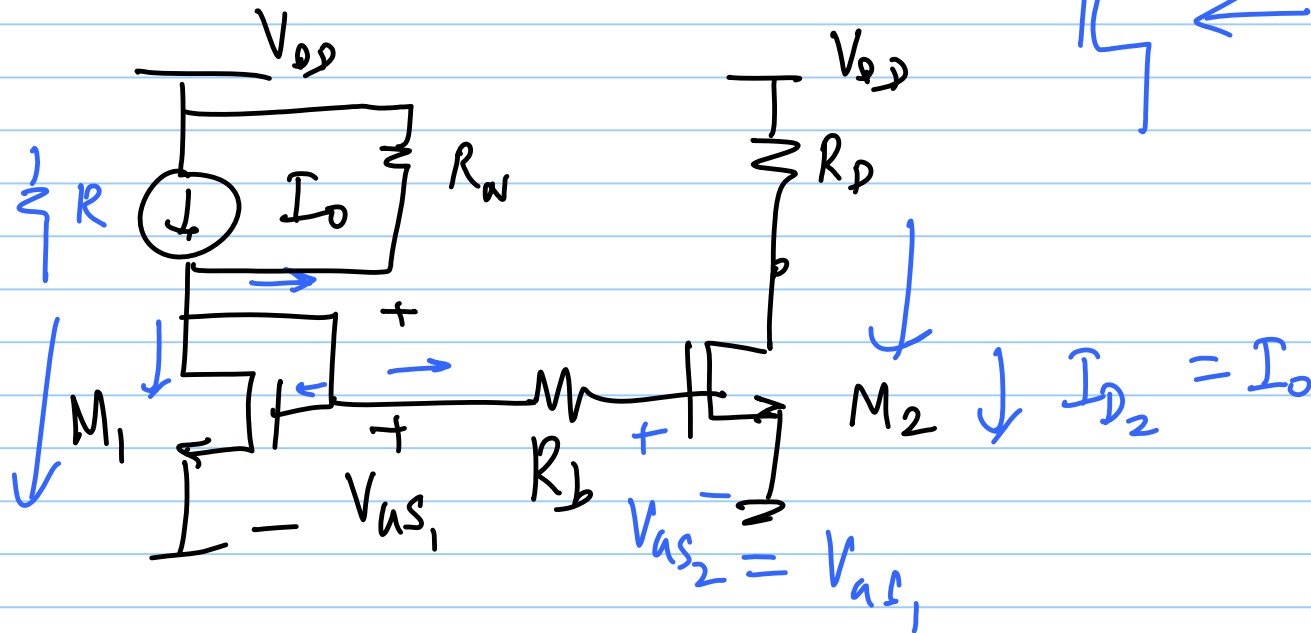


20/8/19

Lec 9



"Replica
Biasing"

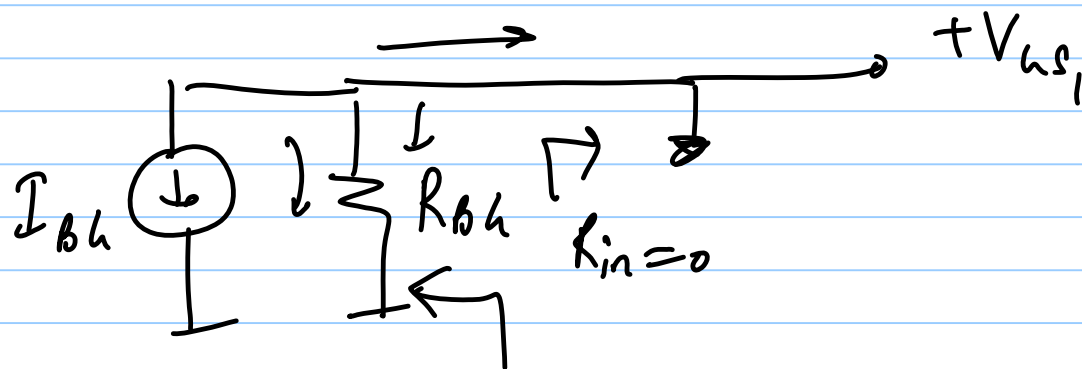
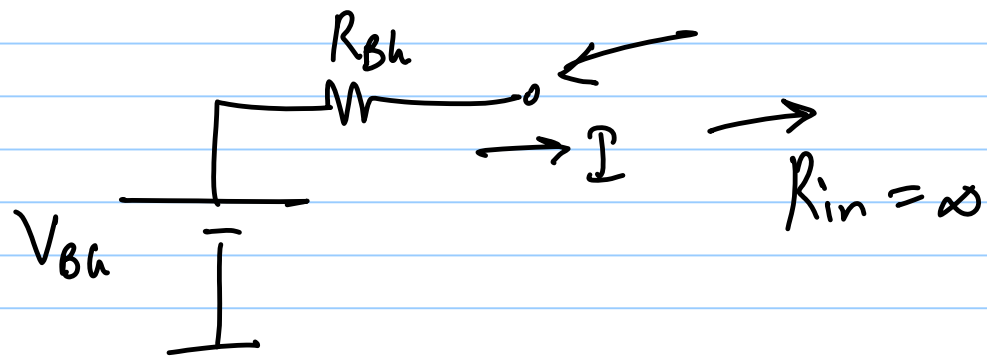
$$M_{n1} = M_{n2}$$

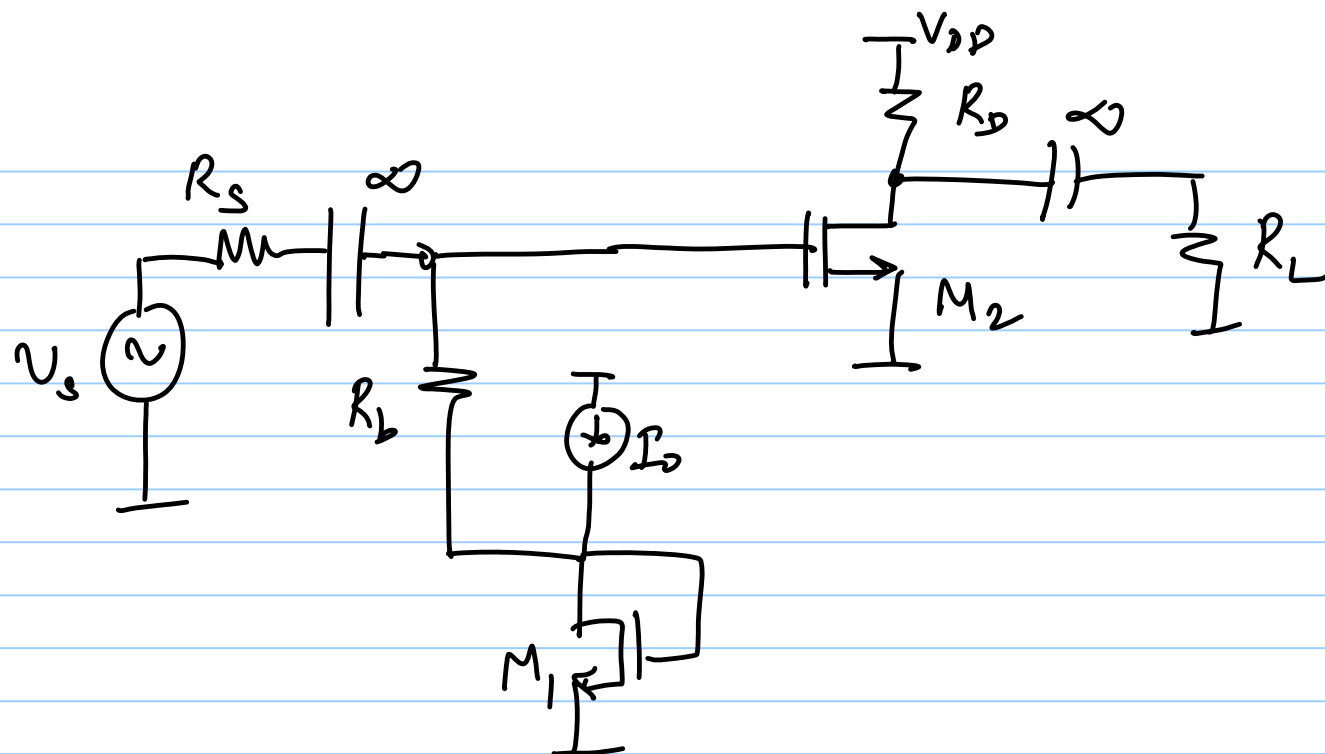
$$C_{ox1} = C_{ox2}$$

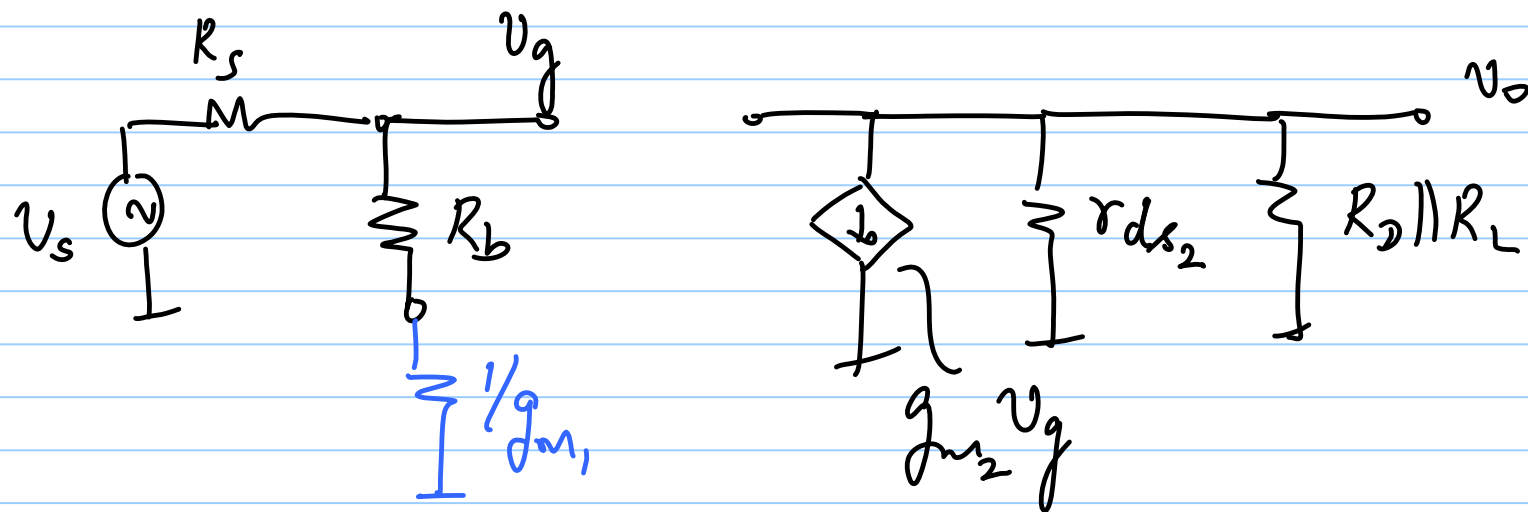
$$V_{T1} = V_{T2}$$

$$W_1 = W_2$$

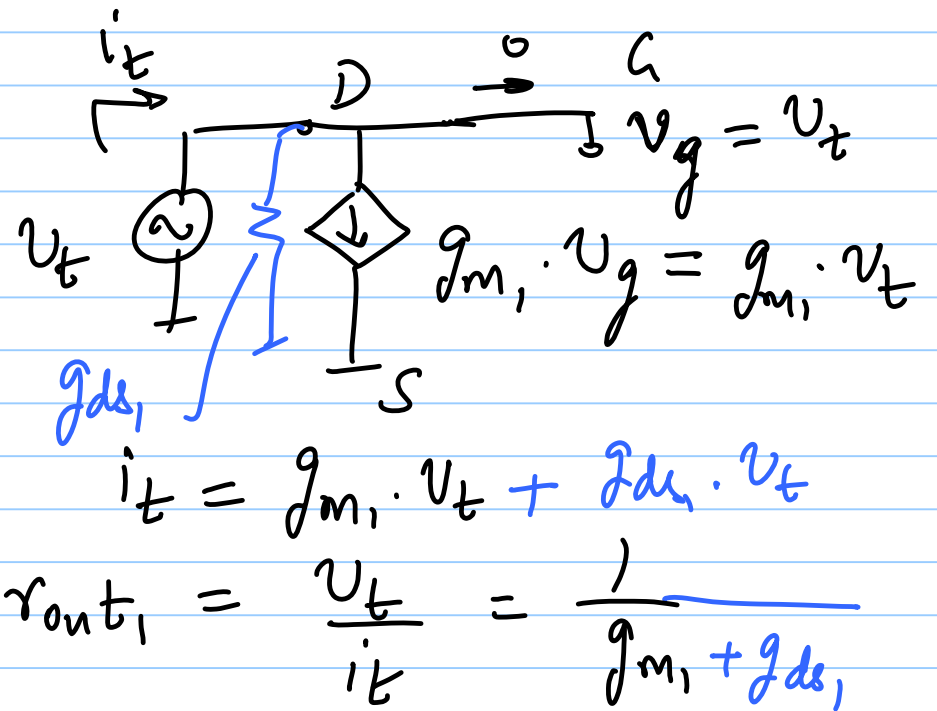
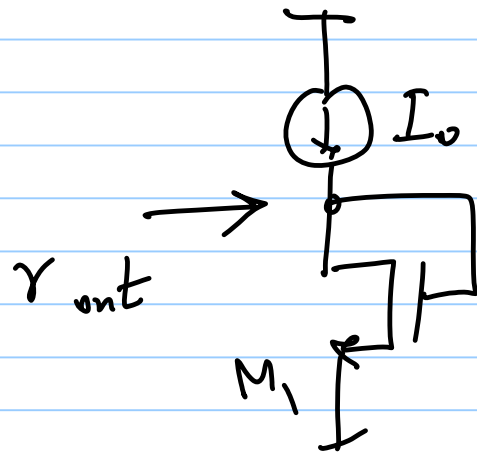
$$L_1 = L_2$$







$$v_g = \frac{R_b + 1/g_{m1}}{R_s + R_b + 1/g_{m1}} \approx v_s \quad \text{if } R_b \gg R_s$$



With no R_b ,

$$v_g = \frac{1/g_{m1}}{R_s + 1/g_{m1}} = \text{very small}$$

$$i_d = g_{m2} v_g$$

$$\begin{aligned} v_o &= -i_d \cdot (r_{ds2} \parallel R_D \parallel R_L) = -g_{m2} (r_{ds2} \parallel R_D \parallel R_L) \cdot v_g \\ &= -g_{m2} (r_{ds2} \parallel R_D \parallel R_L) \cdot \frac{R_b + 1/g_{m1}}{R_b + 1/g_{m1} + R_s} \cdot v_s \end{aligned}$$