

$$x' = a_{11}x + a_{12}y + b_1$$

$$y' = a_{21}x + a_{22}y + b_2$$

$$\frac{d}{dt} \bar{X} = \begin{bmatrix} a_{11} & a_{12} \\ a_{21} & a_{22} \end{bmatrix} \bar{X} + \bar{b}$$

$$e^{At}$$

$$y'' - 2y' - 8y = 6e^{-2t}$$

$$y(0) = 0 \quad y'(0) = -7.$$

$$y(t) = y_1(t)$$

$$y'(t) = y'_1(t) = y_2(t)$$

$$y''(t) = y'_2(t)$$

$$y'_2(t) - 2y_2(t) - 8y_1(t) = 6e^{-2t}$$

$$y'_1(t) = y_2(t)$$

$$y'_2(t) = +8y_1(t) + 2y_2(t) + 6e^{-2t}$$

$$y_1(0) = 0 \quad y_2(0) = -7$$

$$X_{\text{cer}} = \begin{bmatrix} 0 \\ -7 \end{bmatrix} \begin{bmatrix} y'_1(t) \\ y'_2(t) \end{bmatrix} = \begin{bmatrix} 0 & 1 \\ 8 & 2 \end{bmatrix} \begin{bmatrix} y_1(t) \\ y_2(t) \end{bmatrix} + \begin{bmatrix} 0 \\ 6e^{-2t} \end{bmatrix}$$

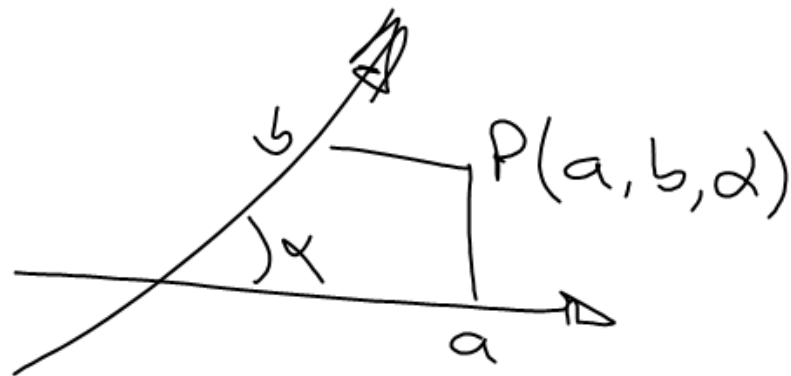
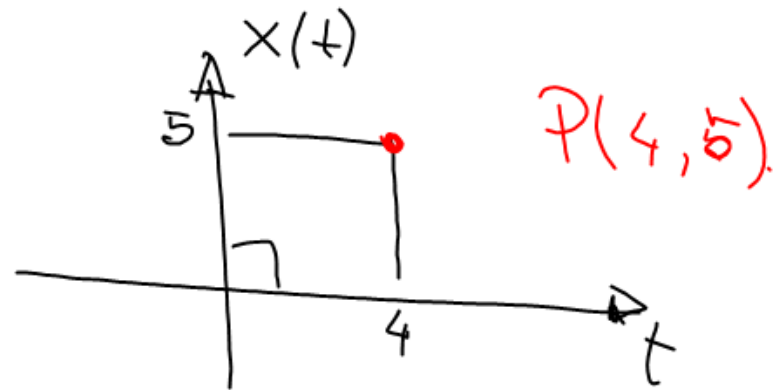
$$\frac{d}{dt} \bar{x} = A \bar{x} + B$$

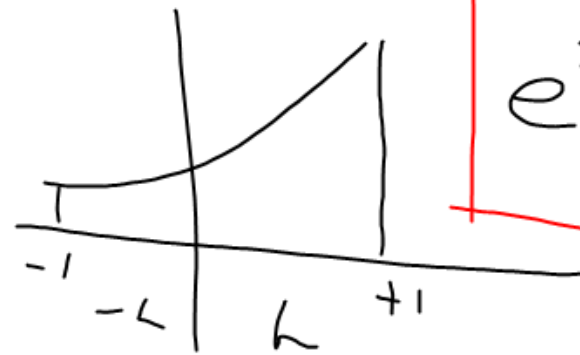
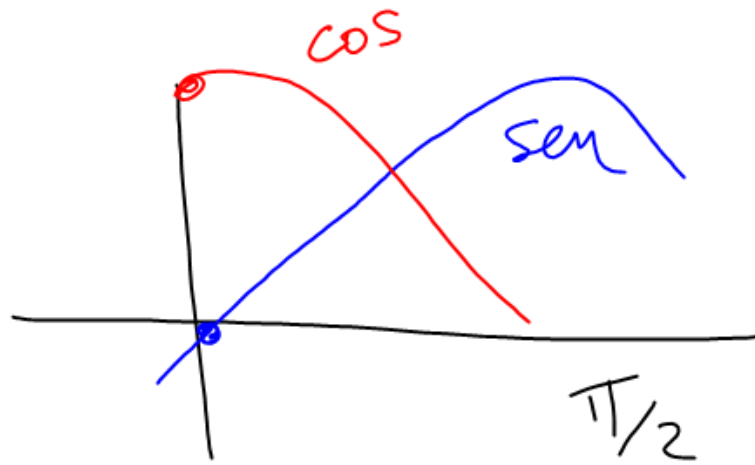
$$\bar{y}(t) = e^{At} \times X_{\text{cer}} + \int_0^t e^{A(t-\tau)} B(\tau) d\tau.$$

$S \in \mathbb{R} | \varepsilon \Rightarrow (2), (5) \text{ y } (7) \text{ por sistemas de ED.}$
 $\Rightarrow (9) \rightarrow \text{Sustituir } (*) \text{ por } (+)$

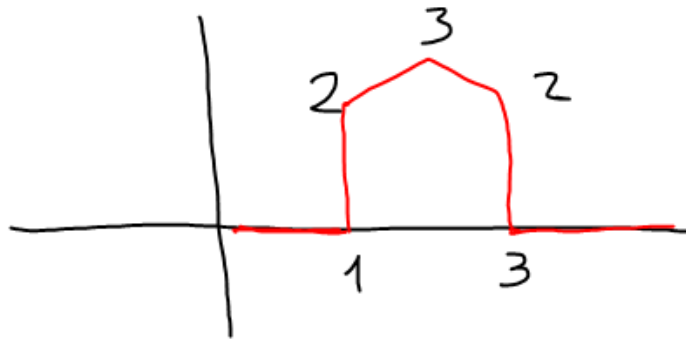
ED en DP \longrightarrow Varias soluciones generales.

$$y(x, t) = F_1(x, t) + F_2(x, t)$$

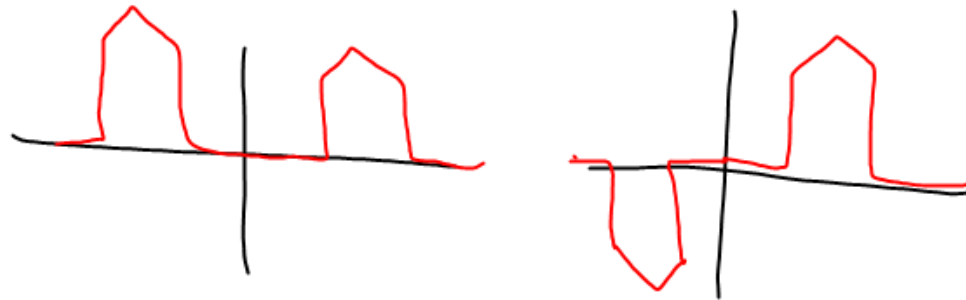


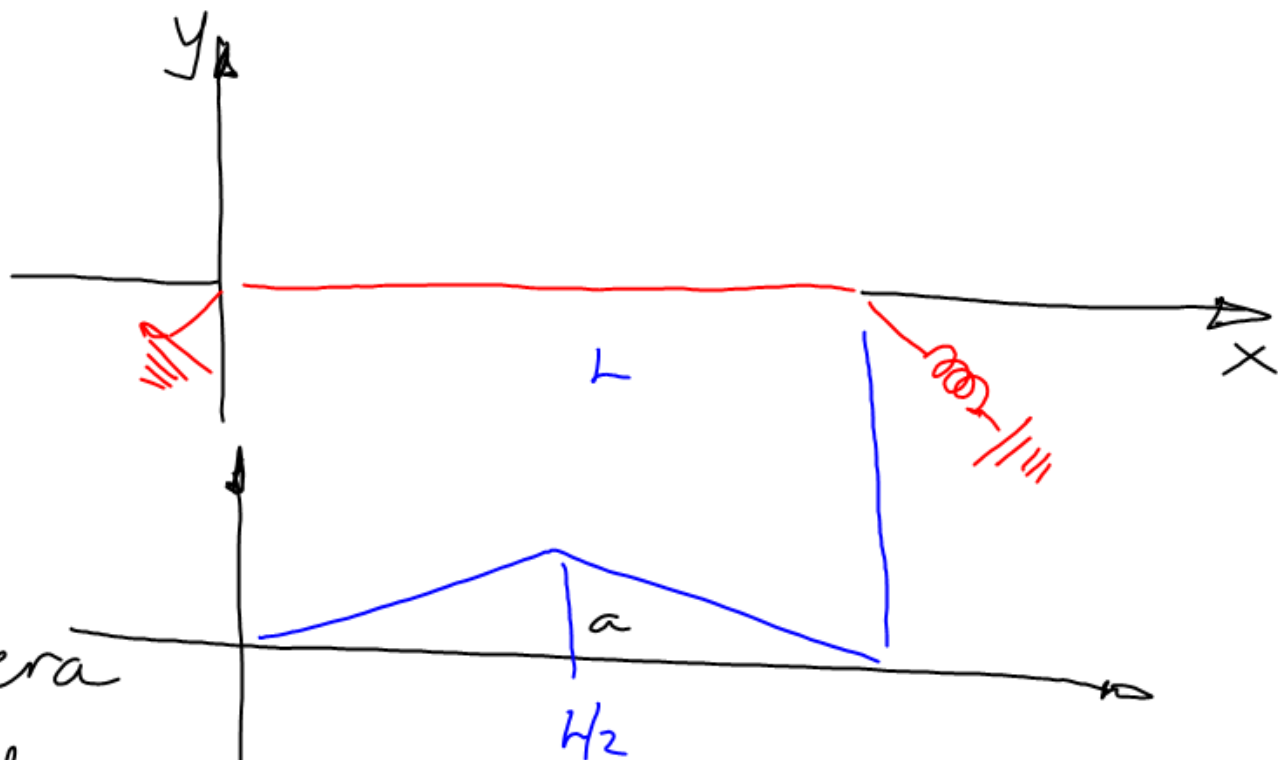


$$e^{zt}$$
$$L=1$$



$$f = 2u(t-1) + (t-1)u(t-1) - 2(t-2)u(t-2) + (t-3)u(t-3) - 2u(t-3).$$





Cond.
frontera

$$x=0 \quad y=0$$

$$x=L \quad y=0$$

$$y(x, t)$$

$$\frac{\partial^2 y}{\partial t^2} = c^2 \frac{\partial^2 y}{\partial x^2}$$

Cond. $y(x, 0) =$

$$\text{inicial} \quad y(x, 0) = \begin{cases} \frac{a}{L/2} x & ; 0 \leq x \leq L/2 \\ 2a - \frac{a}{L/2} x & ; L/2 < x \leq L \end{cases}$$

$$\frac{\partial y}{\partial t}(x, 0) = 0$$