

A survey on graphs with a distinguishing partition

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Abstract

A *distinguishing partition* for an action of a group Γ on a set X is a partition of X that is preserved by no nontrivial element of Γ . As a special case, a distinguishing partition of a graph is a partition of the vertex set that is preserved by no nontrivial automorphism. Not all graphs admit a distinguishing partition – for example, the complete graph K_n for $n \geq 2$ does not admit a distinguishing partition – so a natural goal is to get a better understanding of which graphs admit such a partition. In this talk, we explore three items related to this goal. First, we look at known families of graphs that admit a distinguishing partition, particularly complete equipartite graphs. Second, we determine the maximum (and minimum) number of edges for a graph with connections between distinguishing partitions and the distinguishing number of a graph.

Keywords: vertex partition, graph, automorphism.