Determinar la solución contínua de la ecuación diferencial con valores iniciales:

1. $$\begin{cases} x'' - 2x' + x = \operatorname{sen}(t)\,\mathtt{u}(t-\pi/2), \\ x(0) = 0, \quad x'(0) = 0 \end{cases}$$

2. $$\begin{cases} x'' - 2x' + x = \cos(t)\,\mathtt{u}(t-\pi/2), \\ x(0) = 0, \quad x'(0) = 0 \end{cases}$$

3. $$\begin{cases} x'' + 2x' + x = \operatorname{sen}(t)\,\mathtt{u}(t-\pi/2), \\ x(0) = 0, \quad x'(0) = 0 \end{cases}$$

4. $$\begin{cases} x'' + 2x' + x = \cos(t)\,\mathtt{u}(t-\pi/2), \\ x(0) = 0, \quad x'(0) = 0 \end{cases}$$

5. $$\begin{cases} x'' + x = \operatorname{sen}(t), \\ x(0) = 0, \quad x'(0) = 0 \end{cases}$$

6. $$\begin{cases} x'' - 2x' + x = e^{t}\,\mathtt{u}(t-1), \\ x(0) = 0, \quad x'(0) = 1 \end{cases}$$

7. $tx'(t) + x(t) = \operatorname{sen}(t)$

8. $tx'(t) + x(t) = \operatorname{sen}(2t)$

9. $$\begin{cases} x'' + x = \mathtt{u}(t-\pi), \\ x(0) = 0, \quad x'(0) = 1 \end{cases}$$

10. $$\begin{cases} x'' - x = e^{-t}\,\mathtt{u}(t-1), \\ x(0) = 0, \quad x'(0) = 1 \end{cases}$$

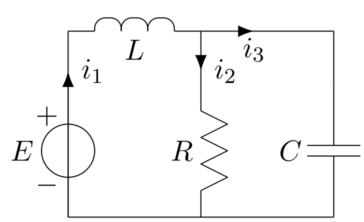
11. $$\begin{cases} x'' + x = \cos(t), \\ x(0) = 0, \quad x'(0) = 0 \end{cases}$$

12. $$\begin{cases} x'' - x = t\,\mathtt{u}(t-1), \\ x(0) = 0, \quad x'(0) = 2 \end{cases}$$

13. $$\begin{cases} x'' + 4x = \operatorname{sen}(2t), \\ x(0) = 0, \quad x'(0) = 0 \end{cases}$$

14. $$\begin{cases} x'' + 3y' + 3y = 0, \\ x'' + 3y = te^{-t}, \\ x(0) = 0, \quad y(0) = 0, \\ x'(0) = 2 \end{cases}$$

**Sistema de Ecuaciones diferenciales con circuitos.**
Dado el circuito RLC con $E(t) = 60U$, $L = 1H$, $R = 50\Omega$, $C = 10^{-4}F$, siendo las intensidades iniciales $i_1(0) = 0$, $i_2(0) = 0$, resolver el sistema de ecuaciones diferenciales:




$$\begin{cases} L\,\dfrac{di_1}{dt} + Ri_2 = E(t), \\ RC\,\dfrac{di_2}{dt} + i_2 - i_1 = 0 \end{cases}$$