

(mbreak N 4)

$$V_D - V_S > V_{G1} - V_S - V_{TH}$$

$$V_D > V_G - V_{TH}$$

$$V_D - V_{G7} > -V_{TH}$$

$V_{GD} < V_{TH}$ ← finish

Other condition: $V_{GS} \geq V_{TH}$

Step 2)

V_{GS}	V_{DS}	I_D	State
1V	3.6125	295.2 μ A	cutoff
2V	4.38336	131.2 μ A	triode
4V	-17.199	4.72 mA	saturation

$$V_{th} = 1.6V$$

$$K = 0.00082$$

Showing process for $V_{GS} = 1V$. (2V & 4V share same process)

$$V_{DS} = V_{DD} - I_D R_D = V_{DD} - R_D (K (V_{GS} - V_{TH}))^2$$

for $V_{GS} = 1$: $3.612 > 1 - 1.6$ & $1 \geq 1.6$

2 : $4.38336 > 2 - 1.6$ \checkmark \times $2 \geq 1.6$

4 : $-17.199 > 4 - 1.6$ & $4 \geq 1.6$


