Problem 3.4 (2 points) Resistor $R$ can be used to model the parasitic resistance associated with routing current sources for long distances on an IC. Find the largest value for $R$ such that $I_o$ is within 1% of the current reference value in Figure 3. Assume $(W/L)_1 = (W/L)_3 = (W/L)_2 = 2$.

$$I_o (\text{min}) = (0.99) (600 \, \mu \text{A}) = 594 \, \mu \text{A}$$

$$I_o (\text{min}) R = \Delta V_{o1} - \Delta V_{o2} \bigg|_{I_o (\text{min})} \Rightarrow R \left(594 \, \mu \text{A}\right) = \frac{2(600 \mu \text{A})}{\sqrt{(300 \mu \text{A}/\sqrt{2})^2}} - \frac{2 (594 \, \mu \text{A})}{\sqrt{(300 \mu \text{A}/\sqrt{2})^2}}$$

$$R = 119 \, \Omega$$