M_2: edge of saturation $\rightarrow$ $\underbrace{V_{in} - V_{th}}_{V_b} = \underbrace{V_{DS}}_{V_{out}}$

$$V_{th} = V_{th0} + \gamma\left(\sqrt{2\phi_F + \underbrace{V_{SB}}_{0}} - \sqrt{2\phi_F}\right)$$

$V_{th} = V_{th0} = 0.7$

$V_b = V_{DS} + V_{th} = 1.5 + 0.7 = 2.2V$

$\boxed{V_b = 2.2V}$ $\rightarrow$ $V_b = V_{gs_2} = V_{gs_1} + 0.5$

$V_{gs_1} = 2.2 - 0.5 = 1.7V$

$\boxed{\left(\dfrac{W}{L}\right)_2 = 11.66}$ $\boxed{V_{gs_1} = V_{in} = 1.7V}$