

# Poster advertisement

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September 27, 2010



# A dynamical, random matrix toy model with spectral phase transition

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## The model

We aim to present a study of a certain dynamical random matrix model which evolves in a rather intriguing way. The problem concerned is a product of two random hermitian matrices, namely

## The method used and main results

In general the eigenvalues of a non-hermitian random matrix are complex numbers and the standard diagrammatic approach does not work. The distribution of eigenvalues is governed by the non-analytic behavior of the Green's function  $\rho(z) = \frac{1}{2\pi} \partial_{\bar{z}} G(z, z)$  with  $G(z, z) =$

The outcome of calculation

## Infinite products of large random matrices and matrix-valued diffusion

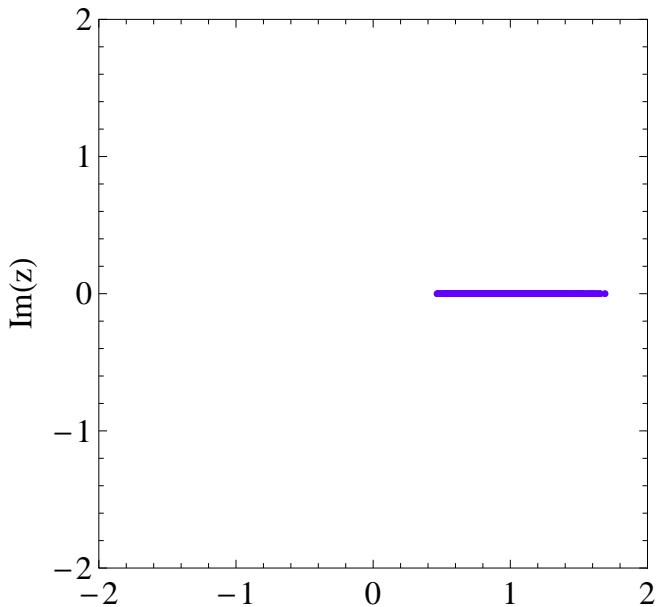
E. Gudowska-Nowak, R. A. Janik, J. Jurkiewicz, M. A. Nowak,

*Nucl. Phys.* **B670** (2003) 479.

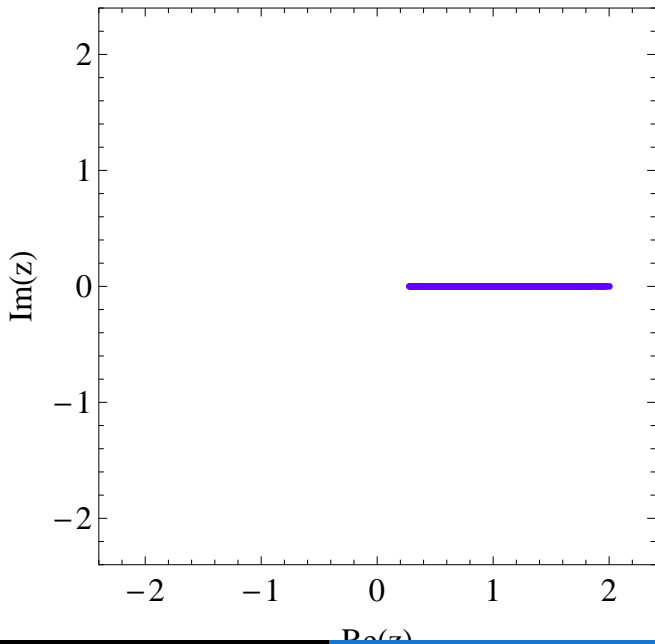
$$X(\tau)$$



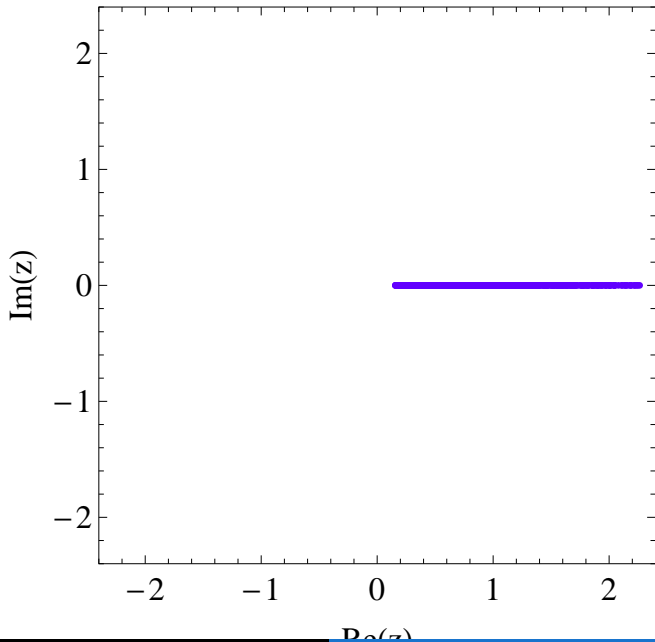
$$0.1 = \tau$$



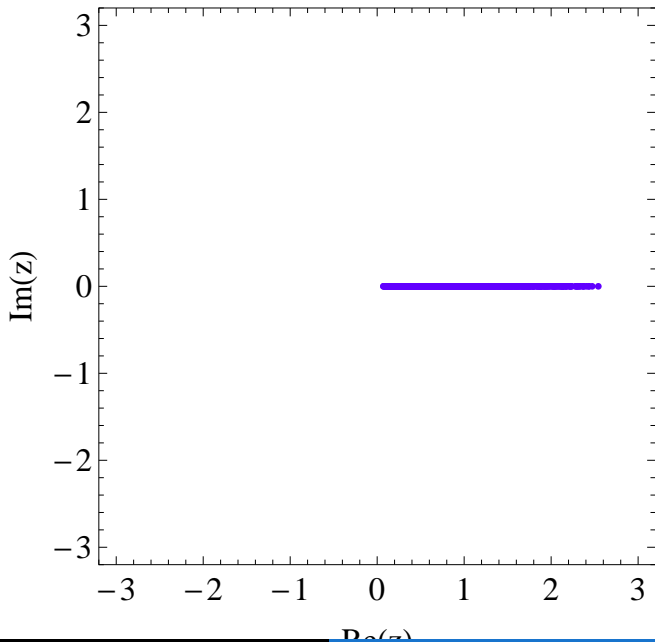
$$0.2 = \tau$$



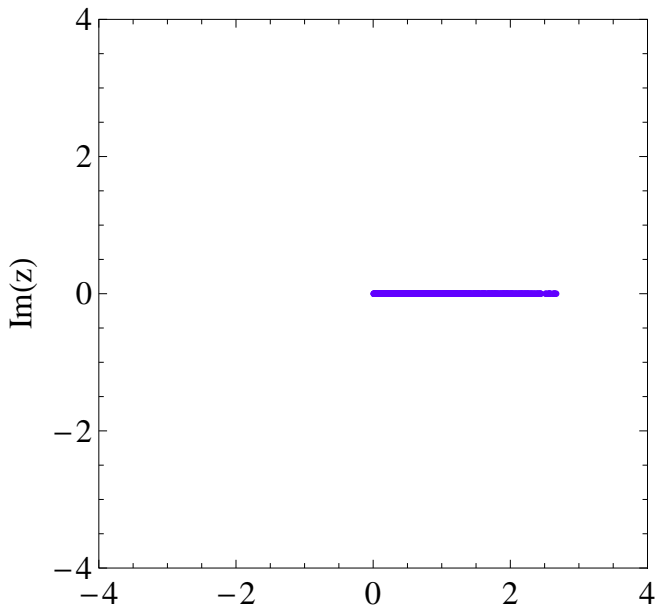
$$0.3 = \tau$$



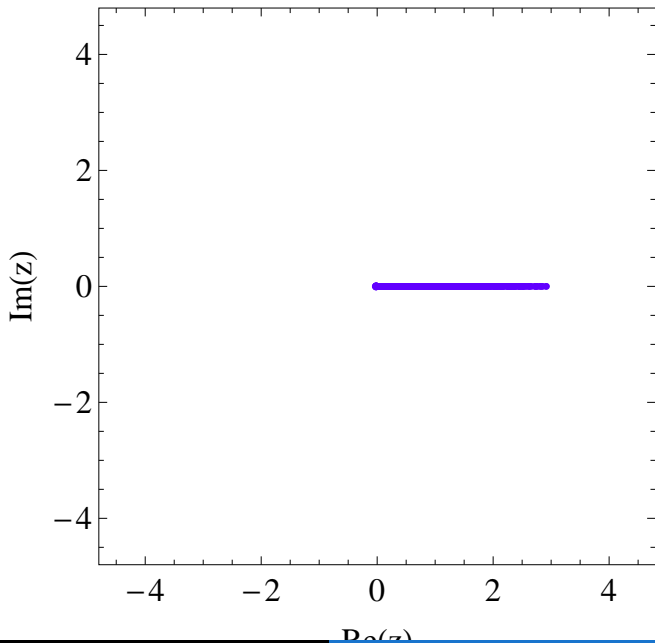
$$0.4 = \tau$$



$$0.5 = \tau$$

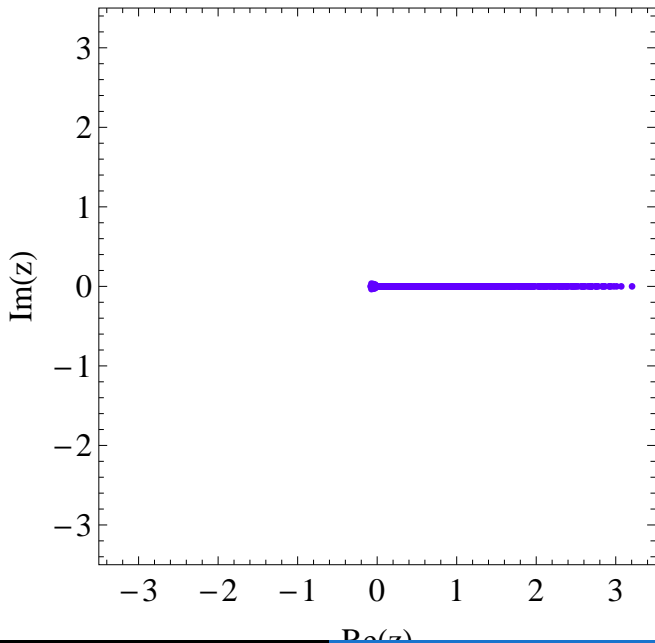


$$0.6 = \tau$$

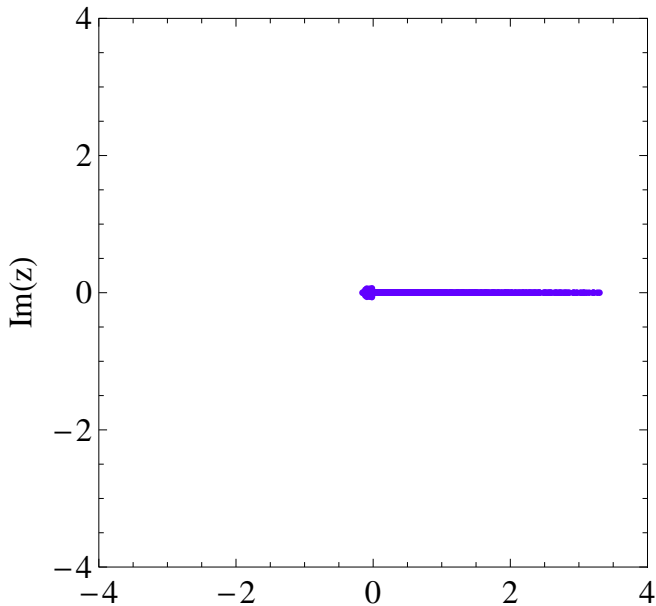




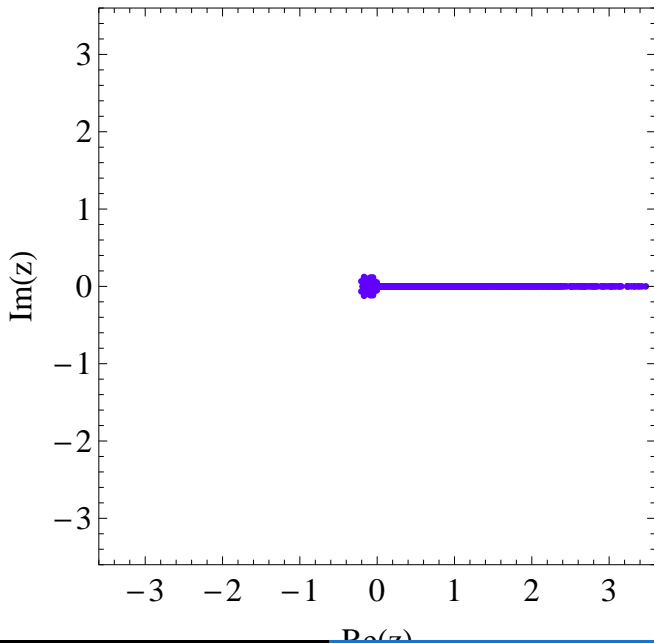
$$0.7 = \tau$$



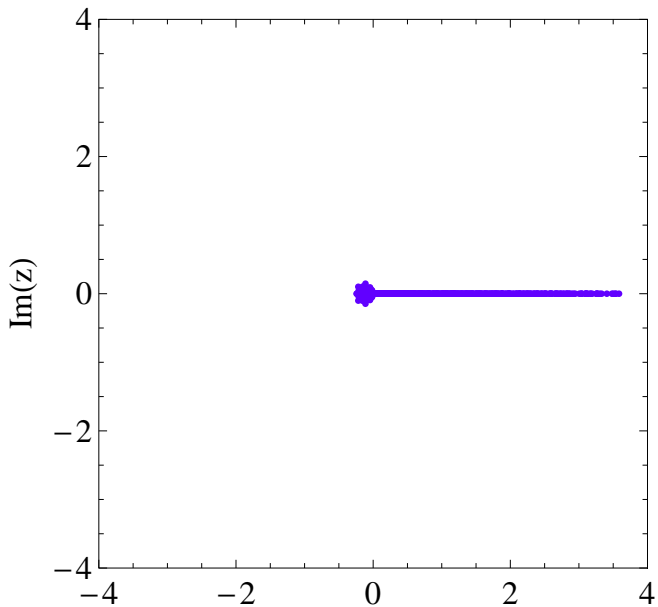
$$0.8 = \tau$$



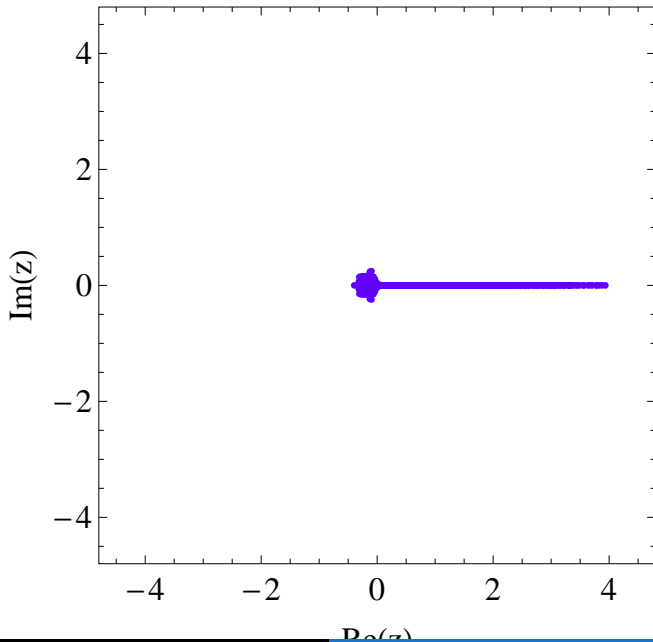
$$0.9 = \tau$$



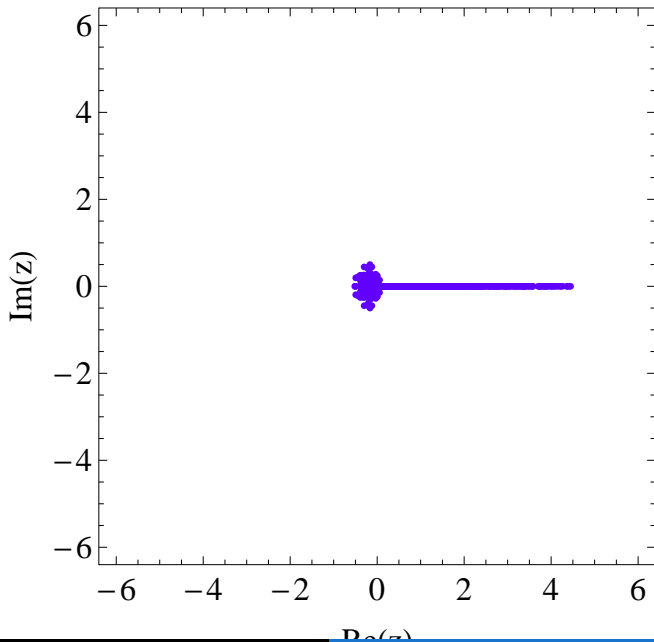
$$1. = \tau$$



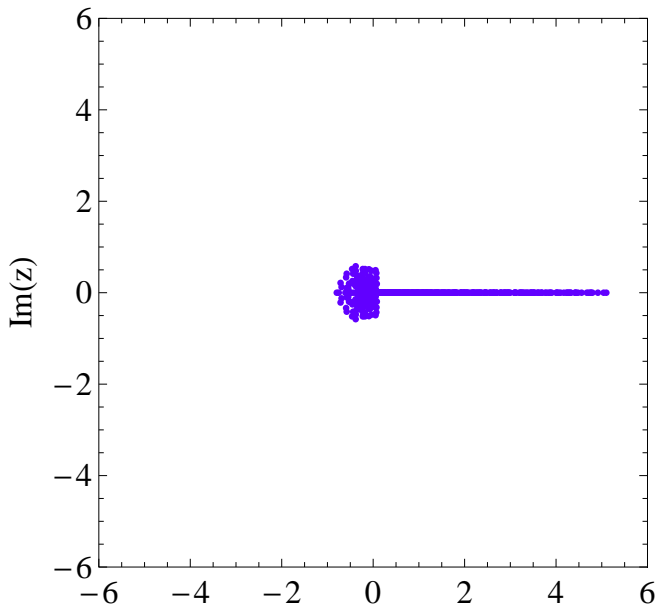
$$1.2 = \tau$$



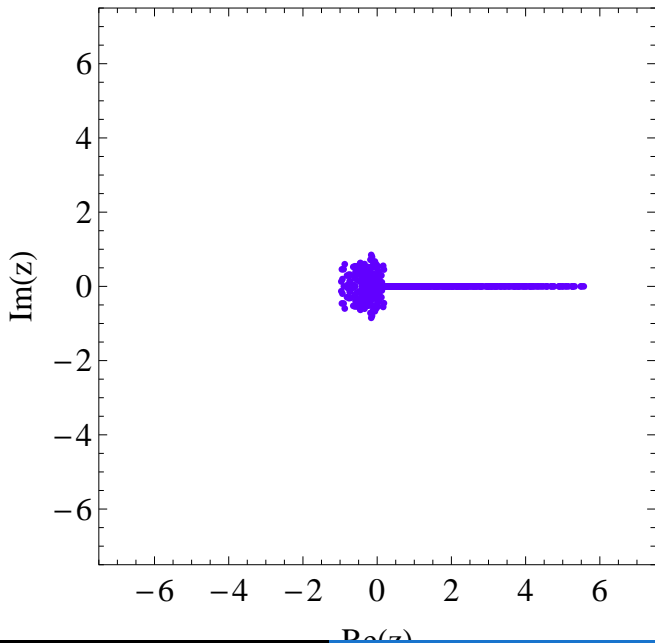
$$1.6 = \tau$$



2. =  $\tau$

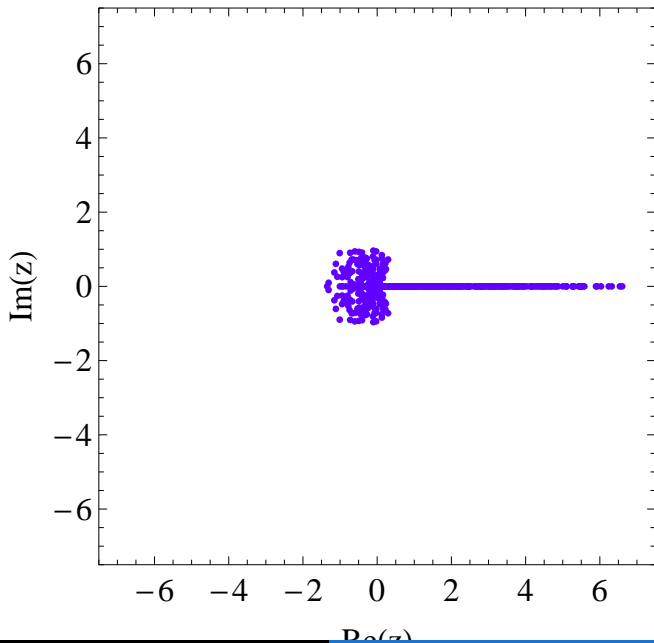


$$2.5 = \tau$$

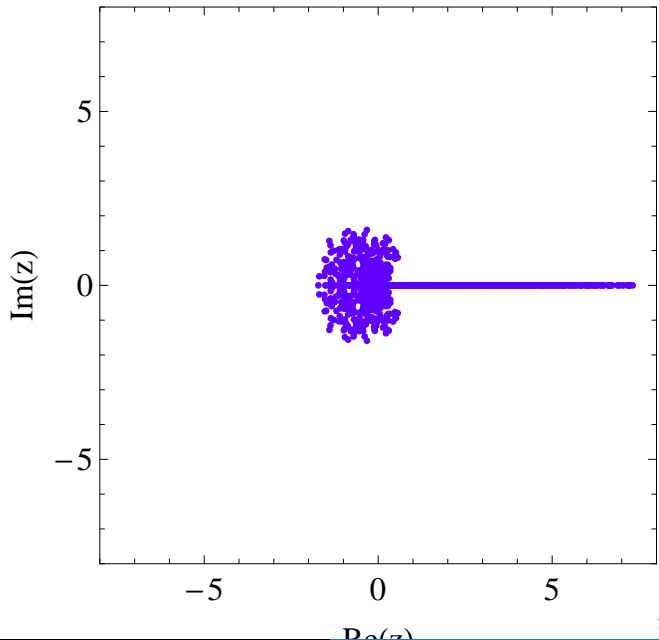




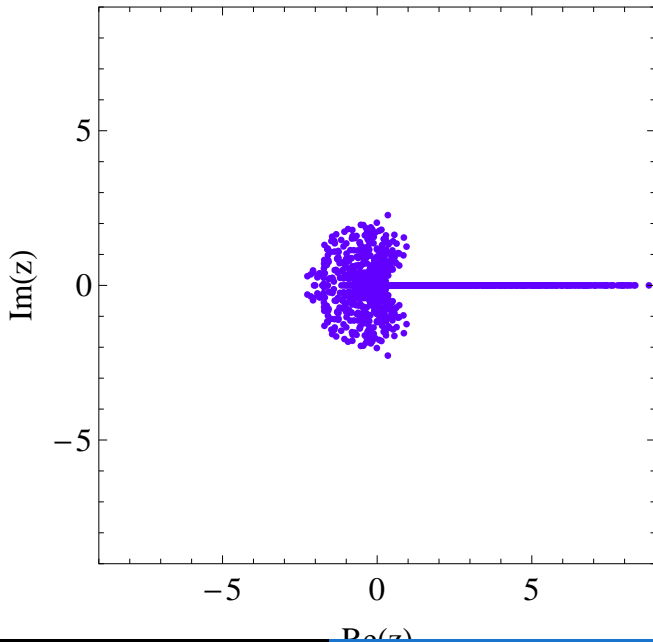
$3. = \tau$



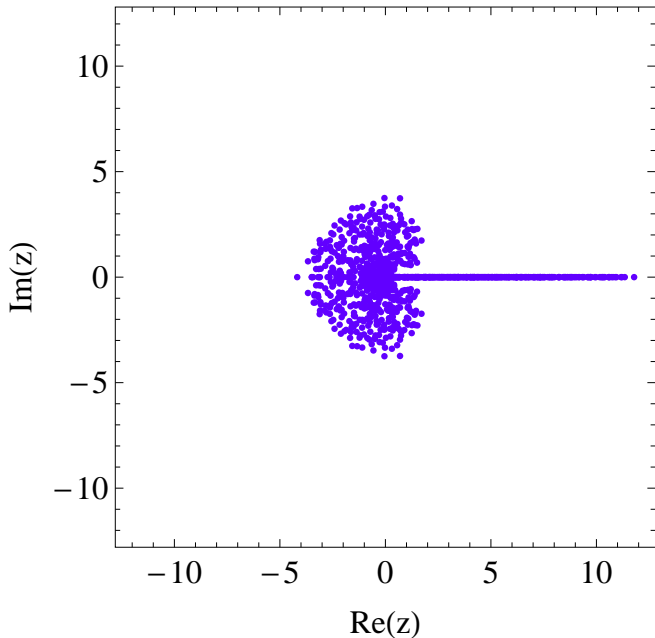
4. =  $\tau$



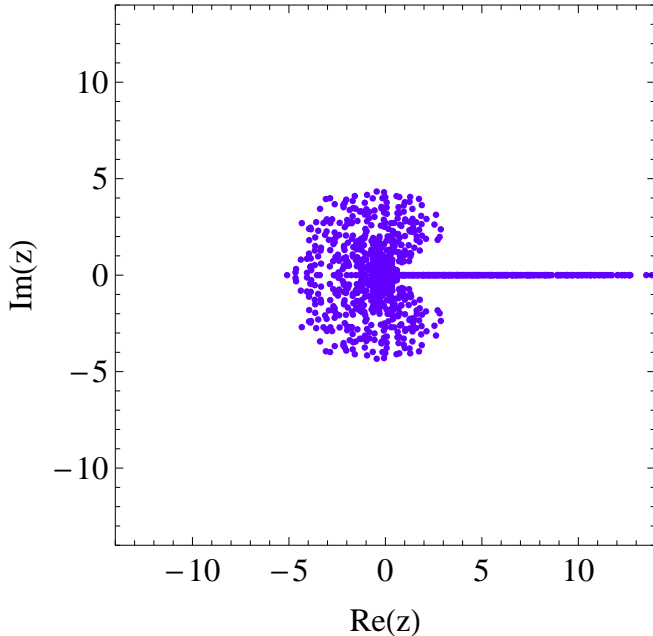
5. =  $\tau$



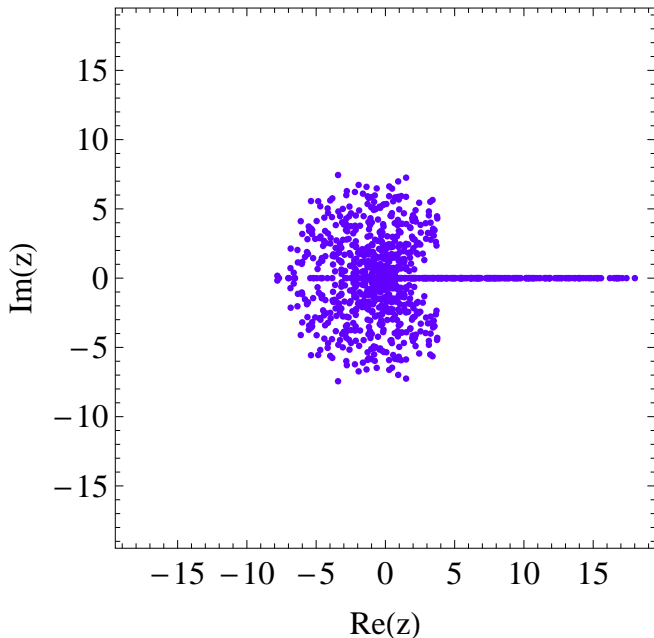
8. =  $\tau$



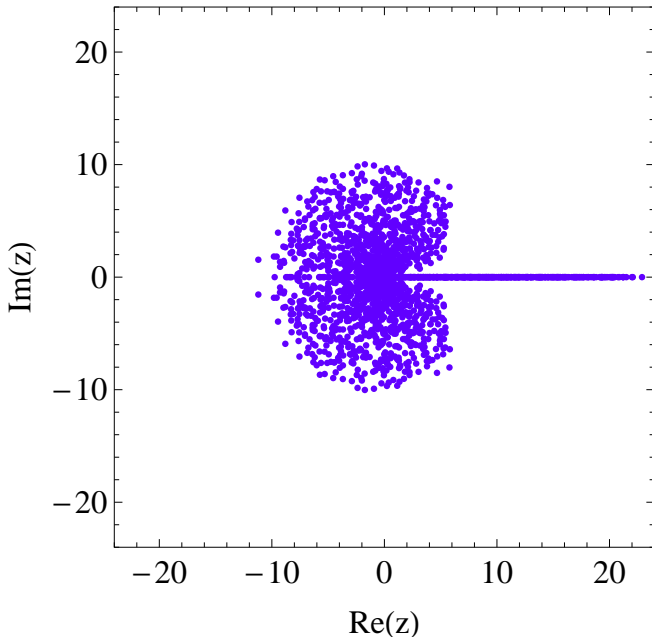
$10. = \tau$



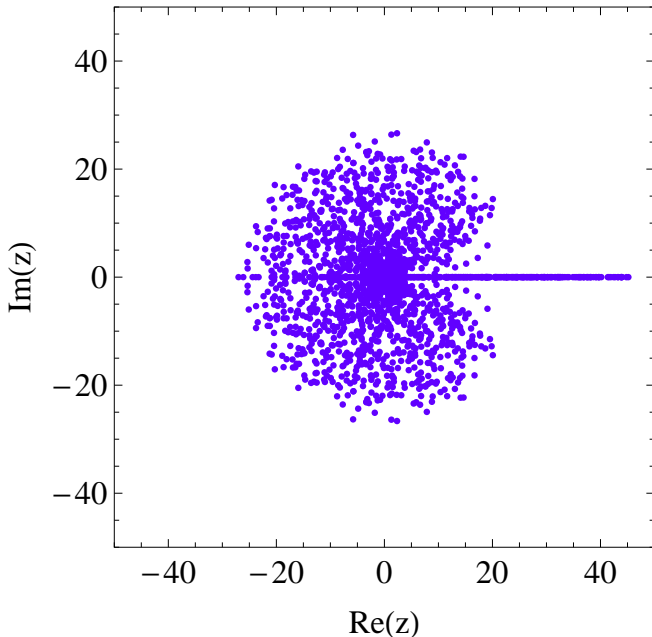
15. =  $\tau$



20. =  $\tau$

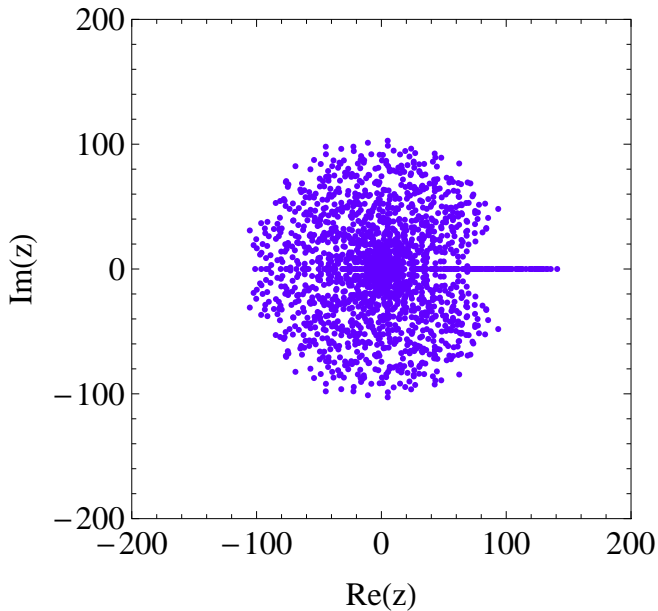


50. =  $\tau$

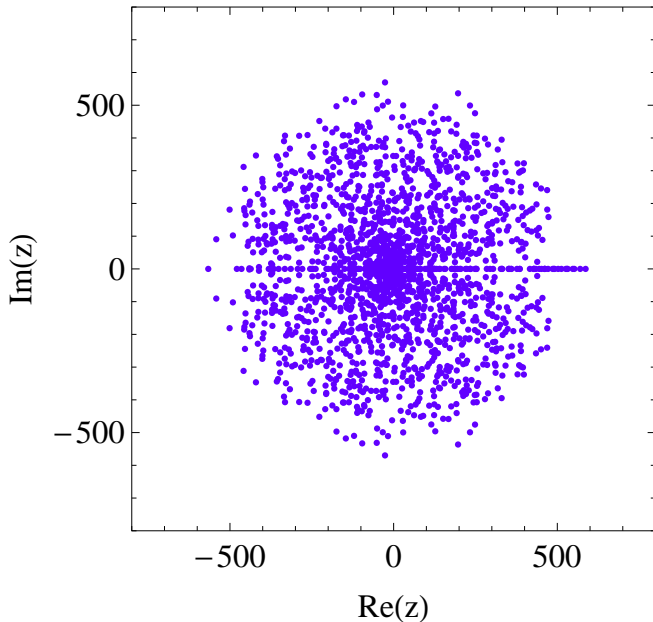




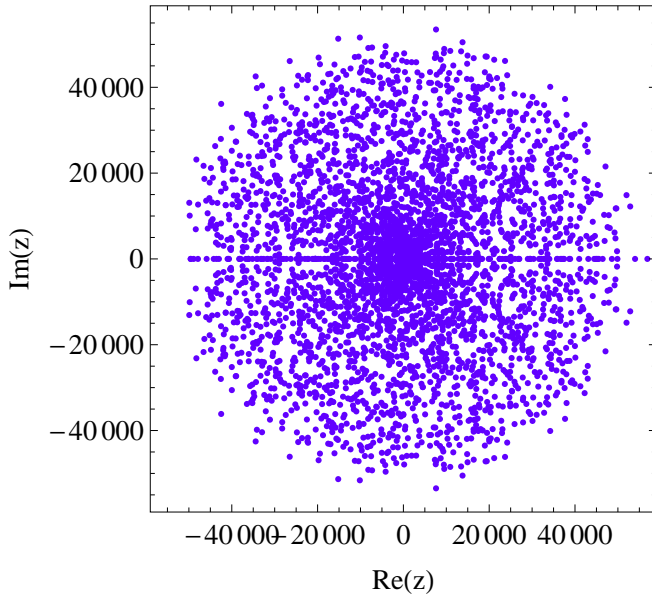
$200. = \tau$



1000. =  $\tau$



100 000. =  $\tau$



Thank you.