Department of Physics, University of Maryland, College Park, MD 20742-4111

Physics 404   **HOMEWORK ASSIGNMENT #2**   **Spring 2012**

Due date: Thursday, Sept. 13   **Deadline:** Tuesday, Sept. 18

S means a problem in Schroeder's text.

1. S 1.28 Time to heat water in microwave. Assume the water is initially at 20°C.

2. S 1.34 This problem involves computing work during isobaric and isochoric/isovolumetric processes.

3. S 1.36 a & b, S 1.37 Adiabatic processes, including why Diesel engines do not need spark plugs. In S 1.36 b, you must derive the general formula for work done in an adiabatic process, a very important result.

4. S 1.41 Measuring heat capacity.

5. S 1.47 & S 1.54c Exercise using heat capacity and latent heat: Using ice to cool a drink and how much water to drink while hiking. In S 1.54c, you may use the result of 1.54a that the mechanical work in climbing to the summit is 210 kcal, that the hiker is only 25% efficient, and that the remaining food (chemical) energy is thermal energy that must be dissipated by sweating (evaporating water). Note that at 25°C the latent heat involved is 40 kcal/kg higher than at 100°C.