

## Método del Factor Integrante.

$$M(x,y) + N(x,y) \frac{dy}{dx} = 0 \quad \text{EDO(1)NL - No EXACTA.}$$

$$\underbrace{F(x,y)M(x,y)}_{MM} + \underbrace{F(x,y)N(x,y)}_{NN} \frac{dy}{dx} = 0 \quad \text{EXACTA.}$$

$$F(x,y) \Rightarrow \text{FACTOR INTEGRANTE.}$$

$$MM + NN \frac{dy}{dx} = 0 \quad \text{EXACTA.}$$

$$\frac{\partial MM}{\partial y} = \frac{\partial NN}{\partial x}$$

$$\frac{\partial}{\partial y}(F \cdot M) = \frac{\partial}{\partial x}(F \cdot N)$$

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

Si  $F(x)$

$$F \cdot \frac{\partial M}{\partial y} + (0) = F \cdot \frac{\partial N}{\partial x} + N \frac{dF}{dx}$$

$$N \frac{dF}{dx} = F \left( \frac{\partial M}{\partial y} - \frac{\partial N}{\partial x} \right)$$

$$\frac{dF}{dx} = F(x) \left[ \frac{\frac{\partial M}{\partial y} - \frac{\partial N}{\partial x}}{N} \right]$$

$$\frac{dF}{F} = \left[ \frac{\frac{\partial M}{\partial y} - \frac{\partial N}{\partial x}}{N} \right] dx$$

$u(x)$

$$\underbrace{x^3 y^2 + 5x^4 y^3 + 6x^2 y^4}_{P(x,y)} = C_1$$

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

$$(3x^2 y^2 + 20x^3 y^3 + 12x y^4) + (2x^3 y + 15x^4 y^2 + 24x^2 y^3) \frac{dy}{dx} = 0$$

$$x(3x y^2 + 20x^2 y^3 + 12y^4) + x(2x^2 y + 15x^3 y^2 + 24x y^3) \frac{dy}{dx} = 0$$

$$(3x y^2 + 20x^2 y^3 + 12y^4) + (2x^2 y + 15x^3 y^2 + 24x y^3) \frac{dy}{dx} = 0$$

$$y(3x^2 y + 20x^3 y^2 + 12x y^3) + y(2x^3 + 15x^4 y + 24x^2 y^2) \frac{dy}{dx} = 0$$

$$(3x^2 y + 20x^3 y^2 + 12x y^3) + (2x^3 + 15x^4 y + 24x^2 y^2) \frac{dy}{dx} = 0$$

$$(3x^2y + 20x^3y^2 + 12xy^3) + (2x^3 + 15x^4y + 24x^2y^2) \frac{dy}{dx} = 0$$

$F(y)$

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

$$F \frac{\partial M}{\partial y} + M \frac{dF}{dy} = F \frac{\partial N}{\partial x} + (0)$$

$$\frac{dF}{dy} = F \left( \frac{\frac{\partial N}{\partial x} - \frac{\partial M}{\partial y}}{M} \right)$$

$$\frac{dF}{F} = \left( \frac{\frac{\partial N}{\partial x} - \frac{\partial M}{\partial y}}{M} \right) dy$$

$$(3x^2y^2 + 20x^3y^3 + 12xy^4) + (2x^3 + 15x^4y^2 + 24x^2y^3) \frac{dy}{dx} = 0$$

$$xy(3xy + 20x^2y^2 + 12y^3) + xy(2x^2 + 15x^3y + 24xy^2) \frac{dy}{dx} = 0$$

$$(3xy + 20x^2y^2 + 12y^3) + (2x^2 + 15x^3y + 24xy^2) \frac{dy}{dx} = 0$$