

# Digraph conditions equivalent to certain Mal'tsev conditions

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By a 1973 result of Hagemann and Mitschke a variety is congruence  $n$ -permutable iff any edge in any reflexive directed graph compatible with the operations of an algebra of the variety is part of an  $n$ -circle. Accordingly, the  $n$ -permutability of a variety depends only on the set of digraphs admitted by it. Similarly, the  $n$ -permutability of a *locally finite* variety depends only on the *finite* digraphs admitted by it. In this talk, we show similar results for Taylor varieties and for varieties omitting TCT types 1 and 5. The graph conditions appearing here are rather nice, as they can be described by certain connectivity conditions of the admitted digraphs. We also consider the digraphs admitted by Polin's variety, which suggest that a digraph description for congruence modularity is hard to find, and possibly does not exist.