1. This circuit is called a Wilson Current Mirror.
(a) Find $V_{in}$, $V_{out,min}$, $R_{out}$ and $\epsilon$ for this current mirror. Assume all devices have the same $I_s$ and beta.
(b) Draw a PNP version of this current mirror.

2. Select an $I_b$ and $V_b$ for the amplifier shown in Figure 2 to achieve a differential mode gain of 20 and a DC output voltage of 4V. Assume $\mu n C_{ox} = 200 \mu A/V^2$, $V_t=1V$, $\lambda = 0 V^{-1}$, and the tail node sits at 1V.
Note that MOSFET mirrors have no ε because there is no gate current, but also note that the output current is affected by the W/L ratio of the output MOSFET.