Physics 410 - 2003

Thermal Physics

Problem Set 5

1. Chapter 3, p. 82, problem 3 (6 pt); calculate the heat capacity (3 pt)

2. Chapter 3, p. 84, problem 6 (a)-(d)(2 pt for each of the 4 parts)

3. Chapter 3, p. 86, problem 11 (6 pt)

4. Heat capacity for constant pressure is given by the expression

$$C_p = \tau \left(\frac{\partial \sigma}{\partial \tau} \right)_p .$$

   Using Maxwell relations, show that

$$[\partial C_P / \partial p]_\tau = -\tau [\partial^2 V / \partial \tau^2]_p \, (6\,\text{pt})$$

You need to have 25 points out of 29 (4 points are extra credit).

The problems are from Kittel & Kroemer, *Thermal Physics*, 2nd edition, (Freeman, NY 1980).