AOS 100/101
Spring 2012

HOMEWORK #2
(Due Fri. February 24)

Please provide concise, grammatically correct, neatly written answers to the following questions. All questions can be answered in, at most, a few sentences. Don't forget to write your name on the paper!!!

NAME:

1) In some winters the temperature can drop below 0°C even in central Florida. On such occasions, orange growers intentionally spray their trees with liquid water knowing the water will freeze. With reference to latent heats, explain how this practice insulates the valuable fruit from freezing.

(10 pts)

2) A friend of yours conducts an experiment in which she places a small beaker of fluid into a larger beaker of fluid and observes changes in the temperatures of the fluids. She tells you that the initial and final conditions of the experiment are represented by the diagrams labeled INITIAL and FINAL in Fig. 1. Is this an accurate statement? How can you be sure? Explain your answer in terms of the Second Law of Thermodynamics.

(10 pts.)

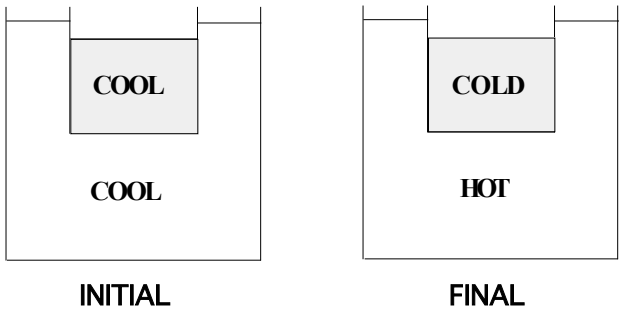

FIG. 1

3) Assume Object A does not become progressively warmer or colder with the passage of time. If Object A is absorbing 100 units of radiant energy every second, how much is it emitting? Explain your answer with reference to the concept of *radiative equilibrium*. (10 pts.)

4) Snow behaves like a *black-body* with respect to infra-red radiation. Given this fact, explain why the temperature inside igloos and snowcaves becomes more comfortable the longer they are inhabited. (Kirchoff's Law will help here).

(10 pts.)