Claw-Free Equimatchable Graphs

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A graph is equimatchable if all of its maximal matchings have the same size. A graph is claw-free if it does not have a claw as an induced subgraph. Equimatchable graphs are formally introduced in 1984 [1]. From the structural point of view, all 3-connected planar equimatchable graphs and all cubic equimatchable graphs are determined in [2]. Equimatchable graphs with girth at least 5 are characterized in [3], while factor critical equimatchable graphs with vertex connectivity 1 and 2 are characterized in [4].

In this study, we provide, to the best of our knowledge, the first characterization of claw-free equimatchable graphs by identifying the equimatchable claw-free graph families. First, we show that the case of equimatchable claw-free even graphs or with independence number at most 2 are trivial. We then show that the remaining equimatchable claw-free graphs have connectivity at most 3. Based on this fact, we focus on 1-connected, 2-connected (based on a result of [4]) and 3-connected equimatchable claw-free odd graphs separately.

References

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