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Carlos M. Nicolas* (cmnicola@uncg.edu), Mathematics and Statistics Department, University of North Carolina at Greensboro, NC 27402. *Interval decompositions of k -edges and applications.*

Given a set S of points in the plane, a k -edge interval is the set of k -edges of S whose normal vectors belong to a given interval of the unit circle. These intervals are complete in the following sense: any k -edge interval is equal to an i -edge interval for the set of vertices incident to its edges, for some $i \leq k$. This provides a recursive approach to the study of k -edges because k -edge intervals decompose into simpler edge-disjoint sub-intervals. Using this approach we obtain alternative proofs, sometimes simpler, for several properties of the set of k -edges such as the k -edge crossing identity and the current lower bound on the number of k -edges. (Received September 14, 2010)