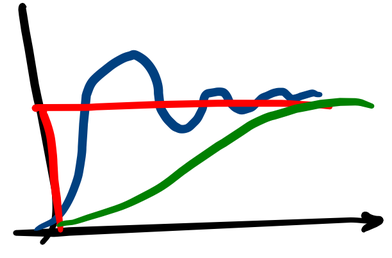
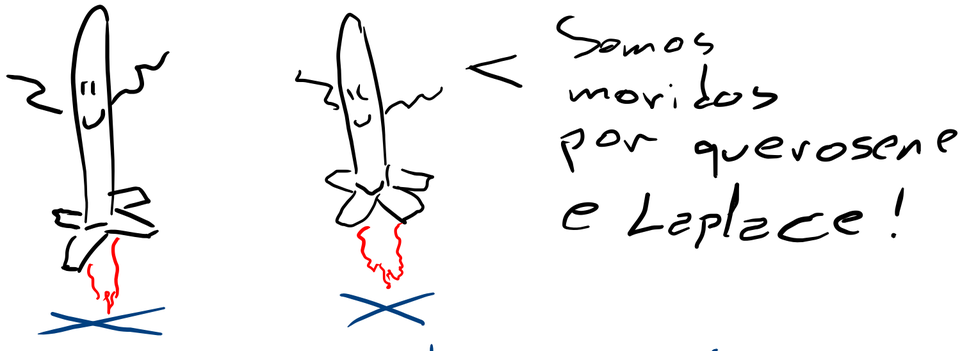
Minicurso Sistemas Lineares



CAEEL

Lucas Zischler

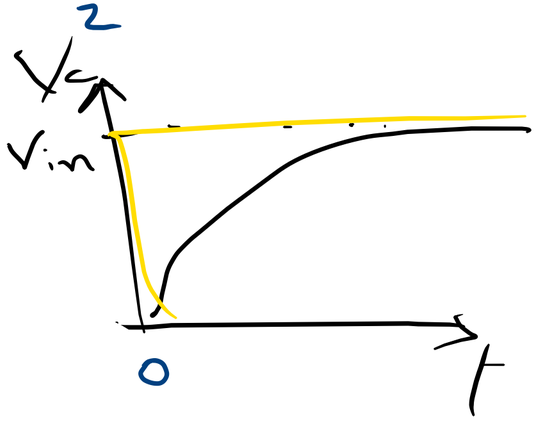
Não consigo exportar vídeo :\

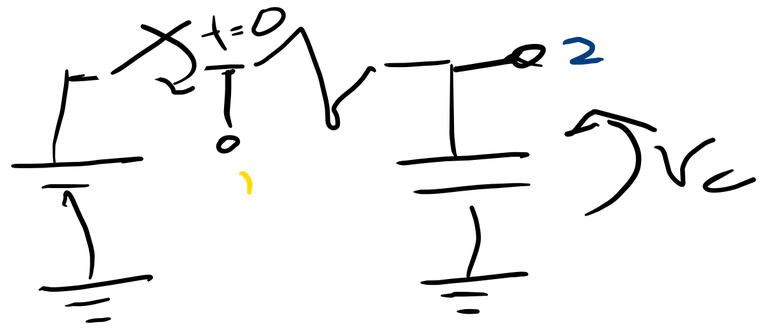


< Somos movidos por querosene e Laplace!

Fica um desenho no lugar

Definição Função de Transferência





Sinal 1 → ? → Sinal 2

$f_1(t) = V_{in}$

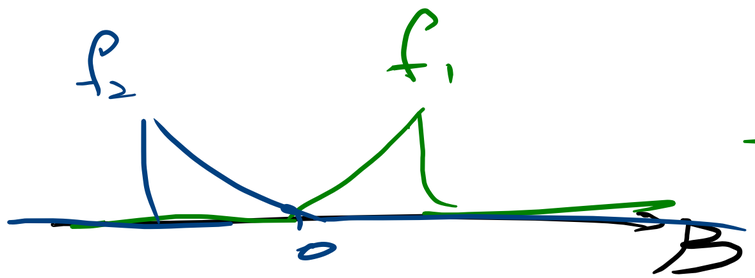
$t = 0$

$f_2(t) = V_{in}(1 - e^{-t/RC})$

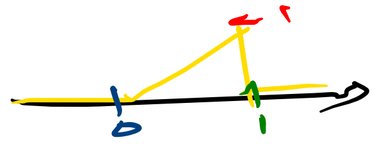
$t \geq 0$

Convolução

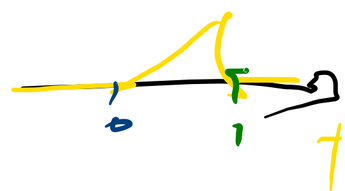
$$\int_{-\infty}^{\infty} f_1(\beta) f_2(t-\beta)\, d\beta = f_1(t) * f_2(t) = g(t)$$



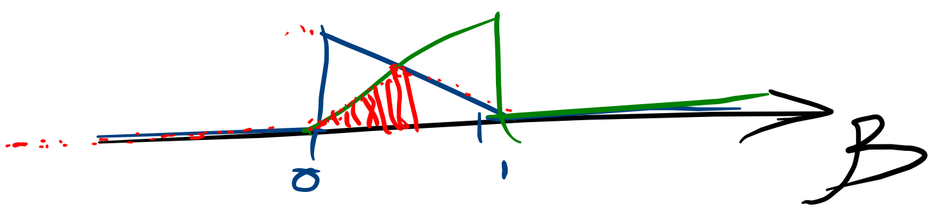
$t = 0$

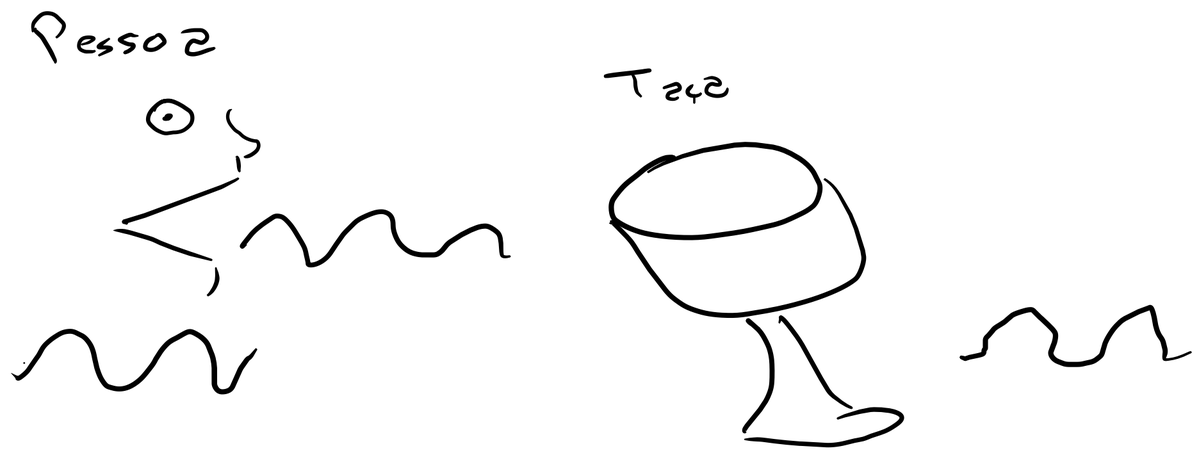


$+ f_1(-1)$

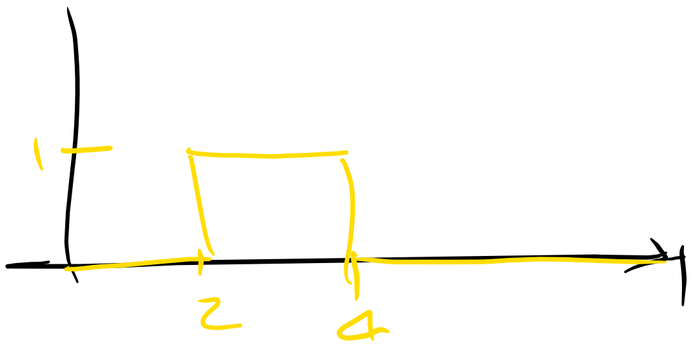


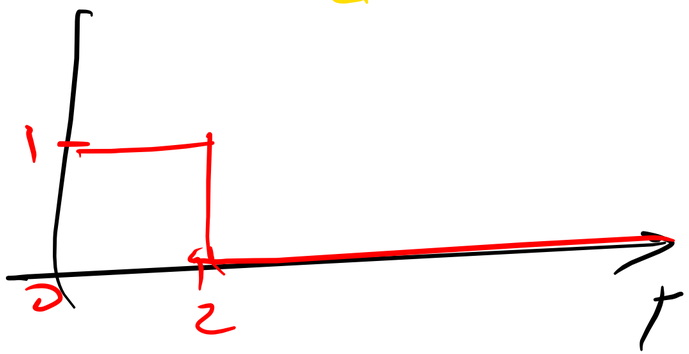
$f_2(+)$

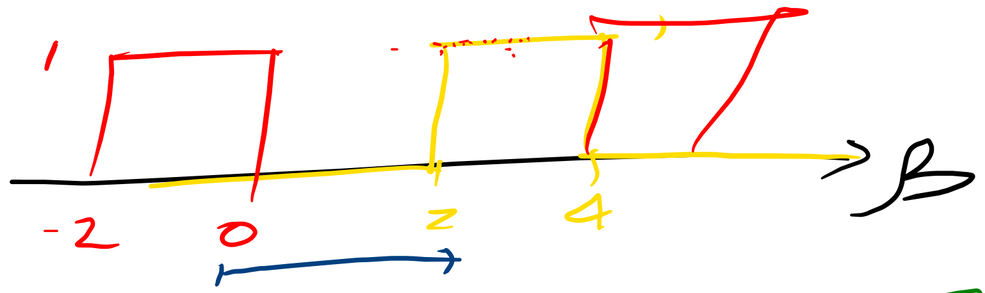




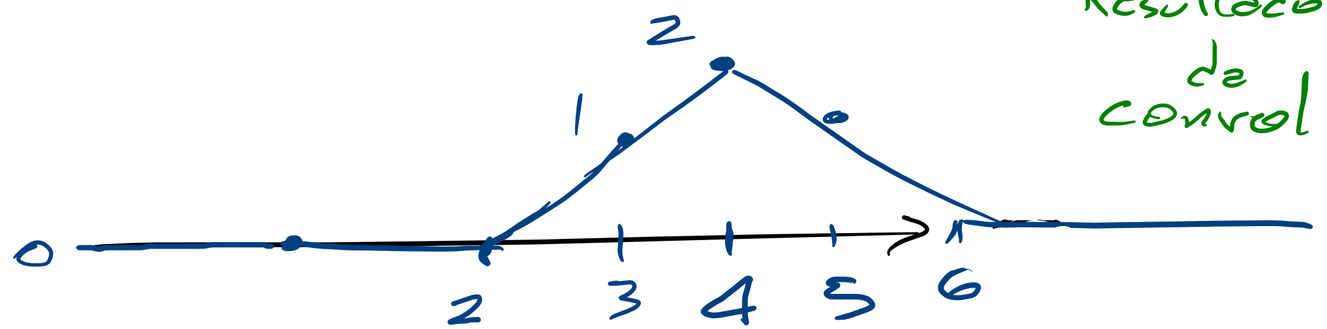
A convolução define o quanto as ondas são iguais



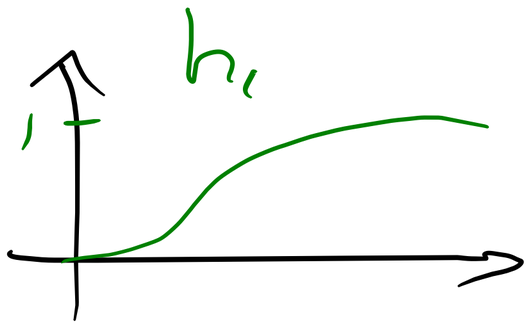


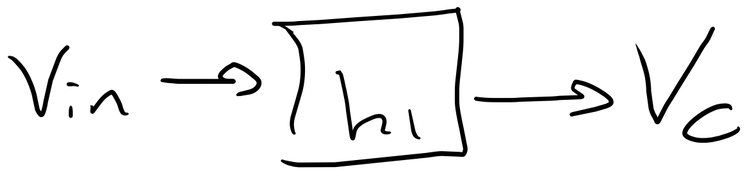


Resultado da convolução



$g(t) =$





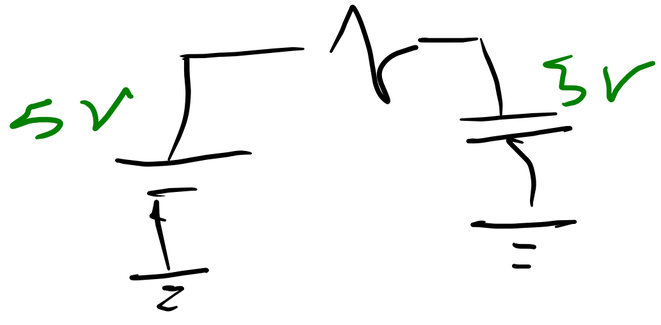
$$V_{in} * h_1 = V_c$$

$$V_{in}(t) * h_1(t) = V_c(t)$$

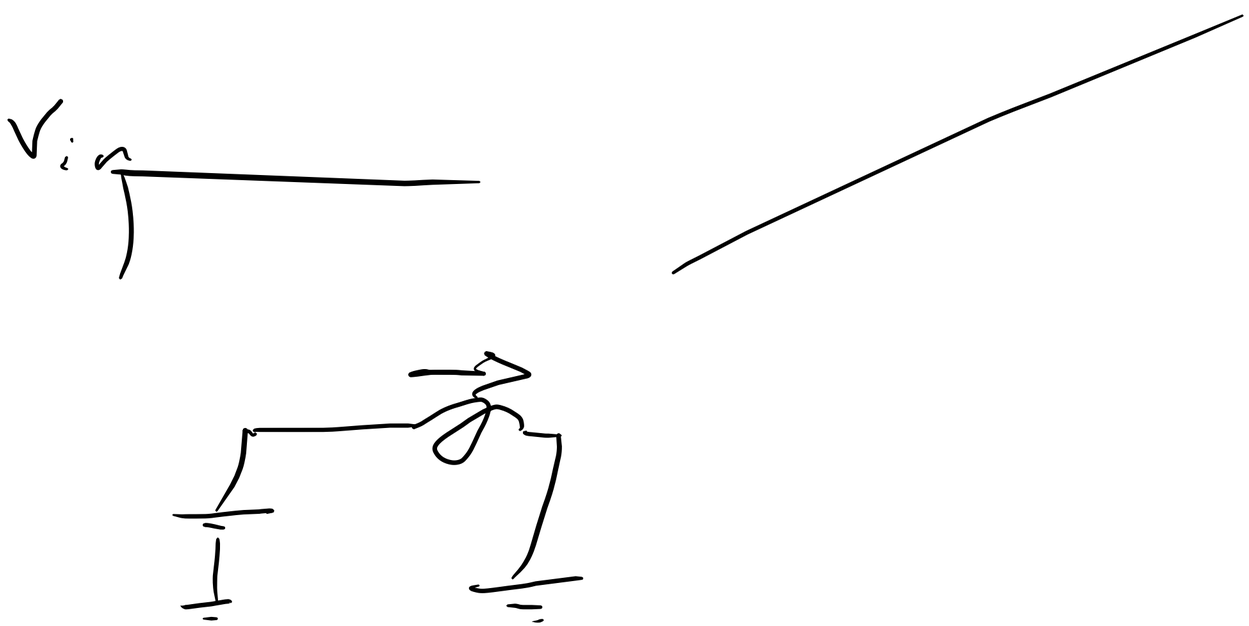
Definições de Sistema

- ↳ BIBO Bounded Input Bounded output
- ↳ causalidade
- ↳ linearidade

BIBO

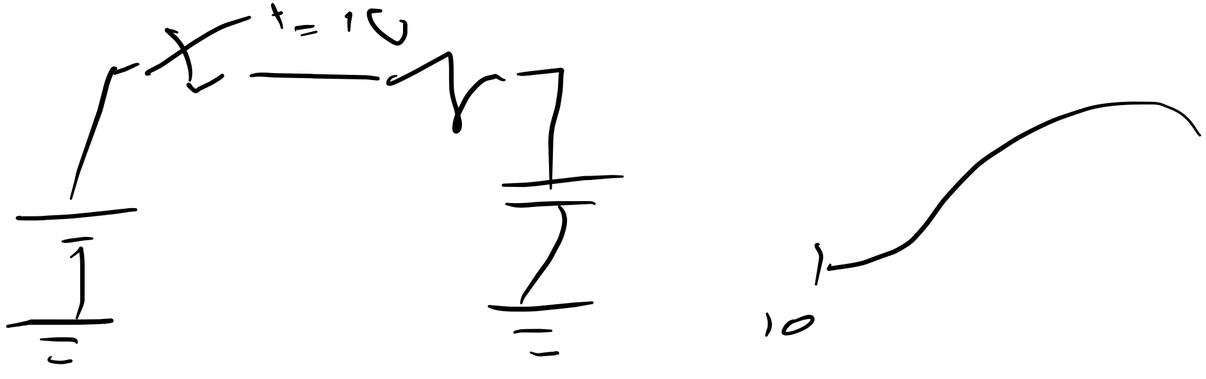


BIBO estável

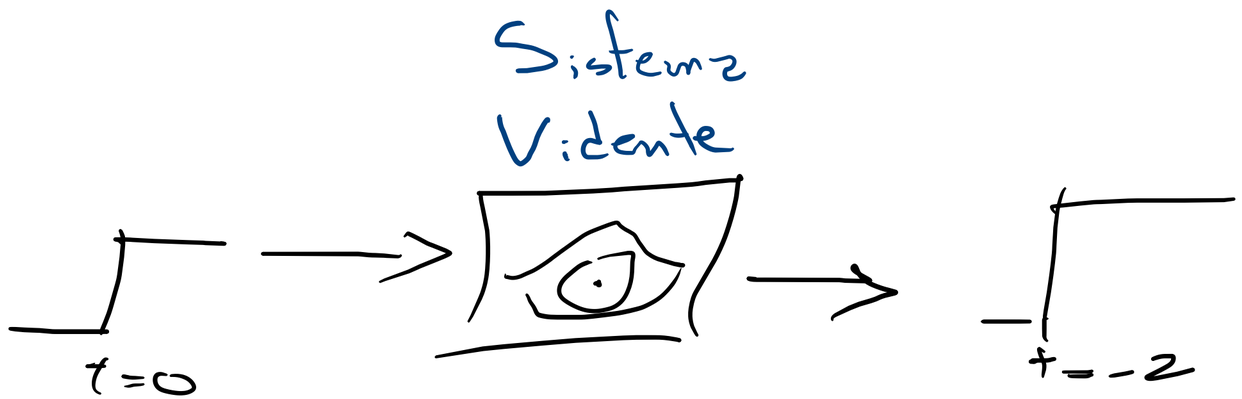


BIBO instável

Causalidade

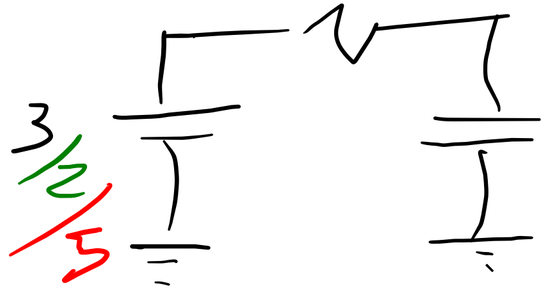


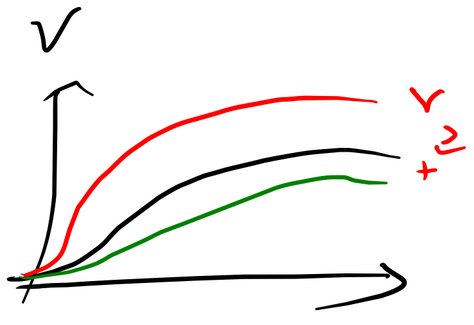
Causal



Não causal

Linearidade





$V_{in}(1-e^{x})$ $\frac{-t}{RC}$

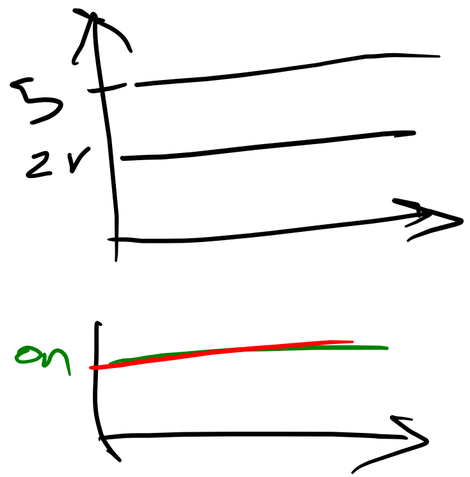
2+3

Linear

$x_1 \rightarrow \square \rightarrow y_1$

$x_2 \rightarrow \square \rightarrow y_2$

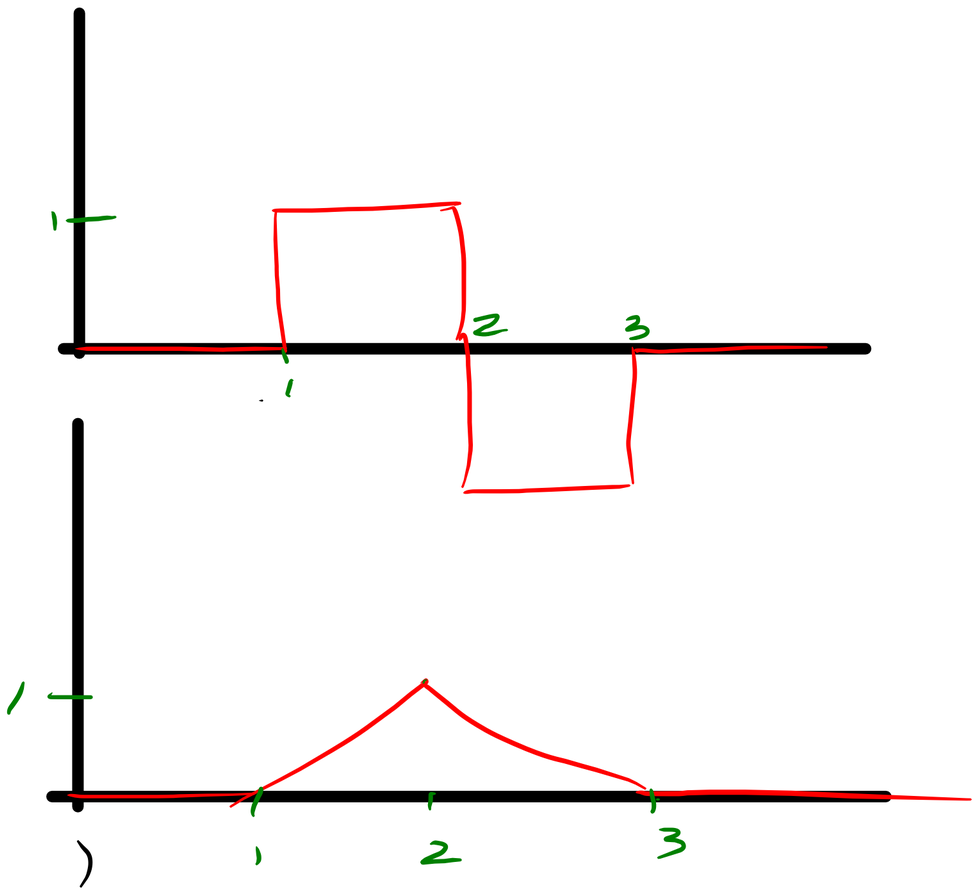
$x_1+x_2 \rightarrow \square \rightarrow y_1+y_2$



Não Linear

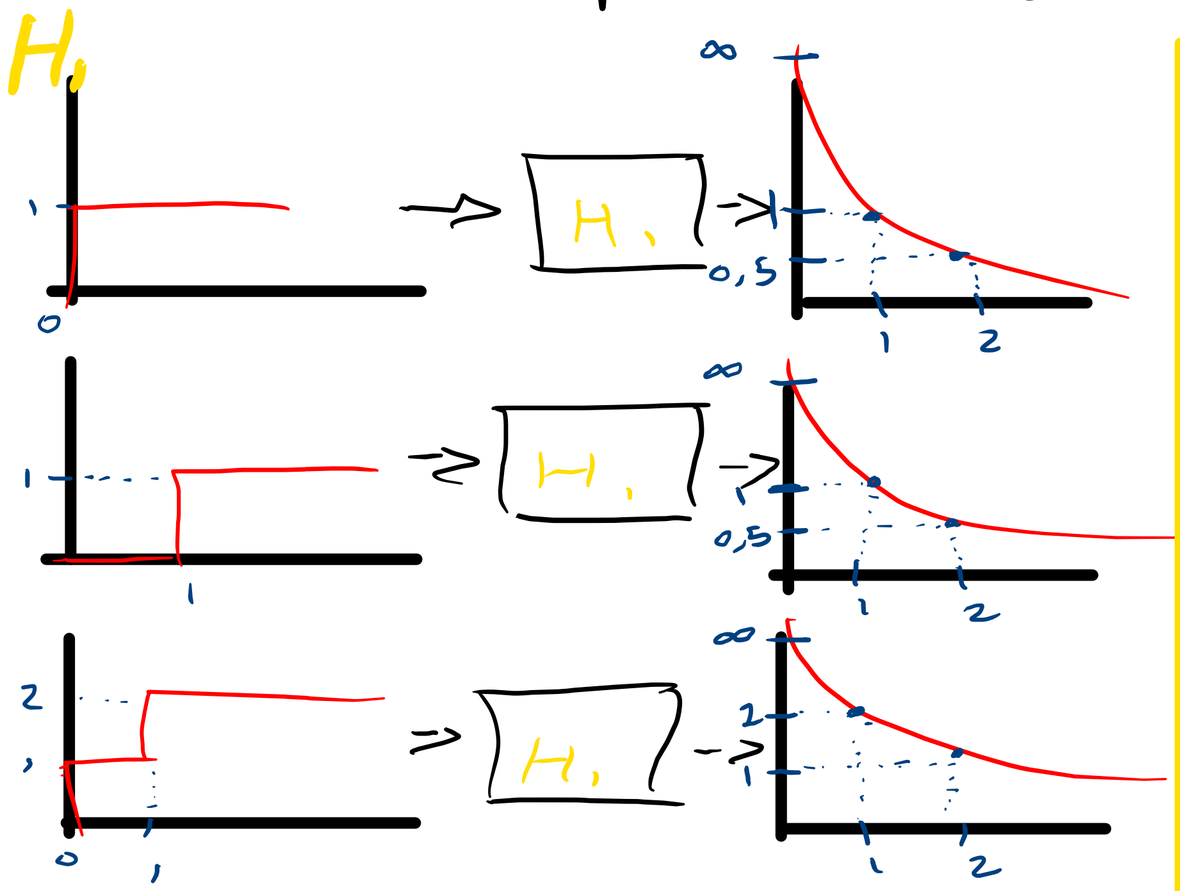
Exercícios :

1. Realize a Convolução

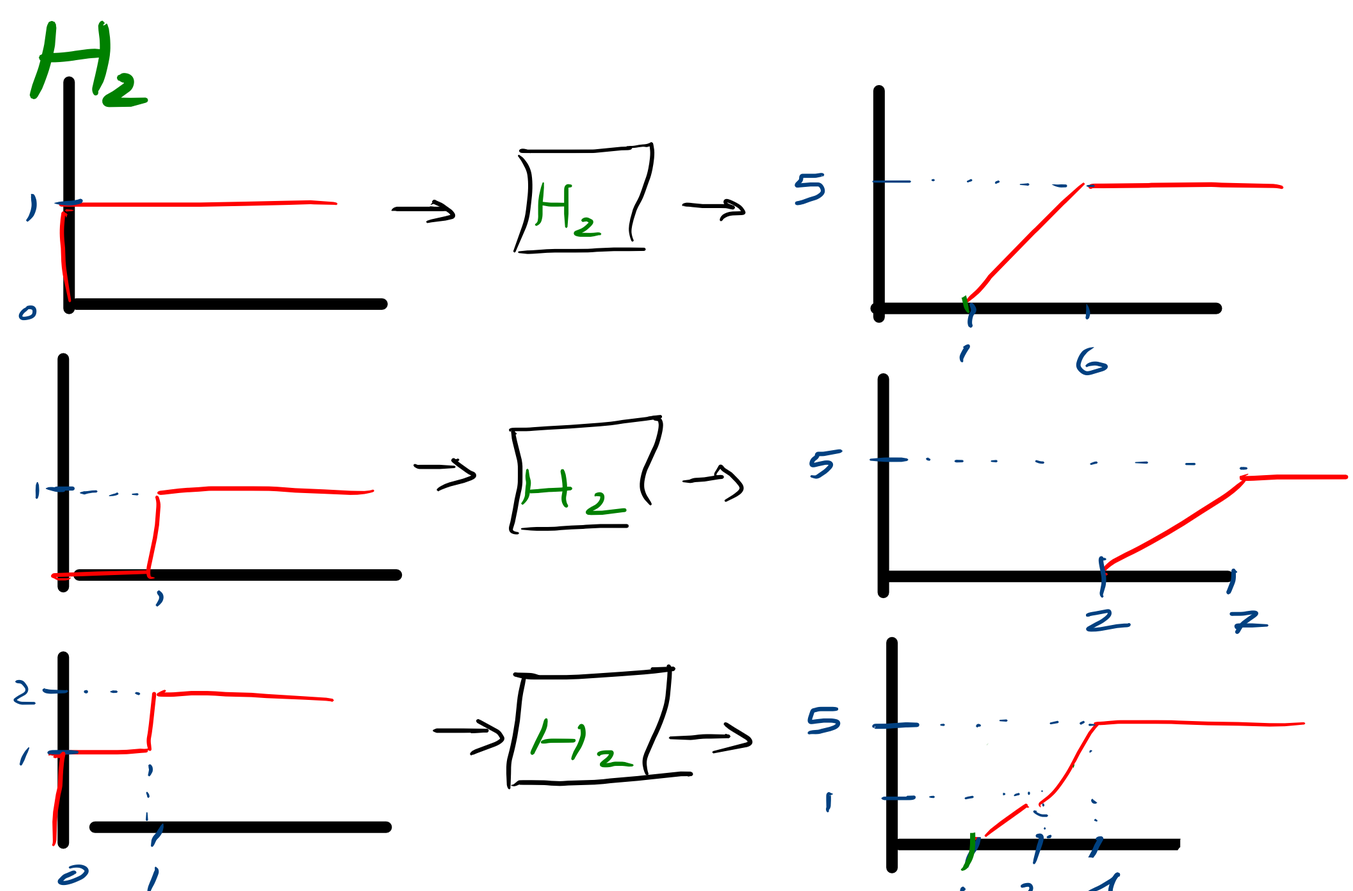


2 Classifique os Sistemas

H_1



H_2



Material e informações para contato:

www.lucas.zischler.nom.br

Obrigado
pela
atenção!