

GENERALIZED CATALAN NUMBERS AND OBJECTS: X, Y EQUIVALENCE CLASSES AND POLYOMINOES

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ABSTRACT. There are numerous sets of combinatorial objects that are counted by the Catalan numbers, $C_n = \frac{1}{n+1} \binom{2n}{n}$, and many mathematicians have constructed bijections between these sets. The Catalan numbers can be generalized using the parameter k to obtain the family of sequences known as the k -Catalan numbers, $C_n^k = \frac{1}{kn+1} \binom{kn+1}{n}$. Here we present two new generalizations of Catalan sets to k -Catalan sets, k -Generalized x, y Equivalence Classes and k -Generalized Polyominoes, including a novel bijection between them.

KEYWORDS: *Catalan numbers, polyominoes*

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