

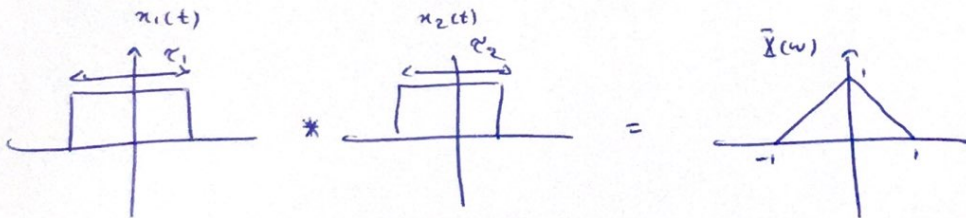
#1

$$H(j\omega) = \frac{H_1(j\omega) \cdot H_2(j\omega)}{\omega^2}$$

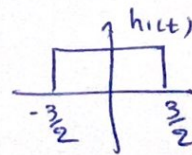
$H_1(j\omega)$        $H_2(j\omega)$   
 $(\sin^2(3\omega))$        $\cos \omega$

$$H(j\omega) = H_1(j\omega) \cdot H_2(j\omega) \quad (I)$$

$$H_1(j\omega) = \frac{\sin^2(3\omega)}{\omega^2} = \frac{\sin(3\omega)}{\omega} \times \frac{\sin(3\omega)}{\omega} = 9 \operatorname{sinc}^2\left(\frac{3\omega}{\pi}\right)$$



$$\Rightarrow h_1(t) = \begin{cases} 1 & |t| < \frac{3}{2} \\ 0 & \text{other} \end{cases}$$



$$H_2(j\omega) = \cos \omega = \frac{1}{2} e^{j\omega} + \frac{1}{2} e^{-j\omega} \xrightarrow{F} \frac{1}{2} \delta(t+1) + \frac{1}{2} \delta(t-1) = h_2(t)$$

$$(I) \rightarrow h(t) = h_1(t) * h_2(t) =$$

