5.25   Assume that the mobility of electrons in silicon at $T = 300$ K is $\mu_n = 1300$ cm²/V-s.
Also assume that the mobility is limited by lattice scattering and varies as $T^{-3/2}$.
Determine the electron mobility at (*a*) $T = 200$ K and (*b*) $T = 400$ K.

We are given that $\mu \propto T^{-3/2}$. This implies $\mu_{n,300} = 1300 = C(300)^{-3/2}$ where C is the proportionality constant.

Solving for C yields $\Rightarrow C = 1300\,(300)^{3/2} = 6754998.15$.

a) At 200 K, $\mu_{n,200} = 6754998.15(200)^{-3/2}$ $\Rightarrow$ $\underline{\mu_{n,200} = \mathbf{2388.25\ cm^2/V \cdot s}}$

b) At 400 K, $\mu_{n,400} = 6754998.15(400)^{-3/2}$ $\Rightarrow$ $\underline{\mu_{n,400} = \mathbf{844.37\ cm^2/V \cdot s}}$