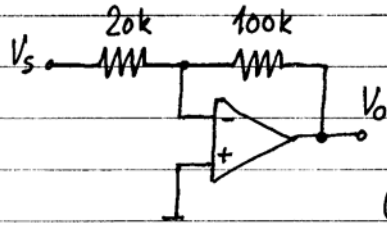
Resolução (compacta):

E1(A) - 1mt

a) 

$$\frac{V_o}{V_s} = -\frac{100k}{20k} = -5\ V/V$$

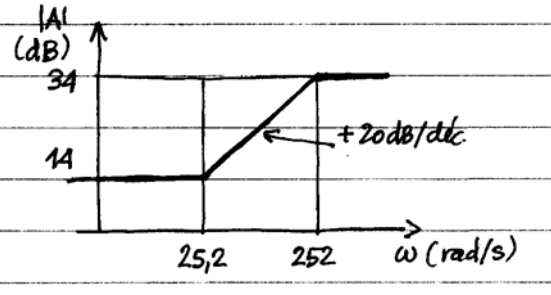
Como a entrada inversora é uma massa virtual:

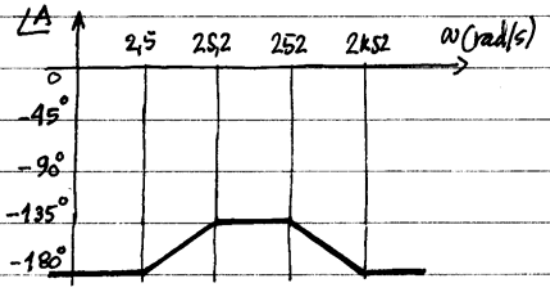
$$R_i = 20\ k\Omega$$

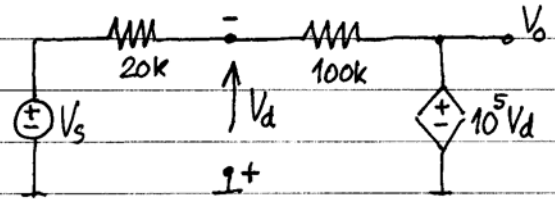
b)

$$Z_1 = [2k + 18k \,//\, 2{,}2\mu] = 20k\,\frac{1 + s\,3{,}96m}{1 + s\,39{,}6m} \qquad Z_2 = 100\ k\Omega$$

$$\frac{V_o}{V_s} = -\frac{Z_2}{Z_1} = -\frac{100k}{20k}\,\frac{1+s\,39{,}6m}{1+s\,3{,}96m} = -5\,\frac{1+s/25{,}2}{1+s/252}$$



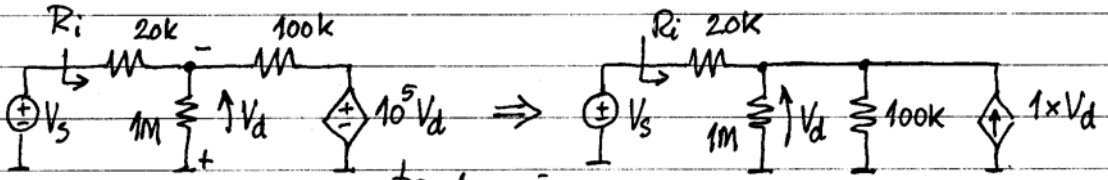


c) 

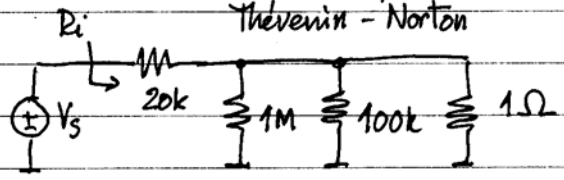
$$V_o = 10^5 V_d$$

$$V_s = 20k\,\frac{V_s - V_o}{120k} - V_d = \frac{V_s - V_o}{6} - \frac{V_o}{10^5}$$

donde $\dfrac{V_o}{V_s} = -\dfrac{5}{1 + \frac{6}{10^5}} \cong -5\ V/V$

d) 

transformação Thevenin - Norton

Teorema da absorção $\Rightarrow$ 

$$R_i = 20k + 1M \,//\, 100k \,//\, 1 \cong 20k + 1 \cong 20\ k\Omega$$