

Por causas de fuerza mayor  
se cambió el correo de entrega  
de tareas y series a mi ayudante.

ecuaciones1501@gmail.com (no es funcional) ~~X~~

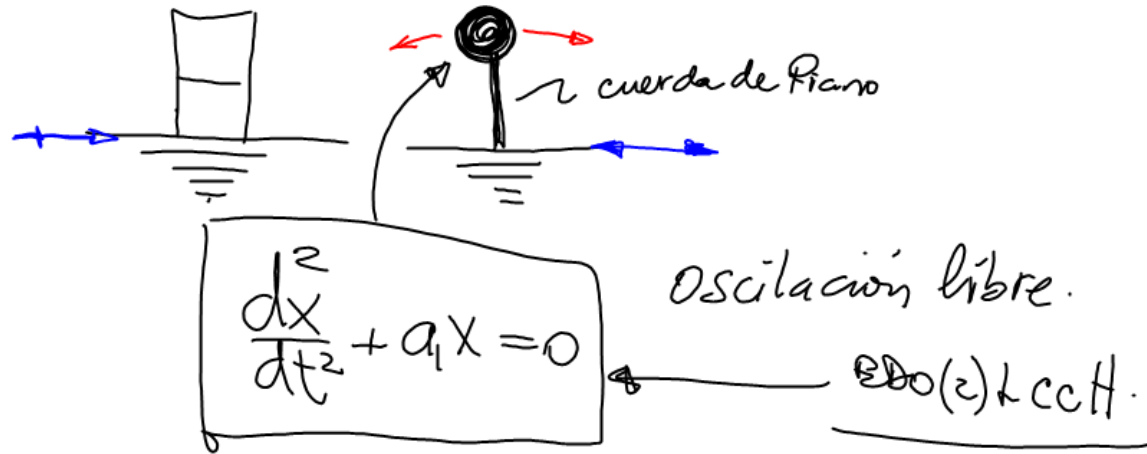
↓  
⇒ ecuaciones15.1@gmail.com (activo) ✓

Volver a enviar las 2 tareas para  
poder registrarlas con el nuevo ayudante.

\* { Hoy se subirá la Serie 1 (cap. 2) a la página  
fecha límite de entrega 22 sept. a las 23:59 hs.

$$\text{EDO}(n) \in \{cc\} \text{ NH.}$$

Método de los Parámetros Variables.



$$\frac{d^2x}{dt^2} + a_1x = f(t) \quad \leftarrow \text{sismo}$$

$$150 \text{ sen}(4t)$$

Fenómeno de resonancia

$$\frac{d^2x}{dt^2} + 16x = 150 \sin(4t) \quad \left. \begin{array}{l} \text{EDO(2) LCC NH} \\ x(0) = 0 \\ x'(0) = 0 \end{array} \right\}$$

MPV

$$\frac{d^2x}{dt^2} + 16x = 0 \quad \text{EDO(2) LCC H.}$$

$$m^2 + 16 = 0 \quad \left\{ \begin{array}{l} m_1 = 4i \\ m_2 = -4i \end{array} \right. \quad \text{CASO III.}$$

$$\text{SG H} \quad \textcircled{A} \quad y = c_1 \cos(4t) + c_2 \sin(4t).$$

$$\text{SG NH} \Rightarrow y = A(t) \cos(4t) + B(t) \sin(4t)$$

$$\begin{bmatrix} \cos(4t) & \sin(4t) \\ -4 \sin(4t) & 4 \cos(4t) \end{bmatrix} \begin{bmatrix} A'(t) \\ B'(t) \end{bmatrix} = \begin{bmatrix} 0 \\ 150 \sin(4t) \end{bmatrix}$$

$$A'(t) = \frac{\begin{vmatrix} 0 & \operatorname{sen}(4t) \\ 150 \operatorname{sen}(4t) & 4 \cos(4t) \end{vmatrix}}{\begin{vmatrix} \cos(4t) & \operatorname{sen}(4t) \\ -4 \operatorname{sen}(4t) & 4 \cos(4t) \end{vmatrix}}}$$

$$A'(t) = \frac{-150 \operatorname{sen}^2(4t)}{4 \cos^2(4t) + 4 \operatorname{sen}^2(4t)} = \frac{-150}{4} \operatorname{sen}^2(4t)$$

$$B'(t) = \frac{1}{4} \begin{vmatrix} \cos(4t) & 0 \\ -4 \operatorname{sen}(4t) & 150 \operatorname{sen}(4t) \end{vmatrix} = \frac{150}{4} \cos(4t) \operatorname{sen}(4t).$$

$$\begin{aligned}
 A(t) &= \int -\frac{150}{4} \left( \frac{1}{2} - \frac{1}{2} \cos(8t) \right) dt \\
 A'(t) &= -\frac{150}{8} \int dt + \frac{150}{8} \int \cos(8t) dt + C_1 \\
 &= -\frac{150}{8} t + \frac{150}{64} \int \cos(8t) 8dt + C_1 \\
 &= -\frac{150}{8} t + \frac{150}{64} \sin(8t) + C_1 \\
 A(t) &= -\frac{150}{8} t + \frac{150}{64} \cdot 2 \sin(4t) \cos(4t) + C_1
 \end{aligned}$$

$$\begin{aligned}
 B(t) &= \frac{150}{4} \int \sin(4t) \cos(4t) dt + C_2 \\
 &= \frac{150}{16} \int \sin(4t) [\cos(4t) 4dt] + C_2 \\
 &= \frac{150}{16} \frac{\sin^2(4t)}{2} + C_2 \\
 &= \frac{150}{32} \sin^2(4t) + C_2
 \end{aligned}$$

$$\begin{aligned}
 y &= \left( -\frac{150}{8} t + \frac{150}{32} \sin(4t) \cos(4t) + C_1 \right) \cos(4t) + \\
 &\quad + \left( \frac{150}{32} \sin^2(4t) + C_2 \right) \sin(4t).
 \end{aligned}$$

$$= -\frac{150}{8} t \cos(4t) + \dots$$

