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JONES' WORK ON HILBERT'S TENTH PROBLEM AND RELATED TOPICS

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Abstract

This paper is a survey of modern results on Hilbert's tenth problem (especially the work of Prof. James P. Jones). It consists of six sections: 1. Hilbert's tenth problem; 2. The nine unknowns theorem; 3. Universal Diophantine equations; 4. Classification of quantifier prefixes over Diophantine equations; 5. Diophantine representations; 6. Applications of Hilbert's tenth problem. Some new results due to the author, such as the undecidability of $\exists^{11}$ over $\mathbb{Z}$, are also mentioned in the survey.