

# Whitney duals and Whitney twins: a plausible approach to questions related to Whitney numbers

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## Abstract

The Whitney numbers of the first and second kind are a pair of invariants of a finite graded partially ordered set (poset) that are relevant in various areas of mathematics. In particular, they appear as the coefficients of the chromatic polynomial of a graph and enumerating regions in the complement of a hyperplane arrangement. Two graded posets are said to be Whitney twins if their Whitney numbers of the first and second kind are equal. They are said to be Whitney duals if (the absolute value) of their Whitney numbers of the first and second kind are swapped between the two posets. These notions were introduced by González D'León and Hallam when studying a particular family of poset-labelings that imply the existence of Whitney duals. In this talk, I will introduce these concepts and will present the main results in the theory of Whitney labelings. The results presented are joint work with Josh Hallam, Yeison Quiceno, and José Samper.

**Keywords:** Whitney numbers first/second kind, poset, chromatic polynomial, hyperplane arrangement.