Research Proposal:  
Continued Fractions

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1 Introduction

I propose to examine the field of continued fractions, exploring a variant of the usual form.

2 Proposed Research

Continued fractions are usually represented as

$$a_0 + \frac{1}{a_1 + \frac{1}{a_2 + \ldots}}.$$ \[1\]

Modified versions of this formula include a variant described by Pippenger [2] in 1979:

$$1 + \frac{1}{-1 + t_k \left(1 + \frac{1}{-1 + \ldots + t_2 \left(1 + \frac{1}{-1 + \ldots\ldots}\right)}\right)},$$

where each $t_i$ is an integer greater than or equal to 2.

Continued fractions of this type were used to examine properties of a certain type of graphs and a related Diophantine problem [2]. I propose to explore this type of continued fraction further, as very little is known about its properties. I may also investigate other applications of the modified form.

3 Prior Research

Continued fractions were developed and described by Khinchin [1]; the modified form shown above and an application to graph theory and Diophantine approximation was studied by Pippenger [2].
References
