215c Homework exercises 5, Spring 2020, due May 11

1. Compute in dim reg the $1/\epsilon$ part of the one-loop correction to the $\bar{c}^a c^b$ ghost two-point function; this is subtracted off by a counter-term. Please work it out for general ξ.

2. Compute the $1/\epsilon$ part of the one-loop correction to the $A^a_\mu A^b_\nu$ gauge field two-point function from a loop of massless, complex scalar field in representation r_{CS} of the gauge group. Do not forget to consider both diagrams (one using two cubic vertices, and the other using the quartic "seagull" diagram). Please write the answer for general r_{CS} using the definition of $T_2(r)$ in the class lecture notes.