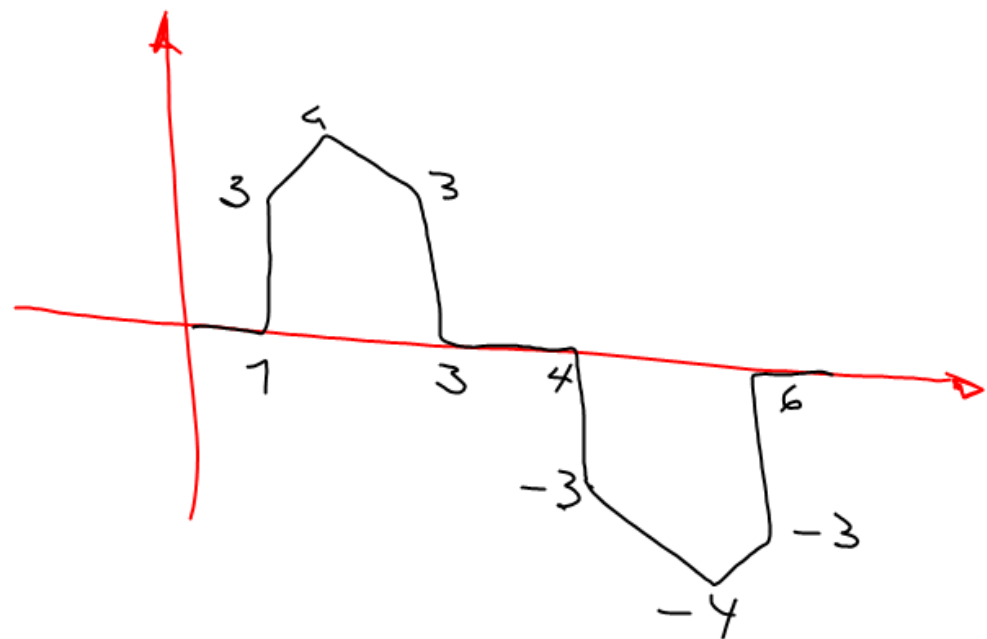
$$12B = 7\left(\frac{14}{144}\right) - \frac{2}{12}$$

$$12B = \frac{7(7)}{72} - \frac{2}{12}$$

$$B = \frac{49}{(72)12} - \frac{2}{144}$$

$$B = \frac{37}{864}$$

$$y = C_1 e^{4x} + C_2 e^{3x} + \frac{37}{864} + \frac{7}{72}x + \frac{1}{12}x^2 - 5xe^{3x}$$



$$z' + 4x - 2y = 6e^t$$

$$y' + 4y - 3x = t^2$$

$$x' = z$$

$$y' = 3x - 4y + t^2$$

$$z' = -4x + 2y + 6e^t$$

$$x' = z$$

$$\begin{bmatrix} x' \\ y' \\ z' \end{bmatrix} = \begin{bmatrix} 0 & 0 & 1 \\ 3 & -4 & 0 \\ -4 & 2 & 0 \end{bmatrix} \begin{bmatrix} x \\ y \\ z \end{bmatrix} + \begin{bmatrix} 0 \\ t^2 \\ 6e^t \end{bmatrix}$$