DEFINITIONS

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Abstract. Definitions

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1. Definitions

- $T(n,k)$ recursively defines central factorial numbers of the second kind (in the context of Knuth and Riordan (see references)). It is defined in mathematica package as `CentralFactorialNumber1`

$$\begin{cases} T(n,1) & = 1 \\ T(n,n) & = 1 \\ T(n,k) & = T(n-1,k-1) + k^2 T(n-1,k) \end{cases}$$

- Identity in central factorial numbers defined as `CFNIdentity1` in mathematica package

$$(2k-1)!T(2n,2k) = \frac{1}{k}\sum_{j=0}^{k}(-1)^j \binom{2k}{j}(k-j)^{2n}$$

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- Identity in central factorial numbers defined as `CFNIdentity2` in mathematica package

$$(2k-1)!T(2n,2k)=\frac{1}{k}\sum_{j=0}^{k}(-1)^{k-j}\binom{2k}{k-j}j^{2n}$$

- Identity in central factorial numbers defined as `CFNIdentity3` in mathematica package

$$(2k-1)!T(2n,2k)=\frac{1}{2k}\sum_{j=0}^{2k}(-1)^{j}\binom{2k}{j}(k-j)^{2n}$$