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A Simple (?) Geometric Question with Deep Consequences for BMO Functions

I will pose and invite you to solve a seemingly rather simple geometric/combinatoric question. My coauthors and I have discovered that an affirmative answer to this question would have some very interesting consequences in analysis. They relate to the very important function space BMO (of functions of Bounded Mean Oscillation). I will briefly describe BMO, and mention some of its remarkable properties and connections with harmonic analysis and complex analysis. Special cases of one of our results give alternative proofs of the celebrated John-Nirenberg inequality for BMO functions. An affirmative answer to the above-mentioned question would lead to a version of the John-Nirenberg inequality with dimension free constants. A more extensive version of this abstract and a first version of our detailed paper etc. are available at <http://www.math.technion.ac.il/%7Emcwikel/bmo>

This is joint work with Yoram Sagher and Pavel Shvartsman.