

PHY 5667 : Quantum Field Theory A, Fall 2007

November 20th, 2007

Assignment # 8

(due Thursday December 6th, 2007)

1. Problem 6.3 of Peskin and Schroeder's book.
2. Verify explicitly (i.e. calculating it explicitly) that at one loop in QED:
 - 2.a) the three photon vertex is zero (there are two diagrams contributing to the three photon vertex at one loop and they cancel);
 - 2.b) the four photon vertex is UV finite, i.e. it does not give origin to ultraviolet divergences (there are six diagrams contributing to the four photon vertex at one loop and their potential UV logarithmic divergences cancel).

Explain why this is important for the renormalizability of the theory.

3. Problem 7.2 of Peskin and Schroeder's book.