$$Z = \int \mathcal{D}\vec{n}(x)\delta\left(\vec{n}^2(x) - 1\right) \exp\left(-\frac{\rho_s}{2T}\int d^2x \left(\nabla_x \vec{n}\right)^2\right)$$

Generalize $\vec{n}$ to a N-component vector n_α, $\alpha = 1 \ldots N$, and take the $N \to \infty$ limit while taking $\rho_s \propto N$. This is implemented by a Lagrange multiplier λ

$$Z = \int \mathcal{D}\lambda(x)\mathcal{D}n_\alpha(x) \exp\left(-\frac{\rho_s}{2T}\int d^2x \left[\left(\nabla_x n_\alpha\right)^2 + i\lambda(n_\alpha^2 - 1)\right]\right)$$

We can now perform the Gaussian integral over n_α

$$Z = \int \mathcal{D}\lambda(x) \exp\left(-\frac{N}{2}\mathrm{Tr}\ln\left(-\nabla_x^2 + i\lambda\right) + \frac{\rho_s}{2T}\int d^2x\, i\lambda\right)$$

Because $\rho_s \propto N$, in the $N \to \infty$ limit the partition function is dominated by the saddle point.