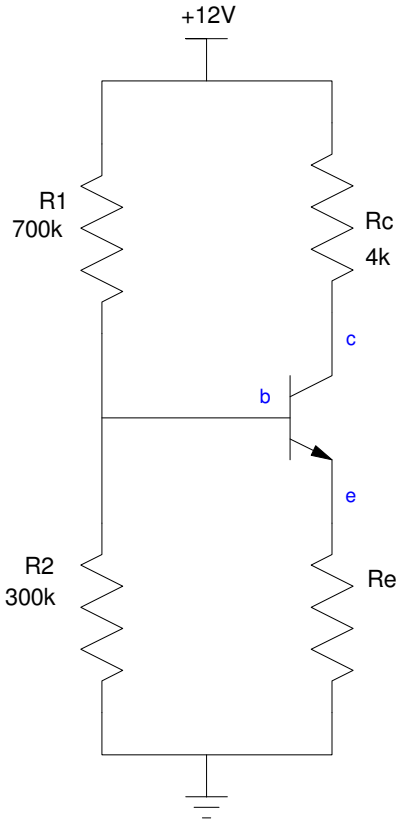
ECE 321 - Quiz #5 - Name _____

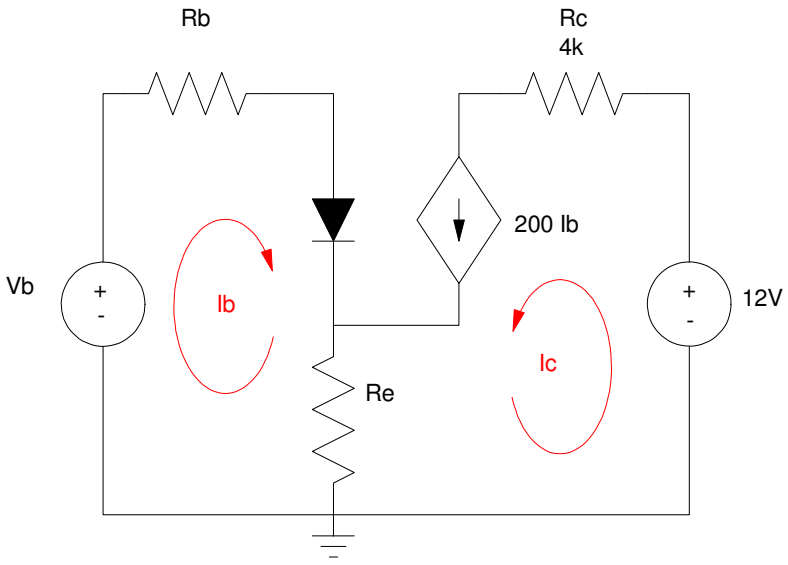
BJT Amplifiers. Due midnight, April 6th

1) BJT Amplifier: DC Analysis. Determine the Thevenin equivalent of R1 and R2 as well as the Q-point. Assume ideal silicon transistors:

- |Vbe| = 0.7V
- $\beta = 200$
- Re = 1000 + 100*(your birth month) + (your birth day). May 14th would give R = 1514 Ohms

Re 1000 + 100*mo + day	Vb	Rb	Vce	Ic





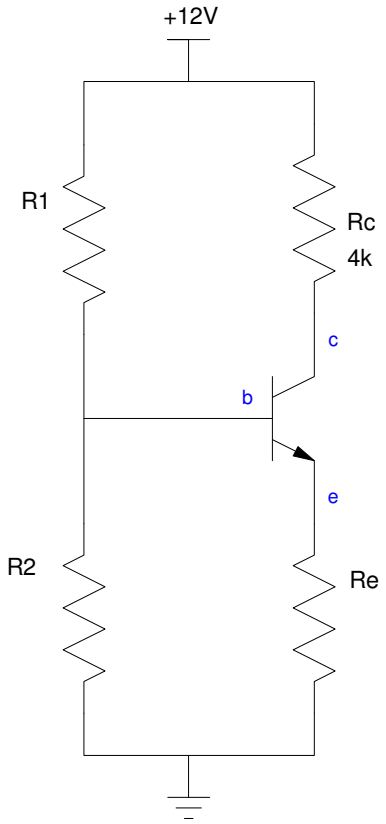
2) BJT Amplifier: DC Design. Determine R1 and R2 so that

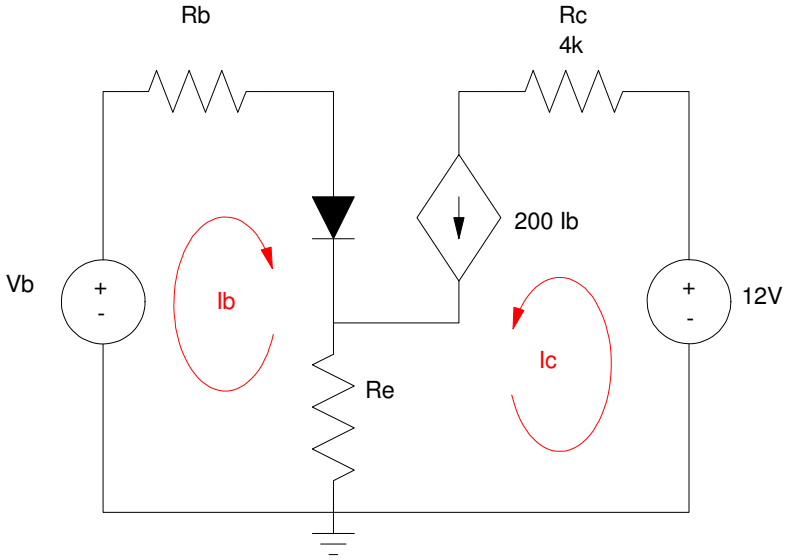
- The Q point is Vce = 6.00V and
- The Q point is stabilized for variations in β

Assume

- Ideal silicon transistors (Vbe = 0.7V, $\beta = 200$)
- Re = 1000 + 100*(birth month) + (birth day). May 14th gives R = 1514 Ohms

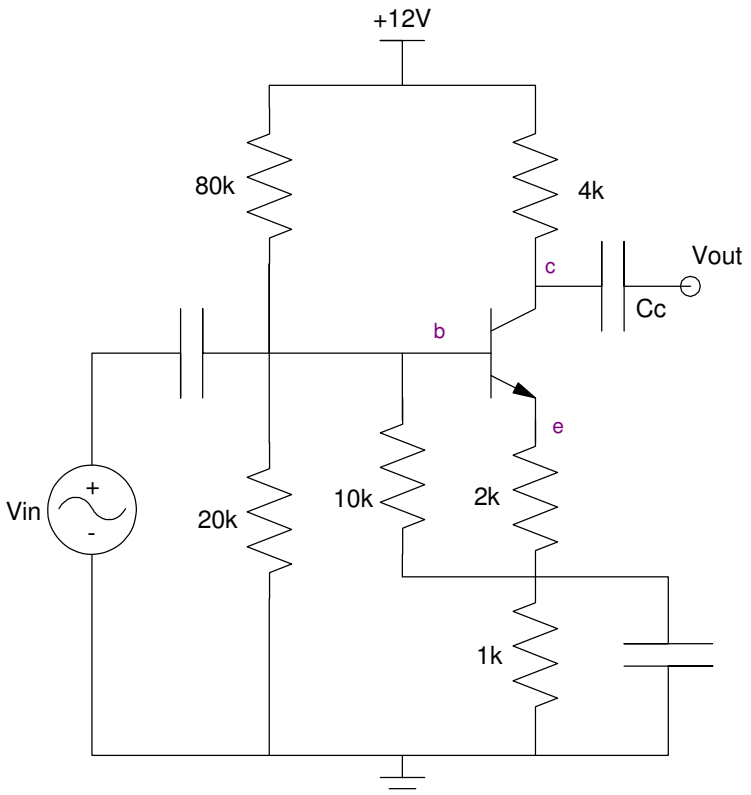
Re 1000 + 100*mo + day	R1	R2	Vb	Rb





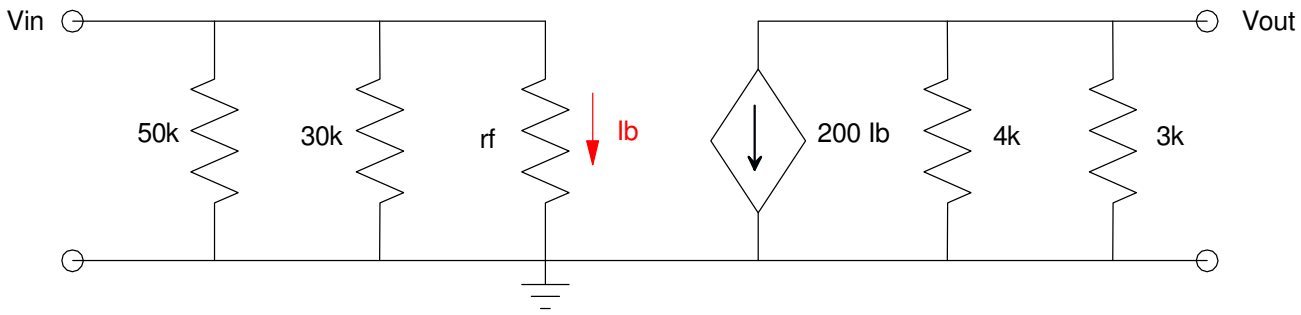
3) BJT: AC Analysis: Draw the small signal model for the following BJT amplifier. Assume

- $r_f = 3000\Omega$
- $\beta = 200$



4) BJT: AC Analysis: Determine the 2-port model for the following CE amplifer.

rf 1000 + 100*mo + day	Rin	Ain	Rout	Ao



5) 2-Port model (experimental): Determine the 2-port parameters based upon the following experimental data:

Case 1:
- Vin = 1mV @ 1kHz
- R1 = 0 Ohms
- R2 = 10M Ohms

results in Vout = 173mV

Case 2:
- Vin = 1mV @ 1kHz
- R1 = X Ohms
- R2 = 10M Ohms

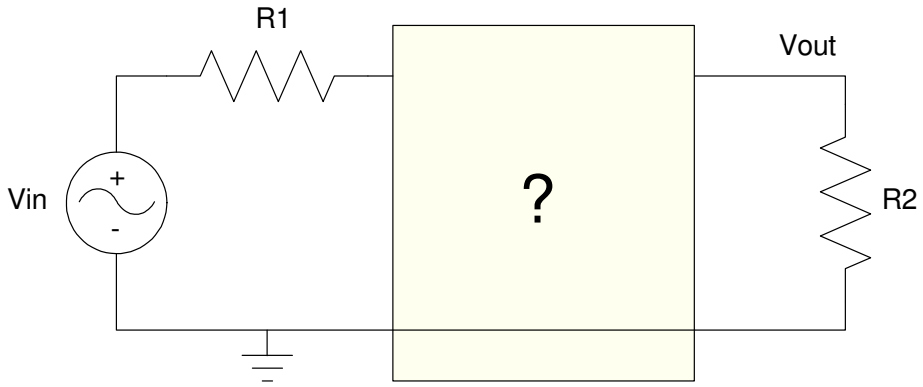
results in Vout = 100mV

Case 3
- Vin = 1mV @ 1kHz
- R1 = 0 Ohms
- R2 = X Ohms

results in Vout = 50mV

Assume
- X = 1000 + 100*(your birth month) + (your birth date) Ohms
- Ai = 0

X 1000 + 100*mo + day	Rin	Ai	Rout	Ao
		0		



6) Determine the 2-port model for the following cascaded CE amplfier

R 1000 + 100*mo + day	Rin	Ai	Rout	Ao