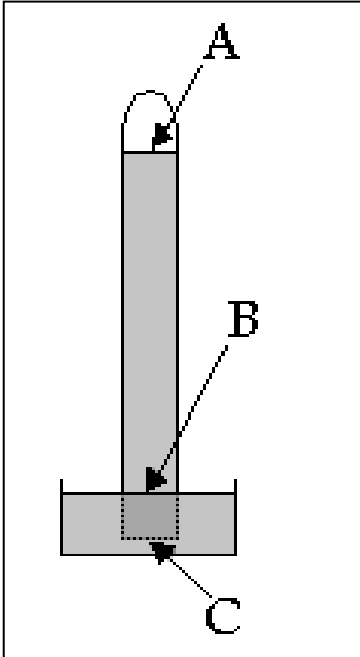


NAME: _____ QUIZ SECTION: _____

Atmospheric Sciences 101 Spring 2013
Homework #1 (Due Thursday, 11 April 2013)

1. Atmospheric pressure is defined as the weight of the atmosphere above a surface. The figure below represents a mercury (Torricelli) barometer. The atmospheric (barometric) pressure is measured to be 1000mb. [2]



- a. At the top of the column of mercury (point **A**), what would be the pressure in millibars (mb)? [0.5]
- b. At point **B** (level with the surface of mercury in the surrounding dish), what would be the pressure in millibars due to the weight of mercury? [0.5]
- c. How would the pressure at point **C** (due to the weight of mercury in the column) compare to that of point **B**? [0.5]
- d. If the atmospheric pressure were to increase, what will happen to the mercury column height? [0.5]

2. Temperature and Latent Heat Transfer [2]

- a. As temperature increases what happens to the kinetic energy of the molecules? [1]
- b. Dry ice (frozen carbon dioxide) changes directly from solid to gas. What is this process called? [0.5]
- c. During this process, is latent heat released to or absorbed from the surroundings? [0.5]

3. Atmospheric Structure [4]

- a. What word is used to describe a layer in the atmosphere where temperature increases with height? [0.5]
- b. Name two layers of the atmosphere discussed in class in which temperature increases with height. [1]
- c. In what layer of the atmosphere does the majority of weather occur? [0.5]
- d. What is the name of the high winds that occur near the tropopause in the mid-latitudes? [0.5]
- e. What is an “isothermal” layer in the atmosphere? [0.5]
- f. Why does the lapse rate generally decrease in the lowest layer of the atmosphere? [1]

4. Heat Transfer Methods [2] (0.5 pt. each)

Name the type of heat transfer (conduction, convection, or radiation) associated with each of the following observations:

- a. Smoke rises from a chimney.
- b. The handle of a cast iron pan feels hot after the pan has been heated for some time.
- c. You are warmed as the sun comes out from behind a cloud.
- d. The branches of the tree above a campfire sway gently.