Special Problem 5.7-1

In the circuit below:

a) the DC drain current is $I_D = 4.0 \text{ mA}$.

b) the DC gate voltage of $Q_1$ is $V_{G1} = 10.0 \text{ V}$.

c) the DC source voltage of $Q_1$ is $V_{S1} = 7.0 \text{ V}$.

d) MOSFETs $Q_1$ and $Q_2$ are in saturation (you do not need to check).

Carefully draw the small-signal circuit for this amplifier and then determine the small signal gain $A_v = \frac{V_o}{V_i}$.