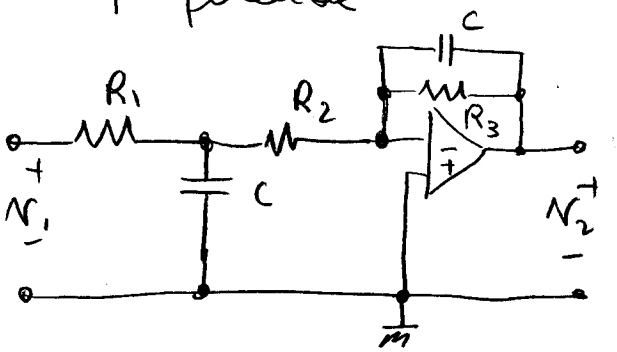
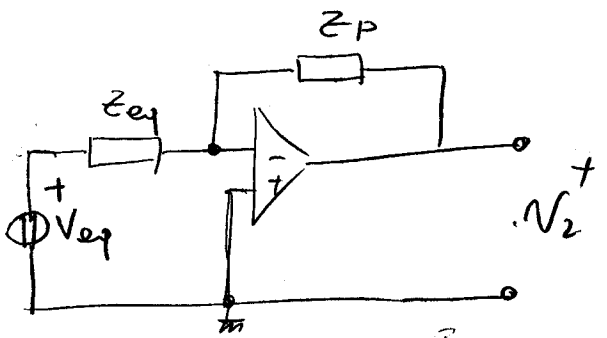
ELE_INF_2001_12_12 **ES. 1**

Calcolare la $F(s) = \frac{V_2(s)}{V_1(s)}$ del circuito in figura e tracciarne l'andamento qualitativo delle risposte in frequenza

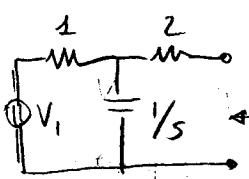


$R_1 = 1, R_2 = 2, R_3 = 3, C = 1$ [Ω, F]

Il circuito è un amplificatore invertente del tipo:



$$V_2 = -\frac{Z_P}{Z_{eq}} \cdot V_{eq}$$



V_{eq}, Z_{eq} Thèvenin

$$Z_P = \frac{1}{sC} // R_3 = \frac{3}{s+3}$$

$$Z_{eq} = \left(R_1 // \frac{1}{sC}\right) + R_2 = \frac{1}{1+s} + 2 = \frac{3+2s}{1+s}$$

$$V_{eq} = \frac{V_1}{R_1 + \frac{1}{sC}} \cdot \frac{1}{sC} = \frac{V_1}{s+1}$$

$$\Rightarrow F(s) = \frac{V_2}{V_1} = -\frac{3}{(s+3)(2s+3)} = -\frac{1}{3}\frac{1}{\left(1+\frac{1}{3}s\right)\left(1+\frac{2}{3}s\right)}$$

$\tau_1 = \frac{1}{3}$

$\tau_2 = \frac{2}{3}$