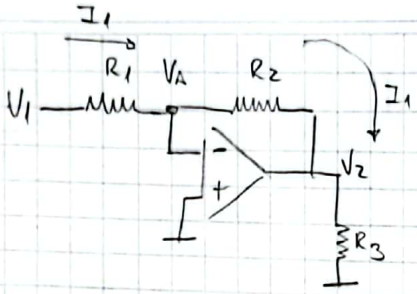
HOJA Nº

FECHA

① 2) $Z_1 = 47K$

$\frac{V_2}{V_1} = -70\,dB$

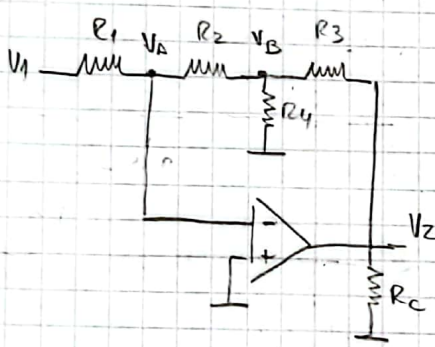


Ganancia de un inversor $A_V = -\frac{R_2}{R_1}$

$$-20 \log\left(\frac{R_2}{47K}\right) = 70\,dB$$

$$10^{-7/2} = \frac{R_2}{47K} \rightarrow R_2 \approx 15\,\Omega$$

b)



$$V_1 G_1 + V_B G_2 = \phi \rightarrow V_B = -V_1 \frac{G_1}{G_2}$$

$$V_B (G_2 + G_3 + G_4) - V_2 G_3 = \phi$$

$$-V_1 \frac{G_1}{G_2} (G_2 + G_3 + G_4) - V_2 G_3 = \phi$$

$$V_2 G_3 = -V_1 \left(G_1 + \frac{G_1 G_3}{G_2} + \frac{G_1 G_4}{G_2}\right)$$

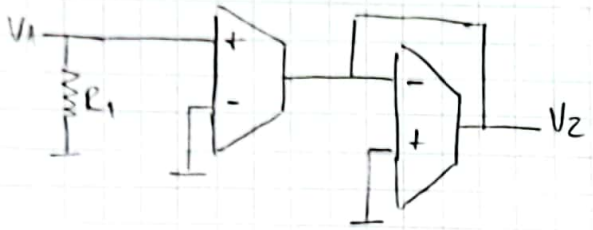
$$\frac{V_2}{V_1} = -\left(\frac{G_1}{G_3} + \frac{G_1}{G_2} + \frac{G_1 G_4}{G_3 G_2}\right) = -\left(\frac{G_1 G_2 + G_1 G_3 + G_1 G_4}{G_2 G_3}\right)$$

$$\frac{V_2}{V_1} = -\frac{G_1}{G_2 G_3} \cdot (G_2 + G_3 + G_4)$$

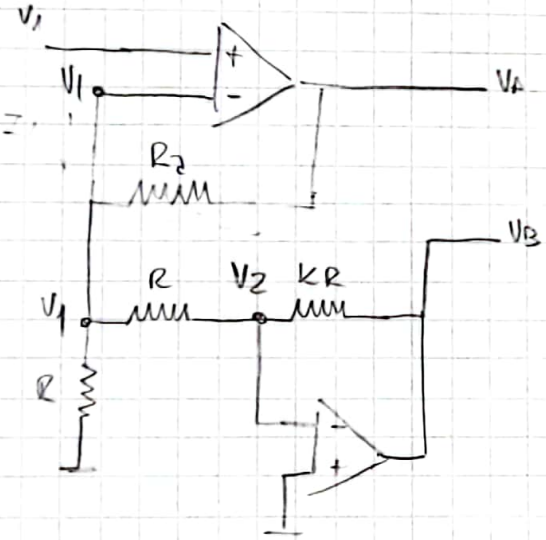
K

NOTA

c)



(2)



Obtener V_{AB}. $R_2 = R\left(\frac{K-1}{2}\right)$

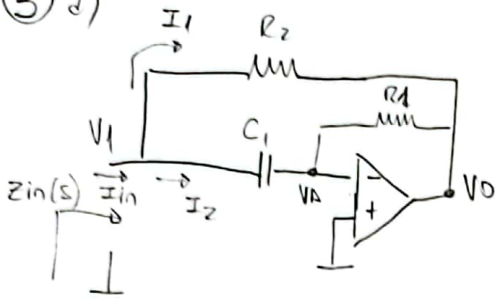
$V_{AB} = V_A - V_B$

$\frac{V_2 \cdot (G + G_K) - V_B G_K - V_1 G = \emptyset}{}$

$V_B G_K + V_1 G = \emptyset$

$G = \frac{1}{R}$

③ a)



$$I_{in} = \frac{V1}{Z_{in}}$$

$$I_{in} = I_1 + I_2$$

$$I_1 = (V1 - V_O)\, G_2$$

$$I_2 = (V_1 - V_O)(G_1 + SC_1)$$

$$\frac{V1}{Z_{in}} = (V1 - V_O)\, G_2 + (V1 - V_O)(G_1 + SC_1)$$

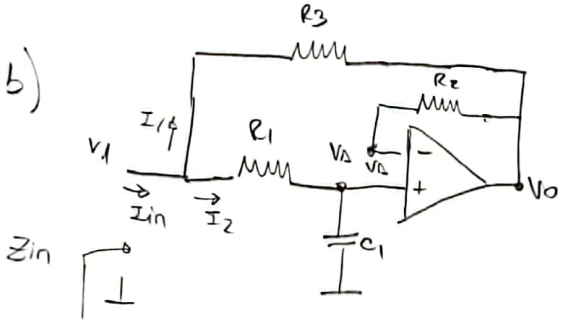
$$\frac{V1}{Z_{in}} = V1\, G_2 - V_O G_2 + V1\, G_1 + V1\, SC_1 - V_O G_1 - V_O SC_1$$

$$\frac{V1}{Z_{in}} = V1\,(G_2 + G_1 + SC_1) - V_O\,(G_2 + G_1 + SC_1)$$

$$Z_{in} = \frac{V1}{V1\,(G_2 + G_1 + SC_1) - V_O\,(G_2 + G_1 + SC_1)}$$

$$Z_{in} = \frac{V1}{V1 - V_O} \cdot \frac{1}{G_2 + G_1 + SC_1}$$

b)



$$V_A (G_1 + SC_1) - V1\, G_1 = \emptyset \rightarrow V_A = V1\, \frac{G_1}{G_1 + SC_1}$$

$$I_{in} = I_1 + I_2$$

$$I_1 = (V1 - V_A)(G_3 + G_2)$$

$$I_2 = (V_1 - V_A)\, G_1 + V_A \cdot SC_1$$

$$\frac{V1}{Z_{in}} =$$

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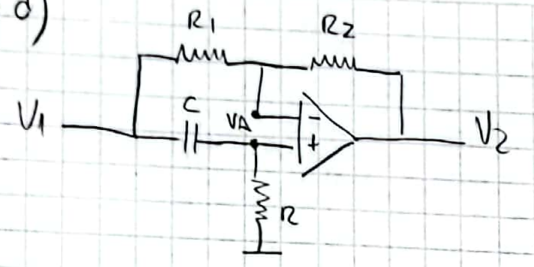
④ a)



$$\frac{V_A}{R_1+R_2} - \frac{V_1}{R_1} - \frac{V_2}{R_2} = \emptyset$$

$$V_A\left(\frac{1}{R}+SC\right) - V_1 SC = \emptyset$$

$$V_A = \frac{V_1 SC}{\frac{1}{R}+SC} = V_1 \frac{1}{\frac{1}{SCR}+1} = \frac{1}{\frac{1+SCR}{SCR}} = \frac{SCR}{1+SCR}$$

$$V_1 \frac{SCR}{1+SCR}\left(\frac{1}{R}+SC\right) - \frac{V_1}{R_1} - \frac{V_2}{R_2} = \emptyset$$

$$V_1\left(\frac{SCR}{R+SCR^2}+\frac{S^2C^2R}{1+SCR}\right) - \frac{V_1}{R_1} - \frac{V_2}{R_2} = \emptyset$$

$$V_1\left(\frac{SC+S^2C^2R}{1+SCR}\right) - \frac{V_1}{R_1} - \frac{V_2}{R_2} = \emptyset$$

$$\frac{V_2}{R_2} = V_1\left(\frac{SC+S^2C^2R}{1+SCR} - \frac{1}{R_1}\right)$$

$$\frac{V_2}{V_1} = R_2\left(\frac{SC+S^2C^2R}{1+SCR} - \frac{1}{R_1}\right)$$

$$\frac{V_2}{V_1} = R_2\left(\frac{SCR_1+S^2C^2RR_1-(1+SCR)}{(1+SCR)R_1}\right)$$

$$\frac{V_2}{V_1} = R_2\left(\frac{S^2C^2RR_1+SCR_1-SCR-1}{R_1+SCRR_1}\right)$$

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