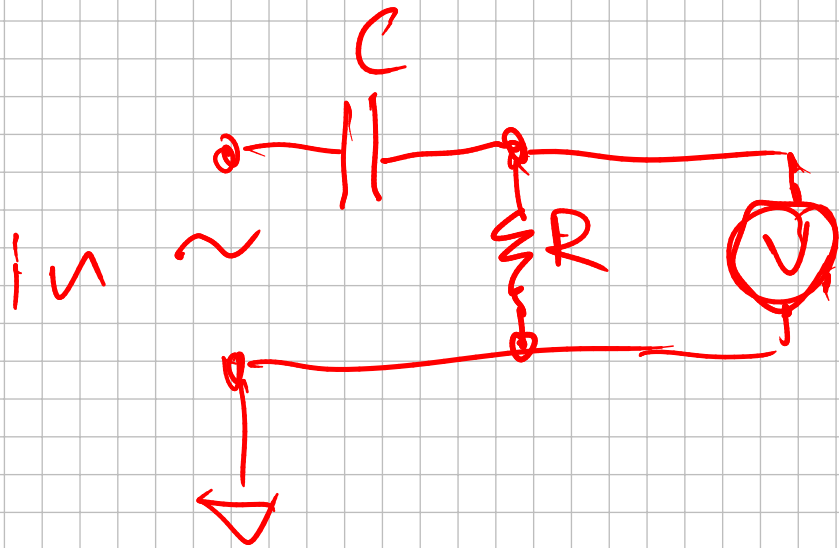
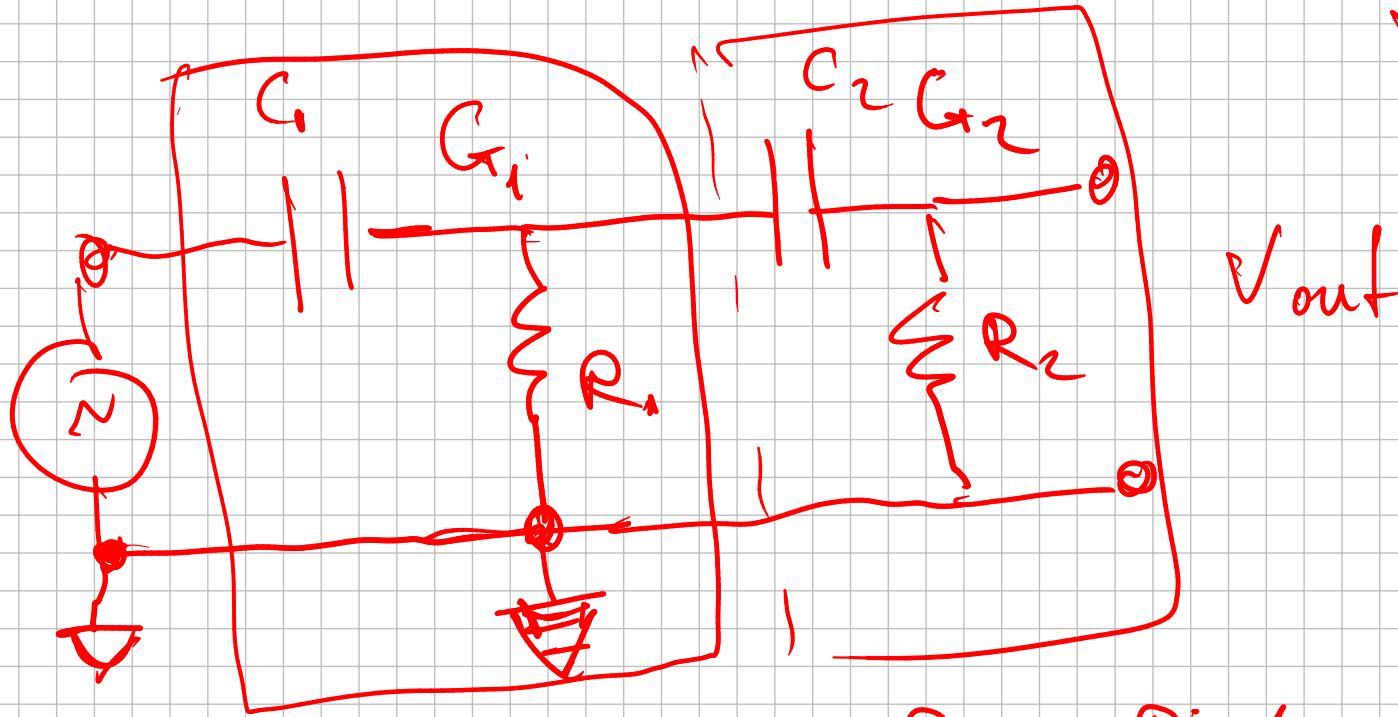


# AC - coupling

High Pass Filter





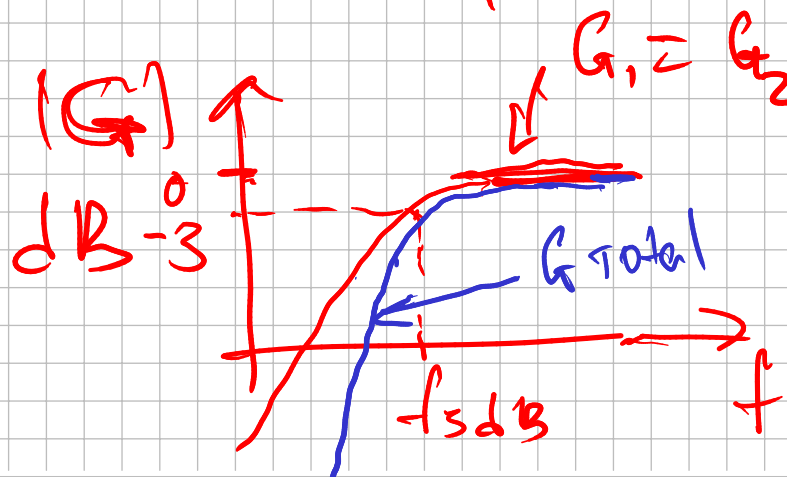
High order filters

Cascading

$$R_1 \ll R_2 \Rightarrow R_1 < R_2/10$$

Rule of 10

$$\Rightarrow G_{total} = G_1(f) \cdot G_2(f)$$

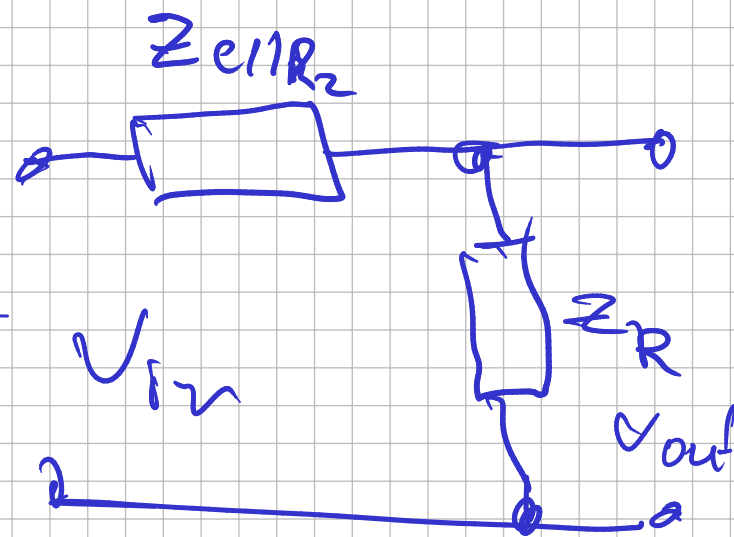
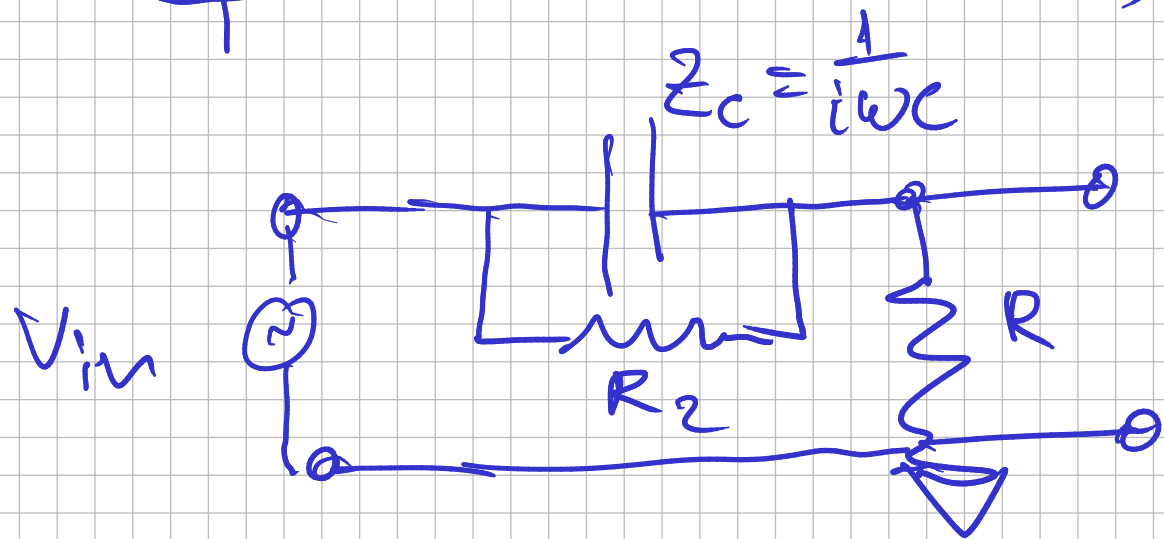


$$G_A = |G_1|^2$$

# Shelving High-Pass



$$\omega \rightarrow \infty, Z_c = 0$$



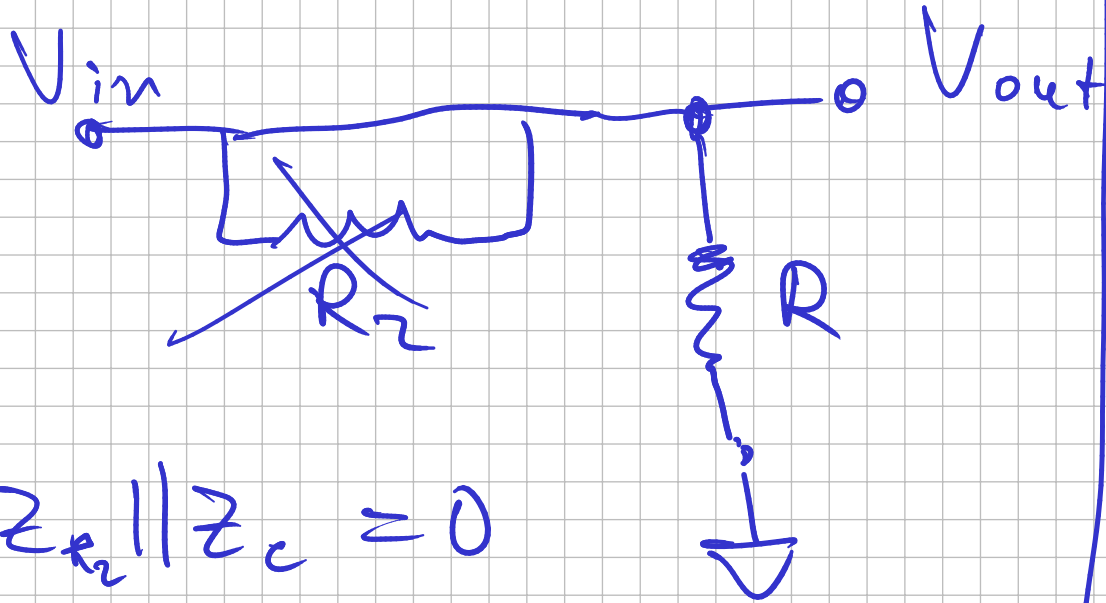
$$V_{out} \approx \frac{Z_R}{Z_R + Z_{C||R_2}}$$

$$Z_{C||R_2} = \frac{Z_c \cdot Z_{R_2}}{R_c + R_{R_2}}$$

$$G(\omega) \approx \frac{R}{R + Z_{\text{cell}} \parallel Z_{R_2}} \approx \frac{R}{R + \frac{1}{\frac{1}{R_2} + j\omega C}}$$

High-pass shelving transfer function

$$\omega \rightarrow \infty$$



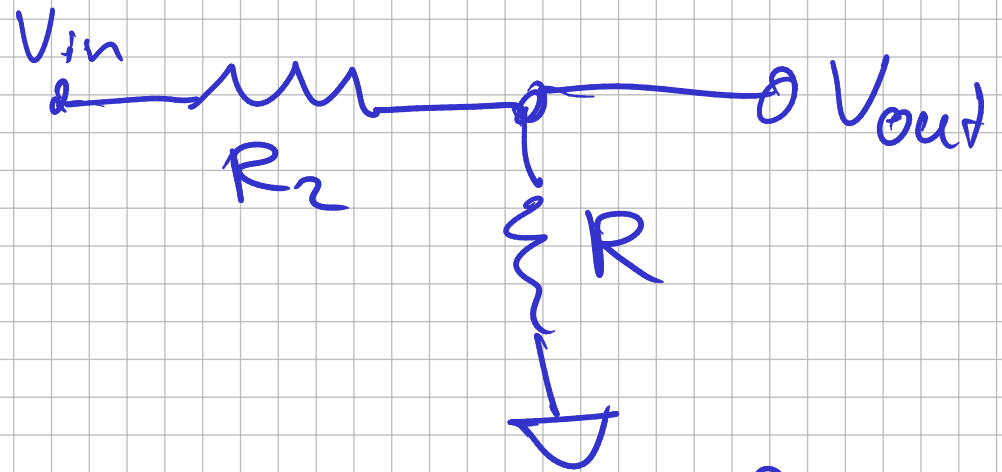
$$Z_{R_2} \parallel Z_c = 0$$

$$G(\omega \rightarrow \infty) = 1$$

$$\omega \rightarrow 0$$

$$Z_c = \frac{1}{i\omega c} \rightarrow \infty$$

$$Z_{R_2} \parallel Z_c = Z_{R_2} = R_2$$



$$G(\omega \rightarrow 0) = \frac{R}{R_2 + R}$$