

Es1

$$y(t) = \begin{cases} 0 & t \leq 2 \\ \cos(t+2) \int_{-1}^{t-2} x(u) du & t > 2 \end{cases}$$

a) CAUSALE? SÌ

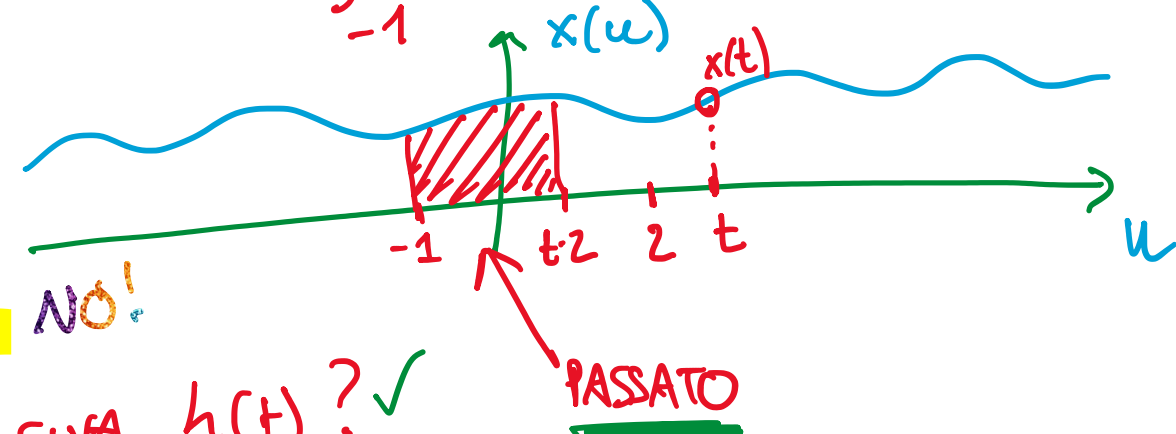
b) LINEARE? SÌ

c) BIBO STABILE? NO!

d) RISPOSTA IMPULSIVA  $h(t)$ ? ✓

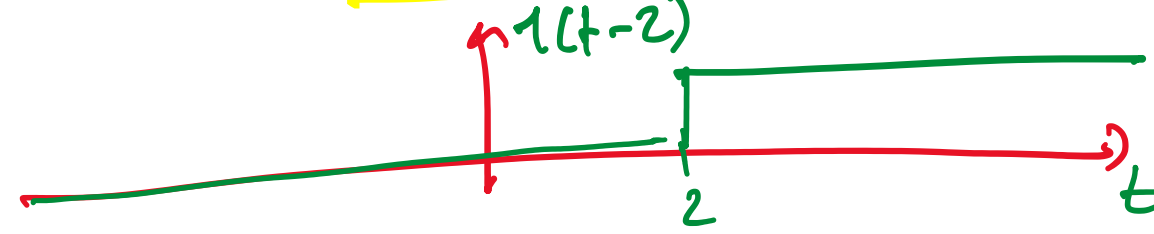
e) RISPOSTA AL GRABINO  $h_{-1}(t)$ ? ✓

f) TEMPO INVARIANTE?



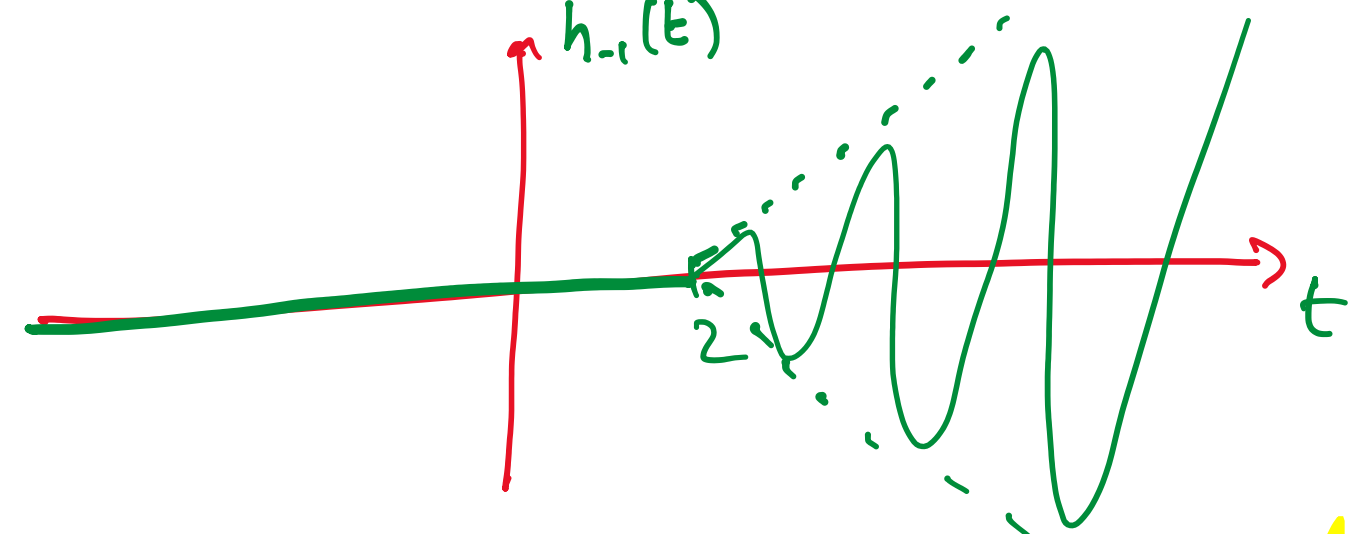
$$h(t) = \sum [\delta(t)] = \begin{cases} 0 & t \leq 2 \\ \cos(t+2) \int_{-1}^{t-2} \delta(u) du & t > 2 \end{cases}$$

$$= 1(t-2) \cos(t+2)$$



$$h_{-1}(t) = \sum [1(t)] = \begin{cases} 0 & t \leq 2 \\ \cos(t+2) \int_{-1}^{t-2} 1(u) du & t > 2 \end{cases}$$

$$= 1(t-2) \cdot (t-2) \cdot \cos(t+2)$$



TEMPO INVARIANTE? NO

$$y(t) = \begin{cases} 0 & t \leq 2 \\ \cos(t+2) \int_{-1}^{t-2} x(u) du & t > 2 \end{cases}$$

$$y(t-t_0) = \begin{cases} 0 & t-t_0 \leq 2 \\ \cos(t-t_0+2) \int_{-1}^{t-t_0-2} x(u) du & t-t_0 > 2 \end{cases}$$

$$\sum [x(t-t_0)] = \begin{cases} 0 & t \leq 2 \\ \cos(t+2) \int_{-1-t_0}^{t-2-t_0} x(u-t_0) du & t > 2 \end{cases}$$

Es2

$$y(n) = \begin{cases} \text{sign}(1/x(n)) & x(n) \neq 0 \\ 0 & x(n) = 0 \end{cases} = f(x(n))$$

CAUSALITA'? ISTANTANEO, SÌ È CAUSALE

TEMPO INVARIANTE?

BIBO STABILITA'?

RISPOSTA IMPULSIVA?

LINEARITA'?

NO perché sign non è LINEARE.

$$y(n-n_0) = \sum [x(n-n_0)]$$

$$f(x(n-n_0)) = f(x(n-n_0))$$

$$g(n) = \sum (\delta(n)) = \begin{cases} \text{sign}(1/\delta(n)) & \delta(n) \neq 0 \\ 0 & \delta(n) = 0 \end{cases}$$

$$= \delta(n)$$

