

Even orientations of graphs

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We examine the structure of 1-extendable graphs G which have no even F -orientation, where F is a fixed 1-factor of G . In the case of regular graphs, graphs of connectivity at least four and of graphs of maximum degree three, a characterization is given.

Terminology A graph G is 1-extendable if every edge belongs to at least one 1-factor. An *orientation* of a graph G is an assignment of a “direction” to each edge of G . Now suppose that G has a 1-factor F . Then an *even F -orientation* of G is an orientation in which each F -alternating cycle has exactly an even number of edges directed in the same fixed direction around the cycle.