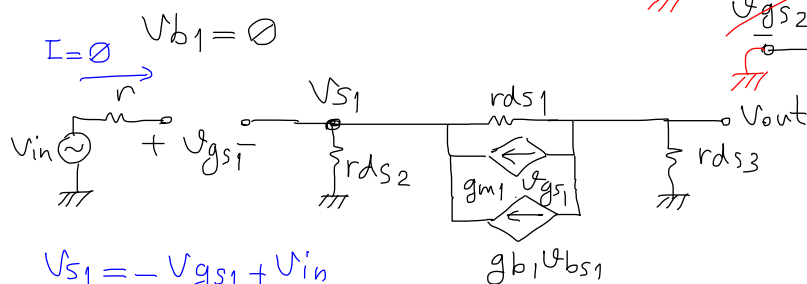
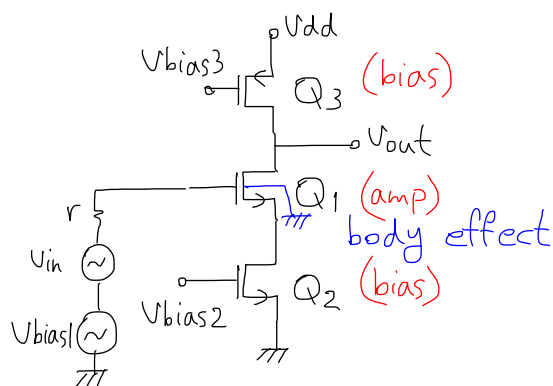


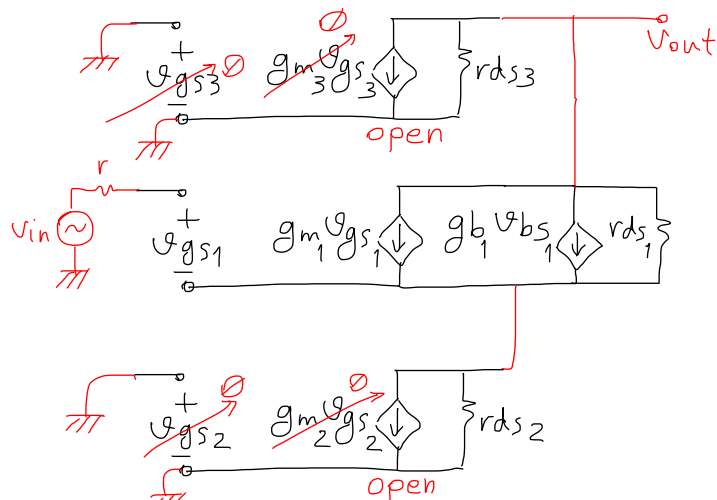
* Source degeneration amplifier: All transistors are in saturation

→ find A_{v0}



* using the KCL equations: (practice)

$$A_{v0} \approx \frac{-r_{ds3}}{r_{ds2}}$$



$$g_{m1} \cdot (r_{ds1} \parallel r_{ds2}) \approx g_m \cdot \frac{r_{ds}}{2}$$

$$g_m = \sqrt{2I_{DS}\mu_n C_{ox} \frac{W}{L}}, \quad r_{ds} = \frac{1}{\lambda I_{DS}}$$

$$A_{v0} = \frac{g_m r_{ds}}{2} = \frac{\sqrt{2\mu_n C_{ox} \frac{W}{L}}}{2\lambda} \cdot \frac{1}{\sqrt{I_{DS}}}$$

