

Problem Set 5
(due Wednesday, February 15)

1. Problem 3.10, page 97.
2. Problem 3.14, page 97.
3. Problem 3.16, page 98.
4. Problem 3.20, page 107.
5. Problem 3.24, page 107. (This is another spreadsheet problem. In it you will see why the vibrational degrees of freedom in a solid “freeze out” at low temperature. It is this feature of heat capacities that Einstein was trying to explain when he proposed his model of a solid in 1907. Be sure to pay attention to the detailed instructions and hints in the problem, especially the bit about the centered-difference approximation for derivatives.)
6. Problem 3.25 (except part f), page 108. (This is an analytic approach to the same problem that you just solved numerically. For the graph in part (e) you could use a spreadsheet, but I recommend Mathematica. See the “Computer problems” page on the textbook’s web site for an example of how to use Mathematica’s Plot function. There’s no need to repeat the estimates of ϵ that you made at the end of the previous problem.)
7. Problem 3.31, page 114.
8. Problem 3.32, page 114.
9. Answer the questions on the reverse side of this sheet.

Textbook Comments

Problem Set 5

With respect to the portion of your textbook that was covered by this problem set, including the problems themselves ...

Describe at least one thing that you liked about the book. Please be as specific as you can.

Describe at least one thing that you disliked about the book, or one way in which the book could be improved. Please be as specific as you can.