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The inner power of a graph

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Abstract

We define a new graph operation called the *k*th inner power. The construction—which is somewhat analogous to the *k*th power with respect to the direct product—seems to lend itself nicely to certain questions concerning cancellation over the direct product. We prove several results about bipartiteness and connectedness of inner powers, and we prove that the inner power distributes over the direct product. We explore a potential connection between inner powers and the problem of cancellation over the direct product.

Keywords: Graph products, graph operations, cancellation in graph products.

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Notranja moč grafa

Povzetek

Definiramo novo operacijo na grafih imenovano k -ti notranja potenca. Zdi se, da konstrukcija – ki je na nek način podobna k -ti potenci glede na direktni produkt – lepo ujema z določenimi vprašanji v zvezi s krajšanjem direktnega produkta. Dokažemo številne rezultate o dvodelnosti in povezanosti notranjih potenc, dokažemo pa tudi, da se notranja potenca porazdeli čez direktni produkt. Raziščemo možne povezanosti med notranjo potenco in problemom krajšanja direktnega produkta.

Ključne besede: Produkti grafov, grafovske operacije, krajšanje v grafovskih produktih.