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An Application of the LLL Algorithm in Number Theory

The Mertens conjecture if proven to be true would imply one of the millennium problems, the Riemann Hypothesis. Odlyzko and te Riele disproved this conjecture by utilizing the Lenstra-Lenstra-Lovász algorithm (LLL). Moreover, the LLL algorithm can efficiently provide solutions for the problem of simultaneous Diophantine approximation. The purpose of this project is to study applications of the LLL algorithm, namely, Diophantine approximation and Mertens conjecture.