

Exercise 1

1. Consider from the superpotential

$$W = \frac{1}{2}M\phi_H^2 + \frac{\lambda}{2}\phi_H\phi^2 + \frac{\delta}{3}\phi_H\phi^3 + \frac{y}{6}\phi_H^3 ,$$

find the exact effective superpotential after integrating out ϕ_H . Can you argue from holomorphy what the general form of the effective superpotential has to be?

2. Using holomorphy and symmetries show that the superpotential

$$W = \mu_1\phi + \mu_2\phi^2 + \dots + \mu_n\phi^n + \dots$$

is not renormalized.