EDO(1) L cv H.

$$a_0(x)\frac{dy}{dx} + a_1(x)\,y = 0$$

normalizar

$$\frac{dy}{dx} + \frac{a_1(x)}{a_0(x)}\,y = 0$$

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

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

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

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

$$\int \frac{dy}{y} = -\int p(x)dx$$

$$\ln y + k_1 = -\left[\int p(x)dx\right] + k_2$$

$$\ln y = -\left[\int p(x)dx\right] + (k_2 - k_1)$$

$$y = e^{-\left[\int p(x)dx\right] + (k_2 - k_1)}$$

$$y = e^{k_2 - k_1}\, e^{-\int p(x)dx}$$

$$\boxed{y = C_1 e^{-\int p(x)dx}}$$

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

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

$$p(x) = -\frac{1}{x}$$

$$\int p(x)\,dx = -\int \frac{dx}{x}$$

$$= -Lx$$

$$y = C_1 e^{-\int p(x)\,dx}$$

$$y = C_1 e^{-[-Lx]}$$

$$y = C_1 e^{Lx}$$

$$Ly = L\left(C_1 e^{Lx}\right)$$

$$Ly = Lx\, L\left(C_1 e\right)$$

$$Ly = Lx\, LC_1$$

$$\boxed{y = C_1 x}$$

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

$$\frac{\frac{a}{b}}{\frac{c}{d}} \Rightarrow \frac{a\cdot d}{b\cdot c}$$

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

$$p(x)=\frac{-1}{x\,Lx}$$

$$\int p(x)\,dx=-\int\frac{dx}{x\,Lx}$$

$$=-\int\frac{\frac{dx}{x}}{Lx}$$

$$u=Lx \qquad du=\frac{dx}{x}$$

$$=-\int\frac{du}{u}\Rightarrow -Lu$$

$$-\int\frac{\frac{dx}{x}}{Lx}=-L(Lx)$$

$$y=Ce^{-(-L(Lx))}\Rightarrow Ce^{L(Lx)}\Rightarrow C\,Lx$$

$$\boxed{y_g=C\,Lx}$$

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

$$\frac{dy}{dx}=C\,\frac{1}{x}$$

$$x\,Lx\left(\frac{C}{x}\right)-C\,Lx=0$$

$$C\,Lx-C\,Lx=0$$

$$0=0$$

Sol. Gral

$$y = Ce^{-\int p(x)\,dx} \Rightarrow y = \frac{C}{e^{\int p(x)\,dx}}$$

$$y e^{\int p(x)\,dx} = C$$

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

$$\frac{d}{dx} F(x, y) = 0$$

$$\frac{\partial F}{\partial x} + \frac{\partial F}{\partial y} \cdot \frac{dy}{dx} = 0$$

$$y e^{\int p(x)\,dx} p(x) + e^{\int p(x)\,dx} (1) \frac{dy}{dx} = 0$$

$$e^{\int p(x)\,dx} \left(\frac{dy}{dx} + p(x) y \right) = 0$$

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

Resolver EDO(1)LCV NH.

$$a_0(x)\frac{dy}{dx} + a_1(x)y = Q(x)$$

$$\frac{dy}{dx} + \frac{a_1(x)}{a_0(x)}y = \frac{Q(x)}{a_0(x)}$$

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

$$e^{\int p(x)dx}\left(\frac{dy}{dx} + p(x)y\right) = e^{\int p(x)dx}q(x)$$

$$\frac{d}{dx}\left(ye^{\int p(x)dx}\right) = e^{\int p(x)dx}q(x)$$

$$d\left(ye^{\int p(x)dx}\right) = e^{\int p(x)dx}q(x)\,dx$$

$$\int d\left(ye^{\int p(x)dx}\right) = \int e^{\int p(x)dx}q(x)\,dx$$

$$ye^{\int p(x)dx} = \int e^{\int p(x)dx}q(x)\,dx + C_1$$

$$\boxed{y = C_1e^{-\int p(x)dx} + e^{-\int p(x)dx}\int e^{\int p(x)dx}q(x)\,dx}$$

$$\frac{dy}{dx} + p(x)y = q(x) \quad \text{EDO(1)LCV NH.}$$

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

Regla de Oro de las EDO(n)L

178. $x \ln x \cdot y' - y = x^3 (3 \ln x - 1).$

$$x Lx \cdot \frac{dy}{dx} - y = x^3 (3 Lx - 1)$$

$$\frac{dy}{dx} - \frac{y}{x Lx} = \frac{x^3 (3 Lx - 1)}{x Lx}$$

$$\frac{dy}{dx} - \frac{y}{x Lx} = 3x^2 - \frac{x^2}{Lx}$$

$$p(x) = \frac{1}{x Lx}$$

$$q(x) = 3x^2 - \frac{x^2}{Lx}$$