Abstract

Here we find a general method for computing the limit of differences of consecutive terms of nth roots of weighted factorials by a sequence x_n (under some technical condition). As a consequence, we show that $\lim_{n\to\infty} \left(\sqrt[n+1]{(n+1)!x_{n+1}} - \sqrt[n]{n!x_n} \right) = \alpha e^{-1}$, where $\alpha \geq 1$ is the dominant root of the characteristic equation of an increasing linear sequence x_n, and e is Euler's constant.