7.60 To do a good sketch we need to know a couple of points. Of course, both contributions to the heat capacity go to 0 at T=0. Next let's determine where the two contributions are equal. Abbreviating
\[
A = \frac{12\pi^4 N k}{5 T_0^3}, \quad 7.116 \text{ needs}
\]

\[
\text{lattice}
\]

\[
C_v = 8T + AT^3.
\]

\[
\text{conduction electrons}
\]

Setting the two terms equal gives

\[
\sqrt{\frac{\gamma}{A}} = AT^{\gamma/2} \Rightarrow T = \sqrt[\gamma/2]{\frac{\gamma}{A}}
\]

We can estimate \( \gamma \) from the intercept in fig 7.28 and \( A \) from the slope of the same graph.

\[
\gamma = 0.7 \times 10^{-3} \text{ J/K}^2 \quad A = 5.4 \times 10^{-5} \text{ J/K}^4
\]

\[
T \approx \sqrt{\frac{0.7 \times 10^{-3} \text{ J/K}^2}{5.4 \times 10^{-5} \text{ J/K}^4}} = 3.5 \text{ K}
\]

We can evaluate the heat capacity of one of the terms at the temperature:
\[ C_v^{\text{electron}} \approx gT = 0.7 \times 10^{-2} \frac{T}{K} \times \frac{3.5}{K} \]

\[ \approx 2.5 \times 10^{-3} \text{ J/K}. \]

So our sketch would look like:

![Graph](image_url)