DC Voltage Shifer/Source Follower
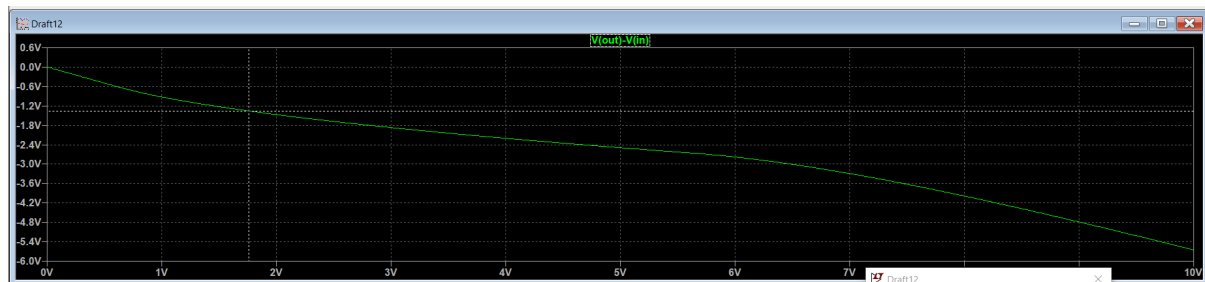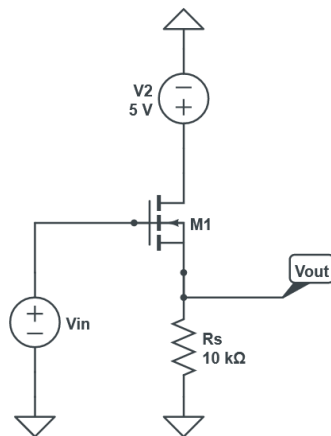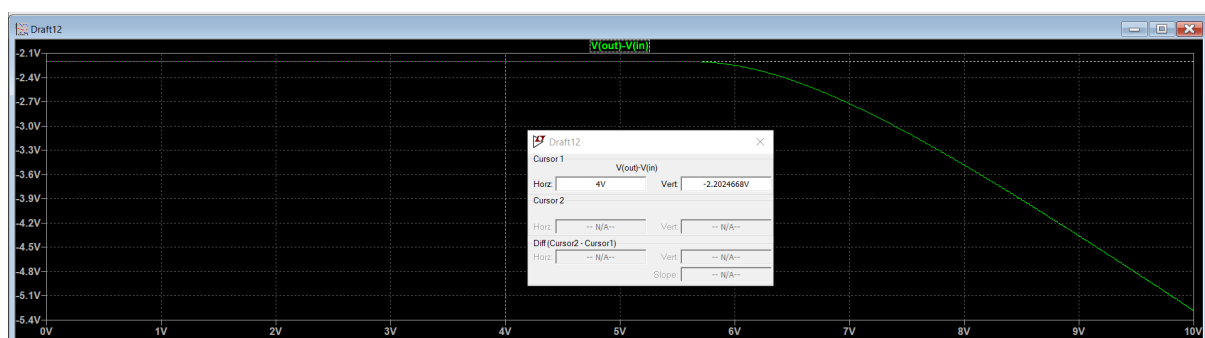
1. When Resistor Load is there:
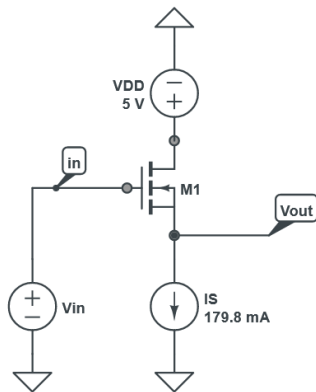

With Resistor load

- In this case output voltage V_{out} will depend on square-root of input voltage V_{in}.
- because current varies as function of input voltage due to finite resistance R_S.
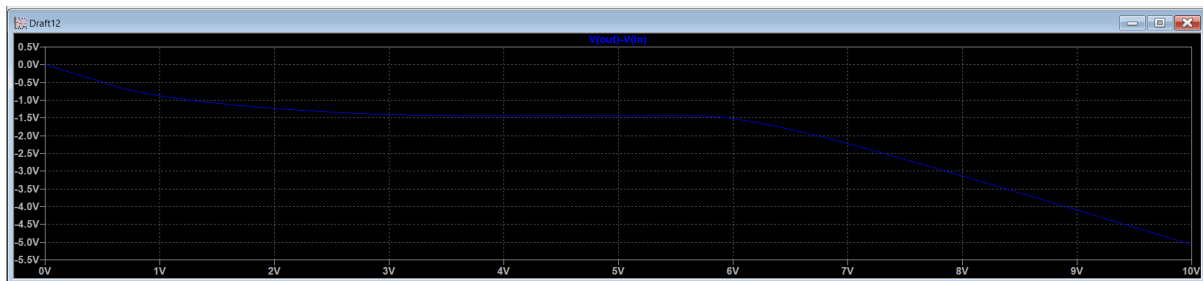

2. Ideal Current Source

Ideal Current source

- As this is ideal current source with infinite parallel resistance,

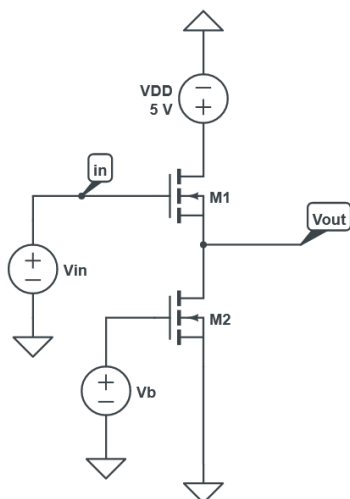 $V_{out} - V_{in}$ remains constant till `M1` is in saturation

3. MOSFET Current Source

Current source using MOSFET

- In this case there is finite r_o due to channel length modulation but, $V_{out} - V_{in}$ remains constant for some range of V_{in}.

https://s3-us-west-2.amazonaws.com/secure.notion-static.com/04540a74-7a82-44e0-ab2a-e288dbdf19ab/Draft12.asc