Problem numbers refer to the 6th edition of the textbook.

Problem 5.51.
The NMOS transistors in the circuit shown have $V_t = 1V$, $k' = 120 \mu A/V^2$, and $L_1 = L_2 = L_3 = 1 \mu m$. Find the required values of gate width for each of $Q_1$, $Q_2$, and $Q_3$ to obtain the voltage and current values indicated.

Problem 5.56.
For each of the circuits shown below, find the labeled node voltages. For all transistors $k_n \left( \frac{W}{L} \right) = 0.5 \text{ mA/V}^2$, and $V_t = 0.8 \text{ V}$. 
Problem 5.75.
An NMOS technology has $k' = 250 \, \mu A/V^2$ and $V_t = 0.5 \, V$. For a transistor with $L = 0.5 \, \mu m$, find the value of $W$ that results in $g_m = 1 \, mA/V$ at $I_D = 0.25 \, mA$. Also, find the required $V_{GS}$.

Problem 5.88.
Two identical CS amplifiers are connected in cascade. The first stage is fed with a source $v_{sig}$ having a resistance $R_{sig} = 100 \, k\Omega$. A load resistance $R_L = 10 \, k\Omega$ is connected to the drain of the second stage. Each MOSFET is biased at and operates with $V_{ov} = 0.25 \, V$. Each stage utilizes a drain resistance $R_D = 10 \, k\Omega$.
(a) Sketch the equivalent circuit of the two-stage amplifier.
(b) Calculate the overall voltage gain $G_v$.

Problem 5.93.
A common-gate (CG) amplifier using an NMOS transistor for which $g_m = 4 \, mA/V$ has a 5 k\Omega drain resistance $R_D$ and a 5 k\Omega load resistance $R_L$. The amplifier is driven by a voltage source having a resistance of 500 \Omega. What is the input resistance of the amplifier? What is the overall voltage gain $G_v$? By what factor must the bias current $I_D$ of the MOSFET be changed so that $R_m = R_{sig}$?