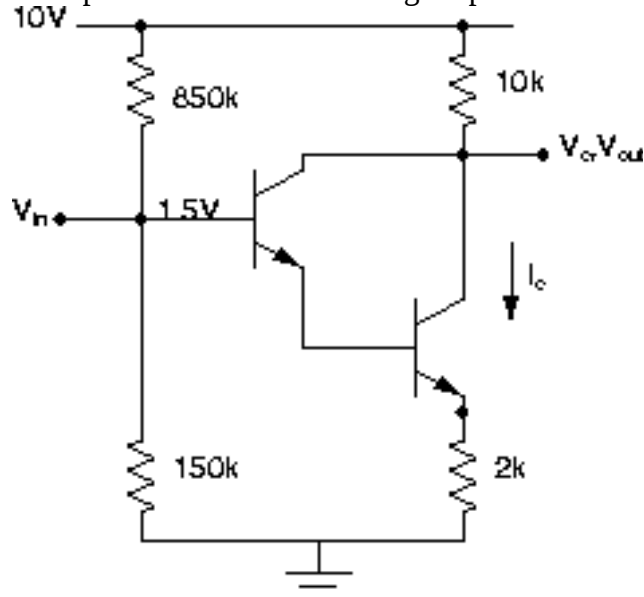


## Week #6 Homework

1. a) If all the transistors in the Darlington pair based amplifier below have  $V_{PN} = 0.5 \text{ V}$ , what are the quiescent values of  $I_c$  and  $V_c$ ? What is the gain of this amplifier? b) Repeat using a Sziklai pair instead of the Darlington pair.



2. Design a DC-coupled differential amplifier with a differential gain of 50 for input signals near ground, supply voltages of  $\pm 15 \text{ V}$ , and quiescent currents of  $0.1 \text{ mA}$  in each transistor. What is the common-mode gain and thus the CMRR? Express the CMRR in dB. If  $h_{FE}$  is 100, what is the input impedance for one of the two inputs? Add an emitter follower output stage.