

TEMA I.- EC. DIF. ORDINARIA (1) NO LINEAL
EDO(1)L

TEMA II.- EDO(n)L

TEMA III.- TRANSF. LAPLACE EDO(n) $\left\{ \begin{array}{l} L \\ NL \end{array} \right.$ COND INIC
SIST. EDO(1)L - MATRIZ EXPONENCIAL

TEMA IV.- EDENDP $\left\{ \begin{array}{l} \text{MÉTODO DEL MISMO ORDEN} \\ \text{MÉTODO DE VAR. SEP.} \end{array} \right.$
SERIE TRIGONOMÉTRICA FOURIER
SOL PART.

CAPÍTULO I.- EDO(1)L

$$\frac{dy}{dx} + P \cdot y = Q$$

$$y(x) = C_1 e^{-\int P dx} + e^{-\int P dx} \cdot \int e^{\int P dx} Q(x) dx$$

$$\frac{dx}{dy} - \operatorname{sen}(y) x(y) = 2 \operatorname{sen}(2y)$$

$$P(y) = -\operatorname{sen}(y) \quad Q(y) = 2 \operatorname{sen}(2y)$$

$$y(x) = C_1 e^{-\cos(y)} + 4 - 4 \cos(y)$$

$$M(x,y) + N(x,y) \frac{dy}{dx} = 0$$

$$x(2x^2 + y^2) + y(x^2 + 2y^2) y' = 0$$

$$M = 2x^3 + xy^2 \quad N = yx^2 + 2y^3$$

$$\frac{\partial M}{\partial y} = 2xy \quad \frac{\partial N}{\partial x} = 2yx \quad \text{EXACTA.}$$

$$\text{Int } M_x = \int (2x^3 + xy^2) dx = 2\left(\frac{x^4}{4}\right) + \frac{x^2 y^2}{2}$$

$$\int (N - \frac{\partial}{\partial y} \text{Int } M_x) dy = \int (\cancel{yx^2} + 2y^3 - \cancel{x^2 y}) dy$$

$$\text{Sol gral} \Rightarrow \frac{x^4}{2} + \frac{x^2 y^2}{2} + \frac{y^4}{2} = C$$

$$\Rightarrow x^4 + x^2 y^2 + y^4 = C$$

$$(x+y^2) - 2yx \frac{dy}{dx} = 0$$

$$M = x + y^2 \quad N = -2xy$$

$$\frac{\partial M}{\partial y} = 2y \quad \frac{\partial N}{\partial x} = -2y \quad \text{No EXACTA.}$$

$$\frac{dy}{y} = \left(\frac{\frac{\partial M}{\partial y} - \frac{\partial N}{\partial x}}{N} \right) dx$$

$$\frac{dy}{y} = \left(\frac{2y + 2y}{-2xy} \right) dx$$

$$= \frac{4y}{-2xy} dx$$

$$\int \frac{dy}{y} = \int \frac{2}{-x} dx$$

$$= -2 \int \frac{dx}{x}$$

$$\hookrightarrow M = -2 \ln x$$

$$\hookrightarrow M = \ln \left(\frac{1}{x^2} \right)$$

$$M(x) = \frac{1}{x^2}$$

$$\cancel{M} = \frac{x+y^2}{x^2} \quad \cancel{N} = \frac{-2xy}{x^2}$$

$$= \frac{1}{x} + \left(\frac{y^2}{x^2} \right) \quad = -\frac{2y}{x}$$

$$\frac{\partial MM}{\partial y} = \frac{2y}{x^2} \quad \frac{\partial NN}{\partial x} = 2yx^{-2} \quad \text{EXACTA.}$$

$$\frac{dMM}{dx} = -\frac{1}{x^2} - \frac{y^2}{x}$$

$$\int \left(NN - \frac{dMM}{dx} \right) dy \quad \frac{dMM}{dx} = -\frac{2y}{x}$$

$$\int \left(-\frac{2y}{x} + \frac{2y}{x} \right) dy = 0$$

$$\text{Sol}_{\text{gen}} \quad \ln(x) - \frac{y^2}{x} = C_1$$