

METR 2603 - Severe and Unusual Weather
Spring 2001

Problem Set #1

*Distributed Friday, 26 January 2001
Due Wednesday, 7 February 2001*

Instructions: Please print the problem set and answer all questions in the spaces provided.

1. Why do airmass storms tend to occur most often during the summer, as opposed to longer-lived storms such as squall lines and supercells?
2. How/why do air-mass storms "self destruct?"
3. A Houdini wanna-be decides to lay on a bed of nails that measures 6 ft x 4 ft in area. If he weighs 200 pounds, what would be the pressure exerted upon his body (assuming it's the same as the area of the bed) in pounds per square inch? How would the pressure change if the bed was reduced to 2 ft x 2 ft in size?

4. How much greater is the pressure exerted on a diver at a depth of 100 ft compared to the surface of the water? Assume densities of water and air equal to 1000 and 1 kilogram per cubic meter, respectively. (See page 234 in the text) BE CAREFUL WITH UNITS!!

5. Why does pressure decrease more rapidly with height in cold air compared to warm air?

6. What is the difference between temperature and heat?

7. Using the ideal gas law, compute the air pressure in millibars when the air temperature is -23 degrees Celsius and the air density is 0.70 kilograms per cubic meter. (See pages 212-213). **BE CAREFUL WITH UNITS!!**

8. Provide one question or topic for my weather column!!