

The Jacobi Polynomials

Let

$$C(n) := 2n + \alpha + \beta$$

$$F(n) := C(n-1) C(n)$$

$$G := \alpha^2 - \beta^2$$

$$A(n, x) := (F(n)x + G) (C(n) - 1) \frac{1}{2}$$

$$B(n) := (n + \alpha - 1) (n + \beta - 1) C(n)$$

$$E(n) := n C\left(\frac{n}{2}\right) C(n-1)$$

and the initial conditions be given by

$$P(0, x) = 1$$

$$P(1, x) = \frac{C(1)x - \beta + \alpha}{2}$$

then the rest of them are given by

$$P(n, x) = \frac{A(n, x) P(n-1, x) - B(n) P(n-2, x)}{E(n)} \quad \forall n \geq 2$$