Lecture23:
Selected examples

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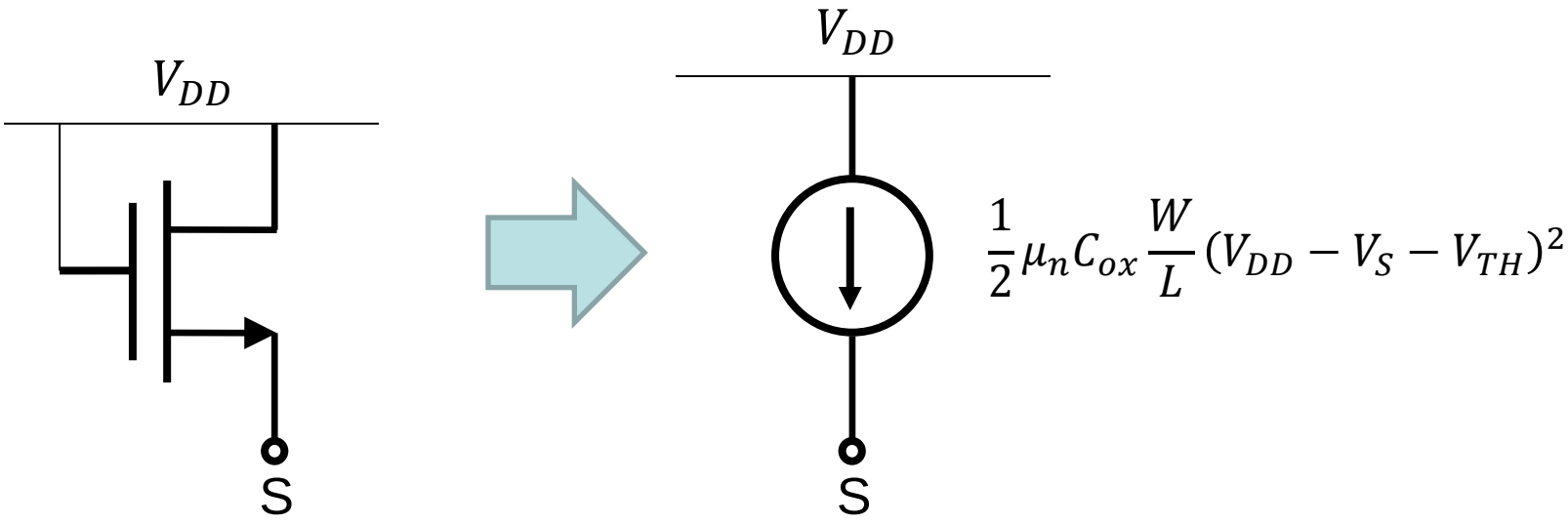
Example 6.13

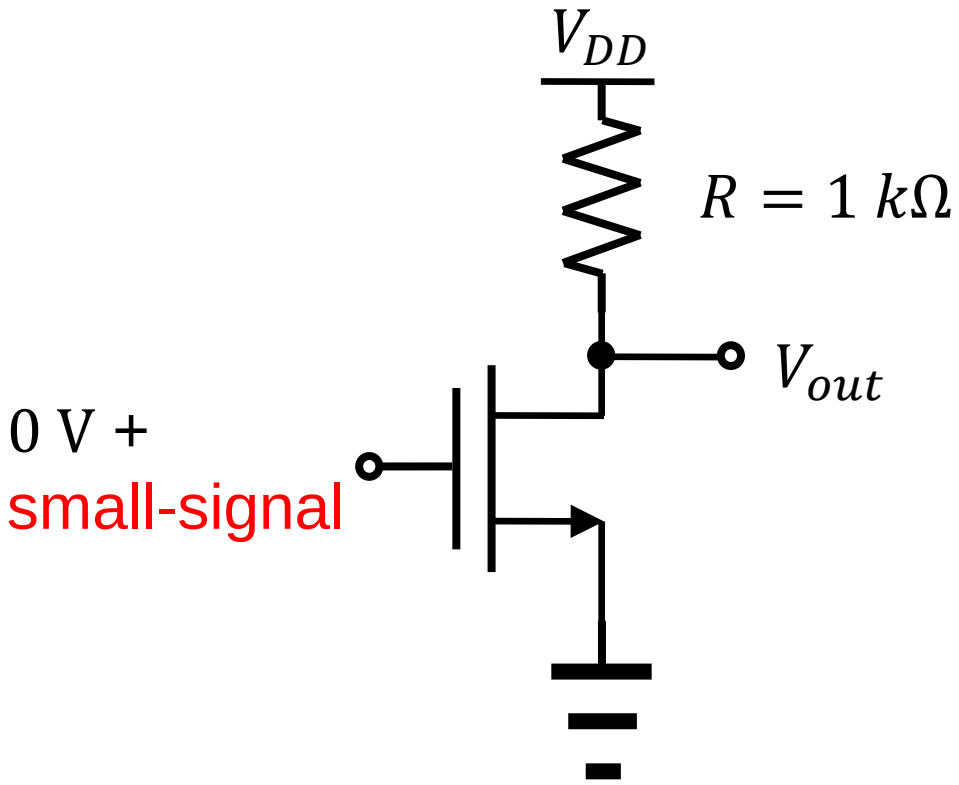
- Always in the saturation region!
  - Any necessary condition?



Gate and drain are tied.
They are connected to V_{DD}.

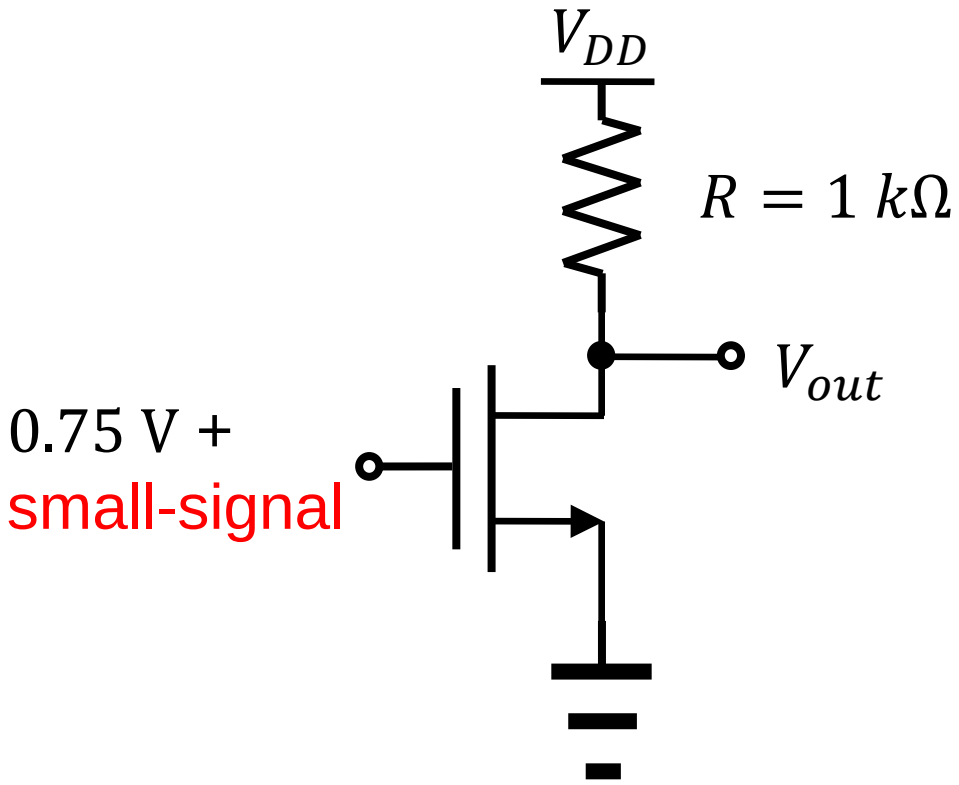
Example 17.5

- The example 17.5 shows an amplifier circuit.
  - But, the transistor is not turned on.
  - The circuit generates no output signal.



Example 17.7

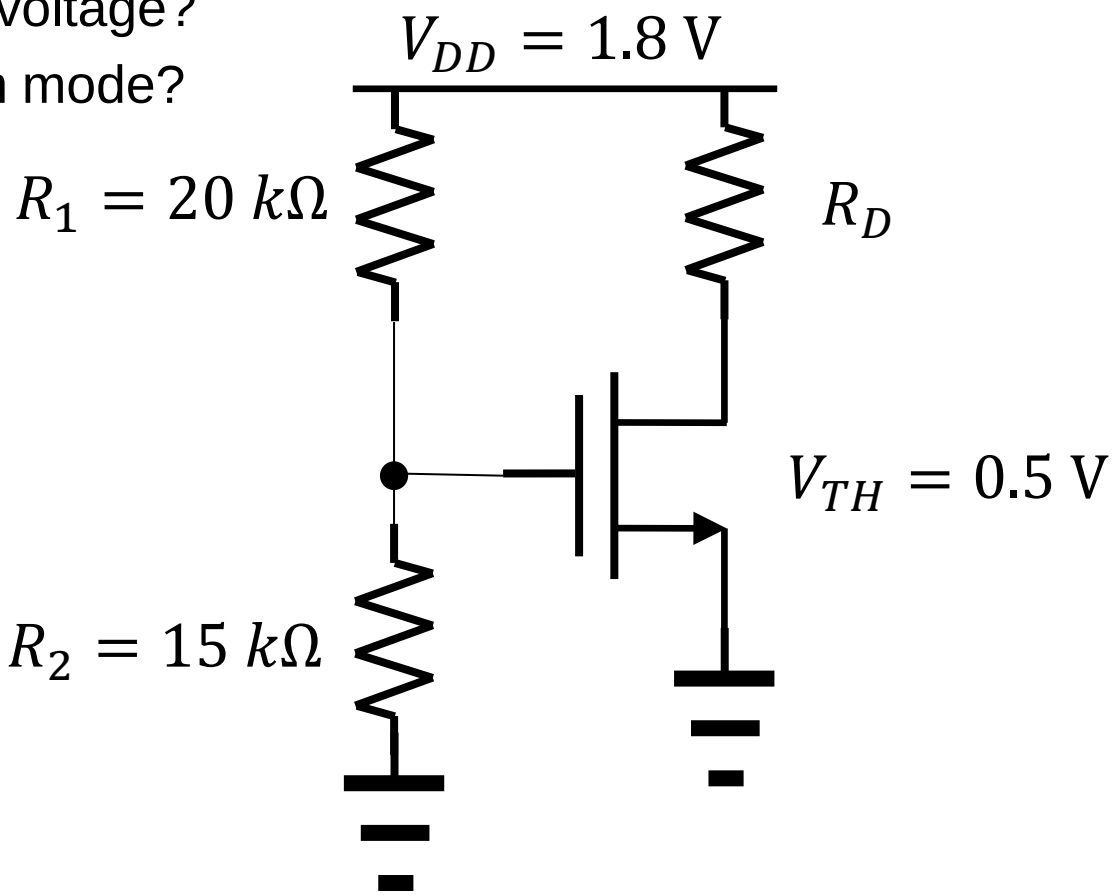
- The example 17.7 shows a revised circuit.
  - Then, how can we generate 0.75 V, for example?
  - Use of a separate battery can be a way… But,



Example 17.8

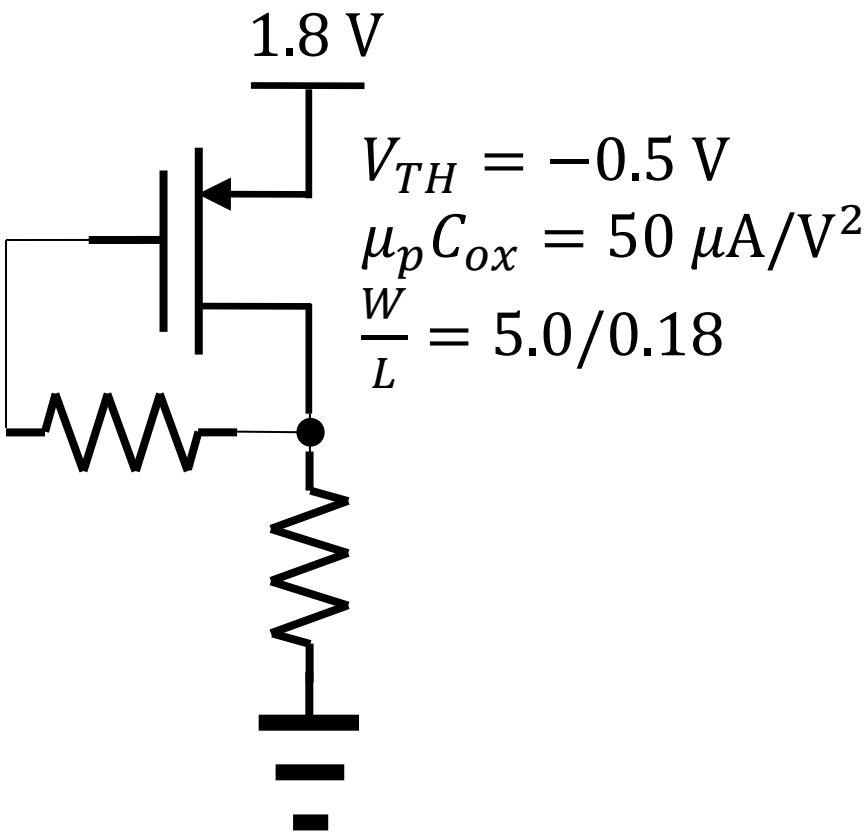
- A much better way
  - Then, what is the gate voltage?
  - Condition for saturation mode?

$\mu_n C_{ox} = 100\ \mu\text{A/V}^2$
$W/L = 5/0.18$



Example 17.13

- PMOS biasing
  - How can we get the drain current? (BTW, where is the drain?)



Example 17.14

- Calculate the gain.
  - The gain is given by $A_v = -g_m R_D$.
  - How can we get the transconductance?

$\mu_n C_{ox} = 100\ \mu\text{A/V}^2$
$V_{TH} = 0.5\ \text{V}$
$W/L = 10/0.18$