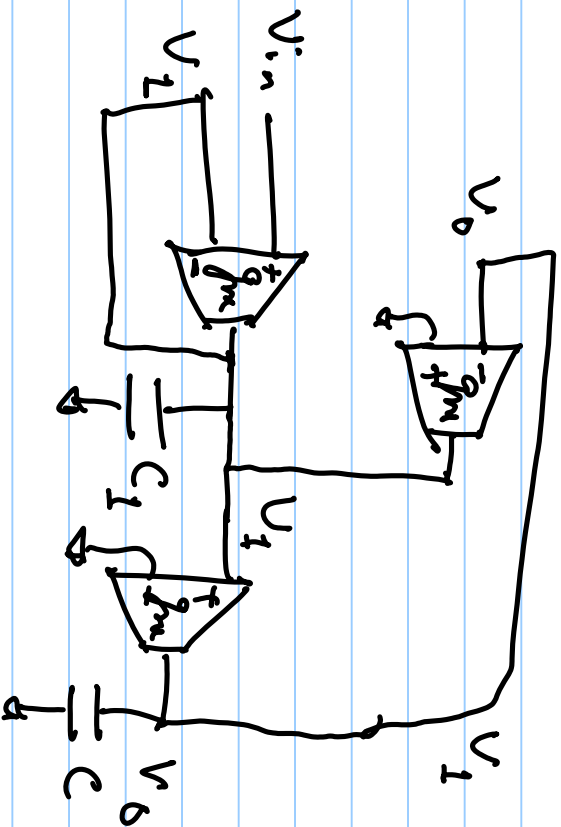


$$R i_L = V_{in} - i_L R - V_0$$

$$i_L R = V_1$$

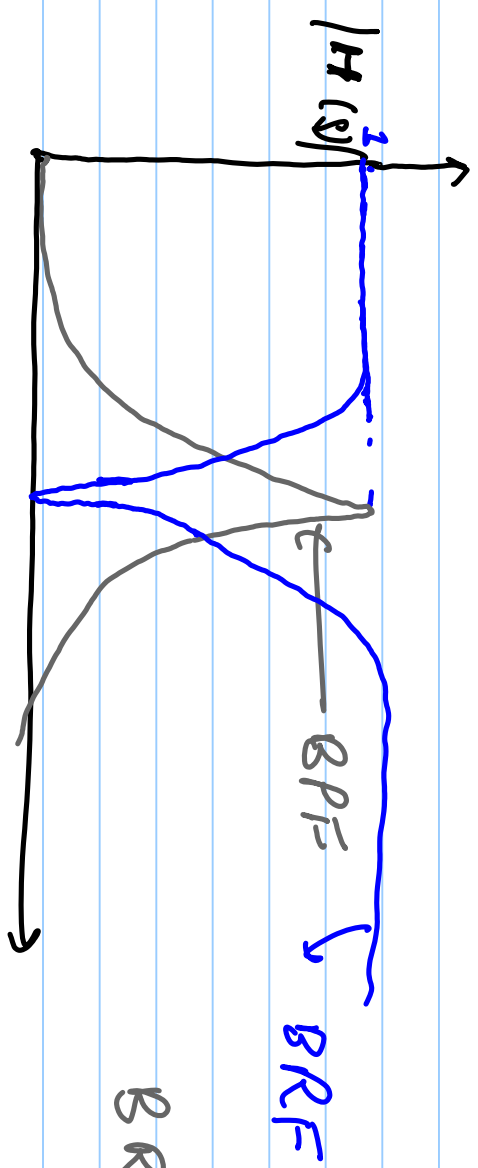


$$V_1 = \frac{V_{in} - V_1 - V_0}{g_m L / R}$$

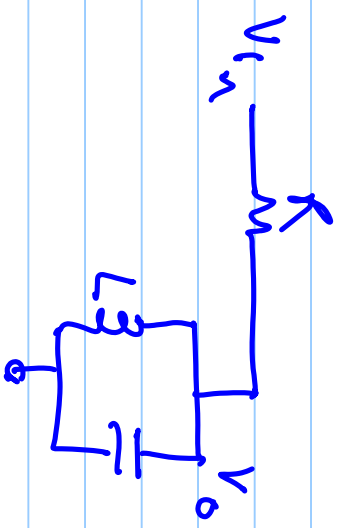
$$V_0 = \frac{i_L}{g_m C}$$

$$\frac{i_L R}{g_m R} = \frac{V_1}{R g_m}$$

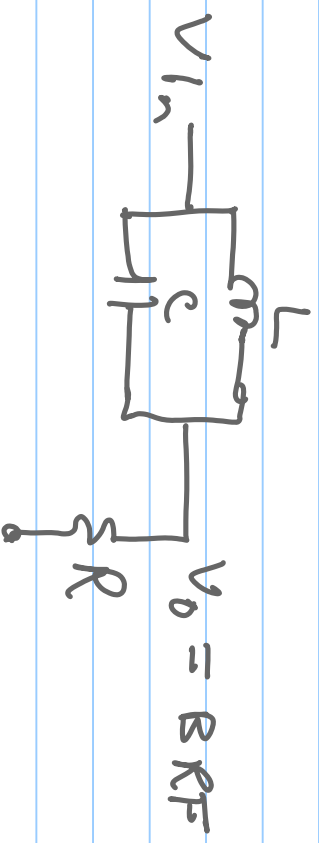
Band Reject Filter (Notch Filter)

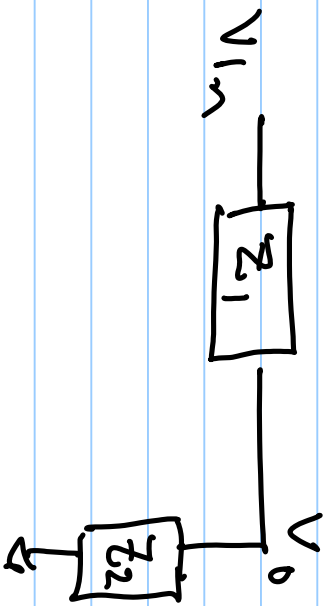


$$BRF = 1 - BPF$$



$$\frac{V_o}{V_{in}} = BPF$$





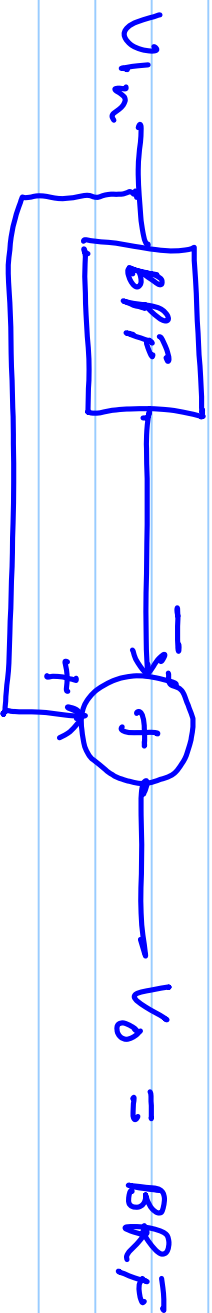
$$\frac{V_0}{V_{in}} = \frac{Z_2}{Z_1 + Z_2}$$

$$1 - \frac{V_0}{V_{in}} = \frac{Z_1}{Z_1 + Z_2}$$

$$H_{BPF}(s) = \frac{\omega_0 s}{s^2 + \frac{\omega_0}{Q} s + \omega_0^2}$$

$$H_{BPF}(s) = 1 - H_{BPF} = 1 - \frac{(\omega_0 / Q) s}{s^2 + \frac{\omega_0}{Q} s + \omega_0^2}$$

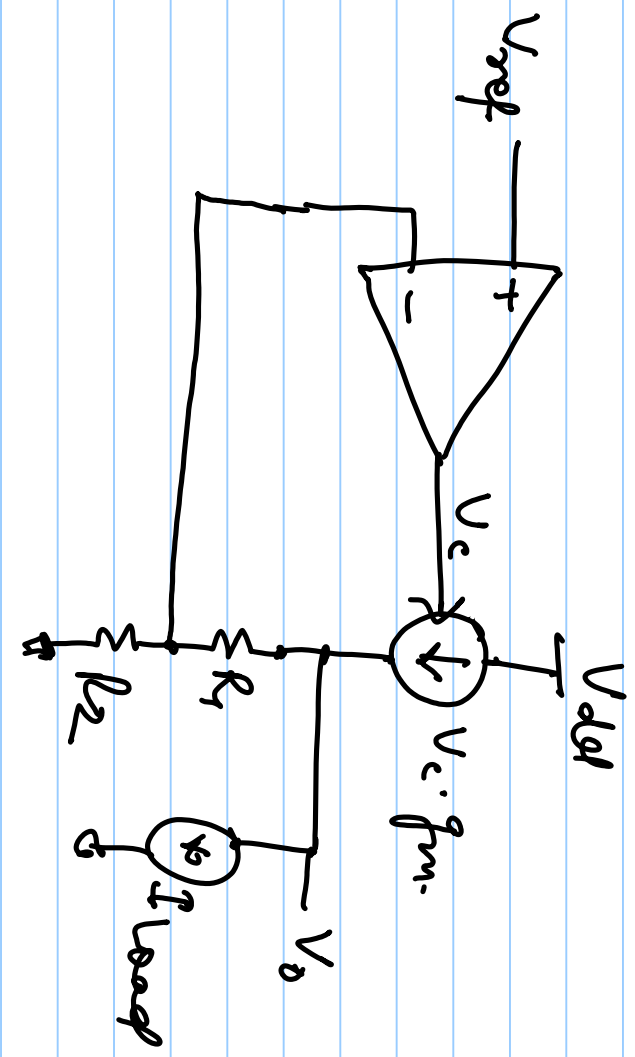
$$H_{BRF}(s) = \frac{\lambda^2 + \omega_0^2}{\lambda^2 + \frac{\omega_0}{Q_0} + \omega_0^2}$$



$$V_o = V_{in} - H_{BRF}(s) V_{in}$$

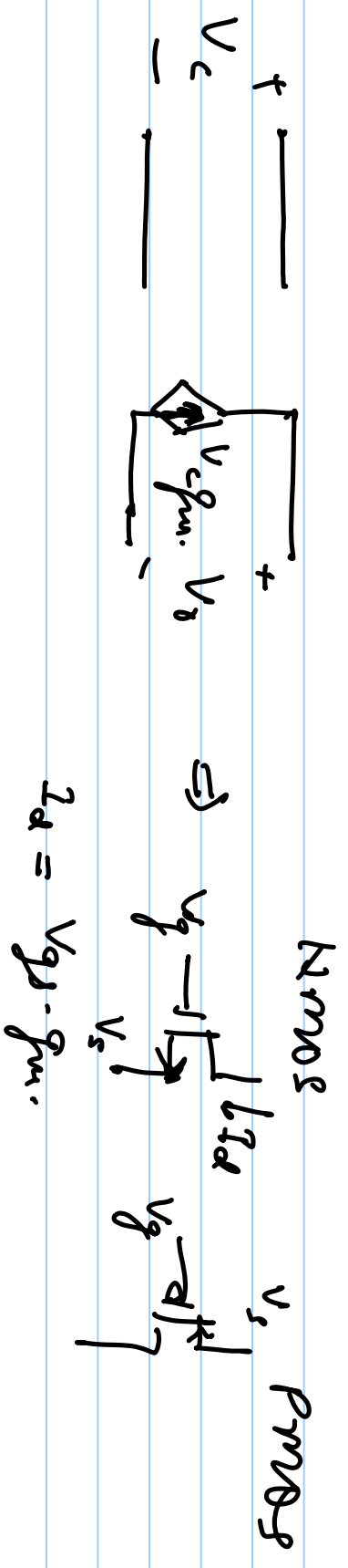
$$\frac{V_o}{V_{in}} = 1 - H_{BRF}(s)$$

LDO



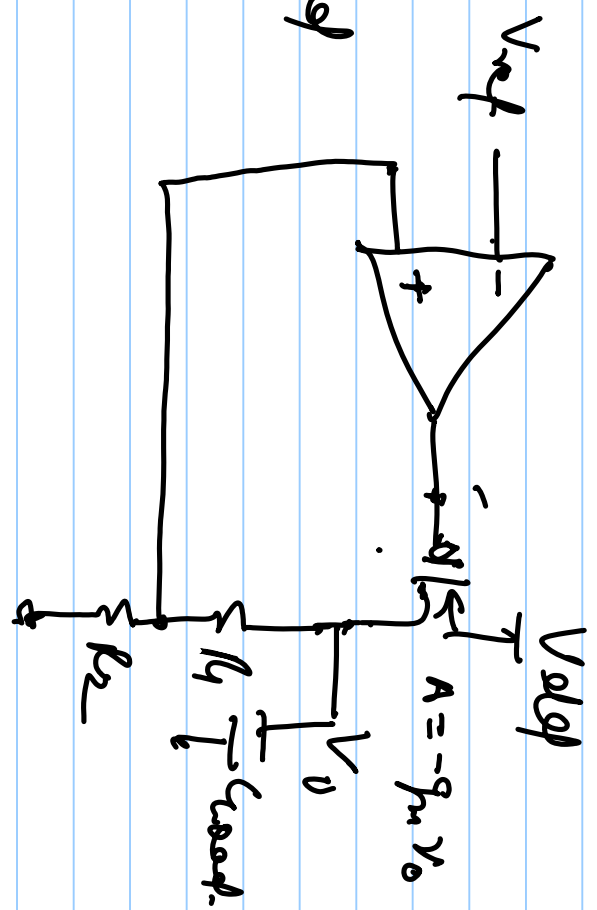
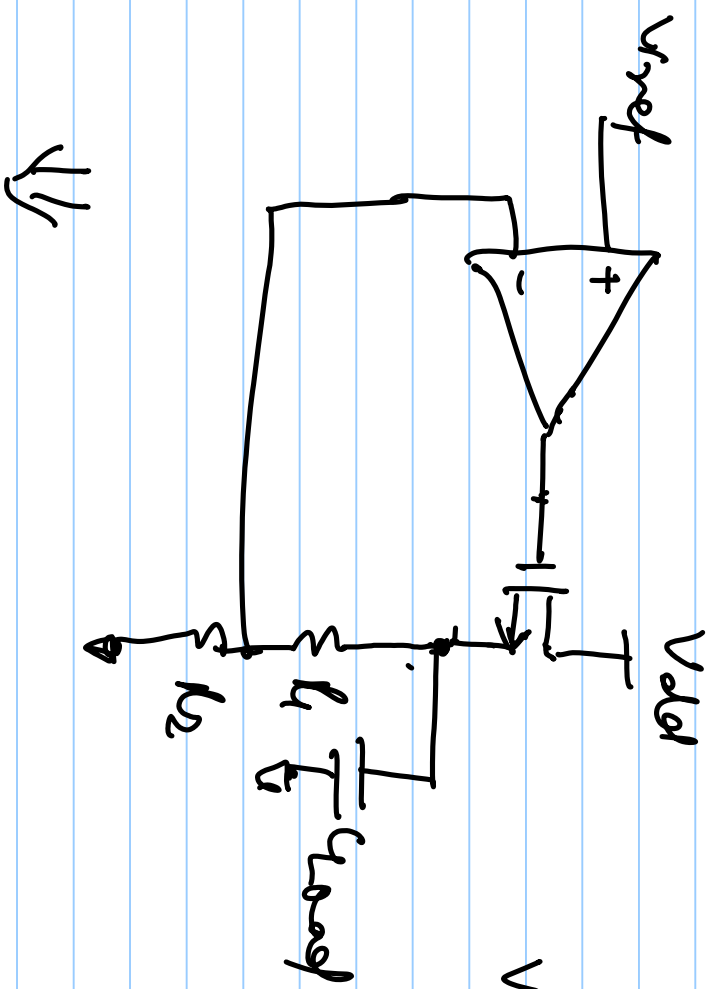
$$V_d = \frac{1}{\beta} \cdot V_{ref}$$

$$\beta = \frac{R_2}{R_1 + R_2}$$

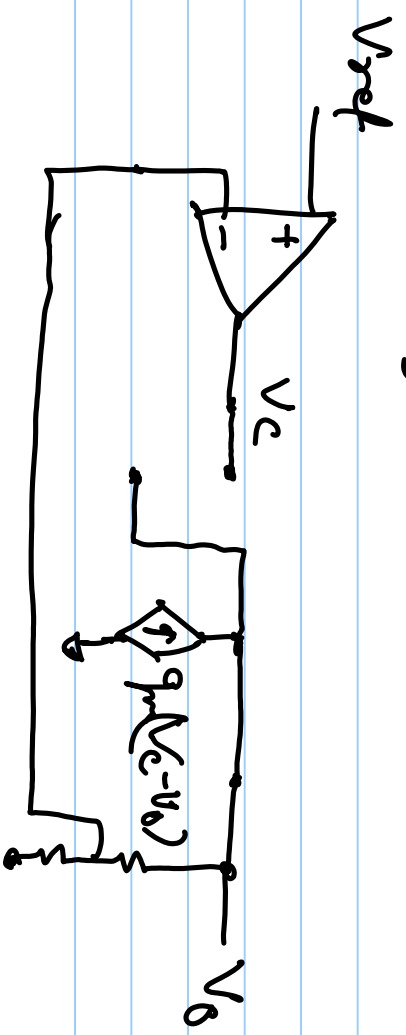


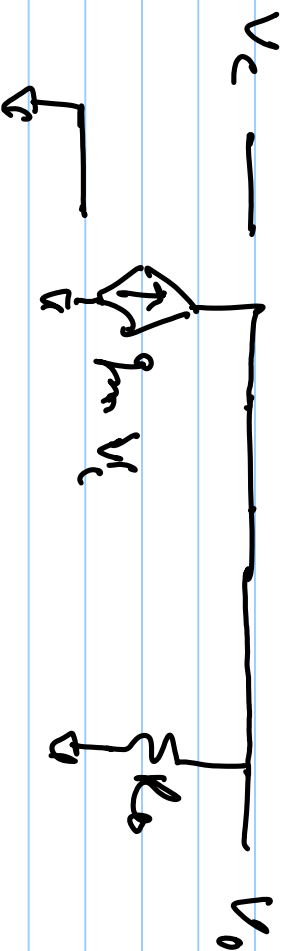
$$I_d = V_{g_s} \cdot g_m$$

NUMS 200

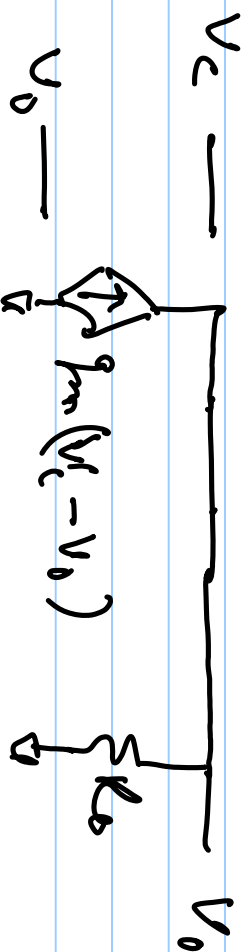


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$$\frac{V_o}{V_c} = g_m \cdot R_o$$



$$V_o = g_m (V_c - V_o) R_o$$

$$V_0 = g_m \cdot R_0 V_c - g_m \cdot R_0 V_0$$

$$\Rightarrow V_0 (1 + g_m R_0) = g_m R_0 V_c$$

$$\frac{V_0}{V_c} = \frac{g_m R_0}{1 + g_m R_0}$$

$$g_m R_0 \gg 1$$

$$\frac{V_0}{V_c} = 1$$