EXERCISE III
(MAY 22 2013, TO BE HANDED IN JUNE 05 2013)

DYSON SCHWINGER EQUATIONS (KREIMER, SUMMER '13)

- 1.
  Let v_i be the sum of all 1PI graphs for the photon self-energy in QED. Let I be the co-ideal for the Ward Identity of QED, its k-loop components i_k are the sum of all 1PI k-loop graphs for the QED vertex plus fermion self-energy.
  Show: $\Delta'(v_3) = 2i_2 \otimes v_1 + 4i_1 \otimes v_2 + v_1 \otimes v_2$.
- 2.
  Try to give a formula for $\Delta'(v_k)$.
- 3.
  Consider a QED-like theory with two different photons initiated by decoupled gauge groups $U(1) \times U(1)$. What is the co-ideal structure which you expect?