Step 3 $$I_D = \frac{\mu C'_{ox}}{2} \cdot \frac{W}{L}(V_{GS} - V_{TH})^2$$

$$\sqrt{I_D} = \sqrt{\frac{\mu C'_{ox}}{2} \cdot \frac{W}{L}(V_{GS} - V_{TH})^2}$$

$$\sqrt{I_D} = \left(\sqrt{\frac{\mu C'_{ox}}{2} \cdot \frac{W}{L}}\right)(V_{GS} - V_{TH})$$

$$5.9161m = \left(\sqrt{\frac{\mu C'_{ox}}{2} \cdot \frac{W}{L}}\right)(1.46 - V_{TH}) \qquad \text{(case 1)}$$

$$\frac{5.9161m}{1.46 - V_{TH}} = \left(\sqrt{\frac{\mu C'_{ox}}{2} \cdot \frac{W}{L}}\right), \quad \frac{1.46}{5.9161m} - \frac{V_{TH}}{5.9161m} = \left(\sqrt{\frac{\mu C'_{ox}}{2} \cdot \frac{W}{L}}\right)^{-1}$$

$$\frac{V_{TH}}{5.9161m} = \frac{1.46}{5.9161m} - \left(\sqrt{\frac{\mu C'_{ox}}{2} \cdot \frac{W}{L}}\right)^{-1}, \quad \boxed{V_{TH} = 1.46 - 5.9161m\left(\sqrt{\frac{\mu C'_{ox}}{2} \cdot \frac{W}{L}}\right)^{-1}}$$

$$20.7364m = \left(\sqrt{\frac{\mu C'_{ox}}{2} \cdot \frac{W}{L}}\right)(2.18 - V_{TH}) \qquad \text{(case 2)}$$

$$\frac{20.7364m}{2.18 - V_{TH}} = \left(\sqrt{\frac{\mu C'_{ox}}{2} \cdot \frac{W}{L}}\right), \quad \frac{2.18}{20.7364m} - \frac{V_{TH}}{20.7364m} = \left(\sqrt{\frac{\mu C'_{ox}}{2} \cdot \frac{W}{L}}\right)^{-1}$$

$$\frac{V_{TH}}{20.7364m} = \frac{2.18}{20.7364m} - \left(\sqrt{\frac{\mu C'_{ox}}{2} \cdot \frac{W}{L}}\right)^{-1}, \quad \boxed{V_{TH} = 2.18 - 20.7364m(\ldots)^{-1}}$$

let $\left(\sqrt{\frac{\mu C'_{ox}}{2} \cdot \frac{W}{L}}\right)^{-1} = \alpha$. $1.46 - 5.9161m\alpha = 2.18 - 20.7364m\alpha$

$\left(\sqrt{\frac{\mu C'_{ox}}{2} \cdot \frac{W}{L}}\right) = \frac{1}{\alpha} = 20.58375m$ $\quad 14.8203m\alpha = .720$, $\alpha = 48.58201251$

or

$$\frac{\mu C'_{ox}}{2} \cdot \frac{W}{L} = (20.58375m)^2 = 423.6908m = 4.236408 \cdot 10^{-4}$$

$$V_{TH} = 2.18 - 20.7364m(48.58201251) = 1.172583956$$