

A generalization of the parallelogram law to higher dimensions

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Abstract

We propose a generalization of the parallelogram identity in any dimension $N \geq 2$, establishing the ratio of the quadratic mean of the diagonals to the quadratic mean of the faces of a parallelotope. The proof makes use of simple properties of the exterior product of vectors.

Keywords: Parallelogram law, parallelotope.

Math. Subj. Class.: 51M04

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Posplošitev paralelogramskega zakona na višje dimenzije

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Povzetek

Predstavimo posplošitev paralelogramske identitete v poljubni dimenziji $N \geq 2$, s tem da določimo razmerje kvadratne sredine diagonal in kvadratne sredine lic paralelotopa. Dokaz uporablja enostavne lastnosti zunanlega produkta vektorjev.

Ključne besede: Paralelogramski zakon, paralelotop.

Math. Subj. Class.: 51M04

*Verjetno ne bi nikoli napisal tega članka brez podpore mojega sina Marcella. Toplo se mu zahvaljujem, še posebej ker mi je pomagal najti formulo za tri-dimenzionalni primer.

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