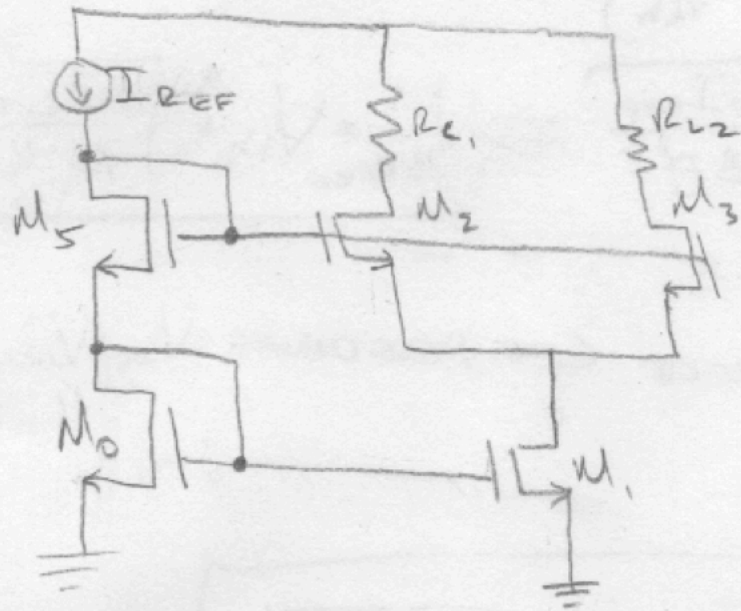* TO GENERATE V_{BIAS_2} WITHOUT AN ADDITIONAL CURRENT SOURCE I WILL USE THE TOPOLOGY BELOW:

$$I_{REF} = \frac{\beta}{2}\left(\frac{W}{L}\right)_S \left(V_{BIAS_2} - 2S\sqrt{I_{REF}} - V_{th}\right)^2 \quad \overbrace{}^{V_{OV-0}}$$

$$\left(\frac{W}{L}\right)_S = \frac{2I_{REF}}{\beta\left(V_{BIAS_2} - 2S\sqrt{I_{REF}} + V_{th} - V_{th}\right)^2}$$

$$\boxed{\left(\frac{W}{L}\right)_S = \frac{2I_{REF}}{\beta\left(2S\sqrt{I_{REF}} + V_{th}\right)^2}}$$

* SENSITIVE TO PROCESS VARIATION.

* THIS CIRCUIT IS SENSITIVE TO V_{BIAS} BECAUSE IT DIRECTLY AFFECTS THE CURRENT (AND HENCE THE TRANSCONDUCTANCE AND GAIN) THROUGH M_2 & M_3.