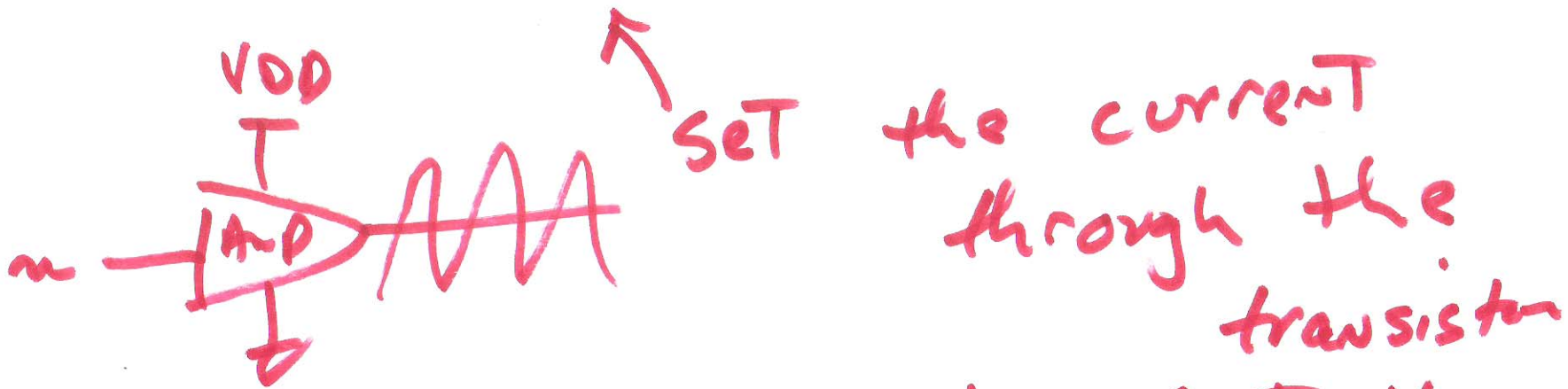


Lecture 16

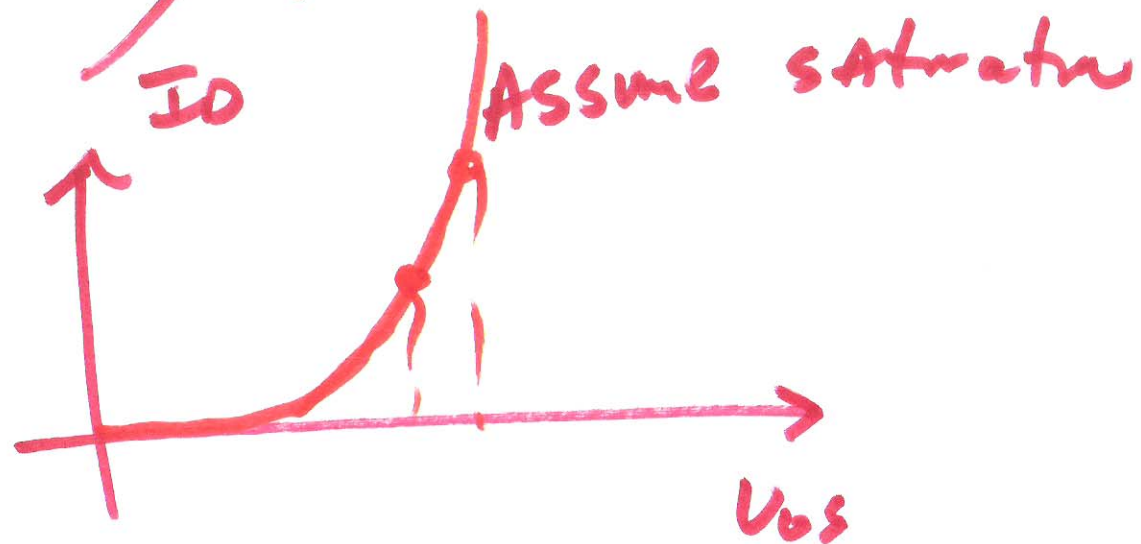
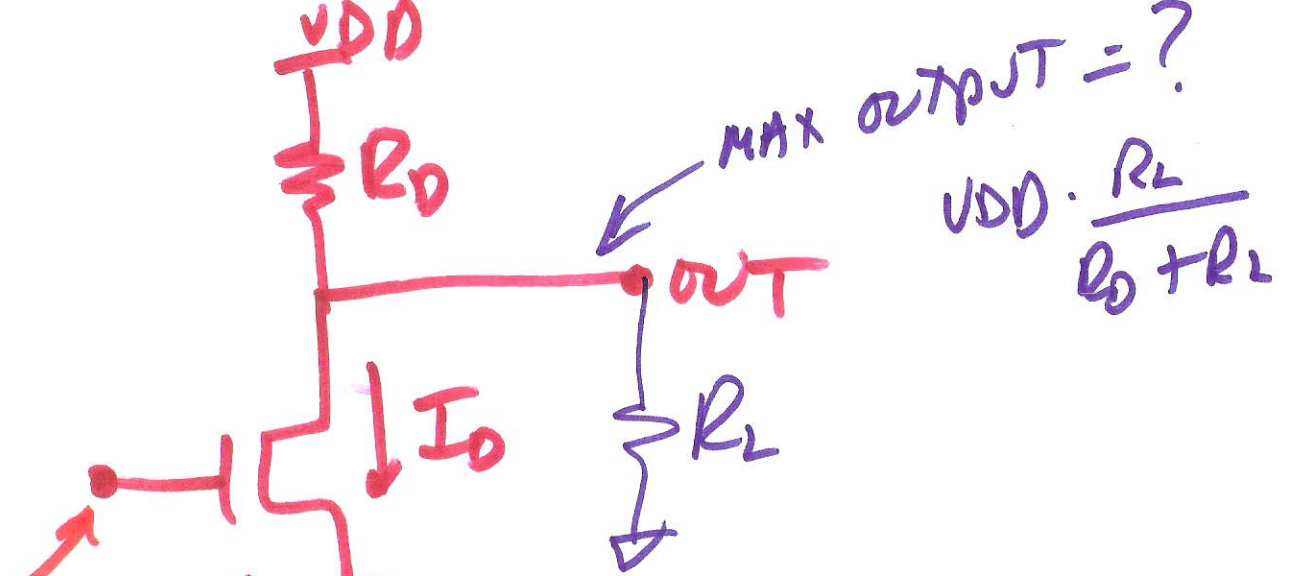
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EE 320 Electronics

Bias the transistor

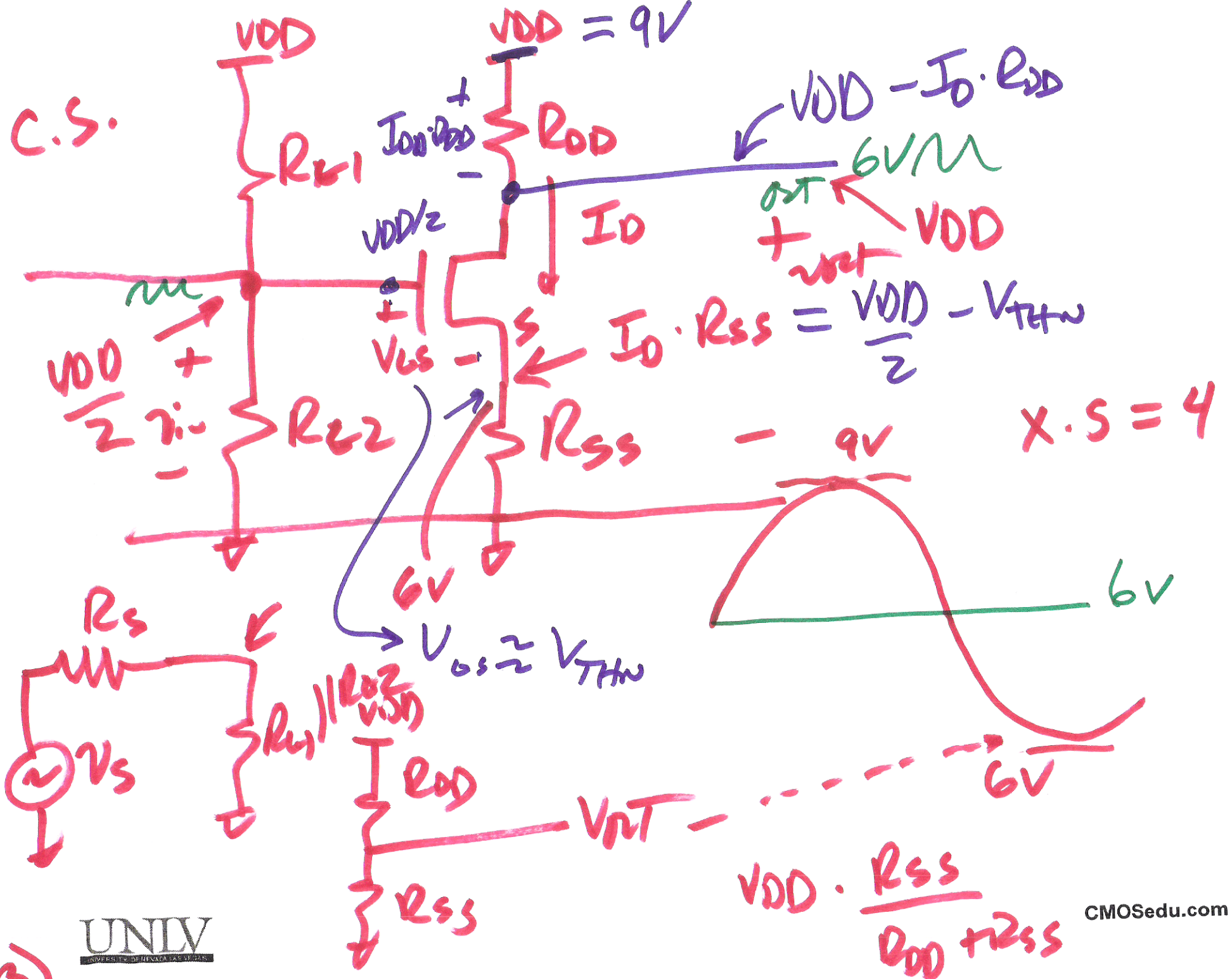


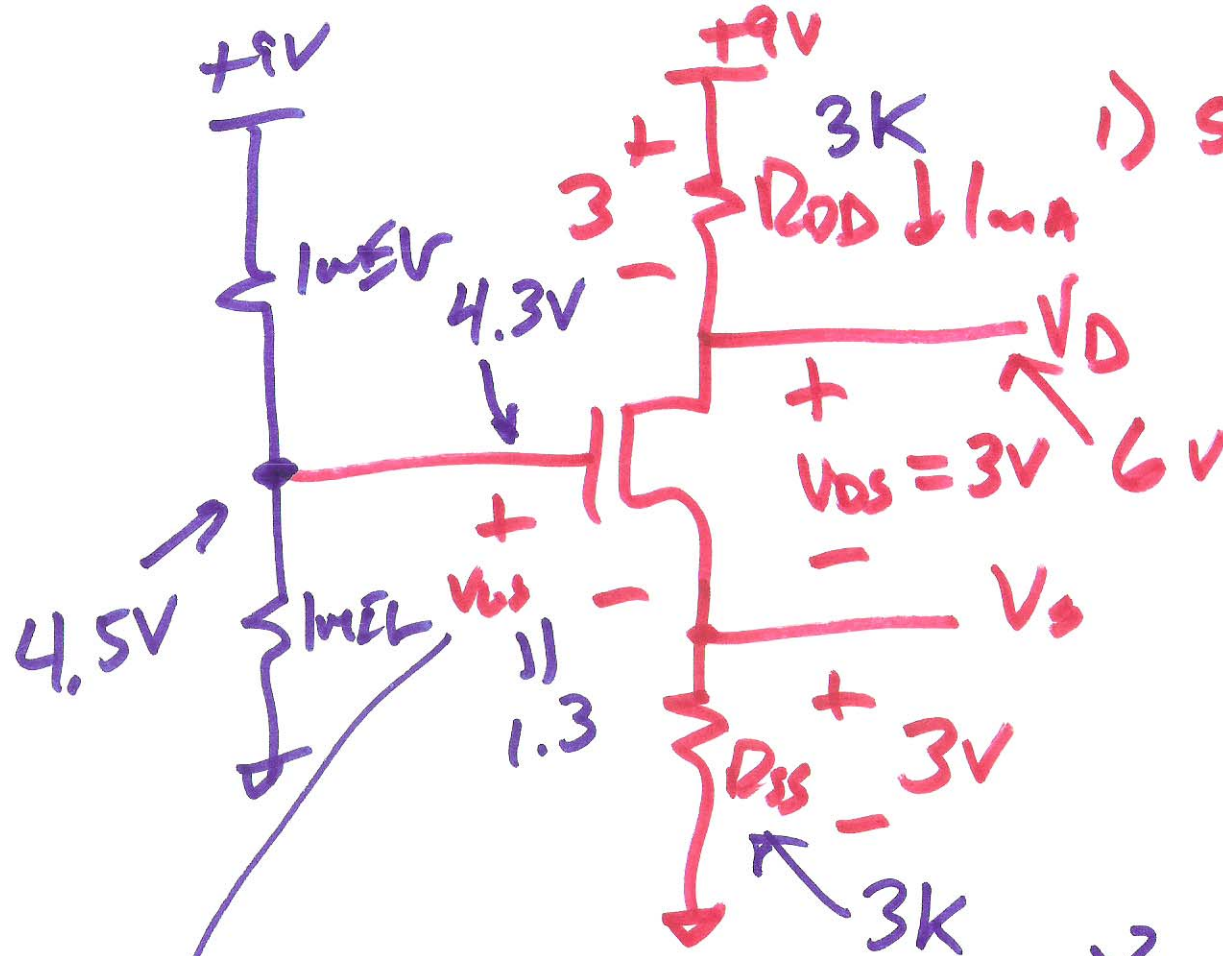
AND also set the voltages across the transistor.



2)

C.S.





1) set $V_D = \frac{2}{3} V_{DD}$

2) set $V_S = \frac{1}{3} V_{DD}$

$K'_N = 100 \mu A / V^2$

$V_T = 0.7$

$\frac{W}{L} = \frac{100}{1}$

$$I_0 = \frac{K'_N}{2} \frac{W}{L} (V_{GS} - V_{THN})^2 = \frac{3}{10^{-3}} = 3 \mu A$$

$$V_{GS} = \sqrt{\frac{2I_0 \cdot L}{K'_N \cdot W}} + V_{THN} = \sqrt{\frac{2 \mu A}{100 \mu A}} + 0.75 = 0.45 + 0.75 = 1.2V$$

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$$i_d = g_m \cdot v_{gs}$$

Diagram of a MOSFET gate showing the gate-source voltage v_{gs} with a positive terminal at the gate and a negative terminal at the source.

