Root Behavior of Golden-like Recursive Polynomials

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We present properties of the classic Fibonacci-type recursive polynomials defined by Hoggatt in 1973 and the Golden-type recursive polynomials described by Moore in 1993. This work introduces a second order recursive sequence of Golden-like polynomials defined by

$$G_{n+1}(x) = x^k G_n(x) + x^l G_{n-1}(x),\ k, l \text{ positive integers}$$

with $G_0 = -1,\ G_1 = x - 1$

We will show analytic and numerical results on the nature of the real roots of G_n, which extends the known results for Fibonacci-like polynomials. Depending on time and audience interest, Binet forms, Pascal-like triangle representations, matrix representations for G_n, and noteworthy sequences and identities will also be discussed.

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