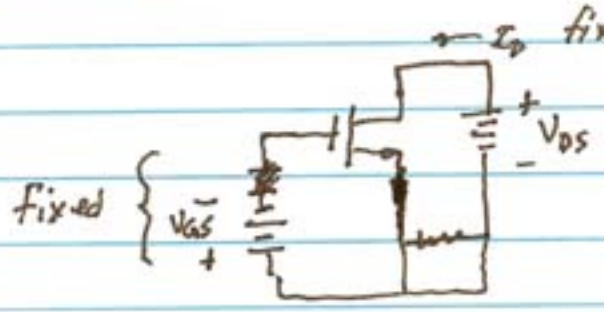
4 types MOSFETS

Voltages, currents & relations

use?



V_{GS}, V_{DS}, I_D

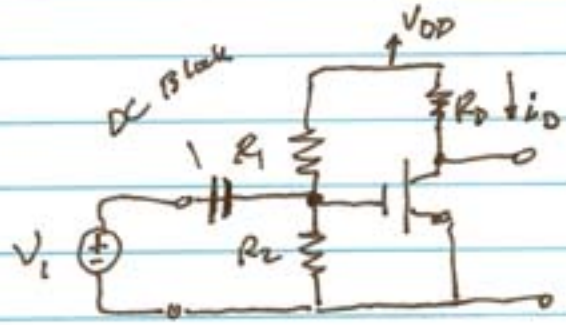
useless!

why?

not possible input

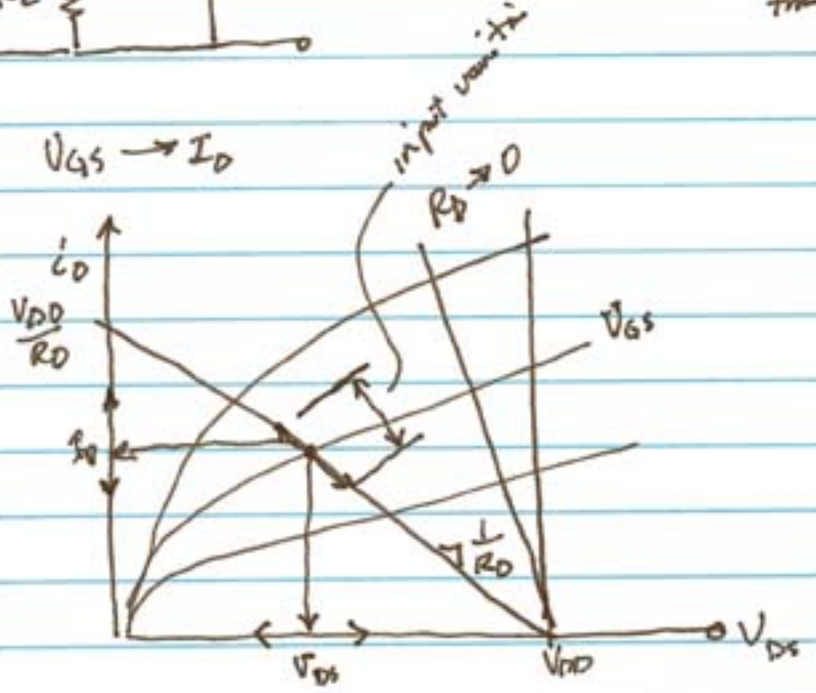
no possible output

must be able to vary input → varying output

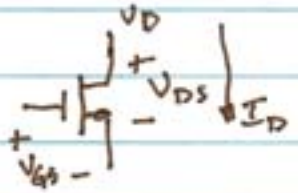


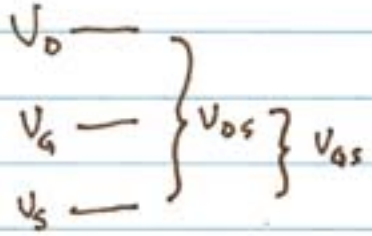
$V_{DD} - R_D i_D = V_{DD} - R_D(I_D + \theta i_D)$

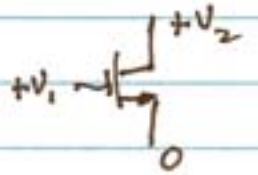
↑ from V_{GS}



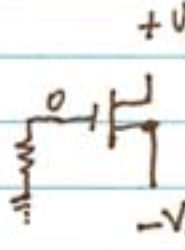
Biasing = setting of DC values that allow AC variation



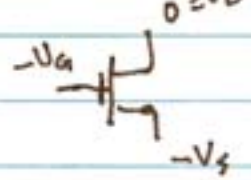




$V_2 \geq V_1$



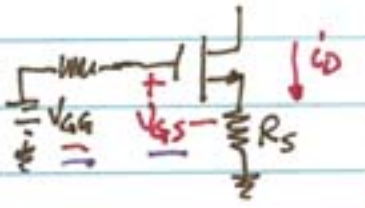
Fixed Bias



Compensate for device variation
"feedback"

SELF BIAS

for V_{GS} fixed, i_D is > or < design value



Case 1 i_D < design

$V_{GS} = V_{GG} - R_S i_D$

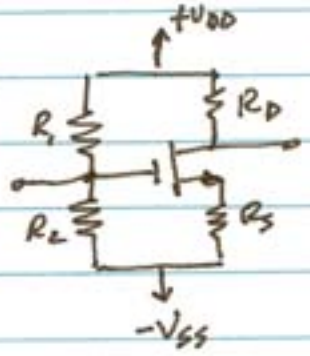
↑ too small

increase

$V_{GS} = V_{GG} - R i_D$

↑ too large

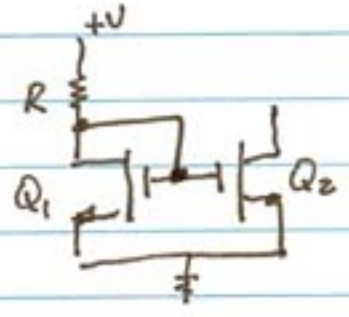
reduce



$V_{DD}, -V_{SS}$ can be = 0 (only one)

Current source bias

Current mirror



$V_{GS1} = V_{GS2}$

$I_{D1} = I_{D2}$ Given that $V_{DS1} = V_{DS2}$

$Q_1 \equiv Q_2$

$V - R I_{D1} = V_{GS1} = V_{GS2}$

↑ specify