COEFICIENTES HOMOGÉNEOS.

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

PRUEBA

$$M(\lambda x, \lambda y) = \lambda^m M(x,y)$$

$$N(\lambda x, \lambda y) = \lambda^n N(x,y) \qquad m=n$$

CH

sust. incognita

$$\left.\begin{aligned} y(x) &= u(x)\cdot x \\ \frac{dy}{dx} &= x\frac{du}{dx} + u \end{aligned}\right\} \rightarrow$$

automática

$$M(x,u) + N(x,u)\frac{du}{dx} = 0$$

VS.

146. $xy' = y + \sqrt{y^2 - x^2}$.

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

$$M(x,y) = y + \sqrt{y^2 - x^2}$$

$$M(\lambda x, \lambda y) = \lambda y + \sqrt{(\lambda y)^2 - (\lambda x)^2}$$

$$= \lambda y + \sqrt{\lambda^2 y^2 - \lambda^2 x^2}$$

$$= \lambda y + \sqrt{\lambda^2 (y^2 - x^2)}$$

$$= \lambda y + \sqrt{\lambda^2}\sqrt{y^2 - x^2}$$

$$= \lambda y + \lambda\sqrt{y^2 - x^2}$$

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

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

$$N(\lambda x, \lambda y) = -(\lambda x)$$

$$= \lambda(-x) \quad n = 1$$

$$m = n$$

Resolver E.D. (1^{er}).

$$F\left(x, y, \frac{dy}{dx}\right) = 0$$

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

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

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

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

$$\left(y+\sqrt{y^2-x^2}\right) - x\frac{dy}{dx} = 0 \qquad \text{EDO(1) NL CH.}$$

$$y = ux \qquad \frac{dy}{dx} = x\frac{du}{dx} + u$$

$$\left(ux+\sqrt{(ux)^2-x^2}\right) - x\left(x\frac{du}{dx}+u\right) = 0$$

$$\cancel{u}x + \sqrt{x^2(u^2-1)} - x^2\frac{du}{dx} - \cancel{u}x = 0$$

$$\sqrt{x^2}\sqrt{u^2-1} - x^2\frac{du}{dx} = 0$$

$$x\sqrt{u^2-1} - x^2\frac{du}{dx} = 0$$

$$\frac{x\,dx}{x^2} - \frac{du}{\sqrt{u^2-1}} = 0$$

$$SG \Rightarrow \int\frac{dx}{x} - \int\frac{du}{\sqrt{u^2-1}} = C_1 \qquad y = ux \qquad u = \frac{y}{x}$$

$$\ell x - \text{arg sen } u = C_1$$

$$SG \quad \boxed{\ell x - \text{arg sen}\frac{y}{x} = C_1}$$