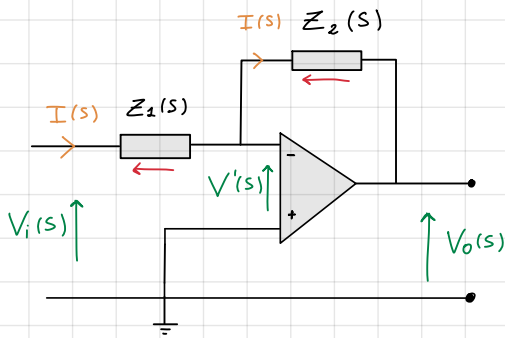


METODO DELLE IMPEDENZE



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

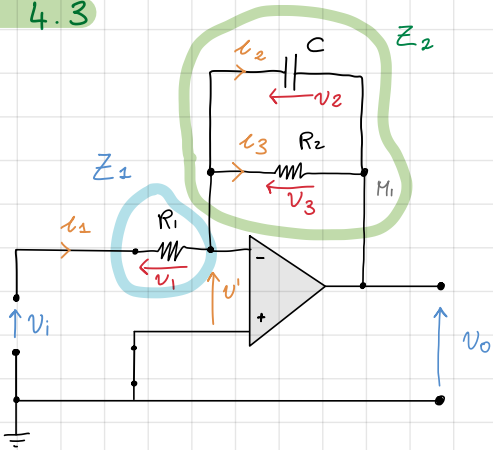
$$\text{ma } V_1(s) = V_i(s) - V'(s), \quad V_2(s) = V'(s) - V_o(s)$$

$$\Rightarrow \text{Siccome } I_1 \doteq I_2 \Rightarrow \frac{V_i(s) - \cancel{V'(s)}}{Z_1(s)} = \frac{\cancel{V'(s)} - V_o(s)}{Z_2(s)} \quad \text{ma } V'(s) \doteq 0$$

$$\Rightarrow \frac{V_i(s)}{Z_1(s)} = -\frac{V_o(s)}{Z_2(s)} \Rightarrow \frac{V_o(s)}{V_i(s)} = -\frac{Z_2(s)}{Z_1(s)} \quad \text{Siccome } G(s) = \frac{V_o(s)}{V_i(s)}$$

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

ES 4.3

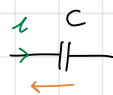


SICCOME

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

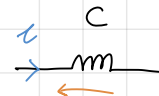


$$\Rightarrow Z(s) = \frac{V}{I} = \frac{R \cdot I}{I} \Rightarrow Z_R(s) = R$$



$$Z(t) = \frac{V}{I} = \frac{V}{C \cdot \dot{V}} \Rightarrow Z(s) = \frac{\cancel{V(s)}}{C s \cancel{V(s)}}$$

$$\Rightarrow Z_C(s) = \frac{1}{Cs}$$



$$Z_C(s) = \frac{1}{Cs}$$

$$\Rightarrow Z_{2C} = Z_R \parallel Z_C = \frac{Z_R \cdot Z_C}{Z_R + Z_C}$$

$$= \frac{R \cdot \frac{1}{Cs}}{R + \frac{1}{Cs}} = \frac{\frac{R}{Cs}}{\frac{RCS + 1}{Cs}} = \frac{R_2}{R_2CS + 1}$$

$$Z_1 = Z_R = R_1$$

$$\Rightarrow \frac{V_o(s)}{V_i(s)} = -\frac{Z_2(s)}{Z_1(s)} = -\frac{\frac{R_2}{R_2CS + 1}}{R_1} = -\frac{R_2}{R_1} \cdot \frac{1}{R_2CS + 1} \quad G(s)$$