

Due date: Thursday, Oct. 2

Deadline: Tuesday, Oct. 7

1. (5) 3.1 Explicit calculation of C_v using Table 3.1. Use the center-difference approximation: take a difference of the values just above and just below the point where you seek the derivative.
2. (15) 3.34 (except g) Use of 2-state model to understand the negative linear expansion coefficient of rubber, as promised earlier in the semester.
3. (15) 3.24 Consideration of the Einstein model with Excel. Warning: when doing the case $N=5000$, you will probably not be able to go beyond $q=160$ or so. This will not hinder you in finding the low-temperature behavior of the heat capacity, which is the goal of this problem.
4. (15) 3.25 (except f) Analytic consideration of the Einstein model.
5. (10) 2.37. Mixing of non-equal quantities of gases. The initial volumes of the 2 gases are proportional to their number. They should be imagined as ideal gases having the same pressure. Thus, for example, the xN B molecules expand to fill a volume that is greater by a factor $1/x$.