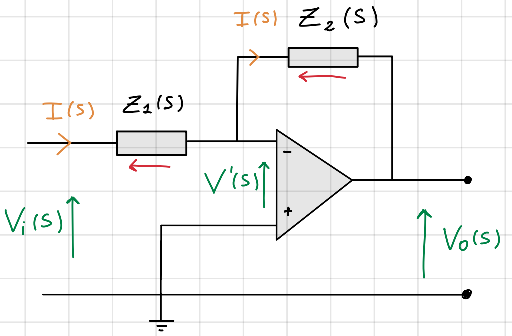
METODO DELLE IMPEDENZE



$I_1(s) = \dfrac{V_1(s)}{Z_1(s)}$, $I_2 = \dfrac{V_2(s)}{Z_2(s)}$

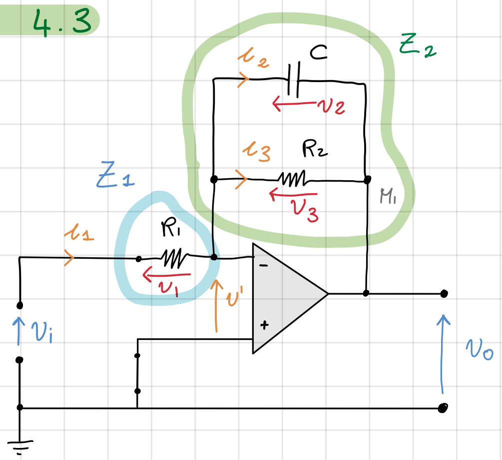
ma $V_1(s) = V_i(s) - V'(s)$, $V_2(s) = V'(s) - V_0(s)$

$\Rightarrow$ Siccome $i_1 \doteq i_2 \rightarrow \dfrac{V_i(s) - \cancel{V'(s)}}{Z_1(s)} = \dfrac{\cancel{V'(s)} - V_0(s)}{Z_2(s)}$ perche' $V'(s) \doteq 0$

$\rightarrow \dfrac{V_i(s)}{Z_1(s)} = -\dfrac{V_0(s)}{Z_2(s)} \Rightarrow \boxed{\dfrac{V_0(s)}{V_i(s)} = -\dfrac{Z_2(s)}{Z_1(s)}}$ Siccome $G(s) = \dfrac{V_0(s)}{V_i(s)}$

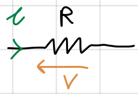
allora $G(s) = -\dfrac{Z_2(s)}{Z_1(s)}$

ES 4.3

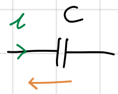


SICCOME

$Z(s) = \dfrac{V(s)}{I(s)}$



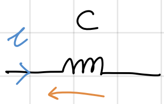
$\rightarrow Z(s) = \dfrac{V}{I} = \dfrac{R \cdot \cancel{I}}{\cancel{I}} \Rightarrow \boxed{Z_R(s) = R}$



$Z(t) = \dfrac{v}{i} = \dfrac{v}{C\dot{v}} \rightleftharpoons Z(s) = \dfrac{\cancel{V(s)}}{Cs\,\cancel{V(s)}}$

$\hookrightarrow \boxed{Z_c(s) = \dfrac{1}{Cs}}$

∇ dovrebbe essere $Z_c = Ls$



$\boxed{Z_c(s) = \dfrac{1}{Ls}}$

$\Rightarrow Z_{2C} = Z_R // Z_C = \dfrac{Z_R \cdot Z_C}{Z_R + Z_C}$

$= \dfrac{R \cdot \frac{1}{Cs}}{R + \frac{1}{Cs}} = \dfrac{\frac{R}{\cancel{Cs}}}{\frac{RCs + 1}{\cancel{Cs}}} = \underbrace{\dfrac{R_2}{R_2Cs + 1}}_{Z_2}$

$\underbrace{Z_R = R_1}_{Z_1}$

$\Rightarrow \dfrac{V_0(s)}{V_i(s)} = -\dfrac{Z_2(s)}{Z_1(s)} = \dfrac{\frac{R_2}{R_2Cs + 1}}{R_1} = \underbrace{\dfrac{R_2}{R_1} \cdot \dfrac{1}{R_2Cs + 1}}_{G(s)}$