1. Use Fig. 5.53 (a) or the one shown below with \( V_{CC}=9\,\text{V}, \ R_C=1\,\text{k}, \ R_B=10\,\text{k}, \) and \( v_i(t)=0.001\sin wt. \) 
Given: \( \beta=50, \ |V_{BE}|=0.7, \ V_T=25\,\text{mV}. \) The circuit has \( V_{BB} \) adjusted so that \( I_C=3\,\text{mA}. \) Find the total instantaneous voltage at the output \( v_C(t). \)

2. Sedra & Smith: 5.83 (for just \( \beta=\infty \)), D5.90, D5.97, 5.115 (use a hybrid \( \pi \) if desired), D5.134

3. Refer to the circuit in Fig. 5.44(a). Use \( |V_{BE}|=0.7. \) (a) Name two problems that are eliminated by using biasing techniques. (b) Use biasing techniques to establish a current \( I_E=2\,\text{mA} \) for the circuit by finding all resistor values.

4. Use \( |V_{BE}|=0.7, \ \beta=100, \ V_T=25\,\text{mV}, \ V_A=0. \) (a) Find \( R_i \) and \( R_o \) for each circuit. (b) Find the gain \( \frac{V_o}{V_s} \)