

## QFT Homework 10 Due 1 Dec 2022

This homework is due to <https://uwcloud.uwinnipeg.ca/s/Xks9XWXz9yo5CpG> by 10:59PM on the due date. Your file(s) must be in PDF format; they may be black-and-white scans or photographs of hardcopies (all converted to PDF), PDF prepared by LaTeX, or PDF prepared with a word processor *using an equation editor*.

**Reading Assignment:** Srednicki chapters 29.

**For a grade** Submit your answers for the following questions

1. **Renormalization of  $\phi^3$**  *Srednicki 29.2* Presentations: (a) Bardh (b) Phil

**Not to be marked** Do not submit your answers for the following questions

2. **Scheme Independence to Next-to-Leading Order** *Srednicki 29.1* Presentations: (a) Zunaira (b) Naman

This problem actually shows that beta functions are independent of renormalization scheme through two-loop (next-to-leading) order. Suppose we start with one scheme. If we take some different renormalization scheme, the physical definition of the Lagrangian coupling constant is different at subleading order, but we see that the  $\beta$  function still turns out the same as a function of the new coupling  $\tilde{g}$ .