

What is an Engel series?

Sohail Farhangi

farhangi.3@osu.edu

Abstract

We will show that any real number in the $(0,1]$ interval has a unique expansion in what is known as an Engel series. We will discuss how this series can be used to detect the rationality of a number along with some examples. Lastly, we will discuss the ergodic properties and digit statistics of Engel series.

References

- [1] Number Theory: An Elementary Introduction Through Diophantine Problems By Daniel Duverney
- [2] N. Dunford and D. S. Miller, On the ergodic theorem, Trans. Amer. Math. Soc. 60 (1946), 538549.
- [3] F. Schweiger, Ergodische Theorie der Engelschen und Sylvesterschen Reihen, Czechoslovak Math. J. 20(95) (1970), 243245.
- [4] J. Galambos, Representations of Real Numbers by Infinite Series, vol. 502, Springer-Verlag, Berlin, 1976, Lecture Notes in Mathematics.