

Massachusetts Institute of Technology
Department of Nuclear Science and Engineering
Department of Electrical Engineering and Computer Science

22.071/6.071 - Introduction to Electronics, Signals and Measurement
Spring 2006

Homework 9
 Due 4/26/06

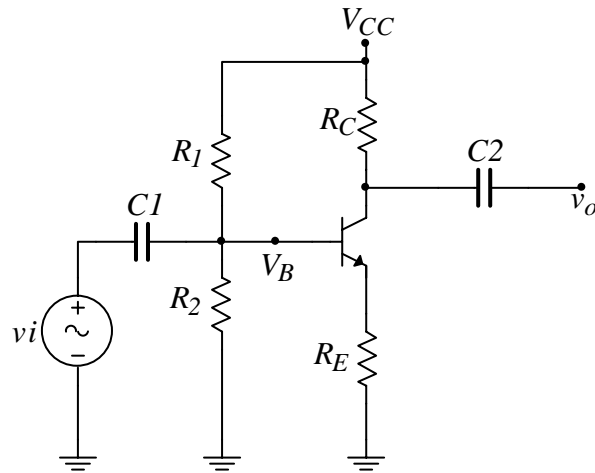
Problem 1.

Determine the value of β for the transistor such that the small signal voltage gain

$$(A_v = \frac{v_o}{v_i} \cong -\frac{R_C}{R_E})$$

is within 10% of the actual value.

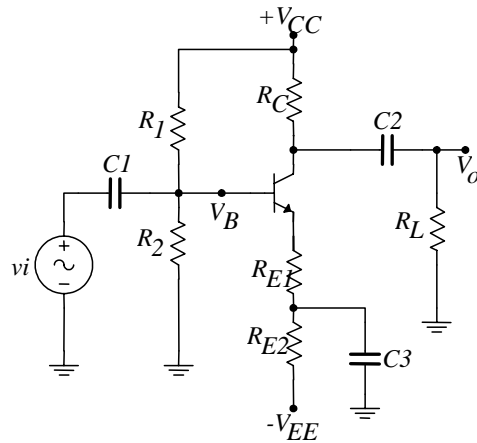
Use $R_C = 4k\Omega$, $R_E = 1k\Omega$,
 $R_1 = 50k\Omega$, $R_2 = 10k\Omega$,



Problem 2

Draw the small signal equivalent AC circuit.

Calculate the small signal gain of this circuit.



Problem 3.

The transistor in this circuit has $\beta=100$.
and $V_{CC}=5$ Volts.

- Determine the DC voltages V_B and V_E
- Find R_C so than $V_{CEQ}=3$ Volts.
- Calculate the small signal voltage gain. (assume that $C1$ and $C2$ are large)

