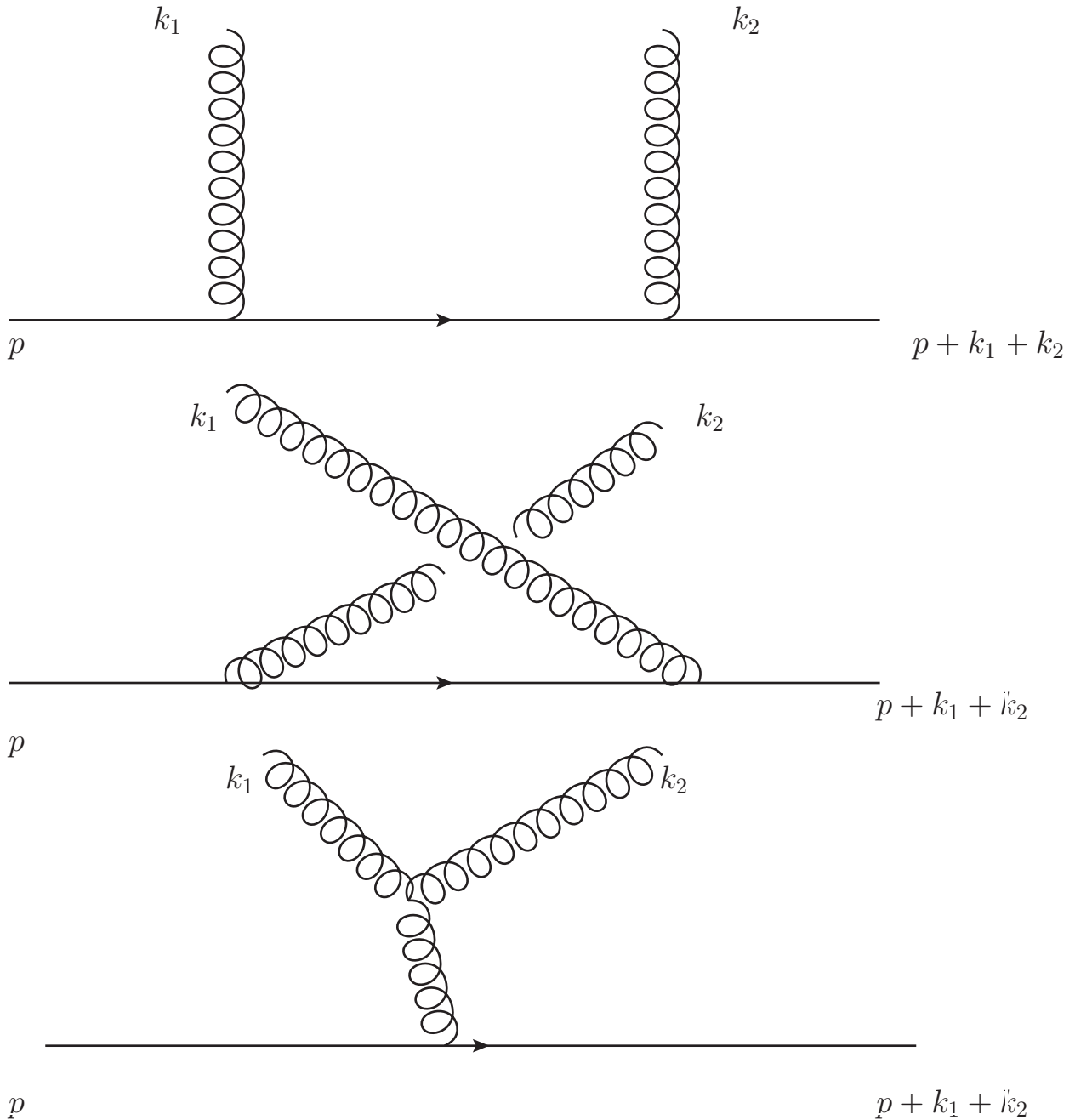## QFT II (Kreimer, Summer 2014)

Exercise IV (June 25 2014, to be handed in July 09 2014)

Consider the following three Feynman graphs for a tree-level coupling of two gluons to a propagating quark.

1.(20 points)
Write down the corresponding matrix elements.
2.(20 points)
Show that the sum over the three diagrams vanishes when one of the external gluons is contracted with its external momentum and the other particles are on-shell.