QFT

Chapter 52: Beta Functions in Yukawa Theory

Overview

- Beta functions and anomalous dimensions work exactly the same way for fermions that they did for scalars.

- The bare fields should be independent of mu (the energy scale). We introduce beta functions and anomalous dimensions to enforce this condition.

- What do these physically mean?
  - Beta functions show how coupling strengths depend on energy.
    - Recall that we said that coupling strengths get weaker at higher energies are called asymptotically free.
  - We've never really talked about what anomalous dimensions mean.
    - By definition, it is the degree to which renormalization (of a field or mass) is scale-dependent.

- There's no point going through the calculation procedures again, we'll do so in the problems (and we already did so in the chapter 28 problems)….