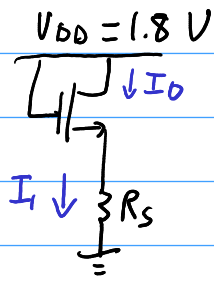


6.26



Given  $\lambda = 0$ .

Find an expression for  $\frac{W}{L}$  to achieve a bias current  $I_1$ .

Notice  $V_{GS} = V_{DS} \quad \therefore V_{DS} > V_{GS} - V_{TH}$   
 $\therefore$  Device is in saturation.

Also notice  $I_D = I_1$

$$\therefore I_1 = \frac{1}{2} \mu_n C_{ox} \frac{W}{L} (V_{GS} - V_{TH})^2$$

$$V_{GS} = V_{DD} - I_1 R_S$$

$$\therefore I_1 = \frac{1}{2} \mu_n C_{ox} \frac{W}{L} (V_{DD} - V_{TH} - I_1 R_S)^2$$

Solve for  $\frac{W}{L}$ .

$$\frac{W}{L} = \frac{2 I_1}{\mu_n C_{ox} (V_{DD} - V_{TH} - I_1 R_S)^2}$$