CÓDIGO COMUNICACIÓN

LOPEZ_GARCIA_TAREA2.MW

¿Qué es una ecuación diferencial?

¿Qué se entiende por ECUACIÓN?

$f(x) = 0$

x_1
x_2
x_3
$\vdots$
x_n

} Solución

$y = f(x)$

$f(x_1) = 0$

$\downarrow$

$0 \equiv 0$

$x^3 - 6x^2 - 7x + 60 = 0$

$(5)^3 - 6(5)^2 - 7(5) + 60 = 0$

$125 - 150 - 35 + 60 = 0$

$185 - 185 = 0$

$0 \equiv 0$

$x_1 = 5$
$x_2 = -3$
$x_3 = 4$

ECUACIÓN $\longleftrightarrow$ SOLUCIÓN

	VR	ED
EDO	20%	80%
ED P.	80%	20%

$$F\left(x, y, \frac{dy}{dx}, \frac{d^2y}{dx^2}, \ldots\right) = 0$$ — Ecuación Diferencial Ordinaria

EDO

(ODE)

$y = f(x)$

- x: variable independiente.
- y: incógnita

$$G\left(x, y, z, \frac{\partial z}{\partial x}, \frac{\partial z}{\partial y}, \ldots\right) = 0$$ — Ecuación Diferencial en Derivada Parcial

ED en DP

(PDE).

$\frac{dy}{dx} = 0$ **EDO**

Solución

$y = 5 \rightarrow \frac{dy}{dx} = 0$

$y = -2 \rightarrow \frac{dy}{dx} = 0$

$y(x)$ ← incógnita

$[0] = 0 \longrightarrow 0 \equiv 0$

$y = C_1 \quad C_1 \in \mathbb{R}$

$\frac{dy}{dx} = 0$

$y = \frac{a}{b} \quad a, b \in \mathbb{R}$

$\frac{dy}{dx} = 0$

$y = \sqrt{2} \quad — \quad \frac{dy}{dx} = 0 \quad y = C_1 \in \mathbb{R}$

$y = 4 + 2i \quad \frac{dy}{dx} = 0$

$\boxed{y = C_1} \quad \frac{dy}{dx} = 0$

SOLUCIÓN GENERAL

$$\frac{d^2y}{dx^2} = 0 \longrightarrow \frac{dy}{dx} = C_1$$

$$\int dy = C_1 \int dx$$

$$y + k_1 = C_1 (x + k_2)$$

$$y = C_1 x + (C_1 k_2 - k_1)$$

$$\boxed{y = C_1 x + C_2} \quad SG$$

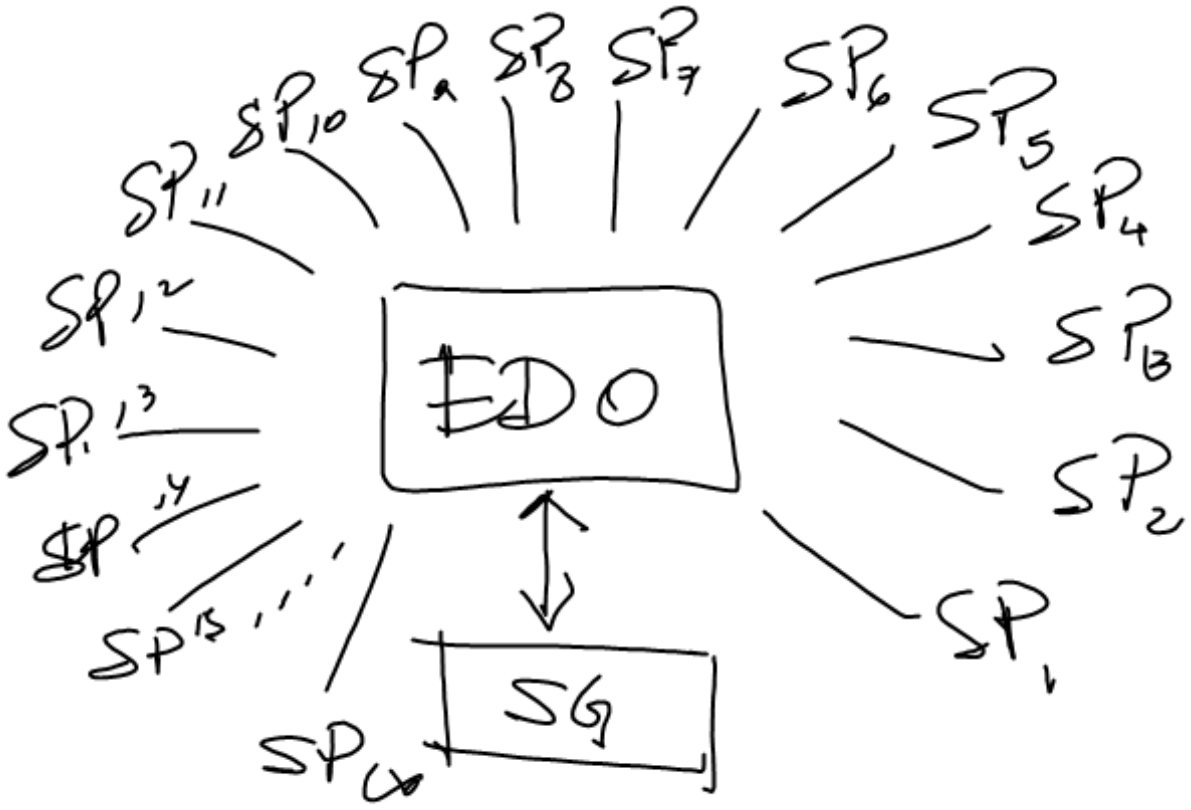
y...

SOLUCIÓN PARTICULAR

$$\boxed{y = \sqrt{3}\, x + \log(7)}$$

$$\frac{dy}{dx} = \sqrt{3}$$

$$\frac{d^2y}{dx^2} = 0$$


EDO
SG

$$y = C_1 x^2 + C_2 x + C_3 + C_4 e^x$$ SG

$$\frac{dy}{dx} = 2C_1 x + C_2 + (0) + C_4 e^x$$

$$\frac{d^2y}{dx^2} = 2C_1 + (0) + C_4 e^x$$

$$\frac{d^3y}{dx^3} = (0) + C_4 e^x$$

$$\frac{d^4y}{dx^4} = C_4 e^x$$

$$\frac{d^4y}{dx^4} = \frac{d^3y}{dx^3} \longrightarrow \boxed{\frac{d^4y}{dx^4} - \frac{d^3y}{dx^3} = 0}$$