

Strongly regular graphs with parameters (37, 18, 8, 9) having nontrivial automorphisms*

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Abstract

All strongly regular graphs having at most 36 vertices have been enumerated. Hence, the first open case is enumeration of the SRGs with parameters $(37, 18, 8, 9)$. In this paper we show that there are exactly forty SRGs with parameters $(37, 18, 8, 9)$ having nontrivial automorphisms. Comparing the constructed graphs with previously known SRGs with these parameters we conclude that six of the SRGs with parameters $(37, 18, 8, 9)$ constructed in this paper are new, and that up to isomorphism there are at least 6766 strongly regular graphs with parameters $(37, 18, 8, 9)$.

Keywords: Strongly regular graph, automorphism group, orbit matrix.

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Krepko regularni grafi s parametri (37, 18, 8, 9) in z netrivialnimi avtomorfizmi*

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Povzetek

Vsi krepko regularni grafi (KRG) z najmanj 36 točkami so popisani. Torej je prvi odprt primer popis KRG-jev s parametri $(37, 18, 8, 9)$. V tem članku dokažemo, da obstaja natanko štirideset KRG-jev s parametri $(37, 18, 8, 9)$ in z netrivialnimi avtomorfizmi. Če primerjamo konstruirane grafe s prej znanimi KRG-ji s temi parametri, vidimo, da je šest v tem članku konstruiranih KRG-jev s parametri $(37, 18, 8, 9)$ novih, in da obstaja, do izomorfizma natančno, najmanj 6766 krepko regularnih grafov s parametri $(37, 18, 8, 9)$.

Ključne besede: Krepko regularen graf, grupa avtomorfizmov, matrika orbit.

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