

New Families of Orthogonal Polynomials

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We present a generalization of the work by Wimp et al. (Annals of Numerical Mathematics **2**, 169-180 (1995)) generating new orthogonal polynomials. We consider a class of polynomials $\tilde{P}_n(x)$ defined by: $\tilde{P}_n(x) = (a_n x + b_n)P_{n-1}(x) + (1 - a_n)P_n(x)$, $n = 0, 1, 2, \dots, a_0 \neq 1$ where $P_n(x)$ is any monic orthogonal polynomials satisfying the three-term recurrence relation: $P_{n+1}(x) = (x - \beta_n)P_n(x) - \gamma_n P_{n-1}(x)$, $n \geq 1$, $P_1(x) = x - \beta_0$; $P_0(x) = 1$. We derive explicitly the sequences a_n, b_n and exhibit some relevant examples.