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L'Hospital Type Rules for Oscillation, with Applications

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Abstract:

An algorithmic description of the dependence of the oscillation pattern of the ratio f/g of two functions f and g on the oscillation pattern of the ratio f'/g' of their derivatives is given. This tool is then used in order to refine and extend the Yao-Iyer inequality, arising in bioequivalence studies. The convexity conjecture by Topsøe concerning information inequalities is addressed in the context of a general convexity problem. This paper continues the series of results begun by the l'Hospital type rule for monotonicity. Other applications of this rule are given elsewhere: to certain information inequalities, to monotonicity of the relative error of a Padé approximation for the complementary error function, and to probability inequalities for sums of bounded random variables.



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