

Visualizing Rational Approximation: the Stern-Brocot Tree

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Abstract

In this talk we will introduce the problem of *rational approximation*. In particular, we will answer the question: “What does it mean to be hard to approximate?” trying to look at the problem with a visual approach. Classical results and examples from the fields of continued fractions and special polynomials will show the path to an elegant solution: the Stern-Brocot tree, a binary structure that contains each and every reduced positive fraction.

References

- [1] R. L. Graham, D. E. Knuth, O. Patashnik, *Concrete Mathematics*, Addison Wesley, Massachusetts, 2nd edition, 1994.
- [2] G. H. Hardy, E. M. Wright, *An Introduction to the Theory of Numbers*, Oxford University Press, London, 4th edition, 1975.