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Some new results in extremal graph theory

Vladimir Nikiforov

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In recent years several classical results in extremal graph theory have been improved in a uniform way and their proofs have been simplified and streamlined. These results include a new Erdős-Stone-Bollobás theorem, several stability theorems, several saturation results and bounds for the number of graphs with large forbidden subgraphs. Another recent trend is the expansion of spectral extremal graph theory, in which extremal properties of graphs are studied by means of eigenvalues of various matrices. One particular achievement in this area is the casting of the central results above in spectral terms, often with additional enhancement. In addition, new, specific spectral results were found that have no conventional analogs. All of the above material is scattered throughout various journals, and since it may be of some interest, the purpose of this survey is to present the best of these results in a uniform, structured setting, together with some discussions of the underpinning ideas.

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