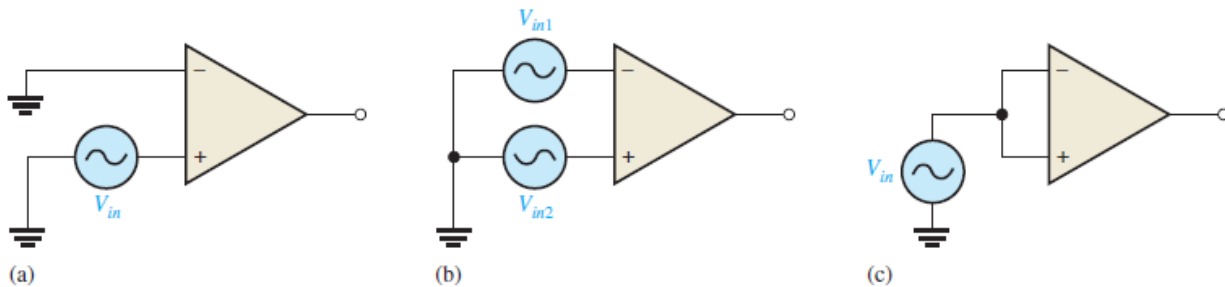
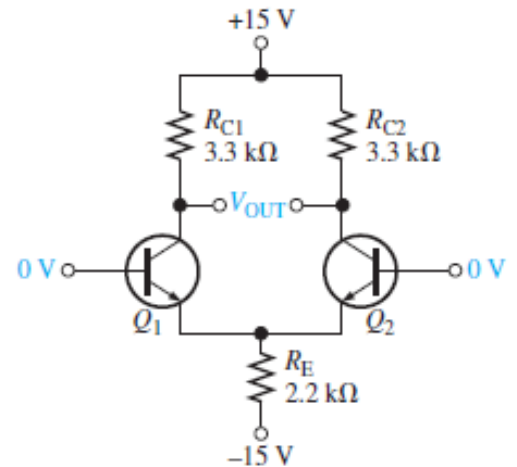




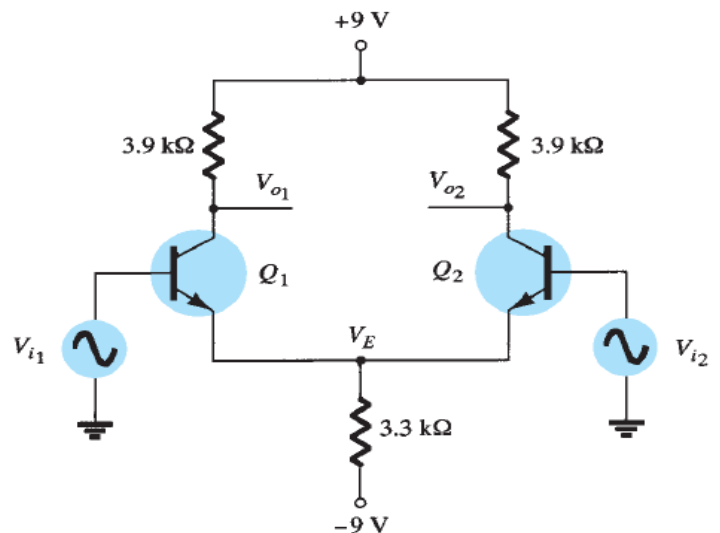
1. Identify the type of input mode for each op-amp in Figure



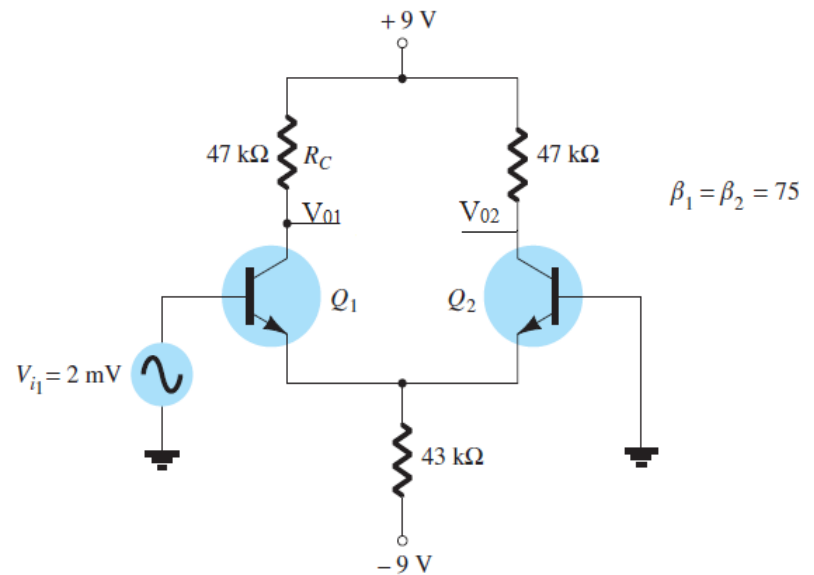
2. The dc base voltages in Figure are zero. Using your knowledge of transistor analysis, determine the dc differential output voltage. Assume that  $Q_1$  has an  $\alpha = 0.980$  and  $Q_2$  has an  $\alpha = 0.975$ .



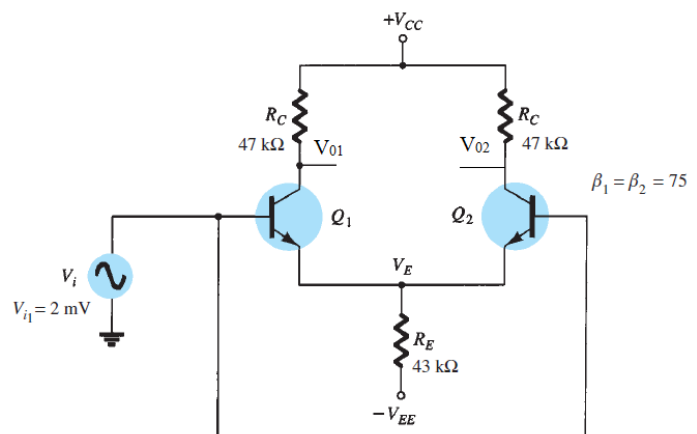
3. Calculate the dc voltages and currents in the circuit of Fig.



4. Calculate the single-ended output voltage  $V_{01}$ ,  $V_{02}$  for the circuit of Fig, and then sketch them.



5. Drive and then calculate the common-mode gain for the amplifier circuit of Fig. and the output voltage  $V_{01}$ ,  $V_{02}$



6. Calculate the common-mode gain and  $I_{C1}$ ,  $I_{C2}$  for the differential amplifier of Fig.

