Homework # 2. See problems on the next page. Use the information below.

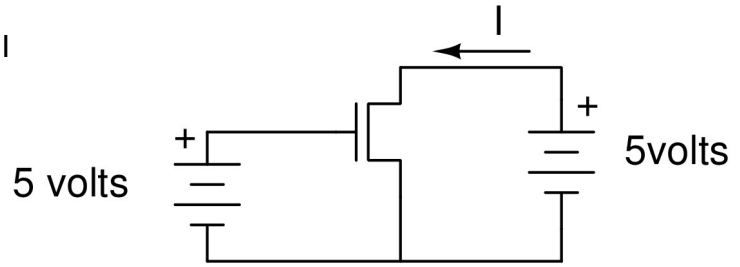
Assume design is being done with the 0.6 um process cited below and assume the following information:

$$I_{ds} = \begin{cases} 0 & V_{gs} < V_t \quad \text{cutoff} \\ \beta\left(V_{gs} - V_t - V_{ds}/2\right)V_{ds} & V_{ds} < V_{dsat} \quad \text{linear} \\ \frac{\beta}{2}\left(V_{gs} - V_t\right)^2 & V_{ds} > V_{dsat} \quad \text{saturation} \end{cases}$$

- Parameters from a 0.6 μm process
  - From AMI Semiconductor
  - t_{ox} = 100 Å
  - μ = 350 $cm^2/V*s$ (mobility for n type mosfets)
  - V_t = 0.7 V for n-mosfets and - 0.7V for p-mosfets

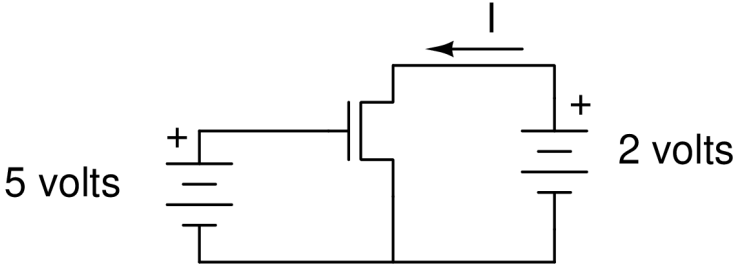
$$\beta = \mu C_{ox}\frac{W}{L} = (350)\left(\frac{3.9 \times 8.85 \cdot 10^{-14}}{100 \cdot 10^{-8}}\right)\left(\frac{W}{L}\right) = 120\frac{W}{L}\,\mu A/V^2$$

Problem 1. Find drain current I



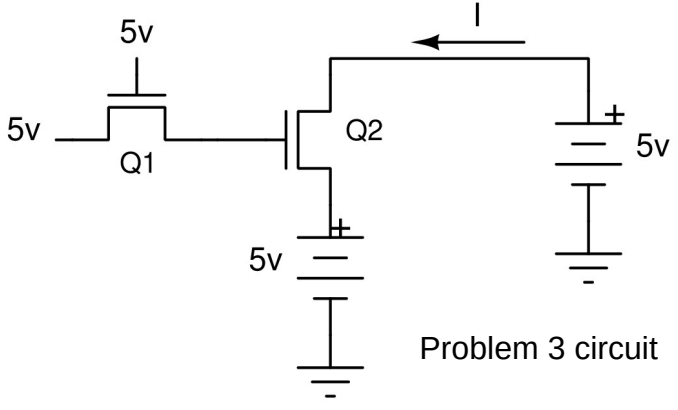
Problem 1 circuit.

Problem 2. Find drain current I



Problem 2 circuit.

Problem 3. Find drain current I



Problem 3 circuit

For credit, show your work