

Physics 6433, Quantum Field Theory  
Assignment #6  
Due Wednesday, March 25, 2015

March 7, 2015

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  $\lambda^3$ . 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.