

CONSTRUCTING MATRIX GEOMETRIC MEANS*

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Abstract. In this paper, we analyze the process of “assembling” new matrix geometric means from existing ones, through function composition or limit processes. We show that for $n = 4$ a new matrix mean exists which is simpler to compute than the existing ones. Moreover, we show that for $n > 4$ the existing proving strategies cannot provide a mean computationally simpler than the existing ones.

Key words. Matrix geometric mean, Positive definite matrix, Invariance properties, Groups of permutations.

AMS subject classifications. 65F30, 15A48, 47A64, 20B35.

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