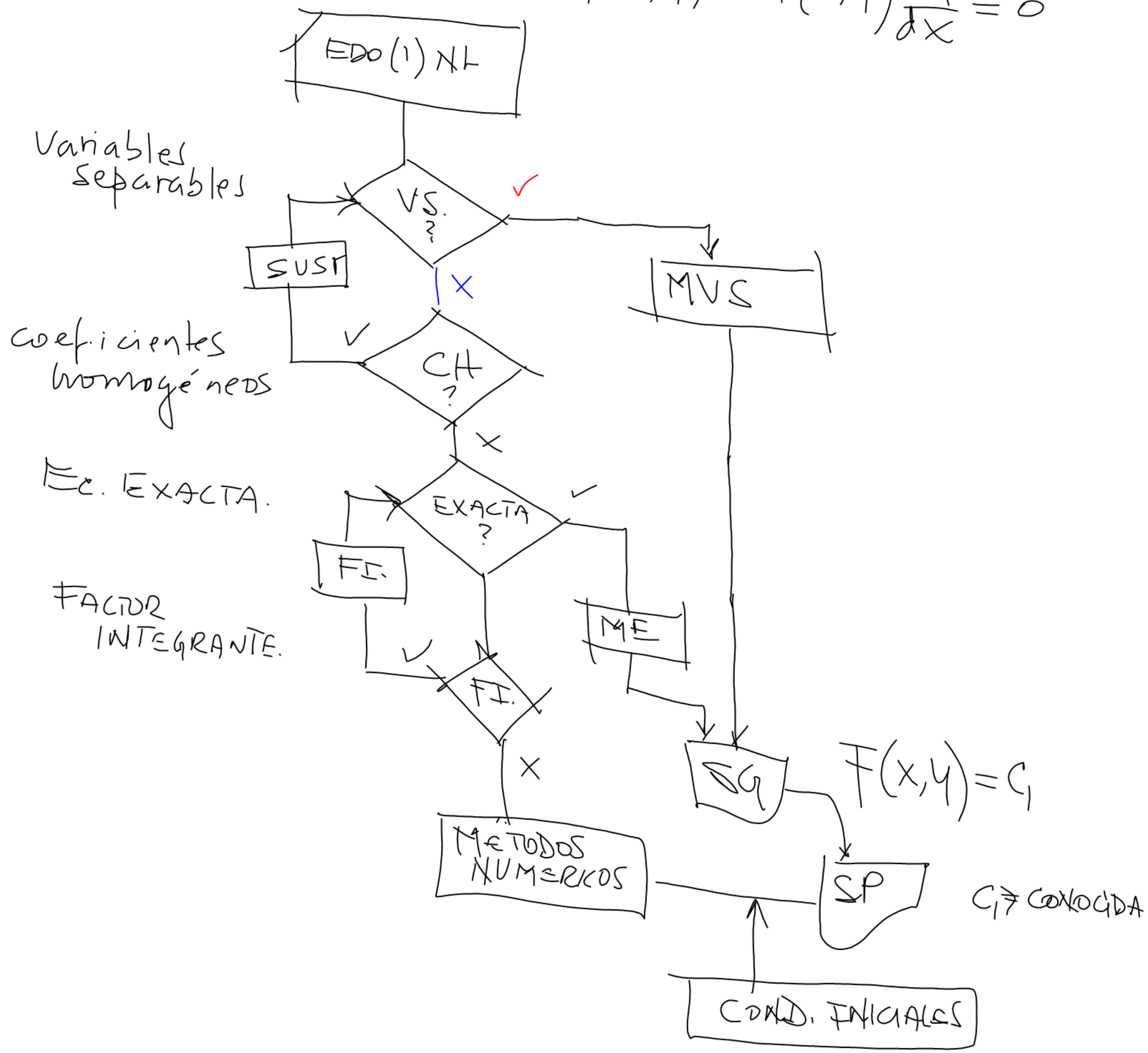
# TEMA I: EDO(1) NL

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



# VARIABLES SEPARABLES

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

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

$$P(x)\,Q(y)\,dx + R(x)\cdot S(y)\,dy = 0$$

$$\frac{1}{R(x)\cdot Q(y)}$$

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

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

$$\left[\int \frac{P(x)}{R(x)}dx + C_1\right] + \left[\int \frac{S(y)}{Q(y)}dy + C_2\right] = 0$$

$$\left[\int \frac{P(x)}{R(x)}dx\right] + \left[\int \frac{S(y)}{Q(y)}dy\right] = -C_1 - C_2$$

SG

$$\boxed{\left[\int \frac{P(x)}{R(x)}dx\right] + \left[\int \frac{S(y)}{Q(y)}dy\right] = C_{10}}$$

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

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

$N(x,y)$

$$x^2(1-y) + (1+x)y^2\frac{dy}{dx} = 0$$

$P(x) = x^2$ $\quad R(x) = 1+x$

$Q(y) = 1-y$ $\quad S(y) = y^2$

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

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

$$\begin{array}{r|l} 1+x & x^2 \\ & -x^2-x \\ & 0\ -x \\ & +x+1 \end{array} \quad x-1$$

$$\begin{array}{r|l} 1-y & y^2 \\ & -y^2+y \\ & 0\ +y \\ & -y+1 \\ & 0\ \ 1 \end{array} \quad -y-1$$

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

SG

$$\boxed{\frac{x^2}{2} - x + \ln(x+1) - \frac{y^2}{2} - y - \ln(1-y) = C_1}$$