Physics 6433, Quantum Field Theory
Assignment #7
Due Friday, October 30, 2009

October 23, 2009

1. For the $\lambda\phi^4$ theory discussed in class, draw coordinate-space diagrams for all the contributions to the connected two-point function,

$$G^{(2)}(x-y),$$

that are of order λ^3. Write down the corresponding analytical expressions in coordinate space, including the symmetry factors.

2. Repeat the previous problem, but for the connected four-point function,

$$G^{(4)}(x_1, x_2, x_3, x_4).$$

3. Show that $W[K] = \ln Z[K]$ generates only connected Feynman diagrams.