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([jmartin@math.ku.edu](mailto:jmartin@math.ku.edu)). *Enumerating cellular colorings, orientations, tensions and flows*. Preliminary report.

We study the enumeration of colorings, orientations, tensions and flows in an arbitrary pure CW-complex  $X$ . These objects are defined via linear algebra and specialize to familiar graph-theoretic definitions in the dimension-1 case. Our results include closed-form and deletion-contraction formulas for the numbers of colorings, tensions and flows of  $X$  with values in  $\mathbb{Z}/k\mathbb{Z}$  or in  $\{0, \pm 1, \dots, \pm k\}$ ; sufficient conditions for these functions to be polynomials in  $k$ ; and reciprocity theorems (i.e., combinatorial interpretations of their evaluations at negative values of  $k$ ) inspired by Stanley's theorem on acyclic orientations. (Received September 24, 2012)