

# Chapter 5.2-5.3 Review Problem

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## 1 Problem 1

Given  $\langle \sigma \rangle = \tanh(\beta q J \langle \sigma \rangle)$ , find an expression for  $\langle \sigma \rangle$  in the limit that  $\delta T = T_c - T$  is small. Assume that there is no external magnetic field.

## 2 Problem 2

Consider a one-dimensional Ising model at temperature  $T > 0$ . Answer yes or no to the following questions:

- Is spontaneous magnetization possible?
- Is the statement "There is no long range order unless there is long range interaction" true?
- Is there phase transition in the exact solution?