EDO(1)NL.

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

Método de Variables Separables (MVS)

$$M(x,y) = P(x)\cdot Q(y)$$
$$N(x,y) = R(x)\cdot S(y)$$

Si se puede alcanzar estas expresiones

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

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

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

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

Solución general

$M(x,y)$ $\qquad$ $N(x,y)$

$$3e^{x}\tan(y) + (2-e^{x})\sec^{2}(y)\,\frac{dy}{dx} = 0$$

$$\frac{3e^{x}}{2-e^{x}}\,dx + \frac{\sec^{2}(y)}{\tan(y)}\,dy = 0$$

$$\int \frac{3e^{x}}{2-e^{x}}\,dx + \int \frac{\sec^{2}(y)}{\tan(y)}\,dy = C_1$$

$$-3L(2-e^{x}) + L(\tan(y)) = C_1$$

$$e^{(-3L(2-e^{x}))} + e^{L(\tan(y))} = e^{C_1}$$

$$\frac{\tan(y)}{(2-e^{x})} = C_{10}$$

$$\tan(y) = C_{10}(2-e^{x})$$

$$\boxed{\tan(y) - C_{10}(2-e^{x}) = 0}$$

$$F(x,y) = 0 \Leftrightarrow F(x,y) = C$$

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

SOL GRAL

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

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

MÉTODO DE COEFICIENTES HOMOGENEOS

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

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

$$u(x) = \frac{y(x)}{x} \qquad \left\{ \begin{array}{l} y(x) = x \cdot u(x) \\ \dfrac{dy(x)}{dx} = u(x) + x\dfrac{du(x)}{dx} \end{array} \right.$$

$$\overbrace{\sqrt{x^2-y^2}+y}^{M}\ \overbrace{-x}^{N}\frac{dy}{dx}=0$$

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

$$N(\lambda x,\lambda y)=(-\lambda x)$$
$$=\lambda(-x)\quad n=1$$

$$m=n$$

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

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

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

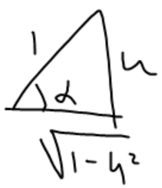
$$\left(\sqrt{x^2(1-u^2)}+x\cdot u\right)-xu-x^2\frac{du}{dx}=0$$

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

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

$\cos(\alpha)=\dfrac{\sqrt{1-u^2}}{1}$

$\operatorname{sen}\alpha=\dfrac{u}{1}$



$\alpha=\operatorname{ang\,sen}(u)$

$$P=x \qquad Q=\sqrt{1-u^2} \qquad R=x^2 \qquad S=-1$$

$$\int\frac{x}{x^2}\,dx+\int\frac{-1}{\sqrt{1-u^2}}\,du=C_1$$

$$\int\frac{dx}{x}-\int\frac{du}{\sqrt{1-u^2}}=C_1$$

$$\int\frac{\cos(\alpha)\,d\alpha}{\cos(\alpha)}$$

$$Lx-\operatorname{ang\,sen}(u)=C_1$$

$$\rightarrow Lx-\operatorname{ang\,sen}\left(\frac{y}{x}\right)=C_1$$ Sol Gral