— y_1 e^{4x}

— y_2 $2x$

$4x-4$ $\quad 2(2x-2)$

— y_3 2

$$y_g = C_1 e^{4x} + C_2 x + C_3$$

EDO(3)LCCNH

$$y_{g/NH} = C_1 e^{4x} + C_2 x + C_3 + Ae^{-4x}$$

$$(D-4)(D^2)y = Q(x)$$

$$(D^3 - 4D^2)y = Q(x)$$

REPASO

$$F(x, y(x), y'(x), \dots) = 0$$

Expresión matemática con al menos una de las derivadas de una función incógnita.

ED

- Ordinarias $y(x)$
  - 1er orden
    - Lineales
    - No lineales. — CAP I.
  - orden > 1
    - Lineales — CAP II
    - No lineales — X
- en Derivadas parciales
  - $y(x,t)$ $\quad z(x,y)$

EDO(1) NL

$$M(x,y) + N(x,y)\frac{dy}{dx} = 0 \quad \begin{cases} \text{MVS} \\ \text{MCH} \\ \text{EXACTA} \\ \text{FACTOR INTEGRANTE.} \end{cases}$$

EDO(1) L CV NH.

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

$$\frac{dy}{dx} + p(x)y = 0 \qquad \text{VS}$$

$$\frac{dy}{dx} = -p(x)y$$

$$\int \frac{dy}{y} = -\int p(x)dx$$

$$\ln y = C_1\left(-\int p(x)dx\right)$$

$$y = C_1 e^{-\int p(x)dx}$$

$$\frac{dy}{dx} + p(x)y = 0$$

$$\frac{d}{dx}\left(e^{\int p(x)dx}(y)\right) = 0 \longrightarrow \int d\left(e^{\int p(x)dx}y\right) = C_1$$

$$e^{\int p(x)dx}y = C_1$$

$$y = C_1 e^{-\int p(x)dx}.$$

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

$$\int d\left(e^{\int p(x)dx}y\right) = \int e^{\int p(x)dx}q(x)\,dx$$

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

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

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

$$F(x,y) = C_1$$

$$\int M\,dx + \int \left[N - \frac{d}{dy}\int M\,dx \right] dy = C_1$$

$$\int N\,dy + \int \left[M - \frac{d}{dx}\int N\,dy \right] dx = C_1$$