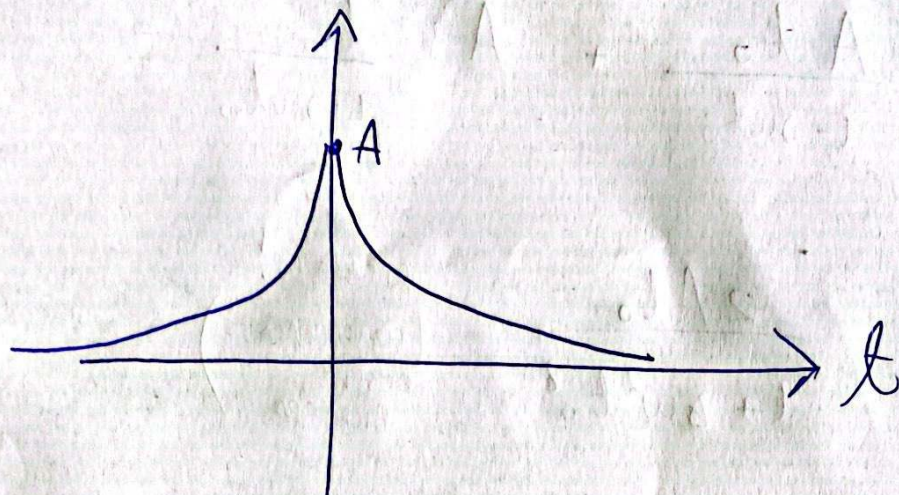


ES 3



$$x(t) = A e^{-\frac{|t|}{\tau_0}}$$

$$\boxed{\tau_0 > 0}$$

$$X(\omega) = \int_{-\infty}^{+\infty} x(t) e^{-j\omega t} dt$$

ANALISI
SEGNALI
APPROXIMATI

$$= \int_{-\infty}^0 A e^{t/\tau_0} e^{-j\omega t} dt + \int_0^{+\infty} A e^{-t/\tau_0} e^{-j\omega t} dt$$

$$= A \int_{-\infty}^0 e^{t(\frac{1}{\tau_0} - j\omega)} dt + A \int_0^{+\infty} e^{t(-\frac{1}{\tau_0} - j\omega)} dt$$

$$= A \cdot \left[\frac{e^{t(\frac{1}{\tau_0} - j\omega)}}{\frac{1}{\tau_0} - j\omega} \right]_{-\infty}^0 + A \cdot \left[\frac{e^{t(-\frac{1}{\tau_0} - j\omega)}}{-\frac{1}{\tau_0} - j\omega} \right]_0^{+\infty}$$

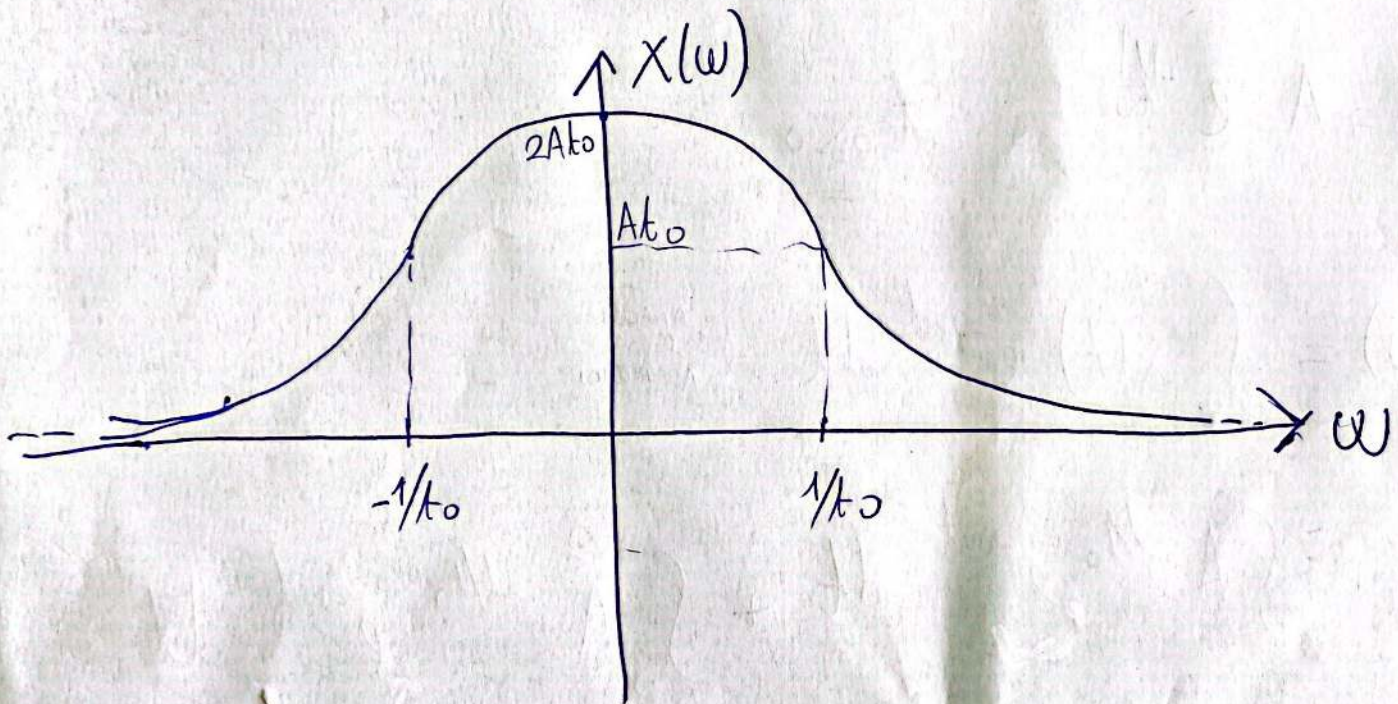
$\tau_0 > 0$ PER DCF.

$$= A \cdot \frac{1}{\frac{1}{\tau_0} - j\omega} + A \cdot \frac{1}{-\frac{1}{\tau_0} - j\omega}$$

$$= \frac{A t_0}{1 - j\omega t_0} + A \frac{t_0}{1 + j\omega t_0} =$$

$$= \boxed{\frac{2 A t_0}{1 + \omega^2 t_0^2}}$$

RISULTATO!
(TRASFORMATA
CUSPIDE
BILATERA)



NOTA: t_0 + PICCOLO \rightarrow CAPACITA + CARICA