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两类广义控制问题的NP-完全性

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NP-completeness for two generalized domination problems

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摘要 研究两类广义控制问题的复杂性: k-步长控制问题和k-距离控制问题, 证明了k-步长控制问题在弦图和平面二部图上都是NP-完全的. 作为上述结果的推论, 给出了k-距离控制问题在弦图和二部图上NP-完全性的新的证明, 并进一步证明了k-距离控制问题在平面二部图上也是NP-完全的.

关键词: k-步长控制 k-距离控制   NP-完全性   弦图   平面二部图

Abstract: We study the complexity of two classes of generalized domination problems: k-step domination problem and k-distance domination problem. We prove that the decision version of k-step domination problem is NP-complete when instances are restricted to chordal graphs or planar bipartite graphs. As corollaries to the results, we obtain new proofs of the NP-completeness of k-distance domination problem for chordal graphs and bipartite graphs, and also prove that this problem remains NP-complete even when restricted to planar bipartite graphs.

Keywords: k-step domination, k-distance domination, NP-completeness, chordal graphs, planar bipartite graphs

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