Phys 4900, Fall 2011
Problem Set #3

1. *Griffiths EP*, **2.7 f)-q)**

2. *Griffiths EP*, Choose any two of the *decays* that you considered in Problem 2.7 and try to find its measurement in the Particle Data Table:

If it is considered *absolutely* forbidden, find the limit on the lifetime (for decay by that mode) and if it is possible, find the best measurement of its branching ratio, i.e. the "Fraction".

3. *Griffiths EP*, **2.10** Hint: It is a strong interaction but OZI-suppressed.

4. *Griffiths EP*, **2.12** Note, a gluon line (such as can arise from $q\bar{q}$ annihilation) can be simply absorbed onto any quark line.

5. *Griffiths EP* This one is easy for the E&M veterans, but just remind yourself of how it comes about:

Show how the equation of continuity

$$\nabla \cdot \mathbf{J} + \frac{\partial \rho}{\partial t} = 0$$

follows from the Maxwell equations. Recall that space and time derivatives commute with one another. If you had an outstanding class in mathematical physics, think of the vector calculus identities you learned there.