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Connected geometric (n_k) configurations exist for almost all n

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Abstract

In a series of papers and in his 2009 book on configurations Branko Grünbaum described a sequence of operations to produce new (n_4) configurations from various input configurations. These operations were later called the "Grünbaum Incidence Calculus". We generalize two of these operations to produce operations on arbitrary (n_k) configurations. Using them, we show that for any k there exists an integer N_k such that for any $n \geq N_k$ there exists a geometric (n_k) configuration. We use empirical results for $k = 2, 3, 4$, and some more detailed analysis to improve the upper bound for larger values of k.

IN MEMORY OF BRANKO GRÜNBAUM

Keywords: Axial affinity, geometric configuration, Grünbaum calculus.

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Povezane geometrijske (n_k) konfiguracije obstajajo za skoraj vse n

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Povzetek

V vrsti člankov in tudi v svoji knjigi o konfiguracijah iz leta 2009 je Branko Grünbaum opisal zaporedje operacij, s katerimi se da dobiti nove (n_4) konfiguracije iz najrazličnejših vhodnih konfiguracij. Te operacije so bile kasneje imenovane "Grünbaumov incidenčni račun". Posplošimo dve od teh operacij in tako dobimo operacije na poljubnih (n_k) konfiguracijah. Z njihovo uporabo pokažemo, da za vsak k obstaja tako celo število N_k, da za poljuben $n \geq N_k$ obstaja geometrijska (n_k) konfiguracija. Uporabimo empirične rezultate za $k = 2, 3, 4$ ter z nekaj bolj podrobnimi analizami izboljšamo zgornjo mejo za večje vrednosti k.

V SPOMIN NA BRANKA GRÜNBAUMA

Ključne besede: Aksialna afiniteta, geometrijska konfiguracija, Grünbaumov račun.

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