ASYMPTOTIC BEHAVIOR OF INTERMEDIATE
POINTS IN CERTAIN MEAN VALUE THEOREMS

Tiberiu Trif

Especially in the last three decades a great deal of work has been done in connection with the asymptotic behavior of intermediate points in certain mean value theorems. The investigations in this direction started with the paper by A. G. Azpeitia [Amer. Math. Monthly 89 (1982), 311-312], dealing with the asymptotic behavior of the intermediate point in the Lagrange-Taylor mean value theorem. A significant step forward was realized by U. Abel [Amer. Math. Monthly 110 (2003), 627-633], who obtained a complete asymptotic expansion of the intermediate point in the Lagrange-Taylor mean value theorem when the length of the involved interval approaches zero. Later, following Abel's method of proof, similar complete asymptotic expansions have been obtained by several authors for other mean value theorems (U. Abel and M. Ivan [J. Math. Anal. Appl. 325 (2007), 560-570] for the differential mean value theorem of divided differences, A. Xu, F. Cui and Z. Hu [J. Math. Anal. Appl. 365 (2010), 358-362] for the differential mean value theorem of divided differences with repetitions, T. Trif [J. Math. Inequal. 2 (2008), 151-161] for the Pawlikowska mean value theorem).

The purpose of the present talk is to present some results concerning the asymptotic behavior of the intermediate points in certain mean value theorems as the involved interval shrinks to zero.