$$y_g = C_1 e^x \cos(x) + C_2 e^x \operatorname{sen}(x) + C_3 x e^x \cos(x) + C_4 x e^x \operatorname{sen}(x)$$

III
$$\begin{cases} m_1 = 1+i & m_2 = 1-i \\ m_3 = 1+i & m_4 = 1-i \end{cases}$$

CASO IV

$$y_g = C_1 e^x + C_2 e^{2x} + C_3 e^{3x} + C_4 e^{4x} \quad \text{CASO I.}$$

$m_1 = 1 \quad m_2 = 2 \quad m_3 = 3 \quad m_4 = 4$

$$y_g = C_1 e^{4x} + C_2 x e^{4x} + C_3 x^2 e^{4x} + C_4 x^3 e^{4x}$$

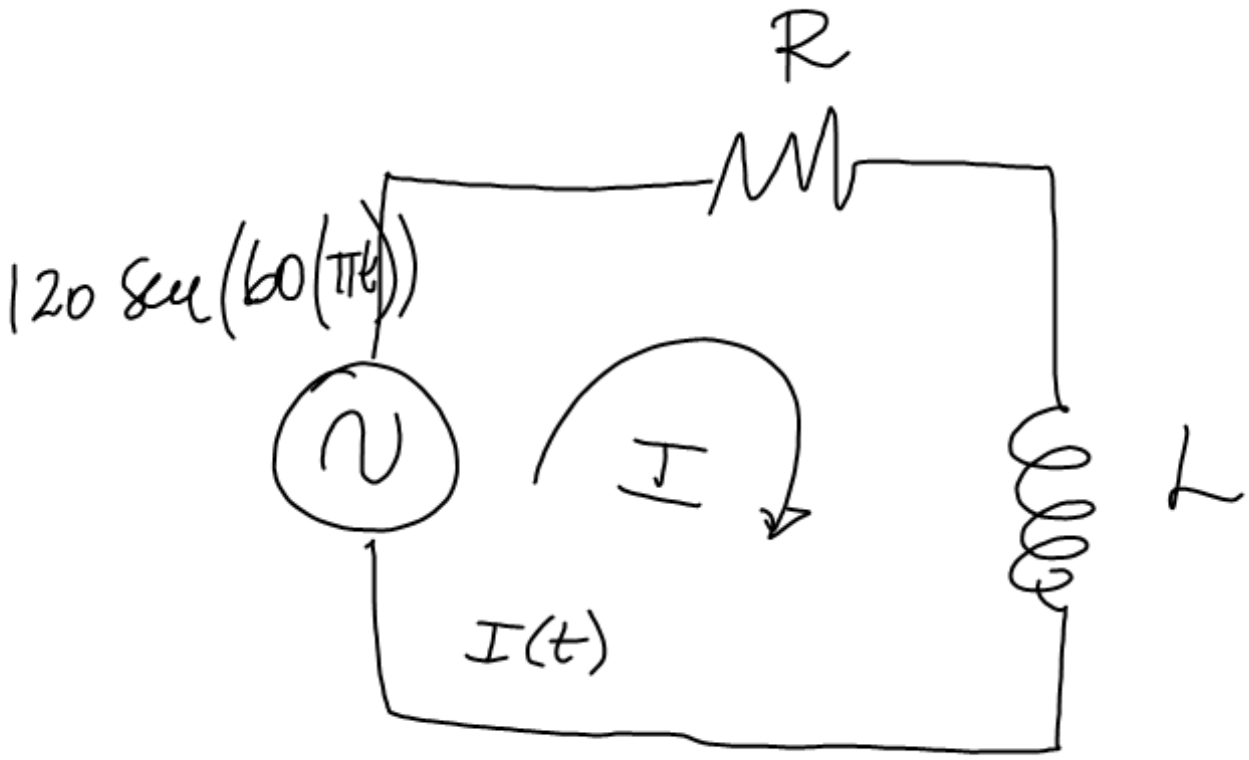
$m_1 = m_2 = m_3 = m_4 \Rightarrow 4$ CASO II

$$y = C_1 x e^x + C_2 x^2 e^x \qquad CV$$

$$y = C_1 e^x + C_2 x e^x + C_3 x^2 e^x \qquad CC$$

$$y = C_1 e^x \cos(2x) + C_2 e^{-x} \operatorname{sen}(2x) \qquad CV$$

$$y = C_1 e^{2x} \cos(3x) + C_2 e^{2x} \operatorname{sen}(3x) \qquad CC$$



$$\sum V = F$$

$$L\frac{dI}{dt} + RI = 120\,\text{sen}(60\pi t).$$

$$x^2 \frac{d^2y}{dx^2} - 4x \frac{dy}{dx} + 5y = 4x^2 \cos(3x)$$

$$x^2 \frac{d^2y}{dx^2} - 4x \frac{dy}{dx} + 5y = 0$$

$$y_c = c_1 y_1 + c_2 y_2$$

$$y_{ns} = A(x) y_1 + B(x) y_2$$

MPU → EDO(n) L.{cc, cv.}

NH

NOTACION DEL OPERADOR DIF.

$\frac{d^2y}{dx^2}$ Leibnitz.

y'' — otros.

$\ddot{y}$ — Newton

D^2y - Operador Diferencial.

$$\frac{d^2y}{dx^2} - 7\frac{dy}{dx} + 12y = 0$$

$$D^2y - 7Dy + 12y = 0$$

$$(D^2 - 7D + 12)y = 0$$

$$m^2 - 7m + 12 = 0$$

$$(m-3)(m-4) = 0 \rightarrow y = c_1e^{3x} + c_2e^{4x}$$

$$(D-3)(D-4)y = 0$$

$$(D-3)(D-4)\left[c_1e^{3x} + c_2e^{4x}\right] = 0$$

$$(D-3)\left[3c_1e^{3x} + 4c_2e^{4x} - 4c_1e^{3x} - 4c_2e^{4x}\right] = 0$$

$$(D-3)\left[-c_1e^{3x}\right] = 0$$

$$0 = 0$$

$$(D-a) \Longleftrightarrow e^{ax}$$

$$(D-a)^2 \Longleftrightarrow xe^{ax}$$

$$(D-a)^n \Longleftrightarrow x^{n-1}e^{ax}$$

$$((m-a)^2-(bi)^2) \Longleftrightarrow e^{ax}\cos(bx)$$

$$(m^2-2am+(a^2+b^2)) \rightarrow e^{ax}\operatorname{sen}(bx)$$

$$\left(x^2D^2-3xD+6\right)y=0$$

$$(xD-6)(D-4)y \neq (D-4)(xD-6)y$$

$$\frac{dy}{dx} + p(x)y = 0 \quad \rightarrow \quad y = C_1 e^{-\int p(x)dx}$$

$$\frac{dy}{dx} + p(x)y = q(x) \rightarrow y = C_1 e^{-\int p\,dx} + e^{-\int p\,dx}\left[\int e^{\int p\,dx} q\,dx\right]$$

$$\frac{d^2y}{dx^2} + 8\frac{dy}{dx} + 9y = 0 \qquad m^2 + 8m + 9 = 0$$

$$y = C_1 e^{m_1 x} + C_2 e^{m_2 x}$$

- CASO I = $m_1 \neq m_2 \in \mathbb{R}$
- CASO II = $m_1 = m_2 \in \mathbb{R}$
- CASO III = $m_1 \neq m \in \mathbb{C}$.

$$\frac{d^2y}{dx^2} + 8\frac{dy}{dx} + 9y = 3e^{3x} + x^2 + 4e^x \cos(5x)$$

MPV