

PHY 5667 : Quantum Field Theory A, Fall 2005

October 6th, 2005

Assignment # 3

(due Thursday October 20th, 2005)

1. Derive explicitly Eqs. (3.104), (3.105), and (3.113) of Peskin and Schroeder's book.
2. Read Section 3.6 of Peskin and Schroeder's book and derive the results summarized in the table on page 71.
3. Show that the QED Lagrangian in Eq. (4.4) of Peskin and Schroeder's book is invariant under the gauge transformation given in Eq. (4.6).
4. Using the same technique applied to prove Eq. (4.37) of Peskin and Schroeder's book, show explicitly how to obtain Eq.(4.39). Also, show that $\langle 0|T\{\phi(x_1)\phi(x_2)\phi(x_3)\}|0\rangle = 0$.