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Generalized Metallic Means,
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Abstract

The metallic means (also known as metallic ratios) may be defined as the limiting ratio of consecutive terms of sequences connected to the Fibonacci sequence via the INVERT transform. For example, the Pell sequence (INVERT transform of the Fibonacci sequence) gives the so-called silver mean, and the INVERT transform of the Pell sequence leads to the bronze mean. The limiting ratio of the Fibonacci sequence itself is known as the golden mean or ratio. We introduce a new family of k th degree metallic means obtained through INVERT transforms of the generalized k th order Fibonacci sequence. As in the case $k = 2$, each generalized metallic mean is shown to be the unique positive root of a k th degree polynomial determined by the sequence.