

## PHY 3513 Fall 2000 – Extra Credit Assignment

*This assignment is voluntary. You can use it to earn up to 25 points extra credit, or 8.33% of the total score computed from the three exams and the homework.*

*Answer as many of the questions as you like. The maximum points for each question are indicated in square brackets. To obtain full credit, you must explain your reasoning and show all working. Please write neatly and include your name on the front page of your answers.*

*This assignment is due **no later than 5 p.m. on Friday, December 15.** Please hand your answers to Kevin Ingersent personally, or push them under his office door if he is absent. **Do not leave them in a Physics Department mailbox.***

1. Callen Problem 5.3–1 [5 points].

Recall that we found the Helmholtz free energy in class, and that we went out of our way to eliminate  $s_0$  (the molar entropy in the reference state “0”) from the final expression. In doing this problem, you may leave  $s_0$  in your answers.

2. Callen Problem 5.3–3 [3 points].
3. Callen Problem 5.3–7 [3 points].
4. Callen Problem 5.3–13 [4 points].
5. Callen Problem 6.2–1 [2 points].
6. Callen Problem 7.2–2 [1 point].
7. Callen Problem 8.1–2 [2 points].
8. Callen Problem 8.2–1 [5 points].