Le23

Friday, 10 May 2024 10:32

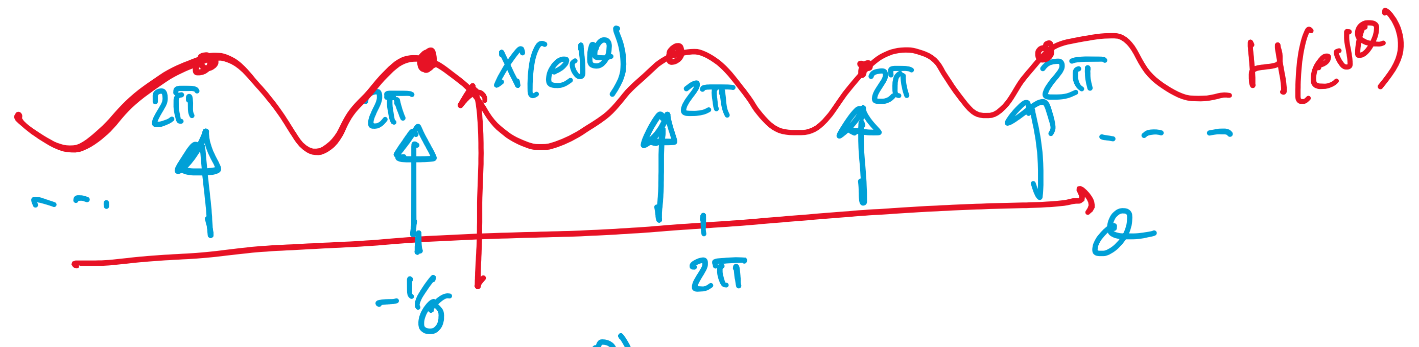
Es5 APPELLO 2, 2021

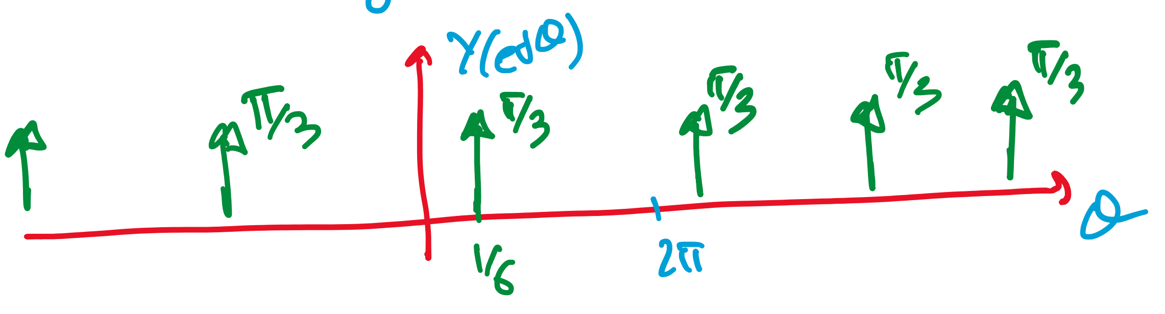
5.a È VERO CHE $x * y(n) = x(n+8) * y(n-8)$?

$$= x * y(n \cancel{+8} \cancel{-8})$$

5b POSSO IDENTIFICARE $h(n)$ TALE CHE

$$x(n) = e^{-jn/6} \rightarrow \boxed{h(\cdot)} \rightarrow y(n) = \frac{1}{6} e^{jn/6} \quad ?$$





$$e^{-jn/6} \rightarrow \boxed{h(\cdot)} \rightarrow H(e^{-j1/6}) \cdot e^{-jn/6} \neq e^{jn/6} \cdot \frac{1}{6}$$

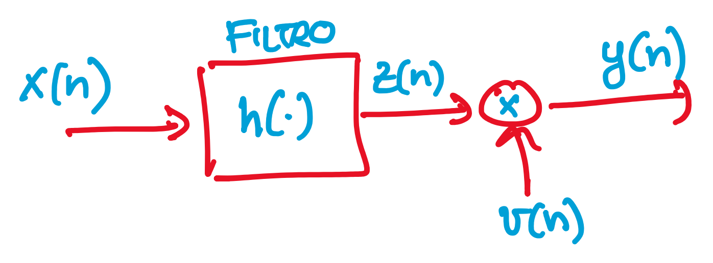
5c

$$e^{-jn/6} \rightarrow \boxed{h(\cdot)} \rightarrow \frac{1}{6} e^{-jn/6} \quad ?$$

SI $h(n) = \frac{1}{6}\delta(n)$

$$H(e^{-j1/6}) = 1/6$$

Es3 SECONDO APPELLO 2021



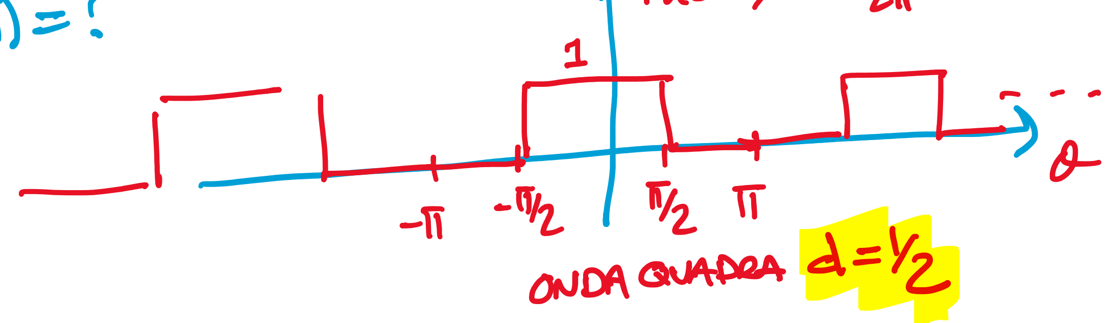
$x(n) = \delta(n-1) - \delta(n+1)$

FILTRO PASSABASSO CON FASE DI TAGLIO $\pi/2$

$v(n) = 1 - e^{-j\pi n}$

$y(n) = ?$

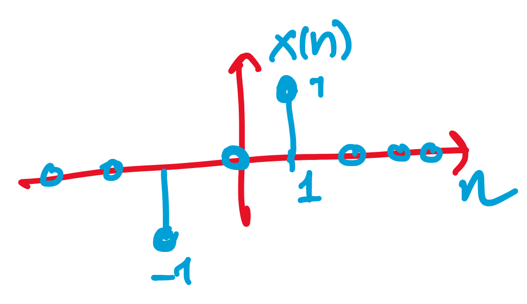
$$H(e^{j\Omega}) = \mathrm{rep}_{2\pi}\, \mathrm{rect}\left(\frac{\Omega}{\pi}\right)$$



ONDA QUADRA $d = 1/2$

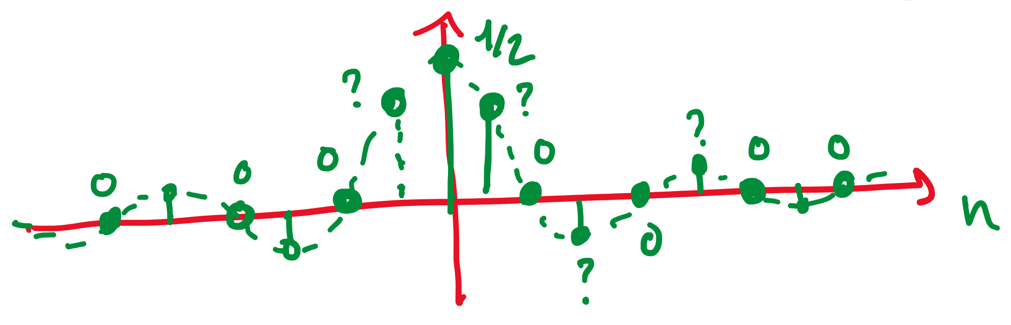
DOMINIO DEL TEMPO

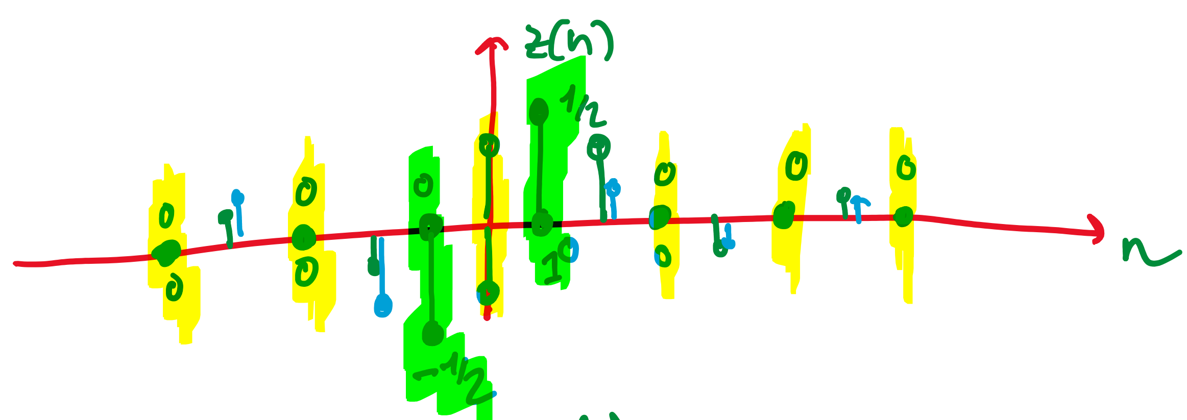
$$z(n) = x * h(n) = [\delta(n-1) - \delta(n+1)] * h(n)$$
$$= h(n-1) - h(n+1)$$

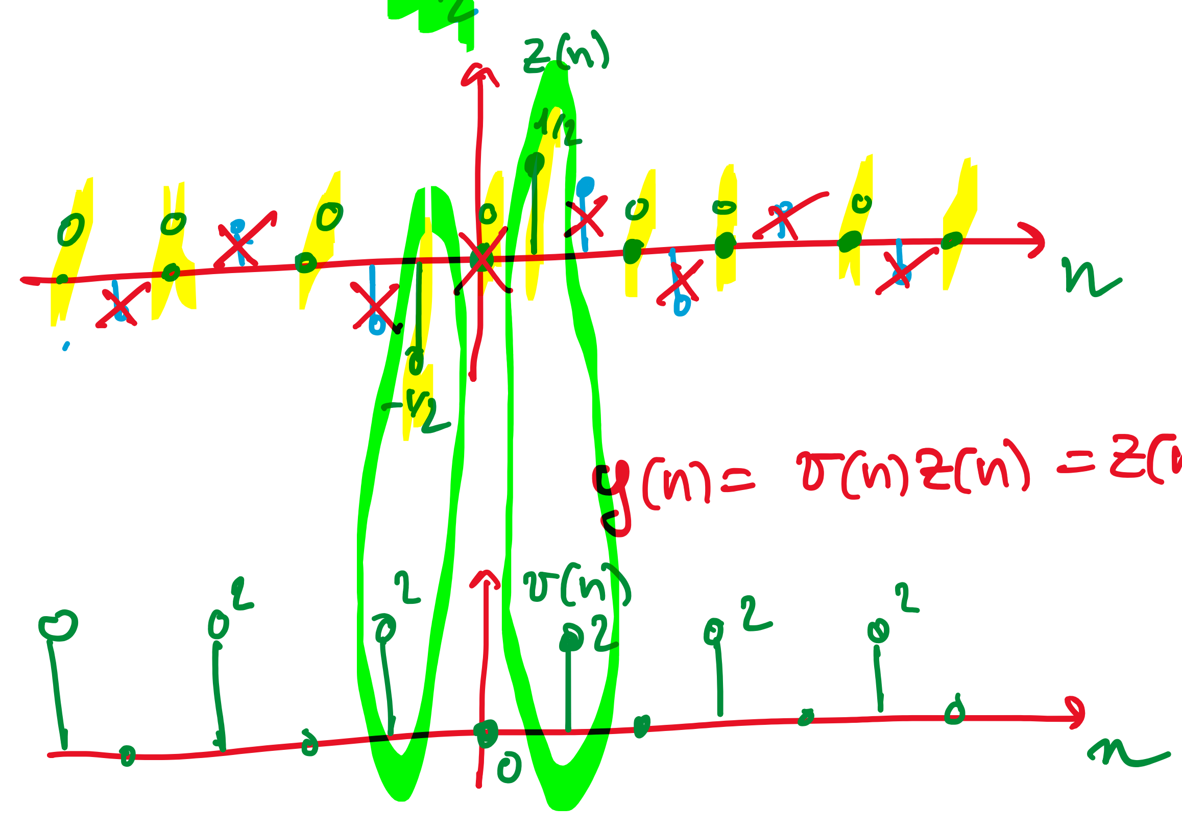


$$h(n) = d\,\mathrm{sinc}(nd) = \frac{1}{2}\mathrm{sinc}(n/2)$$

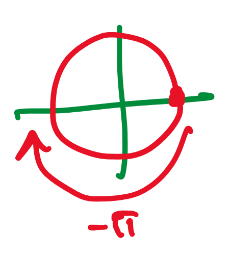
$$\frac{1}{2}\mathrm{sinc}(t/2) \xrightarrow{\mathcal{F}} \frac{1}{\cancel{2}} \cdot \cancel{2}\, \mathrm{rect}\left(\frac{\omega}{\cancel{2\pi}}\right)$$

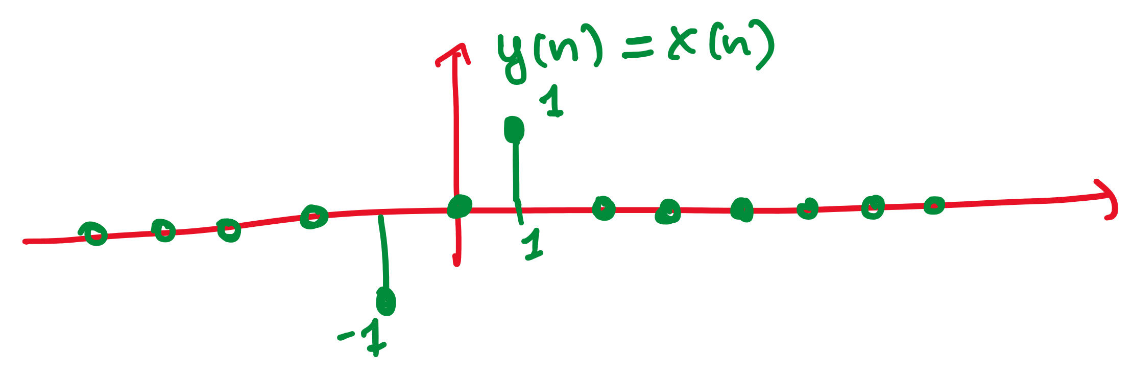




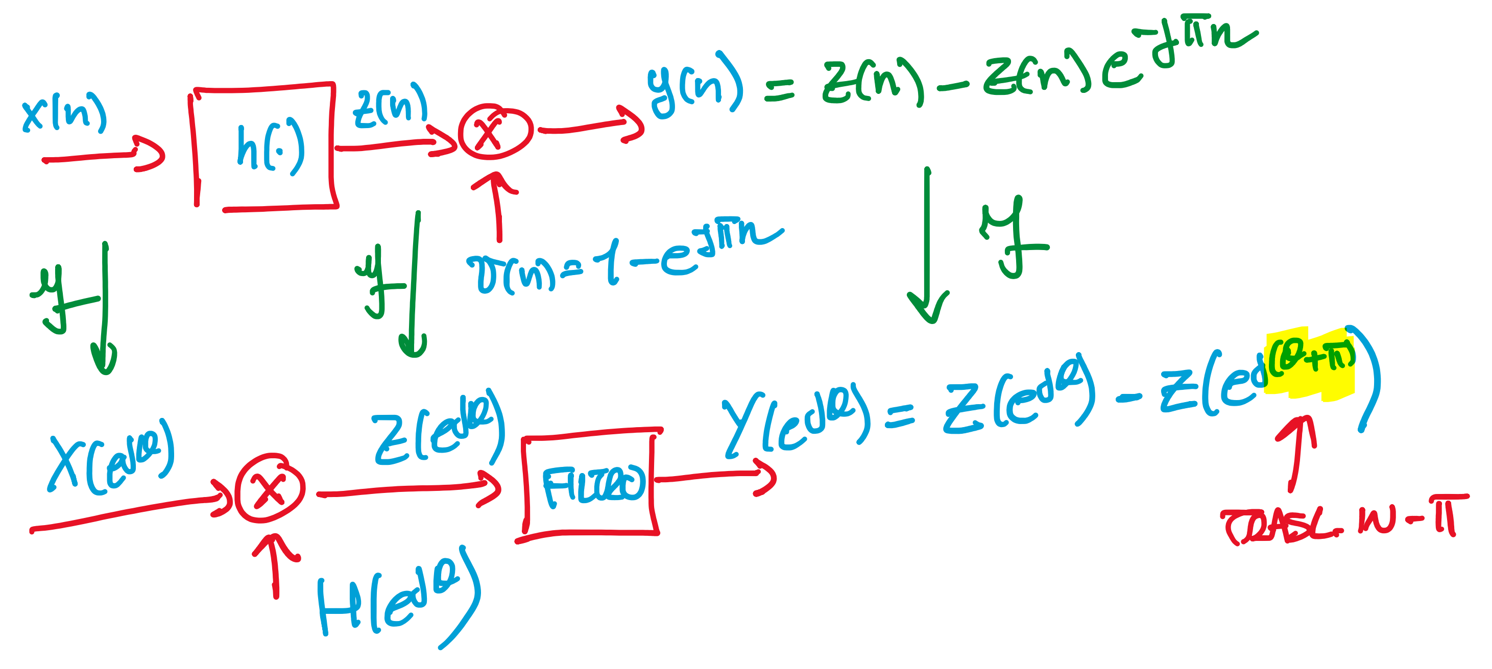


$$y(n) = v(n) z(n) = z(n) \left[1 - \overbrace{e^{-j\pi n}}^{(-1)^n}\right]$$





DOMINIO DI FOURIER

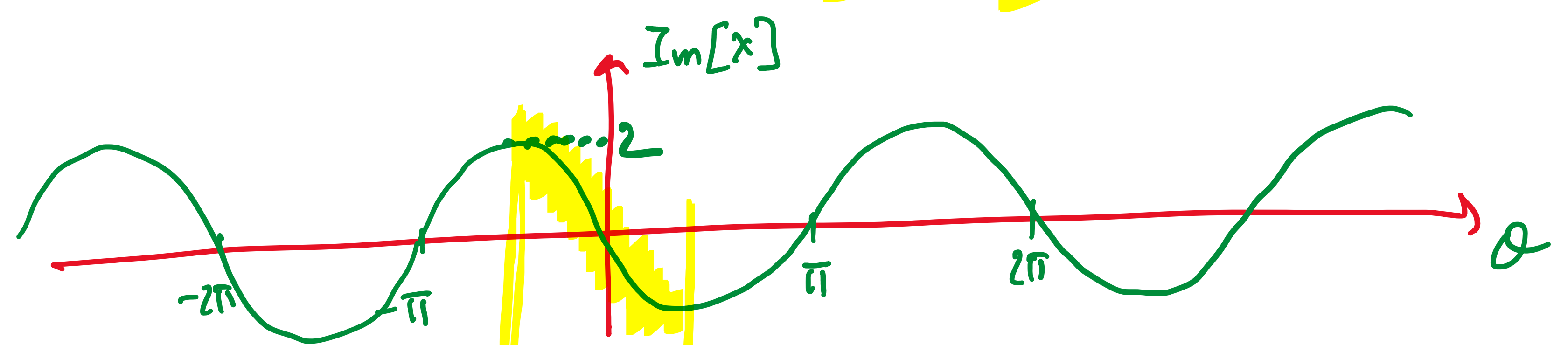


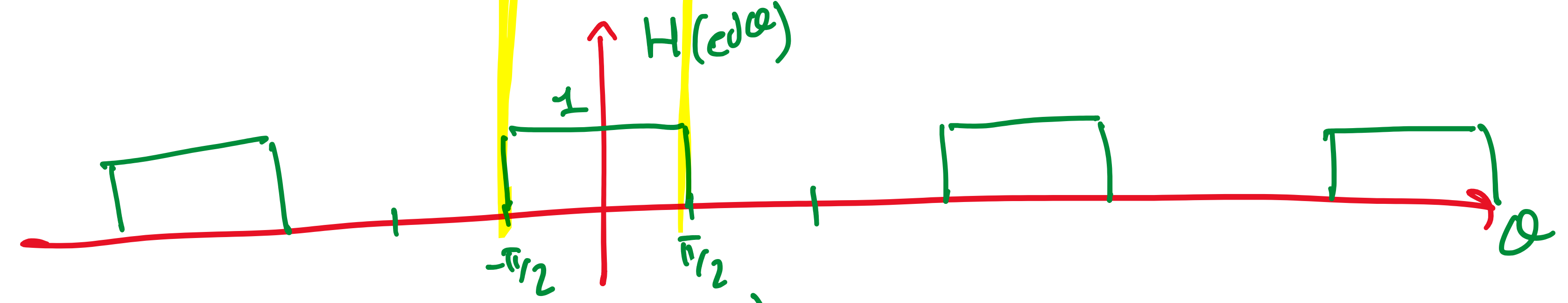
$$y(n) = z(n) - z(n)e^{-j\pi n}$$

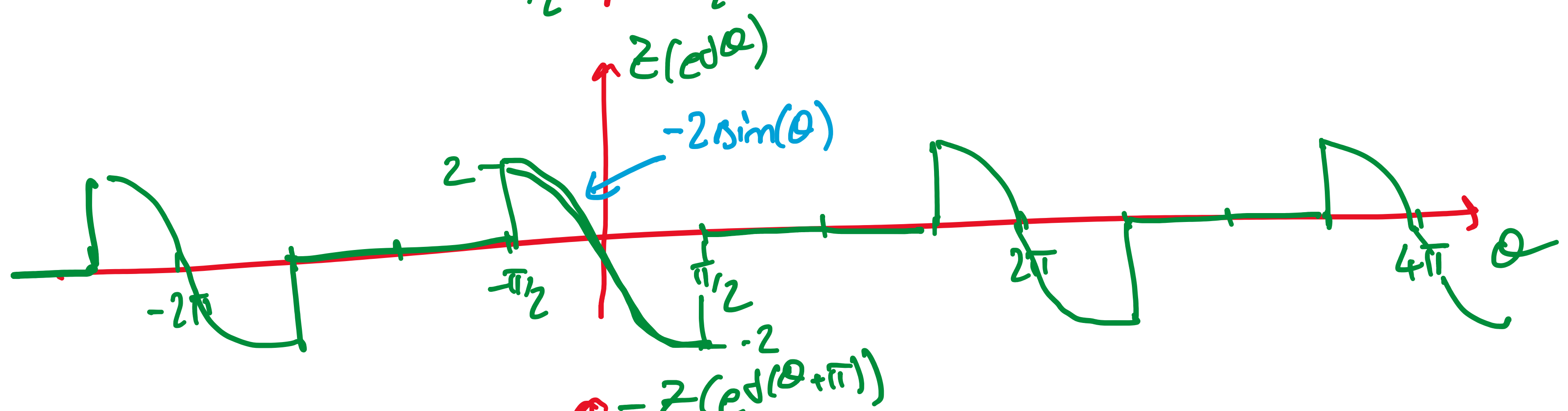
$$Y(e^{j\Omega}) = Z(e^{j\Omega}) - Z(e^{j(\Omega+\pi)})$$

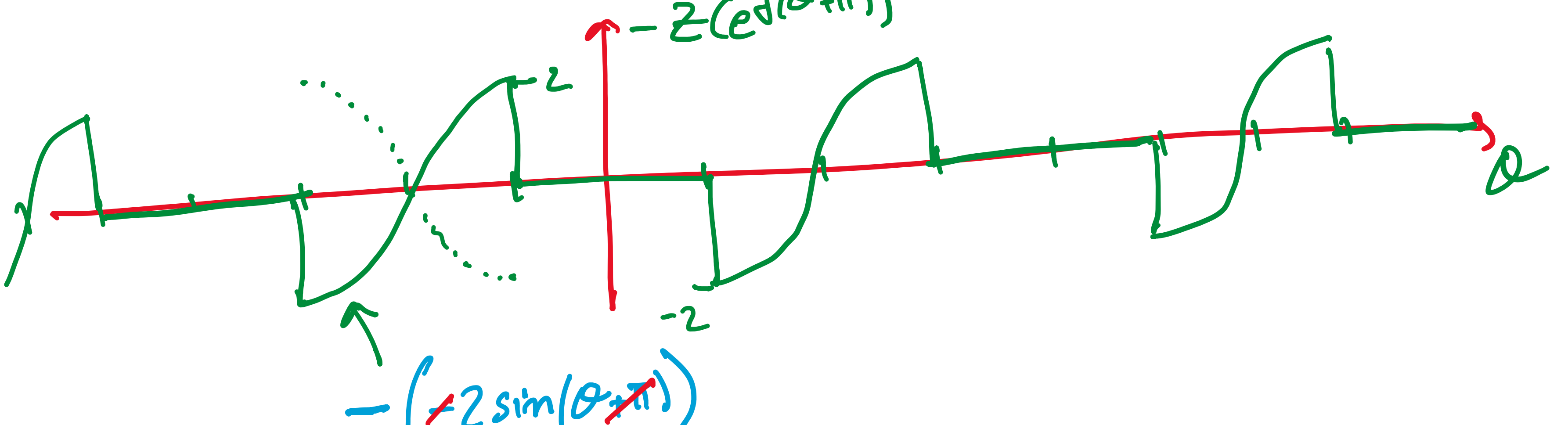
$x(n) = \delta(n-1) - \delta(n+1)$

$$X(e^{j\Omega}) = \sum_n x(n) e^{-jn\Omega} = e^{-j\Omega} - e^{j\Omega}$$
$$= -(e^{j\Omega} - e^{-j\Omega})$$
$$= -2j \sin\Omega$$









$$Y(e^{j\Omega}) = -2\sin(\Omega)$$