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Ghost Symmetries in the Plane

A "ghost symmetry" of a point configuration is a symmetry which appears in some projection of that configuration. Since it is easy to synthesize ghost symmetries by lifting points to higher spaces, ghost symmetries are more interesting when they are abundant. This talk presents a necessary and sufficient condition for the prescribability of a planar configuration to have 3 distinct ghost symmetries. In its statement and proof, the condition appears as an analogue of the classical characterization of 1-skeleta of convex 3-dimensional polytopes due to Steinitz.