Special Problem 5.6-4

In the circuit below, $Q_1$ has $K=1.0 \text{ mA/V}$ and $V_{t1} = 1.0 \text{ V}$.

The transistor $Q_2$ likewise has $K = 1 \text{ mA/V}$, but has a threshold voltage of $V_{t2} = 2.0 \text{ V}$.

In other words $Q_1$ and $Q_2$ are \textbf{not} identical!

The resistor $R_2$ has been selected such that $Q_2$ is in saturation.

1) \textbf{Determine} $R_1$ (note I said $R_1$!) so that the drain current of $Q_2$ (note I said $Q_2$!) is $4.0 \text{ mA}$.

2) What is the \textbf{largest} possible value of resistor $R_2$ so that $Q_2$ remains in saturation?

![Circuit Diagram]