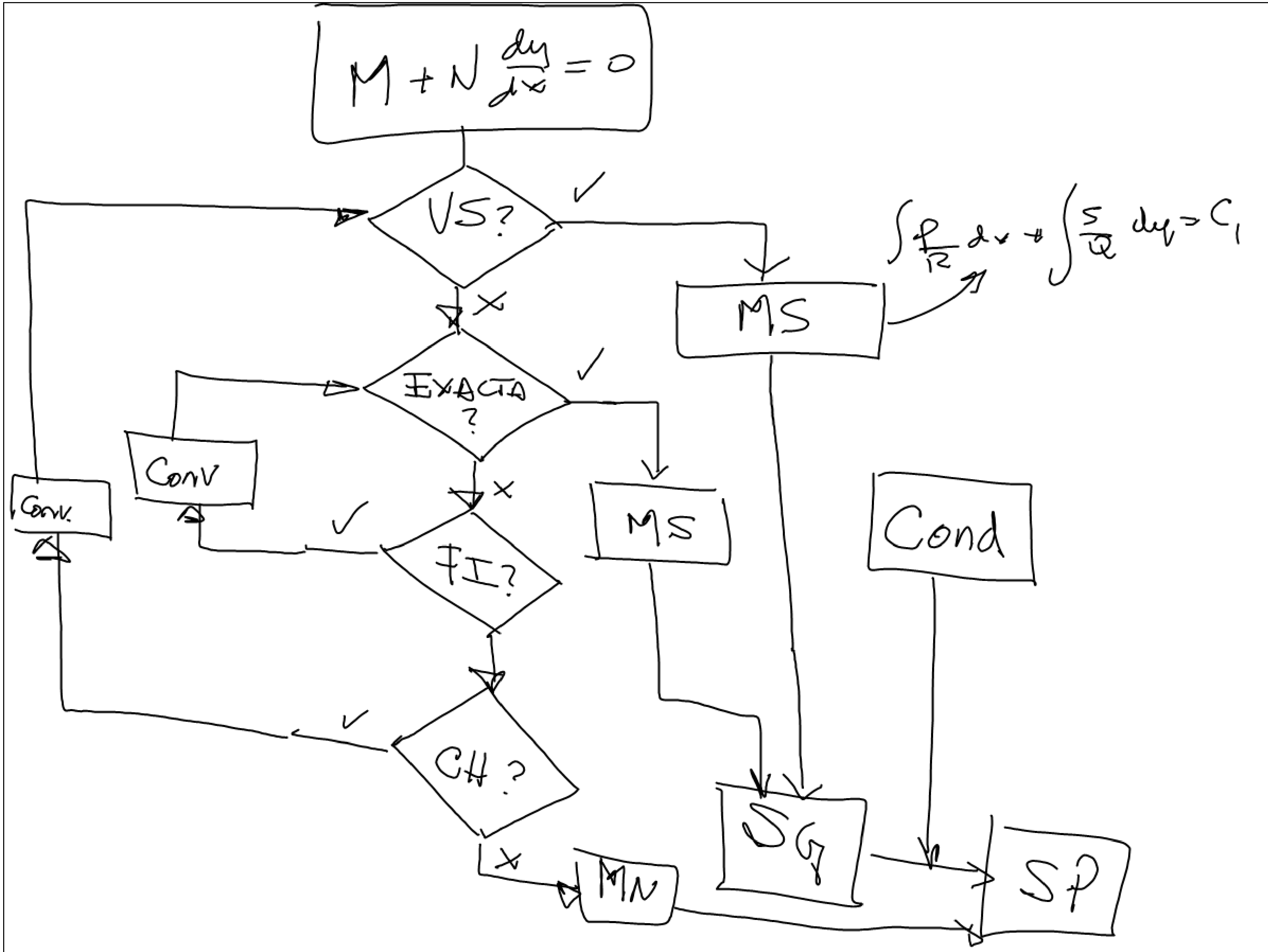
$$F(x, y, y') = 0 \quad \text{EDO}(1)\ \text{NL}$$


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

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

$$F(x,y) = -\frac{M(x,y)}{N(x,y)}.$$


$M + N\frac{dy}{dx} = 0$
VS?
✓
$\int \frac{P}{R}\,dx + \int \frac{S}{Q}\,dy = C_1$
MS
×
EXACTA ?
✓
Conv
Conv.
MS
×
FI?
✓
Cond
✓
CH ?
SG
SP
×
MN

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

$$M(x,y) = p(x)y$$

$$N(x,y) = 1$$

# Método de Variables Separables

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

Si

$$P(x)Q(y) + R(x)S(y)\frac{dy}{dx} = 0$$

$$\text{Sq} \Rightarrow \int \frac{P(x)}{R(x)}dx + \int \frac{S(y)}{Q(y)}dy = C_1$$

$$(y^2 + xy^2)\,y' + x^2 - yx^2 = 0.$$

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

$$\underbrace{x^2}_{P(x)}\underbrace{(1-y)}_{Q(y)} + \underbrace{(1+x)}_{R(x)}\underbrace{y^2}_{S(y)}\frac{dy}{dx} = 0$$

$$\int \frac{P(x)}{R(x)}\,dx + \int \frac{S(y)}{Q(y)}\,dy = C_1$$

$$\int \frac{x^2\,dx}{(1+x)} + \int \frac{y^2\,dy}{1-y} = C_1$$

$$\begin{array}{r|l} x^2 & 1+x \\ \hline -x^2-x & x \\ -x & \end{array} \qquad \begin{array}{r|l} y^2 & 1-y \\ \hline -y^2+y & -y \end{array}$$

$$\int\left(x-\frac{x}{1+x}\right)dx+\int\left(-y+\frac{y}{1-y}\right)dy=C_1$$

$$\int x\,dx-\int\frac{x\,dx}{1+x}-\int y\,dy+\int\frac{y}{1-y}\,dy=C_1$$

Solución general $F(x,y)=C_1$

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