Atmospheric Sciences 5130
Exercise #1
Due Friday, January 22, 2016

This exercise deals with moisture variables and dry adiabatic processes. Use colored pencils. You may write a program to do the calculations.

1. Calculate the quantities in the table below (or on the larger version on the next page) for a parcel that ascends dry adiabatically from $p =1000$ mb, where $T =20$ °C and relative humidity $= 50\%$, to $p =850$ mb.

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

2. *On the accompanying graph paper,* plot the quantities from your table.

   (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.

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