Week 3 (due October 22)

1. Consider a theory of n scalar fields $\phi^i, = 1, \ldots, n$ in four dimensions with a bare Lagrangian

$$L = -\frac{1}{2}\partial_\mu \phi^i \partial^\mu \phi^i - \frac{1}{4!}\lambda_{ijkl}\phi^i\phi^j\phi^k\phi^l.$$

Write down the Callan-Symanzik equation for the renormalized 2-point function $G^{ij}(x_1, x_2)$. (Don't forget to define all the symbols in the CS equation!)

2. Solve Problem 12.2 in Peskin-Schroeder.