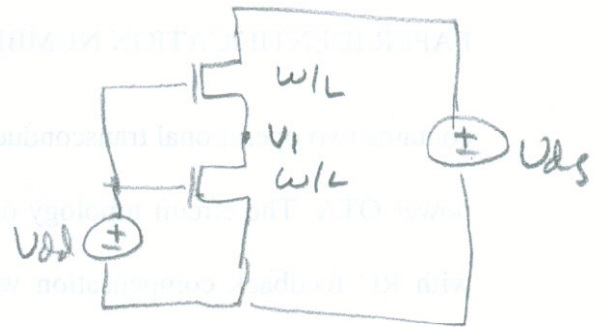
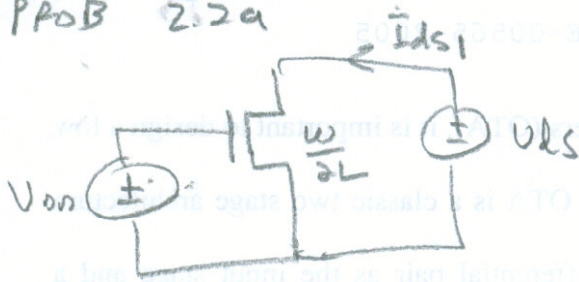


4) Prob 2.2a



Lineare $I_{DS1} = \mu_n C_{ox} \frac{w}{2L} (V_{DD} - V_t - \frac{V_{DS}}{2}) V_{DS}$

$$I_{DS2} = \mu_n C_{ox} \frac{w}{L} (V_{DD} - V_t - \frac{V_1}{2}) V_1$$

$$V_1 = \frac{V_{DS}}{2} \text{ voltage divider}$$

$$\therefore I_{DS2} = \mu_n C_{ox} \frac{w}{L} (V_{DD} - V_t - \frac{V_{DS}}{4}) \frac{V_{DS}}{2}$$

$$\because V_{DD} - V_t \gg \frac{V_{DS}}{4} \quad I_{DS2} = I_{DS1}$$

5) Prob 2.15

$$V_{IL} = .3V$$

$$V_{IH} = 1.05V$$

$$V_{OL} = .15V$$

$$V_{OH} = 1.2V$$

Low Noise Margin

$$NML = V_{IL} - V_{OL}$$

$$= .3 - .15$$

$$= .15V$$

High Noise Margin

$$NM_H = V_{OH} - V_{IH}$$

$$= 1.2 - 1.05 = .15V$$