Lectures:

Monday, 8.7.: Magnetism of independent particles
Thursday, 11.7.: Coupled models

Exercises:
All solutions must be handed in by **Tue. 16.7.** noon in box on 5th floor of Building 46 or electronically to laschwar@rptu.de

Consider a spin-1/2 in a magnetic field $H=-g\mu_B S_z B$ with quantum numbers $S_Z = \pm\hbar/2$. We use units so that $g\mu_B\hbar/2 = 1 = k_B$ (i.e. temperature, energy and field have the same units).

20) The specific heat is defined as $c_V = T\left(\frac{\partial S}{\partial T}\right)_V$. Show that $c_V=B^2\chi/T$, where χ is the susceptibility (Note, that this may be shown in general by use of derivatives without actually calculating c_V.) Plot the result for c_V as a function of $y= T/B$ for the case that $M=\tanh B/T$.

21) Determine the Entropy $S(y)$ als Funktion von $y=T/B$. Plot the result as a function of y. Give the expansion to lowest order for low temperatures y<<1 and for high temperatures y>>1.