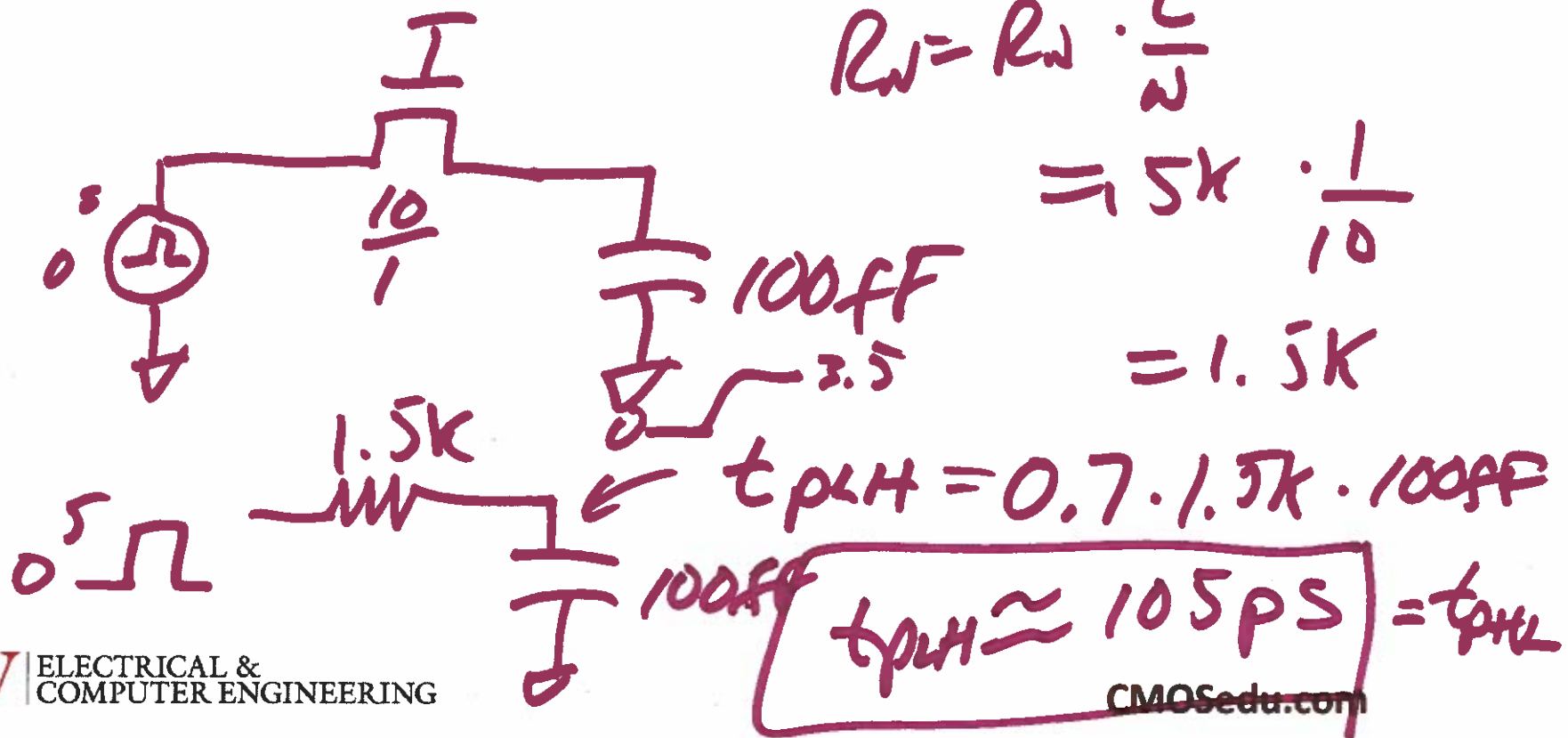


EE421 / ECG 621

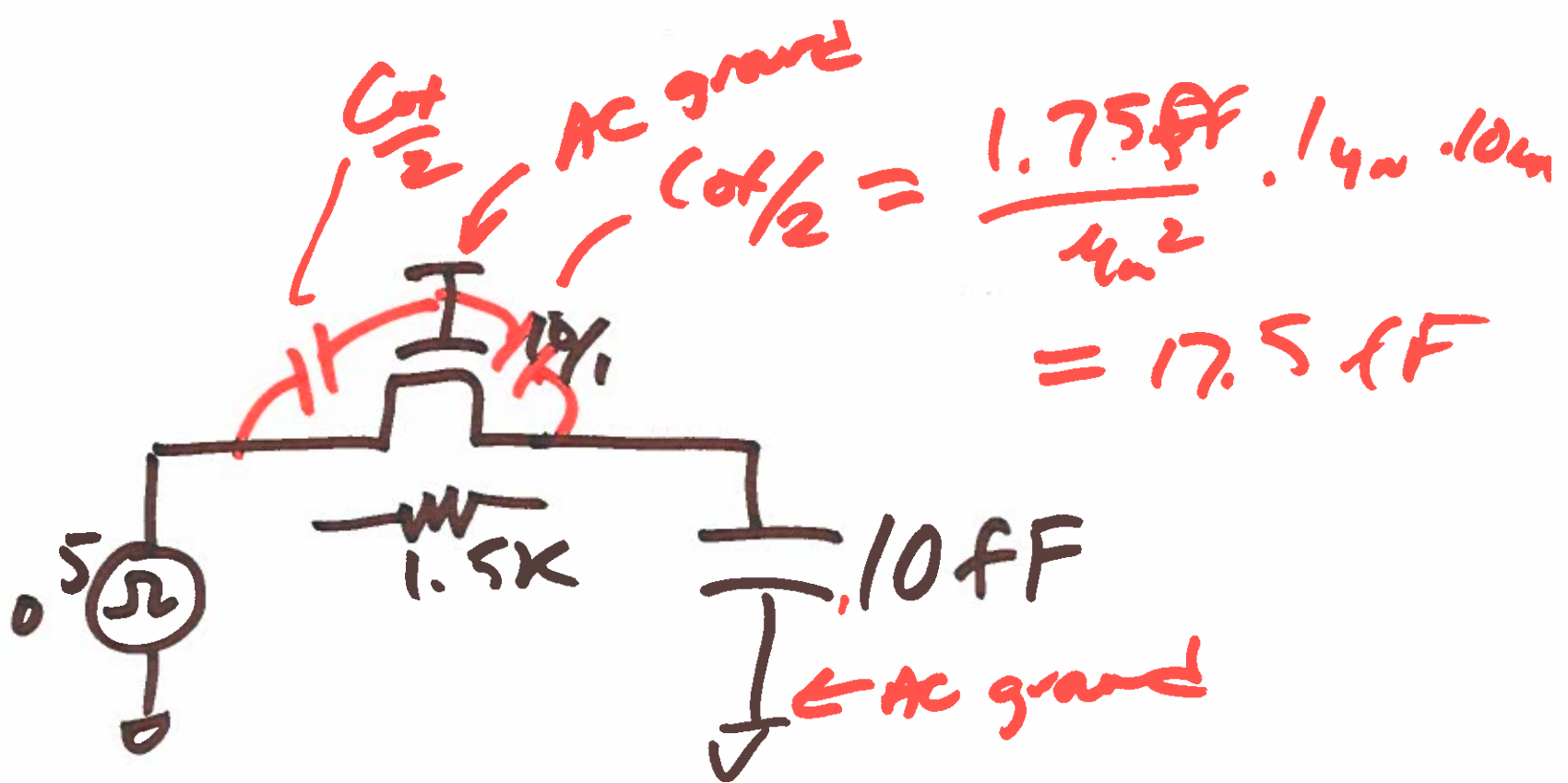
Digital IC Design

Lecture 17

OCT. 28, 2019

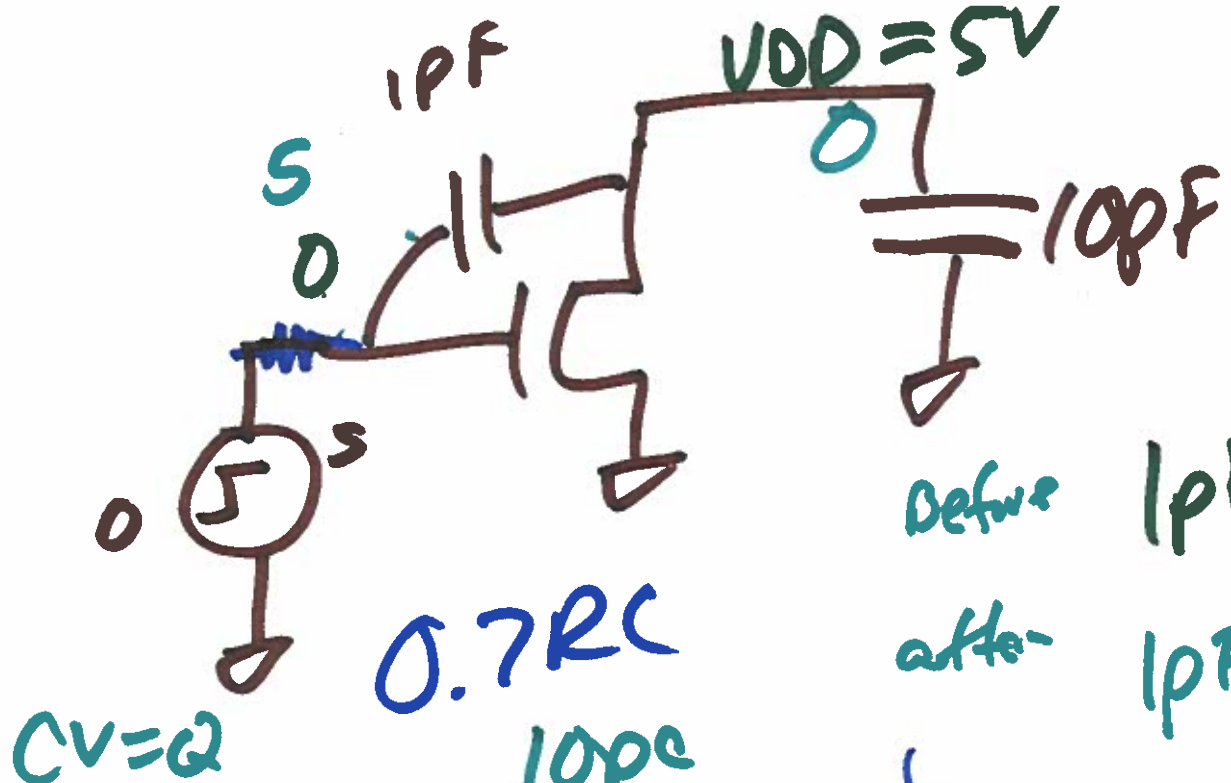


1)



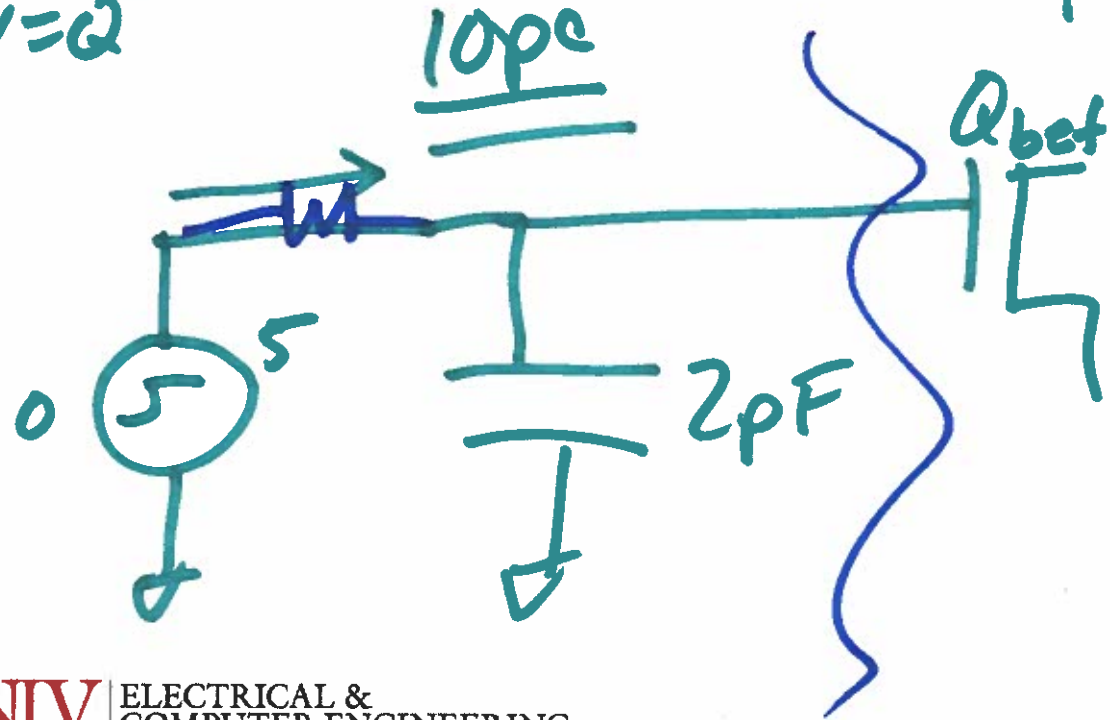
$$t_{pHL} = t_{pLH} = 0.7 \cdot 1.5 \text{ k} \cdot 27.5 \text{ fF} = \underline{\underline{29 \text{ ps}}}$$

2)

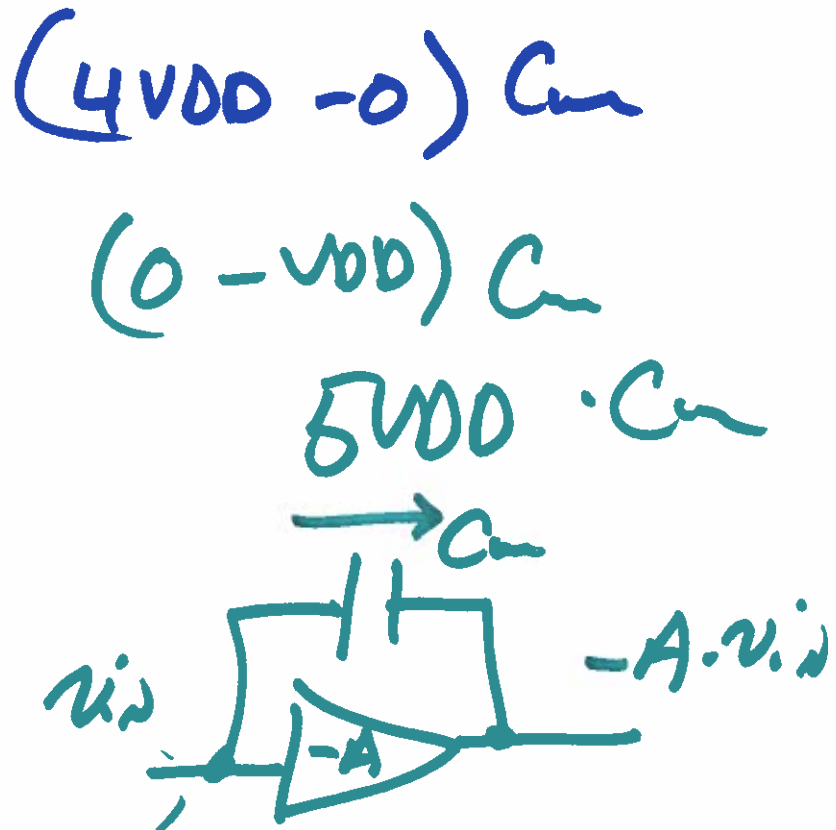
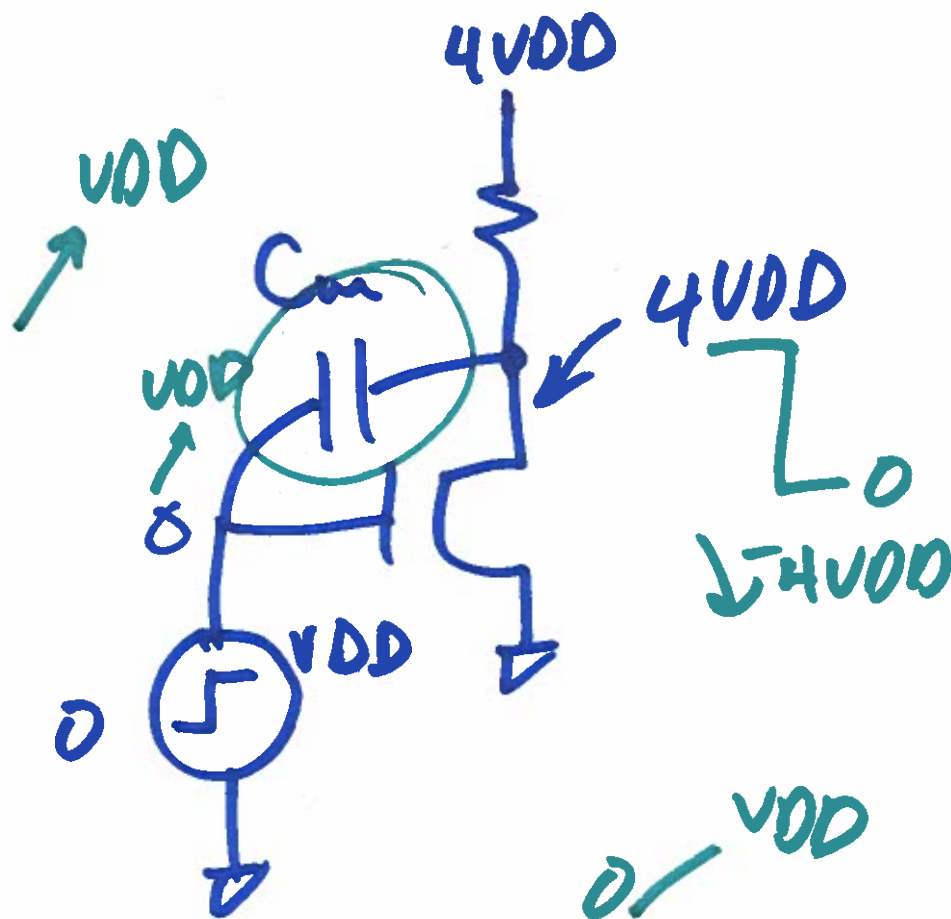


before $1pF(U_{DD}-0) = 5pC$
 after $1pF(0-5) = -5pC$

$Q_{bet} - Q_{aft} = \underline{\underline{10pC}}$



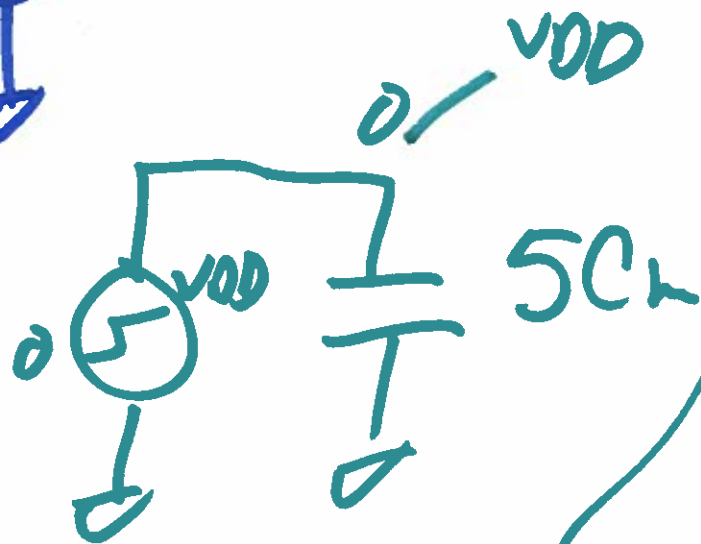
3)



$$(4V_{DD} - 0) C_m$$

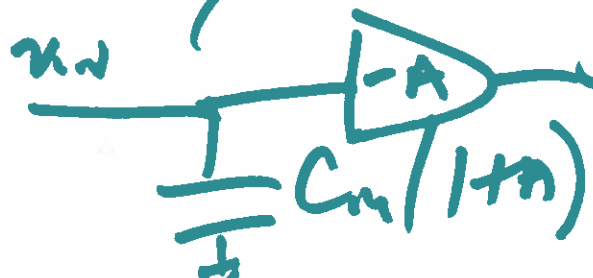
$$(0 - v_{DD}) C_m$$

$$5V_{DD} \cdot C_m$$

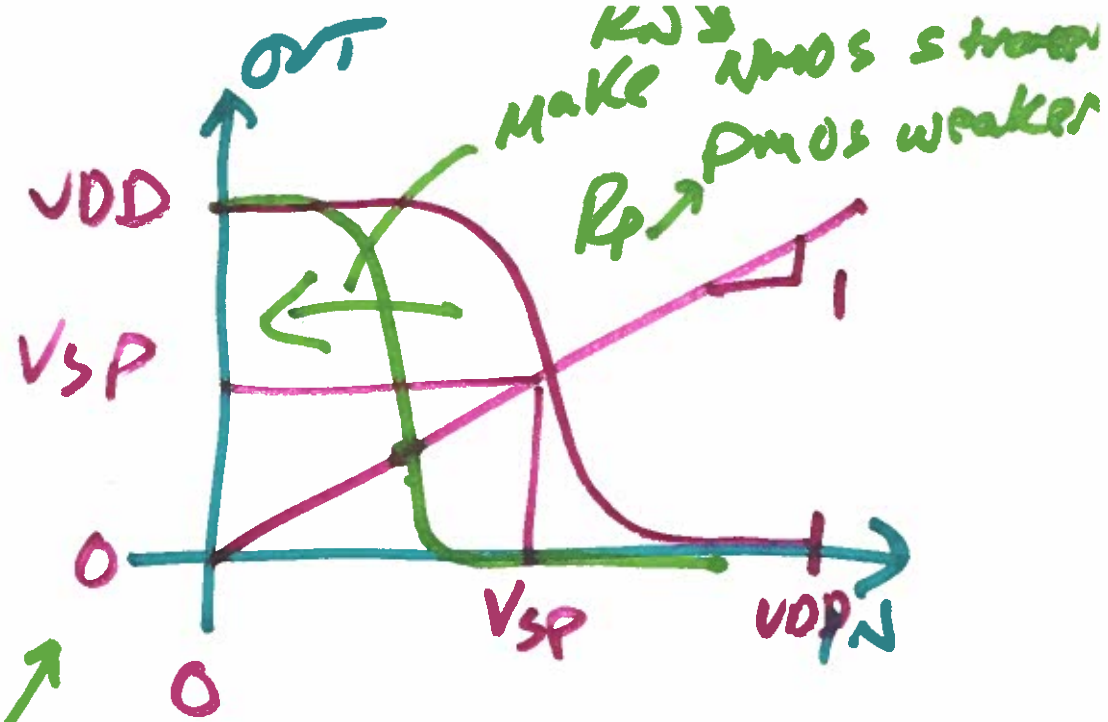
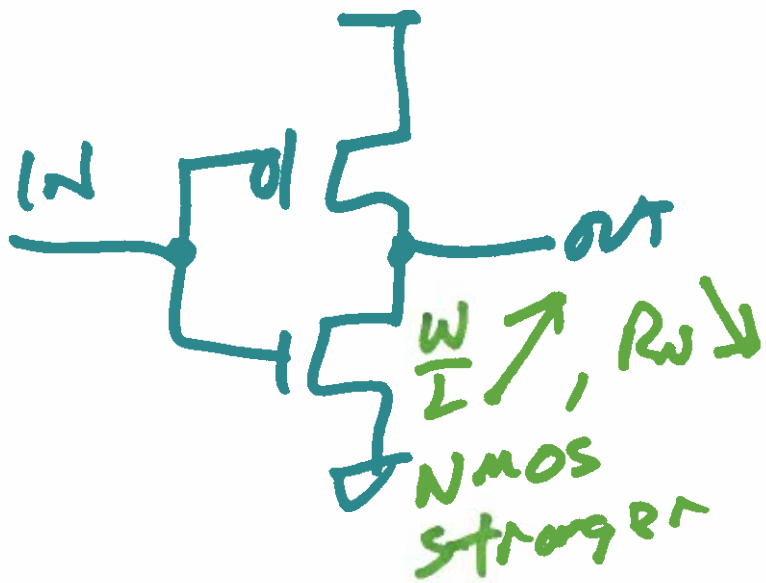


$$= \frac{v_{in} - (-A v_{in})}{\frac{1}{j\omega C_m}}$$

$$= \frac{v_{in}}{\frac{1}{j\omega C_m (1+A)}}$$



4)



$$K_{PN} \cdot \frac{W}{L} = \beta_N \uparrow$$



5)