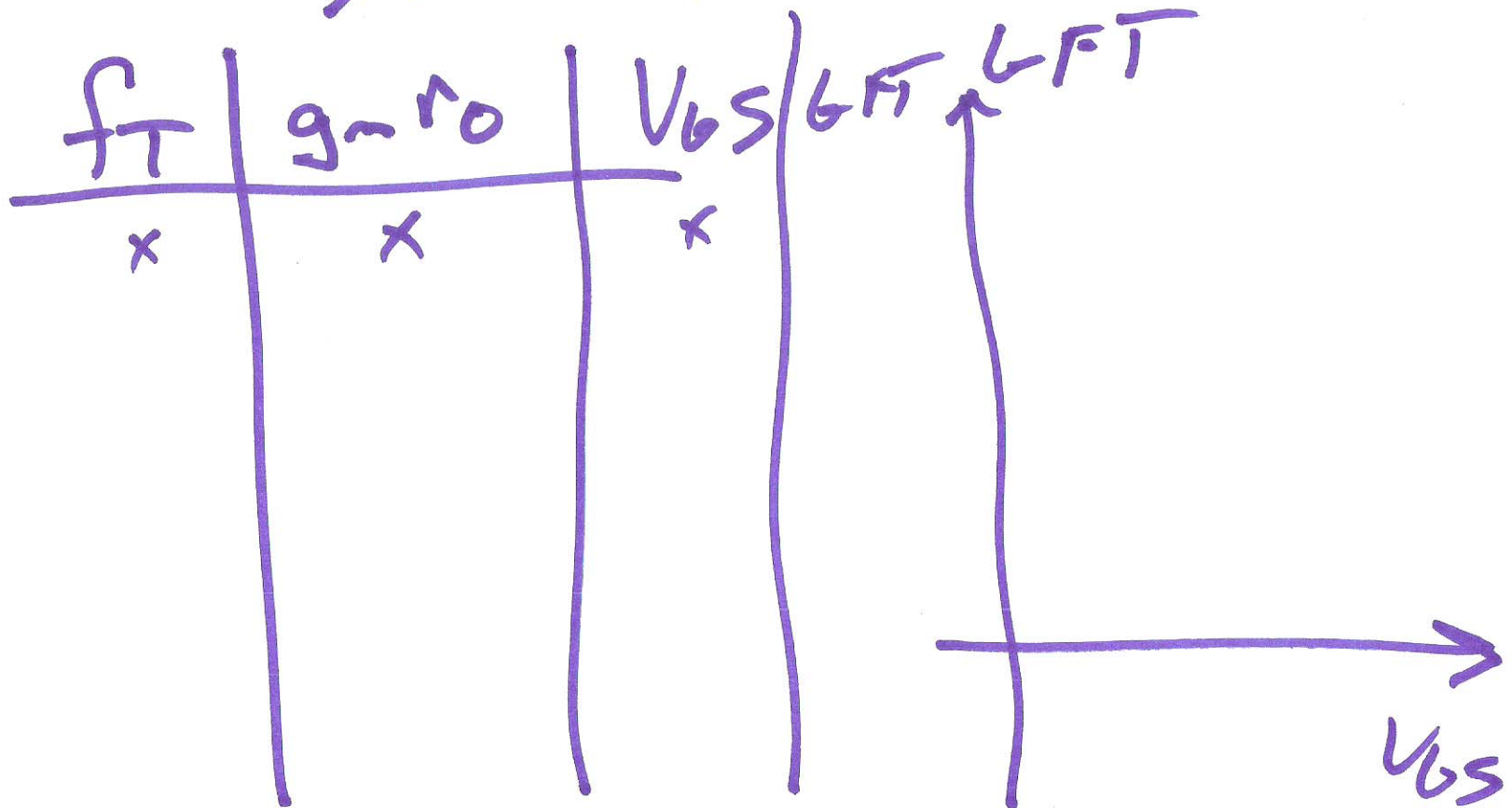
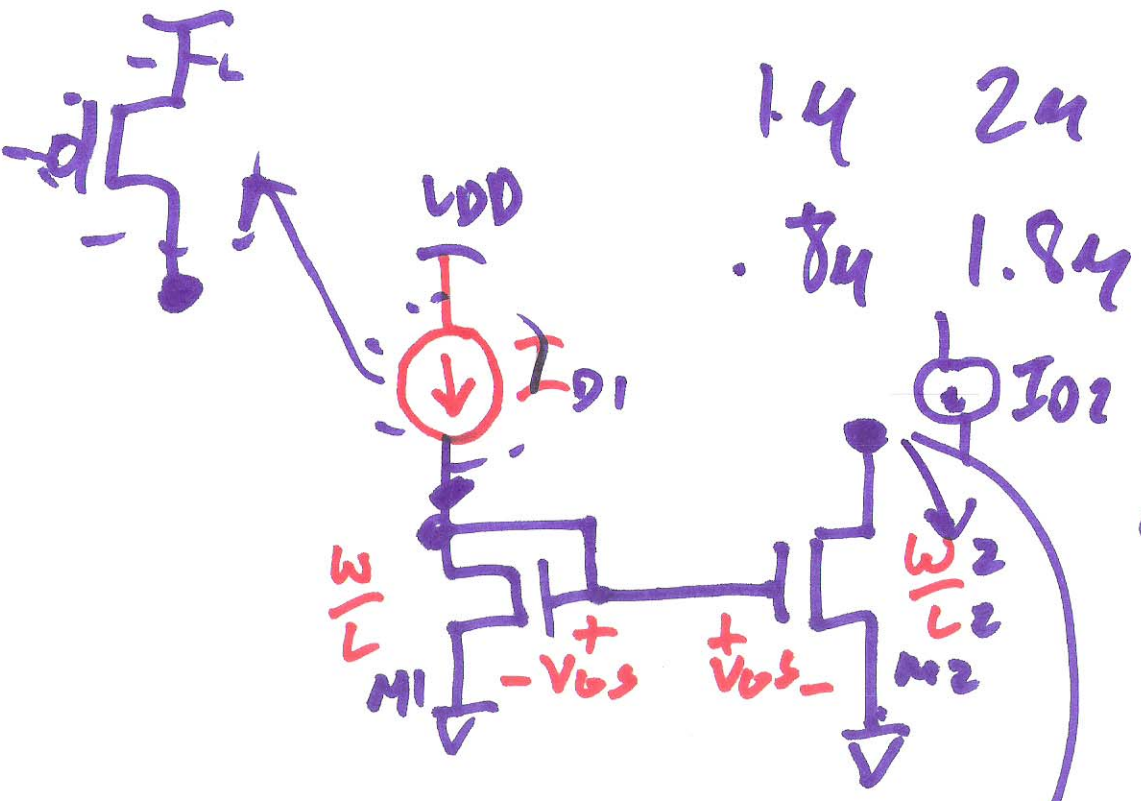


Lecture 8

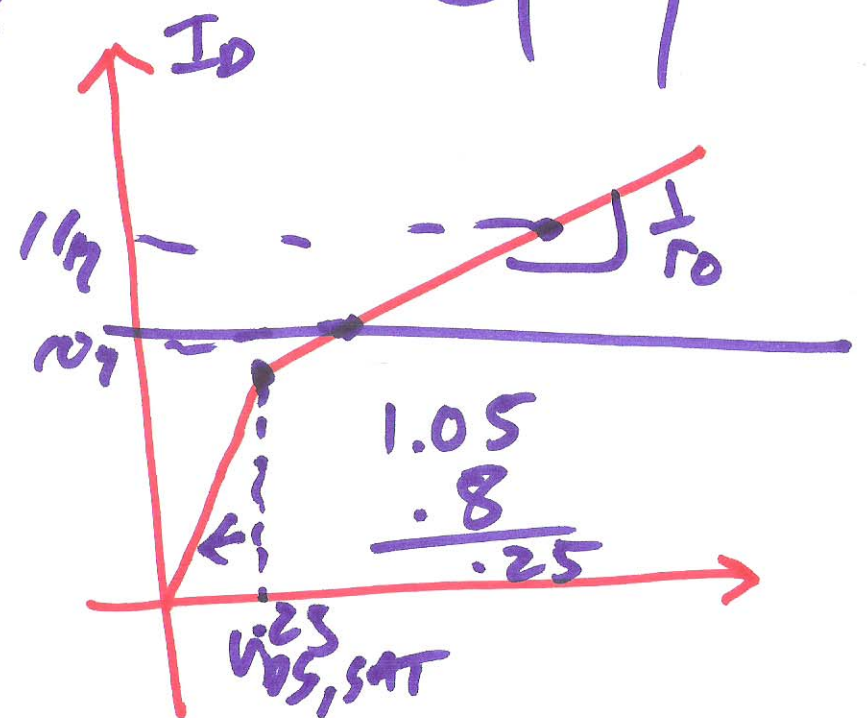
Feb. 9, 2015

EE 420 / ECG 620





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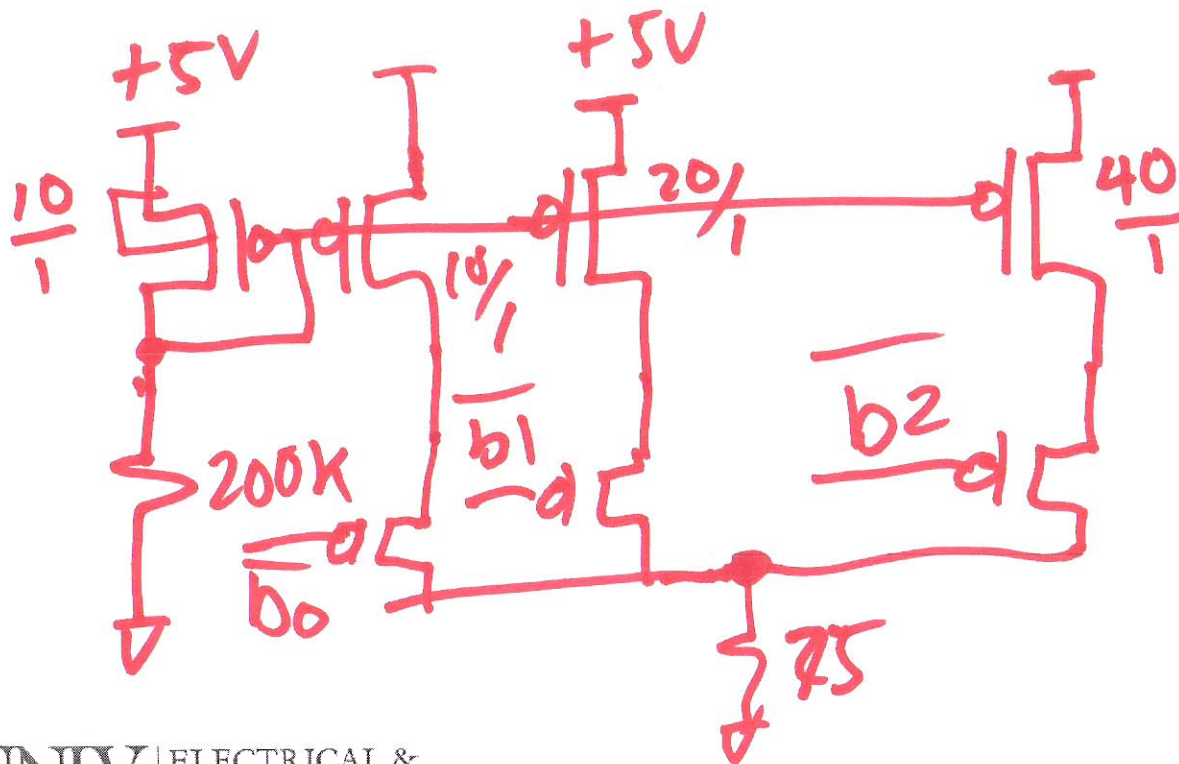
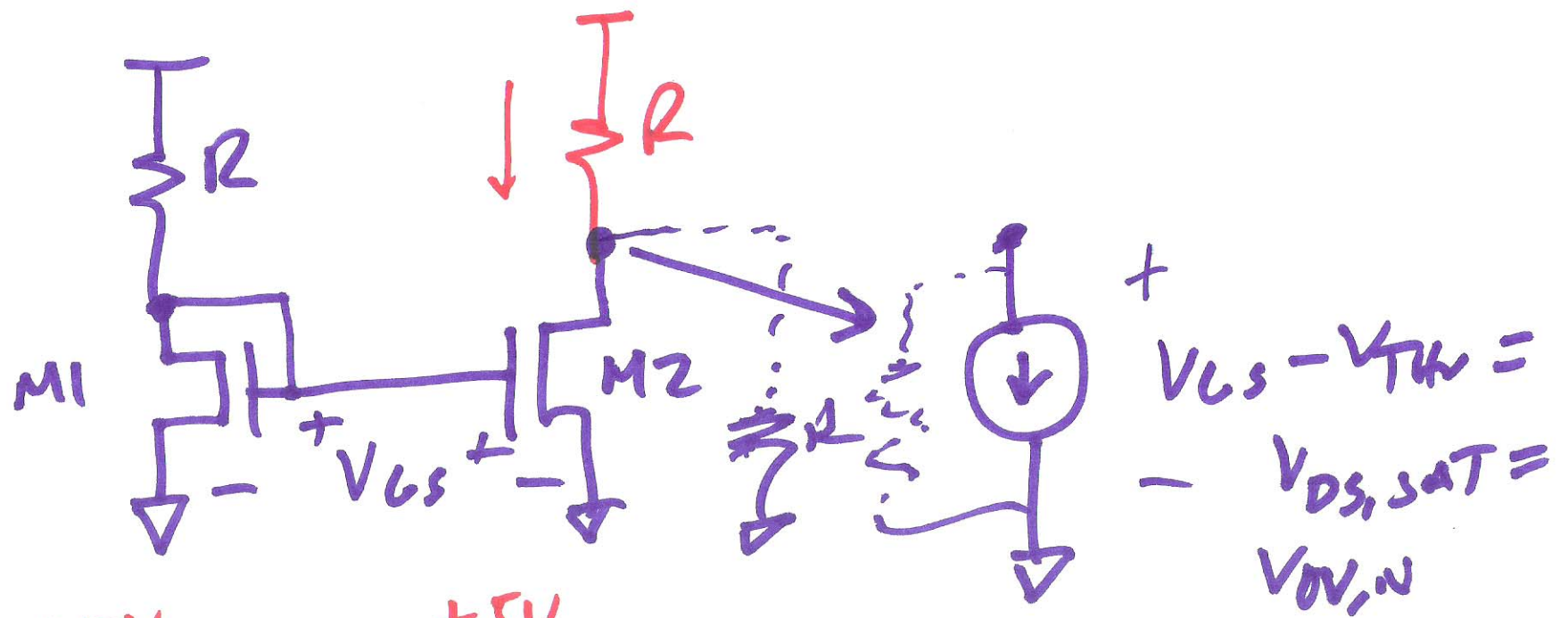
$$\frac{I_{D1}}{I_{D2}} = \frac{\frac{W_1}{L_1} K_{Pn} (V_{GS} - V_{th})^2}{\frac{W_2}{L_2} K_{Pn} (V_{GS} - V_{th})^2}$$

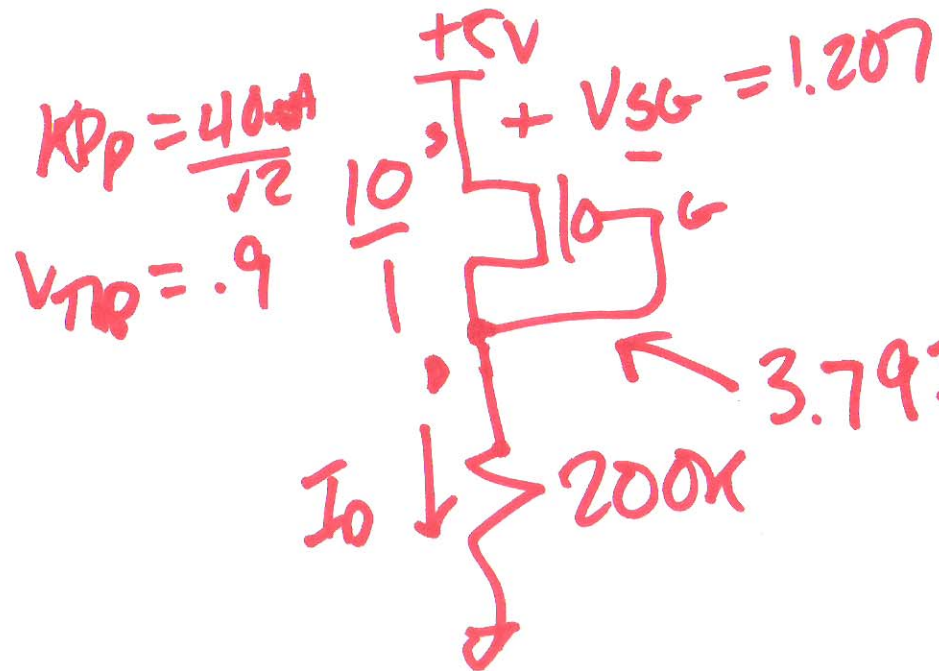
compliance range

$$\frac{I_{D1}}{I_{D2}} = \frac{W_1 \cdot \cancel{L_2}}{\cancel{L_1} \cdot W_2} = \frac{W_1}{W_2}$$

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2)





$$5 - V_{SG} - I_D \cdot 200k = 0$$

$$I_D = \frac{40 \mu A}{2} \cdot \frac{10}{1} \cdot (V_{SG} - .9)^2$$

$$3.793V$$

$$I_D = \frac{3.793}{200k}$$

$$\approx 19.4 \mu A$$

$$V_{SG} = 1.207$$

$$5 - V_{SG} - 40(V_{SG}^2 - 1.8V_{SG} + .81) = 0$$

$$5 - V_{SG} - 40V_{SG}^2 + 72V_{SG} - 32.4 = 0$$

$$40V_{SG}^2 - 71V_{SG} + 27.4 = 0$$

$$V_{SG} = \frac{71 \pm \sqrt{(71)^2 - 160 \cdot 27.4}}{80}$$

$$V_{SG} = \frac{71 \pm 25.63}{80}$$

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