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Independence in computable algebra

An old observation of Mal'cev is that there are two non-computably-isomorphic presentations of the infinite-dimensional vector space over \mathbb{Q} : the standard copy with a computable basis and a second copy with no computable basis. We will introduce the setting of an abstract r.i.c.e. pregeometry and give sufficient conditions for an algebraic structure to have a computable presentation with a computable basis and a computable presentation with no computable basis. We will mention applications to particular algebraic structures such as differentially closed fields and real closed fields.