# Statistical Physics 2, 7.5 hp Home examination

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## I. MEAN FIELD THEORY FOR THE SPIN-1 ISING MODEL

### Problem 1 out of 3

Put up a mean-field theory for the spin-1 Ising model, where each spin can take one of the values

$$\sigma_j = -1,\ 0,\ +1.$$

1. Find the self-consistency equation for the order parameter $m = \langle \sigma_i \rangle$.

2. Find the critical temperature in zero external field.

3. Find the critical exponent for the order parameter.

4. Find the critical exponent for the susceptibility $\chi(0, T)$.

**Deadline Monday 18/4.** *Submissions by pdf file to lundh@tp.umu.se or neat handwriting.*