PCMI 2017 - Introduction to Random Matrix Theory
Handout #7 – 07.06.2017

THE GAUSSIAN β ENSEMBLE - CONTINUED

For any $\beta > 0$ the Gaussian Ensembles of size n have the tridiagonal representation:

$$\frac{1}{\sqrt{\beta}} \begin{pmatrix} N(0,2) & \chi_{(n-1)\beta} & & & \\ \chi_{(n-1)\beta} & N(0,2) & \chi_{(n-2)\beta} & & \\ & \chi_{(n-2)\beta} & \ddots & \ddots & \\ & & \ddots & \ddots & \chi_\beta \\ & & & \chi_\beta & N(0,2) \end{pmatrix}$$

This matrix will have the same joint eigenvalue density as GOE for $\beta = 1$, GUE for $\beta = 2$, and GSE for $\beta = 4$.

We finish the proof of the formula for the joint eigenvalue density for Gaussian Beta Ensembles. See Homework #7.