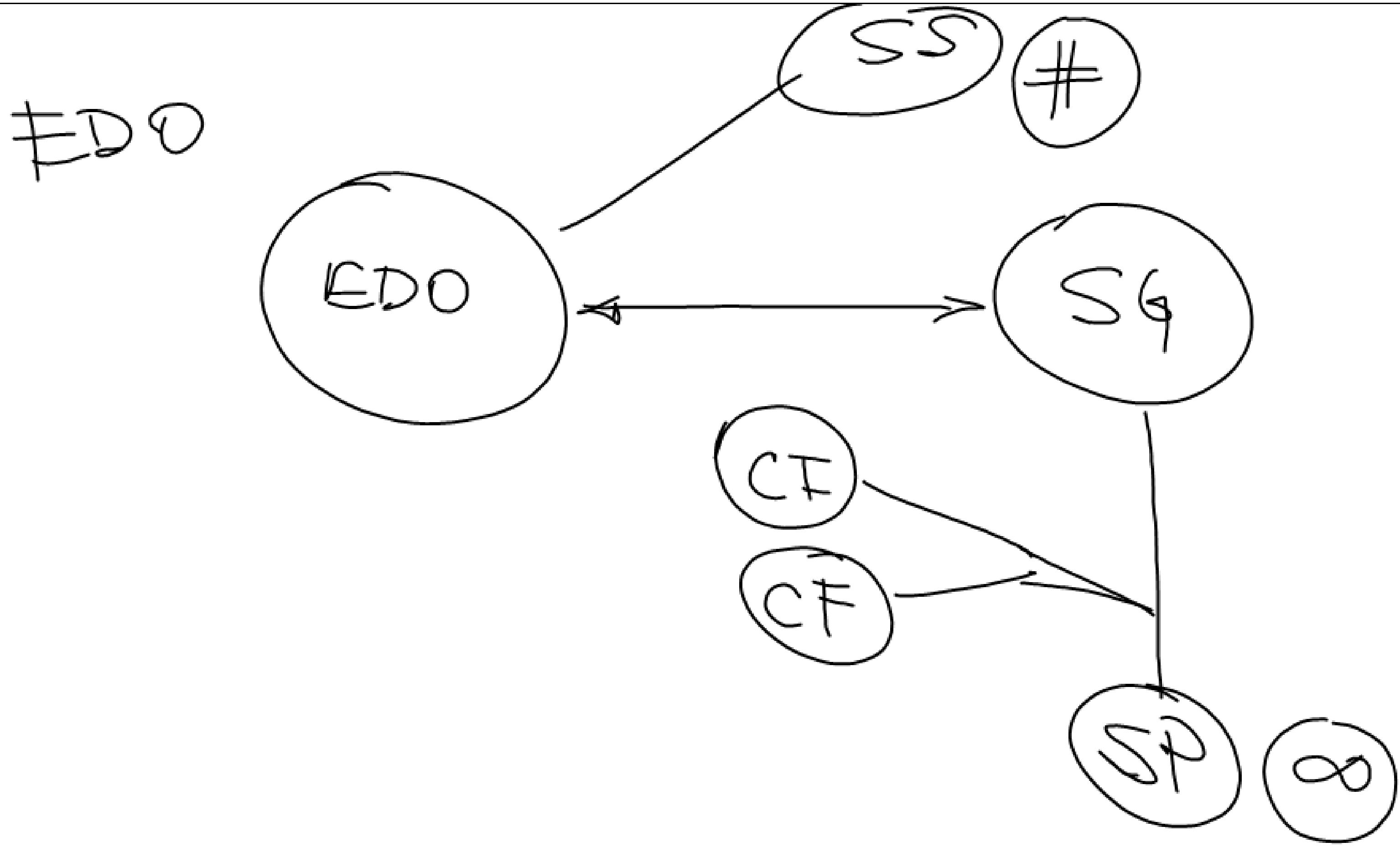

EDO
EDO
SS
#
SG
CF
CF
SP
∞

EDO
- LINEALES
  - PRIMER ORDEN
  - ORDEN SUPERIOR
    - Coef. ctes
      - Homog $\Rightarrow Q(x)=0$
      - No Hom $\Rightarrow Q(x)\neq 0$
    - Coef var
- NO LINEALES
  - PRIMER ORDEN : $M(x,y)+N(x,y)\frac{dy}{dx}=0$
  - ORDEN SUPERIOR ✗

FORMA GENERAL LINEALES

$$a_0(x)\frac{d^n y(x)}{dx^n}+a_1(x)\frac{d^{n-1}y(x)}{dx^{n-1}}+\ldots\ldots+a_{n-1}(x)\frac{dy(x)}{dx}+a_n(x)y(x)=Q(x)$$

$$y_g(x)=C_1y_1(x)+C_2y_2(x)+\ldots+C_ny_n(x)+y_{NH}(x)$$

$\frac{dy}{dx} + 5x^2y^2 = 6\cos(3x)$ EDO(1) NL

$\frac{dy}{dx} + 5x^2y = 6\cos(3x)$ EDO(1) L cv NH

$\frac{dy}{dx} + 8y = 0$ EDO(1) L cc H.

$\frac{d^2y}{dx^2} - 6\frac{dy}{dx} + 9y = 8x^2 + 3x + 2$ $Q(x)$

EDO(2) L cc NH

$\theta(t)$ $\frac{d^2\theta}{dt^2} - 6\,\mathrm{sen}(\theta) = 0$

$\frac{d^2\theta}{dt^2} - 6\theta = 0$ EDO(2) NL

EDO(2) L cc H

$z(y)$ $\frac{d^3z(y)}{dy^3} - 6y\frac{dz(y)}{dy} + \frac{8}{y^2}z(y) = y^3 + \tan(y)$

EDO(3) L cv NH.

$$\frac{\frac{dy(x)}{dx}}{y(x)} + 5 = 0$$ EDO(1) L cc H.

$\frac{dy}{dx} + 5y = 0$

$$\frac{\frac{dy(x)}{dx}}{y(x)} + 5y = 8\,\mathrm{sen}(x)$$

$\frac{dy}{dx} + \frac{x}{y} = \frac{4}{x^2}$ EDO(1) NL

$\frac{dy}{dx} + xy^{-1} = \frac{4}{x^2}$

$\frac{dy}{dx} = \frac{y}{x}$ EDO(1) L cv H.

$\frac{dy}{dx} - \frac{1}{x}y = 0$

$\frac{dy}{dx} = \frac{x}{y}$ EDO(1) NL

$y \cdot \frac{dy}{dx} = x$

$5x^2\frac{dy}{dx} - y - \frac{8e^x}{x} = 0$

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

$\frac{dy}{dx} - \frac{1}{5x^2}y = \frac{8e^x}{5x^3}$ EDO(1) L cv NH.

$$\frac{d^2y}{dx^2} + 5\frac{dy}{dx} + 8y = 4e^{2x} + 3\cos(2x)$$

EDO(2)LCC NH.

+ Ecuación Homogenea Asociada

$$\frac{d^2y}{dx^2} + 5\frac{dy}{dx} + 8y = 0$$

$$\boxed{y_{g/H} = C_1 y_1 + C_2 y_2}$$ Solucion homogenea Asoc.

Método Resolver No homog. asociada

$$y_{p/Q} = f(x)$$

$$\boxed{y_{g/NH.} = y_{g/H.} + y_{p/Q.}}$$

EDO (n) L $\left\{ \begin{matrix} CC \\ CV \end{matrix} \right\}$ NH.

TEOREMA EXISTENCIA Y UNICIDAD SOLUCIÓN

$$\frac{dy}{dx} = F(x,y) \quad EDO(1)NL$$

LA SOLUCIÓN EXISTIRÁ Y SERÁ ÚNICA SI.:

a) $F(x,y)$ existe y es única $\boxed{x \neq 0}$

b) $\frac{\partial F}{\partial y}$ existe y es única

$$y_g = cx \qquad \frac{dy}{dx} = c$$

$$y = \frac{dy}{dx}x \qquad EDO(1)LCVH.$$

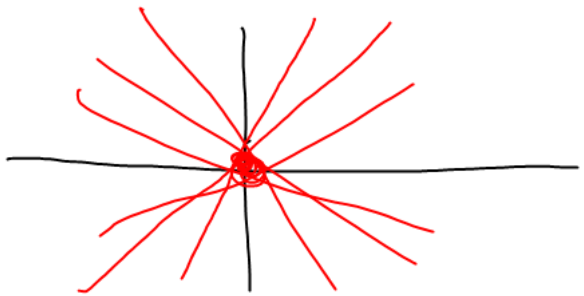
$$x\frac{dy}{dx} - y = 0$$

$$\frac{dy}{dx} = \frac{y}{x} \qquad F(x,y) = \frac{y}{x}$$

$$y = cx$$

$\boxed{x \neq 0}$

$$\frac{\partial F}{\partial y} = \frac{1}{x}$$



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

EDO(1) NL

$$cy-(c-x)^2=0$$

$$y=\frac{(c-x)^2}{c}$$

$$y_{s_1}=4x \qquad y_{s_2}=0$$

$$y_p=\frac{(5-x)^2}{5}$$

$$y_\varphi=\frac{(\pi-x)^2}{\pi}$$

LA ECUACIÓN NO LINEAL PRIMER ORDEN

$$\frac{dy}{dx} = F(x, y) \quad EDO(1)NL$$

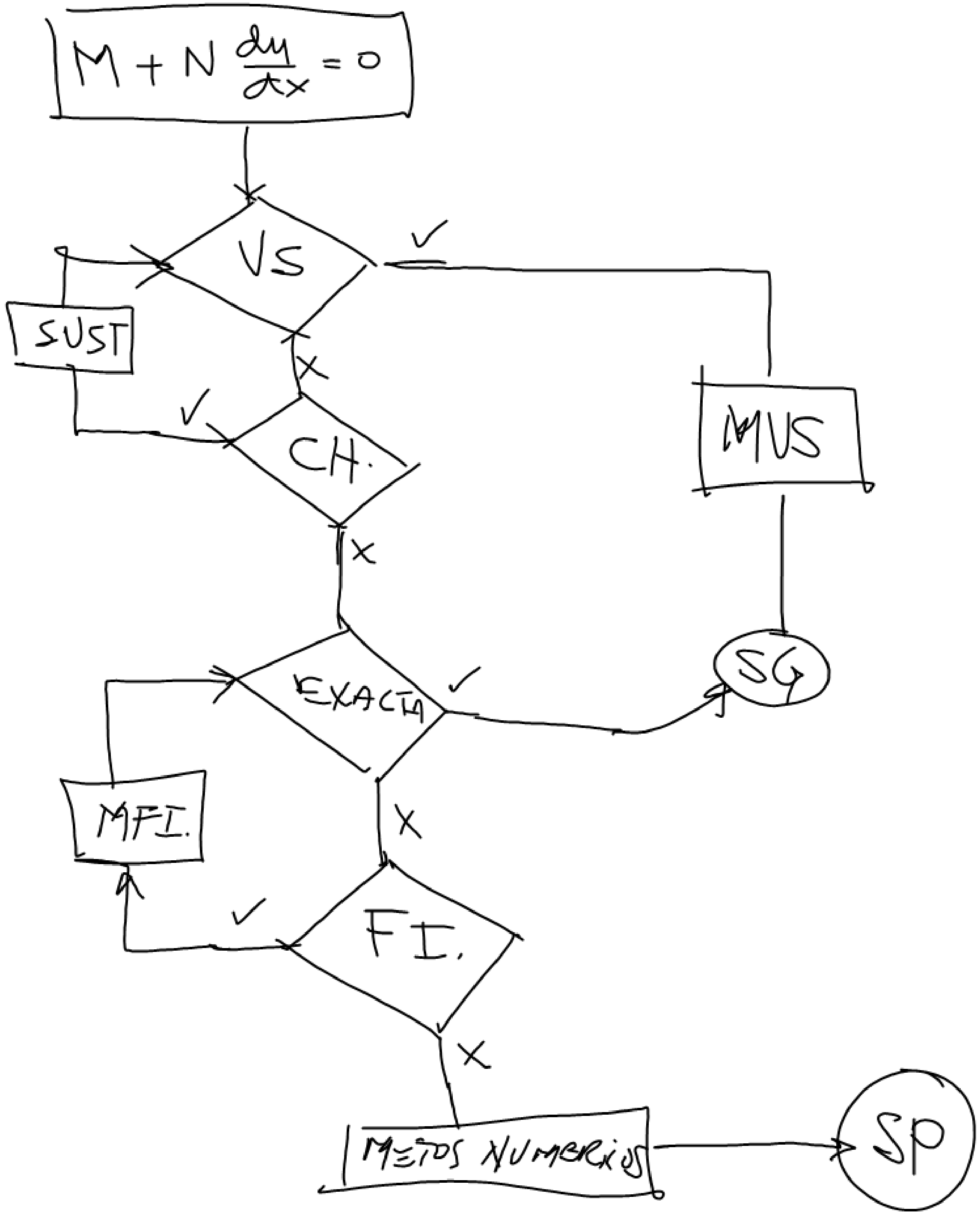
$$\frac{dy}{dx} = -\frac{M(x,y)}{N(x,y)}$$

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

$y(x)$ $$M(x,y) + N(x,y)\frac{dy}{dx} = 0 \quad EDO(1)NL.$$

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

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


$M + N\frac{dy}{dx} = 0$
VS
SUST
CH.
MUS
EXACTA
SG
MFI.
FI.
METOS NUMERICOS
SP