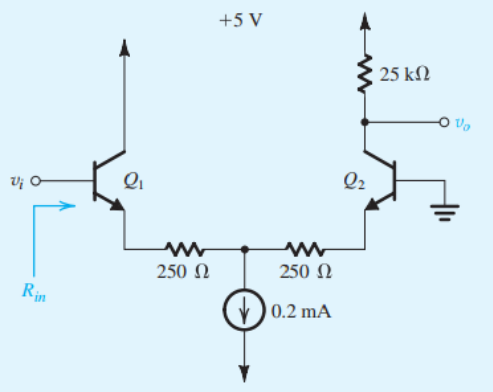
7.1 Find the voltage gain and the input resistance of the amplifier shown in the figure 1. Assuming $\beta = 100$.



7.2 The differential amplifier in figure 2 utilizes a resistor R_{ss} to establish a 1-mA dc bias current. This amplifier uses a single 5-V supply and thus the dc common-mode voltage V_{CM} cannot be zero. Transistors Q_1 and Q_2 have $k_n' \frac{W}{L} = 2.5 \frac{mA}{V^2}, V_t = 0.7\ V, and\ \lambda = 0$.

a) Find the required value of V_{CM}.

b) Find the value of R_D that results in a differential gain A_d of 8 V/V.

c) determine the dc voltage as the drains.