

Primitive Recursiveness of Real Numbers under Different Representations

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In mathematics, various representations of real numbers have been investigated. All these representations are mathematically equivalent because they lead to the same real structure—Dedekind-complete ordered field. Even the effective versions of these representations are equivalent in the sense that they define the same notion of computability of real numbers. However, the primitive recursive (p.r., for short) versions of these representations can lead to different notions of p.r. real numbers. Several interesting results about p.r. real numbers can be found in literatures. In this paper we summarize the known results about the primitive recursiveness of real numbers for different representations as well as show some new relationships. Our goal is to clarify systematically how the primitive recursiveness depends on the representations of the real numbers.