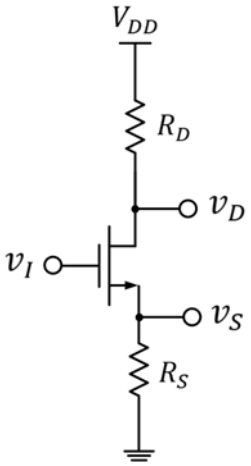
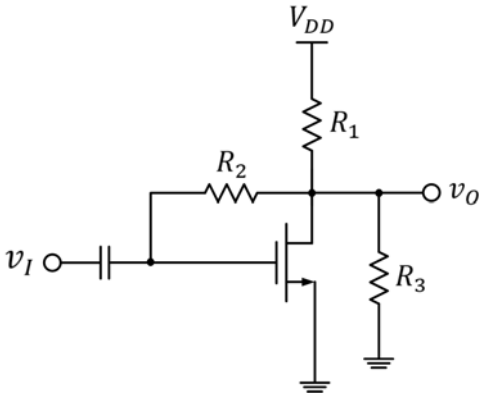
Sheet 2: AC Analysis of MOSFET

1) For the circuit shown find the input resistance, the voltage gain $A_{v1} = v_d/v_i$, $A_{v2} = v_s/v_i$ and the output resistance for the two output locations.



2) The NMOS has $V_{Tn} = 1.5V$, and $k_n = 0.25mA/V^2$. $R_1 = R_2 = R_3 = 10k\Omega$ and $V_{DD} = 15V$. Analyze the circuit to get the values of A_v, R_{in}, and R_{out}.



3) Construct the small-signal model of the circuits shown below and determine the input and output resistances. Assume $\lambda \neq 0$.