Le22

Monday, 4 May 2026 08:34

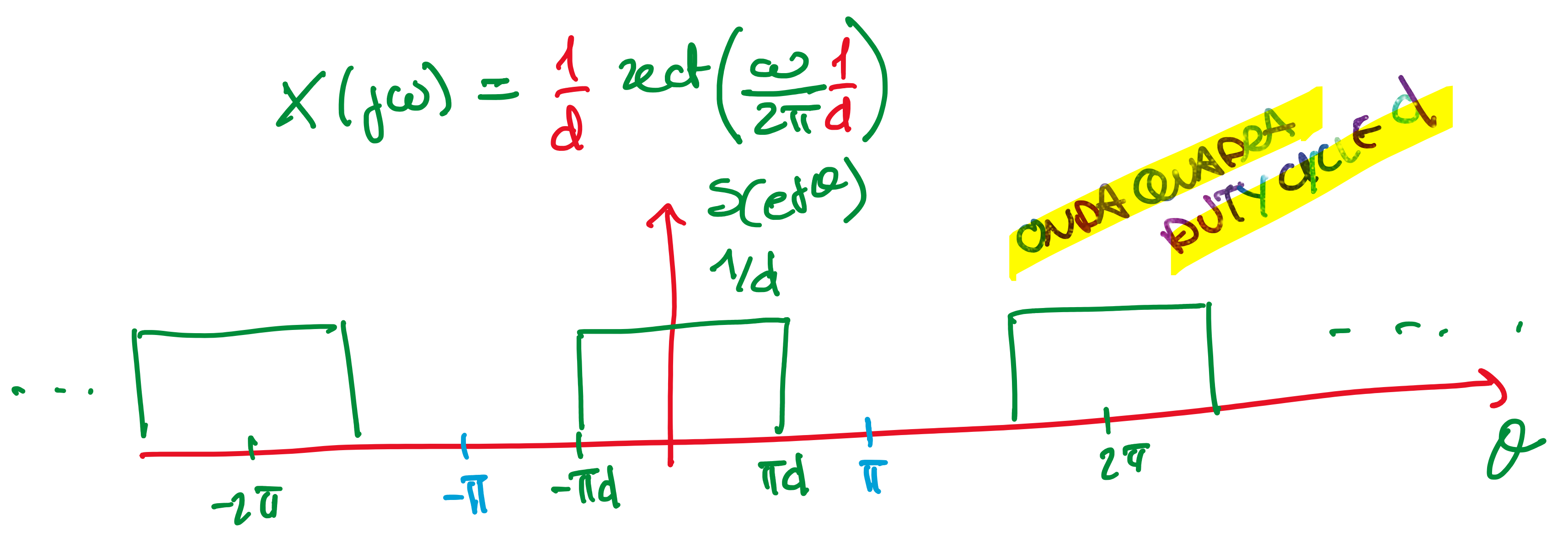
ES1 TROVARE $S(e^{j\theta})$ PER $s(n) = \text{sinc}(nd)$, $d<1$

$x(t) = \text{sinc}(td) \rightarrow \boxed{\downarrow}_{T=1} \rightarrow s(n) = \text{sinc}(nd)$

$\mathcal{F} \downarrow \qquad \mathcal{F} \downarrow$

$X(j\omega) \rightarrow \boxed{\text{rep}_{2\pi}} \rightarrow S(e^{j\theta}) = \sum_{k=-\infty}^{+\infty} X(j(\theta - 2\pi k))$

$$X(j\omega) = \frac{1}{d}\, \text{rect}\left(\frac{\omega}{2\pi d}\right)$$

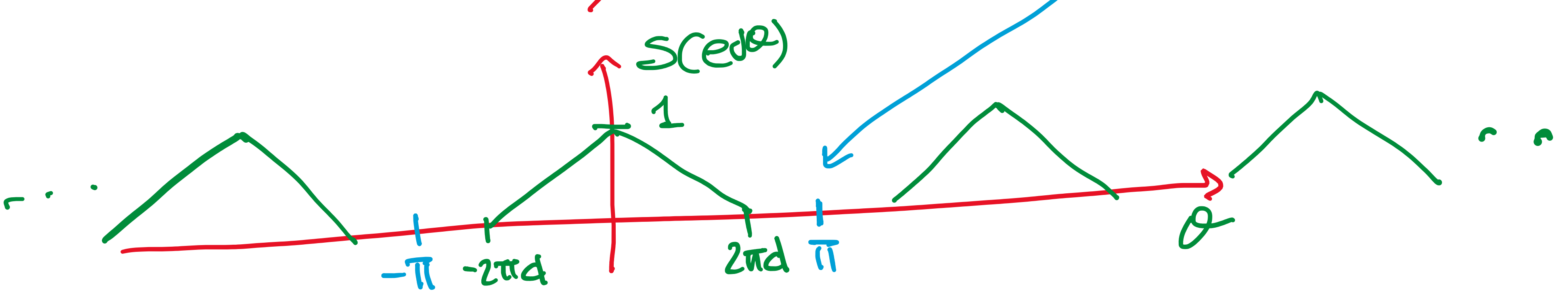


$$d\,\text{sinc}(nd) \xrightarrow{\mathcal{F}} \cancel{\frac{1}{d}}\, \text{rep}_{2\pi}\, \text{rect}\left(\frac{\theta}{2\pi d}\right)$$

ES2 $s(n) = d\,\text{sinc}^2(nd)$, $d < 1/2$

$$x(t) = d\,\text{sinc}^2(dt) = d\,\text{sinc}^2\left(\frac{t}{1/d}\right)$$

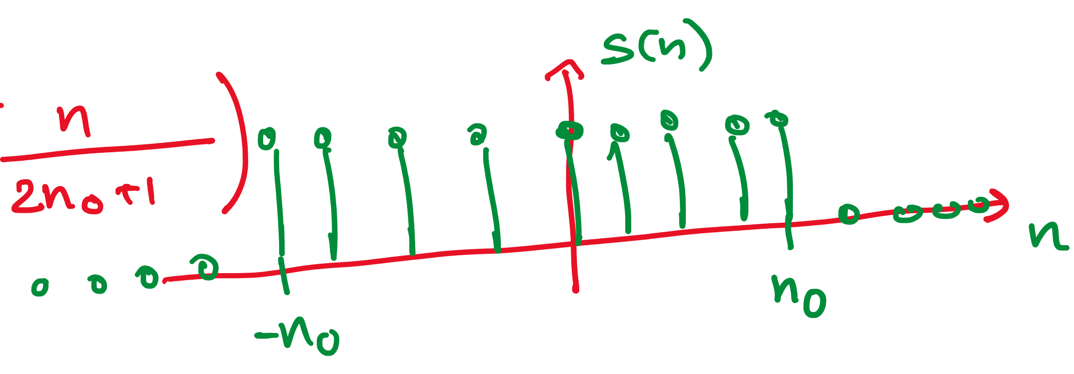
$$X(j\omega) = \cancel{d} \cdot \frac{1}{\cancel{d}}\, \text{triangle}\left(\frac{\omega}{2\pi d}\right)$$



$$d\,\text{sinc}^2(nd) \xrightarrow{\mathcal{F}} \text{rep}_{2\pi}\, \text{triangle}\left(\frac{\omega}{2\pi d}\right)$$

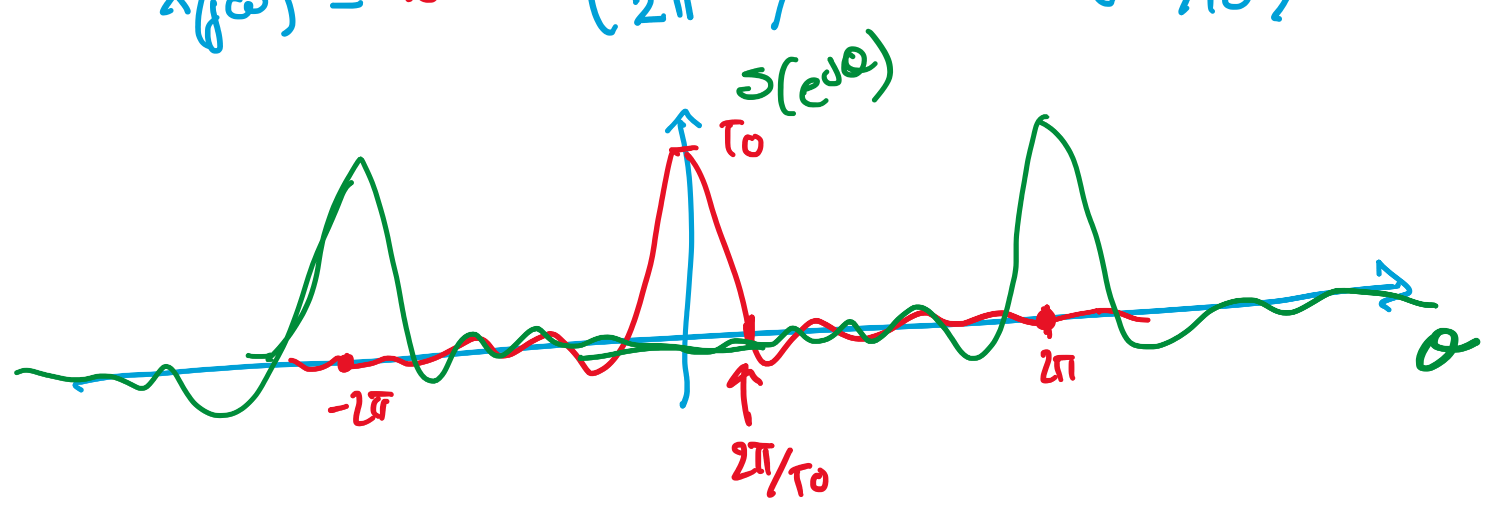
ES3

$$s(n) = \text{rect}\left(\frac{n}{2n_0+1}\right)$$



$x(n) = \text{rect}\left(\frac{t}{T_0}\right) \qquad T_0 = 2n_0+1$

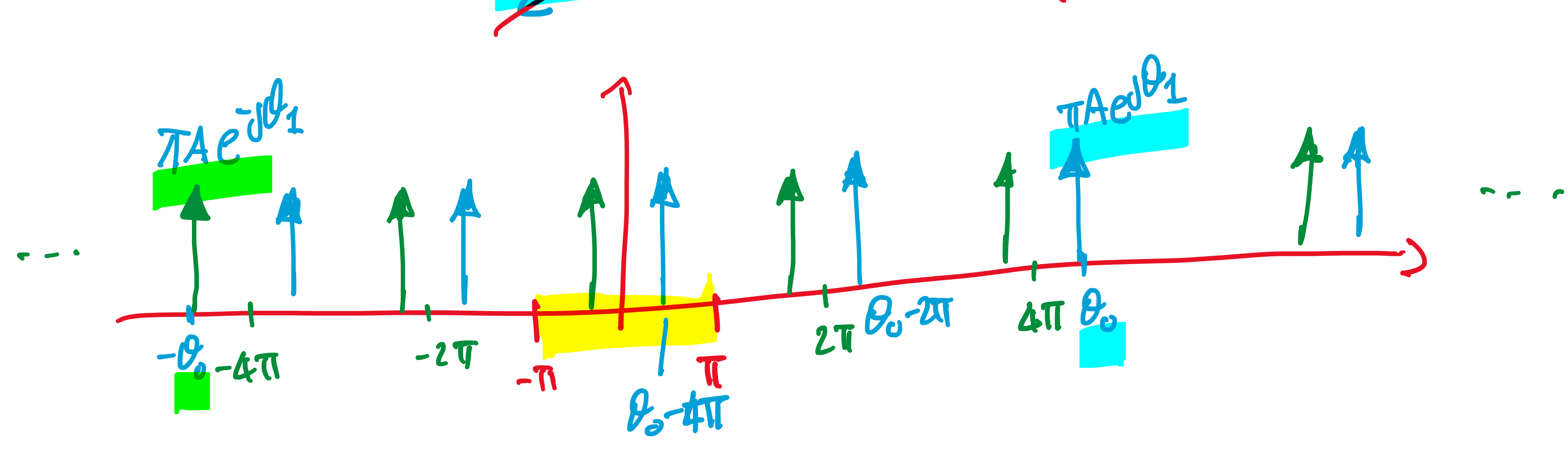
$$X(j\omega) = T_0\, \text{sinc}\left(\frac{\omega}{2\pi} T_0\right) = T_0\, \text{sinc}\left(\frac{\omega}{2\pi/T_0}\right)$$



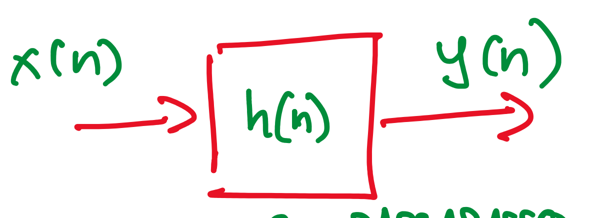
ES4 $s(n) = A\cos(n\theta_0 + \theta_1) = \frac{Ae^{j\theta_1}}{2} e^{j\theta_0 n} + \frac{Ae^{-j\theta_1}}{2} e^{-j\theta_0 n}$

$$x(t) = \frac{Ae^{j\theta_1}}{2} e^{j\theta_0 t} + \frac{Ae^{-j\theta_1}}{2} e^{-j\theta_0 t}$$

$$X(j\omega) = \frac{Ae^{j\theta_1}}{\cancel{2}} \cancel{2}\pi\delta(\omega - \theta_0) + \frac{Ae^{-j\theta_1}}{\cancel{2}} \cancel{2}\pi\delta(\omega + \theta_0)$$



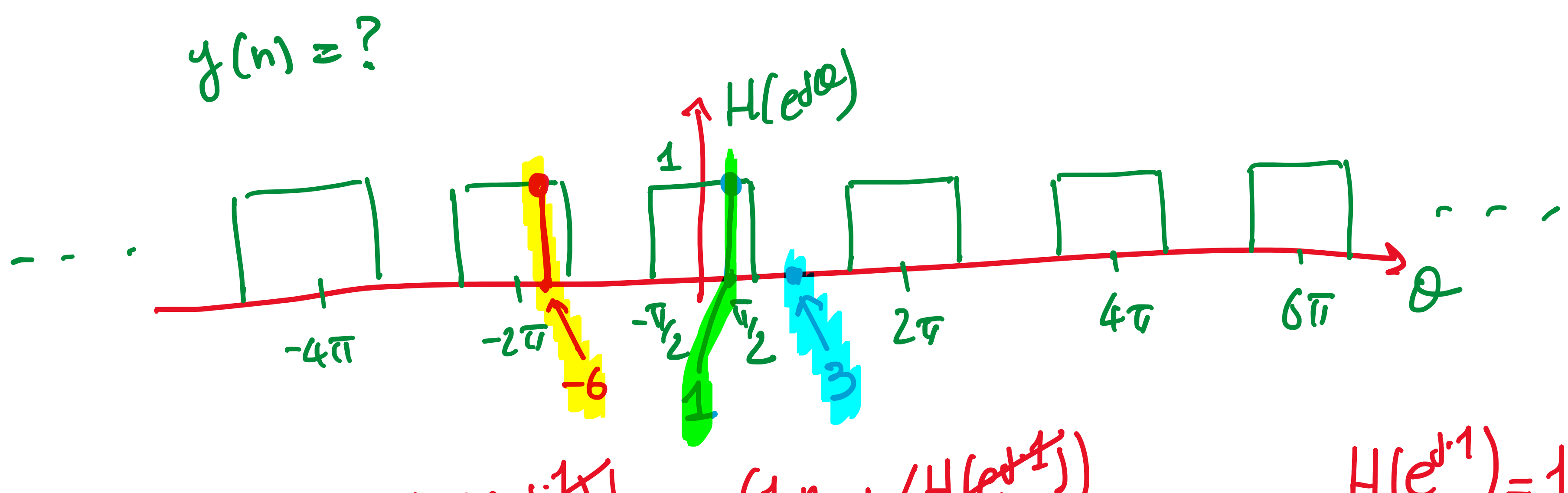
ES5



FILTRO PASSABASSO IDEALE CON FASE DI TAGLIO $\theta_c = \pi/2$

$x(n) = \cos(n) + \sin(3n) + e^{-j6n}$

$y(n) = ?$



$$y(n) = |H(e^{j1})| \cos(1 \cdot n + \angle H(e^{j1})) \qquad H(e^{j1}) = 1$$

$$+ \cancel{|H(e^{j3})|} \sin(3n + \cancel{\angle H(e^{j3})}) \qquad H(e^{j3}) = 0$$

$$+ \cancel{H(e^{j\cdot 6})} \cdot e^{-j6n} \qquad H(e^{j\cdot 6}) = 1$$

$$= \cos(n) + e^{-j6n}$$

ES6 IDENTIFICARE $h(n)$ CHE GARANTISCA $x(n) = e^{-jn/6}$

$y(n) = e^{jn/6}$

NON È POSSIBILE XCHÈ FASE X $-1/6$ DIVERSA FASE Y $1/6$