1125-VB-1613 **Gregory AE Vaughan*** (gavaugha@iupui.edu). *On the Convergence of the Positive Roots of Recursively Defined Polynomials.*

Given seed polynomials $Q_0(x) = q_0$ and $Q_1(x) = q_1$, we recursively define a sequence of polynomials for $n > 1$ by

$$Q_n(x) = Q_{n-1}(x) + x^k Q_{n-2}(x)$$

We show that for $x_0 > 0$, there is a monotonically increasing sequence of integers n_i with $n_1 > 0$ and a sequence of positive real numbers x_{n_i} such that $Q_{n_i}(x_{n_i}) = 0$ and $\lim_{n_i} x_{n_i} = x_0$ if and only if

$$2q_1(x_0) = \left(1 - \sqrt{1 + 4x_0^k}\right) q_0(x_0).$$

Equivalently, when $q_0(x) \neq 0$, the limits of the roots occurs when

$$\frac{q_1(x_0)}{q_0(x_0)} = \frac{1 - \sqrt{1 + 4x_0^k}}{2}$$

where the left side only depends on the seed polynomials and the right side only depends on the recurrence. This extends results from B. Alberts (2011) and D. Thompson (2013). (Received September 18, 2016)