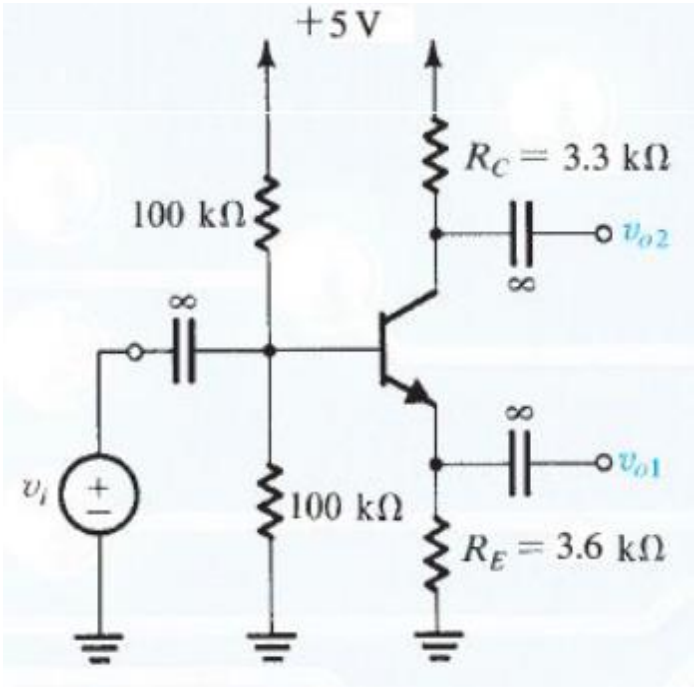
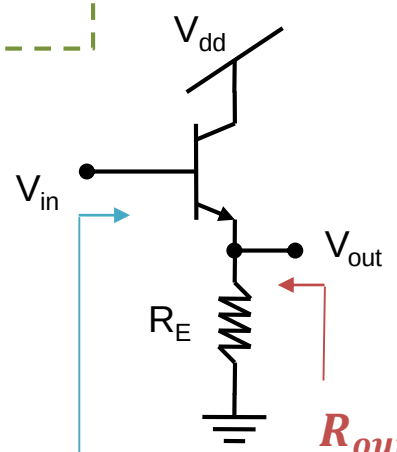
Last Lecture → Common Collector Amplifier

Collector terminal connected at the common node!

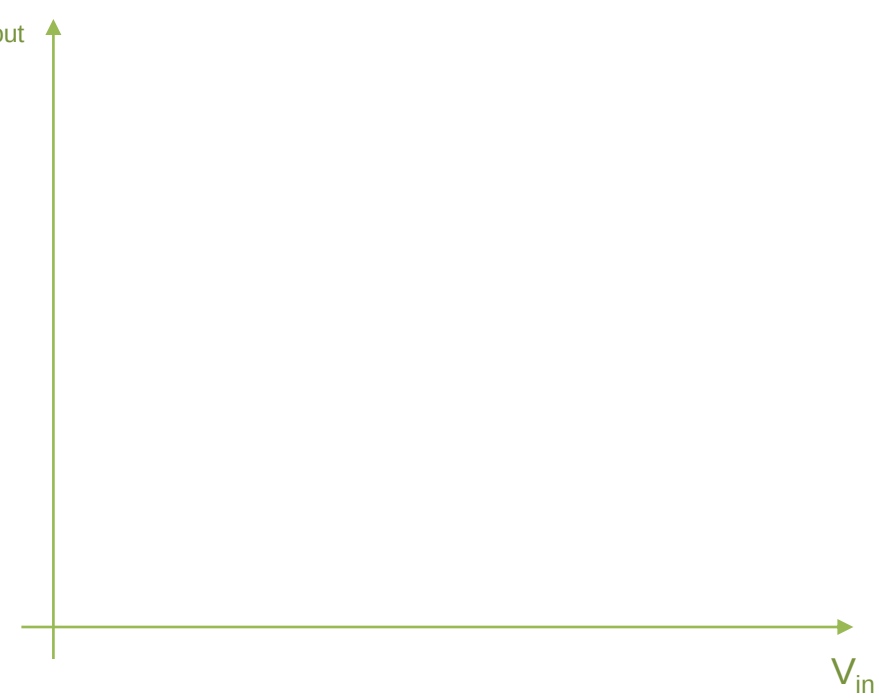




$$R_{out} \approx 1/g_m$$

$$R_{in} = r_\pi(1+g_m R_E)$$

$$A_V = \frac{g_m R_E}{1 + g_m R_E} \approx 1$$



Problem 6.147

***6.147** The amplifier of Fig. P6.147 consists of two identical common-emitter amplifiers connected in cascade. Observe that the input resistance of the second stage, R_{in2}, constitutes the load resistance of the first stage.

(a) For $V_{CC} = 9$ V, $R_1 = 100$ kΩ, $R_2 = 47$ kΩ, $R_E = 3.9$ kΩ, $R_C = 6.8$ kΩ, and $\beta = 100$, determine the dc collector current and dc collector voltage of each transistor.

(b) Draw the small-signal equivalent circuit of the entire amplifier and give the values of all its components.

(c) Find R_{in1} and v_{b1}/v_{sig} for $R_{sig} = 5$ kΩ

(d) Find R_{in2} and v_{b2}/v_{b1}.

(e) For $R_L = 2$ kΩ, find v_o/v_{b2}.

(f) Find the overall voltage gain v_o/v_{sig}.