

### Exercise 5

1. Check that the  $\beta$  function for the quartic squark interaction in SUSY QCD where all legs share the same flavor is consistent with SUSY.
2. Given the results for breaking SUSY QCD with  $N$  colors  $F$  flavors to  $N-1$  colors, give a counting argument which determines the massless spectrum at a point in moduli space where there are  $m$  flavors of squarks with non-zero VEVs and  $m < N, F$ .
3. Starting with the superpotential

$$W = y_t H_u Q_3 \bar{u}_3 ,$$

verify that in the SUSY limit the conditions given in the first lecture to cancel the divergent contributions to the Higgs mass are indeed satisfied.