

## **Homework III**

**Suggested reading:**

1. Pokorski chapter 6.
2. Schwartz chapter 23.

**due date October 28th**

1. Consider two renormalization schemes whose renormalized coupling constants are related by

$$\lambda' = F(\lambda) = \lambda + \mathcal{O}(\lambda^2) .$$

Consider that the model have a fixed point at  $\bar{\lambda}$  ( $\bar{\lambda}'$ ) . Show that,

$$\left. \frac{d\beta'}{d\lambda'} \right|_{\bar{\lambda}'} = \left. \frac{d\beta}{d\lambda} \right|_{\bar{\lambda}} .$$

2. Consider QED. Obtain  $\beta$ ,  $\gamma$  and  $\gamma_m$  at the one-loop level. Obtain the evolution of the running mass.
3. Problem 23.1 in Schwartz's book.