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Blair D Sullivan* (sullivanb@ornl.gov), Oak Ridge National Laboratory, P.O. Box 2008, MS 6015, Oak Ridge, TN 37831. *Counting Paths in Digraphs.*

Say a digraph is k -free if it has no directed cycles of length at most k , for $k \in \mathbb{Z}^+$. Thomassé conjectured that the number of induced 3-vertex directed paths in a simple 2-free digraph on n vertices is at most $(n-1)n(n+1)/15$. We survey Bondy's proof that there are at most $2n^3/25$ such paths, and present the new result that, for the class of circular interval digraphs, a tight upper bound of $n^3/16$ holds. We also show an application of Bondy's result to the problem of bounding the number of (non-induced) 4-vertex paths in 3-free digraphs (we prove there are at most $4n^4/75$). (Received August 25, 2008)