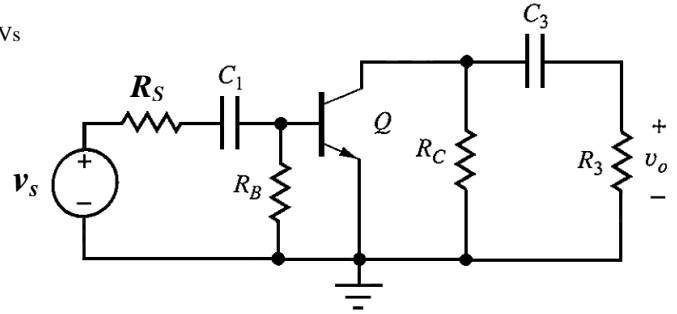
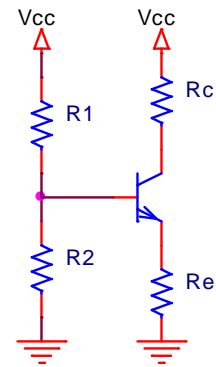


- 1) Text problem 13.60, page 742. Compute  $A_{V_s}$

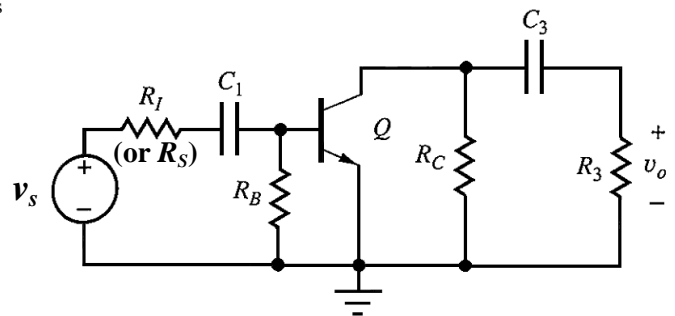


- 2) Text problem 13.61, page 743. Calculate worst-case voltage gain, i.e. the minimum value of  $|A_{V_s}|$  for  $60 \leq \beta_0 \leq 100$  for the circuit in Problem 1.

- 3) Design a four resistor bias network to achieve the operating point given in Text problem 13.60 with the following restrictions,  $R_{th} = R_B$ ,  $R_C = R_C$ , and  $V_{CC} = 20$  V. Assume  $V_{BE} = V_0 = 0.7$  V.

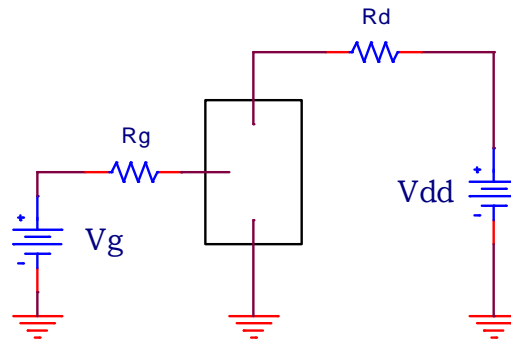


- 4) Text problem 13.62, page 743. Compute  $A_{V_s}$

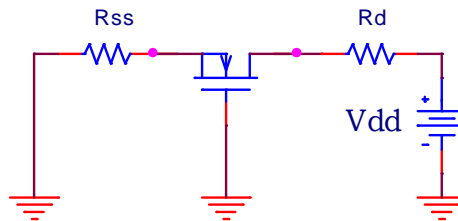


- 5) Text problem 13.63, page 743. Compute  $A_{V_s}$

6–8) The box in the circuit below contains an FET. Using the information provided for each FET in the problems below select all component values to achieve the specified operating points.



- 6) The device is an n-channel JFET with  $I_{DSS} = 25 \text{ mA}$  and  $|V_P| = 4 \text{ V}$ . The desired operating point is to be  $I_D = 16 \text{ mA}$  and  $V_{DS} = 5 \text{ V}$ .
- 7) The device is a p-channel depletion-mode MOSFET with  $|I_{DSS}| = 30 \text{ mA}$  and  $|V_P| = 4 \text{ V}$ . The desired operating point is to be  $|I_D| = 7.5 \text{ mA}$  and  $|V_{DS}| = 8 \text{ V}$ .
- 8) The device is an n-channel enhancement-mode MOSFET with  $|V_T| = 3 \text{ V}$  and a known operating point in the Beyond-Pinch-Off region at  $I_D = 10 \text{ mA}$  when  $V_{GS} = 5 \text{ V}$ . The desired operating point is to be  $I_D = 20 \text{ mA}$  and  $V_{DS} = 10 \text{ V}$ .
- 9) The FET in the circuit below is characterized by  $|I_{DSS}| = 22.5 \text{ mA}$  and  $|V_P| = 3.6 \text{ V}$ . Determine suitable values for the external circuit elements to obtain an operating point of  $|I_D| = 15 \text{ mA}$  and  $|V_{DS}| = 6 \text{ V}$ .



- 10) Determine suitable values for  $R_1$  and  $V_{DD}$  in the circuit below to provide an operating point of  $|I_D| = 12 \text{ mA}$  and  $|V_{DS}| = 8 \text{ V}$ , if the FET is satisfactorily described by the nonlinear relationship  $|I_D| = 4(V_{GS} + 2)^2 \text{ mA}$ .

