Physics 556/714 Problem Set #9

due *beginning of class* Tuesday Nov 25

1. Why don't we use $\sigma(e^+e^- \to e^+e^-)$ in the denominator of equation 8.7 to define R?

2. Griffiths problem 9.6: "Calculate the octet $q\bar{q}$ color factor..."
   Note the typos in parts b and c. The square roots should be in the denominators.

3. Griffiths problem 9.9: "Color factors always involve expressions of the form..."

4. Griffiths problem 9.13: "Determine the branching ratio..."

5. Consider the following diagram representing quark-antiquark annihilation to an intermediate gluon.
   a) Write down the corresponding matrix amplitude. You need not simplify the result.
   b) Evaluate the color factor for the color singlet configuration. Explain the result.