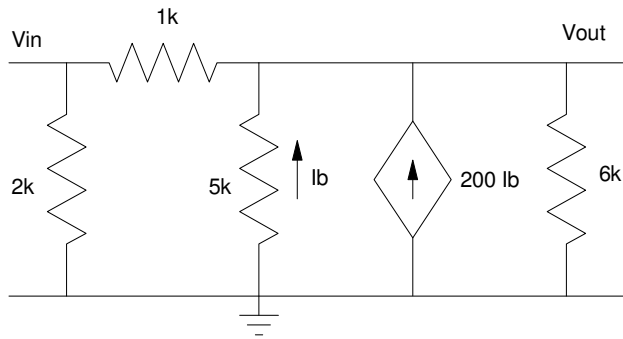


# ECE 321 - Homework #4

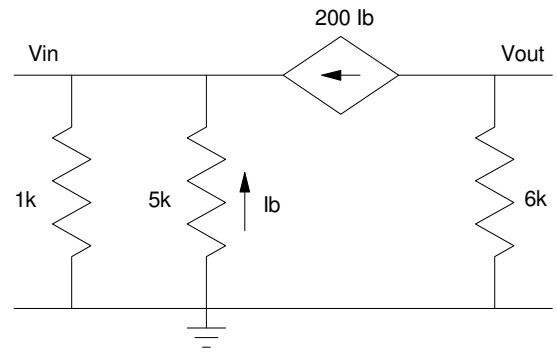
2-Port Models, Transistor Amplifiers. Due Monday, December 9th

## 2-Ports

- 1) Determine the 2-port model for the following circuit
- 2) Determine the 2-port model for the following circuit

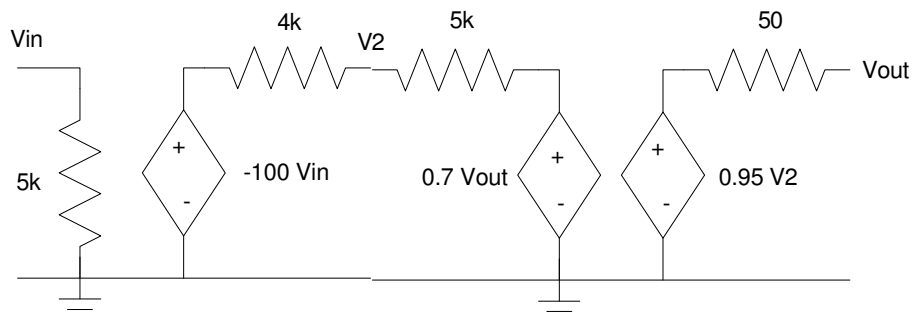


Problem #1



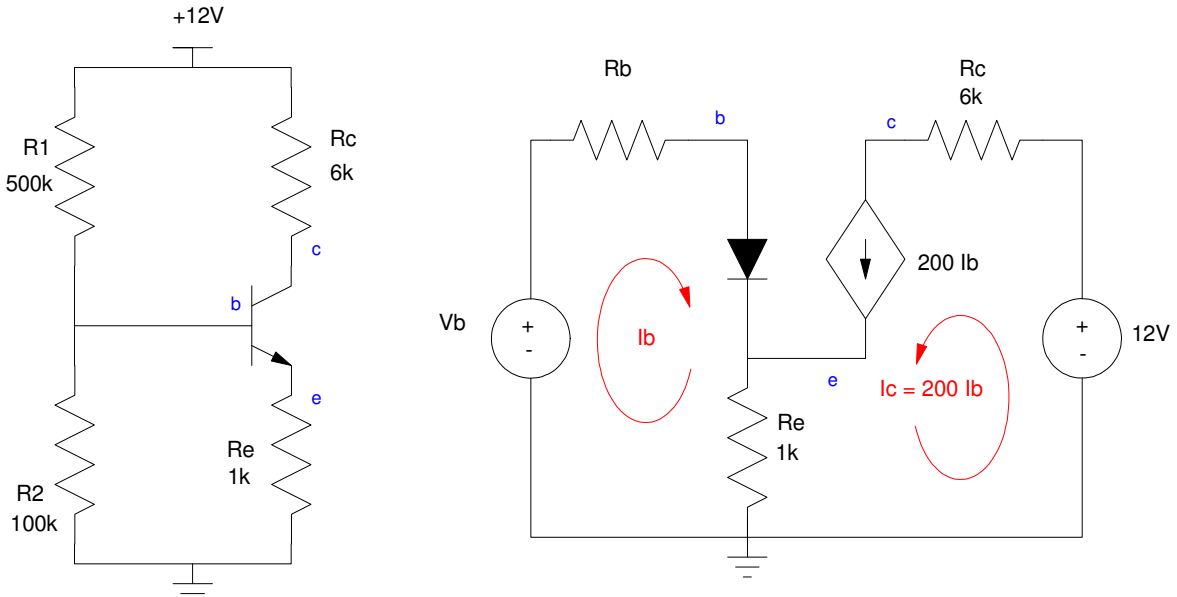
Problem #2

- 3) Determine the 2-port model for the following circuit



## Transistor Amplifiers: DC Analysis

4) Determine the Q-point for the following transistor amplifier. Assume 3904 transistors with  $\beta = 200$  (nominal)



5) Modify the circuit from problem #4 so that

- $V_{ce} = 6.0\text{V}$ , and
- The Q-point is stabilized for variations in  $\beta$

## Transistor Amplifiers: AC Analysis

6) Draw the small-signal model (i.e. AC model) for a single CE amplifier (shown in red). Determine the 2-port model

7) Determine the 2-port model for three CE amplifiers cascaded back-to-back

