

*Please write your name on every page of your homework. Please use a word processor for all written answers. Show your work in any calculation; math work can be hand-written. Please write the day of the week and time that your discussion section meets on your homework.*

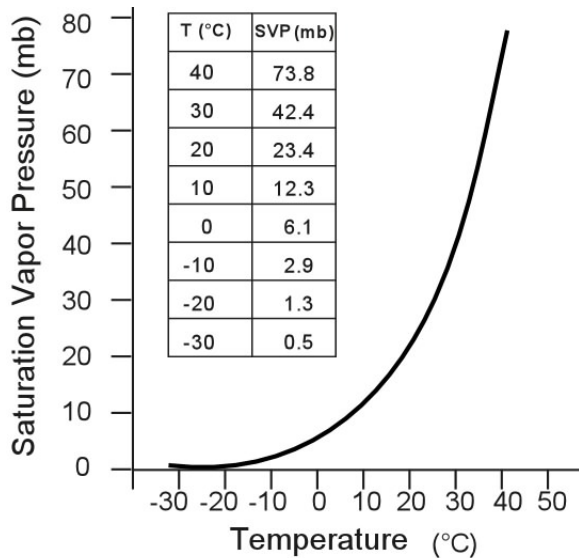
Homework #2

ATM 10  
Fall 2004

Due: 20 October 2004

1. (8 pts) On a warm day you make lemonade in a cup and cool it with ice. You stir the icy drink using a thermometer as a swizzle stick. You notice that moisture suddenly starts condensing on the outside of the cup when the swizzle stick reads 10 C. The air temperature is 20 C. Hint: consider the figure below.

- What is the dewpoint temperature?
- Estimate the vapor pressure.
- Estimate the relative humidity of air away from the cup.
- Why did moisture condense on the outside of the cup?



©2002 Kendall/Hunt Publishing

2. (10 pts) Find two works of art in the campus libraries (reproductions of paintings or drawings) that include clouds as a **prominent** element. The prominent cloud that appears in one work of art must be different from the prominent cloud that appears in the second art work. Make a photocopy of each of the works of art you choose.

(a) On each photocopy please indicate the following: title of artwork, name of artist, call number of document, title of document, page number in document.

(b) Next, discuss the following subjects for each work of art. What type of cloud (by name) is depicted?

(c) What is the elevation of this cloud (low, middle, high, deep)?

(d) Is the cloud mainly made up of ice crystals or liquid water droplets? How did you decide?

Hints: some paintings depict more than one cloud, make sure you indicate on the photocopy what cloud you are referring to in your answer. As a GE course, we need to evaluate communication skills; please double check your wording and grammar for clarity. Note: the art you choose must be *different* from the examples shown in discussion (A list of what was shown is available).

From page 128 in Ahrens:

3. (3 pts) On a bitter cold, snowy morning, the air temperature and dew point of the outside air are  $-7^{\circ}\text{C}$ . If this air is brought indoors and warmed to  $21^{\circ}\text{C}$ , with no change in vapor content, what is the relative humidity of the air inside the home? (Hint: See table 1, p. 122)
4. (3 pts) Explain in words how frozen clothes “dry” outside in subfreezing weather? What is the name for this process?
5. (3 pts) An evaporative cooler cools the air by blowing outside air past a wet surface. Why should that cool the air? Why are evaporative coolers used in Arizona, Nevada, and New Mexico but not in Florida, Georgia, or Louisiana?

Multiple Choice questions (1 pt each):

6. The horizontal transport of any atmospheric property by the wind is called:
  - (a) convection
  - (b) radiation
  - (c) conduction
  - (d) latent heat
  - (e) advection
7. What variable always describes the actual amount of moisture in the air?
  - (a) vapor pressure
  - (b) relative humidity
  - (c) thermal humidity
  - (d) saturation vapor pressure

8. True/false question (1 pt):

When air is saturated, the relative humidity is 100% and the dewpoint temperature is the same as the air temperature.

***Please write your name on every page of your homework. Please use a word processor for all written answers. Show your work in any calculation; math work can be hand-written. Please write the day of the week and time that your discussion section meets on your homework.***