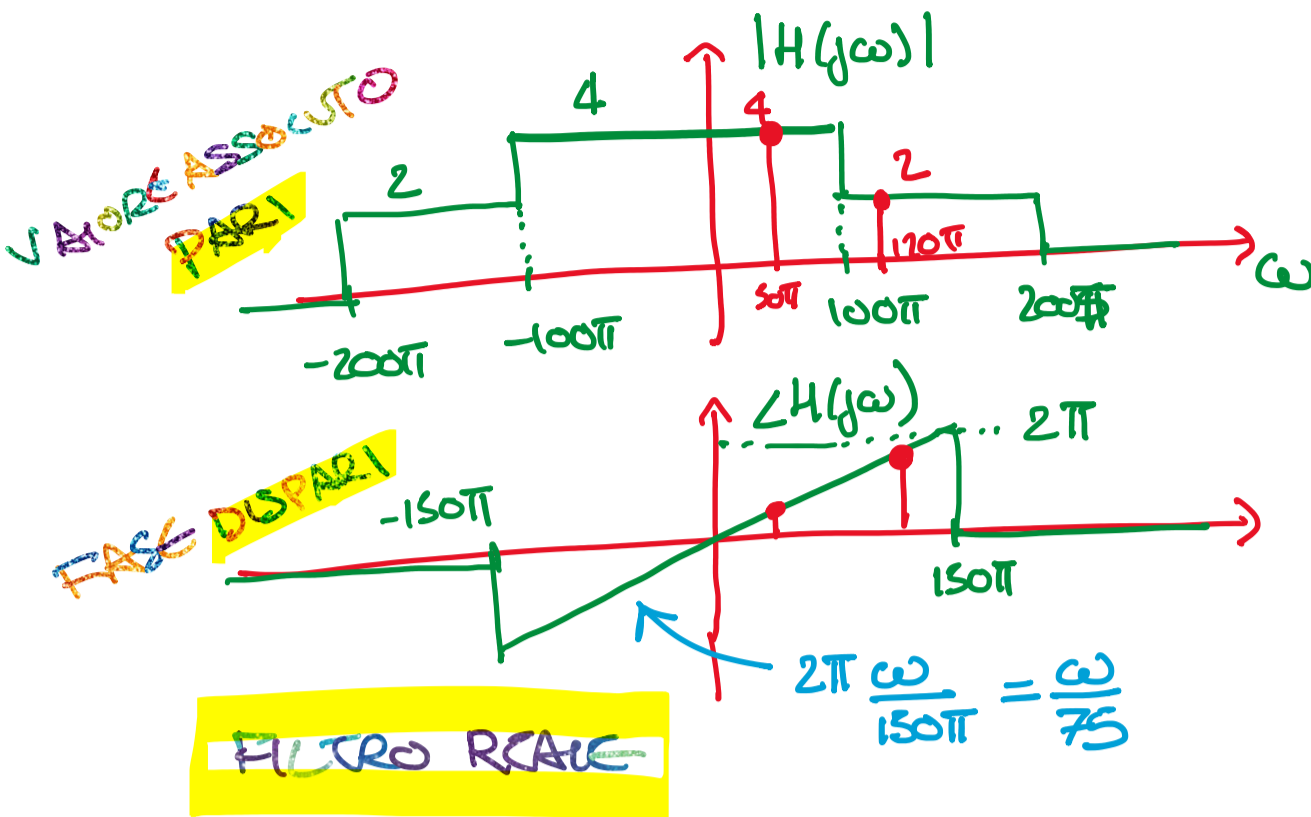


ES1



$$x(t) = \cos(50\pi t) + 5 \cos(120\pi t)$$



SUMMA RISULTATI

$$H(-j\omega) = H^*(j\omega)$$

$$|H(-j\omega)| e^{j\angle H(-j\omega)} = |H(j\omega)| e^{-j\angle H(j\omega)}$$

1) $y(t) = ?$

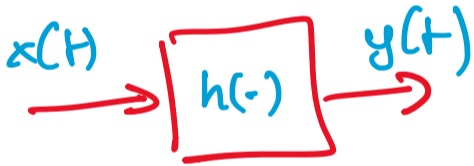
2) IL FILTRO DISTORCE IL SEGNALE $x(t)$?
 FILTRO **NON DISTORCENTE** SE $y(t) = Ax(t-t_0)$ ← DEFINIZIONE

$$x(t) = \cos(50\pi t) + 5 \cos(120\pi t)$$

$$y(t) = \cancel{|H(j50\pi)|} \cdot \cos(50\pi t + \cancel{\angle H(j50\pi)}) + 5 \cancel{|H(j120\pi)|} \cdot \cos(120\pi t + \cancel{\angle H(j120\pi)})$$

$$y(t) = 4 \cos(50\pi(t + \frac{1}{75})) + 10 \cdot \cos(120\pi(t + \frac{1}{75}))$$

ES2 DECOMPOSIZIONE



$$x(t) = \text{triang}(\frac{t}{3})$$

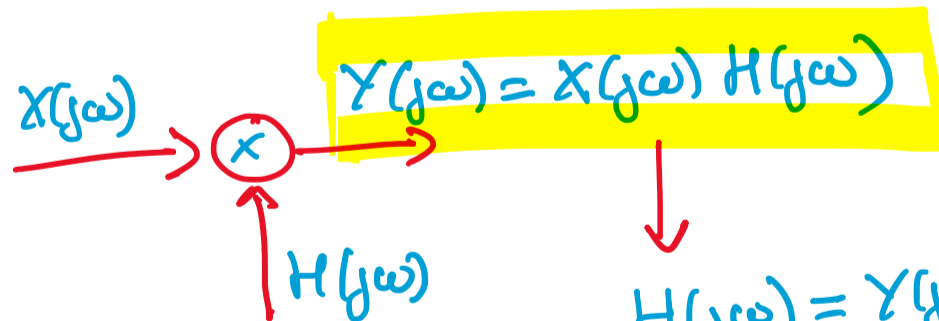
$$y(t) = \text{triang}(\frac{t+2}{3}) + 2 \text{triang}(\frac{t}{3}) + 4 \text{triang}(\frac{t-1}{3})$$

1) $H(j\omega) = ?$

2) $h(t) = ?$

3) BIBO STABILE

4) USCITA PER $x(t) = \delta(t)$

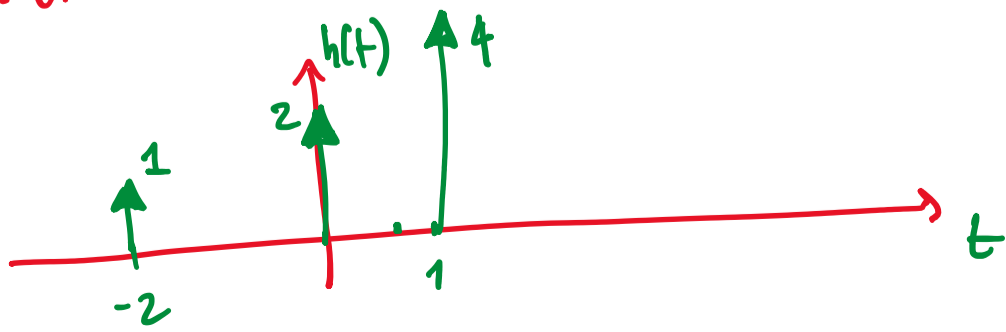


$$H(j\omega) = \frac{Y(j\omega)}{X(j\omega)} = \frac{3 \cancel{\text{sin}^2(\frac{3\omega}{2\pi})} e^{-j\omega \cdot (-2)} + 2 \cdot 3 \cancel{\text{sin}^2(\frac{3\omega}{2\pi})} + 4 \cdot 3 \cancel{\text{sin}^2(\frac{3\omega}{2\pi})} e^{-j\omega \cdot 1}}{3 \cancel{\text{sin}^2(\frac{3\omega}{2\pi})}}$$

$$= e^{j2\omega} + 2 + 4e^{-j\omega}$$

$$h(t) = \delta(t+2) + 2\delta(t) + 4\delta(t-1)$$

$$\int s(t) e^{-j\omega t} dt$$



BIBO STABILE

$$\int |h(t)| dt = \int h(t) dt = 1 + 2 + 4 = 7 < \infty$$