Statistical Field Theory Equation Sheet

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Here are some useful equations

Table 1: Equation Sheet

Name/Description	Equation	Remarks
Equilibrium Magnetisation in the Ising Model	$m = \frac{1}{N\beta}\partial_B \ln(Z)$	
Heat Capacity C	$C = \partial_T \langle E \rangle = \beta^2 \partial_\beta^2 \ln(Z)$	For critical exponents one can use that $c \sim \partial_T^2 f$
Magnetic susceptibility	$\chi = \partial_B m\|_{B=0}$	
Calculating Critical Exponents	$m \sim (Tc - T)^\beta$ for $T < T_c$ when $B = 0$, $csimc_\pm\|T - T_c\|^{-\alpha}$ when $B = 0$ again, $\chi \sim \|T - T\|^{-\gamma}$ when m is small so ignore higher order terms, $m \sim B^{1/\delta}$ when $T \approx T_c$	