EDOL

$\downarrow$

Sol Gral $y = C_1 y_1 + y_p$

función explícita

dsolve( )

EDO NL

$M + N\frac{dy}{dx} = 0$

$\downarrow$

$F(x, y) = c_1$

función implícita

with(DEtools)

EDONL

$$\underbrace{(xy^2 - y^3 + x - 1)}_{M} + \underbrace{(x^2y - 2xy + x^2 + 2y - 2x + 2)}_{N}\frac{dy}{dx} = 0$$

$$M + N\frac{dy}{dx} = 0$$

$$\downarrow$$

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

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

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

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

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

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

$$M + N\frac{dy}{dx} = 0$$

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

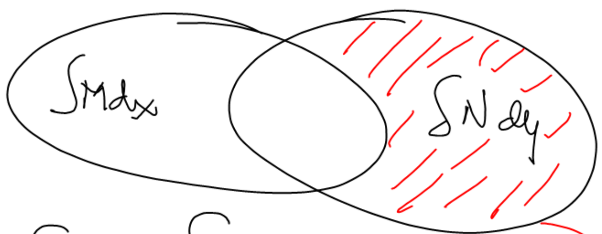
$$\frac{\partial F}{\partial x} + \frac{\partial F}{\partial y}\cdot\frac{dy}{dx} = 0$$

$$\frac{\partial^2 F}{\partial y \partial x} = \frac{\partial^2 F}{\partial x \partial y}$$

$$M = \frac{\partial F}{\partial x} \qquad N = \frac{\partial F}{\partial y}$$

$$\frac{\partial M}{\partial y} = \frac{\partial N}{\partial x}$$

$$\int M\,dx \cup \int N\,dy = C_1$$



SG EXACTA

$$\int M\,dx + \int\left[N - \frac{\partial}{\partial y}\int M\,dx\right]dy = C_1$$

$$\underbrace{(x^3+xy^2)}_{M}+\underbrace{(x^2y+y^3)}_{N}\frac{dy}{dx}=0$$

$$\frac{\partial M}{\partial y}=2xy$$

$$\frac{\partial N}{\partial x}=2xy$$

$$\int M\,dx=\int x^3\,dx+y^2\int x\,dx$$

$$=\frac{x^4}{4}+y^2\frac{x^2}{2}$$

$$\frac{\partial}{\partial y}\int M\,dx = yx^2$$

$$\left[N-\frac{\partial}{\partial y}\int M\,dx\right]=x^2y+y^3-yx^2$$

$$=y^3$$

$$\int\left[N-\frac{\partial}{\partial y}\int M\,dx\right]dy=\int y^3\,dy$$

Sol. gral. $$\frac{x^4}{4}+\frac{x^2y^2}{2}+\frac{y^4}{4}=C_1$$