Homework Exercises for
QCD and Collider Physics

2005/2006

Exercises for Lecture 2 (16. Nov 2005)

Matrix element calculations (do it either by hand or with *FORM*):

- Perform the calculation for $e + \nu \to q_i + q_j$. You can make use of crossing symmetries or calculate the full matrix element with *FORM*.

- Calculate the squared matrix element for the processes $\gamma q \to qg$ and $\gamma g \to q\bar{q}$. Use the photon(gluon) polarization tensor $g_{\mu\nu}$ as given in Halzen-Martin p. 143

- Calculate the trace of the loop in vacuum polarization. Compare your result with Mandl/Shaw Quantum Field Theory, p229.