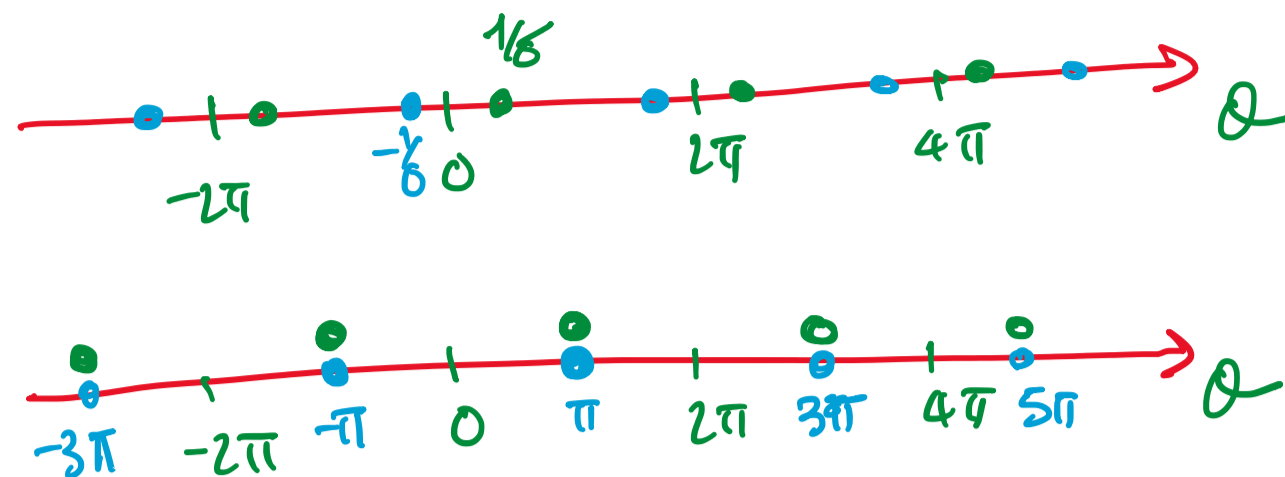


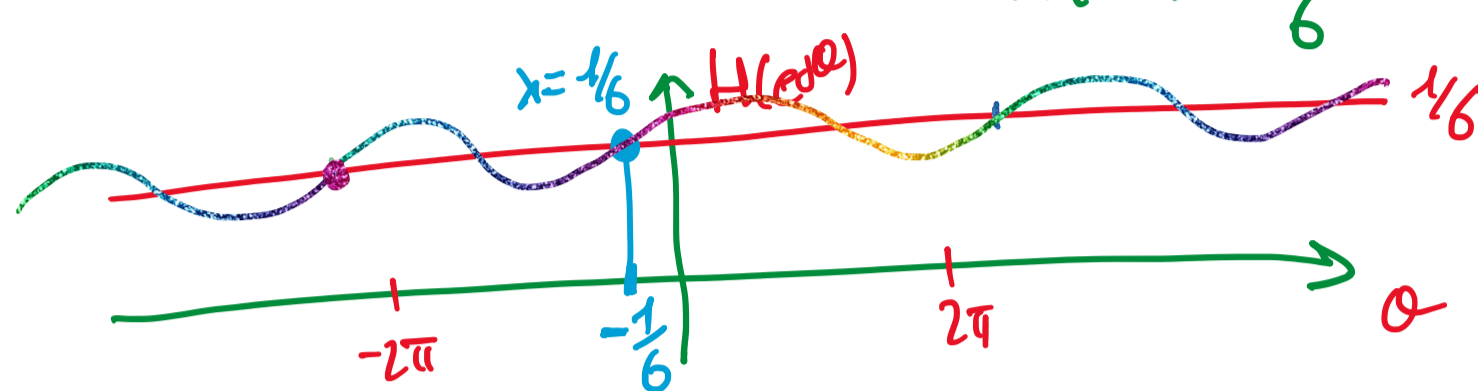
ES0 TROVARE  $h(n)$  TALE CHE

$x(n) = e^{jn/6}$  →  $h(n)$  (FILTRO) →  $y(n) = e^{jn/6} \neq \lambda e^{jn/6}$   
 NON È POSSIBILE

ES1  $x(n) = e^{-j\pi n}$   
 $y(n) = e^{j\pi n} = e^{-j\pi n}$  SI SI PUÒ FARE CON UNA TRASF. IDENTICA  $h(n) = \delta(n)$   
 $\pi - 2\pi = -\pi$



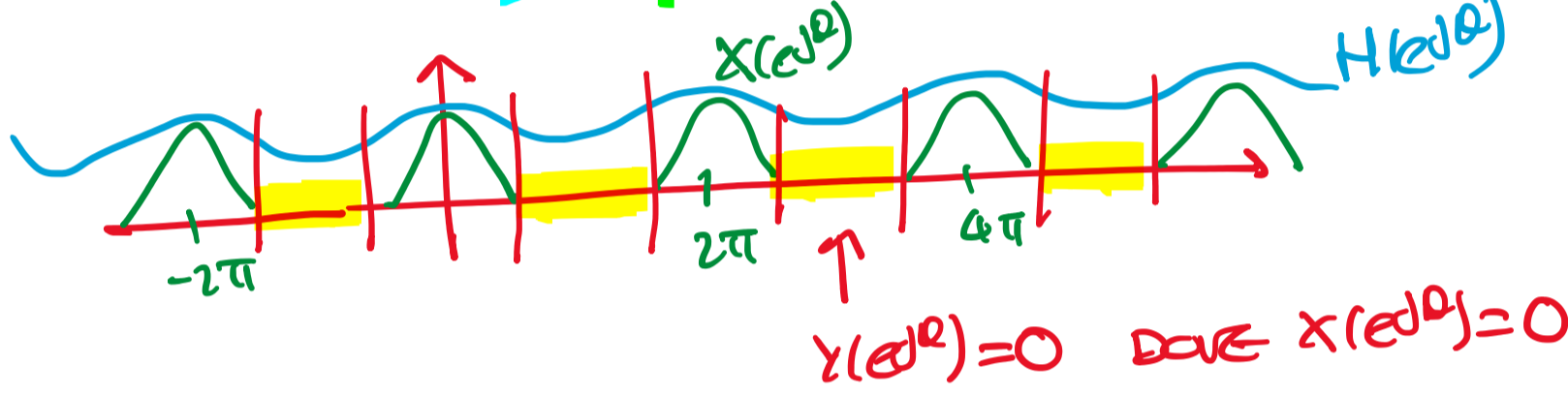
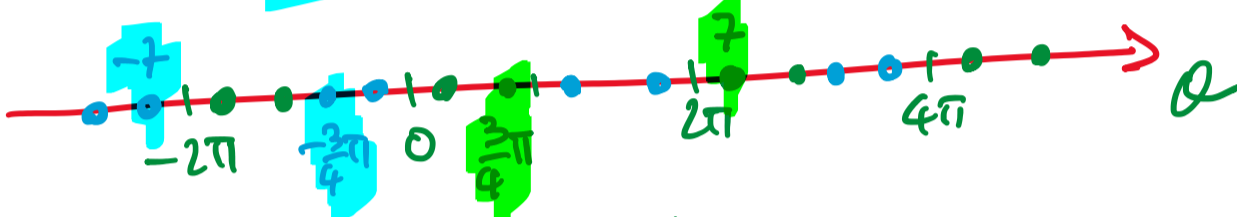
ES2  $x(n) = e^{-jn/6}$   $h(n) = ? \frac{1}{6} \delta(n)$   
 $y(n) = \frac{1}{6} e^{-jn/6}$   $H(e^{j\omega}) = \frac{1}{6}$



ES3  $x(n) = \cos(7n) + \sin(\frac{3}{4}\pi n)$

SI  $y_1(n) = \sin(7n + \pi/3) = \cos(7n - \pi/2 + \pi/3) = \cos(7n - \pi/6)$

$y_2(n) = e^{-j7n} + e^{j\frac{3}{4}\pi n}$   
 $y_3(n) = \cos(\frac{3}{4}\pi n) = e^{j\frac{3}{4}\pi n}$   
 $H(e^{j7}) = 1 \cdot e^{-j\pi/6}$   
 $H(e^{-j7}) = 1 \cdot e^{j\pi/6}$   
 $H(e^{j\frac{3}{4}\pi}) = 0$



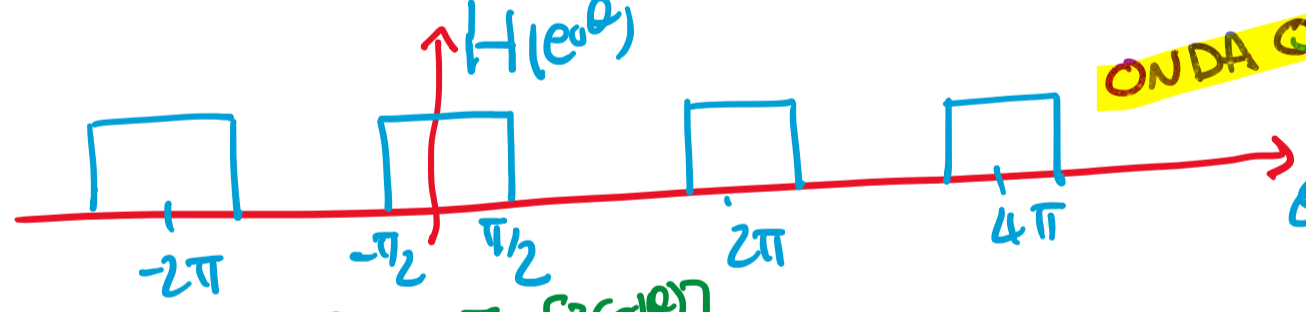
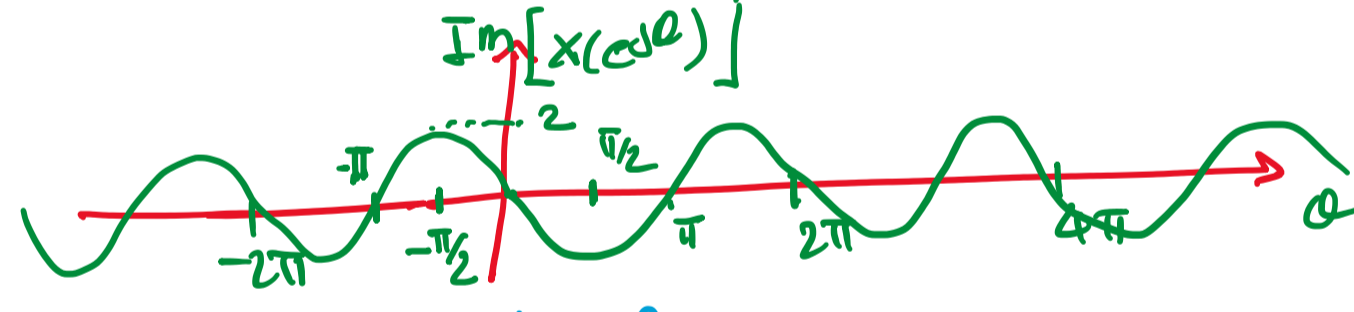
ES4

$x(n) = \delta(n-1) - \delta(n+1)$  →  $h(\cdot)$  (FILTRO) →  $y(n) = ?$   
 PASSABASSO IDEALE  $\theta_c = \pi/2$   
 $v(n) = 1 - e^{-j\pi n}$

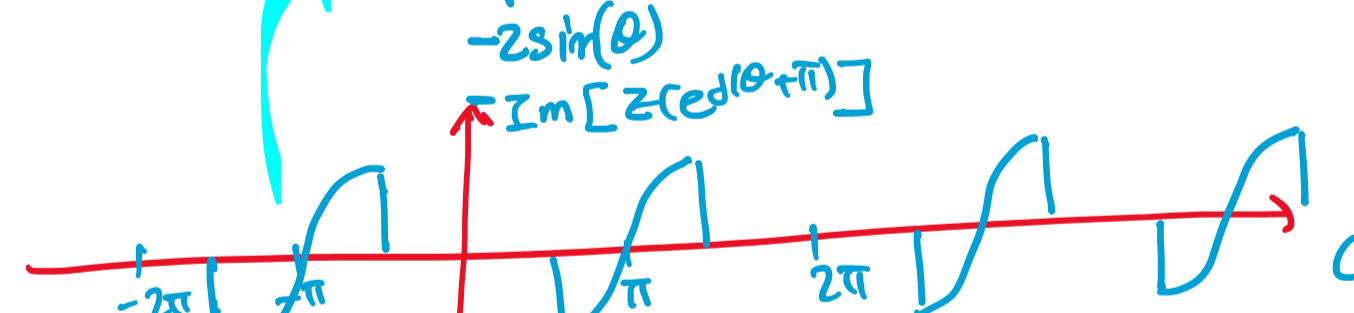
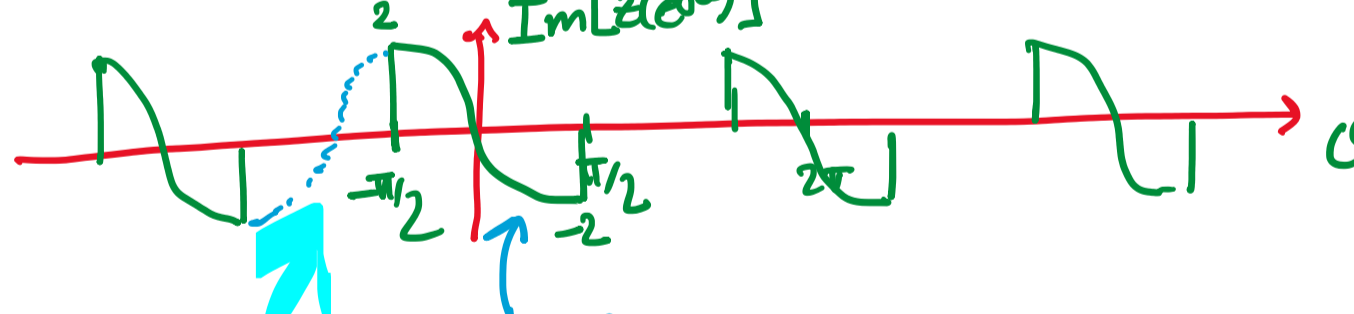
DOMINIO DI FOURIER

$X(e^{j\omega}) \cdot H(e^{j\omega}) \rightarrow$  (FILTRO)  $Y(e^{j\omega})$   
 $Y(e^{j\omega}) = Z(e^{j\omega}) - Z(e^{j(\omega+\pi)})$

$X(e^{j\omega}) = \sum_{n=-\infty}^{+\infty} x(n) e^{j\omega n} = e^{-j\omega} - e^{j\omega} = -(e^{j\omega} - e^{-j\omega}) = -2j \sin(\omega)$



ONDA QUADRA DUTY CYCLE = 1/2  
 $h(n) = \delta \sin(\pi n)$



$Y(e^{j\omega}) = Z(e^{j\omega}) - Z(e^{j(\omega+\pi)}) = -2j \sin(\omega) = X(e^{j\omega}) \rightarrow y(n) = x(n)$

DOMINIO DEL TEMPO

$x(n) = \delta(n-1) - \delta(n+1) \rightarrow h(\cdot) \rightarrow z(n) \rightarrow y(n)$   
 $v(n) = 1 - e^{-j\pi n} = 1 - (-1)^n$

