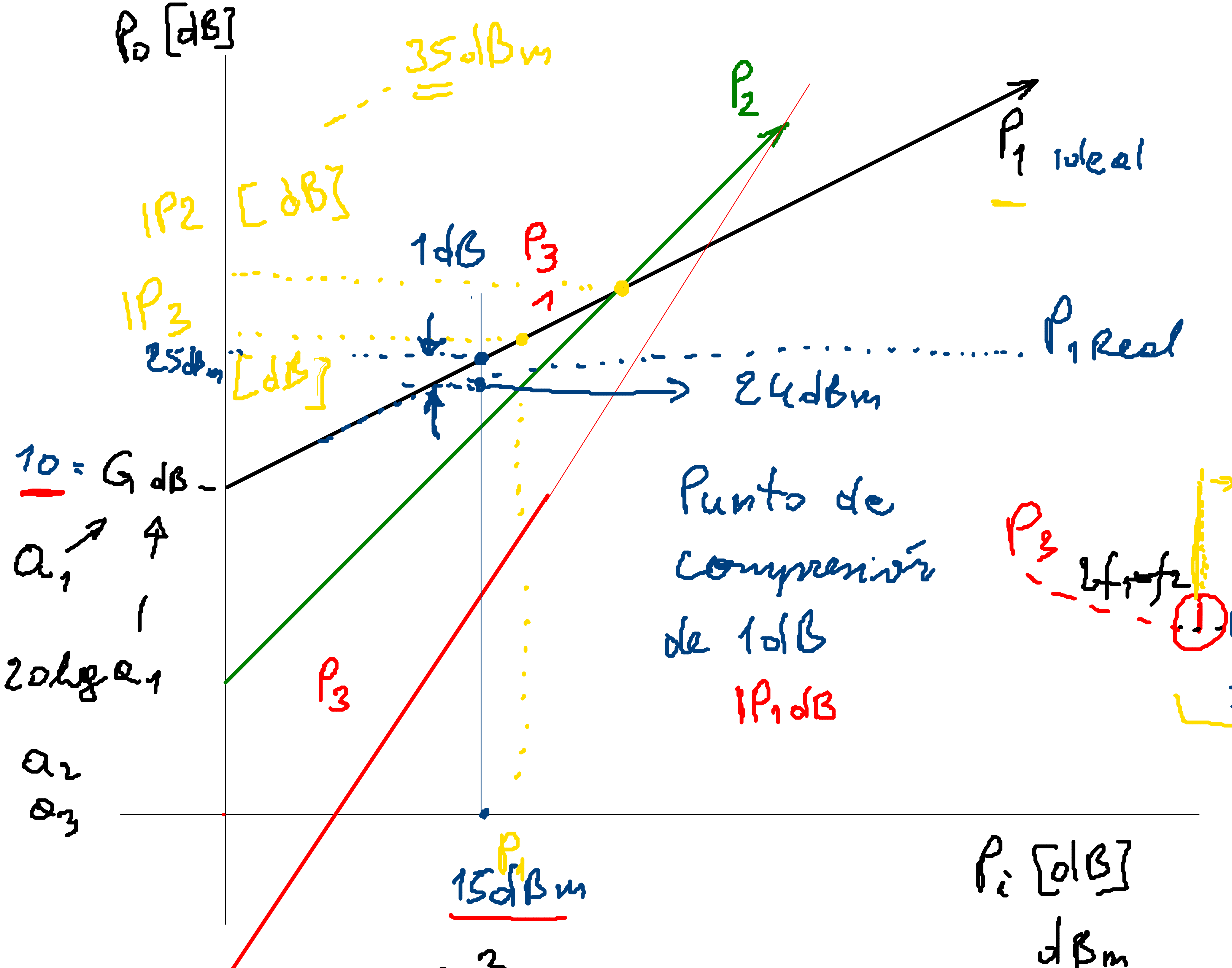


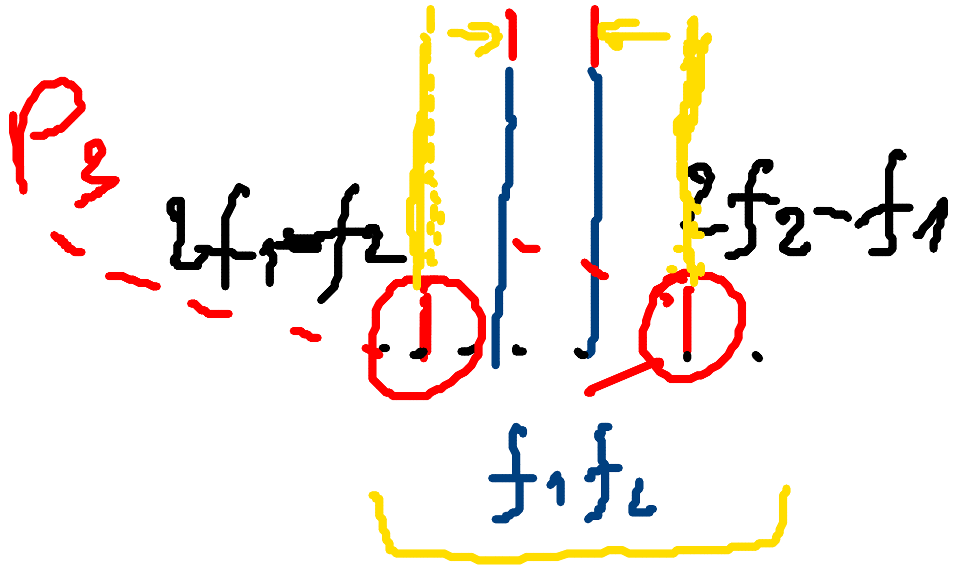
$$P_2 \propto P_{i1}^2 \; ; \; P_2 \propto P_{1o}^2 \text{ salida}$$

$$\boxed{P_3 \propto P_1^3}$$

$$P_2 = cte_2 \cdot P_1^2$$

$$IP_2 = cte_2 \cdot IP_2^2$$

$$\frac{1}{IP_2} = cte_2$$

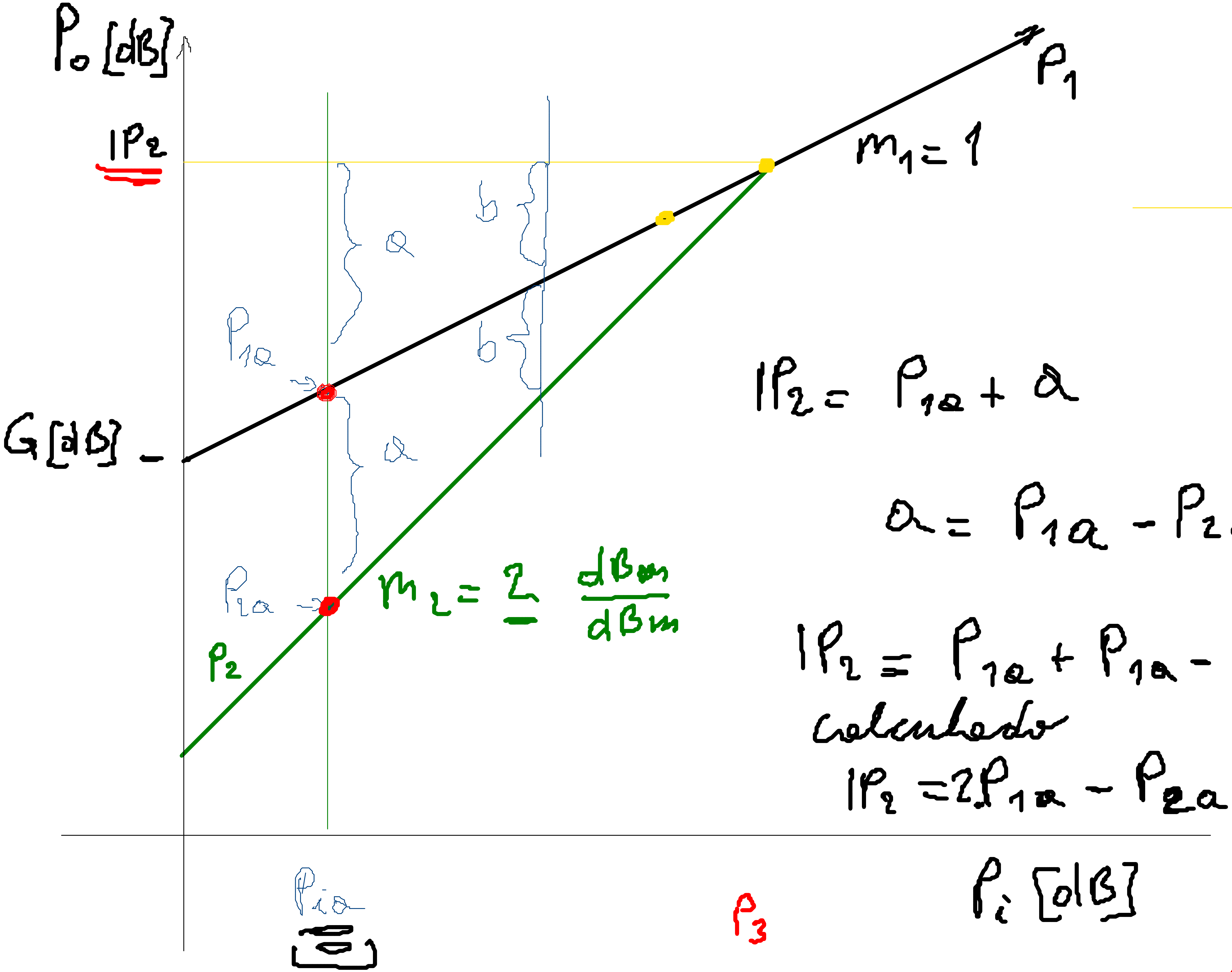


$$P_{2[W]} = \frac{1}{IP_{2[W]}} \cdot P_1^2$$

$$IP_3 = IP_1dB + (8-13\,dBm)$$

$$P_3 = cte_3 \cdot P_1^3$$

$$IP_3 = cte_3 \cdot IP_3^3 \rightarrow cte_3 = \frac{1}{IP_3^2} \rightarrow P_3 = \frac{1}{IP_3^2} \cdot P_1^3$$



$$IP_2 = P_{1a} + a$$

IP_3

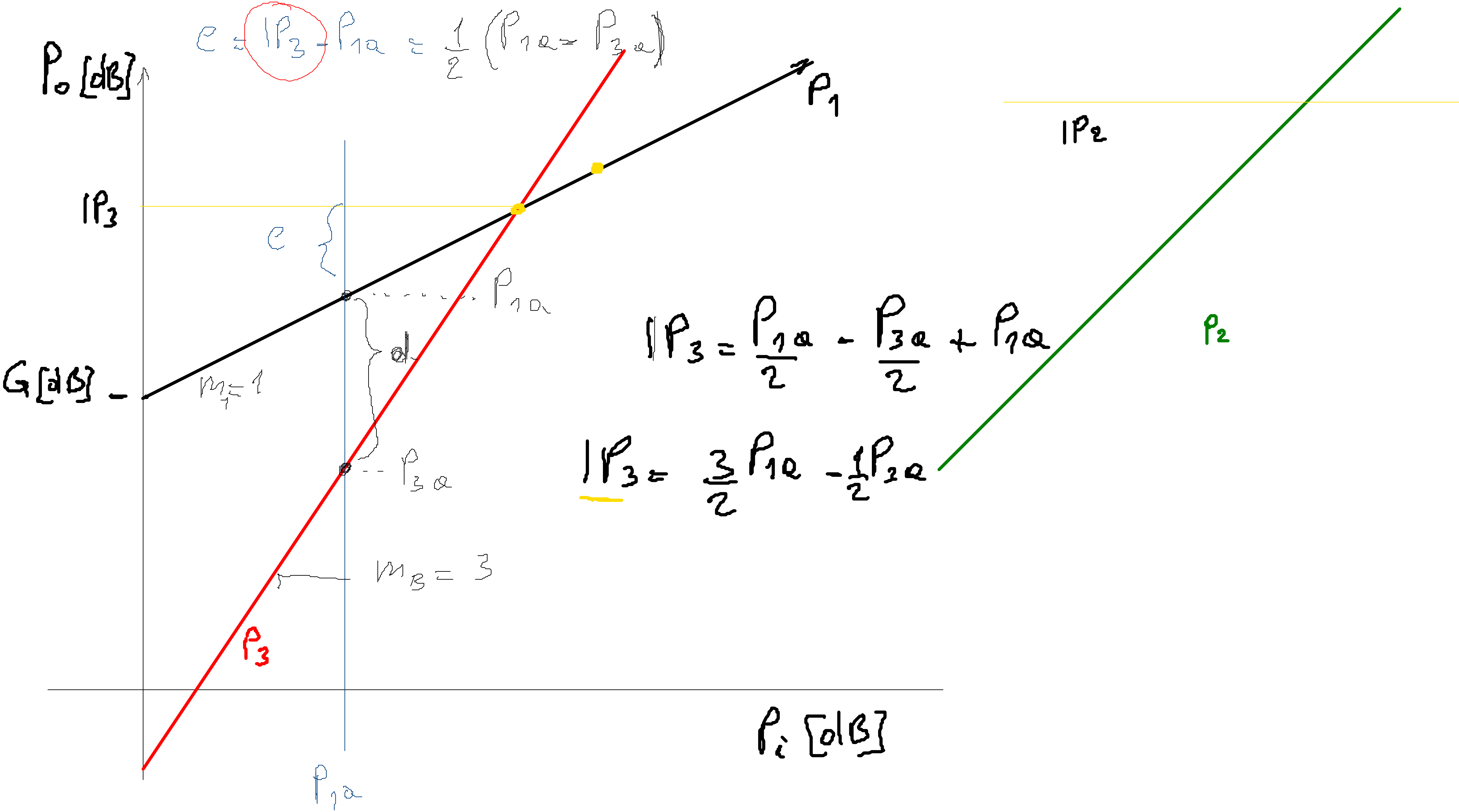
$$a = P_{1a} - P_{2a}$$

$$IP_2 = P_{1a} + P_{1a} - P_{2a}$$

calculado

$$IP_2 = 2P_{1a} - P_{2a}$$

$$e = IP_3 - P_{1a} = \frac{1}{2}(P_{1a} - P_{3a})$$



$$IP_3 = \frac{P_{1a}}{2} - \frac{P_{3a}}{2} + P_{1a}$$

$$IP_3 = \frac{3}{2}P_{1a} - \frac{1}{2}P_{3a}$$

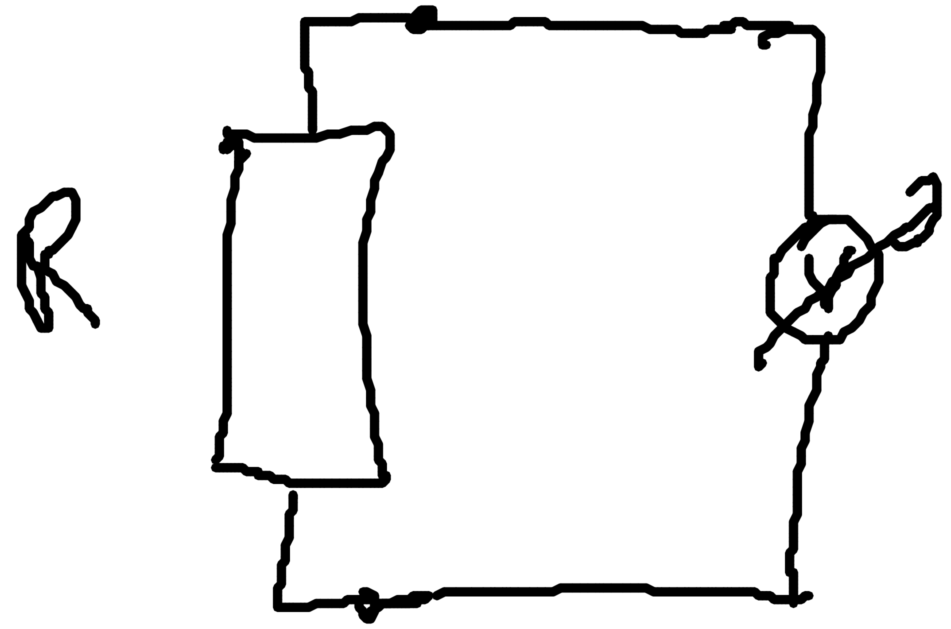
Ruido

Carlson App ; 3.6

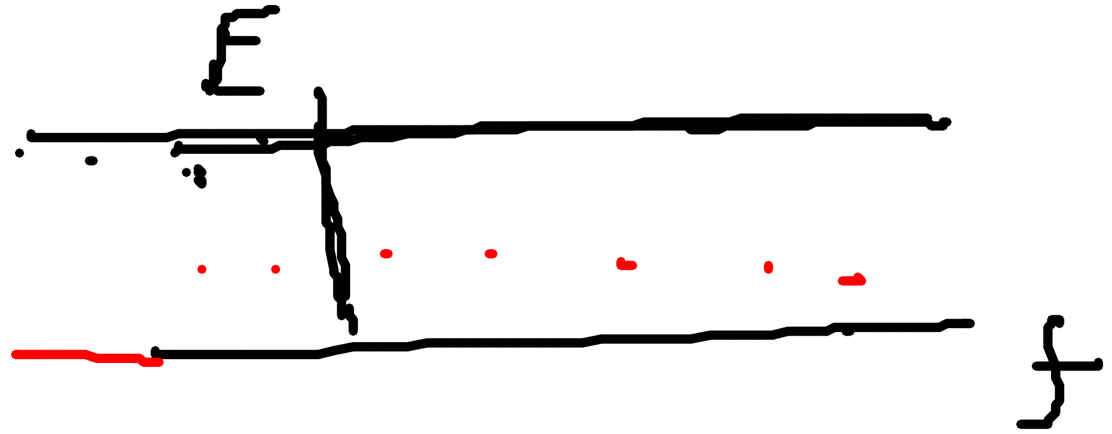
Lathi Cap. 6

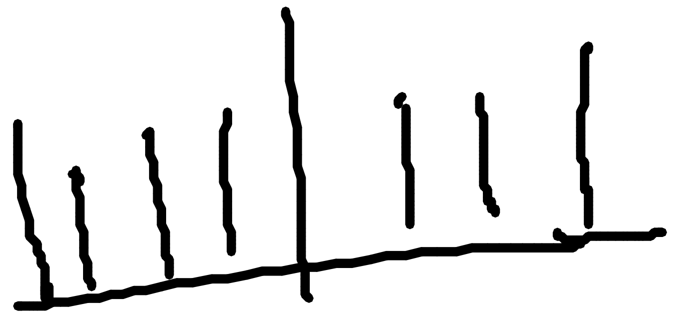
Ruido térmico

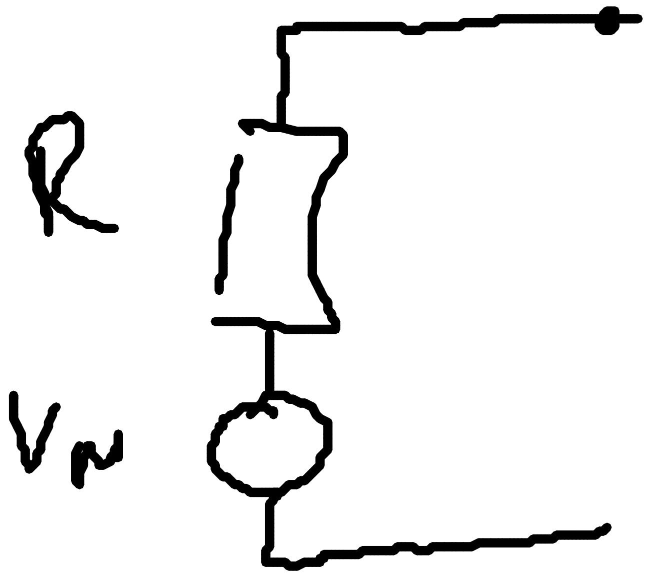
mínimo



$$V_{ef} = \sqrt{4 R T_k B K}$$



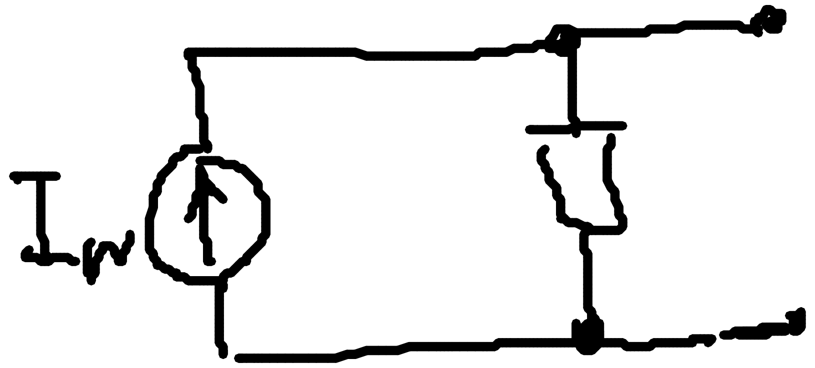




$$P_W = 4 . R . T_k . B . K$$

K: cte Boltzmann

1,38E-23 [W/°K Hz]

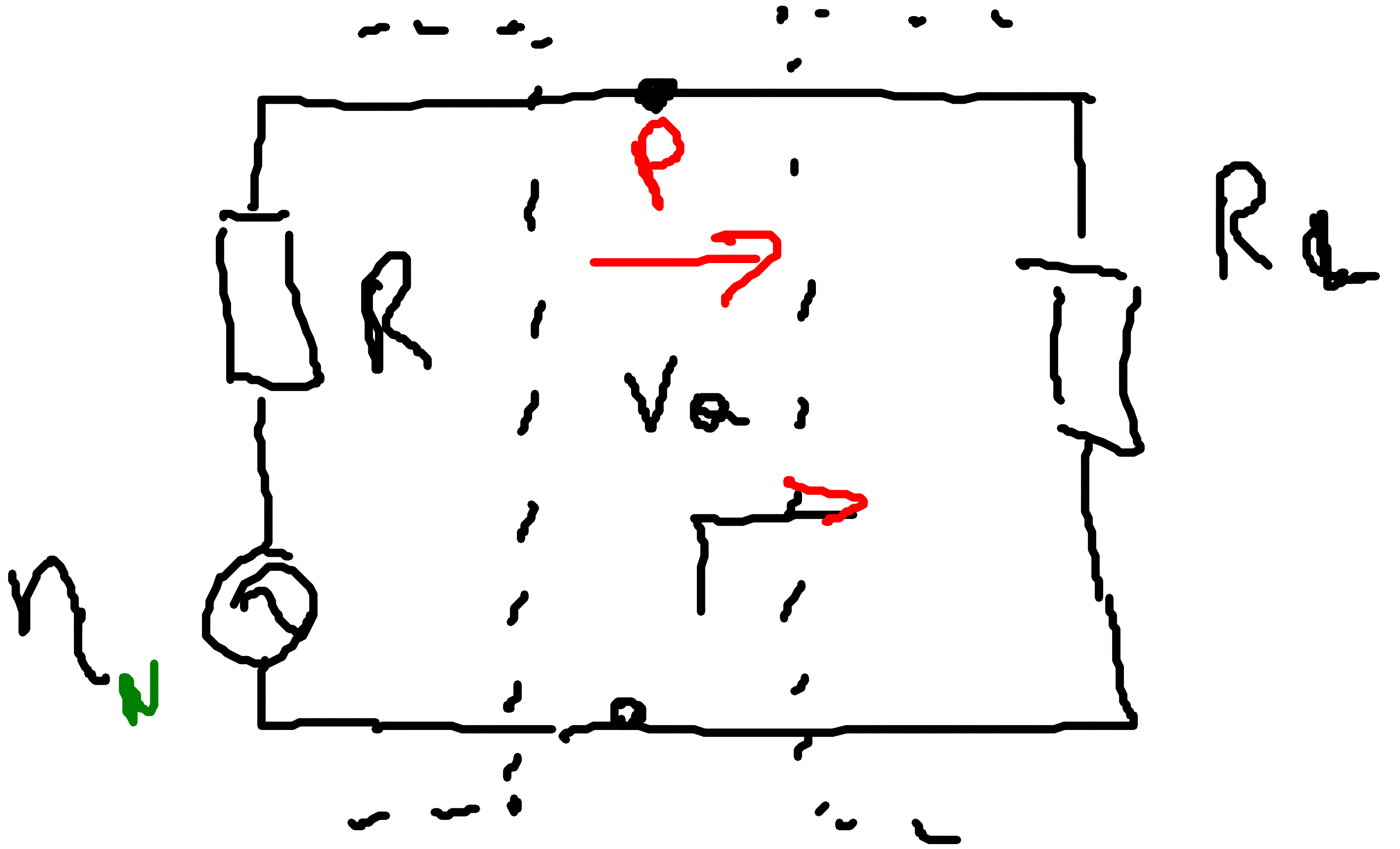


Densidad w

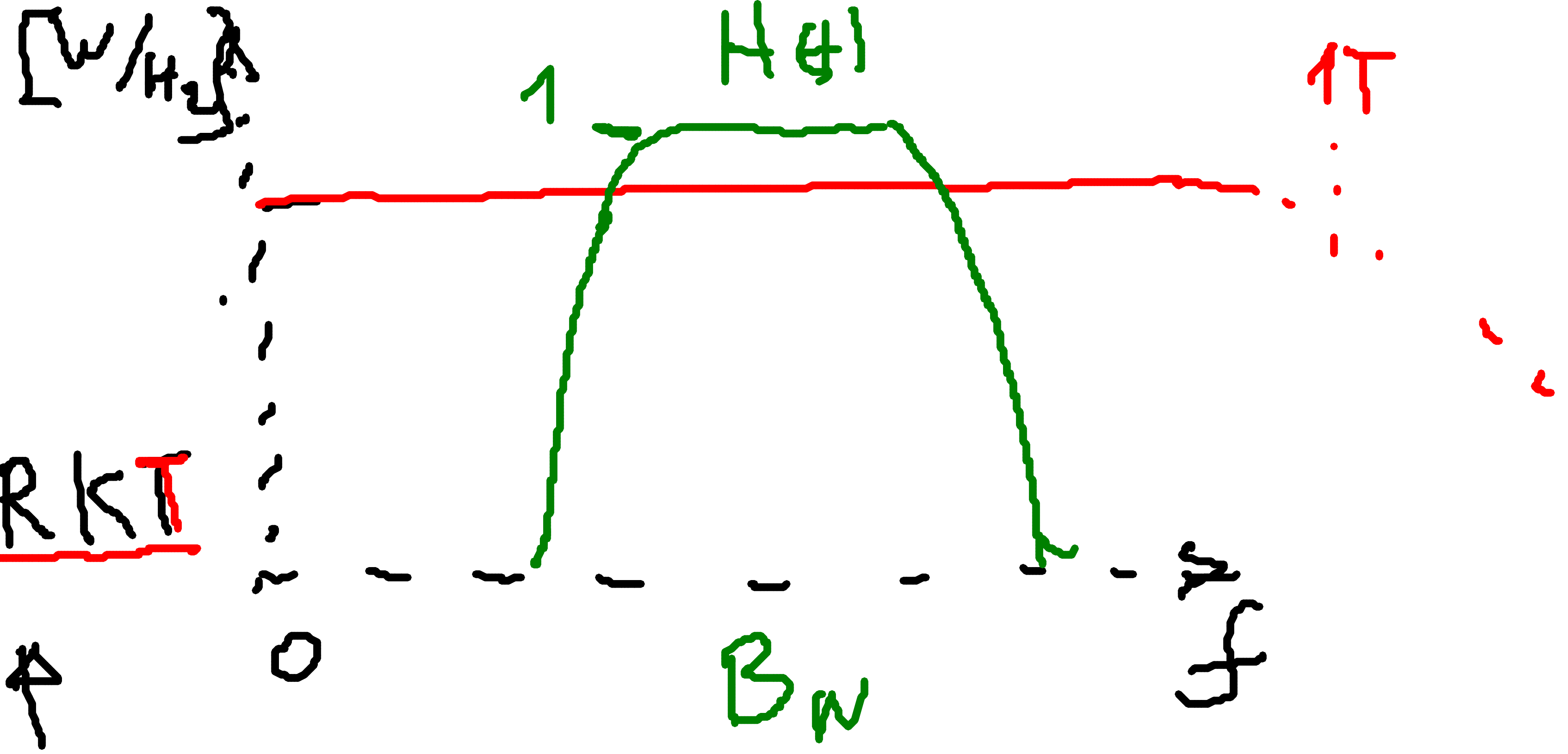
$$\eta = \frac{P_w}{B} \left[W/Hz\right]$$

$$\eta = 4 R T_k . K$$

Circuito A



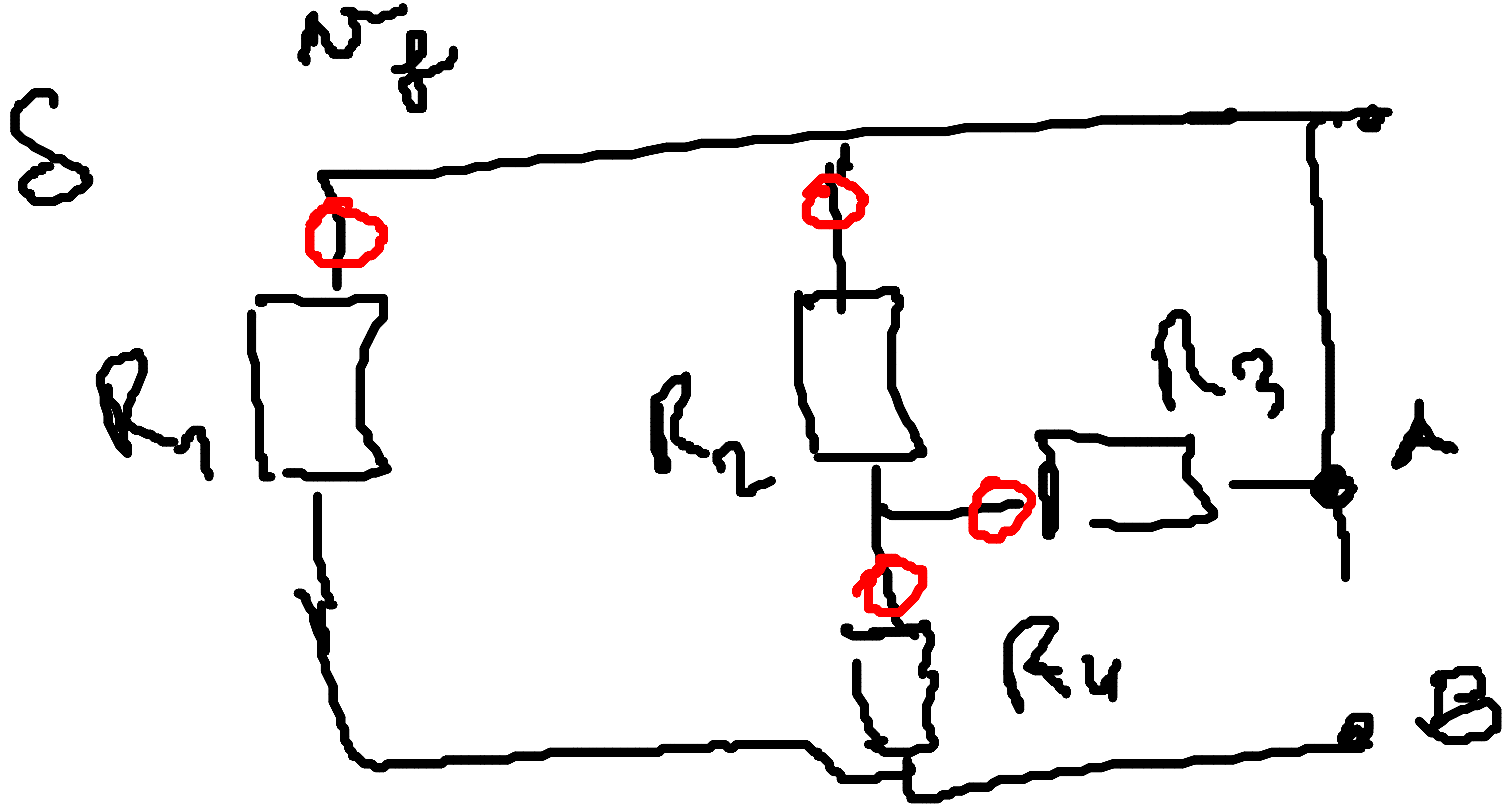
$$\eta_N = 4RKT$$



$$\frac{P_N}{B} = \frac{V_a^2}{R_L B} \rightarrow \left(\frac{R_L}{R_a+R_L}\right)^2 (V_N)^2 \frac{1}{R_L B} = \left(\frac{R_L}{R_a+R_L}\right)^2 \frac{1}{R_L} 4RKT \frac{B}{B}$$

$$= \frac{1}{4}\,\frac{1}{R}\,4RKT$$

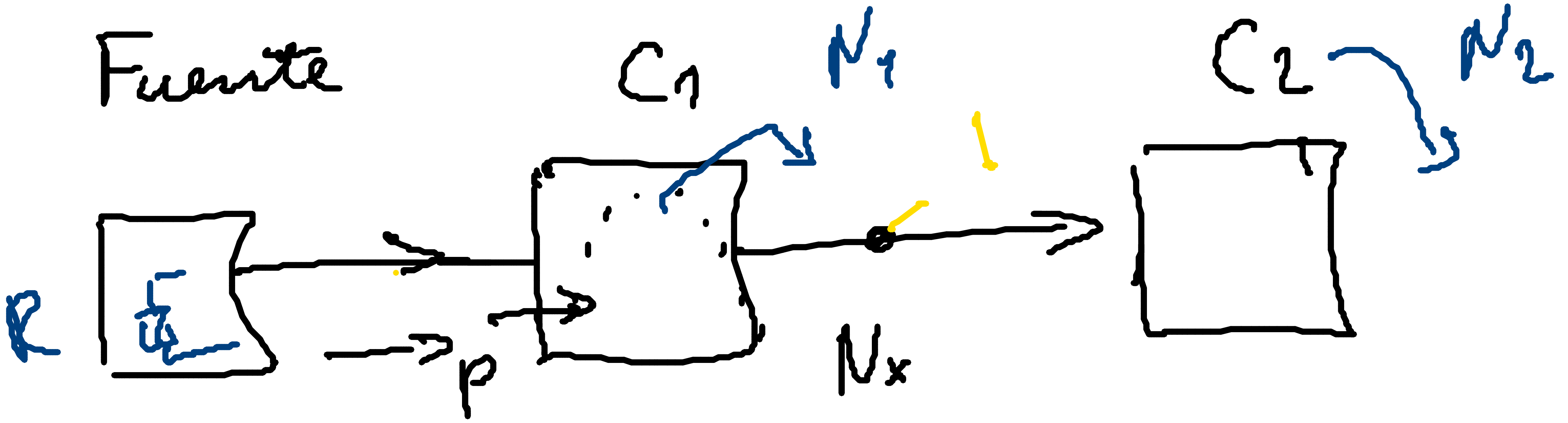
$$[W/Hz] \quad S = K \cdot T$$



$$v_{1fAB}^2 + v_{2fAB}^2 + v_{3fAB}^2 = v_N^2$$

Ruido en Exceso

Temp de Ruido Equivalente

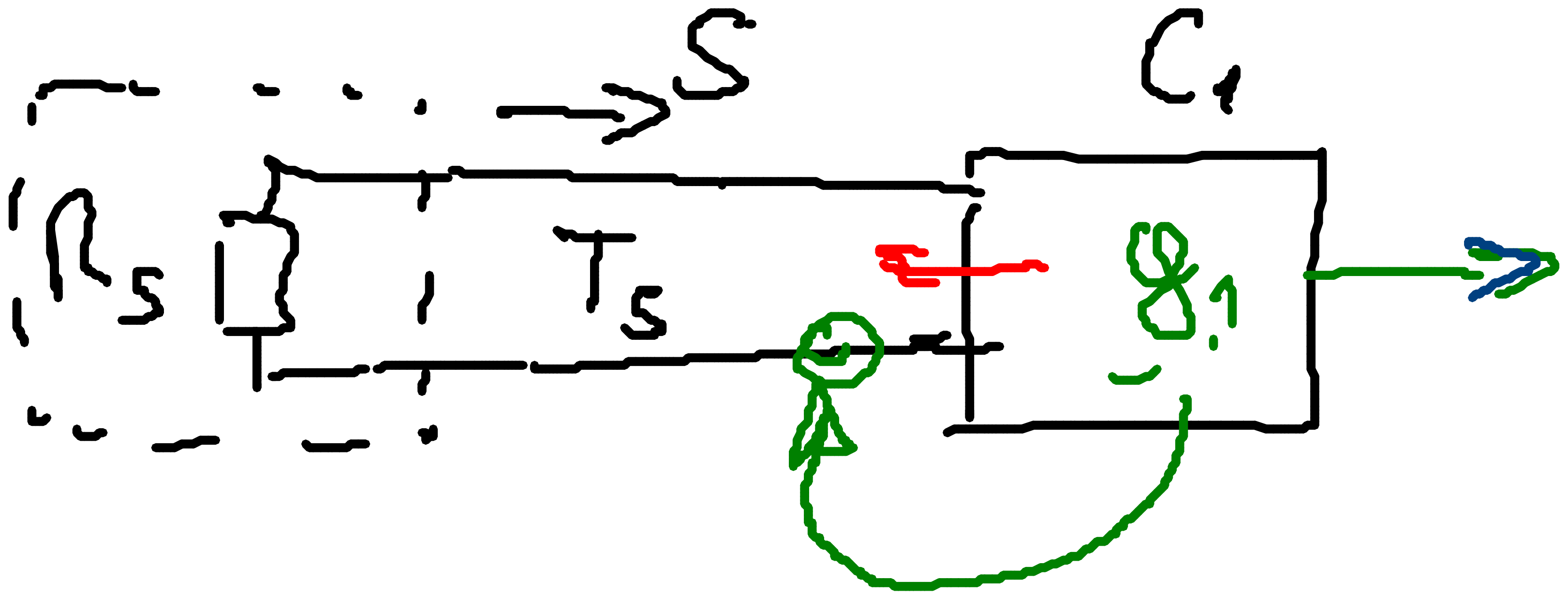


$[W]\ S$

$[W]\ N_s = B\,T_s\,K$

$N_x = B \cdot K\,T_x$

$P_a = S + (T_s + T_x) \cdot B \cdot K$



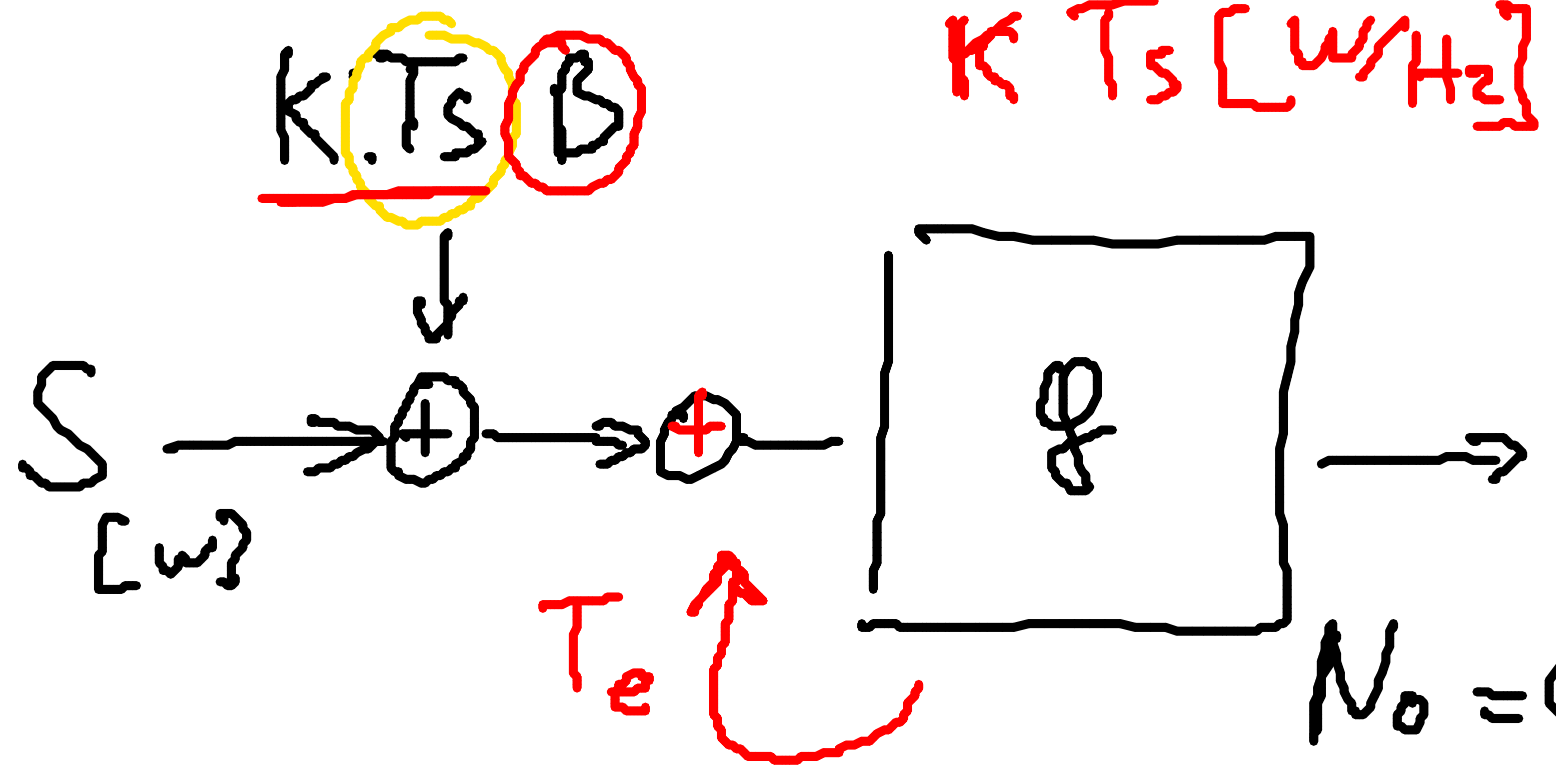
$S \cdot g_1 + K\,B\,T_s \cdot g_1 + T_x\,K\,B\,g_1$

$S \cdot g_1 + K\,B\,(T_s + T_x) \cdot g_1$

$$SNR = \frac{S}{N}$$

x mW

$$N_s = B \cdot k\, T_s$$



$$S_o = S \cdot g$$

$$N_o = g\, k\, B\, (T_e + T_s)$$

$$SNR_i = \frac{S}{k T_s B}$$

$$SNR_o = \frac{S_o}{N_o} = \frac{S \cdot g}{g \cdot k \cdot B (T_e + T_s)}$$

$$SNR_o = \frac{S}{k B\, T_s \cdot \left(1 + \frac{T_e}{T_s}\right)} = \frac{S}{k B T_s} \cdot \frac{1}{1 + \frac{T_e}{T_s}}$$

< 1

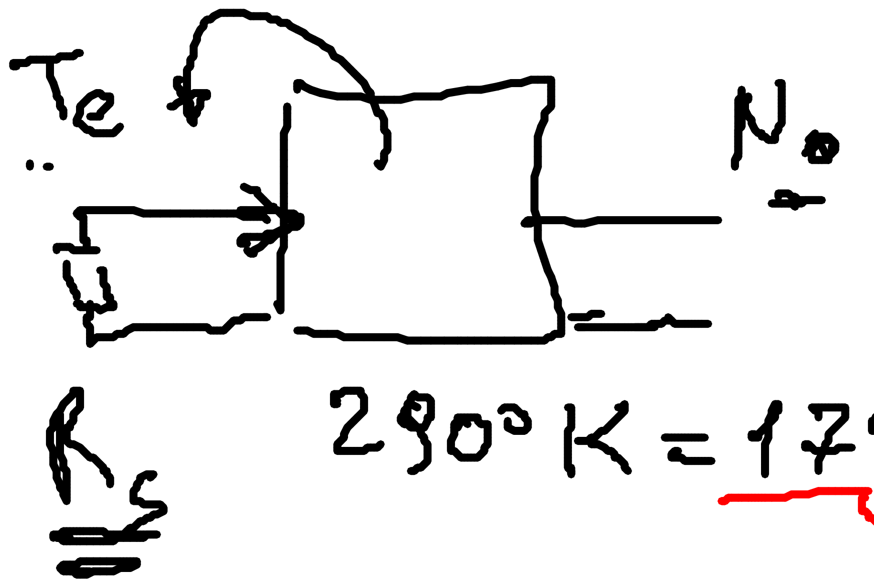
$$SNR_o < SNR_i$$

Número de Ruido

Noise Factor

$$N.F = \frac{SNR_i}{SNR_o} \quad \frac{\text{veces}}{\text{veces}}$$

$[1 \ldots \rightarrow]$



290° K = 17°C

Figura de Ruido

$SNR_i \rightarrow [g] \rightarrow SNR_o$

$$F = 10 \cdot \log(NF)$$

$$NF \Leftrightarrow F$$

$$NF_{dB} = F$$

6 dB

$$1 + \frac{T_e}{T_s} = \frac{SNR_i}{SNR_o} = NF$$

$$T_e = T_s \cdot (NF - 1)$$

$$T_e = 290°K\,(NF - 1)$$

- Ruido Term…
- Teq
- NF ; F