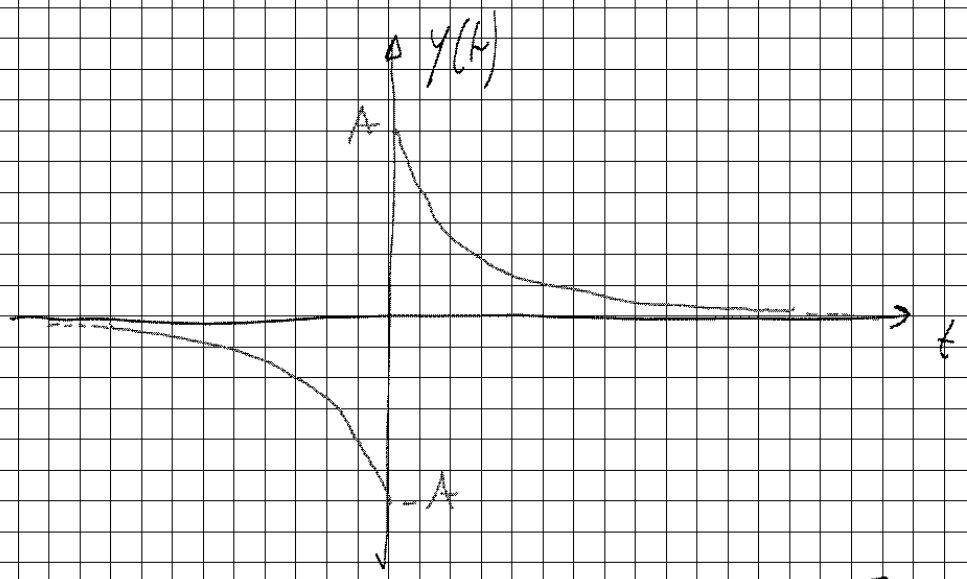
Esercizio

$$y(t) = x(t) - x(-t)$$

$$x(t) = A\, e^{-t}\, u(t) \qquad A \in \mathbb{R}$$



$$P_y(t) = y^2(t) = A\left[e^{-t}\,u(t) + e^{t}\,u(-t)\right] =$$

$$= A^2\left[e^{-2t}\,u(t) + e^{2t}\,u(-t) + 2\underbrace{u(t)\,u(-t)}_{=0}\right] =$$

$$= A^2 e^{-2|t|}$$

$$u(t) = \begin{cases} 1 & t \le 0 \\ 0 & t > 0 \end{cases}$$

$$E_y = \int_{-\infty}^{+\infty} P_y(t)\,dt = 2A^2\int_0^{\infty} e^{-2t}\,dt = 2A^2$$

$$P_y = \lim_{T\to\infty}\frac{1}{T}\int_{-\frac{T}{2}}^{\frac{T}{2}} A^2 e^{-2|t|}\,dt = 2A^2\lim_{T\to\infty}\frac{1}{T}\int_0^{\frac{T}{2}} e^{-2t}\,dt = 0$$

$y_{eff} = 0$

$$y_m = \lim_{T\to\infty}\frac{1}{T}\int_{-\frac{T}{2}}^{\frac{T}{2}} y(t) = 0 \qquad \text{(funzione dispari)}$$