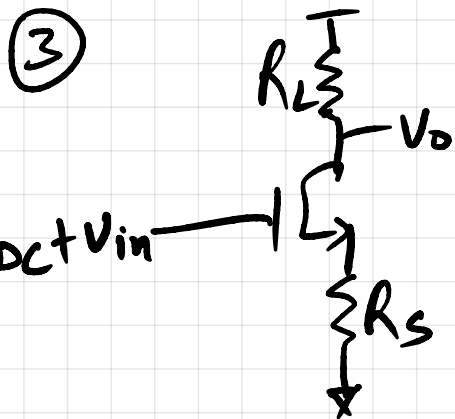
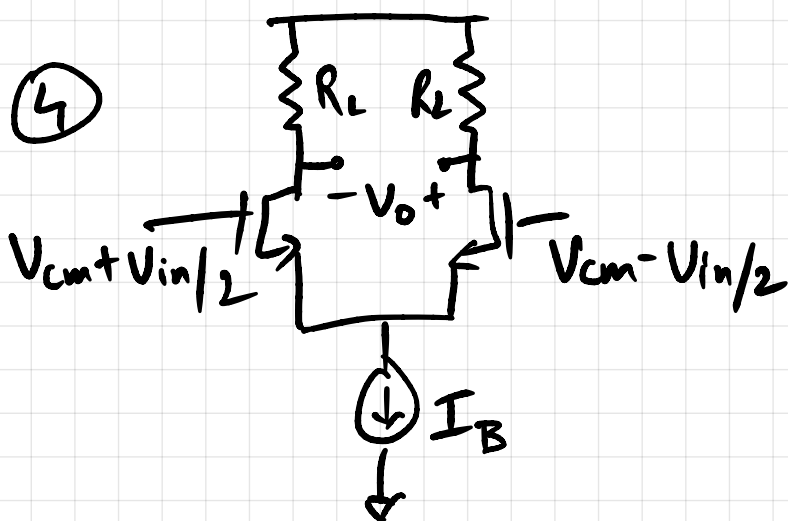


① Find $P_{0.5dB}$ of a system with third-order non-linearity.

② Input & output of an amplifier are related as $\rightarrow V_o = A_1 V_{in} + A_2 V_{in}^2 + A_3 V_{in}^3 + A_4 V_{in}^4 + A_5 V_{in}^5$
Find P_{1dB} & $1IP_3$.

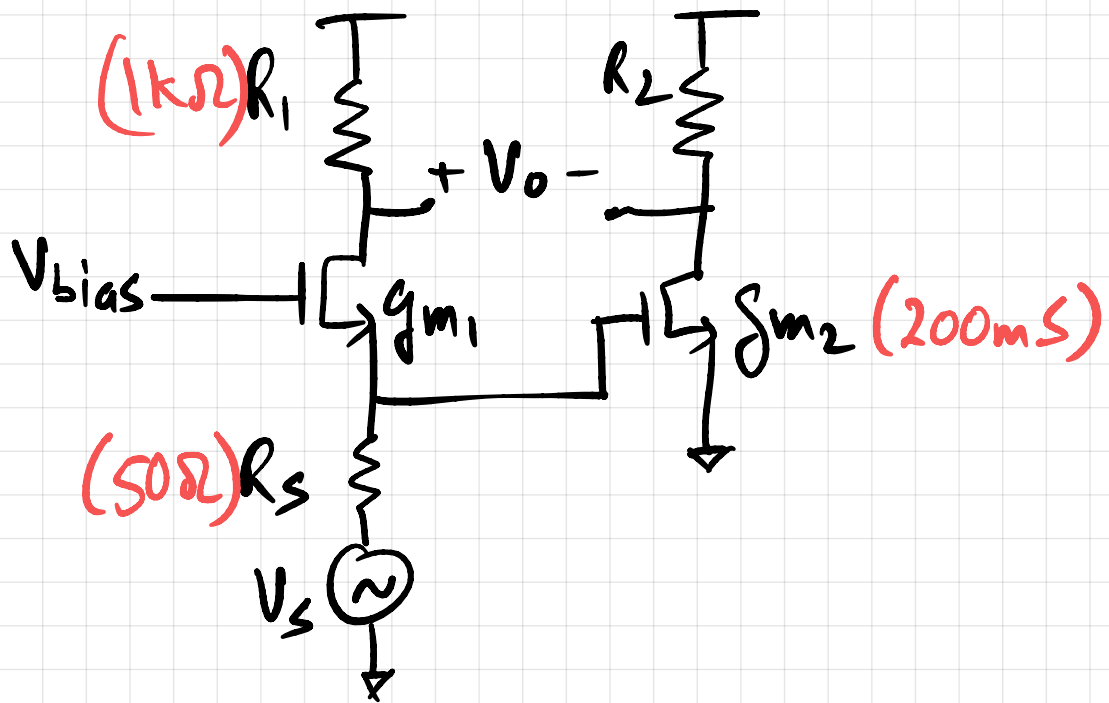


Find P_{1dB} & $1IP_2$.
Ignore body effect and channel length modulation.
Assume square law for NMOS –
$$I_{DS} = \frac{K_n}{2} (V_{GS} - V_T)^2$$



Repeat problem ③ for the differential pair.

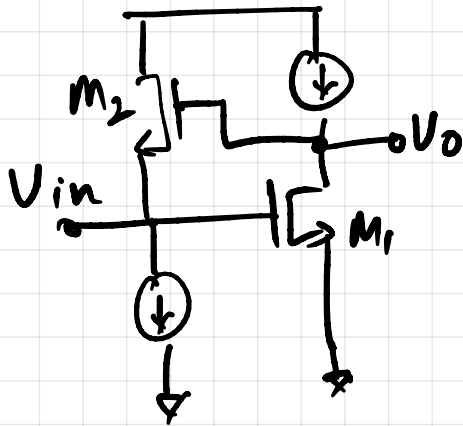
(5)



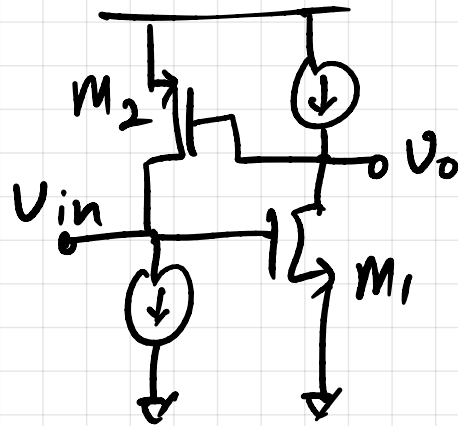
Find g_{m1} & R_2 such that input is matched and noise due to g_{m1} is cancelled at the output.

Also, find gain and N.F.

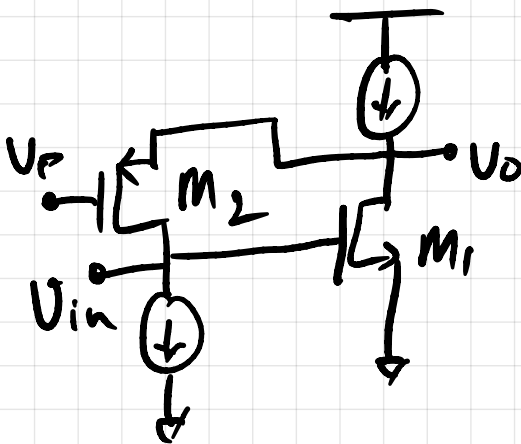
⑥ Find NF of following stages:-



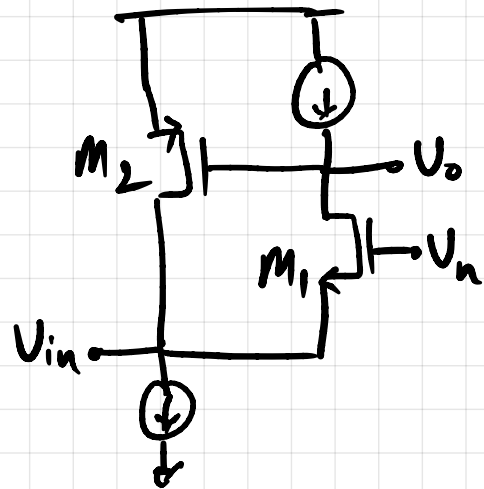
①



②



③



④

- * Assume all transistors are in saturation.
- * Ignore all parasitics and channel length modulation.