Ejercicio:
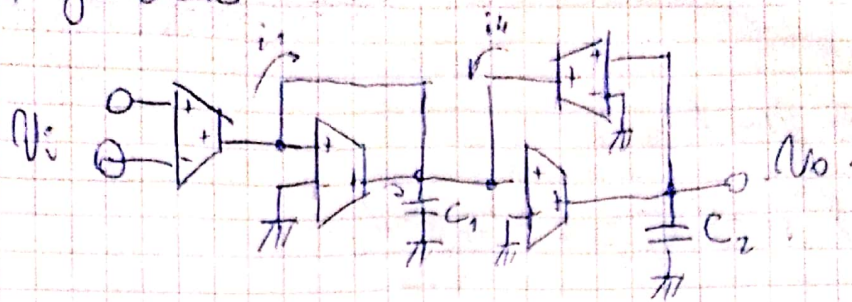

$$V_{C1} = \frac{1}{sC} \cdot (i_1 + i_2 + i_4)$$

$$i_2 = V_2 \cdot g_{m2} = V_{C1} \cdot g_{m2}$$

$$i_1 = V_i \, g_{m1}$$

$$i_3 = V_{C1} \cdot g_{m3}$$

$$V_3 = -V_{C1} \, g_{m3}/s \, C_2$$

$$i_4 = -V_{C1} \, g_{m3} \cdot g_{m4}/C_2 s$$

$$\therefore \quad V_{C1} = \frac{1}{sC} \cdot \left(V_i \, g_{m1} - V_{C1} \, g_{m2} - V_{C1} \frac{g_{m3} \cdot g_{m4}}{C_2 s} \right)$$

$$sC \, V_{C1} + V_{C1} \, g_{m2} + V_{C1} \frac{g_{m3} \cdot g_{m4}}{C_2 s} = V_i \, g_{m1}$$

$$V_{C1} = V_i \cdot \frac{g_{m1}}{sC_1 + g_{m2} + \dfrac{g_{m3} \cdot g_{m4}}{s C_2}}$$

$$V_{C1} = V_i \frac{g_{m1} s / C_1}{s^2 + \dfrac{s \, g_{m2}}{C_1} + \dfrac{g_{m3} \, g_{m4}}{C_1 \, C_2}}$$

$$v_3 = v_0 = -\frac{v_{c_1}}{c_2 s} \, g_{m3} = -v_i \, \frac{\frac{s}{c_1} \cdot g_{m3} \cdot g_{m1}}{s^2 + s \frac{g_{m2}}{c_1} + \frac{g_{m3} g_{m4}}{c_2 c_1}} \cdot \frac{1}{c_2 s}$$

$$v_0 = -v_i \, \frac{g_{m1} g_{m3} / c_2 c_1}{s^2 + s \frac{g_{m2}}{c_1} + \frac{g_{m3} g_{m4}}{c_2 c_1}}$$

$$H(s) = - \frac{g_{m1} g_{m3} / c_2 \cdot c_1}{s^2 + s \frac{g_{m2}}{c_1} + \frac{g_{m3} g_{m4}}{c_2 c_1}}$$