Atmospheric Sciences 5300
Exercise #1
Due Friday, September 4, 2020

This exercise deals with moisture variables and dry adiabatic processes. You may write a program to do the calculations. For Problem 2, please submit a scan or photograph of your plot.

1. Calculate the quantities in the table below for a parcel that ascends dry adiabatically from p =1000 mb, where T =20 °C and relative humidity = 50%, to p =850 mb.

p	RH	e	e_s	w	w_s	θ	T	T_d	T_v
(mb)	(%)	(mb)	(mb)	(g/kg)	(g/kg)	(K)	(K)	(K)	(K)
850									
875									
900									
925									
950									
975									
1000	50						293.15		

2. *On the graph paper available on the course web page,* plot the quantities from your table using colored pencils if available.

   (a) Relative humidity (black).
   (b) e (red), e_s (blue).
   (c) w (red), w_s (blue).
   (d) θ (green), T (red), T_d (blue).
   (e) T_v (brown).

3. Determine the *saturation pressure* (the pressure at the LCL=lifting condensation level) to the nearest mb.

   Answer: