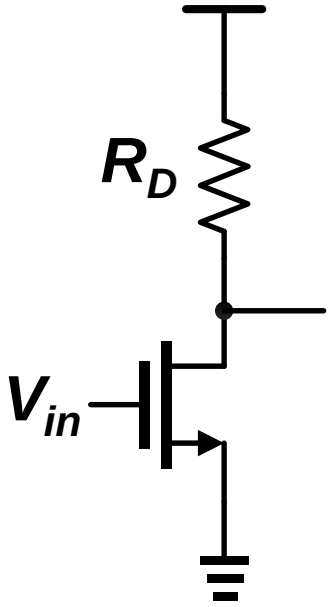
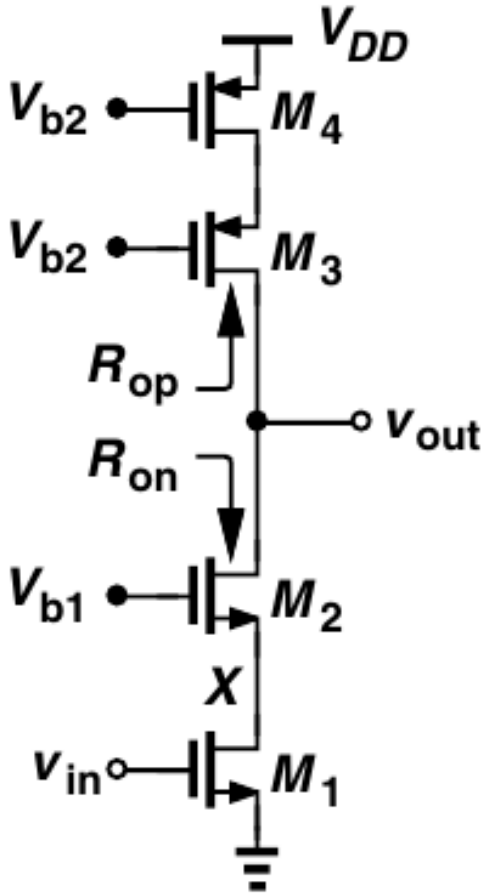
Recall Cascode in Amplifier

- Why don't we apply to differential amplifier?



Higher Gain
Achievable
By large R_{out}



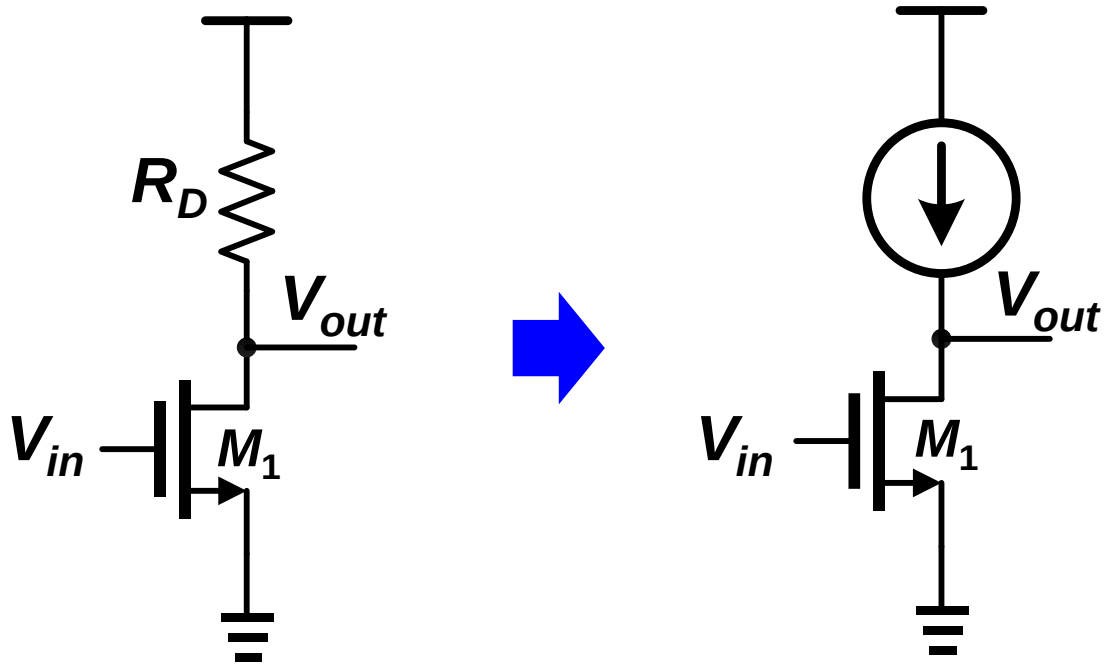
Cascode Differential Amplifier

Hanwool Jeong

hwjeong@kw.ac.kr

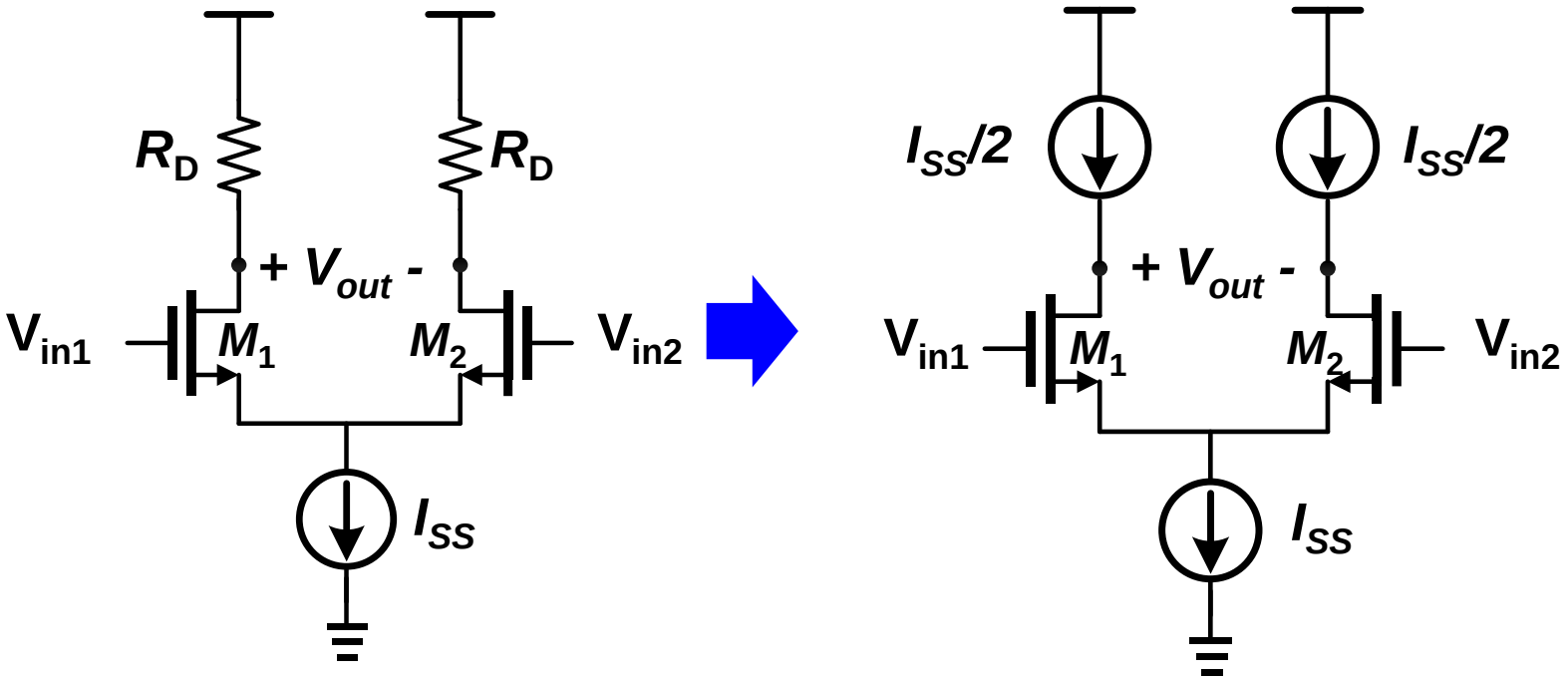
You Remember
Why R_D is Replaced with Current Source?

- You remember that a ideal current source has infinity R_{out}?



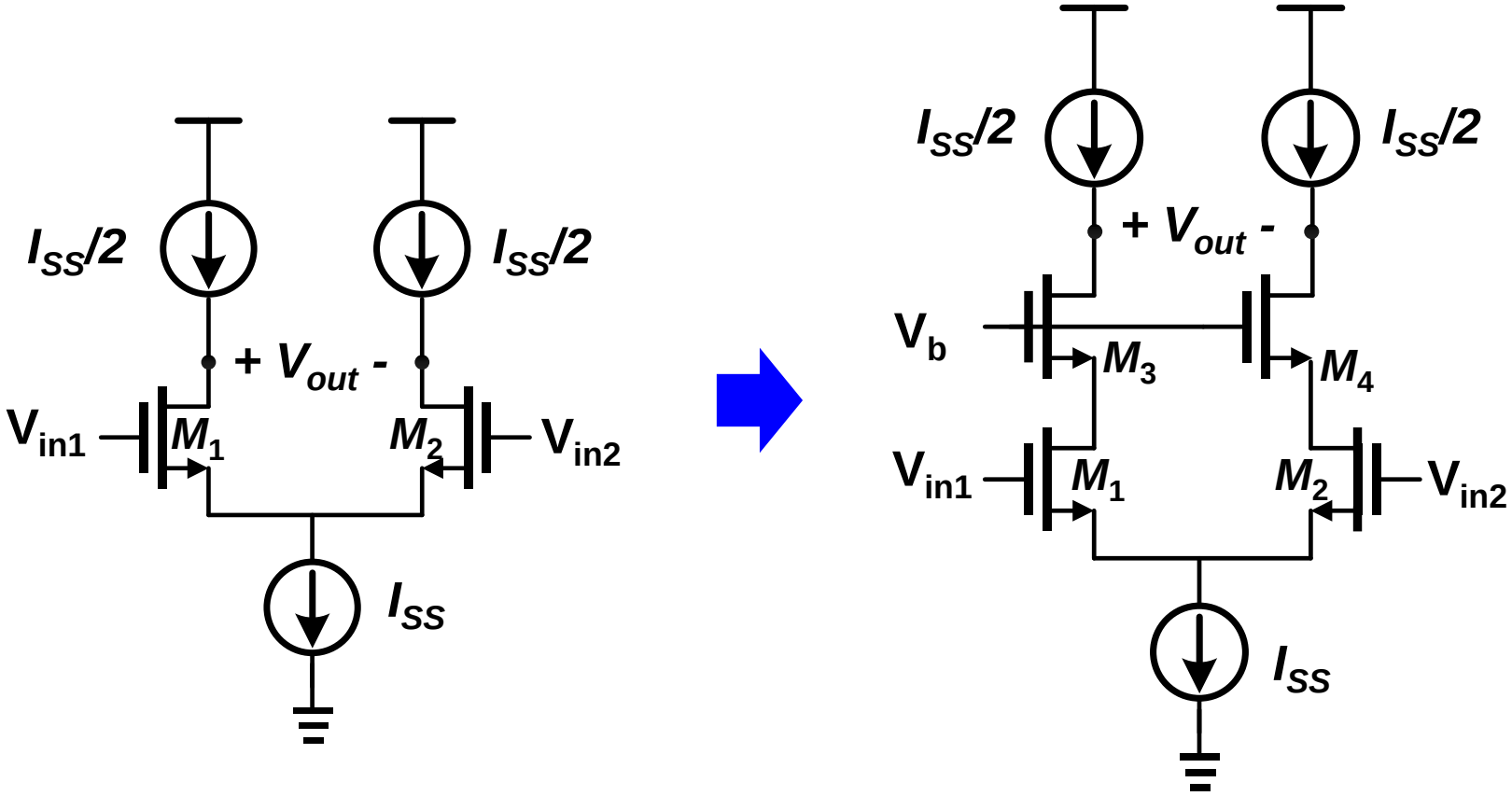
Replacing R_D with Ideal Current Source in Differential Amplifier

- You understand why?



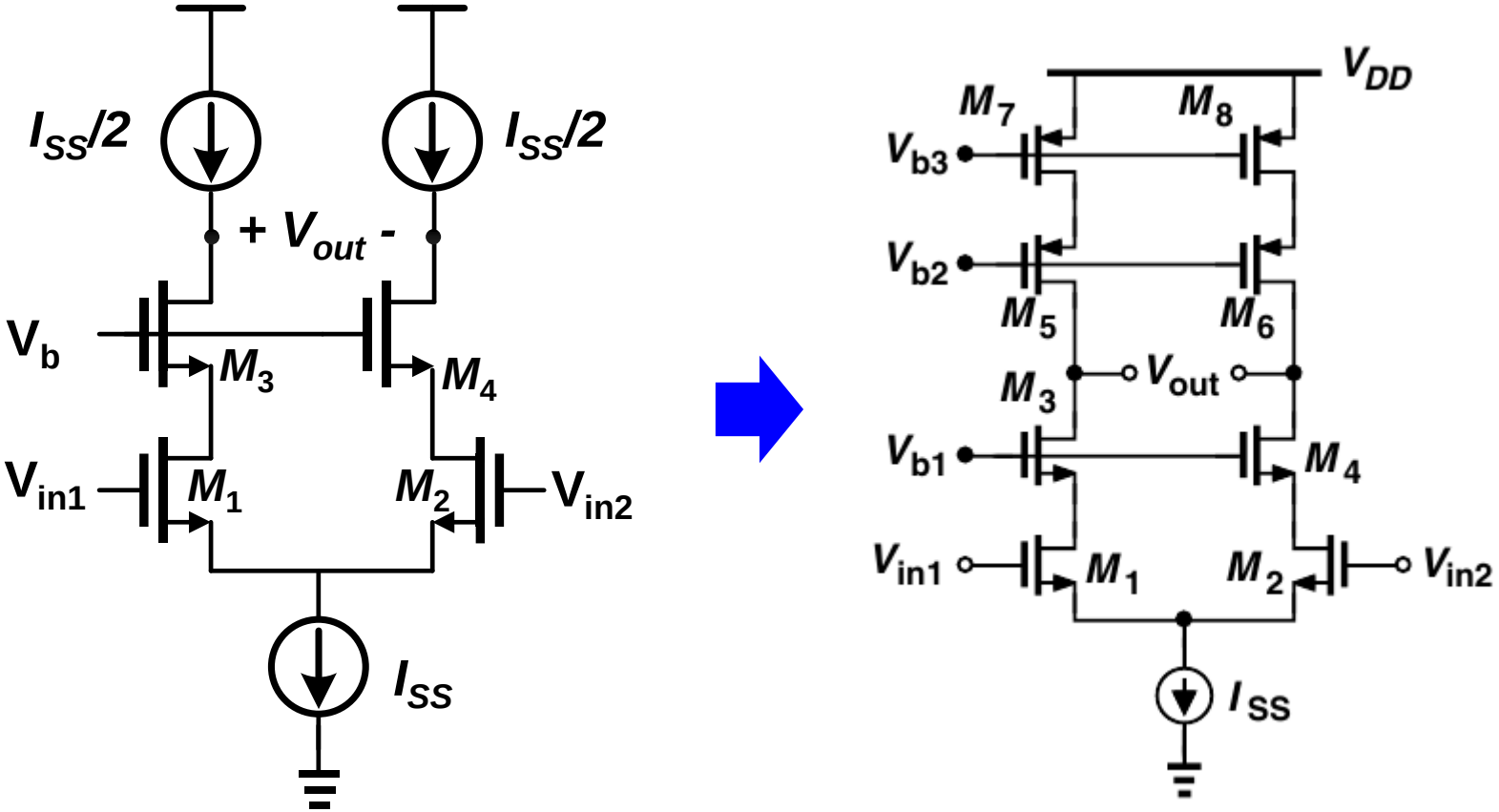
To Cascode Differential Pair

- Can you guess why?



$$A_v \approx -g_{m3}r_{O3}g_{m1}r_{O1}.$$

CMOS Telescopic Cascode Amplifier



$$A_v \approx -g_{m1}[(g_{m3}r_{O3}r_{O1})||(g_{m5}r_{O5}r_{O7})]$$

Example 10.26

Due to a manufacturing defect, two equal parasitic resistances, R_1 and R_2, have appeared as shown in Fig. 10.42(a). Compute the voltage gain of the circuit.

