

## Homework #8

Due We d ., M a r . 1 2 , 2003

1. Use PSPICE to simulate the common-source stage shown in Fig. 4 of the SPICE Tutorial for the following conditions:  $V_{DD} = 3\text{ V}$ ,  $V_{SS} = 0$ ,  $R_D = 10\text{ k}\Omega$ , and  $W/L = 5/0.5$ . Use the same device model as that in the example.

(a) Perform a dc sweep of the input voltage from 0 to 3 V in steps of 5 mV and plot  $V_{out}$  as a function of  $V_{in}$ . At what input voltage is the transistor at the edge of the triode region? Provide the netlist and the PSPICE output plot.

(b) Analyze the circuit by hand to determine the input voltage that places the transistor at the edge of the triode region. Make sure you use the same device model as that in (a). Compare the result with the value obtained in (a).

Sedra/Smith:

2.8

2.16

5.41

5.57

5.75

5.81

**Box** all answers. Answers not highlighted by boxes receive no credit.