Homework (c)

The Canonical RG Flow

Assume there are no physical renormalization effects, i.e. all $\underline{U}_\xi (k)$ are independent of $k$.

Compute the $\beta$-s.f.s. of the dimensionless op.lg.s. $\underline{U}_\xi$ find the fixed point(s) of the rescaling flow, and determine the associated critical exponents.
Homework (E2)

The scalar FRS E can be written in the (still exact!) form

\[ k \frac{\partial}{\partial k} \Gamma_k [\phi] = \frac{1}{2} k \frac{D}{Dk} \, \text{Tr} \, \ln \left[ \Gamma_k^{(2)} [\phi] + R_k \right] \]

How is \( \frac{D}{Dk} \) to be interpreted?

Use this representation to explain the relation of the EAA to the standard effective action in the one-loop approximation.
Homework (E1)

Derive the FRGE for the scalar EAA starting from the functional integral for $W_k$.

Hint: Use (and prove) the relations (a) and (b) involving $G(x,y)$.