1. [5 pts] Kittel-Kroemer, problem 13-1. Expand the results retaining the lowest interesting terms in $\Delta n/n_i$.

2. [5 pts] Kittel-Kroemer, problem 13-2. Mobilities appear as coefficients of proportionality between applied electric field and induced current densities in a medium. They reflect characteristics of carrier motion within the two bands. Treat them as constants independent of dopant concentrations. In (a), take $n_e$ as independent variable and find a value that minimizes the conductivity. Thereafter you can compute $n_h$ and $\Delta n$. In (c), look only for numerical values of the ratio in (b).
