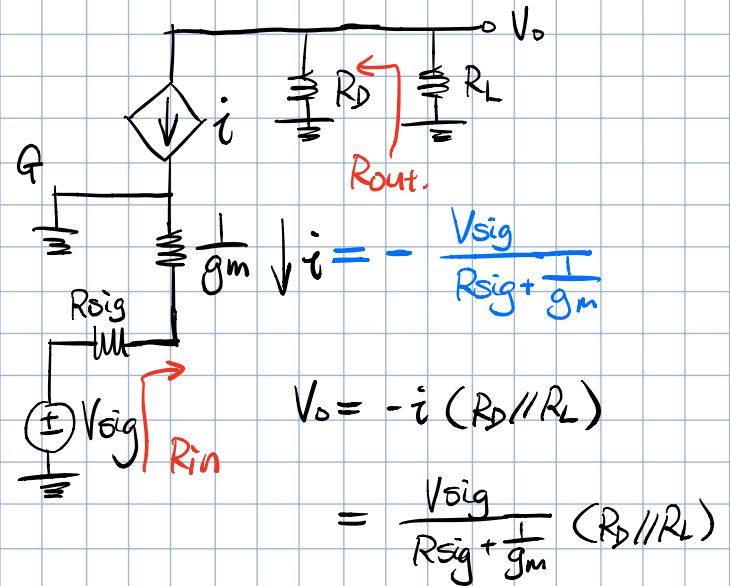
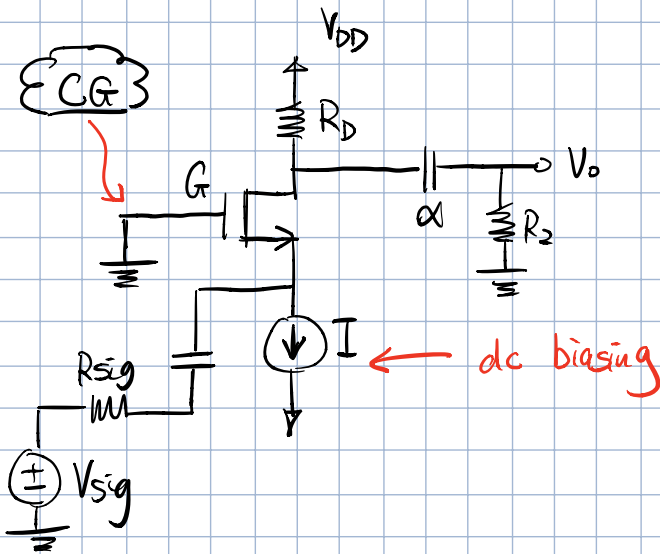


Basic amplifier. CG / CB

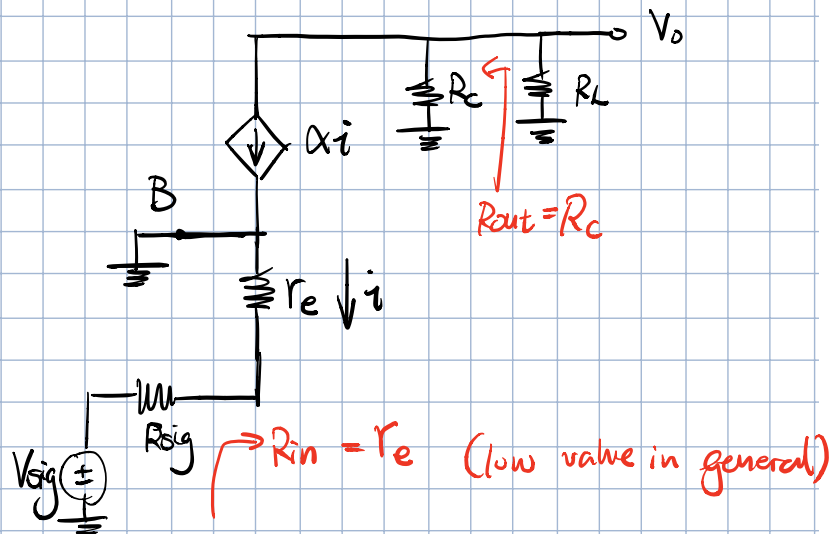
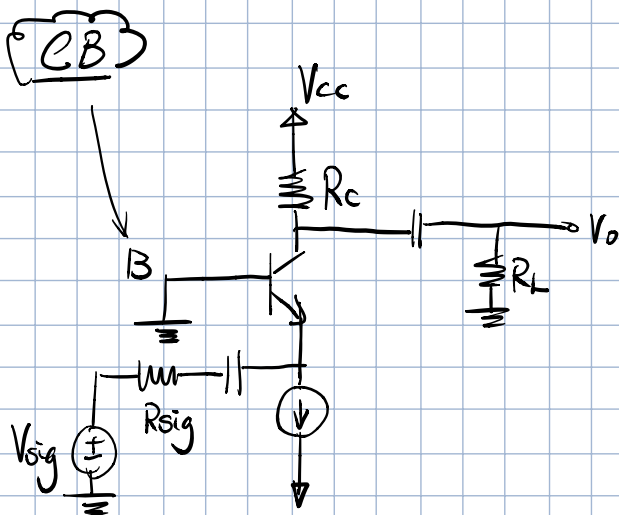


Voltage gain = $V_o / V_{sig} = \frac{R_D \parallel R_L}{R_{sig} + \frac{1}{g_m}}$

$\left\{ \begin{array}{l} \text{resistance in Drain} \\ \text{resistance in source.} \end{array} \right.$

$R_{in} = \frac{1}{g_m}$ \leftarrow $R_{out} = R_D$

low value. in general



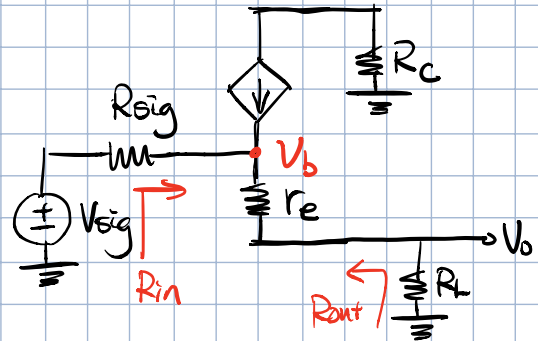
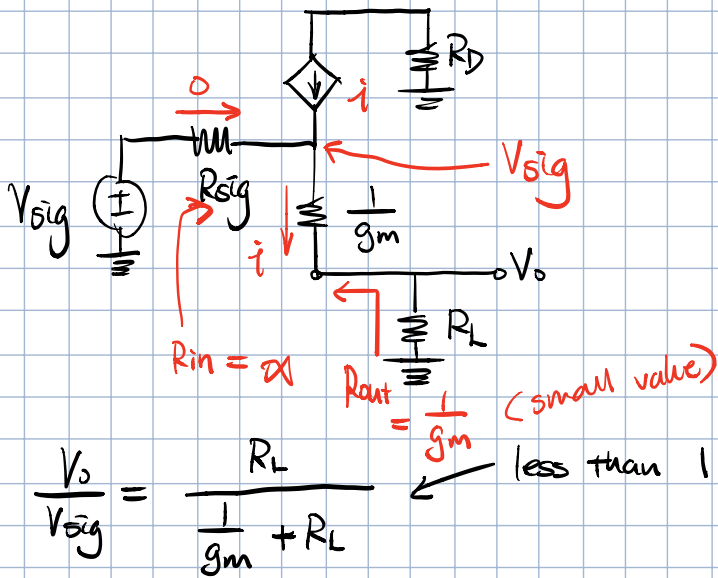
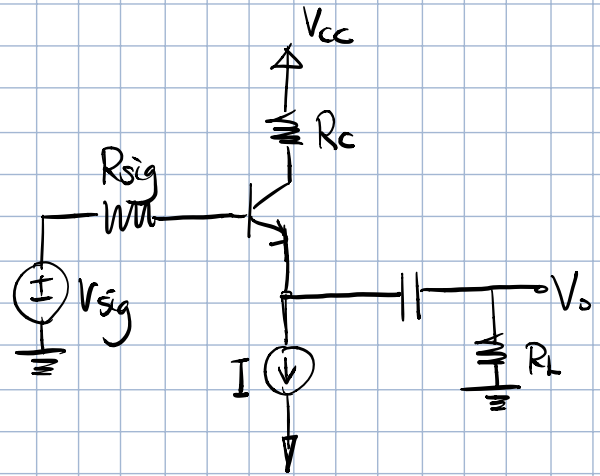
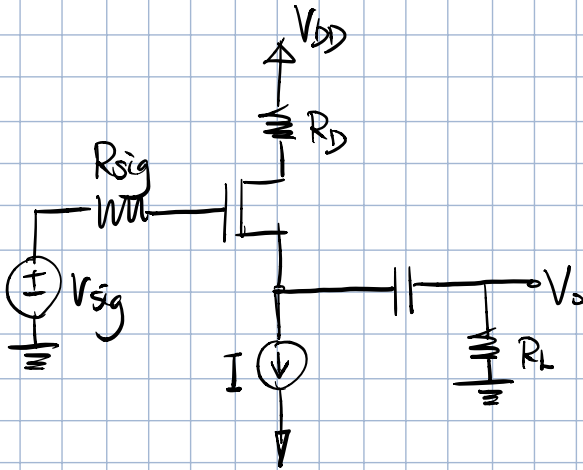
Voltage gain = $\alpha \frac{R_C \parallel R_L}{R_{sig} + r_e}$

\leftarrow resistance in collector

\leftarrow resistance in emitter.

Common Drain (CD) / common collector (CC)

(source follower) (Emitter follower)



$$R_{in} = (\beta + 1)(r_e + R_L)$$

$$\frac{V_b}{V_{sig}} = \frac{R_{in}}{R_{sig} + R_{in}}$$

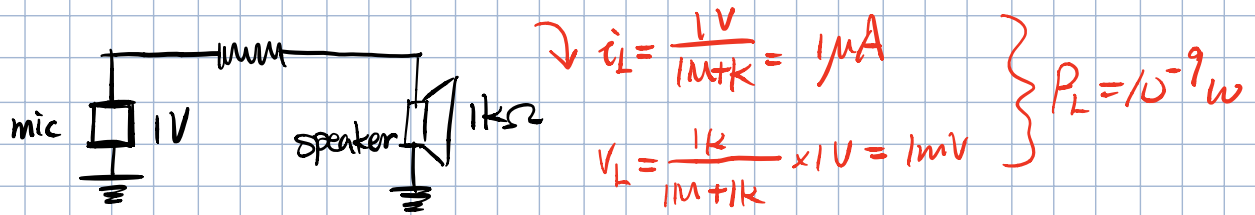
$$\frac{V_o}{V_b} = \frac{R_L}{r_e + R_L}$$

$$\frac{V_o}{V_{sig}} = \frac{V_o}{V_b} \cdot \frac{V_b}{V_{sig}} = \frac{R_{in}}{R_{sig} + R_{in}} \cdot \frac{R_L}{r_e + R_L}$$

$$\frac{V_o}{V_{sig}} = \frac{R_L}{\frac{R_{sig}}{\beta + 1} + r_e + R_L} \quad \leftarrow < 1 \text{ but close to } 1$$

$$R_{out} = \frac{R_{sig}}{\beta + 1} + r_e$$

buffer (source follower or Emitter Follower)



but with a buffer...

