Reading: We will finish the discussion of spin systems, with the exact solution of the
two-dimensional Ising model and then the role of randomness on spontaneous
ordering. With the remaining course time, I will present some topics for
“fun”.

Notes: The final examination is scheduled for Wednesday Dec. 20 at 12:30pm in
SCI 113. Please plan for a 3-hour exam. The exam be closed book, with no
notes, calculators, or other ancillary material allowed. Considerable algebra
should not be needed in solving any problem.

Problems: Due Wednesday December 13 at 5pm.

1. (Huang 17.6) Derive the Ginzburg criterion for a tricritical point. What is
the critical dimension in this case?

2. Following the approach developed in lecture, compute the first few terms
of the high-temperature series for the susceptibility of the two-dimensional
Ising model on the triangular lattice. Compute as many terms as you can;
you should be able to reach to order $v^5$ without too much trouble. From your
series, use the ratio analysis as outlined in lecture to estimate the critical
temperature and the critical exponent $\gamma$. (For comparison, the correspond-
ing exact values are $kT_c/J = 4/\ln 3 \approx 3.641$ and $\gamma = 7/4$.)