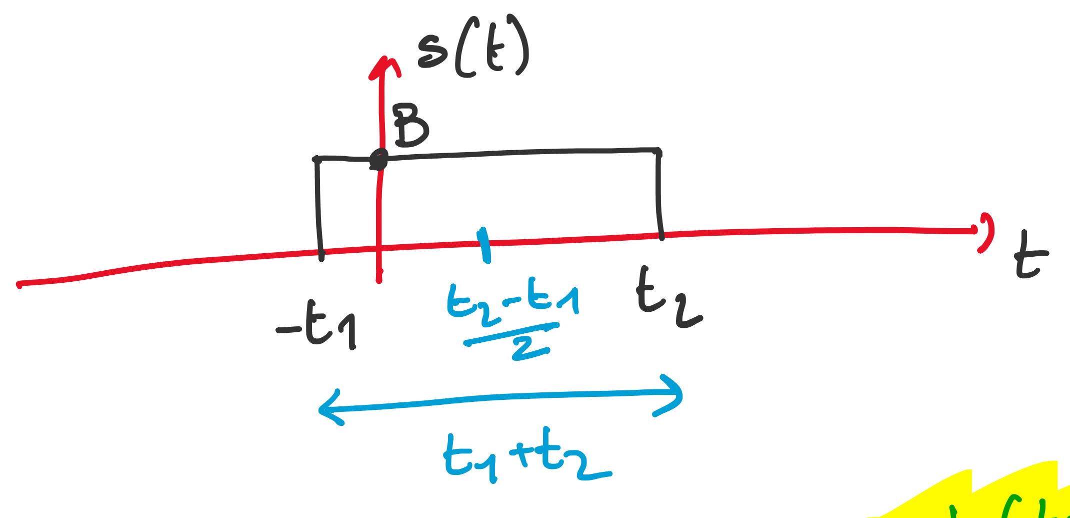
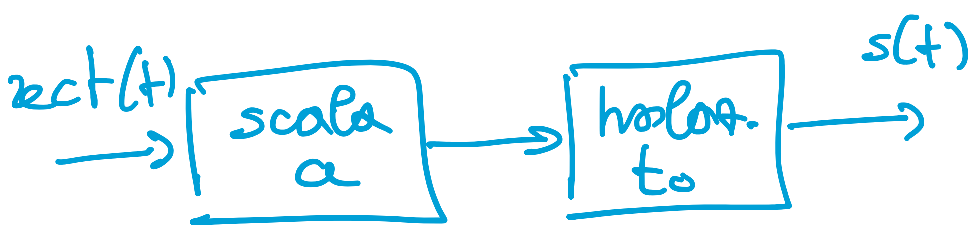
Le5

Wednesday, 8 March 2023 09:51

Es2



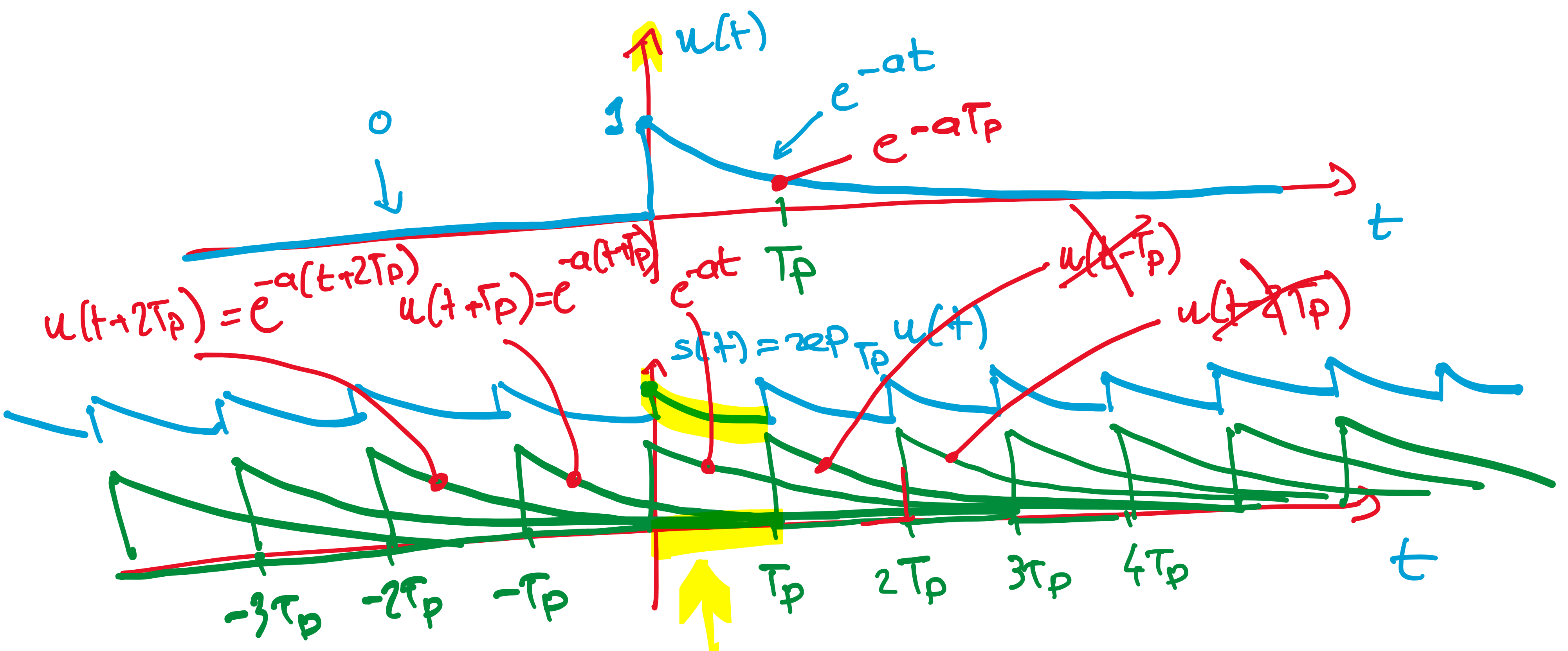


$s(t) = \text{rect}\left(\frac{t-t_0}{a}\right)$

$a = t_1+t_2 \qquad t_0 = \frac{t_2-t_1}{2}$

Es 1 TROVARE $s(t) = \text{rep}_{T_p}\, u(t)$

CON $u(t) = e^{-at}\,1(t)$, $a>0$



PERIODO DI RIFERIMENTO $t \in (0, T_p)$

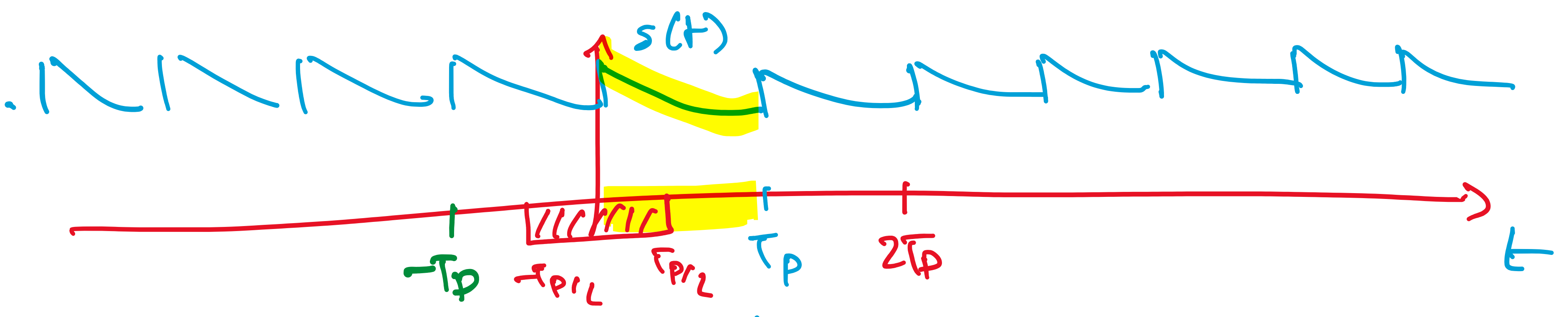
$$s(t) = \sum_{n=-\infty}^{0} u(t-nT_p)$$

$$= \sum_{n=-\infty}^{0} \underbrace{e^{-a(t-nT_p)}}_{e^{-at}\,e^{anT_p}}$$

$$= e^{-at}\sum_{n=-\infty}^{0} \left(e^{aT_p}\right)^n \qquad m=-n$$

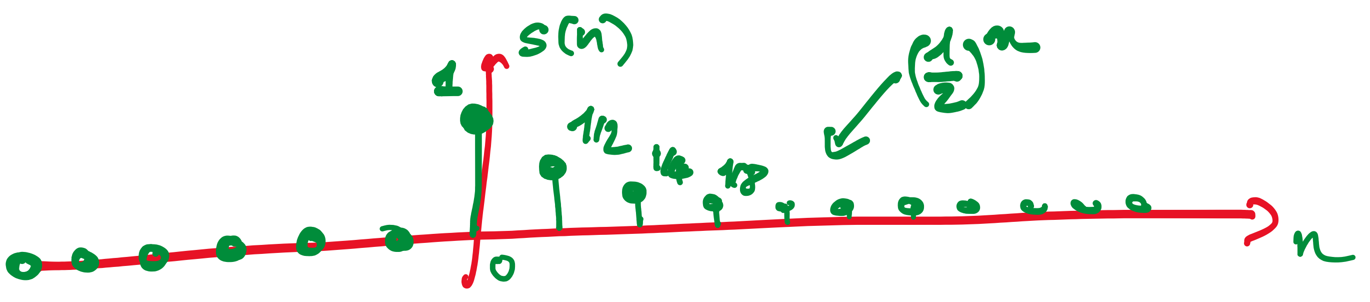
$$= e^{-at}\sum_{m=0}^{+\infty} \left(e^{-aT_p}\right)^m \qquad e^{-aT_p}<1$$

$$s(t) = \frac{e^{-at}}{1-e^{-aT_p}} \qquad \sum_{m=0}^{\infty}\alpha^m = \frac{1}{1-\alpha}$$



$$s(t) = \begin{cases} \dfrac{e^{-at}}{1-e^{-aT_p}} & t\in(0,T_p) \\ \dfrac{e^{-a(t-T_p)}}{1-e^{-aT_p}} & t\in(T_p,2T_p) \\ \dfrac{e^{-a(t+T_p)}}{1-e^{-aT_p}} & t\in(-T_p,0) \\ \vdots \end{cases}$$

Es $s(n) = \left(\frac{1}{2}\right)^n 1_0(n)$ CALCOLARE A_s, m_s, E_s, P_s



$$A_s = \sum_{n=\cancel{-\infty}\,0}^{+\infty} \left(\tfrac{1}{2}\right)^n \cancel{1_0(n)} = \frac{1}{1-\frac{1}{2}} = 2$$

$m_s = 0$

$$|s(n)|^2 = s^2(n) = \underbrace{\left(\tfrac{1}{2}\right)^{2n}}\ \underbrace{\left(1_0(n)\right)^2}$$

$$|s(n)|^2 = \left(\tfrac{1}{4}\right)^n \cdot 1_0(n)$$

$$E_s = \sum_{n=\cancel{-\infty}\,0}^{+\infty} \left(\tfrac{1}{4}\right)^n \cancel{1_0(n)} = \frac{1}{1-\frac{1}{4}} = \frac{4}{3}$$

$P_s = 0$